

# ORANGE COUNTY BOARD OF COMMISSIONERS

## AGENDA

BOCC Work Session  
August 30, 2012  
Meeting – 7:00 p.m.  
Southern Human Services Center  
2501 Homestead Road  
Chapel Hill, NC

- |                |    |   |
|----------------|----|---|
| (7:00 – 7:45)  | 1. | District Court House Tour – Court Programs Overview   |
| (7:45 – 9:45)  | 2. | Draft Comprehensive Assessment of Emergency Medical Services<br>and 911/ Communications Center Operations Study |
| (9:45 – 10:00) | 3. | Report on Paperless Agendas   |

**ORANGE COUNTY  
BOARD OF COMMISSIONERS**

**ACTION AGENDA ITEM ABSTRACT**

**Meeting Date:** August 30, 2012

**Action Agenda  
Item No. 1**

**SUBJECT:** District Court House Tour – Court Programs Overview

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**DEPARTMENT:** Administrative Office of the  
Court and Sheriff's Department

**PUBLIC HEARING: (Y/N)**

No
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**ATTACHMENT(S):**  
Orange County District Court House Tour  
– Court Programs Overview

**INFORMATION CONTACT:**  
Joseph M. Buckner, Chief District Court  
Judge  
Sheriff Lindy Pendergrass

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**PURPOSE:** To receive a presentation from Chief District Court Judge Joseph M. Buckner.

**BACKGROUND:** Judge Joseph M. Buckner will present an overview of Court Programs in Orange County including the following:

1. Current Jail Situation
2. Sentencing Changes for Misdemeanants
3. Pretrial Services
4. Drug Treatment Court
5. Community Resource Court
6. District Court Mediation

Judge Buckner and Sheriff Lindy Pendergrass will be available to answer any questions regarding the operation of the Jail and District Court operations.

**FINANCIAL IMPACT:** There is no financial impact associated with receiving the presentation.

**RECOMMENDATION(S):** The Manager recommends the Board receive the Court Programs presentation. Questions and discussion of related issues will be addressed by Judge Buckner and Sheriff Pendergrass. County staff has been researching the current pre-trial release program issue. Results of that effort will be provided once complete.

# Orange County District Court House Tour

## Court Programs Overview

Hillsborough, NC  
January 23, 2012

### Current Jail Situation

- ❖ The Orange County Jail averages around 165 inmates per day
- ❖ The jail is filled nearly to capacity
- ❖ By housing and transporting federal inmates, the Sheriff's Department brings revenue in through federal reimbursements
- ❖ Approximate Average Daily cost per inmate - \$63.65
- ❖ Total projected cost for upcoming fiscal year - \$3,815,127

## Sentencing Changes for Misdemeanants

- 90 days or less - Placed in jail; no change here.
  - Funded through local government
- **Between 90 days and 180 days – Law passed in 2011 places these offenders in county jails, reimbursed by the DOC**
  - **a local cost.**
- Over 180 days – Placed in Prison
  - Funded by Dept. of Corrections

## Pretrial Services

- Provides the judge with release from jail options for offenders -

- ❖ Supervision for offenders with pending charges
- ❖ Investigates inmates for appropriate recommendation
- ❖ Facilitates placements for problems that manage offender risk factors such as mental health or substance abuse treatment
- ❖ Pro-active on strike order supervision, preventing jail costs on the “front end” as well as avoiding costs after arrest

## Pretrial Services Creates a Social Safety Net:

- ❖ Calls attention to poor risk factors & revokes non-compliance promptly with re-arrest
- ❖ **TREMENDOUS COST SAVINGS:**
  - ❖ 300 inmates released through pretrial at a savings of \$70 per day annually **Example:** average 12 days saved per defendant X \$70/ day (jail costs) X 300 releases = \$252,000 saved
- ❖ Cost sharing of overhead ended with state grant 6/30/2011
- ❖ **Admissions for services increased 100% from two years ago**
  - ❖ \$54,000 increase needed to cover program costs over the \$70,000 allocation from last year @ 70% cost in 15-B
  - ❖ cost sharing of overhead ended with state grant last fiscal year

- ❖ Goal: Drug Treatment Court
  - ❖ Rehabilitate drug and alcohol offenders while also saving our justice and judicial system's valuable resources in the long run.
- ❖ Method:
  - ❖ Hold chemically dependent offenders accountable by requiring them to meet rigorous court ordered treatment plans for a MINIMUM of 12 months.
- ❖ Results:
  - ❖ Over 2/3 remain in treatment for over six months.
  - ❖ **Overall: Effective in rehabilitating offenders while also saving resources.**

### Problem:

#### Drug Treatment Court's State Funding Cut

- ❖ In the state budget, Drug Treatment Courts were eliminated leaving district courts searching for funding from local and other sources.
- ❖ For FY 2011/12 – Orange County Commissioners approved \$67,000 to keep the court operational
- ❖ In 2011 DTC served 61 offenders and graduated 13. Currently, we have 38 participants in this court, 3 of which are in long term residential programs.

### **DTC Cost Savings**

- An example of cost savings: From July to September 2011, we had 5 graduates with suspended sentences totaling over 7 years in prison, however, they served a combined 12 days jail while in DTC, totaling \$763.80 (12 days jail\* 63.65). This county and the state did not have to pay for approximately 2543 days of jail/prison, or approximately \$161,862.

## Community Resource Court

- ❖ **Goal of Community Resource Court:**
  - ❖ Collaboration between mental health and judicial professionals to provide support for offenders suffering from diagnosed mental health conditions.
- ❖ **Method:**
  - ❖ Require these offenders to complete CRC court, as a way to keep them out of trouble, rehabilitate them, provide support, and eventually have their charges dropped.
- ❖ **Results :**
  - ❖ Around 50 participants per year/Orange Co. only – (54 in 2010)
  - ❖ Graduation rate has averaged 50% over the last 10 years.
  - ❖ Local studies show recidivism is slowed after CRC involvement.

## **What is Community Resource Court? (CRC)**

*CRC was created to address the treatment needs of people with mental health issues who became involved with the criminal courts.*

- Links offenders with services and supports that help them to better manage their mental illness.
- Also called “Mental Health Court” because it helps people address their mental health needs as well as helping them to be law abiding residents.
- Funding is \$189,000 per year which comes from DHHS and covers the salary and expenses of the program manager and care coordinator-covers both Orange and Chatham Counties
- Currently there are no funds that cover court administrator, judges, or attorneys time.
- **The total number served since 2000 in Orange County: 780**

## Dispute Settlement Center

*Mission: "to promote and bring about the peaceful settlement of disputes and prevent the escalation of conflict through mediation, facilitation, conciliation and training."*

- ❖ The Dispute Settlement Center is the original and model mediation center in NC, founded in 1978 by concerned citizens with support of Orange County Board of County Commissioners.
- ❖ DSC serves 3000 people a year through Mediation, Public Disputes, Training and Youth Programs.

## Dispute Settlement Center

### District Court Mediation

- ❖ DSC's core program for over 30 years
- ❖ FY 12 state budget eliminated the allocation to DSC for court mediation: \$60, 227
- ❖ Mediators worked with an average of 200 cases/year with 85% resolution rate for mediated cases
- ❖ Mediation saves court time and effectively moves cases through the system

**ORANGE COUNTY  
BOARD OF COMMISSIONERS**

**ACTION AGENDA ITEM ABSTRACT**

**Meeting Date:** August 30, 2012

**Action Agenda**

**Item No.** 2

**SUBJECT:** Draft Comprehensive Assessment of Emergency Medical Services and 911/  
Communications Center Operations Study

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**DEPARTMENT:** Emergency Services

**PUBLIC HEARING: (Y/N)**

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**ATTACHMENTS:**

Draft Comprehensive Assessment of  
Emergency Medical Services &  
911/Communications Center  
Operations Study  
Comprehensive Assessment of  
Emergency Medical Services &  
911/Communications Center  
Operations Study Presentation

**INFORMATION CONTACT:**

F. R. Montes de Oca, 919-245-6100  
Michael Talbert, 919-245-2153

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**PURPOSE:** To receive a presentation on the Draft Comprehensive Assessment of Emergency Medical Services & 911/Communications Center Operations Study dated August 30, 2012, which has been reviewed and evaluated by the Emergency Services Workgroup (ESW) with comments incorporated into the Draft Study.

**BACKGROUND:** The Orange County Emergency Medical Services (EMS) provides pre-hospital care and transport to residents and visitors throughout the County. Originated from volunteer services, Orange County EMS began providing advanced life support ambulances in the 1980's. EMS is a branch of the Orange County Emergency Services Department and is staffed by dedicated paramedics and Emergency Medical Technicians around the clock. The EMS branch is the largest and highest-profile group within the department providing emergency response, patient care and patient transport from 400 square miles covering densely-populated urban settings to rural areas throughout the County. In addition to responding to 10,700 calls annually, EMS must be able to address extraordinary events such as multi-casualty incidents, large sporting events, stock car races and mass gatherings, assist at fires, evacuations and other disaster situations affecting public safety.

The Orange County 911 Center is the public safety answering point for residents to access emergency services agencies. It originated in the former Orange County Sheriff's Office at Columbia and Rosemary Streets in Chapel Hill. It is a branch of Orange County Emergency Services and is staffed by dedicated professionals around the clock.

On December 13, 2011 the Board discussed the Emergency Medical System Delivery and E911 Communications Center improvements. There was consensus that the County needed to develop a strategic plan to improve the County's Emergency Management Services Delivery System and E911 Communications Center. The Charge for the ESW included reviewing alternatives and making recommendations for the following:

System improvements for EMS Ambulance response times including but not limited to equipment, staffing, facility's and/or a strategic plan, to define data elements for meaningful analytical data as related to ambulance response time and to discuss and review that data.

Improvements for the E911 Communications Center including but not limited to technology, equipment, staffing, training and/or a strategic plan.

On March 22, 2012 the Board approved a contract with Solutions for Local Government, Inc. to develop a multi-year strategic plan addressing Emergency Medical Services System and E911 Communications Center needs.

**FINANCIAL IMPACT:** There is no financial impact to receiving the Draft Comprehensive Assessment of Emergency Medical Services & 911/Communications Center Operations Study.

**RECOMMENDATION(S):** The Manager recommends that the Board receive the presentation on the Draft Comprehensive Assessment of Emergency Medical Services & 911/Communications Center Operations Study dated August 30, 2012 and provide comments and direction to staff. The next steps will be the acceptance of the Study and incorporation of the recommendations into the Fiscal Year 2013/14 Annual Budget & Capital Investment Plan along with appropriate increases in future operational budget funding.

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Orange County, North Carolina



**Draft Report**

**Comprehensive Assessment of Emergency Medical Services  
&  
911/Communications Center Operations Study**

**30 August 2012**

Prepared by:  
**Solutions for Local Government, Inc.**

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## SECTION 1-INTRODUCTION

### STUDY SCOPE

Emergency medical Services (EMS)

911/Communications Center

### THE PROCESS

Coordination

Resources

Data Development

### REPORT ORGANIZATION

Emergency medical Services

County Population

911/Communications Center

Probable Costs

Implementation Schedule

Appendix

### SUMMARY OBSERVATIONS

## SECTION 2-EMERGENCY MEDICAL SERVICES (EMS)

### 2.1 HISTORICAL & STATUTORY REFERENCES

As a means of introduction to the information and issues discussed in this report section, the references that follow are provided for context and background. They are excerpted from several sources; including the North Carolina General Statutes

#### EMS

In 1971 the General Assembly directed the Legislative Research Commission to study emergency medical care in North Carolina. The Commission's study resulted in the Emergency Medical Services Act of 1973 (G.S. 143, Article 56). The Act established the State's Emergency Medical Services (EMS) Program within the State Department of Human Resources (now the Department of Health and Human Services). The Office of Emergency Medical Services administers the State's EMS program, which is placed in the Division of Facility Services of the Department of Health and Human Services (G.S. 143-508). Two state agencies regulate the program. The North Carolina Medical Care Commission adopts the rules and standards that govern ambulance licensure and basic life support services, and the North Carolina Medical Board adopts rules and standards governing advanced life support services.<sup>1</sup>

The Office of Emergency Medical Services (OEMS) is responsible for ensuring that emergency treatment centers are available throughout the state, inspecting and permitting ambulances, licensing ambulance service providers, certifying ambulance personnel, designating trauma centers and a state poison-control center, and assisting in the development of a statewide EMS communications system. Neither the State nor the regional EMS offices are engaged in the actual delivery of emergency medical services in North Carolina. That responsibility is taken on by agencies and organizations at the local level, the principal being County government.

G.S. 153A-250 identifies County responsibilities and authority in this regard. Counties may franchise ambulance services via adopted ordinance(s), or operate its ambulance services directly.

The following North Carolina Administrative Code subsections provide the most current definition and explanation of EMS *System* Requirements.

.0102(25) EMS System- a coordinated arrangement of local resources under the authority of the county government (including all agencies, personnel, equipment, and facilities) organized to respond to medical emergencies and integrated with other health care providers and networks including public health, community health monitoring activities, and special needs populations.

G.S. 143-517 Each county shall ensure that emergency medical services are provided to its citizens.

#### 10A NCAC 13P .0201 EMS SYSTEM REQUIREMENTS

.0201(a) County governments shall establish EMS Systems. Each EMS System shall have:

- A defined geographical service area for the EMS System.
- The minimum service area for an EMS System shall be one county.
- There may be multiple EMS Provider service areas within the service area of an EMS System.
- The highest level of care offered within any EMS Provider service area must be available to the citizens within that service area 24 hours per day;

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<sup>1</sup> A. Fleming Bell and Warren Jake Wicker; County Government in North Carolina; Inst. of Government, UNC at Chapel Hill; 1998.

The actual operation of local services is financed entirely at the local level. If the County operates an ambulance service as a line department, it may establish rates, fees, and charges to be collected by the service and it may appropriate County funds to the service (G.S. 153A-250).

By statute, all ambulance service providers in North Carolina must be licensed by the State (G.S. 131E-151.1), each vehicle that is operated as an ambulance must be permitted by the State (G.S. 131E-156), and all assigned ambulance personnel must be certified by the State (G.S. 151E-158).

### **Medical Direction**

"Medical Oversight" refers to the responsibility for the management and accountability of the medical care aspects of an EMS System. Medical Oversight includes physician direction of the initial education and continuing education of EMS personnel or medical (responder) crew members; development and monitoring of both operational and treatment protocols; evaluation of the medical care rendered by EMS personnel or medical (responder) crew members; participation in system or program evaluation; and directing, by two-way voice communications, the medical care rendered by the EMS personnel or medical (responder) crew members. Subsequently, the County's "Medical Director" is the physician responsible for the medical aspects of the management of an EMS System, or Trauma Center.

Subsequently, the Medical Director in Orange County is a licensed, practicing physician whose responsibilities with regards to the County's EMS operation ultimately include certification, medical control, and the continuing education of its employees.

### **Level of Care**

"Level of Care" refers to the level of training and legal certification held by the caregiver or responder. Individuals are certified based on their highest completed level of training. 10 NCAC 3D and 21 NCAC 32H are quite specific with regards to the type of care, procedures, and medications that can be administered by individuals at each level of certification. In North Carolina there are four (4) levels of certification assigned to EMS providers. The brief descriptions provided below are those defined by the North Carolina Office of Emergency Medical Services (NCOEMS). *The Medical Responder (MR) and Emergency Medical Technician-Basic (EMT-B) levels are referred to as "Basic Life Support", or BLS. The remaining levels of care; EMT-I, and EMT-P, are referred to as "Advanced Life Support", or ALS.*

**Medical Responder (MR):** Assists pre-hospital technicians in providing basic life support (BLS) care; follows training guidelines of first responders per USDOT.

**Emergency Medical Technician-Basic (EMT-B):** Second level of BLS; individuals trained in advanced first aid, measuring vital signs, CPR, oxygen therapy, etc. intended to take advantage of automatic and semi-automatic external cardiac defibrillators for on-scene defibrillation of patients risking sudden death from ventricular defibrillation; additional training includes advanced airway and administration of epinephrine.

**Emergency Medical Technician-Intermediate (EMT-I):** Allowed to use advanced airway devices, provide intravenous fluid replacement, administer various medications used to correct diabetic, narcotic overdose, respiratory emergency, allergic reactions, and use of automatic and semi-automatic defibrillators.

**Emergency Medical Technician-Paramedic (EMT-P):** In addition to all previous skills, trained in techniques of cricothyrotomy, needle chest decompression, urinary catheter insertion and nasal intubations; in addition to administration of a broad range of medications.

## 2.2 EXISTING CONDITIONS

Organizationally, Emergency Medical Services (EMS) in Orange County is provided as a major division within the Orange County Emergency Services Department. Subsequently, the EMS “system” designation as registered with the North Carolina Office of Emergency Medical Services (OEMS) is “Orange County”.

The requirements that must be met to become certified as an “EMS System” in North Carolina are identified in Administrative Code Section 10 NCAC 13P .0201; which is included in the Appendix section of this report.

The system response area consists of the 398 square miles (US Census Bureau) that lie within and comprise the boundaries of Orange County. According to the North Carolina Office of Management and Budget, the estimated July 2011 County population was 135,776 residents.

EMS services, per statute, are available 24 hours per day, 365 days per year. The EMS Unit is managed on a day-to-day basis by an Operations Manager, with the rank of Captain, who currently reports directly to the Emergency Services Department Director. Additional full-time administrative personnel include a Training Officer, and a Staff Operations Officer. Technical support within the department is provided as needed by personnel currently assigned to the Planning & Logistics Unit.

Operations personnel include four (4) Shift Supervisors, 36 certified Paramedics and 23 certified Emergency Medical Technicians (EMT’s); including the Division Manager, the Operations Officer, and the Training Officer, a total of 66 full-time employees at the present time. In addition, EMS also has access to a small contingent of certified part-time employees that are able to fill in during staff vacations, absences, or when position vacancies occur.

Orange County EMS is certified as a “Paramedic” level agency by the State, which designates them as an advanced life support (ALS) provider. This system certification level requires that any time an ambulance responds to a medical emergency, it must have at least one (1) certified Paramedic level EMT on board.

The County is a single EMS district which comprises the referenced 398 square miles of the County. The County’s current EMS Plan on file with the State OEMS, states that a minimum of five (5) EMT-Paramedic ambulances, will be staffed and available within the County 24 hours per day.

Currently, the highest concentration of population within the County, and subsequently the highest percentage of EMS calls occur within and proximate to the adjacent, south county municipalities of Carrboro and Chapel Hill.

### Personnel & Vehicle Deployment

During the period of this study, EMS employees worked either 24-hour or 12-hour shifts. The 24-hour schedule includes one (1) 24-hour shift followed by 72 hours off plus mandatory call-back duty 1-2 times per month. The 12-hour schedule utilizes an alternating two and three day sequence of days worked and days off; i.e. 2-days work, 2-days off, 3-days work, 3-days off, 2 days work, etc. And, as stated, each on-duty ambulance must be staffed with no less than two (2) certified EMT’s-at least one of which must be certified at the Paramedic level. **NOTE: The EMS Division, effective July 27<sup>th</sup>, is transitioning to all 12-hour shifts.**

Shift Supervisors, are certified EMT-Paramedics, and are on duty during every shift. And, although having numerous administrative, oversight, and quality assurance responsibilities as the senior member of the shift, they are also, by virtue of the vehicle that they are assigned, able to respond to any medical emergency if needed. Their vehicle, while not OEMS certified as a *transport vehicle*, is equipped with the necessary equipment, medications, and supplies to enable the responding Paramedic Supervisor to initiate treatment in any incident to which they may be called

The ambulances assigned to EMS shift personnel are referred to by their “unit” designation; for example, “Medic 1”. Medic 1, Medic 2, Medic 3, and Medic 4 are currently designated as 24 hour units, while Medic 5 (6am-6pm) and Medic 8 (6pm-6am) combine to provide the fifth 24-hour ambulance referenced in the EMS System Plan. In addition, two (2) “prime-time” ambulances; Medic 6 (9am-9pm) and Medic 7 (12 noon-midnight) are assigned to the Chapel Hill and Carrboro area seven days per week.

Figure 1  
EMS Unit Assignments

Unit	Hours	Location	
<b>Medic 1</b>	24/7	Revere Rd.	Hillsborough
<b>Medic 2</b>	24/7	Roberson St.	Carrboro
<b>Medic 3</b>	24/7	Mason Farm Rd.	Chapel Hill
<b>Medic 4</b>	24/7	Mt. Willing Rd.	Efland
<b>Medic 5</b>	12/7 6am-6pm	[Phelps Rd. Location Pending]	N. Orange Co.
<b>Medic 6</b>	12/7 9am-9pm	Eubanks Rd.	Chapel Hill
<b>Medic 7</b>	12/7 12pm-12 am	TBD	Chapel Hill
<b>Medic 8</b>	12/7 6pm-6am	Roberson St.	Carrboro

**EMS Response Zones**

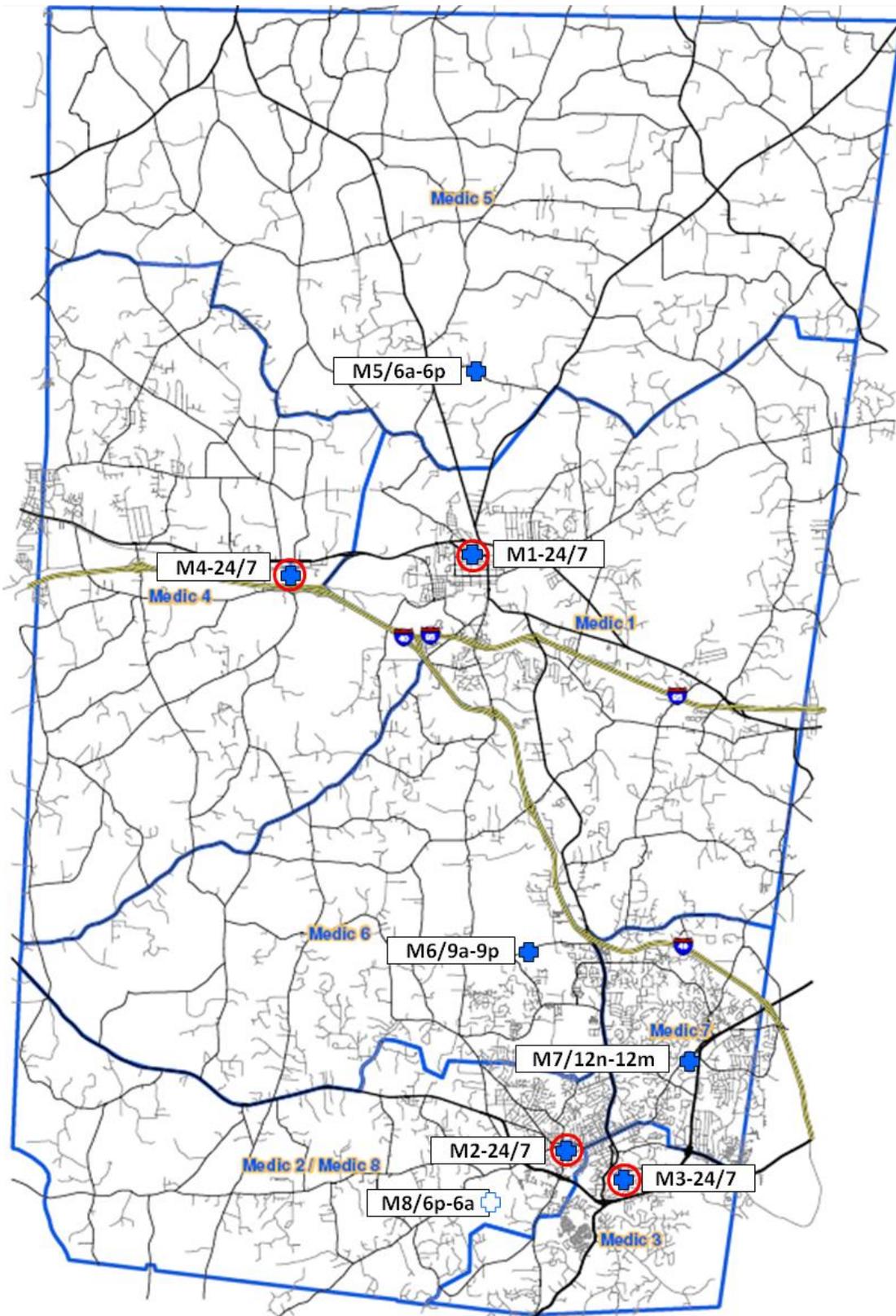
The diagram that follows identifies the currently designated EMS District boundaries within Orange County as well as the vehicle and staff staging locations referenced above.

As the County has grown in population and the corresponding EMS annual call volume has grown with it, EMS has evolved, out of necessity, from a traditional “static” model of ambulance location and deployment to a modified “system status” model of vehicle deployment in an effort to keep pace with call demand as well as citizen expectations of providing timely response.

It is not unusual during the busiest hours of the day, for EMS to be down to one (1) or “no” ambulances available to respond to the next incoming 911 call requesting emergency medical assistance somewhere in the county. For example, referring to the County EMS map that follows, say that Medic 1, 6, and 7 are each on scene at three separate emergencies, Medic 4 and 8 are each at different hospitals with recently transported victims, Medic 2 is enroute to a hospital with a victim, and Medic 3 has just been dispatched to a highway accident with injuries. At this point, Medic 5, normally staged in the northern area of the County, would be directed to “move-up” to either the Hillsborough or the Hampton Point area to be closer to the center of the County and in turn more readily available to respond in any direction if called; at least until another ambulance becomes available.

Medic Units were directed to “move-up” to address ambulance shortages 2,360 times in 2011.

Figure 2  
Existing EMS Districts & Staging Locations



## Training & Certification

In North Carolina, the successful completion of established minimum training requirements must occur before an individual can be certified to work as a Medical Responder (MR), Emergency Medical Technician (EMT), or Paramedic. This applies to both volunteer and paid/career participants.

The current training hours that must be successfully completed to receive certification at either level are as follows:

**Figure 3**  
**Minimum Training Hours Required per Level of Certification**

Certification Level	Hours
<b>Medical Responder</b>	<b>69</b>
<b>EMT-Basic</b>	<b>169</b>
<b>EMT-Intermediate; in addition to "Basic" hours</b>	<b>256</b>
<b>EMT-Paramedic; in addition to all "Basic" &amp; "Intermediate" hours</b>	<b>1,096</b>

In addition to the minimum hours required for certification, continuing education is also required of all Department field personnel. The current *minimum* requirement is 36 hours per year, per employee.

While EMS is not currently allocated designated Field Training Officer (FTO) positions, newly hired employees, particularly trainees, are assigned to work with a senior Paramedic who will serve as such for at least the employee's orientation and/or initial probationary period.

The EMS Division Training Officer is responsible for organizing, implementing, certification, oversight and documentation of all training activities within EMS as directed by the EMS Operations Supervisor. In addition to direct training responsibilities for department personnel, the Training Officer is also responsible for re-credentialing (per state requirements) all personnel every four (4) years, providing a continuing education annually to each certified fire department or rescue squad medical first responder, as well as serving as the principal contact and liaison with the State Office of Emergency Medical Services (NCOEMS) with regards to medical protocols, agency and individual licensures, and the receipt and implementation of new/updated EMS practice policy as it is issued by the State. The Training Officer will also work closely and coordinate activities with the Medical Director.

## Communications & Dispatch

While the emergency medical operations discussed in this report section address predominately those activities that require the movement of personnel with special vehicles, skills, and equipment to the scene of the emergency reported, it is the actual **reporting** of that emergency which gets everything started.

In this instance, the County's 911/Communications Center is also an operational division of the Orange County Emergency Services Department. It is located on the second level of the Emergency Services Administration building at 510 Meadowlands Drive in Hillsborough. In the professional terminology of the communications industry, the Communications Center is the designated *public safety answering point*, or PSAP, for emergency communications in Orange County.

The Center operates 24 hours per day and is continuously staffed by Telecommunicators who receive, dispatch calls for not only EMS, but Fire, Rescue, and Law Enforcement throughout the County.

**DRAFT REPORT**

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In the case of EMS calls, once the Dispatcher (Telecommunicator) receiving the 911 call is able to verify the location of the incident being reported, he/she will notify (dispatch) the EMS team/station that is responsible for responding to that call's location.

"Emergency Medical Dispatch" (EMD) is a level of certification that enables Telecommunicators that answer 911 medical emergency calls to, while simultaneously dispatching an ambulance, offer the caller instructions in first aid; e.g. CPR, compression/abatement of serious bleeding, making the victim comfortable, etc; while also obtaining information from the caller as to circumstances and medical indications that then can be communicated to the EMS responders on their way.

These procedures require the activation of medical protocols that must be approved by the County's Medical Director and must be reviewed per State requirements for quality assurance on a regular basis. In a County the size of Orange with EMS response times as they are, these capabilities can and often do prove valuable at the very least in initiating patient care.

The Communications Center also maintains call log reports, on every call received and dispatched which include the type of incident being reported, the agency(s) dispatched, location of the incident, and dispatch and response activity interval times.

**First Response**

In general terms EMS Division employees are considered "first responders" to any emergency to which they are dispatched; as are fire, specialized rescue, and law enforcement personnel. Realistically, however, an EMS ambulance may in fact *not* be the first unit or service on the scene of a medical emergency.

In Orange County's case, a "first responder" in medical emergencies could best be described as; *The first EMS, Rescue, Fire service person to arrive at the scene, with or without an ambulance, and initiate medical assistance in an effort to stabilize the patient until advanced life support capabilities arrive to administer additional aid and/or transport.*

Of course under the County's EMS System Plan and State regulations the individual responding in these instances and the agency the individual represents must be certified as Medical Responders by the State.

In Orange County, the identified first responders to medical emergencies include the ten (10) volunteer or combination paid/volunteer fire departments within the County, the two career/municipal fire departments and South Orange Rescue Squad.

- Caldwell Fire Department
- City of Carrboro Fire Department
- Cedar Grove Fire Department
- City of Chapel Hill Fire Department
- Efland Fire Department
- Eno Fire Department
- Hillsborough/Orange Rural Fire Department
- Mebane Fire Department
- New Hope Fire Department
- North Chatham Fire Department
- Orange Grove Fire Department
- White Cross Fire Department

Currently Carrboro Fire Department is certified at the EMT level while the remaining departments are certified at the Medical Responder (MR) level.

In addition to these identified Fire Departments, the South Orange Rescue Squad (SORS) is also available for dispatch to medical emergencies and is certified at the EMT level. The Squad shares a unique relationship with Orange County EMS both in that 36 of its 57 certified members are also listed on the Orange County EMS roster on file with the NCOEMS and, that members share duties with EMS employees on Medic Unit 8 on an alternating 3-4-3 day schedule which also includes the use of SORS' 2 BLS ambulances.

Two significant factors necessitate the need for agencies, *in addition to EMS*, to provide medical first response;

- First, the obvious; time is critical in medical emergencies; and,
- Second, during peak daytime hours there may be seven (7) staffed ambulances with transport capabilities based at but five (5) designated staging locations throughout the County's 398 square mile area.

Compare this with the combined (potential) capabilities of the 12 Fire departments and one Rescue Squad that are (or could be) available to respond from 19 additional station locations within the same 398 square miles as EMS. It becomes an issue of proximity if nothing else.

Subsequently, in as much as time is critical, first responders with basic skills, once on the scene can offer significantly to the stabilization of the victim until paramedic level responders arrive; i.e. . . ., "get there fast and stabilize the victim until advanced life support assistance arrives".<sup>2</sup>

### **Dispatchers as First Responders**

In significant medical emergencies, the Telecommunicator (Dispatcher) handling the call will simultaneously answer the call, solicit vital information, alert and dispatch the appropriate EMS unit, maintain communications with the caller *and* initiate medical instructions, all while *also* maintaining ongoing communications with the EMS unit responding. Typically, in a serious emergency situation, this communication with the caller/victim will continue until the responding EMT's (paramedics) have communicated that they are on the scene and have assumed patient care.

"Emergency Medical Dispatch" (EMD) certification is required before a Telecommunicator can issue treatment instructions of any kind to a victim or caller. This is a significant designation which requires that a specific set of protocols be followed when receiving and handling emergency medical calls.

In calls involving medical emergencies, a significant responsibility of the Telecommunicator relates specifically to these EMD protocols. In this instance the Telecommunicator will remain on the line with the caller to obtain as much additional patient/victim information as possible since they must simultaneously and continuously communicate with the responding Paramedics as to the patient's condition, physical characteristics, scene circumstances, etc.; *and* to provide actual medical/first aid instructions to the caller in an effort to help the victim; i.e., *emergency medical dispatch* (EMD).

In most people's eyes, once the Telecommunicator alerts the appropriate law enforcement agency, EMS unit, or fire station of an emergency and provides dispatch information and general instructions their job is over. Not so in the case of medical emergencies. In many instances, Telecommunicators continue to monitor and support the call and the responding service unit by maintaining on-going

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<sup>2</sup> A. Fleming Bell, and Warren Jake Wicker; County Government in North Carolina; Institute of Government, University of North Carolina at Chapel Hill; 1998.

communications and following the efforts of those responder(s) enroute to the incident and throughout the on-site incident activities that follow. (More detailed discussion will be provided in Section II of this report, The 911/Communications Center).

**Mutual Aid** As stated in the County’s EMS System Plan; *Orange County Emergency Medical Services is party to the North Carolina Statewide Emergency Management Mutual Aid and Assistance Agreement.*

**Reports & Reporting**

The record keeping system for EMS providers in North Carolina is “PreMIS”, the *Pre-Hospital Medical Information System*. Under the North Carolina EMS Rules and Regulations, every EMS System is required to collect and submit (electronically) EMS data based on the North Carolina College of Emergency Physician’s Standards for Medical Oversight and Data Collection.<sup>3</sup>

PreMIS provides a method for each EMS provider in North Carolina to enter patient care data into a central database. Other components of PreMIS include: billing export capabilities, technician and provider tracking, and an extensive quality management toolkit.<sup>4</sup>

Orange County EMS personnel currently input Patient Care Reports (PCR’s) into individually issued laptop computers. Data is transferred to PreMIS as soon as possible and no less than on a daily basis except during weekends after which data is transmitted the following Monday.

**EMS Facilities**

Currently the four (4) 24-hour Medic Units and four (4) 12-hour Medic Units and their assigned 2-person Paramedic Teams operate from five (5) designated staging locations within the County. Note that the term “staging locations” is used versus the more common “EMS Base” because in reality none of the staging “areas”; i.e. facilities available; were originally built or intended to accommodate EMS operations. Space has essentially been found, donated for use or assumed for use as the space became available. Furthermore, none of the current staging areas; i.e. facilities; can accommodate a Medic Unit in a temperature controlled, enclosed and securable environment.

**Figure 4**  
**EMS Unit Staging Locations**

Unit	Location	
<b>Medic 1</b>	Revere Rd.	Hillsborough
<b>Medic 2</b>	Roberson St.	Carrboro
<b>Medic 3</b>	Mason Farm Rd.	Chapel Hill
<b>Medic 4</b>	Mt. Willing Rd.	Efland
<b>Medic 5</b>	[Phelps Rd. Location Pending]	N. Orange Co.
<b>Medic 6</b>	Eubanks Rd.	Chapel Hill
<b>Medic 7</b>	TBD	Chapel Hill
<b>Medic 8</b>	Roberson St.	Carrboro

<sup>3</sup> Pratt, Drexdal; “Required EMS Patient Care Reporting”; NCOEMS Memorandum; 2004

<sup>4</sup> North Carolina EMS Performance Improvement Center website; 2007

**EMS Vehicles**

EMS currently maintains an inventory of 11 transport vehicles; eight (8) of which are in service 12-24 hours per day. The remaining three (3) transport vehicles, not currently assigned, are reserve back-up units for use when a vehicle is down for repairs or service or otherwise unavailable for use. EMS Division management personnel and the designated in-field Shift Supervisors drive either sedan or SUV type vehicles up-fitted to accommodate their respective assigned responsibilities.

As noted in Figure 5 recent year ambulance purchases signify a significant shift to the Freightliner M2, medium duty type ambulance from Ford F-450, light duty ambulance that was prominent in the past and of which several are still in service. While the cost of the newer ambulances were considerably more than the previous models; \$94,575 in 2005 & 2007 for the Ford vs. \$186,900 in 2012 for the Freightliner; the decision was not made in haste.

Available documentation indicates that the issue was researched and studied jointly by personnel representing Emergency Services, Asset Management Services, and Fleet Management

- Cheaper to operate; first-year mileage of medium duty @ 9 miles/gallon vs. light duty @ 8.6 miles/gallon; first year service cost of light duty @ 8.92 cents/mile vs. medium duty @ 5.98 cents/mile;
- Better survivability in an accident; illustrated during/after actual rollover experienced in 2010;
- Better field of vision- safer scene approach and driver visibility during both emergency response and normal driving conditions;
- Better internal vehicle systems; braking, cooling, transmissions, chassis, electrical;
- Overall dimensions offer better internal maneuverability and patient access
- On-going maintenance advantages cited included serviceability, reliability, and quality of design and construction.

Figure 5  
EMS Fleet Vehicles\*

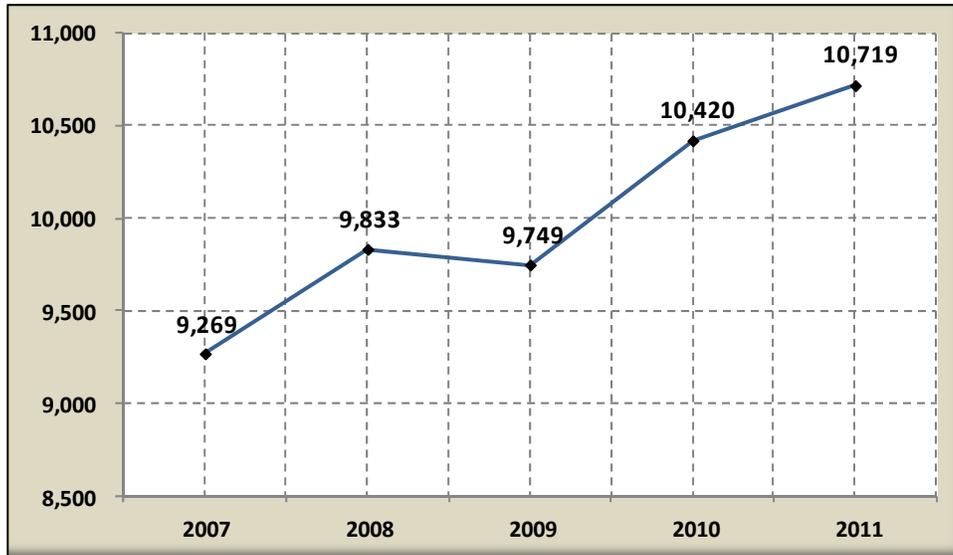
Vehicle Number	Model Year	Model	Manufacturer
633	2005	Ford F-450 XLT Super Duty Ambulance	Wheeled Coach
634	2005	Ford F-450 XLT Super Duty Ambulance	Wheeled Coach
714	2007	Ford F-450 XLT Super Duty Ambulance	Wheeled Coach
715	2007	Ford F-450 XLT Super Duty Ambulance	Wheeled Coach
793	2011	Freightliner M2 Ambulance	Excellance
794	2011	Freightliner M2 Ambulance	Excellance
813	2011	Freightliner M2 Ambulance	Excellance
840	2012	Freightliner M2 Ambulance	Excellance
842	2012	Freightliner M2 Ambulance	Excellance
843	2012	Freightliner M2 Ambulance	Excellance
845	2012	Freightliner M2 Ambulance	Excellance

\*The Emergency Services Department is anticipating the replacement of Vehicles 633 and 714 during FY 2012-2013 and 2013-2014. Engines were replaced in Units 634 and 715 in 2011; each are expected to remain in the fleet for several more years.

## Call Volume

During calendar year 2011, Orange County EMS units were dispatched a total of 10,719 times. In addition to these incidents, Medic Units were ordered into “move-up” status 2,360 times.

Figure 6  
EMS Annual Call Volume



“Move-ups” occur when the number of ambulances available to respond to a call is down to one (1) ambulance and that ambulance, regardless of where it is normally assigned, will be directed to “move-up” to a location generally towards the center of the County to be accessible to respond in any direction.

If there comes a point that “no” ambulances are available (which does occur) South Orange Rescue and/or one or more of the County Fire Departments will be alerted to stand-by or, if available, to “move-up” to a specific staging location.

It is a practice common in the industry often referred to as “*modified system status management*” as it provides a means of spreading thin resources strategically in an effort to provide the greatest range of coverage during peak call periods.

## Type of Call

The type of calls to which EMS is dispatched will of course vary. A review of those calls dispatched during 2011 identified more than twenty call classifications. Of the 10,719 calls dispatched during 2011, almost 90 percent were listed in one of the 18 categories identified in Figure 7 i.e. as noted, any call type representing more than one percent of the total.

And, while they are not emergency dispatches per se, 2,360 “move-ups” were directed for strategic purposes; primarily to enhance coverage when the number of available ambulances to respond to an emergency was down to one (1). While the NCOEMS and the Performance Improvement Center recommend that any EMS Unit activity be recorded in PreMIS in order that unit hour utilization rates can be (eventually) accurately determined, they are not included in this table or in the previous Call Volume table as emergency dispatches.

Figure 7  
Ems Calls by Type

Condition	Code	Frequency	Percent
Sick Person	SICK	1322	12.3%
Fall	FALL	1117	10.4%
Transfer Interfacility Palliative Care	TIPC	1111	10.4%
Breathing Difficulty	BREA	795	7.4%
Unconscious	UNCO	747	7.0%
Chest Pain	CHES	716	6.7%
Accident w/Personal Injury	ACPI	713	6.7%
Convulsion	CONV	472	4.4%
Hemorrhage	HEMO	376	3.5%
Trauma	TRAU	354	3.3%
Overdose	OVER	336	3.1%
Abdominal Pain	ABDO	322	3.0%
Unknown	UNKN	292	2.7%
Stroke	STRO	245	2.3%
Diabetes	DIAB	209	1.9%
Allergy/Allergic Reaction	ALLE	172	1.6%
Assault	ASLT	158	1.5%
Heart Problem	HEPR	147	1.4%
		<b>9,604</b>	<b>89.6%</b>
		10,719	100%

### Call Distribution

The green dots on the map that follows represent the more than 30,000 calls to which EMS units were dispatched during 2009, 2010, and 2011.

As stated previously, the most significant clusters of calls were in the Carrboro and Chapel Hill areas. Smaller, yet still significant call clusters were also noted in and around Hillsborough and a number of the County's major roadways; i.e. I-85, SR 70, and 86, etc.

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Figure 8  
2009-2011 Cumulative EMS Call Distribution



**Calls Dispatched per Hour**

Among the significant County concerns presented to the consultant as an impetus for this study was the apparent increasing frequency during which EMS units were often out of service; albeit on an active call; or out of the County transporting a victim to a medical facility when emergency calls from within the County continued to be received and dispatched.

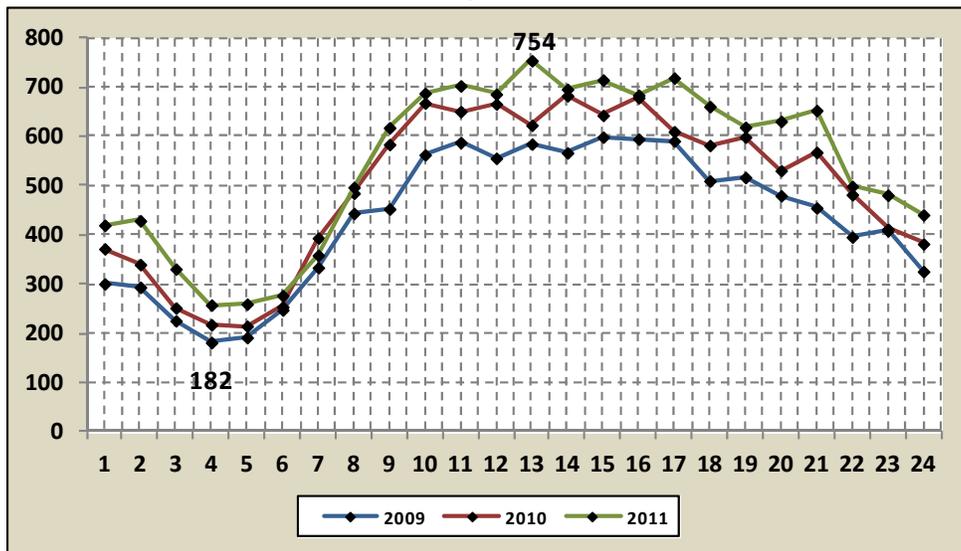
Subsequently, a look at the “calls received per hour”, plotted for an entire year, will identify both the peak and approximate time frame of the busiest call periods during any given day and of course the times when EMS personnel are most likely to be needed.

In order to ascertain whether these periods of activity were unique or consistent in their occurrence, the most recent three (3) years of data was reviewed and plotted. The results, illustrated in Figure 9 for 2009, 2010, and 2011 were very consistent

Based on the illustration, the busiest hour of the day during 2011 was between noon and 1:00 pm wherein 754 calls were received. The least busy hour of the day, based on this illustration appears to be between 3:00 am and 4:00 am and is generally consistent for the years studied.

Subsequently, the daily “prime-time” hours; the busiest 12 hour period of the day (give or take); appears to be between 9:00 am and 9:00 pm or, between the numbers 9 and 21 on the horizontal axis. This of course then will be the time period when EMS ambulance units will be in greatest demand.

Figure 9  
EMS Calls per Hour/Year



Note: the number ‘1’ on the horizontal axis represents 1:00 am; the number 12 represents noon, the number 18, 6:00 pm, etc.

**Emergency vs. Non-Emergency Response**

When the average citizen calls 911-it *IS* an emergency. Medical dispatch protocols have been developed, however, that dictate, based on the condition identified, how the response is to be coded; i.e. Alpha-least serious, non-emergent through Echo-most serious, emergent. In turn, the response code identified and broadcast to responding units will dictate the Status of their response; i.e. lights and sirens, or no lights and sirens.

For the most part these response codes are universal and well known to emergency medical and first responder agency personnel.

The table that follows identifies the medical dispatch response codes, the condition identified and associated with that code, the agency/unit dispatched and the level (status) at which they are expected to respond.

**Figure 10**  
Medical Dispatch Response Codes

Response Code	Condition Identified	Agency/Unit Dispatched	Response Status
<b>ALPHA</b>	<b>Non-life threatening, low priority assessed</b>	<b>Ambulance only</b>	<b>Non-Emergency</b>
<b>BRAVO</b>	<b>Non-life threatening, but more serious</b>	<b>Ambulance only</b>	<b>Emergency</b>
<b>CHARLIE</b>	<b>Potentially life threatening</b>	<b>First Responders Ambulance</b>	<b>Emergency Non-Emergency</b>
<b>DELTA</b>	<b>Life threatening</b>	<b>All Units</b>	<b>Emergency</b>
<b>ECHO</b>	<b>Circling the drain</b>	<b>All Units; including Law Enforcement</b>	<b>Emergency</b>

The distribution of emergency to non-emergency medical calls has changed significantly since 2009 when the “response determinants” were adjusted to reflect more closely those recommended by the National Academy of Emergency Medical Dispatch (NAEMD). The distribution of emergency and non-emergency medical calls dispatched during 2011 is illustrated in Figure 11. This issue will also be addressed further in *Section 3-911/Communications Center*.

**Figure 11**  
Medical Call Response Levels-2011

Response Level	Number of Responses	Percent of Total
<b>Initial Lights &amp; Sirens, Downgraded to No Lights or Sirens</b>	330	<b>3.1%</b>
<b>Initial No Lights or Sirens, Upgraded to Lights &amp; Sirens</b>	111	<b>1.1%</b>
<b>Lights &amp; Sirens</b>	3,577	<b>34.1%</b>
<b>No Lights &amp; Sirens</b>	6,476	<b>61.7%</b>
<b>Total Responses</b>	<b>10,494</b>	

The non-emergency to emergency call ratio of 2-to-1 is not unusual among North Carolina EMS agencies. In fact, it could be expected to remain close to these percentages for the near future.

The first two Response Level categories listed in Figure 11 may result as the EMD (Emergency Medical Dispatcher) continues their questioning of the 911 caller following the actual dispatch of the response units. As such, the patient’s condition may worsen from that initially reported; i.e. “Initial No Lights or Sirens, Upgraded to Lights & Sirens”; or, improve or through further questioning be determined to not be as serious as initially reported; i.e. “Initial Lights & Sirens to No Lights or Sirens”.

**Emergency Transports**

Tracking the number of emergency victims transported, together with the number of emergency incidents to which ambulances are dispatched, becomes important when later analyzing average call duration together with call volume during “prime-time” hours to determine the basis for ambulance availability.

Figure 12  
Annual Emergency Transports

Patients transported by EMS are billed for the service, which in recent years has generated considerable revenue to offset the County’s operating costs.

Year	EMS Calls Dispatched	Number Transported	Percentage
2007	9269	6171	66.6%
2008	9833	6631	67.4%
2009	9749	7330	75.2%
2010	10420	7284	69.9%
2011	10719	7562	70.5%

With the exception of 2009, the ratio of EMS patient transports to total EMS calls dispatched has shown to be increasing at a relatively steady rate between 2007 and 2011. The 5-year average ratio of transports to total EMS calls is just under 70% at 69.92.

Figure 13  
EMS Transport Destinations

**Transport Destinations**

There were a total of 10 transport destinations listed on the NCOEMS/CIS website for Orange County EMS during calendar year 2011. Of the 7,562 transports made, 87.6% were to the first five destinations identified in this table.

Facility	Number	Percent
UNC Hospital	4,875	64.5%
Duke Univ. Medical Center	1,125	14.9%
Durham Regional Hospital	438	5.8%
Alamance Reg. Medical Center	129	1.7%
Durham VA Medical Center	61	0.8%
	<b>6,628</b>	<b>87.6%</b>
UNC Healthcare Chapel Hill	934	12.4%
UNC Heart Center		
UNC Student Health		
Carillon Assisted living		
Carol Woods Retirement Comm.		
	<b>7,562</b>	<b>100%</b>

It is significant to note that of the state’s six (6) certified Level I Trauma Centers, two (2); UNC Hospitals and Duke University Hospital; are within minutes of most areas of Orange County. As well, a third Level I Trauma Center: Wake Med; can generally be reached within 40-50 minutes depending upon the point of origin within Orange County.

**2.3 PERFORMANCE & COSTS**

**Response Time**

An EMS Ambulance/Unit’s response time is: *the time from the initial alert or announcement by the Communications Center (also called “tone”, “page”, or “dispatch”) of the reported emergency, to the time that the service vehicle and appropriate personnel arrive on the scene.*

Why is time so important? According to the National Emergency Number Association (NENA), “The most elementary explanation of why time is important in a medical emergency has to do with the obvious; “. . . it may mean the difference between life and death”.<sup>5</sup>

<sup>5</sup> NENA; “911 System Survey and Resource Guide”; 2002

Factors impacting response time include of course the distance that must be covered, but also specific and/or unique area characteristics such as road conditions, geography, and development density.

Factors influencing the *quality* of the response have to do with not only the time it takes to get to the scene of the emergency but also the information communicated to the responding service unit, the skill of the personnel responding, and the availability of the proper equipment to adequately address the emergency at hand. Of course, the emergency service agency *must* be prepared to address the most serious emergency *every time* that they are dispatched.

Call data for the years 2007-2011 were extracted from the Communications Center's CAD system for both the "Turn-Out" and "Travel Time" intervals. For purposes of this report the terms Turn-Out Time and Travel Time are described as follows:

- Turn-Out Time-represents the time from when the radio announcement and request for assistance is received at the EMS Unit "start" location by the EMT's on duty, until the wheels on that response vehicle (ambulance) are moving; i.e. and is announced as enroute.
- Travel Time-is the time interval between that when the ambulance's wheels are moving with EMT's on board, to the time it arrives on the scene and the vehicle's wheels have stopped; i.e. "travel time".

The numbers listed represent the *average* times, in minutes and seconds, of all calls dispatched during each of the corresponding years. As previously described, the Total (average) Response Time for each year, is the sum of the average Turn-Out and the average Travel Time for that year.

**Figure 14**  
EMS Interval & Total Average Response Times/2007-2011

Year	Total Units Dispatched	Turn-Out Time	Travel Time	Total Resp. Time
<b>2007</b>	<b>9,269</b>	1:41	7:41	<b>9:26</b>
<b>2008</b>	<b>9,833</b>	1:38	8:15	<b>9:56</b>
<b>2009</b>	<b>9,749</b>	1:29	9:15	<b>10:49</b>
<b>2010</b>	<b>10,420</b>	1:27	9:47	<b>11:14</b>
<b>2011</b>	<b>10,719</b>	1:16	9:30	<b>10:47</b>
<b>5 Year Average:</b>		0:01:30	0:08:53	<b>0:10:26</b>

Subsequently, the average Turn-Out Time for the years studied was 1 ½ minutes. The average Travel Time was just under nine (9) minutes. And, the average Total Response Time for the five years studied was 10 minutes and 26 seconds. As illustrated, although the Total Response Time average for 2011 decreased (improved) by 27 seconds over that documented for 2010, the trend is definitely "upward" and appears to be increasing.

Prominent industry standard setting organizations, such as NFPA, NCOEMS/PreMIS and others, in recent years have emphasized and defined new standards for measuring response time performance that no longer consider *average* times but rather "*fractile*" times as a percentage of all calls for response performance measurement. For example, "*that 90% of all calls dispatched be responded to in "x" minutes or less*".

Historically response times have been the most readily measured performance indicator for EMS and that measurement has been the “average”. This method however results in highlighting the problem of inequity of service because, by definition, 50% of the patients experienced response times *longer* than average. To ensure more equitable service to all areas of the community; i.e. County; fractile response time measurement was introduced and is now commonly used by EMS systems throughout the Country.<sup>6</sup>

Figure 15  
Average vs. Fractile Time Intervals

Interval	# Calls	Average	90%
<b>Turnout Time</b>	3,517	0:00:55	0:02:00
<b>Travel Time</b>	3,445	0:08:31	0:15:00

The previously referenced NCOEMS Performance Improvement Center runs periodic “performance toolkits” based on actual samples of an individual EMS system’s call data. The Center, in addition to “average” times also runs the calculations based on the 90% fractile suggested by NFPA for Fire and EMS systems. The Orange County EMS calls identified in this table (Figure 15) were selected from 2011 call data and run for average and 90% fractile times for both Turn-Out Time and Travel Time. Of course, analysis of the average and 90% fractile times identified do little more than prove the point already stated; 50 % of the patients experienced response times that took *longer* than the “average”.

This will continue to be the case until the paradigm is changed which, in this case, will be the performance standard regarding response time(s) and the manner by which these response times are measured and assessed.

**Total Event Duration**

The total event duration is the time from the initial announcement of the call (dispatch) for service to the time the EMS Unit that responded to that dispatch is back in service and available to take another call. While the Turn-Out Time and Travel Time are the first two time intervals of consequence in this regard, the time on scene with the patient, transport time to the appropriate medical facility, and time at the medical facility until release, are significant as well. Cumulatively they combine to result in the total event duration time.

Figure 16  
Total Average Event Duration  
2007-2011



EMS Operations and Medical personnel familiar with EMS operations that were queried indicated that travel distance; i.e. *travel time* as well as the number and rate of admissions to the emergency rooms of the destination hospitals are impacting these times.

Note: Preliminary numbers from the first quarter of 2012 indicate that total average event duration times have again increased by several minutes.

<sup>6</sup> American College of Emergency Physicians; *Principals of EMS Systems*; 2006

**Expenses & Revenue**

Orange County EMS is funded with General Fund (tax) dollars within the County Budget. The table below illustrates the total annual expenditures approved for EMS for the fiscal years 2008-2009 through 2011-2012.

**Figure 17**  
**Annual EMS Expenditures/FY 2008-2011**

Account	FY 2008-09 Actuals	FY 2009-10 Actuals	FY 2010-11 Actuals	FY 2011-12 Actuals
<b>PERSONNEL SERVICES</b>				
PERM SALS	\$ 1,714,386	\$ 1,707,256	\$ 1,777,621	\$ 2,125,380
OT	\$ 488,184	\$ 441,054	\$ 407,296	\$ 411,056
TEMP	\$ 267,873	\$ 78,615	\$ 131,519	\$ 111,068
HOLIDAY	\$ 92,905	\$ 92,336	\$ 98,924	\$ 124,305
SOC SEC	\$ 157,258	\$ 138,261	\$ 145,180	\$ 163,856
MEDICARE	\$ 36,778	\$ 32,413	\$ 33,953	\$ 38,321
MED INS	\$ 322,839	\$ 329,134	\$ 346,366	\$ 455,629
RETIRE	\$ 113,483	\$ 108,953	\$ 147,524	\$ 184,889
PERS-OTHER	\$ 56,655	\$ 21,401	\$ 38,226	\$ 88,791
<b>SUBTOTAL-PERSONNEL SERVICES</b>	<b>\$ 3,250,362</b>	<b>\$ 2,949,423</b>	<b>\$ 3,126,609</b>	<b>\$ 3,703,295</b>
<b>OPERATIONS</b>				
TRAINING	\$ 4,971	\$ 1,325	\$ 1,410	\$ 980
CERT&LICSN	\$ (252)	\$ 359	\$ 810	\$ 1,527
TELEPHONE	\$ 30,017	\$ 19,858	\$ -	\$ 3,323
VEH MAINT	\$ 110,466	\$ 131,932	\$ -	\$ -
GAS & OIL	\$ 4,973	\$ 99	\$ -	\$ -
MOTOR POOL	\$ 77,866	\$ 37,438	\$ -	\$ -
EQUIP RPR	\$ 35,662	\$ 28,947	\$ 33,518	\$ 43,735
EQUIP RENT	\$ 46,438	\$ 12,600	\$ 12,600	\$ 12,600
DUES	\$ 750	\$ 690	\$ 1,080	\$ 1,032
SUBS	\$ 215	\$ 259	\$ 269	\$ 269
MED SUPS	\$ 170,600	\$ 176,139	\$ 214,356	\$ 251,644
CONT SVS	\$ 50,609	\$ 54,462	\$ 58,970	\$ 63,747
ELECTRICIT	\$ 24,150	\$ 12,600	\$ 12,600	\$ 12,600
SUP-ED, OFF, DEP, OTH	\$ 8,989	\$ 10,024	\$ 2,362	\$ 3,700
OP-OTHER	\$ 26,449	\$ 26,650	\$ 4,235	\$ 285
<b>SUBTOTAL-OPERATIONS</b>	<b>\$ 591,903</b>	<b>\$ 513,381</b>	<b>\$ 342,210</b>	<b>\$ 395,442</b>
<b>RECURRING CAPITAL</b>				
EQUIPMNT	\$ 5,130	\$ -	\$ -	\$ -
IT EQUIP	\$ 1,197	\$ -	\$ -	\$ -
VEHICLES	\$ -	\$ -	\$ -	\$ 612,946
<b>SUBTOTAL-RECURRING CAPITAL</b>	<b>\$ 6,327</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 612,946</b>
<b>TOTAL: EMERGENCY MEDICAL SERVICES</b>	<b>\$ 3,848,591</b>	<b>\$ 3,462,804</b>	<b>\$ 3,468,819</b>	<b>\$ 4,711,683</b>

The largest expense category is of course personnel. Although major capital expenditures, in this case typically vehicles, may alter the percentage somewhat from year to year; the average annual costs of personnel as a percentage of the total budget for the years studied was 84.5%.

***It is significant to note, and should signal concern, that the expense category "Training" averaged but 3/10ths of one percent per year, of the total annual budget allocations, for the past three years.***

**Revenue**

Orange County EMS is able to generate revenue to offset its operating costs by billing the recipients of the services delivered. Most often Medicaid, Medicare and private insurance will pay for significant portions of the amounts billed. The more significant charges are of course assessed and subsequently collected for patients that are "transported" typically to a designated medical facility. The current list of fees charged by the Orange County EMS includes the following:

**Figure 18  
EMS Fee Schedule**

Activity/Response	Charge
<b>Basic Life Support (Non-Emergency)</b>	\$ 300
<b>Basic life Support (Emergency)</b>	\$ 375
<b>Advanced life Support (Non-Emergency)</b>	\$ 400
<b>Advanced Life Support (Emergency)</b>	\$ 475
<b>Advanced Life Support (Non-Transport)</b>	\$ 150
<b>Mileage</b>	\$7.50/mile

**Billing & Collections**

Since January of 2010, the County has contracted with a private firm that specializes in providing EMS billing services. Prior to that time the County (Tax Office) handled EMS billing and collections responsibilities. Although the billing contractor handles the bulk of the monthly EMS billing, collections and required legal bookkeeping, the County continues to monitor and pursue collection of delinquent accounts.

**Figure 19  
FY EMS Budget & Collections (Revenue)**

Fiscal Year	Annual Budget	Collections	Collections (Revenue) as % of Budget
<b>FY 08-09</b>	\$ 3,848,591	<b>1,862,114</b>	<b>48.4%</b>
<b>FY 09-10</b>	\$ 3,462,804	<b>2,001,204</b>	<b>57.8%</b>
<b>FY 10-11</b>	\$ 3,468,819	<b>2,246,517</b>	<b>64.8%</b>
<b>FY 11-12</b>	\$ 4,711,683	<b>1,803,384</b>	<b>38.3%</b>

For calendar years 2010 and 2011 the percentage of net collections to total billings was 65.7% and 59.6% respectively. Note also, however, that very much like FY 2011-2012 *Collections* and *Revenue as % of Budget* are incomplete so to will net collections on billings be incomplete. That is, they will continue

to increase as payment of bills that have recently been sent out, as well as those as long as a year or more in arrears are paid.

## 2.4 ISSUES OF CONCERN

This section discusses the significant EMS issues of concern identified during the analyses of the various data collected, the visual study of conditions found to exist, and numerous conversations and formal interviews conducted over the course of the study.

The determination of whether or not an “issue” was identified as such was based on the assessment of current operations and performance discussed in subsections 2.2 and 2.3.

The issues identified as being of significant concern with regards to EMS involved the following topics:

- Availability of ALS Ambulances
- Response Times
- EMS Facilities

### Issue: Availability of Ambulances

During 2011 ambulances were directed to “MOVE” 2,360 times from their identified staging area or location to another point in the County because;

- a. The number of ambulances immediately available was down to one (1) and the subject ambulance was directed to move to a location typically near the center of the County in anticipation of being able to respond in any direction the call may direct; or,
- b. In tracking the status of multiple ambulances, the Communications Center and/or EMS Supervisor(s) noted significant area gaps in coverage and redirected movement of ambulance(s) accordingly.

The practice itself is not uncommon and is referred to as system status management; locating/moving ambulances to address the current level of coverage or lack thereof.

The risk, however, of being down to one (or “no”) ambulances is that the next emergency medical call that comes in to the Communications Center may not have an ambulance available to respond.

Granted first responders fill a significant and vital role at this point, however, without an ambulance available there is likely no ALS level of service available and in turn no means of transport available.

### **EMS Call Scenarios**

While monitoring EMS radio traffic during onsite time in the County over the months during which this study occurred, the actual call that “we are out of ambulances”, or “we have one ambulance left” was heard numerous times.

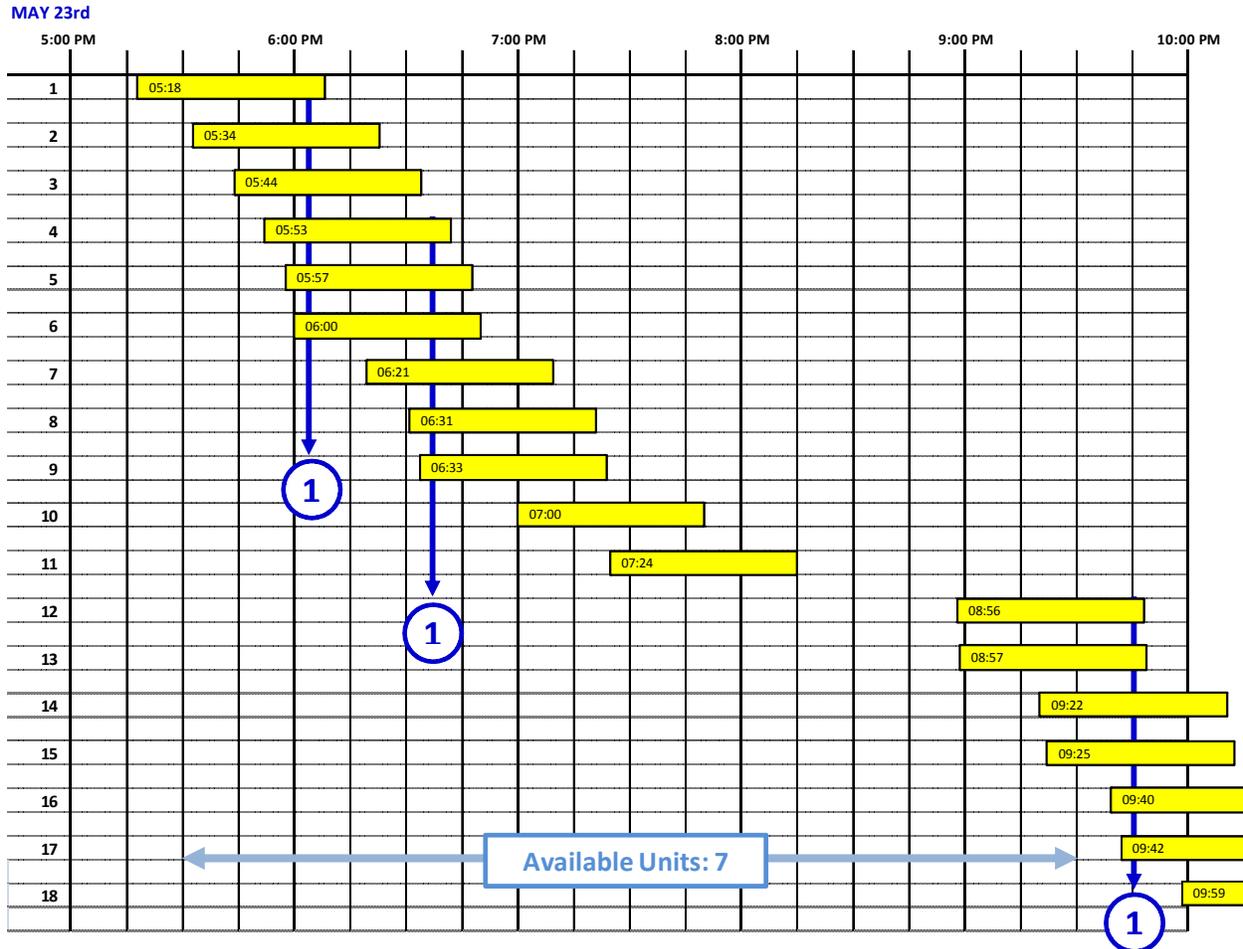
In an effort to understand the specific circumstances that were resulting in such conditions, EMS call logs were reviewed over several months during 2011 to identify the specific conditions that occurred and the circumstances that contributed to them.

On several occasions, typically during the busiest hours of the day previously noted, a closely bunched series of calls could be identified, each call was reviewed individually, and the “dispatch” and

“available” (back in service) times were documented, as was the type of call; i.e. Chest Pains, Diabetic, Fall, etc.

For purposes of the diagram that follows, the *average* call duration calculated for 2011 (48 minutes) was used for each call recorded.

**Figure 20**  
**Actual Ambulance Demand Profile-23 May 2011**



The five (5) hour period depicted includes the actual calls and the times that they were dispatched. The duration of the individual calls varied from 18 minutes to 1-hour and 44 minutes, and for all 18 calls noted the average duration was 51 minutes. The “Available Units: 7” notation is the number of Medic Units on duty during the referenced 5-hour time frame.

Note that during this five hour period there were three (3) instances where 6 of the 7 on duty ambulances were in service simultaneously; resulting in the circled number “1” referring to the last available ambulance. Subsequently, the remaining ambulance was in all likelihood directed to “move” to a location that would permit the most flexible response should another call come in before another ambulance was available.

This scenario was found to occur many times during the review of the 2011 EMS call records.

### **Issue: Response Time**

For the purposes of this report and as referenced in Subsection 2.3, EMS ambulance response time is: *The time from the initial alert or announcement by the Communications Center (also called “tone”, “page”, or “dispatch”) of the reported emergency, to the time that the service vehicle and appropriate personnel arrive on the scene.*

The factors that most commonly impact response time include:

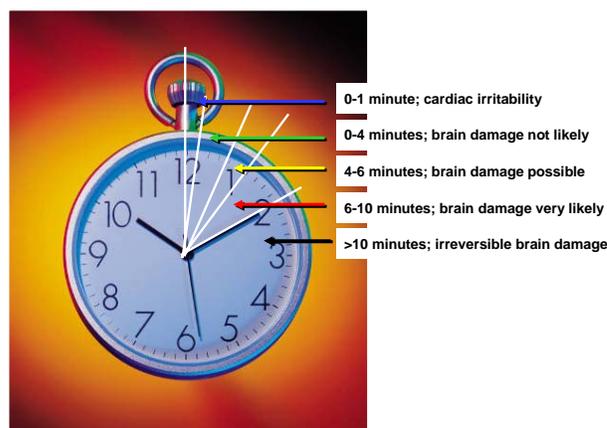
- The time required to access and engage the vehicle,
- The speed at which the emergency vehicle is able to travel,
- The distance that must be covered to the incident dispatched, and
- Under what conditions.

Consequently, the basis upon which pre-hospital emergency medical response criteria has been established is medical case history data regarding the body’s need for oxygen. Simply, the human body needs oxygen to survive. While some cells may tolerate short periods without oxygen, most require a constant supply of oxygen to survive. Figure 38 illustrates the significance of time in this equation.

Figure 21

Concerns and subsequent standards regarding emergency medical response times are based on the findings of various significant medical organizations and professional associations. Among these, the American College of Emergency Physicians (ACEP) and the American Heart Association has each similarly stated:

“The most important factor in successfully resuscitating a patient in cardiac arrest is the speed of response. The survival rate from untreated ventricular fibrillation decreases up to 10% for every minute that passes and definitive care is not provided.”



The American Heart Association, ACEP, and other respected organizations recommend that EMS vehicles should respond to deliver BLS (basic life support) skills within 3 to 4 minutes, with ALS (advanced life support) skills available within 6 to 8 minutes. The ALS-within-8-minute concept was developed from research that showed the survival rate of cardiac arrest victims decreases significantly with each passing minute, and that optimal probabilities for survival increase when BLS has been provided within 4 minutes followed by ALS within 8 minutes.”<sup>7</sup>

In addition,

- The American Association of Orthopedic Surgeons (source of Figure \_\_) suggests that “in an incident involving lack of oxygen, brain damage is very likely at 6 to 8 minutes; irreversible after 10 minutes.”
- The National Fire Protection Association states in NFPA 1710 that AED (BLS) capabilities must arrive within a 4-minute response time to 90% of the incidents; and that ALS capabilities shall be deployed to arrive within an 8-minute response time to 90% of the incidents.

<sup>7</sup> American College of Emergency Physicians; “Principles of EMS Systems”; 2006

Ultimately then, *someone* with *at least* basic life-saving skills (BLS) **needs to be on the scene of the emergency within 4 minutes**; and, someone with *advanced* life-saving skills (ALS); i.e. Orange County EMS; **within 8 minutes**. And, according to NFPA, those response times are to be achieved in at least 90% of all calls dispatched.

The *concern* in this regard is that the years of data gathered and analyzed for this report showed that the total average response time intervals, both turn-out time and travel time, for Orange County EMS exceeded the time standards recommended; consistently.

Figure 22  
EMS System Annual Average Response Times

Year	Total Units Dispatched	Turn-Out Time	Travel Time	Total Resp. Time
2007	9,269	1:41	7:41	9:26
2008	9,833	1:38	8:15	9:56
2009	10,614	1:29	9:15	10:49
2010	11,893	1:27	9:47	11:14
2011	13,079	1:16	9:30	10:47
<b>5 Year Average:</b>		0:01:30	0:08:53	<b>0:10:26</b>

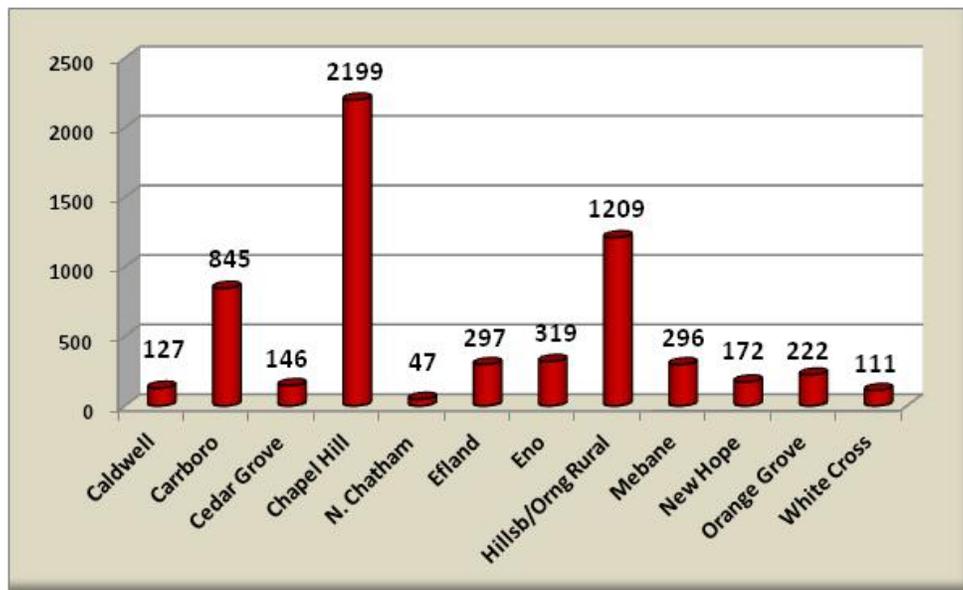
As illustrated, the 5-year average turn-out time of 1 minute-30 seconds exceeds the recommended standard of “no more than one (1) minute”<sup>8</sup>; as well, the 5-year average Total Response Time, of 10 minutes-30 seconds exceeds the recommended standard by almost 2 ½ minutes.

Turn-out time is an issue that must be studied internally and specifically, often times by studying the patterns of individual crews.

The focus of the discussion that follows focuses on First Responder and EMS Total Response Time.

Standards also suggest that basic life support (BLS) capabilities; i.e. “first responders”; arrive on scene in no less than four (4) minutes. As previously stated, the Orange County EMS System Plan filed with the State identifies 12 Fire Departments within the County that support EMS as Medical First Responders. In 2011 the medical calls recorded to which these Fire departments responded were as follows:

Figure 23  
Fire Department Medical Call Responses-2011



<sup>8</sup> NFPA 450 Guide for Emergency Medical Services and Systems; Subsection 5.6.8 Turnout (Activation) Interval

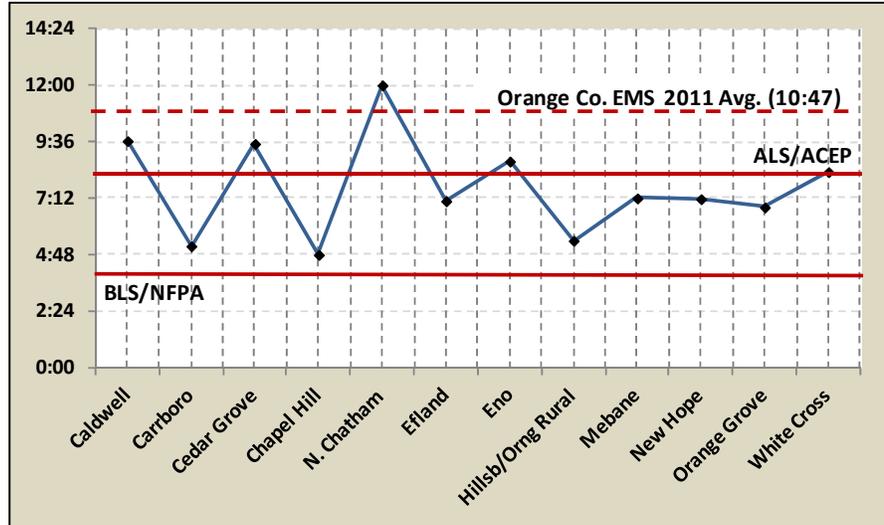
DRAFT REPORT

The total medical calls to which the Fire Departments responded was 5,990; which represents approximately 56% of the emergency calls to which EMS was dispatched. The concern, however, with regards to the response time standards cited is illustrated here:

**Figure 24**  
Fire Dept. Average Response Times  
to Emergency Medical Calls

Department	Avg. RT
Caldwell	9:38
Carrboro	5:10
CedarGrove	9:31
Chapel Hill	4:48
N. Chatham	12:00
Efland	7:05
Eno	8:46
Hillsb/Orng. Rural	5:24
Mebane	7:12
New Hope	7:10
Orange Grove	6:49
White Cross	8:19

**Figure 25**  
EMS & Fire Average Response Times vs. AACP & NFPA Standards



Moving upward from the horizontal axis in Figure 25 the first horizontal red line represents four (4) minutes; the second horizontal red line represents eight (8) minutes. The horizontal red-dashed line represents the total average response time for EMS in 2011.

Based upon the response time standards cited, at the very least the Fire Department/BLS response times should be *below* the 4-minute line and the EMS/ALS response times should be below the 8-minute line. On the basis of the numbers and times illustrated, none of the Fire Departments who serve as BLS level medical first responders meet the 4:00 minute BLS response time standard called for; albeit several are very close and several certainly meet the criteria much of the time assuming that +/- 50% of the “average” responses are in fact less than the average.

At the same time, the 2011 EMS average response time is nearly 3:00 minutes greater than the 8:00 minutes suggested for ALS response.

NOTE: This issue is about EMS “response time”, and as an issue it very much needs to be addressed. However, *time* of response is not the only factor that ultimately will determine the quality if the response.

The role of the Communications Center in Medical emergencies is extremely important; in fact vital, if the “correct” response to a medical emergency is going to occur. The efforts to adequately triage a call based on the NAED and EMD protocols can many times provide valuable advise and/or verbal assistance in initiating basic care for the patient; can identify the specific conditions and/or symptoms to determine the level of response to be dispatched and can keep responders informed of any changes in the patient’s condition or scene circumstances as they are enroute.

The medical dispatch response codes used by Communications Center Telecommunicators (see Figure 10, page 18) will identify for first responders and EMS Medic personnel the initially identified condition identified and the Response Code as well as the Response Status recommended; i.e. "DELTA" = "life threatening, First Responders respond Emergency Status; i.e. lights & siren".

Proper triaging of an emergency medical call is vital and can go a long way to assuring the responder does not run over a pedestrian at a crosswalk on the way to an incident that is not an emergency.

This said; response "time" in Orange County must still be addressed. The professional organizations that have spoken to and suggested the time standards referenced have identified their basis for doing so. In many discussions of the topic with local EMS professionals in North Carolina, ALS response objectives are typically established at between 8:00-9:00 minutes.

On the basis if the organizations that have endorsed this standard it merits attention and until the North Carolina Medical Board which is responsible for adopting the rules and standards governing advanced life support services says otherwise, the standard; albeit its potential consequences, need to be considered seriously.

#### **Vehicle Speed & Distance to Incident Location**

For reference, the following formula can be used to calculate the average travel time, particularly for major emergency vehicle; i.e. ambulances and Fire trucks; between two points; (NFPA 1720-A.4.3.2):

$$1.7 \times \text{Distance} + 0.65 = \text{Travel Time}$$

For example, if the distance to the scene of an incident is known to be five (5) miles;

$$(1.7 \times 5) + .65 = 9.15; \text{ a Travel Time of 9 minutes and 12 seconds}$$

This travel time equates to an average speed of 33-34 miles per hour, which actually *is not* unusual for fire vehicles (or for rescue and EMS vehicles) for this distance considering acceleration, deceleration, time of day, road conditions, other traffic, etc.

Reversing this formula, using the 2011 EMS average Travel Time of 09:30, and converting the 32 seconds to hundredths of a minute, would result in the following:

$$9.50 \text{ minutes Travel Time} = 1.7 \text{ times Distance "x"} + .65$$

or

$$(7.53 - .65)/1.7 = 4.2 \text{ miles traveled}$$

This being the case, how far *could* the Medic Units travel and still meet the objective of an 8:00 minute total response time?

*However, were* this to be the case; i.e. ALS ambulances never responding to incidents further than 4.2 miles from their assigned base-in order to meet the 8:00 minute Total Response Time objective; the area within which the EMS units could effectively travel would leave the majority of the County essentially "uncovered".

The pages that follow include a sequence of County maps that illustrate the concern associated with this issue.

**Map #1** is that previously shown on page 8; it identifies the existing EMS district boundaries and the staging locations of the current EMS Medic units.

**Map #2** outlines in various colors the 4-mile/8-minute drive time road-based limits from each Medic location. Note that the boundaries for Medic 1, Medic 4, and the temporary location of Medic 5 overlap one another somewhat. Also, the south County locations identified for Medic 2, 3, 6, 7, and 8 overlap to such an extent that the outermost distances of each were used and combined in order to determine the extent of area covered.

**Map #3** shows the same 4-mile/8-minute road-based boundaries as Map #2, however, this time overlain onto the map illustrating the county-wide distribution of EMS call locations over the past three years; 2009-2011.

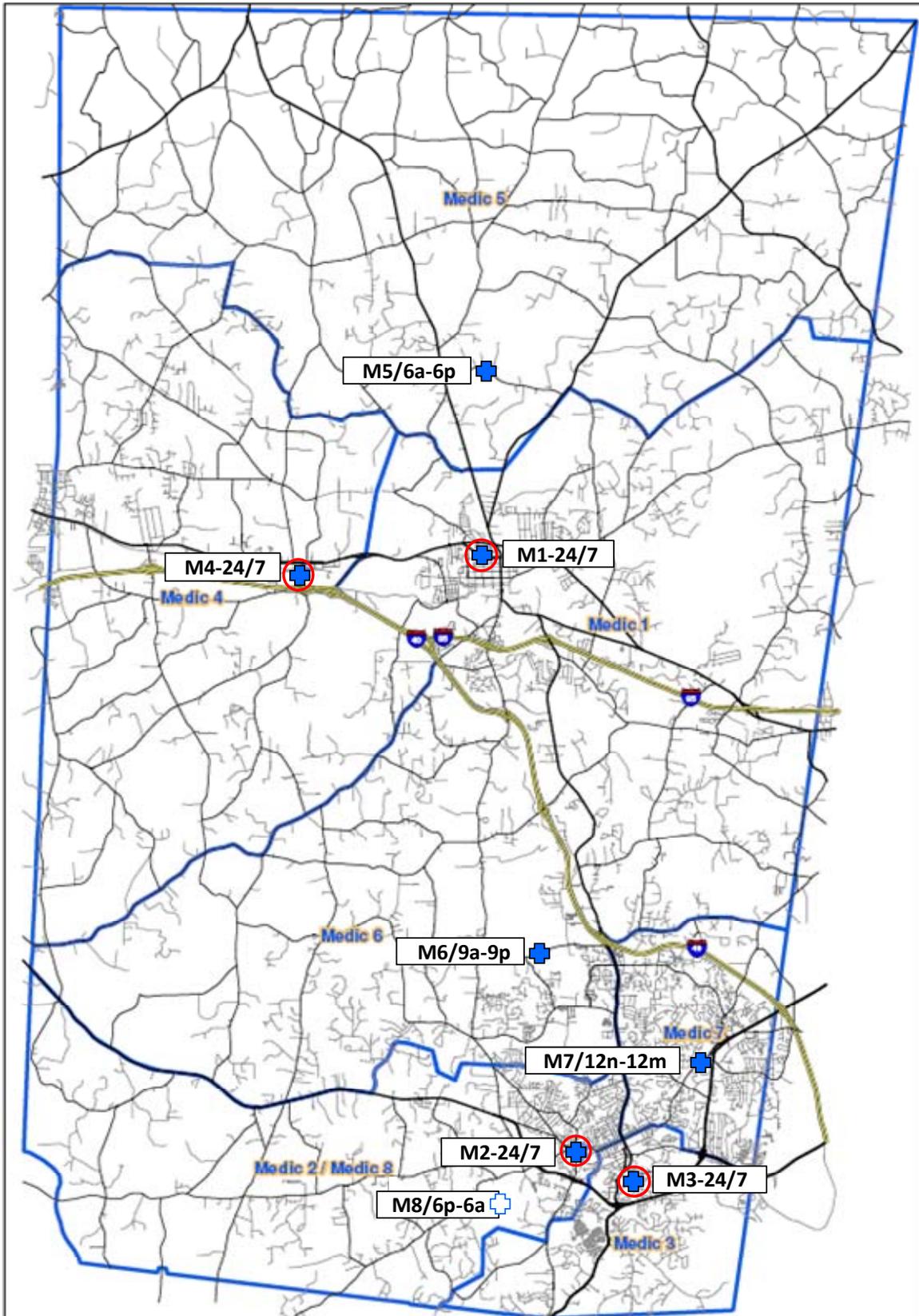
**Map #4** includes gray shading over the areas of the County that currently lay *outside* the limits of the 4-mile/8-minute ALS response perimeter(s).

**Map #5** is a duplicate of Map #4, however, this time it also include red dots at the approximate locations of each of the 22 Fire Department station locations located within; and as the case with Mebane and North Chatham Fire Departments-very near; the County.

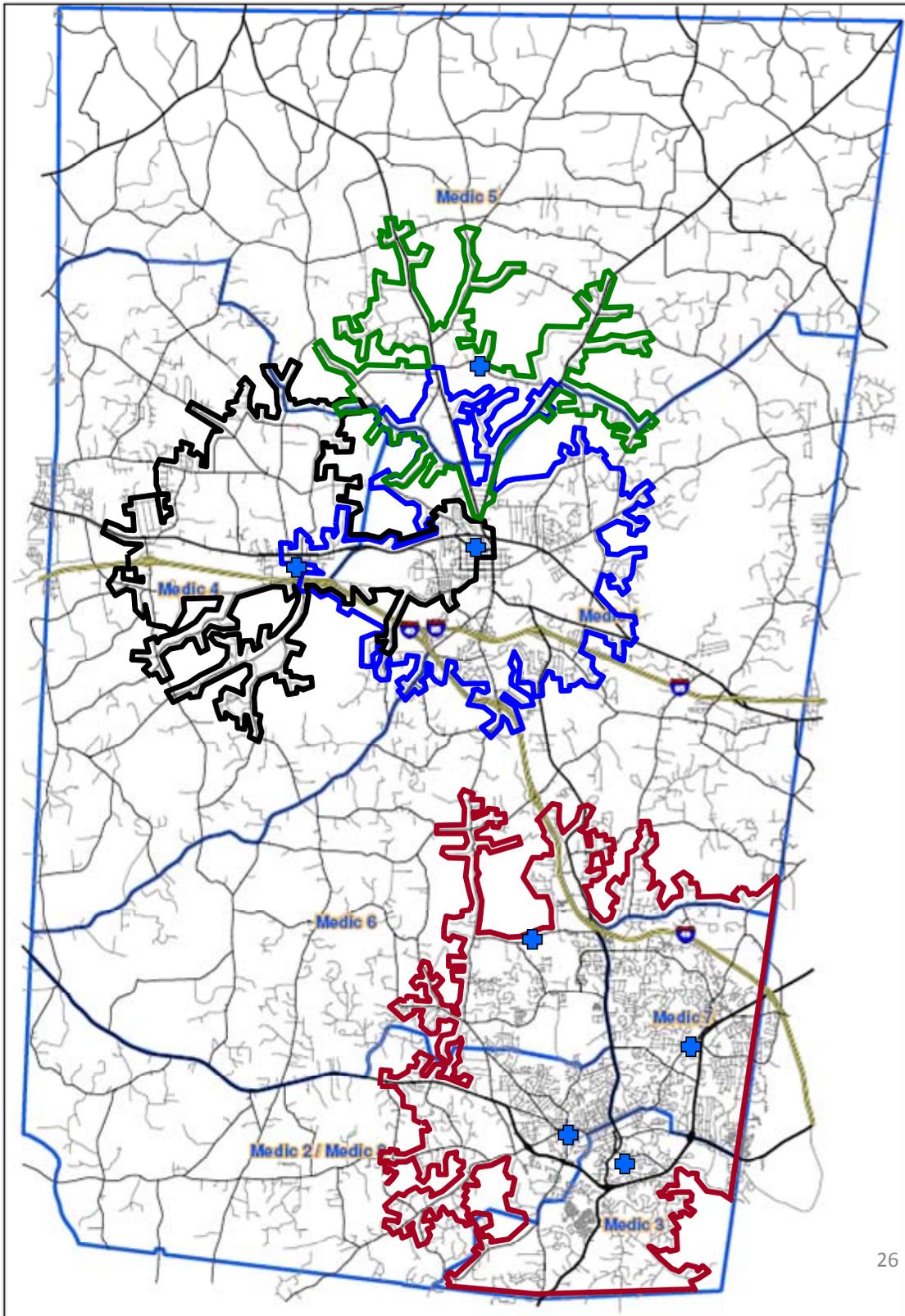
#### Comments re: Maps

- While the maps emphasize significant characteristics impacting ALS response time, they (collectively) also exacerbate somewhat the previous issue having to do with ambulance availability.
- The areas of the County identified wherein ALS Medic Units should be able to travel within the 4-mile/8-minute time standard are, in fact centered within the more populated areas of the County and, for the most part, proximate the major highways corridors. However, there are still many hundreds of EMS calls that have been dispatched beyond these areas of coverage over the past three years that *have not* received the same level of response.
- A visual estimate of the shaded area noted in Map #4 would suggest as much as 55-60% of the County is outside the 4-mile/8-minute ALS response perimeter.
- As previously stated, the combined (potential) capabilities of the 12 Fire Departments that are available to respond from 22 additional station locations *could* provide some assurance to areas of the County that take longer than 8 minutes for EMS/ALS Units to access; however, to get to the incident scene within the 4-minutes suggested for a BLS response, would mean a 2-mile/4-minute Total Response Time. A response time that, as an overall or individual department average, has yet to be accomplished.

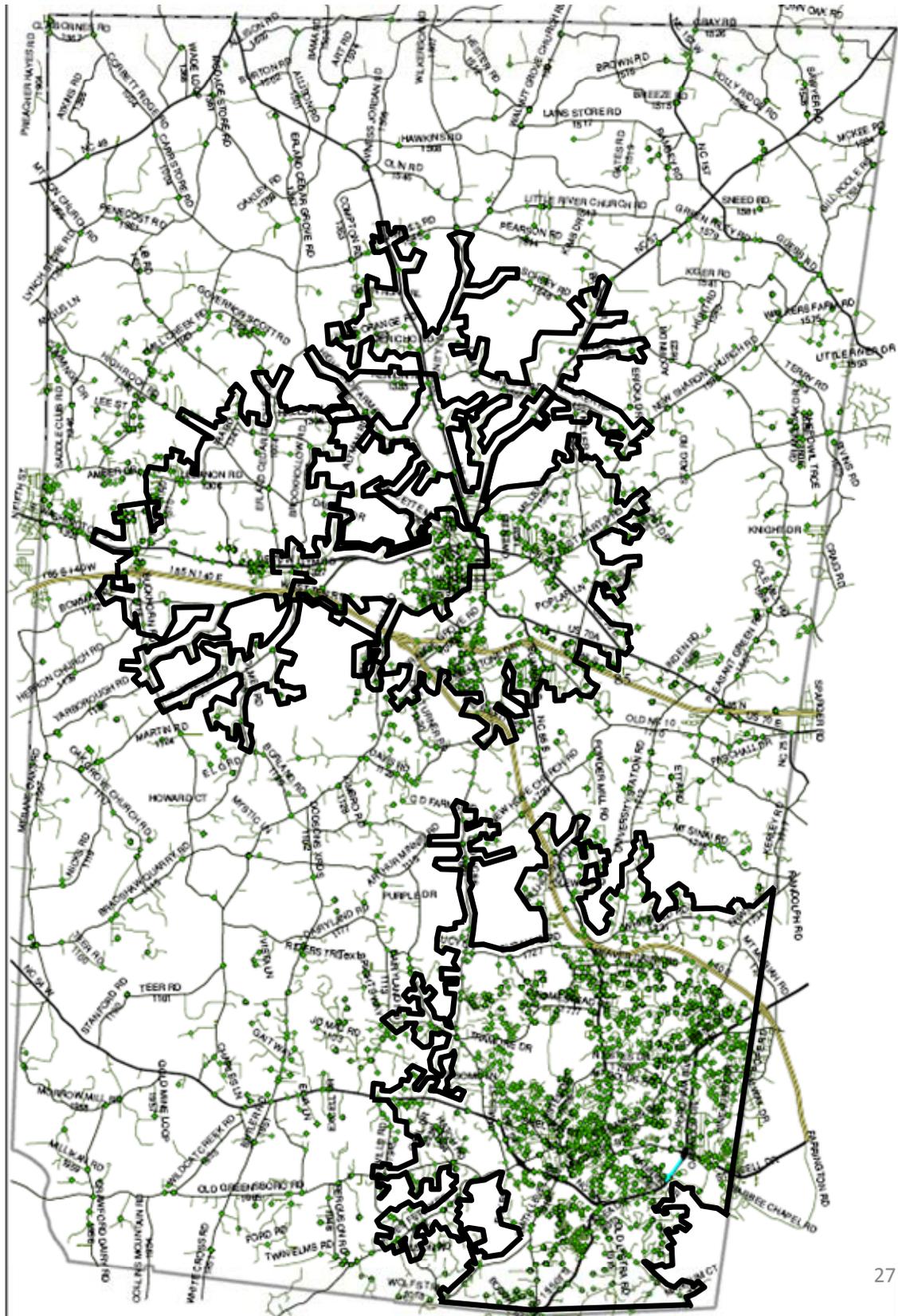
MAP #1



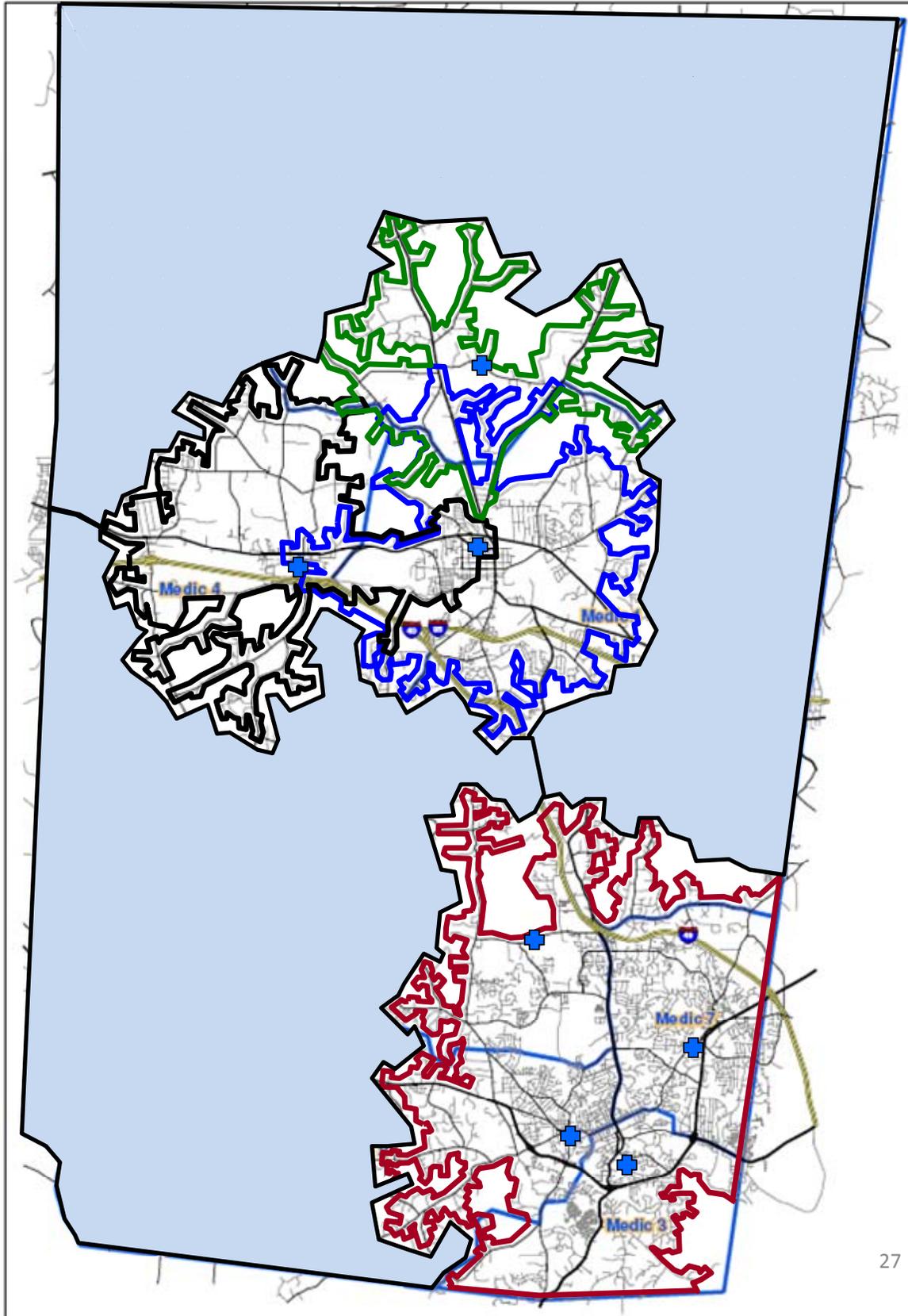
MAP #2



MAP #3

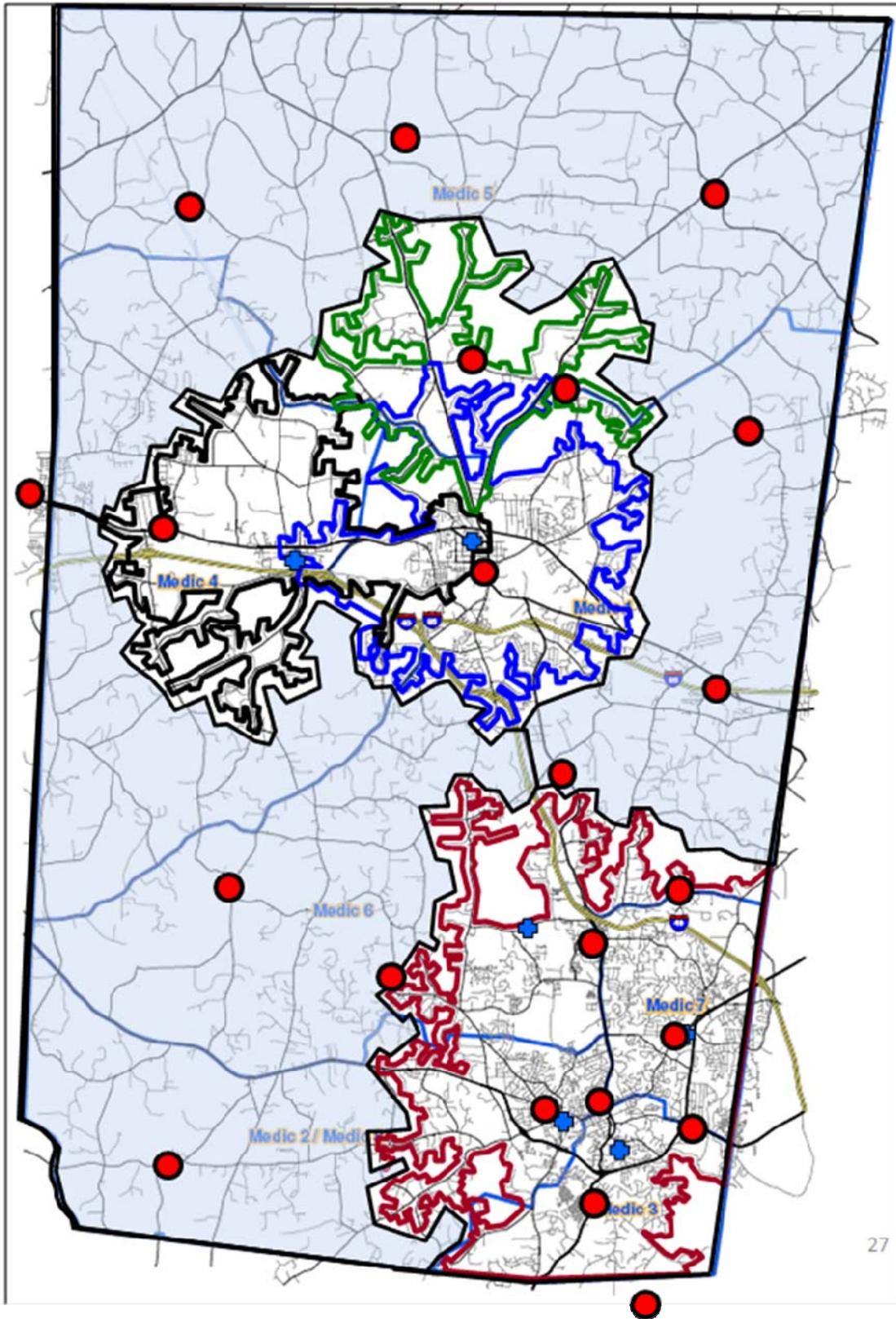


MAP #4



27

MAP #5



**Average vs. Fractile Response Time Performance Criteria**

It has been a common practice in the past to report response times by using *averages*. This is an easy-to-understand methodology that calculates response times by adding all applicable response times together and then dividing the total number of minutes by the total number of responses to come up with an average.

Unfortunately, measuring and reporting *average* response times is inadvisable because one-half of the patients may receive the required response time, while the other half do not. Given what has been learned about the need for an eight-minute response to maximize survivability from cardiac arrest, an *average* eight-minute response, by definition, means that one-half, or more, of the service’s patients are not reached within that critical time.

Many high-performance emergency ambulance services use a different methodology to measure response times to ensure service equality to all patients: *fractile distribution*; in most instances as suggested by NFA and others, reported at the 90<sup>th</sup> percentile.

This methodology places each response within the minute it is achieved and stacks the minutes in ascending order to establish a fractile response-time distribution. The point at which the fractile response time crosses the percentile measures the point of the service’s response-time reliability.

For example; the current Orange County EMS response time objectives, as published in the Orange County EMS System Plan on file with the State Office of EMS, states that:

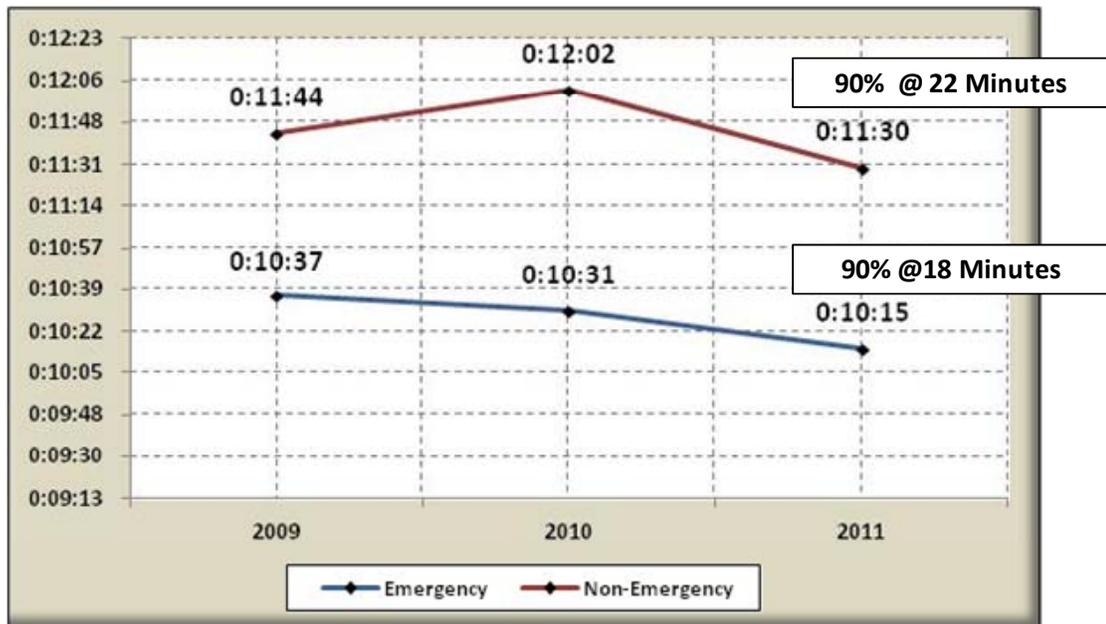
**For Emergency Responses;**

... A Paramedic be on scene within 12 minutes 90% of the time

**For Non-Emergency Responses;**

... A Paramedic be on scene within 15 minutes 90% of the time

Figure 26  
Annual Average Response Time-Emergency vs. Non-Emergency-All Calls 2009-2011  
90% Fractile Times-Emergency vs. Non-Emergency-All Calls 2011



Highlighting the 2011 numbers; while the emergency and non-emergency *average* response times were less than the 12-minute and 15-minute objectives established for each; the *90% fractile response* for the non-emergency calls was *22 minutes* vs. the *15 minute* objective , and the *90% fractile response* for the emergency calls was *18 minutes* vs. the *12 minute* objective.

### **Response Time by Area of the County**

During the initial presentation of study findings to the Emergency Services Work Group it was suggested that it had long been the perception within the County that rural areas of the county did not receive as rapid a response as the more urban and populated areas of the County. And, that it would be helpful to see and assess what those actual call numbers and corresponding EMS response times actually were.

In doing so, a second series of County maps follows.

**Map #6**-is again a map of Orange County; in this instance, divided into 2-mile square, numbered grids. The map was developed by Emergency Services Department personnel.

**Map #7**-color codes each grid on the basis of the average EMS response times recorded for the calls responded to within it during calendar year 2011. The number of calls per grid ranged from '0' to 1,505. The color key located at the bottom of the page provides an explanation of the colors used:

- The average response time into red grid squares was greater than 20 minutes
- The average response time into green grid squares was between 16-20 minutes
- The average response time into blue grid squares was between 12-16 minutes
- The average response time into orange grid squares was between 8-12 minutes
- There were no EMS calls dispatched during 2011 into those grids that were left white

Note also that the Appendix Section of this report includes a larger scale County Grid Map (Map #6) together with the number of EMS calls dispatched into each grid and the average response time for those calls; for the years 2009-2011.

**Map #8**-identifies the boundaries (in blue) of the existing designated EMS districts. Within each district there are notations that indicate the number of EMS calls and the average response time to those calls for the calendar year 2011. District 5 appears to be the largest in land area followed by District 4 and District 1. District 7 is the smallest.

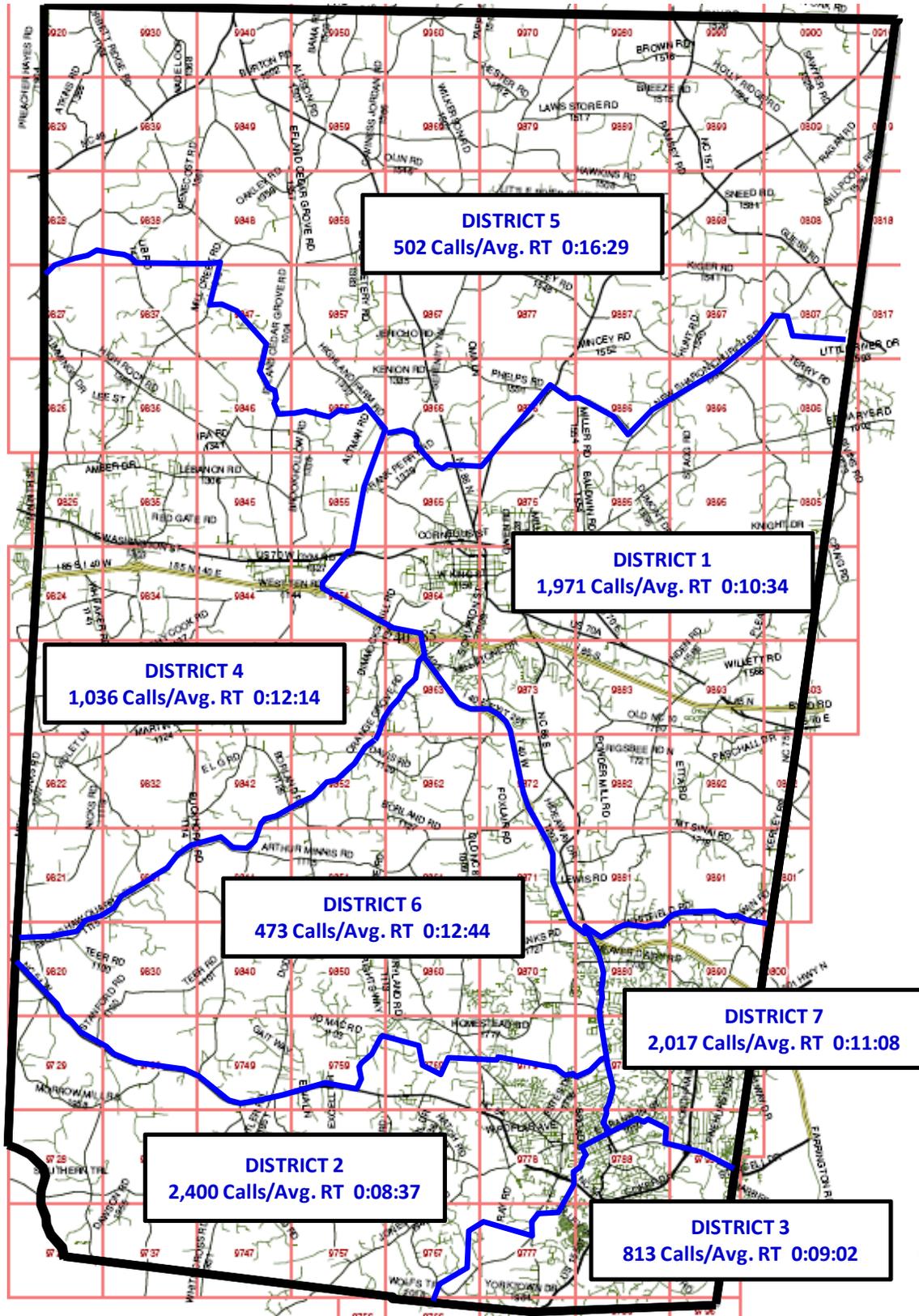
**Map #9**-divides the County into hypothetical "zones" based upon the study of EMS call volume, response time, area accessibility, and population. Then, calculating the number of calls and corresponding average response times that occurred within each zone to provide a look at the response time issue from another perspective. For example EMS District 2, in Map 8 showed 2,400 calls with an average response time of 08:37 to all calls. When dividing that District and considering the grid characteristics of "Zone 8" , which includes the western half of District 2, there is a dramatic decrease in the number of calls and significant increase in the average response time.

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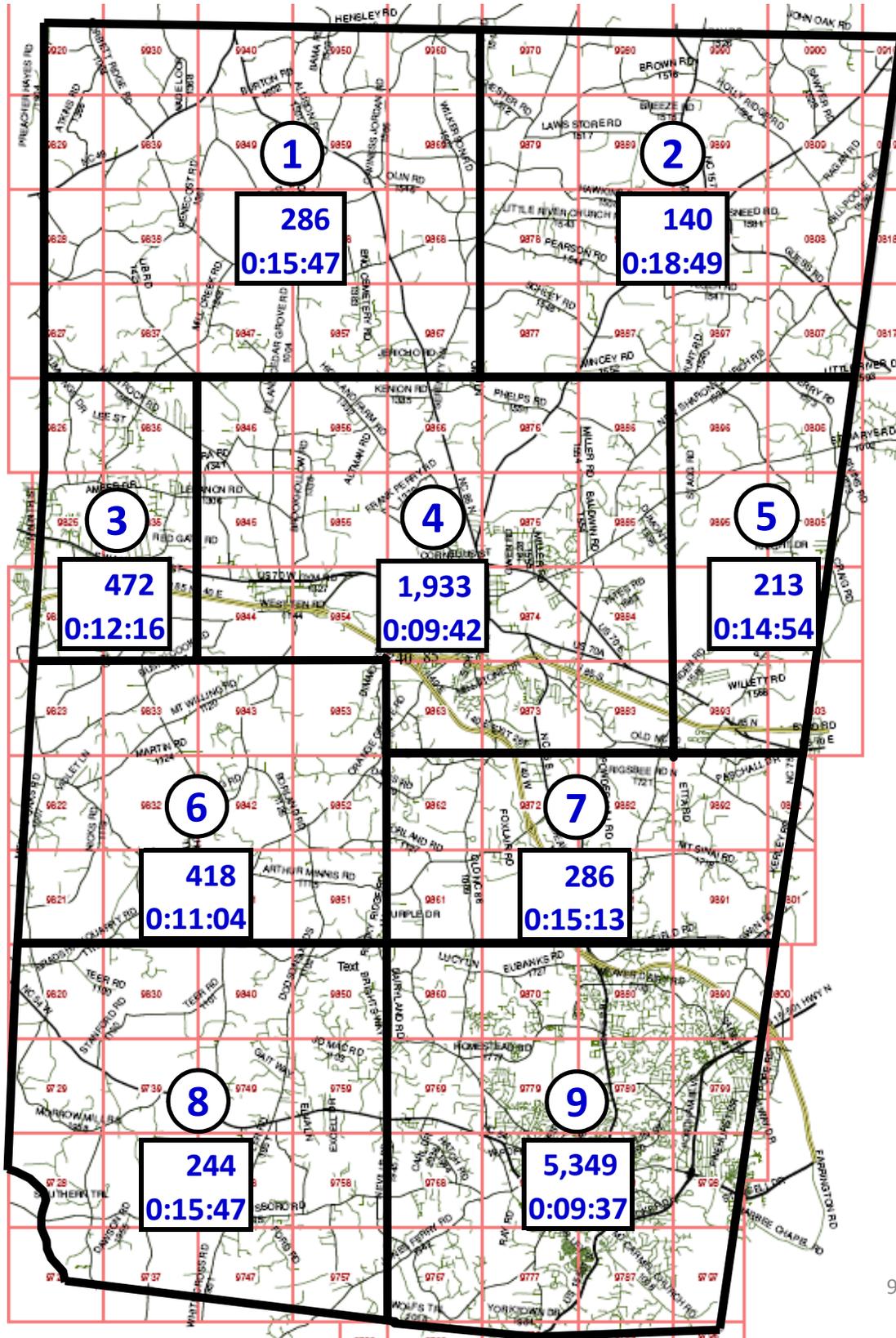




MAP #8



MAP #9



The responsibility for determining *what* the EMS system response time objective(s) should be is clearly the County's, in that it is the County that must define the level of care that it intends to provide.

#### 10A NCAC 13P .0201 EMS SYSTEM REQUIREMENTS

*.0201(a) County governments shall establish EMS Systems. Each EMS System shall have:*

- *A defined geographical service area for the EMS System.*
- *The minimum service area for an EMS System shall be one county.*
- *There may be multiple EMS Provider service areas within the service area of an EMS System.*
- ***The highest level of care offered within any EMS Provider service area must be available to the citizens within that service area 24 hours per day.***

#### **Issue: EMS Base Facilities**

When conducting space needs assessments to determine the requirements for an EMS building that is to house and secure an ambulance or ambulances and provide for the needs of the personnel assigned to them, one must begin by considering and discussing at least: the size of the vehicles to be housed, the type of support spaces required, the policy and legal requirements that will dictate specific utilitarian, safety, health, hazard prevention and decontamination procedures, the adjacency of and circulation between the individual spaces to be provided, and the overall security requirements of the facility. After which, the real details follow.

The Existing Conditions sub-section did not allude to physical EMS "bases" or "stations". Rather it referred to EMS "staging" locations. This is because there **are no** EMS bases or stations; at least none that are in buildings that were ever planned, built or intended for the purpose of accommodating EMS ambulances or EMS personnel.

Of significant concern, particularly in view of their cost, is that none of the staging locations available now can offer or assure EMS that it can house an assigned and equipped ambulance inside a code compliant, temperature controlled, securable building as suggested by NCOEMS policy..

Staff *may* have seating and work areas available to them but not always adequate restroom, meal preparation, respite, or specifically required OSHA and/or OEMS decontamination facilities.

The ambulance staging areas currently assigned have essentially come to EMS by default. There is no evidence that current staging area locations were strategically planned, but simply that space that was available via recent vacation or not otherwise being used, was offered as a location, for the most part, near the more populated areas of the County. There are currently areas of the County essentially uncovered and without any visible evidence that Orange County EMS has a presence in the area or community.

Orange County EMS, like Law Enforcement is an on-going and at times almost continuous service that functions 24 hours a day throughout the entire County. Its services are far from occurring on a casual "periodic" or "sporadic" basis. This concern must be addressed as a *long term* issue. And, it must (in the long term) dovetail with the Response Time and Ambulance Availability issues previously addressed.

EMS area base facilities, built to accommodate the needs of personnel, daily operations, equipment and vehicles, adequately staffed, and strategically located within the County, can significantly impact the response time concerns previously addressed.

An EMS facility must include at the very least, the following type of spaces:

- Indoor, temperature controlled vehicle bays with exhaust ventilation and recharging stations
- Secure equipment, materials and medication storage
- Special storage for certain narcotics and refrigerated medical supplies
- Decontamination showers for personnel
- Decontamination/wash areas for equipment
- Space for air drying decontaminated equipment
- Storage accommodations for contaminated clothing, waste, sharps, etc.
- Accommodations for the handling of medical gases (oxygen)
- Laundry facilities
- Food preparation and dining space
- Common/dayroom space
- Multipurpose storage space
- Staff Restrooms
- Technology to permit wireless internet capabilities, phone, radio, and pager communications
- Public entrance and space to accommodate visitors

There have been those quick to suggest that EMS should “share space” with the Fire Departments. And there are those that have been just as quick to suggest that, “no, it would never work-Fire and EMS I could never get along”. The fact is, Fire and EMS personnel work together throughout the County every day . . . and get along just fine.

The actual issue of Fire and EMS “sharing” facilities is more complex:

- The ultimate purpose (mission) of each is different
- Fire Department service areas are specific and limited
- EMS’ service area is the entire County
- The schedules of each are different
- EMS may run continuously for extended periods of time
- Fire will more often respond to “periodic” incidents
- The work habits of each are different
- The facility requirements of each are different
- Fire Departments are visible within their respective communities; few know where EMS is
- Existing Fire station locations are not strategically located to adequately address the deployment of EMS vehicles; to push the “sharing” of these facilities would simply continue a practice that has already worn out its welcome.

**EMS Base Location Scenarios**

Again, prompted by discussions during presentations to the Emergency Services Work Group regarding EMS response times and the lack currently of adequate EMS base facilities, two (2) hypothetical facility location scenarios were developed to enable a more in-depth discussion and subsequent assessment of options that might be available to the County.

As noted previously, prominent national organizations have suggested that an ALS ambulance be on the scene of a medical emergency within eight (8) minutes of being dispatched. In turn, Orange County EMS has established a response time objective of 12-minutes, to 90% of all emergency calls dispatched.

Therefore, utilizing a “blank slate” approach; i.e. looking at a map of the County without regard to existing EMS district boundaries or existing ambulance staging locations; identify the number of EMS base facilities and plot their approximate location on a map of the County that would be able to provide:

1. An OCEMS ambulance to be on scene to *anywhere* in the County **within eight (8:00) minutes**.
2. An OCEMS ambulance to be on scene to *anywhere* in the County **within twelve (12:00) minutes**.

In reality it took the development (and redevelopment) of many trial-and-error partial scenarios to eventually achieve the objective set for each; the fewest number of EMS stations that would provide the maximum possible coverage. The results are illustrated on the maps that follow.

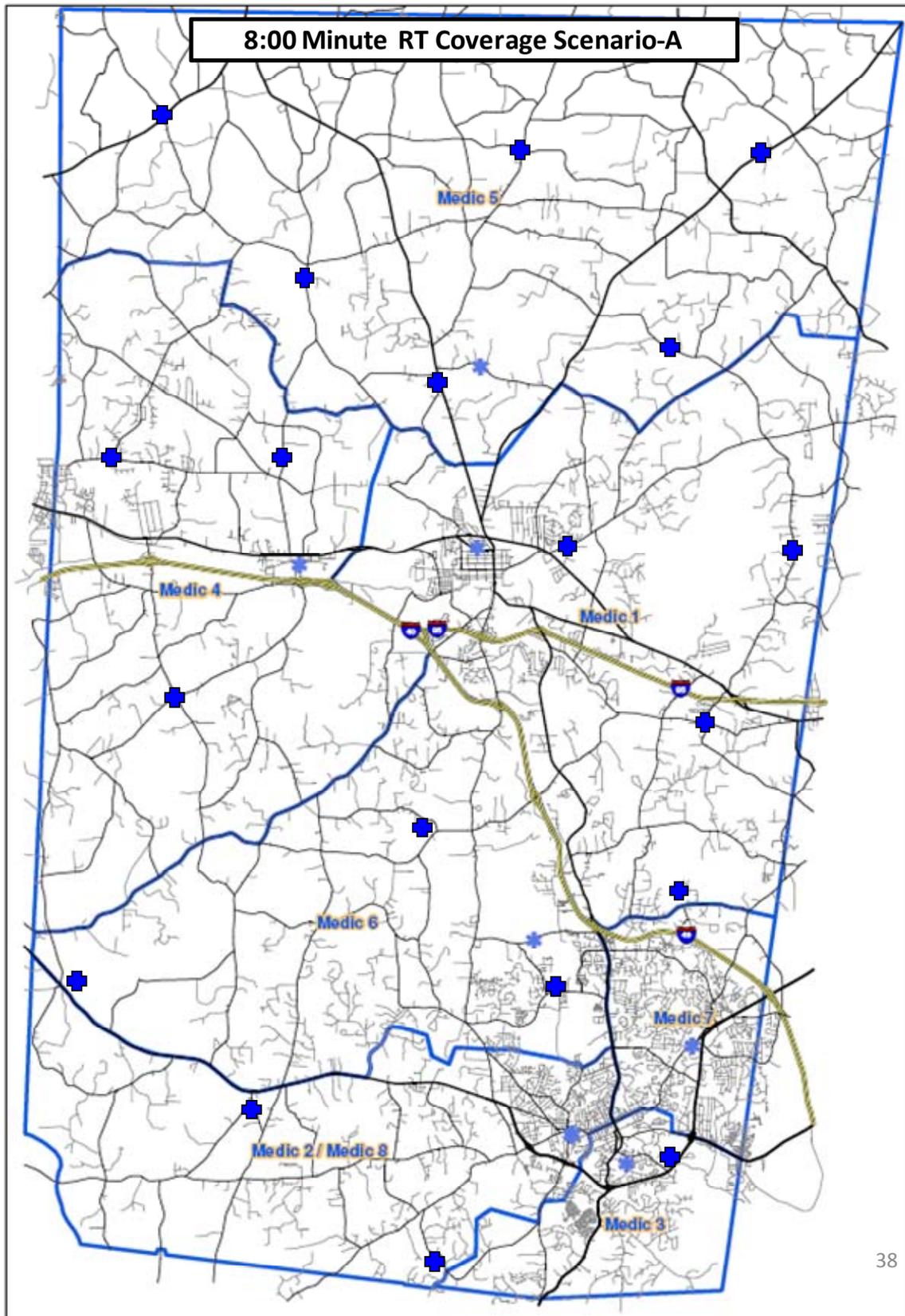
- **MAP #10-8:00 Minute (Response Time) RT Coverage Scenario-A;** identifies 19 EMS station locations
- **MAP #11-8:00 Minute (Response Time) RT Coverage Scenario-B;** identifies (in red) remaining “pockets” of land not accessible within the 8:00 minute response time limitation
- **MAP #12-12:00 Minute Response Time (RT) Coverage Scenario-A;** identifies nine (9) EMS station locations
- **MAP #13-12:00 Minute Response Time (RT) Coverage Scenario-B;** identifies (in red) remaining “pockets” of land not accessible within the 12:00 minute response time limitation

**Scenario Personnel Costs**

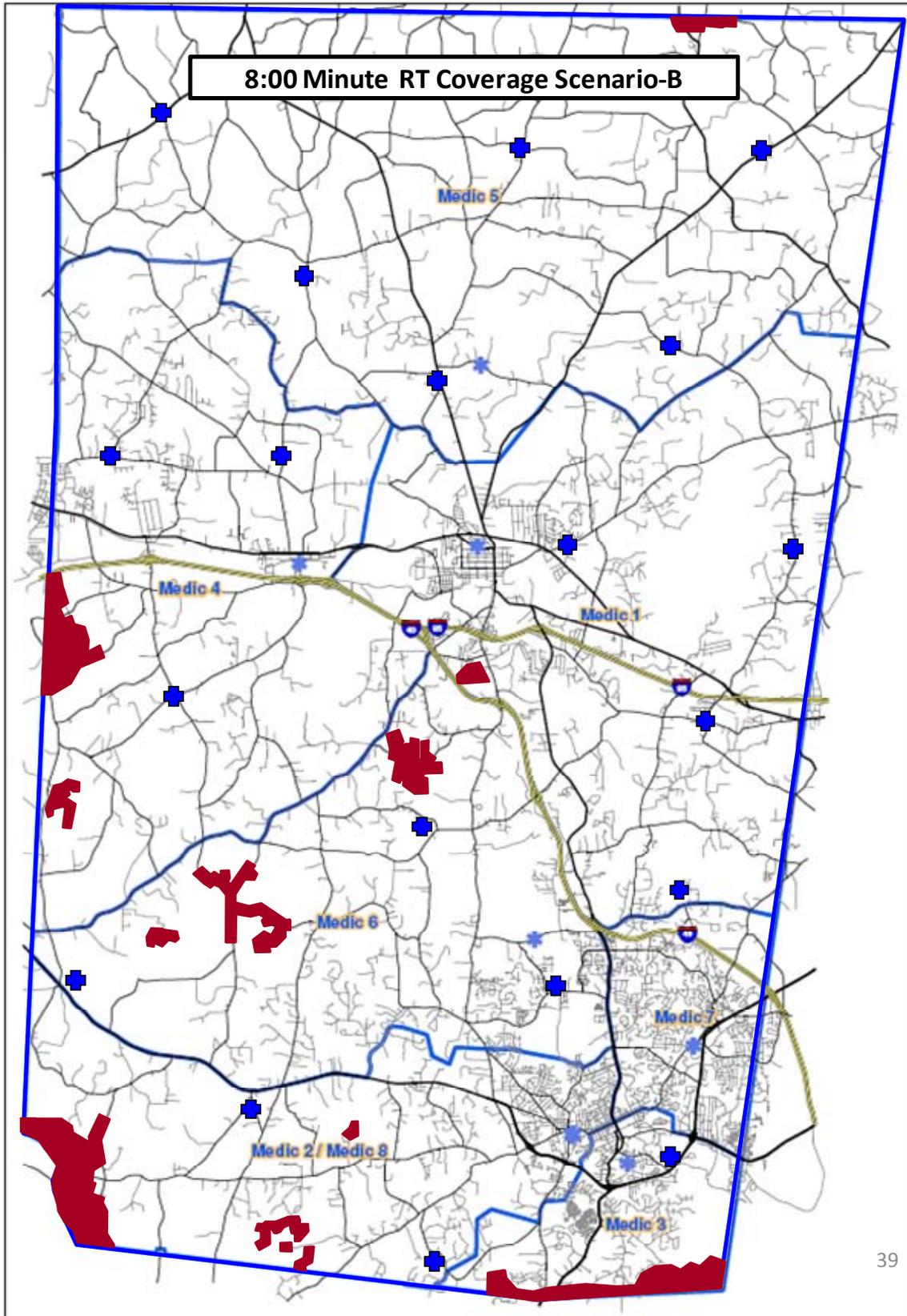
As a means of comparison, the number of stations and the corresponding FTE’s required to staff a single 24 hour ambulance in each proposed station, and the estimated personnel costs of each coverage scenario were assessed against existing FY 2011-2012 budget figures.

<u>12:00 Minute Response Time Coverage</u>		<u>8:00 Minute Response Time Coverage</u>	
19 Stations	204 FTE's	9 Stations	97 FTE's
	versus		versus
6 Locations	63 FTE's	6 Locations	63 FTE's
<hr/>		<hr/>	
<b>Total Personnel Cost</b>	<b>\$ 10,135,976</b>	<b>Total Personnel Cost</b>	<b>\$ 4,818,233</b>
Less Existing Budget Pers. Cost	\$ (3,703,295)	Less Existing Budget Pers. Cost	\$ (3,703,295)
Less Est. Overtime Savings [1/2]	\$ (200,000)	Less Est. Overtime Savings [1/2]	\$ (200,000)
<b>Total Net Cost Addt'l. Personnel</b>	<b>\$ 6,232,681</b>	<b>Total Net Cost Addt'l. Personnel</b>	<b>\$ 914,938</b>

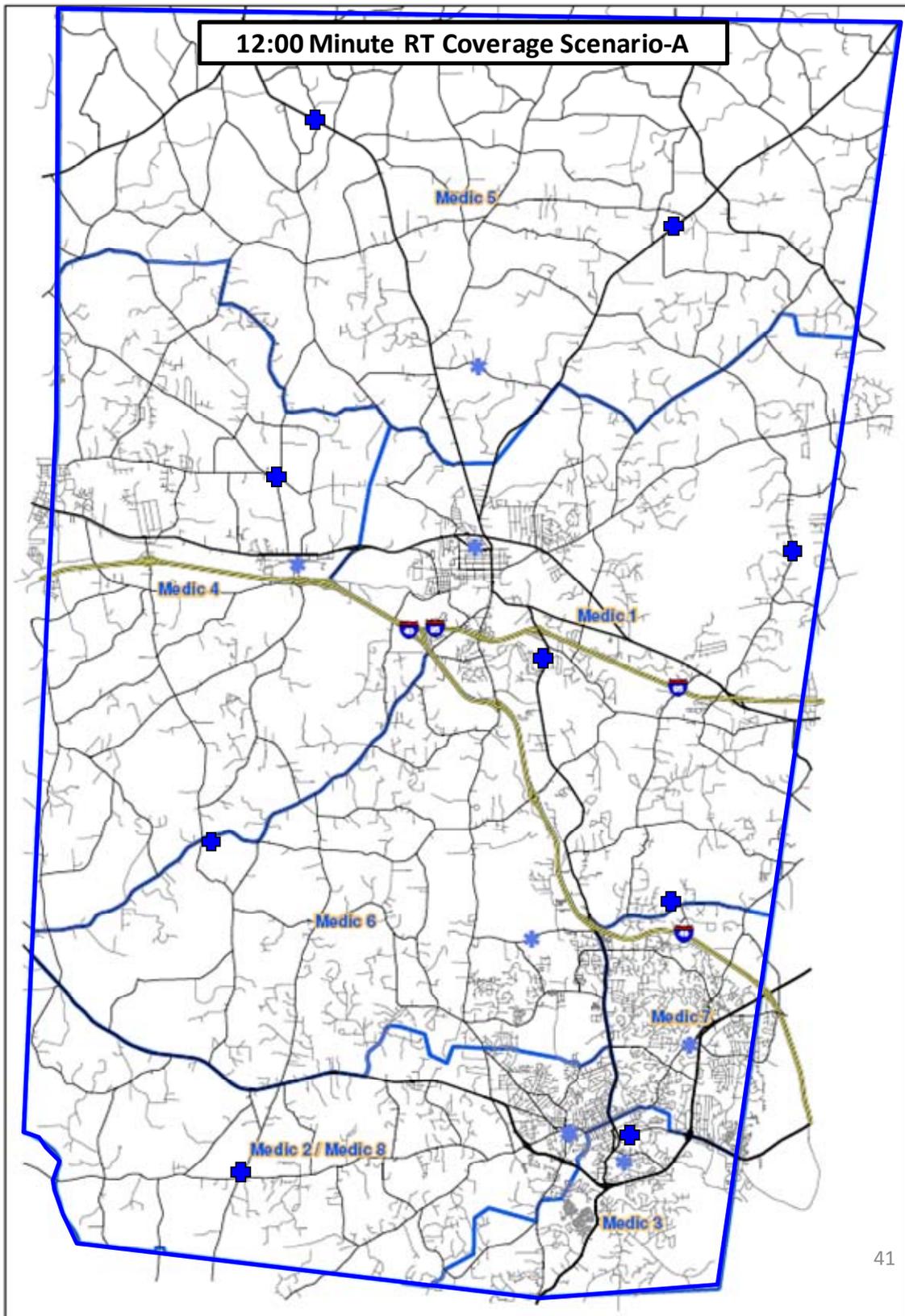
MAP #10



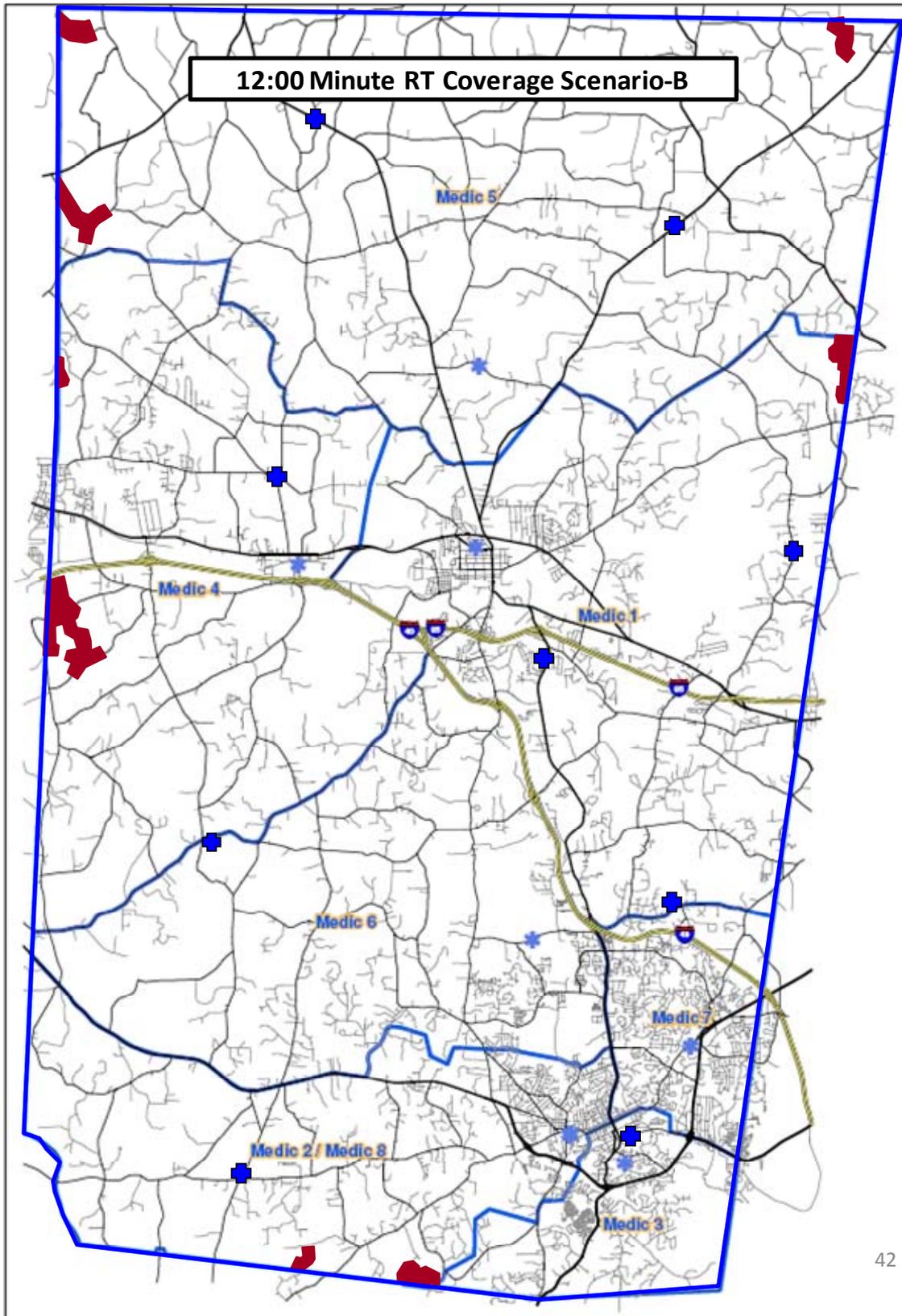
MAP #11



MAP #12



MAP #13



## 2.5 RECOMMENDATIONS

### Issue: Availability of Ambulances

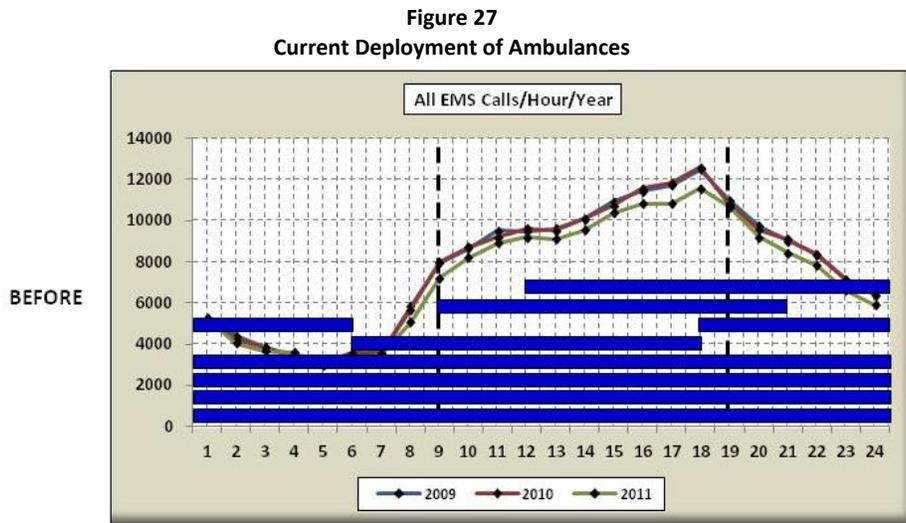
#### Recommendations:

#### R-1. OCEMS should adjust Medic 5 and Medic 8 coverage hours.

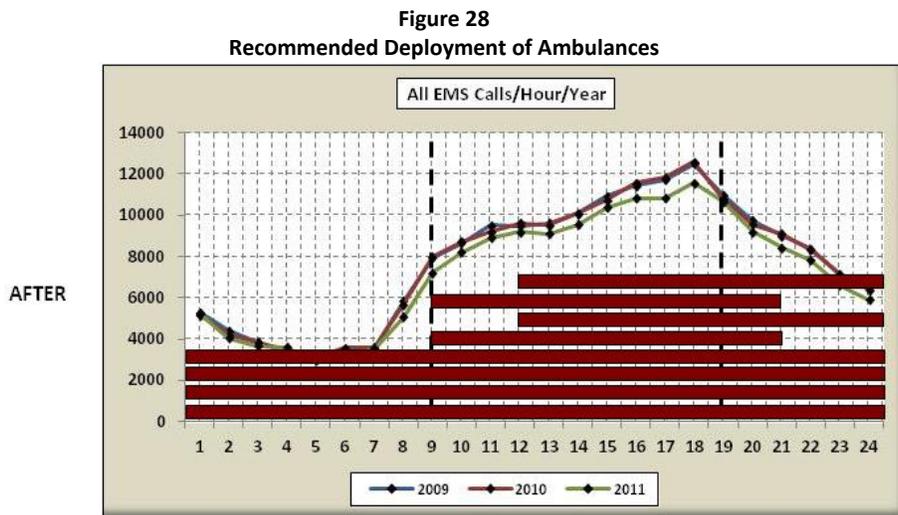
As an initial but immediate response to improve ambulance availability, adjusting assigned hours of available ambulances to more heavily load the prime time block of hours from 9:00 am-9:00 pm when many of the “move-ups” occur. Specifically:

- Move Medic 5 from 6:00 am-6:00 pm to 9:00 am-9:00 pm
- Move Medic 8 from 6:00 pm-6:00 am to 12:00 noon-12:00 midnight

The blue bars in Figure 27 represent the eight (8) Medic Units and their currently assigned shift hours.



The red bars in Figure 28 represent the coverage of the eight Medic Units once the changes to Medic 5 and \* have been made.



The objective of course in adjusting the coverage hours of Medic 5 and 8 is to increase the availability of ambulances and decrease the number of “move-ups” that must be ordered on a daily basis. Call data and corresponding move-up information will need to be closely maintained in order to assess the effectiveness of the shift adjustments.

The data collected will need to include information specific to each Medic Unit individually, including those already in place. The minimum information collected, collated and distributed for review on at least a monthly basis should include at least

- The number of calls dispatched per day, week, and month
- The total event time of each call
- The number times “move-ups” were ordered per day, week, and month
- The time of day the each move-up was ordered and its duration

Monthly summary reports of Medic Unit activities should be reviewed by at least the EMS Operations Director, the Medical Director, and the Emergency Services Director. A comprehensive assessment of the progress made towards improving ambulance availability should occur if it determined that the coverage adjustments are not having the desired impact, however, no later than the end of the sixth month of operation.

**R-2. OCEMS should add an additional ALS Ambulance 9:00 am-9:00 pm, 12 hours/day, 7 days/week.**

Adjusting the coverage hours of two Medic Units will certainly help reduce the number of “move-ups”; i.e. the number of times per day that available ambulances are down to one (1) or “no” ambulances. If, however, after no more than six (6) months of the enhanced prime-time coverage the number of “move-ups has not been reduced by at least two-thirds (from an average of 6.5/day to no more than 2/day) efforts should be made to immediately bring on-line a fully staffed and equipped ALS ambulance assigned to the 9:00 am-9:00 pm hours, 7 days/week.

**R-3a. Utilize available SORS/BLS ambulance for non-emergency patient transports.**

**R-3b. OCEMS should bring on line and staff a BLS ambulance to provide non-emergency patient transports.**

The concept suggested by this recommendation utilizes a BLS staffed ambulance to provide patient transportation (via ambulance) in non-life threatening circumstances. The basis being that ALS Medic Units would of course respond to all calls dispatched, however, rather than then having to transport the patient; i.e. travel to the hospital with the patient, and spend time at the hospital until released, they could return to “in-service” status and be available to respond to another call much sooner.

The reason for there being a “part a” and a “part b” to this recommendation is that they represent two options to accomplish this time saving effort to increase ambulance availability. If South Orange Rescue Squad (SORS), which is essentially a volunteer organization, cannot provide an ambulance and certified EMT personnel, and the concept is considered viable by the County, OCEMS should provide the ambulance and personnel to do so.

Note that while not addressed specifically in the wording of the recommendation it is assumed that the referenced prime-time hours would be the target time this BLS unit would be assigned. However, should EMS recognize call time/call volume or noticeable trends regarding patient transports that vary from those times, it should be able to assign and schedule the unit accordingly.

**Issue: Response Time****Recommendations:****R-4. Assess Fire Department capabilities to meet BLS First Responder response time objectives.**

This recommendation calls for an independent, objective assessment of existing Fire Department capabilities and the actions, procedures, and associated costs-if any, to address the Medical First Responder response time objectives established by the County.

The information to be reviewed and assessed for each department will include at least, but not be limited to the following:

- Department roster/membership
- Number of paid vs. volunteer personnel
- Available vehicles & relevant equipment
- Station location(s)
- Recent year call volume & type
- Past call locations
- Included map grids
- Existing funding
- Anticipated performance requirements

**R-5a. Schedule and implement Fire Department MFR initiative which includes performance objectives.****R-5b. Staff and equip four (4) EMS Quick Response Vehicles (QRV's) for assignment, initially, 12 hours/day, 7 days/week with shift start/end times to be determined by EMS.**

Should the findings and recommendations identified in the Assessment of Fire Department Capabilities recommended in R-4 be approved by the County, R-5a the implementation of the individual and collective Fire Department initiatives should take place as soon as possible following approval. Granted all actions and recommendations approved may not be able to occur at the same time for various reasons; i.e. logistics, funding, availability of personnel, etc.

Note that specific performance objectives, particularly with regards to response time, have not been defined at this time. This issue should be addressed during the Assessment (R-4) process, with every Fire Chief individually and with every Department having an opportunity to provide input.

In the event that the findings and recommendations identified in the Assessment of Fire Department Capabilities recommended in R-4 **not** be acceptable to the County, an alternative means of providing a medically trained and certified first responder on the scene of a medical emergency “fast”; i.e. *much* faster than the EMS average response times recorded in recent years; *is critical*.

Subsequently, the alternative recommendation in this case is that stated in R-5b. While not as widespread as 12 fire departments, four (4) single-person ALS Quick Response Vehicles (QRV's), appropriately deployed and monitored with regards to directing placement, can go a long way towards improving the initial first response to medical emergencies which is currently averaging 2-3 times that established by NFPA and others as the recommended standard for medical emergencies.

Note that this concept does not take an n EMT out of an ambulance and put them in a car instead. It places an EMT in a vehicle with the single purpose of improving the Medical First Responder response times to medical emergencies . . . “get there fast, assess the situation, stabilize/treat the patient, communicate the conditions found and await an ALS Medic Unit to arrive to transport the patient if necessary”. The EMT **does not** leave his/her vehicle to ride in the ambulance. Once control is assumed by the Medic Unit, the assigned EMT will be “in service” and assume the duties assigned.

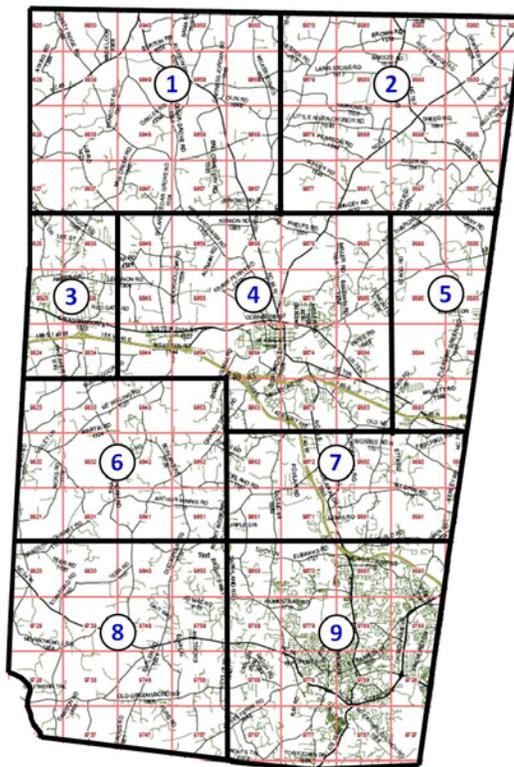
**R-6. Staff & equip three (3) 12 hour/7 day ALS ambulances at appropriate staging/base facility locations proximate to (1) Zones 1 & 2, (2) Zones 7 & 5, and (3) Zones 6 & 8.**

If Orange County intends to work towards addressing its statutory responsibility of providing the same level of EMS care to all areas of the County 24 hours per day, this recommendation, once acted upon, will demonstrate a significant step in that direction.

And, while the EMS Base Facilities issue will be addressed specifically in recommendations R-8 through R-12, the strategic placement of those facilities will need to coincide closely with this recommendation. Ultimately, it will be recommended that the County provide no less than nine (9) EMS base station facilities, preferably one within each of the nine zones identified in this map and in larger scale on page 41.

The basis for suggesting that the additional ambulances along with accompanying personnel and equipment be provided within each of 3 “pairs” of two zones each included that:

- Each of the total of six zones identified have among *if not the* slowest EMS response times in the County.
- Each of the “paired” zones is adjacent to one another.
- The location of an EMS station within one of the two adjacent zones *initially*, will improve response times to incidents in both zones, (although perhaps only “somewhat” improved in the zone without the station).
- As will be noted in *Section 6-Implementation Schedule*, the development of the EMS stations will require careful study as to location as well as scheduling of the capital and operating costs identified; these initially “shared” EMS base stations will permit the County to phase the development of future stations.



**R-7. Hire a Paramedic Level Shift Supervisor @ 24/7.**

The additional EMS personnel to be hired that correspond with the recommendations presented thus far, to address the Availability of Ambulances and Response Time issues discussed, will warrant an additional 24 hour/7 day Shift Supervisor position by Year 4 as identified in the *Implementation Schedule* provided in Section 6.

The relief factor calculations in Subsection 4.4, page 76, identified a multiplier of 5.1 per 24 hour position to enable 8,760 hours of coverage 24/7/365. In addition to personnel, a vehicle (typically SUV) up-fitted to provide two-way radio and computer communications with the Communications Center and on-duty Medic Units in the field, and GPS and AVL equipment will be required as well.

**Issue: EMS Base Facilities****Recommendations:**

**R-8. Prepare a detailed Space Needs Assessment that addresses the essential building and site requirements to accommodate a stand-alone, functional, code compliant EMS base facility that can serve as a prototype for all future facilities.**

The recommendation suggests that the County contract for professional services, working directly with the County and EMS personnel, to detail and document the space and site requirements for an EMS Base facility.

Once the essential space needs are identified various options can be refined based upon the specific type(s) of facilities needed; for example a station that would accommodate a single ambulance, a station that would accommodate multiple ambulances, etc.

The benefit of such an assessment and the documentation of the specific space and site requirements could serve the County in multiple ways;

- As a conceptual “pattern” it could be utilized as the prototype facility to be built at multiple locations.
- As a “test template”, were a building identified in a strategic location, the information detailed with this “template” could be utilized to evaluate the building in question as to its applicability for reuse as an EMS facility.

**R-9. Identify a minimum of nine (9) strategic locations, preferably no less than one (1) location within each major zone previously identified, for the potential location in each of a future EMS base.**

The criticality of the location of EMS base facilities in an area as large, and as varied as Orange County *cannot* be over emphasized. As alluded to in R-8 above, while the “ideal” situation would be available property on which to build-to-suit a *new* building, the eventual option that presents itself may in fact be an existing building that may be appropriate for reuse as an EMS facility.

Regardless of the approach, the previous EMS Issues discussions made clear the need for these facilities in locations in addition to only the more populated areas of the County.

**R 10. The County should purchase/obtain identified sites (and/or buildings) for development.**

The completed Space Needs Assessment suggested in R-8 should provide the criteria for evaluating the potential of any site or building considered.

**R 11. Procure EMS base planning and design services.**

Depending upon the level of detail provided in the referenced Space Needs Assessment, planning and design of a single EMS base facility could take 4-6 months, particularly considering the various regulatory requirements imposed on “public building” projects.

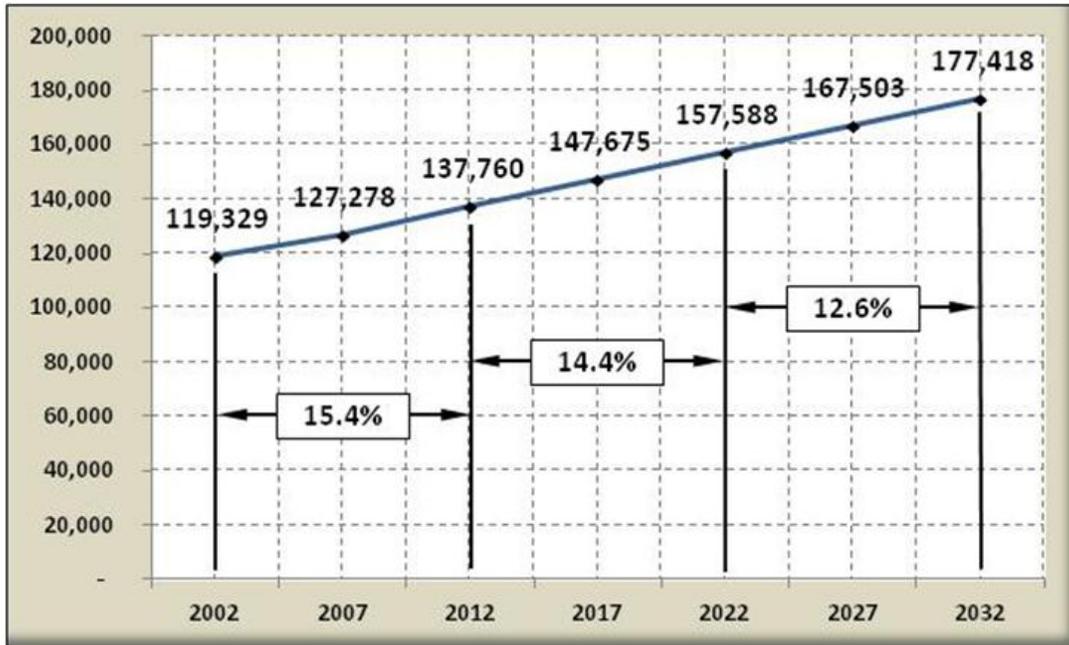
**R 12. Advertise, bid, and commence construction on designated EMS base facilities.**

Once the design is completed and approved, the bidding and construction of this type of building could take 6-8 months depending upon whether it is to be new construction on a “clean” site, renovation and a building addition to an existing structure, etc. Of course any number of additional options (and benefits) could be realized if for example, a single contractor (or designer) was selected to do more than one facility at a time; i.e. a “package deal”.

## SECTION 3-COUNTY POPULATION

This section briefly examines the Orange County’s recent past and projected future populations. The relevance of the County’s resident population to the future demand for EMS services and later 911/Communications Center call demands will be considered in an effort to project future demands and in turn needs of both operations. The source of the material presented in this section is the North Carolina Office of Budget and Management (NCOBM).

**Figure 29**  
**Orange County Experienced & Projected Populations**



Source: NC Office of Budget & Management

These figures indicate that over the past 10 years the County’s population has increased 15.4 %. The projected July 2012 resident population is 137,760. Over the next decade the County’s population is projected to increase by just under 20,000 residents; 14.4%. The following decade, 2022-2032, although increasing at a lower percentage; i.e. 12.6%; will still experience an increase in population of yet another 20,000 residents.

In turn, as a means of comparison, the counties adjacent to Orange are expected to experience the following in terms of growth over the next 20 years:

**Figure 30**  
**Adjacent County Projected Populations/2012-2032**

County	Jul-12	Jul-22	% Change	Jul-32	% Change	Total % Change
<b>Alamance</b>	<b>153,498</b>	163,168	6.30%	172,841	5.93%	12.23%
<b>Caswell</b>	<b>23,727</b>	23,733	0.03%	23,756	0.10%	0.12%
<b>Chatham</b>	<b>65,814</b>	78,411	19.1%	91,011	16.1%	35.21%
<b>Durham</b>	<b>275,946</b>	312,265	13.2%	348,584	11.6%	24.79%
<b>Orange</b>	<b>137,760</b>	<b>157,588</b>	<b>14.4%</b>	<b>177,418</b>	<b>12.6%</b>	<b>26.98%</b>
<b>Person</b>	<b>40,247</b>	45,010	11.8%	49,776	10.6%	22.42%

The experienced EMS call volumes and the corresponding EMS calls per 1,000 resident population has been identified for the years 2000-2011 and will provide the basis for future year call volume projections.

Figure 31  
Experienced EMS Call Volume/2000-2011

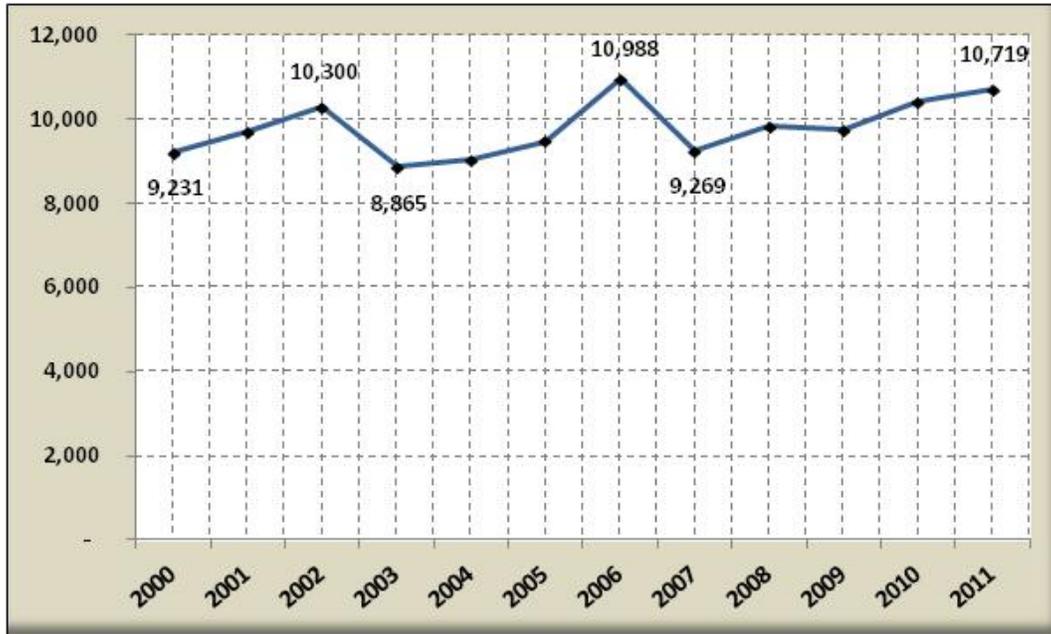
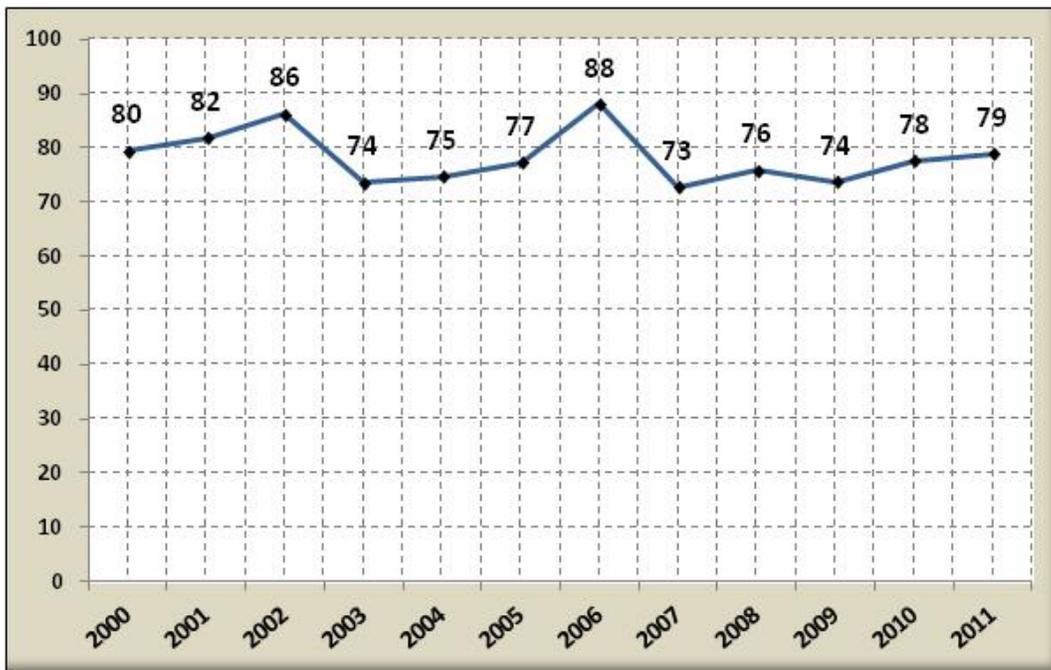


Figure 32  
Annual EMS Calls per 1,000 Population/2000-2011



The methodologies used to project future needs; whether people, workload, or in this instance EMS call volume; will typically involve an examination of recent year trends of those same characteristics. Today of course the application of technology and various software programs are available as well; all of which also, however, will typically require historical data to feed their formulas.

Subsequently, the starting point for these calculations will be the experienced (known) annual EMS call volumes for 2000-2011 and noted in Figure 31, together with the annual County populations as documented by the North Carolina Office of Budget & Management for the same years.

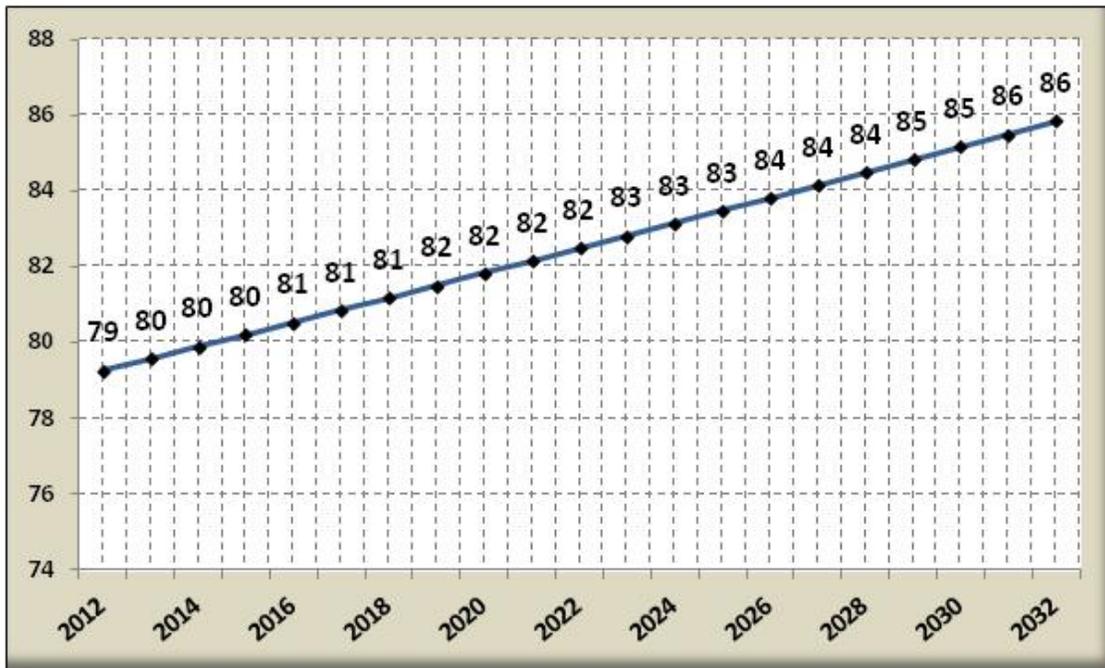
Between 2000 (116,106) and 2011 (135,776) the County’s population increased 16.9 percent.

Between 2000 (9,231) and 2011 (10,719) the County’s annual EMS call volume increased 16.1 percent.

While the County’s total annual population figures are important, the correlation of the number of EMS calls per *unit of population served*; in this case the number of calls per 1,000 residents; is the variable that will be incorporated into the calculations of future annual EMS call volumes; Figure 34.

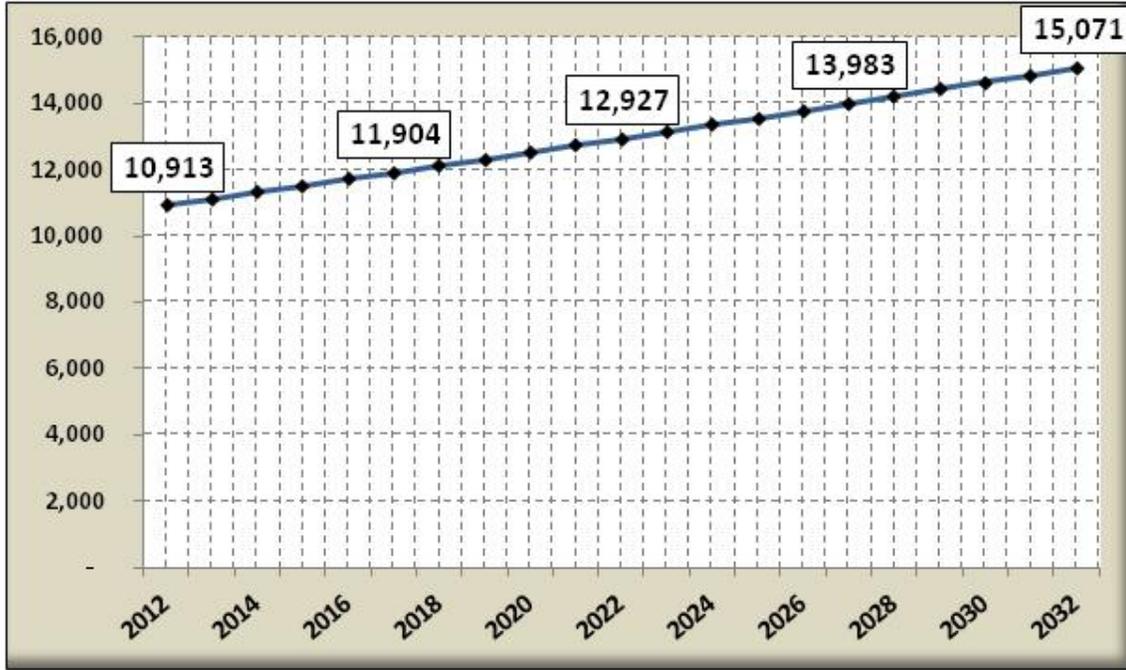
As illustrated in Figure 33 the number of EMS calls per 1,000 residents of course varied from year-to-year; in this case, the ratio increased during eight (8) different years and decreased during three (3) different years. In this case the *average annual change* in the EMS calls/1,000 ratio was + 3/10ths of 1%.

Figure 33  
Projected Annual EMS Calls/1,000 County Population/2012-2032



Now, of course, knowing the future year EMS call/1,000 population ratios and the projected annual County populations for 2012-2032 per Figure 29; future year EMS call volumes can be calculated. The results are as follows:

**Figure 34**  
Projected Annual EMS Call Volumes/2012-2032



**Figure 35**  
Projection Summary

Factor	2012	% Change	2022	% Change	2032
<b>Co. Population</b>	<b>137,760</b>	<b>14.4%</b>	<b>157,588</b>	<b>12.6%</b>	<b>177,418</b>
<b>EMS Calls</b>	<b>10,913</b>	<b>18.5%</b>	<b>12,927</b>	<b>16.6%</b>	<b>15,071</b>

When tracked over the years to come the numbers certainly will not fall into a straight line and at times may vary considerably. In all likelihood, however, the most significant indicator in the years ahead will be the County’s general population and its subsequent demographic sub-groups.

As an example, one of those demographic subgroups very likely to have an impact are those in the age group of 65 and over. According to the North Carolina Office of Budget & Management’s demographics section the projected numbers are as follows:

Age Group 65 yrs. & older-2012	10.6% of County's Population
Age Group 65 yrs. & older-2032	18.2% of County's Population
<b>Age Group's Total Increase:</b>	<b>121%</b>

## SECTION 4-911/COMMUNICATIONS CENTER

### 4.1 HISTORICAL & STATUTORY REFERENCES

Emergency communications in the mind of both citizens and public safety professionals is synonymous with “911”; the number dialed in an emergency. Since this concept deals essentially with telephone communications, the federal government, particularly the Federal Communications Commission (FCC) has played a significant role in its development.

In 1967 the President’s Commission on Law Enforcement and the Administration of Justice recommended that a “single number” be established for nationwide use to report emergency situations. On March 22, 1974, the Office of Telecommunications Policy issued National Policy Bulletin Number 73-1, the *National Policy for Emergency Telephone Number 911*. This policy stated that:

1. It is the place of the Federal Government to encourage local authorities to adopt and establish 911 emergency telephone services in all metropolitan areas, and throughout the United States. [Paragraph 3(a)]
2. Responsibility for the establishment of 911 services should reside with the local government. [Paragraph 3(b)]
3. The cost for basic 911 service should not be a deterrent to its establishment [Paragraph 3(c)]

By 1996 cellular and commercial mobile telephone service had become so popular and widespread that the FCC issued a report (CC Docket No. 94-102; July 26, 1996) calling for the requirement that 911 service be available to wireless phone users in two phases; phase I would provide calling party’s number and cell tower location; phase II would provide calling party’s number and location of the mobile phone by latitude and longitude. The *Wireless Communications and Public Safety Act of 1999* was subsequently signed by the President on October 26<sup>th</sup>, of that year.

#### **North Carolina Public Safety Telephone Act**

In 1989 the North Carolina General Assembly passed the Public Safety Telephone Act recognizing 911 as a toll free number through which an individual in the State can gain rapid, direct access to public safety aid. The Act became law as North Carolina General Statute Chapter 62A. Local governments were to set a rate and collect a 911 service fee to pay eligible costs associated with providing that direct access to Public Safety Answering Points (PSAP).

When wireless phones became popular, they did not fit the wireline model for providing location information, so in 1998 the Legislature adopted NC Senate Bill 1242 providing for a 911 Wireless Fund and creation of the Wireless 911 Board. This bill defined the composition of the fund and the requirements for participation. It became law as Article 2 of §62A.

During the 2007 legislative session House Bill 1755 was introduced "to modernize and improve the administration of the State's 911 system through a statewide 911 Board by ensuring that all voice services contribute to the 911 system and by providing parity in the quality of service and the level of 911 charges across voice communications service providers." The bill was passed as Session Law 2007-383, and took effect January 1, 2008. It requires all voice communications service providers to collect a single rate 911 service fee and remit collections to the State 911 Board rather than to the local governments. The State 911 Board distributes funds to the PSAPs based upon criteria set forth in the new law.

The duties and responsibilities of the 911 Board are significant. While GS 62A-42 appears to emphasize the Board's duties regarding the collection, management and distribution of 911 funds, an additional, long overdue, and very important responsibility of the Board is the establishment of performance, reporting, operational, and technical capability standards for all certified Communications Centers (PSAP's) throughout the State. At this time, the standards are expected to go into effect in January 2014. A draft of those standards as they currently exist is included in the Appendix of this report.

As well, a major initiative, underway since February 2012, is the provision to each County and established PSAP in the State, the installation of "Emergency Call Tracking System" (ECaTS)" capabilities which is expected to greatly enhance , make uniform, and formalize the complex tasks of collecting, reporting and managing 911 call statistics.

### **2.1.2 62A-42. Powers and duties of the 911 Board.**

- (a) Duties. – The 911 Board has the following powers and duties:
- (1) To develop the 911 State Plan. In developing and updating the plan, the 911 Board must monitor trends in voice communications service technology and in enhanced 911 service technology, investigate and incorporate GIS mapping and other resources into the plan, and formulate strategies for the efficient and effective delivery of enhanced 911 service.
  - (2) To administer the 911 Fund and the monthly 911 service charge authorized by G.S. 62A-43.
  - (3) To distribute revenue in the 911 Fund to CMRS providers and PSAPs in accordance with this Article and advise CMRS providers and PSAPs of the requirements for receiving a distribution from the 911 Fund.
  - (4) *To establish policies and procedures to fund advisory services and training for PSAPs, to set operating standards for PSAPs, and to provide funds in accordance with these policies, procedures, and standards.*
  - (5) To investigate the revenues and expenditures associated with the operation of a PSAP to ensure compliance with restrictions on the use of amounts distributed from the 911 Fund.
  - (6) To make and enter into contracts and agreements necessary or incidental to the performance of its powers and duties under this Article and to use revenue available to the 911 Board under G.S. 62A-44 for administrative expenses to pay its obligations under the contracts and agreements.
  - (6a) To use funds available to the 911 Board under G.S. 62-47 to pay its obligations incurred for statewide 911 projects.
  - (7) To accept gifts, grants, or other money for the 911 Fund.
  - (8) To undertake its duties in a manner that is competitively and technologically neutral as to all voice communications service providers.
  - (8a) To design, create, or acquire printed or web based public education materials regarding the proper use of 911.
  - (9) To adopt rules to implement this Article. This authority does not include the regulation of any enhanced 911 service, such as the establishment of technical standards for telecommunications service providers to deliver 911 voice and data.
  - (10) To take other necessary and proper action to implement the provisions of this Article.

## 4.2 EXISTING CONDITIONS

Orange County's emergency services network, which includes virtually all of the public safety agencies operating in the County, could not exist; i.e. could not *begin* to approach the general public's expectations of it, without a sophisticated emergency communications system.

While there is no doubt that much credit is due the many Fire, Rescue, EMS, and Law Enforcement personnel that respond with special vehicles, skills, and equipment to the scenes of countless reported emergencies, it is the actual **reporting** of those emergencies which gets everything started.

In this instance, the County's Communications Center; or "911 Center" as it is often called; is an operational component of the Orange County Emergency Services Department. It is located on the upper level of the Department's headquarters facility at 510 Meadowlands Drive in Hillsborough, together with the offices of the Emergency Services Director, EMS Administration, Planning & Logistics, and Life Safety Divisions of the Emergency Services Department. The personnel who work in the Center are of course employees of the County.

In the professional terminology of the communications industry, the Communications Center is referred to as the primary **public safety answering point**, or **PSAP**, for emergency communications in Orange County.

On duty personnel receive, handle and dispatch calls for Fire, Rescue, Emergency Medical Services (EMS), and Law Enforcement throughout Orange County.

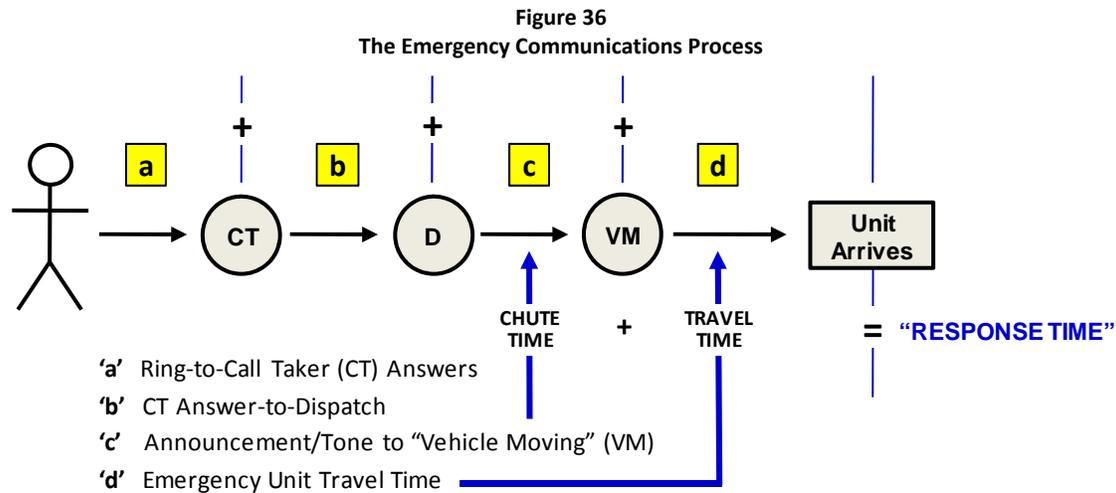
While generally referred to as "dispatchers" the position classification of the employees who work within the Center answering and dispatching calls is "Telecommunicator". During the period of the study, the Center was staffed with four (4) 12-hour shifts, each having five (5) assigned Telecommunicators. The variance in the number of staff on duty at one time, and the Center having to frequently work "short" was most frequently due to staff illness, vacation, approved personal leave, off-site training, or position vacancies.

### The Process

The essential functions involved in the emergency communications process are illustrated in the diagram that follows (Figure 36). The time intervals identified as 'a', 'b', 'c', and 'd' represent significant activity periods identified for the purposes of this study, particularly with regards to performance. In real life these activities will vary somewhat from call to call and certainly from service to service.

The involvement of Communications Center staff will also vary depending upon the type of call or emergency initially reported and the number of units or agencies dispatched. In some instances, the Telecommunicator may terminate the call when the dispatched agency has been notified, or when they respond via radio "on-scene", in others they will continue to monitor and communicate as necessary with some or all of the units/agencies responding to the emergency for the duration of the call; i.e. until the responding units are "back in service".

The diagram will be repeated later in the report with additional information regarding the Center's performance relative the specific time intervals.



The significant activities illustrated and undertaken by Communications Center staff include:

**1. The telephone is answered in the Communications Center (now) by a Telecommunicator who:**

- Follows initial question protocols; verification of address, phone number, immediate circumstances, etc. and either;
- Determines that the emergency is a significant event requiring that a Fire, Rescue, EMS, or law enforcement agency or unit be dispatched,

**Or**

- Determines that the call is not an emergency, is a duplicate call, or is one describing an incident already reported, and terminates call.

**2. The call is dispatched**

- The dispatch is official once the "tone" or page has been sent and the announcement has been made via radio in the station or vehicle of the service agency to be assigned the call; this announcement of course will include the initial incident description, victim information, reported status/condition, and address.
- A Telecommunicator may maintain communications with units dispatched and responding to the reported incident via radio (versus telephone) oftentimes for indeterminate periods until the full extent and nature of the incident can be personally observed by the responders and the need for additional resources, personnel or information is determined.

**3. During calls involving medical emergencies** a significant responsibility of the Telecommunicator continues after the call has been dispatched, and relates specifically to "emergency medical dispatch" (EMD) protocols. In this instance the Telecommunicator will remain on the line with the caller to obtain as much additional patient/victim information as possible as they will then (oftentimes) simultaneously and continuously alert the responding Paramedics as to patient condition, physical characteristics, scene circumstances, etc.; *and* as appropriate provide First-aid instructions to the caller in an effort to help the victim; i.e., "emergency medical dispatch".

### Emergency Medical Dispatch (EMD)

Orange County is a licensee of the National Academies of Emergency Dispatch (NAED) "ProQA" automated emergency medical dispatch program. NAED's EMD standard medical protocols are the accepted national standard for EMD providers.

EMD is based on the premise that a fire engine or ambulance does not have to be the first unit on the scene of a medical emergency. Once a caller reaches a Telecommunicator, that Telecommunicator can, almost immediately, begin providing medical information and pre-arrival instructions via phone. Subsequently, EMD consists of three key components:

**First**, is triaging the in-coming call request for medical assistance to determine the level of response required; i.e., no response, non-emergency transport, emergency transport.

**Second**, is providing pre-arrival instructions so the caller can immediately help the victim. The level of telephone assistance can vary from just simple advice to complete instructions for CPR. This is the most visible component of EMD and, in the eyes of some, its most valuable feature in that it can very well save a life.

Pre-arrival instructions are based on the concept that Telecommunicators are the victim's first medical contact and can provide basic first-aid via telephone, by asking specific questions and giving the caller instructions. The questions and instructions—"protocols" in medical parlance—are predetermined, given in a structured sequence, and specially designed to be effective when given to a third party over the telephone. The intended result is a dramatic decrease in the time it takes to begin administering emergency care.

**Third**, and perhaps the most critical feature of EMD, is quality assurance. *State law requires that each EMD program—and each aspect of the EMD protocol—must be reviewed, revised as needed and approved by the local or regional EMS agency; in Orange County, that authority is the Medical Director; a licensed physician.* This ensures that the information and procedures being given by the dispatchers is correct, and appropriate for the incident. In addition, there must be an on-going review of the use of EMD protocols by Communications Center Telecommunicators to ensure that the protocols are continually followed correctly, and that application of the protocols contributes to a positive patient outcome.

### Call Codes

In their communications regarding medical emergencies, Telecommunicators will utilize call codes in radio communications with responding agencies to indicate both the severity of the situation reported and the associated level of response; i.e. emergency, or non-emergency.

The codes utilized are those approved by the National Academy of Emergency Medical Dispatch (NAEMD) and range from the least severe; i.e. not life threatening: ALPHA; to the most severe; i.e. "circling the drain": ECHO, which calls for an "all units" emergency status response.

The table that follows identifies the Condition Identified, Agency/Unit, and Response Status protocols for each of the five Response Codes.

Figure 37  
Medical Dispatch Response Codes

Response Code	Condition Identified	Agency/Unit Dispatched	Response Status
ALPHA	Non-life threatening, low priority assessed	Ambulance only	Non-Emergency
BRAVO	Non-life threatening, but more serious	Ambulance only	Emergency
CHARLIE	Potentially life threatening	First Responders Ambulance	Emergency Non-Emergency*
DELTA	Life threatening	All Units	Emergency
ECHO	Circling the drain	All Units; including Law Enforcement	Emergency

Note the asterisk (\*) next to “Non-Emergency” in the Response Status column in the CHARLIE row. In a potentially life threatening emergency, First Responders (typically the closest Fire Department) will be dispatched to respond with lights & siren; i.e. emergency status; while the ambulance (Medic Unit) will be dispatched at the same time, however, in non-emergency status...*initially*. The assumption being that First Responders, assumedly first on the scene, will be able to assess and confirm (or not) the level of severity of the patient’s condition. If First Responders in fact confirm the condition to be life threatening, the Medic Unit will (typically) immediately upgrade to emergency status and respond accordingly. Should the condition be determined to not in fact be life threatening, the Medic Unit will, in most cases, continue on to the scene to confirm the condition of the patient and if necessary provide transportation to a medical facility.

#### Note Regarding the Communications Process

The above narrative examples, explanation of Call Codes, etc. focus on medical emergencies and EMS response; albeit the stated focus of this study. Of course Communications Center personnel must also deal with Fire and Law Enforcement emergencies on a daily basis as well. Subsequently, the Appendix includes process maps outlining examples of the call processing, dispatch, and ongoing communications activities that will typically occur not only with EMS, but with Fire and Law Enforcement as well.

#### Communications Center Staff

The individuals who occupy the workstations or “consoles” in the County’s Communications Center are classified as “Telecommunicators”. At present there is one (1) Shift Supervisor (Lieutenant), one (1) Lead Telecommunicator/Assistant Shift Supervisor (Sergeant), one (1) Communications Training Officer, and two (2) Telecommunicators assigned to each shift.

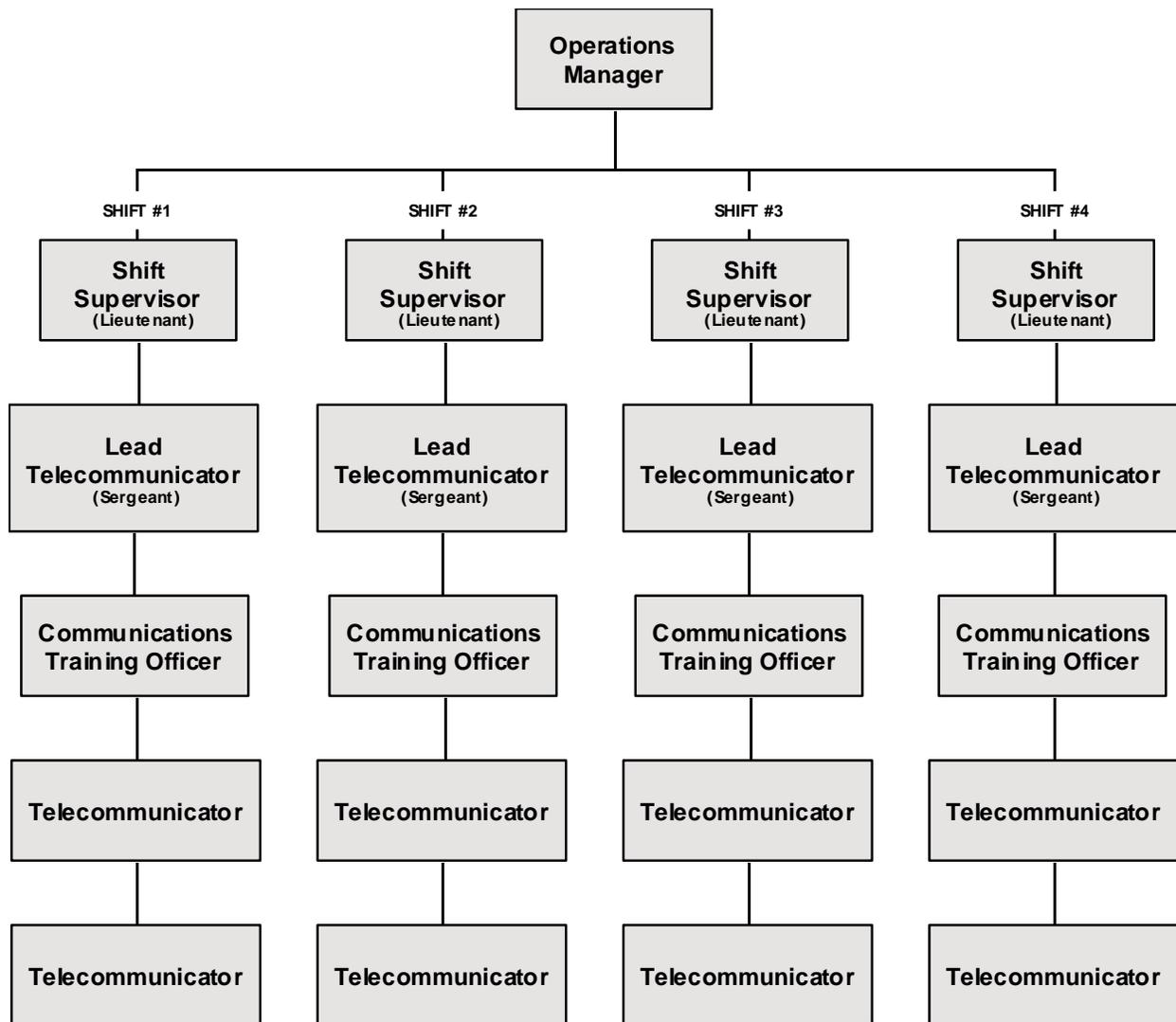
While the designated Supervisors will carry additional responsibilities, they are expected to handle them *in addition to* receiving, dispatching and monitoring 911 emergency and administrative calls received as the call volume dictates.

In this and similar County facilities, the principal activities occurring on the call center floor are those directly involved with the processing of calls received. In this regard, while the position title “Telecommunicator” is totally appropriate, the *functional* responsibilities of the position may vary somewhat between call-taking and dispatching, depending on the call volume occurring or whether the Communications Center is working “short”.

- A *Calltaker's* primary responsibility is answering 911 and administrative calls coming into the Center, recording essential information in the computer aided dispatch (CAD) system, and (ideally) transmitting that information to a Telecommunicator.
- A *Telecommunicator's* primary responsibility is to dispatch the call to the appropriate agency and handle on-going responding agency communications & radio traffic.

In Orange County all Telecommunicators have been trained and are certified as “Emergency Medical Dispatchers” or EMD’s. During the course of this study, the Communications Center was operating with a total *allocation* of 30 full-time positions, plus the Communications Center Operations Manager. However, it should be noted that during that time eight of those positions were either vacant (4) or in training (4) and therefore unavailable for duty. Figure 38 illustrates the current organization and position designations.

Figure 38  
Orange County Communications Center Organization



**Shift Schedules**

Communications Center employees currently work 12 hour shifts on a rotating “2-days on, 2-off, 3-on, 2-Off, 2-on, 3-off” schedule. In addition to permanent employee salaries, annual budget allocations are also included for overtime and part-time employees to assure continuous coverage of the Center.

**Training & Certification**

The current formal classroom hours that an employee candidate must complete to work as a Telecommunicator include the following:

**Figure 39**  
**Telecommunicator Minimum Classroom Training Hours for Certification**

Certification/Training	Hours
<b>North Carolina Sheriff’s Training Standards Certification</b>	<b>47</b>
<b>North carolina State Bureau of Investigation DCI Certification</b>	<b>24</b>
<b>Emergency Medical Dispatch EMD certification</b>	<b>32</b>
<b>Communications Center Operations</b>	<b>160</b>

Following successful completion of the training classes referenced, the candidate then will begin work in the Communications Center under the supervision of the shift Communications Training Officer to whom they are assigned for a minimum of three (3) months before they are released to work independently.

In addition to their initial certification, Telecommunicators must maintain their certifications by participating in continuing education classes each year. For example; : NC Sheriff’s Training & Standards @ 16 hours per year; NAED/EMD @ 24 hours every 2 years; and recently, the NC 911 Board has passed mandatory training of 16 hours per year for any agency that receives 911 funding. It is also mandated by Title II ADA 28 C.F.R. Part 35, that Centers (PSAP’s) train on TTY/TDD calls twice a year.

**Call Volume & Distribution**

For the calendar years 2009-2011, Communications Center records reflect that a total of 746,037 calls of all types were received; an average of 248,679 calls per year; on average, approximately 681 calls per day. These call totals are *not* all 911/emergency calls, however. The total call numbers include what are referred to as *Administrative* calls as well as 911/Emergency calls.

Depending upon a jurisdiction’s population, the number of service agencies and the geographic area served, Communications Centers such as Orange County’s will generally find that anywhere from 55-65 percent of all calls received are administrative calls; while 35-45 percent are 911/emergency calls.

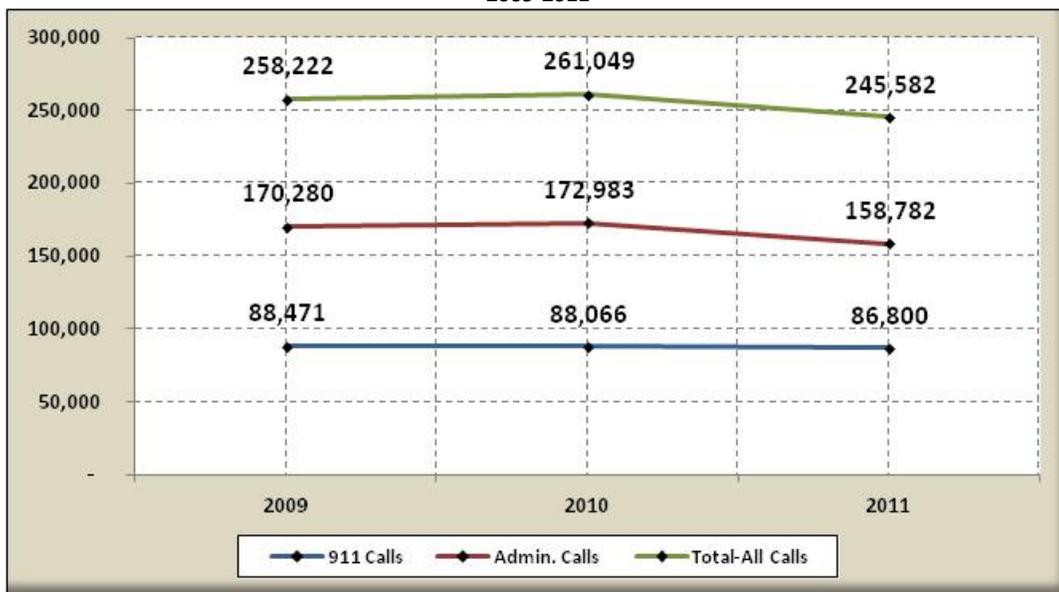
It must be recognized that administrative calls for the most part are a very important responsibility of the Telecommunicators assigned to the Communications Center. While the calls may not be emergencies per se, they may be calls from law enforcement or first responders asking for back-up, assistance, or other information relevant their immediate incident or emergency. Of course from time to time calls are received that are duplicate calls or calls that have nothing to do with an emergency. The determination of a call’s status alone is a significant responsibility. Examples of incoming “administrative” calls will include:

- License tag checks
- Inquiries regarding outstanding warrants

- Request for information; directions, phone numbers, names, etc.
- Requests for assistance at a crime or accident scene
- Duplicate calls
- Nefarious or misplaced calls
- Incoming admin calls:
- Alarms; i.e. fire, burglar, medical lifelines, etc.
- Operator transferred calls (they can't connect calls to 911 - only to a ten digit number.)
- Non-emergency calls which a citizen did not want to report on a 911 line.

The following table identifies the total 911/emergency and administrative calls received for each of the years 2009-2011.

**Figure 40**  
**Total Calls Received by Type**  
**2009-2011**



For the 3-year period the average annual 911 calls received was 88,186 and the average annual administrative calls received was 167,933; 34% and 66% respectively.

**Agencies Dispatched**

The agencies currently dispatched by the Orange County Communications Center include:

Law Enforcement

- Orange County Sheriff’s Department
- Chapel Hill Police Department
- Carrboro Police Department
- Hillsborough Police Department

Medical

- Orange County EMS

Rescue

- South Orange Rescue Squad

Fire Departments

- |                                     |   |
|-------------------------------------|---|
| Caldwell Fire Department            | Eno Fire Department                       |
| Carrboro Fire Department            | Hillsborough/Orange Rural Fire Department |
| Chapel Hill Fire Department         | Mebane Fire Department                    |
| City of Carrboro Fire Department    | New Hope Fire Department                  |
| Cedar Grove Fire Department         | North Chatham Fire Department             |
| City of Chapel Hill Fire Department | Orange Grove Fire Department              |
| Efland Fire Department              | White Cross Fire Department               |

“Other” agencies that are listed to receive after-hour call-outs:

- |                                 |                                |
|---------------------------------|--------------------------------|
| NC Department of Transportation | Orange County Public Works     |
| Animal Control                  | Orange County Probation/Parole |
| Utility Companies               | OCDSS/Child & Adult Services   |

**Distribution of Calls by Agency/Service Type**

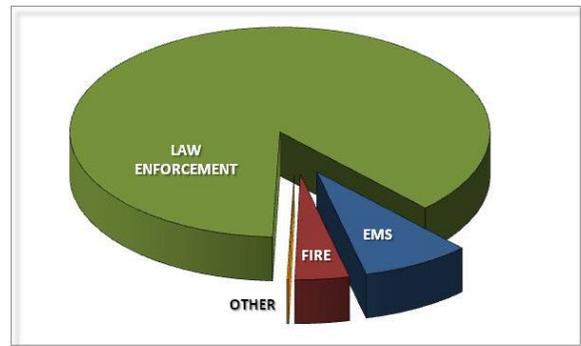
Collecting, organizing, and assessing incoming call data received at the Communications Center becomes very important to not only the Communications Center but also to the various responding agencies and, ultimately the entities that are responsible for funding both the Communications Center as well as the various emergency services and public safety response agencies.

For example, for responding fire, rescue, medical, and law enforcement agencies keeping track of where the calls came from and being able to plot or track the “patterns” of those high (and low) call areas can aid agency managers significantly when planning for the deployment of personnel and equipment throughout their respective jurisdictions and throughout the County generally. The total calls per year, by agency type; i.e. Law Enforcement, EMS, Fire and Other; were collected for the calendar years 2009-2011 and averaged. The chart that follows illustrates the average annual distribution of these calls for the referenced 3-year period.

The breakdown of these calls is clear from the illustration. The actual percentages by agency type are as follows:

<b>Law Enforcement</b>	<b>87.3%</b>
<b>EMS</b>	<b>8.4%</b>
<b>Fire</b>	<b>4.2%</b>
<b>Other</b>	<b>.14%</b>

**Figure 41**  
Call Distribution by Agency



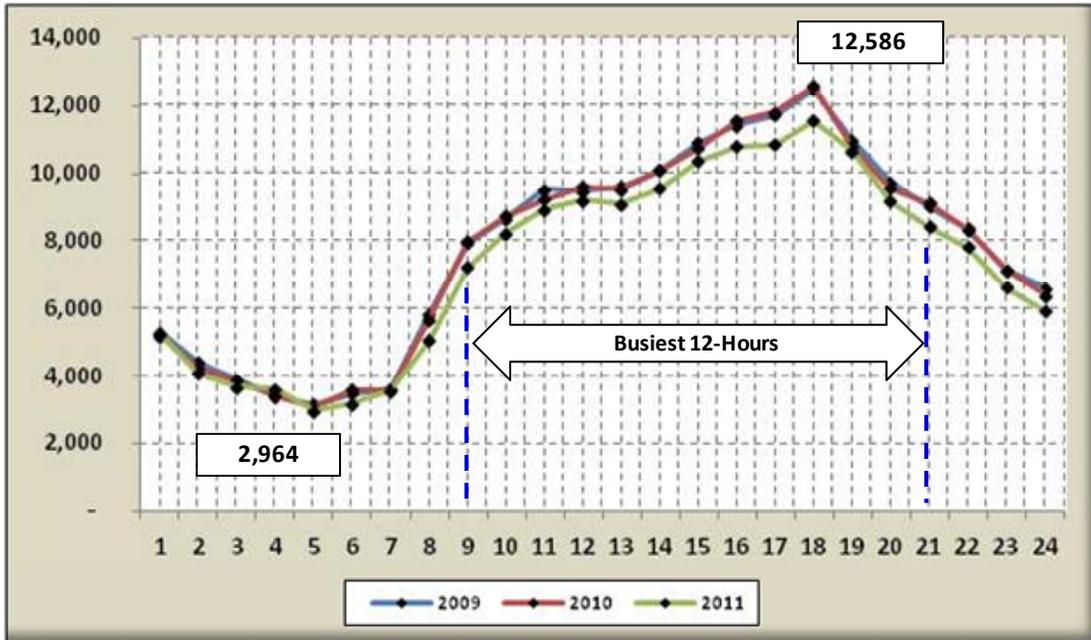
**Distribution of Calls by Hour of Day**

When considering staffing requirements and the assignment of personnel, it is the call data itself and the processing of that data that becomes important. In this case, the distribution of incoming calls by “Hour of Day” is quite significant.

The tracking of incoming calls by *hour of day per year* becomes critical when anticipating staff assignments ultimately not only to make sure that all emergency calls for assistance get answered, but that they also get answered quickly.

Figure 42 illustrates the total calls received by hour of day for the calendar years 2009-2011.

Figure 42  
Call Rate per Hour of Day/Year



The “hour of day” is indicated along the bottom of the graph by the numbers “1” through “24”. As an example, all calls received between 11:00 pm and Midnight are indicated on the vertical axis extending upward from “24”.

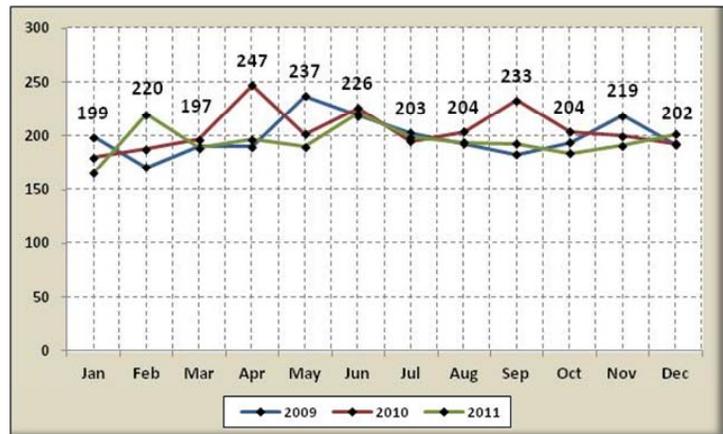
Based on these findings the lowest call volume per hour/year has consistently been between 4:00 am-5:00 am (2,964 in 2011). The highest call volume per hour has consistently been between 5:0 pm-6:00 pm (12,586 in 2009 and 2010). Not surprisingly, the busiest 12-hours of the day for the Communications Center is the same as that identified for EMS; 9:00 am-9:00 pm. For all 3 of the years considered, the call volume between 9:00 am-9:00 pm was never less than 8,000 calls per hour.

Figure 43  
Peak Hour Call Load/Month

**Peak Hour Call Load**

Again, an important variable in calculating eventual staffing and subsequent workload requirements is the total number of calls received during the busiest hour of the day.

While the average peak hour call load per hour over the past three (3) years has been 200 calls or 3.3 calls/minute; the peak hour call load for the 36 months studied was 247 calls, a rate of 4.1 calls per minute.



### 4.3 PERFORMANCE & COSTS

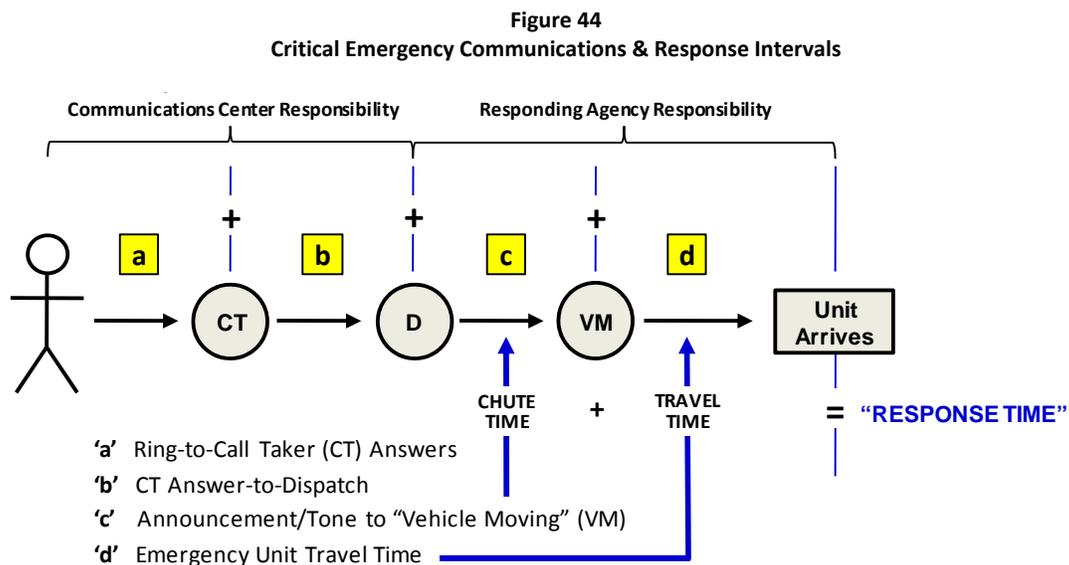
Ask the average citizen what they expect when they call 911 and they will inevitably say “they want help. . . FAST”! Ask them to think about it a minute or two and they might add that they want, “qualified personnel, with the proper equipment. . . FAST!”

In either case, it is the end result; i.e., the arrival on the scene and the effectiveness of the action taken that is what the average citizen will be most concerned with, and for obvious reasons. How well informed those actually responding to the incident are with regards to what to expect at the scene, or how effectively the emergency response process was implemented are less frequently considered outside of professional circles. A number of professional organizations offer significant commentary and/or specific, documented performance standards in which emergency communications plays some role. They include:

- National Academy of Emergency Dispatch (NAED)
- Association of Public-Safety Communications Officials (APCO)
- National Emergency Number Association (NENA)
- National Fire Protection Association (NFPA)
- Insurance Services Organization (ISO)
- Federal Communications Commission (FCC)
- Federal Emergency Management Agency (FEMA)
- Commission on Accreditation for Law Enforcement Agencies (CALEA)

While the citizen is immediately concerned with how long it takes from the time they call 911 to the time the responding agency vehicle arrives on the scene, the emergency responder(s) will be concerned with the steps it will take to mobilize once they have received the dispatch, and the time it will take to travel to the scene of the emergency. Thus, making the process of answering the 911 call, obtaining the necessary information needed to initiate dispatch, and activating the dispatch itself as promptly and efficiently as possible, extremely important.

Figure 44 is essentially the same as Figure 36, previously shown. In this case, however, with added emphasis as to who bears the responsibility for the various critical time intervals.



**Time Interval 'a'** = the time from first ring to answer

**Time Interval 'b'** = the time from answer to dispatch/completion of call

**Time Interval 'a' + 'b'** = The Communication Center's principal call taking and dispatch responsibilities, except:

- When the responding agency requests that additional units, ambulances, or engine companies be dispatched to assist at a scene or, for assistance enroute with directions, for example, to the location of the incident. In these instances, communications with the Center will continue and be via radio versus the telephone; or,
- A 911 call that is a medical emergency wherein the certified EMD Telecommunicator will stay on the telephone with the caller *after* they have dispatched the ambulance to ask the caller a series of "medical condition" questions, based on established medical protocols, to identify the extent and circumstances of the injury or condition, that they in turn then can communicate to the EMS responders enroute while also proceeding to offer instructions to the caller to assist the victim; for example, CPR, "continue to apply pressure to the wound", "keep them warm and still", etc. In this instance the Telecommunicators total "call time" may in fact include time intervals 'a' + 'b' + 'c' + 'd'

From the responding service agency's perspective the critical time interval for them becomes 'b'; based on the premise that they cannot *begin* to respond until they are notified of the incident.

### **Why time is important**

The most elementary explanation of why time is important in a police, fire, or medical emergency has to do with the obvious; serious injury and/or the potential of loss of life and property. Of course not all 911 calls are going to be that serious. Also, the variety, type, and circumstances faced with a single service agency will vary considerably from call to call; even more so between those calls placed to police, fire, and emergency medical services. Of course too, the agency or service *must be* prepared to address the most serious scenario each time they are dispatched.

Critical of course, and a factor that neither dispatchers nor responders can do anything about, is the time between when an event actually "begins" and the time it is reported or 911 is dialed. For example, the time between the fire actually starting and the time it is discovered and reported, the length of time an individual had not been breathing before being discovered, or the delay between a crime occurring and it being discovered and reported.

Additional factors that can impact the time it takes the call-taker between answering the call and dispatching it include:

- The state of mind or hysteria of the caller
- A "silent" call-wherein TTY/TDD is attempted, however questioning can only begin if there is a response
- Non-English speaking or speech impaired calls

### Police

While a great deal has been written with regards to law enforcement response times there is no identifiable time standard with which to judge performance or efficiency using only time as a basis. Urban or rural setting, nature of the offense, method of notification and personnel and equipment availability only begin to describe the variables that will inevitably effect police response time to an emergency situation to which they are called.

“Ideally, if the police are notified as a crime is in progress, they have a good chance to arrive before the perpetrators leave the scene. If police do not arrive at the scene within a few minutes, but still arrive while witnesses remain and are able to talk with them while the crime is still fresh in their memory, then they have a high probability of being able to solve the crime”. (NENA; *911 System Survey and Resource Guide*; 2002)

### Fire

The National Fire Protection Agency (NFPA) states that if a fire is not suppressed in eight to 10 minutes from the time of ignition, it will flashover, spreading outside the initial area or room of origin.

“As a rule of thumb, first responders should arrive on the scene in less than five minutes, 90% of the time.” (National Institutes of Health)

“The fire department shall establish a response time objective . . . of four minutes or less for the arrival of the first arriving engine company at a fire suppression incident, for not less than 90% of all incidents” [NFPA Standard 1710 for the Organization and Deployment of Fire Suppression Operations; Section 4.1.3.1.1.]. Note that “response time” in this standard is expressed as the time from “wheels are rolling” to “wheels stopped” at the scene.

### Medical

The same NFPA Standard (1710) also states that “deployment objectives are for the first responder/AED level to arrive within four minutes for 90% of all calls”.

“For cardiac arrest, the highest hospital discharge rate has been achieved in patients for whom CPR was initiated within 4 minutes of arrest and advanced cardiac life support within 8 minutes”. (American Heart Association)

In an incident involving lack of oxygen, brain damage is very likely at 6-10 minutes; irreversible after 10 minutes. (American Association of Orthopedic Surgeons)

### Emergency Communications

The aforementioned NENA publication, *911 System Survey and Resource Guide* states that:

“An important unit of measurement for primary public safety answering points (PSAP’s) is **average call length**. Calltakers and dispatchers must try to minimize call length while at the same time processing all of the information required to dispatch a call.”

The study found that the average call length decreased as PSAP size increased. Average call length was 91 seconds for emergency calls in small PSAP’s, 74 seconds for medium PSAP’s and 66 seconds for large PSAP’s, as defined in the survey.

The National Fire Protection Association’s (NFPA) Standard 1221, Section 7.4.1 states; **“Ninety-five percent of alarms (911 calls) received on emergency lines shall be answered within 15 seconds, and 99 percent of alarms shall be answered within 40 seconds”**. Further, NFPA Standard 1221, Section 7.4.2 states; **“Ninety-five percent of emergency call processing and dispatching shall be completed within 60 seconds, and 99 percent of call processing and dispatching shall be completed within 90 seconds”**.

Based upon the time standards suggested, and with reference to the time intervals identified in the Call Process diagram, the most important performance criteria were determined to be “first ring-to-answer” (time interval ‘a’), “answer-to-dispatch” (time interval ‘b’) and the total Communications Center “response time” which was the combination of time interval ‘a’ plus time interval ‘b’. The results of these analyses are included in the tables that follow.

The Communications Center’s telephone vendor allows access to the active data base which records and stores all incoming call times, first ring-to answer, and call duration.

The first report generated, “Call Count per Range”, identified the range in seconds from first ring to call answer for all incoming 911 calls. Figure 45 identifies the number of 911 calls received per month during 2011 and the range of time in seconds it took to answer those calls. Subsequently, 94.8% of all incoming calls were answered within 7 seconds and 99.5% of all calls were answered within 14 seconds not only compatible but well within the referenced NFPA standards.

**Figure 45**  
**First Ring-to-Answer Times/Annual 911 Calls (2011)**

Month	#911	0-7 sec.	7-14 sec.	< 15 sec.
January	6,472	90.3%	8.6%	<b>98.9%</b>
February	6,376	88.8%	9.8%	<b>98.6%</b>
March	6,989	95.9%	3.8%	<b>99.7%</b>
April	7,343	96.0%	3.6%	<b>99.6%</b>
May	7,507	96.2%	3.7%	<b>99.9%</b>
June	7,261	95.3%	4.2%	<b>99.5%</b>
July	7,275	96.1%	3.6%	<b>99.7%</b>
August	7,714	96.0%	3.7%	<b>99.7%</b>
September	7,586	96.2%	3.5%	<b>99.7%</b>
October	7,750	95.6%	4.1%	<b>99.7%</b>
November	7,376	95.6%	4.0%	<b>99.6%</b>
December	7,201	96.1%	3.7%	<b>99.8%</b>
<b>Total Answered</b>	<b>86,850</b>		<b>Total Avg. @</b>	<b>99.5%</b>

The same data base was able to provide individual monthly average Call Answer-to-Call Termination times for all incoming 911 calls.

**Figure 46**  
**Average Call Answer-to-Call Termination/Month & Year-2009-2011**

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann. Avg.
<b>2009</b>	0:01:43	0:01:44	0:01:44	0:01:48	0:01:44	0:01:44	0:01:40	0:01:39	0:01:42	0:01:40	0:01:45	0:01:47	<b>0:01:43</b>
<b>2010</b>	0:01:40	0:01:44	0:01:42	0:01:43	0:01:42	0:01:41	0:01:46	0:01:42	0:01:42	0:01:46	0:01:48	0:01:47	<b>0:01:44</b>
<b>2011</b>	0:01:49	0:01:41	0:01:41	0:01:38	0:01:33	0:01:38	0:01:37	0:01:35	0:01:37	0:01:35	0:01:37	0:01:35	<b>0:01:38</b>

The average annual Call Answer-to-Call Termination times ranged from a low of 01:38 (98 seconds) in 2011 to a high of 01:44 (104 seconds) during 2010.

Keep in mind; however, this is *telephone* Call Answer-to-Call Termination time with the 911 caller. It is *not* the *Call Answer-to-Dispatch* time referenced for which time interval standards have been established. Emergency response agencies are dispatched via *radio*, *not* by telephone. Subsequently as is often the case, the Telecommunicator may in fact dispatch the response agency while on the phone with the caller before, or sometimes well before, they terminate the conversation with the caller; in which case the call answer-to-dispatch time *may be* less than the Call Answer-to-Call Termination time; which then *might* suggest that the Call Answer-to-Dispatch interval objectives suggested were achieved.

**Figure 47**  
Call Answer-to-Dispatch Times

Year	50%	90%
2009	0:00:55	0:03:00
2010	0:00:56	0:02:54
2011	0:00:53	0:02:42

**Call Answer-to-Call Dispatch**

The sub-section that follows briefly addresses the data issues encountered during the conduct of this study. Despite repeated efforts by Emergency Services personnel, this specific time interval (Call Answer-to-Dispatch) proved the most elusive in terms of the data available and its reliability; i.e. lack of reliability. This table represents the latest effort to retrieve this data. Not only are the times excessive, they are 2-2 1/2 times what the referenced performance standards suggest that they should be.

In lay terms, the problem appears to be an issue of how the incoming calls are coded and the current CAD system’s capabilities to (or not) sort 911 calls from *all* calls. Many hours of monitoring Communications Center activity via radio and in the Center itself has demonstrated repeatedly that 911 calls *are* being dispatched in far less than the 2-3 minutes indicated in Figure 47. Considering the County’s recent approval to purchase new CAD system software, and its (hopefully) expedient arrival and installation, it was determined that further efforts by staff to assess this issue would be non-productive.

**The Data**

The availability of and accessibility to useable data from the Communications Centers CAD system was a concern expressed from the very outset of this study by the County itself.

Typically a jurisdiction’s 911 Center’s Computer Aided Dispatch (CAD) data base serves as the foundation of useable emergency call and response data for any and all emergency service agencies, and system managers and the basis upon which they base performance assessments, resource deployment, staffing, and budget decisions. The data must be easily accessible, up to date, user (especially service agency) friendly, and its accuracy; i.e. reliability; assured.

This was not found to be the case in Orange County. Why? For one, the CAD system currently in place was originally purchased and installed in 1992. Many “patches” and “parts” have reportedly been added since that time. The fact remains that the technology used for collecting and analyzing emergency services call and incident response data and is twenty (20) years old!

While Emergency Services staff labored repeatedly to access, reformat if necessary, interpret and make countless runs of data fields to get to the information required for this study, the efforts should not have had to take the time it did had the system been even modestly up to date.

The good news is that the County has recently (June 2012) approved the purchase of new Communications Center CAD technology and accompanying software which, by all reports, will offer a vast improvement for both the Communications Center but also the emergency services agencies that respond to the alarms to which they are called.

**Expenses & Revenue**

Figure 48 identifies the total (“actual”) annual budgets of the Communications Center for fiscal years 2008-2009 through 2011-2012. Not, unexpectedly, the major percentage of the total Communications budget for these years was personnel; which averaged 91.3% of the total annual budget.

***It is significant to note, and should signal concern, that the expense category “Training” averaged but 9/10ths of one percent per year, of the total annual budget allocations, for the past three years***

**Figure 48**  
**Annual Communications Expenditures/FY 2008-2011**

Account	FY 2008-09 Actuals	FY 2009-10 Actuals	FY 2010-11 Actuals	FY 2011-12 Actuals
<b>PERSONNEL SERVICES</b>				
PERM SALS	\$ 1,162,148	\$ 1,137,277	\$ 1,041,197	\$ 1,039,840
OT	\$ 121,819	\$ 117,000	\$ 76,995	\$ 130,883
TEMP	\$ 11,420	\$ 22,128	\$ 32,816	\$ 13,237
HOLIDAY	\$ 54,001	\$ 52,718	\$ 52,657	\$ 56,482
SOC SEC	\$ 82,788	\$ 80,994	\$ 73,487	\$ 75,903
MEDICARE	\$ 19,362	\$ 18,942	\$ 17,187	\$ 17,751
MED INS	\$ 178,809	\$ 177,453	\$ 173,620	\$ 186,475
RETIRE	\$ 66,426	\$ 63,044	\$ 76,783	\$ 86,729
PERS-OTHER	\$ 51,590	\$ 32,004	\$ 33,444	\$ 55,574
<b>SUBTOTAL-PERSONNEL SERVICES</b>	<b>\$ 1,748,363</b>	<b>\$ 1,701,560</b>	<b>\$ 1,578,187</b>	<b>\$ 1,662,873</b>
<b>OPERATIONS</b>				
TRAINING	\$ 584	\$ 2,100	\$ 764	\$ 1,950
CERT&LICSN	\$ 700	\$ 1,520	\$ 1,452	\$ 918
TELEPHONE	\$ 96,519	\$ 108,722	\$ 69,714	\$ 59,477
MOTOR POOL	\$ 158	\$ 450	\$ -	\$ -
EQUIP RPR	\$ 54,127	\$ 34,285	\$ 35,003	\$ 39,644
EQUIP RENT	\$ 6,039	\$ 13,997	\$ 2,151	\$ 5,400
DUPLICATIN	\$ 423	\$ 423	\$ -	\$ -
DUES	\$ 1,685	\$ 1,012	\$ 2,074	\$ 1,575
CONT SVS	\$ 2,021	\$ 22,210	\$ 587	\$ 1,230
SUP-DEPT,ED,OFF,COMP,OTH	\$ 5,315	\$ 4,067	\$ 24,096	\$ 5,216
OP-OTHER	\$ 5,422	\$ 5,819	\$ (10)	\$ (190)
<b>SUBTOTAL-OPERATIONS</b>	<b>\$ 172,993</b>	<b>\$ 194,605</b>	<b>\$ 135,831</b>	<b>\$ 115,219</b>
<b>RECURRING CAPITAL</b>				
EQUIPMNT	\$ 19,068	\$ -	\$ -	\$ -
IT EQUIP	\$ -	\$ -	\$ -	\$ -
FURNISH	\$ -	\$ 2,658	\$ -	\$ -
<b>SUBTOTAL-RECURRING CAPITAL</b>	<b>\$ 19,068</b>	<b>\$ 2,658</b>	<b>\$ -</b>	<b>\$ -</b>
<b>TOTAL: COMMUNICATIONS</b>	<b>\$ 1,940,423</b>	<b>\$ 1,898,823</b>	<b>\$ 1,714,018</b>	<b>\$ 1,778,092</b>

In North Carolina owners of cellular and land-line telephones are assessed a monthly “911 Service Fee”. These funds are collected by the State and /redistributed to the 128 certified PSAP’s (Communications s Centers) in the State for very specifically designated purposes; i.e. typically technical or phone system equipment or upgrades *within the Communications Center*. The amounts received by Orange County as identified in the published annual budget summary for FY 2008-09 through 2011-12 are identified here.

Figure 49  
Annual Budget & Surcharge Revenue Summary

Fiscal Year	Annual Budget	Surcharge Revenue	Collections (Revenue) as % of Budget
FY 08-09	\$ 1,940,423	\$ 659,799	34.0%
FY 09-10	\$ 1,898,823	\$ 658,184	34.7%
FY 10-11	\$ 1,714,018	\$ 657,050	38.3%
FY 11-12	\$ 1,778,092	\$ 506,348	28.5%

**4.4 ISSUES OF CONCERN**

This section discusses the significant Communications Center issues of concern identified during the analyses of the various data collected, the visual study of conditions found to exist, and numerous conversations and formal interviews conducted over the course of the study.

The determination of whether or not an “issue” was identified as such was based on the assessment of current operations and performance in discussed in Subsections 4.2 and 4.3

The issues identified as being of significant concern with regards to EMS involved the following topics;

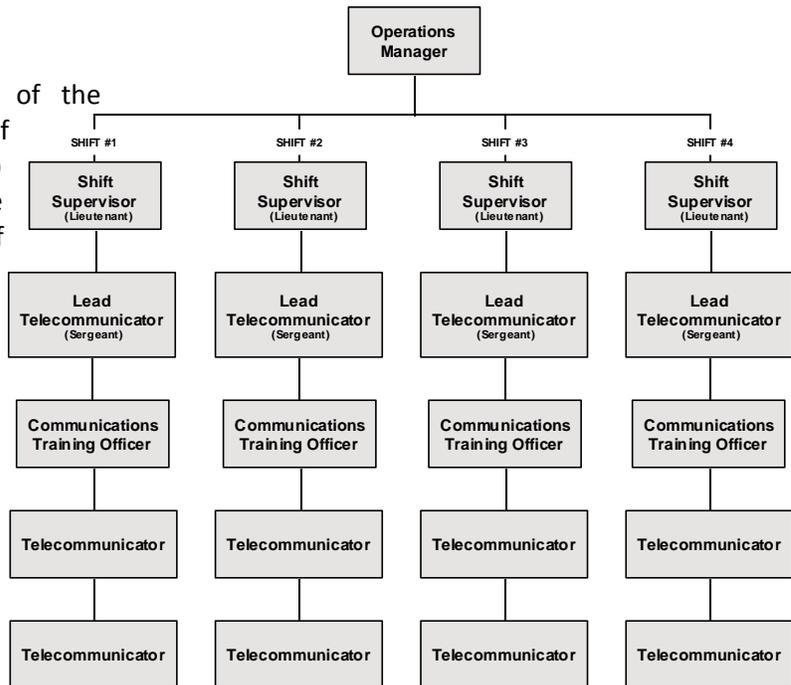
- Staffing
- Data

**Issue: Staffing**

The current staffing configuration of the Communications Center consists of the Operations Manager and four (4) shifts of five (5) positions each; the 5<sup>th</sup> position (Telecommunicator) as of this writing is and has been in training for several weeks. Obviously, with the exception of the Operations Manager, each position currently is expected to be occupied 24 hours per day, 365 days per year by appropriately certified personnel.

**Relief Factor**

Since the Communications Center requires continuous coverage of



each designated post position, it is important that the number of people required to man each position be accurately determined. These coverage requirements are generally calculated using what is called a “Relief Factor”.

The Relief Factor is the ratio between the number of hours a position is “open”; i.e., needs to be covered; and the number of hours of employee time required to fill that position during those open hours. Since the position must be filled each hour that it is open, additional employee time, or “relief” time, must be considered in order to cover for sick leave, vacation schedules, and time away from the position for such things as legal holidays and required training. Theoretically, a position that is open 24 hours per day, 7 days per week will require 8,760 hours of coverage per year.

Communications Center personnel currently work 12 hour shifts. Which, in actuality, based upon their rotation schedule, amounts to a total time assigned of fourteen, 12.2 hour shifts every 28 days; or 2,226.5 total hours assigned per year.

From this total must be subtracted annual holidays, vacation time, sick leave, and required training time spent “out of position” in order to determine the total hours a single staff member *is available* to cover a given position. Figure 50 identifies the calculations used to determine an individual Telecommunicator’s annual availability in hours.

Figure 50  
Annual Available Hours per Officer

<b>a. Total Assigned Hours/Year</b>				<b>2,226.5</b>
No. Days Allowed/Year	Hours/Year	Hours/day	Hrs. Deducted From Hrs. Assigned	
<b>b. Sick</b>	12.0	12.2	<b>146.4</b>	
<b>c. Annual</b>	15.7	12.2	<b>191.5</b>	
<b>d. Holidays</b>	11.0	12.2	<b>134.2</b>	
<b>e. Training</b>	3.0	12.2	<b>36.6</b>	
<b>Total Available Hours/Year; a-(b+c+d+e)</b>				<b>1,717.8</b>

Note that the Hours/Year are based on the accrual rate of second year employees, per Human Services, at the rate of 3.7 hours/pay period for sick leave (12 days/year), and 4.84 hours/pay period for annual leave (15.7 days/year).

The Relief factor for a 24 hour per day position, open 365 days per year would be 8,760 hours (number of hours position is open) divided by 1,717.8 hours (the number of hours an individual is available per year); the result being, **Relief Factor = 5.10**.

Figure 51 illustrates the subsequent calculations for both 24 hour and 12 hour shift positions.

Figure 51  
Shift Relief Factor Calculations

Position Coverage	Annual Hours Required/Position	Hours Available/Yr. Per Employee	Relief Factor
<b>24 Hrs./7 Days</b>	8,760	1,718	<b>5.10</b>
<b>12 Hrs./7 Days</b>	4,380	1,718	<b>2.50</b>

**Determination of Communications Center Staff Requirements**

First, the obvious; what the above calculations illustrate is that four (4) Shift Supervisors, four (4) Lead Telecommunicators/Assistant Shift Supervisors, and four (4) Communications Training Officers cannot cover their respective positions 24/7/365 without some or all of them working *a lot* of overtime or, working short staffed, or a combination of the two; i.e. it takes 5.10 bodies to cover one 24/7/365 position, there are currently four (4) assigned to each position.

Subsequently, in this instance staffing requirements will be calculated two ways:

The first method will include a calculation of the requirements on the basis of the staffing configuration currently *in place*. Note that “*in place*” is emphasized here in that the basis for the number of positions and in turn the number of personnel filling those positions is essentially, based on “history” versus the calculation of needs based on call data or work load.

The second method, which will utilize the Relief Factor calculations identified in the first method, will calculate the Communications Center staffing requirements based on an industry accepted formula matrix that is based on the County’s peak call volume and call duration data identified during this study.

**In-Place Position Requirements**

Once the current Telecommunicator trainees have completed their training the Communications Center will be able to provide an additional Telecommunicator to each existing shift; bringing the total positions assigned per shift to six (6).

With existing Staffing Configuration, at six (6) positions per shift, the minimum number of personnel required to cover each position 24 hours/day, 365 days/year would be:

Position Title	# Positions Per Shift	Relief Factor	# Required per Position
<b>Shift Supervisor</b>	1	5.10	<b>5.10</b>
<b>Lead Telecommunicator</b>	1	5.10	<b>5.10</b>
<b>Communications Training Officer</b>	1	5.10	<b>5.10</b>
<b>Telecommunicator</b>	3	5.10	<b>15.30</b>
	<b>6</b>		<b>30.60</b>

While this number (30.6) corresponds very closely to the number of employees currently allocated to the Communications Center (30), not including the Operations Manager, there are still five (5) vacant positions including, most critically, an Assistant Shift Supervisor and a Shift Communications Training Officer. Also, this staff requirement is based on the number of positions “in place” versus the number calculated as “needed”.

**Determination of Positions Needed**

The methodology used to determine the level of staffing required for a primary PSAP such as Orange County’s was one initially developed by the U.S. Department of Justice, and since utilized by agencies and organizations such as FEMA, the National Emergency Number Association (NENA), and the Assoc-

iation of Public Safety Communications Officials (APCO). It utilizes a matrix format that considers two principal criteria:

- The average call-taker “busy time” in seconds; i.e., average call duration, and
- The peak call rate per hour.

The average telephone call duration was calculated using the three years of call-processing data previously referenced for 2009-2011. Call duration information is recorded automatically for every call received. While the computer printouts and call data reviewed for this purpose did not indicate the type of call or specific emergency service requested, it was generally assumed that total call durations of two minutes or more involved an EMD response.

Call data analyzed identified that **the average call duration was 102 seconds**. This was the average of the entire sample studied; from the one-ring, 6-second hang-up to the 13 minute medical emergency, EMD response.

Based on the numbers illustrated in Figure 42, on page 68, the busiest hour of the day with regards to call volume for each of the calendar years reviewed was consistently between the 5:00 pm and 6:00 pm. Logically, it was assumed that the peak call rate per hour would come from this hour of the day. **The average peak rate per hour identified for the three years studied was 236 calls; 3.9 calls per minute.**

Applying these numbers to the nearest like numbers on the staffing matrix, illustrated in Figure \_\_, identifies ‘100’ as the number closest to the Communications Center’s average busy time of 102 seconds along the top line. The number 230 in the column (below the number 100) is the closest to the Center’s peak call rate per hour of 236. Now, following the line of numbers to the left from the number 230, results in the number of “required call-takers” required; in this case, ten (10).

Figure 52  
Staffing Matrix

Average Call Duration @ 102 seconds

Required Call-Takers	Average Call-Taker Busy Time, In Seconds																			
	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	
1	16	13	11	9	8	7	6	6	5	5	5	4	4	4	4	3	3	3	3	3
2	77	64	54	47	42	37	34	31	28	26	24	23	21	20	19	18	17	16	16	16
3	157	131	112	98	87	78	70	64	59	55	51	48	45	42	40	38	36	34	33	33
4	247	206	177	154	137	123	111	102	94	87	81	76	71	67	64	60	57	55	52	52
5	343	287	248	215	191	171	156	142	131	122	113	106	100	94	89	85	80	77	73	73
6	443	371	318	278	247	222	202	185	170	158	147	138	130	122	116	110	105	100	95	95
7	545	457	393	344	306	275	250	229	211	196	182	171	161	154	152	136	130	124	214	214
8	650	545	469	411	365	329	299	274	252	234	218	205	192	182	172	163	155	148	142	142
9	756	635	546	479	426	384	349	319	295	273	265	239	225	212	201	191	181	173	165	165
10	864	726	625	548	488	439	399	366	338	313	292	274	258	243	230	219	208	199	190	190
11	973	818	705	618	550	496	451	413	381	354	330	309	291	275	260	247	235	224	214	214
12	1082	911	785	689	614	553	503	461	425	395	368	345	325	307	290	278	262	250	239	239
13	1193	1005	866	761	678	611	555	509	470	436	407	382	359	339	321	305	290	277	265	265
14	1304	1099	948	833	742	669	608	558	515	478	446	418	393	371	352	334	318	303	290	290

Peak Call Rate @ 236/hour

Staffing Matrix Source: U.S. Department of Justice

Applying the Relief Factor to these findings; ten (10) Telecommunicator positions at 5.10 “bodies” per position, equals 51 personnel; considerably higher than what the Center is working with currently.

And, not surprisingly, during various audits of the Communications Center activities, both day and evening shifts, it was noted that staff did not take actual meal breaks, but ate at their work stations while continuing to answer calls. As well, they were observed to taking any noticeable form of breaks; for example, getting up from their workstation, leaving the call center area and going somewhere for a legitimate and restful “break”; both of which are addressed in FLSA literature for shift work hours of this duration.

Finally, the most blatant “gap” observed in the staffing configuration of the Communications Center, particularly for a Center with the call volume and *current* number of positions, was the absence of an assigned, dedicated, full-time Data System Manager, a dedicated Quality Assurance Officer, and a full-time Training Officer.

These are **critical** needs. And, while data/technical support is available on an as needed basis from the Planning & Logistics Unit of the Emergency Services Department this *is not* an adequate substitute for permanently assigned personnel; particularly, considering the Communications Center’s position at the very center of the Emergency Services and Public Safety entities in operation in Orange County.

#### **Issue: Data**

As discussed briefly in Subsection 4.3, the availability of easily accessed, workable, reliable, and user friendly data, which would normally be available in the Communication Center’s CAD system, was not. The information was there! However, it was found many times that it was neither easy to find or access nor in a user friendly format when it was finally obtained; albeit, requiring more work to make it so. A major reason, also previously addressed, was that the technology is 20 years old.

During the early phases of this study, interviews and meetings were conducted with Fire Department, Law Enforcement, and Emergency Services personnel. Though “opinions” flowed freely, and occasional personality “differences” were volunteered in often less than subtle terms, little actual, specific criticism of the Communications Center (or EMS) were offered. The one consistent and oft repeated “concern” had to do with “the call numbers”, or the manner in which service agencies were dispatched (or not), the timing of the agency’s “page” or dispatch versus the time the call was originally recorded; in other words the data, and the data system capabilities.

The Communication Center’s; i.e. the County’s technical capabilities were not up to speed, nor apparently have they been up to speed with the expectations of the various agencies served. Much of this will (hopefully) be resolved with County having recently, after many months, finally approved the purchase of new CAD software for the Communications Center; although completion of installation and access to its on-line capabilities remains several months away. It represents the proverbial light at the end of the tunnel.

This combined with the NC 911 Board’s installation of their new **ECatS** (Emergency Call Tracking System) data access and reporting system in Orange County and the other 127 PSAP locations in the State. A year from now, the *Data Issue* will hopefully have “gone away”.

The essential remaining effort to be undertaken will involve the methodology used by Communications Center and Emergency Services personnel in the orientation and training of the County's Emergency Service users as to its capabilities and the reports it can be expected to provide for those agencies.

## 4.5 RECOMMENDATIONS

### Issue: Staffing

#### Recommendations:

**R-13. Hire a full-time, dedicated Data System Manager to be located as close as possible, preferably adjacent to the Communications Center, and answerable first to the Communications Center Operations Manager.**

This position is a priority and efforts to identify and place a qualified person in this role should begin immediately. In turn, the coordination, installation and implementation of the new CAD system software should be at the very top of this individual's 'to-do' list.

**R-14. Hire a full-time, dedicated Training/Quality Assurance Officer to be located as close as possible, preferably adjacent to the Communications Center, and answerable first to the Communications center Operations Manager.**

This position is as important as that of the Data System Manager in that *accountability* and the adherence to EMD protocols is vital to an effective emergency Communications operation.

**R-15. Anticipating increasing responsibilities due to the number of new personnel forthcoming, hire an additional full-time Training/Quality Assurance Officer no later than the end of year-3.**

This recommendation anticipates that by the end of year-3 of the Implementation Schedule identified in Section 6 that the combined Training/Quality Assurance Officer position will evolve with the addition of personnel and require a transition to a full-time Training Officer and a full-time Quality Assurance officer.

**R-16. Prepare a schedule for the hiring and training of the identified Telecommunicator positions and identify the date to begin solicitation and acceptance of applications.**

The Communications Center is currently deficient of resources; i.e. personnel, in key positions; subsequently it will be important to have The Data System Manager and the Training/Quality Assurance Officer in place prior to the hiring of the personnel to fill the recommended Telecommunicator positions. Subsequently, the designated Telecommunicator positions, *particularly* the vacant Assistant Shift Supervisor and Communications Training Officer positions will be critical to an effective and efficient hiring timeline. Delays will prolong and exponentially prolong the problem of lack of staff.

**R-17. Hire 17 new, full-time Telecommunicators.**

The Implementation Schedule suggested in Section 6 identifies a suggested timeline for hiring of these positions. It is important to recall that hiring a "position" in the Communications Center means providing the responsibilities of that position 24 hours/day, 365 days/year. Subsequently, that "position" will require *five (5) bodies* to fill it. Therefore the sequence for hiring suggests that these Telecommunicators be hired in groups of no less than five (5) at one time; versus, for example, approving funding for two (2) people, "one in July and one (1) in January", which is a *very* inefficient process.

**Issue: Data****Recommendations:**

**R-18. Purchase necessary AVL vehicle hardware for each new EMS vehicle purchased to enable compatibility with newly purchased CAD software and existing AVL system hardware.**

Automatic Vehicle Location (AVL) hardware has already been purchased and is installed in current EMS vehicles. The equipment is compatible with the newly purchased CAD system software and the AVL “package” that is included within it. This recommendation is simply to continue with the purchase and installation of this important hardware into each new EMS vehicle as it comes on line.

**R 19. Following the installation of recently purchased Communications Center software and the training of in-house personnel; organize and provide informational meetings to emergency service system members, particularly Fire Departments and Law Enforcement, with regards to the system’s capabilities and the information that will be available to them for their use.**

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**SECTION 5-PROBABLE COSTS**

**EMERGENCY MEDICAL SERVICES**

**Issue: Availability of Ambulances**

<b>RECOMMENDATIONS</b>	
<b>1</b>	<b>Adjust Medic 5 and Medic 8 coverage hours</b>
<b>2</b>	<b>Add ALS ambulance 9a-9p @12 hrs/7 days</b>
<b>3a</b>	<b>Utilize available BLS ambulance(s) for non-emergency transports</b>
<b>3b</b>	<b>Staff BLS ambulance for non-emergency transport @ 12 hrs/7 days</b>

REC	Personnel	Equipment	Prof. Services	Construction	Other	Total
1	n/a	n/a	n/a	n/a	n/a	\$ -
2	\$ 224,100	\$ 228,400	n/a	TBD	TBD	\$ 452,500
3a	n/a	n/a	\$ 300,000	n/a	\$ 105,000	\$ 405,000
3b	\$ 205,876	(existing)	n/a	TBD	TBD	\$ 205,876

**Notes:**

Rec 2. Personnel-Includes equivalent of one (1) Paramedic “position” and one (1) EMT “position” @ 12 hours/7 days each = 2.5 FTE Paramedics + 2.5 FTE EMT’s.

Rec 2. Equipment-Includes estimated cost of one (1) M2 Ambulance, plus equipment, plus first year medical supply costs.

Rec 3a. Prof. Services-if SORS/BLS option is implemented, costs identified assume payment for transportation services billed @ OCEMS rates for estimated 1,000 patient transports/year.

Rec 3a. Other- If SORS/BLS option is implemented, costs identified assume payment of mileage charges @ OCEMS rates/mile x estimated 14,000 miles/year.

Rec 3b. Personnel- Includes equivalent of tow (2) EMT “positions” @ 12 hours/7 days each = 5 FTE’s to staff BLS ambulance if Rec 3a. cannot be implemented; assumes OEMS will have a vehicle available.

**SECTION 5-PROBABLE COSTS**

**EMERGENCY MEDICAL SERVICES**

<b>RECOMMENDATIONS</b>	
<b>4</b>	<b>Assess FD capabilities necessary to meet MFR-RT requirements</b>
<b>5a</b>	<b>Implement FD/MFR initiative w/performance objectives</b>
<b>5b</b>	<b>Add four (4) QRV's @ 12 hrs/7 days</b>
<b>6</b>	<b>Add six (6) 12 hr/7 day ALS ambulances; Zones 1/2, 7/5, 6/8</b>
<b>7</b>	<b>Hire Shift Supervisor; ALS @ 24/7</b>

REC	Personnel	Equipment	Prof. Services	Construction	Other	Total
4	n/a	n/a	\$ 8,000	n/a	n/a	\$ 8,000
5a	TBD	TBD	n/a	n/a	TBD	TBD
5b	\$ 484,650	\$ 220,000	n/a	TBD	TBD	\$ 704,650
6	\$ 1,344,600	\$ 1,370,400	n/a	TBD	TBD	\$ 2,715,000
7	\$ 321,300	\$ 45,000	n/a	n/a	TBD	\$ 366,300

**Notes:**

Rec 4. Prof. Services-Estimated contracted cost to provide independent assessment of existing Fire Department capabilities and needs to accomplish Medical First Responder response time objectives.

Rec 5a. Assumes needs identified and response time objectives resulting from Rec 4 are accepted by the County and Fire Departments respectively and implementation of the initiative is approved.

Rec 5b. Personnel-Assumes Rec 5a is *not* implemented; OCEMS to address critical MFR issue via hire of personnel to staff four (4) Quick Response Vehicles to be staged throughout the County; costs identified to cover one (1) Paramedic “position” per QRV @ 2.5 FTE’s per QRV x four (4) vehicles.

Rec 5 b. Equipment-Estimated cost of four (4) SUV type vehicles, including up-fit of communications systems and equipment.

Rec 6. Personnel-Assumes one (1) Paramedic “position” and one (1) EMT “position” per 12 hour/7 day ambulance = 2.5 Paramedic FTE’s + 2.5 EMT FTE’s per ambulance x six (6) ambulances; [over 8 years].

Rec 6. Equipment- Includes estimated cost of three (3) M2 Ambulances, plus equipment, plus first year medical supply costs for each.

Rec 7. Personnel-Includes one (1) EMS Paramedic level Shift Supervisor “position” 24/7/365 @ 5 FTE’s.

Rec 7. Equipment-Estimated cost of one (1) SUV type vehicle, including up-fit of communications systems and equipment.

**SECTION 5-PROBABLE COSTS**

**EMERGENCY MEDICAL SERVICES**

**Issue: EMS Base Facilities**

<b>RECOMMENDATIONS</b>	
<b>8</b>	<b>Conduct detailed Space Needs Assessment</b>
<b>9</b>	<b>Identify minimum of nine (9) strategic locations</b>
<b>10</b>	<b>Purchase identified site and/or building</b>
<b>11</b>	<b>Procure base design &amp; construction services</b>
<b>12</b>	<b>Construction; nine (9) EMS Bases</b>

<b>REC</b>	<b>Personnel</b>	<b>Equipment</b>	<b>Prof. Services</b>	<b>Construction</b>	<b>Other</b>	<b>Total</b>
<b>8</b>	n/a	n/a	<b>\$ 12,000</b>	n/a	TBD	<b>\$ 12,000</b>
<b>9</b>	n/a	n/a	n/a	n/a	n/a	<b>\$ -</b>
<b>10</b>	n/a	n/a	n/a	n/a	TBD	<b>TBD</b>
<b>11</b>	n/a	TBD	<b>\$ 1,620,000</b>	n/a	TBD	<b>\$ 1,620,000</b>
<b>12</b>	n/a	TBD	n/a	<b>\$ 8,064,000</b>	n/a	<b>\$ 8,064,000</b>

**Notes:**

Rec 8. Prof. Services- Estimated contracted cost to provide a Space Needs Assessment to address and document building and site requirements for an EMS base facility.

Rec 11. Professional Services-Estimated total cost for planning & design services for nine (9) EMS base facilities; assumes design for each facility is contracted for as a *single* project.

Rec 12. Construction- Estimated cost of construction for nine (9) EMS base facilities bid and contracted for as nine (9) separate projects; single facility construction cost based on a current NC County project in final stages of design @ 5,000 square feet x \$180/square foot for pre-engineered steel building.

**SECTION 5-PROBABLE COSTS**

**COMMUNICATIONS CENTER**

**Issue: Staffing**

<b>RECOMMENDATIONS</b>	
<b>13</b>	<b>Hire Full-time Data System Manager</b>
<b>14</b>	<b>Hire full-time Training/Quality Assurance Officer</b>
<b>15</b>	<b>Hire full-time Training/Quality Assurance Officer</b>
<b>16</b>	<b>Prepare schedule for hiring/training of new Telecommunicators</b>
<b>17</b>	<b>Hire 17 full-time Telecommunicators</b>

<b>REC</b>	<b>Personnel</b>	<b>Equipment</b>	<b>Prof. Services</b>	<b>Construction</b>	<b>Other</b>	<b>Total</b>
<b>13</b>	<b>\$ 74,250</b>	<b>n/a</b>	<b>n/a</b>	<b>n/a</b>	<b>n/a</b>	<b>\$ 74,250</b>
<b>14</b>	<b>\$ 64,800</b>	<b>\$ 8,000</b>	<b>n/a</b>	<b>TBD</b>	<b>TBD</b>	<b>\$ 72,800</b>
<b>15</b>	<b>\$ 64,800</b>	<b>\$ 8,000</b>	<b>n/a</b>	<b>TBD</b>	<b>TBD</b>	<b>\$ 72,800</b>
<b>16</b>	<b>n/a</b>	<b>n/a</b>	<b>n/a</b>	<b>n/a</b>	<b>n/a</b>	<b>\$ -</b>
<b>17</b>	<b>\$ 784,890</b>	<b>TBD</b>	<b>n/a</b>	<b>n/a</b>	<b>TBD</b>	<b>\$ 784,890</b>

**Notes:**

Rec 13. Personnel-Estimated annual salary + 35 % matching costs for Data System Manager.

Rec 14. Personnel-Estimated annual salary + 35 % matching costs for Training/Quality Assurance Officer.

Rec 14. Equipment-Estimated first year costs for necessary quality assessment and training materials.

Rec 15. Personnel-Estimated annual salary + 35 % matching costs for Training/Quality Assurance Officer.

Rec 15. Equipment-Estimated first year costs for necessary quality assessment and training materials.

Rec 17. Estimated annual salary + 35% matching costs for one (1) full-time Telecommunicator x 17.

**SECTION 5-PROBABLE COSTS**

**COMMUNICATIONS CENTER**

Issue: Data

<b>RECOMMENDATIONS</b>	
<b>18</b>	<b>Purchase AVL hardware-new vehicles</b>
<b>19</b>	<b>LE &amp; FD Software Orientation</b>

<b>REC</b>	<b>Personnel</b>	<b>Equipment</b>	<b>Prof. Services</b>	<b>Construction</b>	<b>Other</b>	<b>Total</b>
<b>18</b>	n/a	<b>\$ 60,000</b>	n/a	n/a	n/a	<b>\$ 60,000</b>
<b>19</b>	n/a	<b>TBD</b>	n/a	n/a	n/a	<b>TBD</b>

**Notes:**

Rec 18. Equipment-Estimated cost for vehicle hardware necessary to synchronize with CAD system Automatic Vehicle Location (AVL) software for tracking of EMS vehicles; costs identified are based on estimated cost of AVL hardware per vehicle x number of new vehicles (12) projected for purchase during 10-year plan implementation time line.

**SECTION 6-IMPLEMENTATION SCHEDULE**

**YEAR 1-5**

No.	Recommendation	Year 1	Year 2	Year 3	Year 4	Year 5	5-Year Total
1	Adjust Medic 5 & 8 coverage	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2	Add 9a-9p @12/7 ALS	\$ -	\$ 452,500	\$ -	\$ -	\$ -	\$ 452,500
3a	BLS for Non-Em transports @ 12/7	\$ -	\$ -	\$ 405,000	\$ -	\$ -	\$ 405,000
3b	Staff BLS for NE transports @ 12/7	\$ -	\$ -	\$ 205,876	\$ -	\$ -	\$ 205,876
4	Assess FD- MFR/RT requirements	\$ 8,000	\$ -	\$ -	\$ -	\$ -	\$ 8,000
5a	Implement FD/MFR initiative	TBD	\$ -	\$ -	\$ -	\$ -	\$ -
5b	Add four (4) QRV's @ 12/7	\$ -	\$ 704,650	\$ -	\$ -	\$ -	\$ 704,650
6	Add six (6) ALS Ambulances @ 12/7	\$ -	\$ -	\$ -	\$ 1,357,500	\$ -	\$ 1,357,500
7	Hire Shift Supervisor; ALS @ 24/7	\$ -	\$ -	\$ -	\$ 366,300	\$ -	\$ 366,300
8	Space Needs Assessment	\$ 16,000	\$ -	\$ -	\$ -	\$ -	\$ 16,000
9	Identify nine (9) base locations	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
10	Purchase sites/buildings	\$ -	TBD	TBD	TBD	TBD	\$ -
11	Design services- nine (9) bases	\$ -	\$ -	\$ -	\$ 540,000	\$ -	\$ 540,000
12	Construction/Renovation-9 bases	\$ -	\$ -	\$ -	\$ -	\$ 2,688,000	\$ 2,688,000
12	Hire Data System Manager	\$ 74,250	\$ -	\$ -	\$ -	\$ -	\$ 74,250
14	Hire Training/QA Officer	\$ 72,800	\$ -	\$ -	\$ -	\$ -	\$ 72,800
15	Hire T/QA Officer	\$ -	\$ -	\$ 72,800	\$ -	\$ -	\$ 72,800
16	Schedule hiring/training for ne TC's	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
17	Hire 17 new Telecommunicators	\$ -	\$ 230,850	\$ -	\$ -	\$ 230,850	\$ 461,700
18	AVL hardware-new vehicles	\$ -	\$ 40,000	\$ -	\$ 20,000	\$ -	\$ 60,000
19	LE & FD Software Orientation	\$ -	TBD	\$ -	\$ -	\$ -	\$ -
		\$ 171,050	\$ 1,428,000	\$ 683,676	\$ 2,283,800	\$ 2,918,850	\$ 7,485,376
	<b>Capital/One-Time Cost</b>	<b>\$ 24,000</b>	<b>\$ 488,400</b>	<b>\$ -</b>	<b>\$ 993,600</b>	<b>\$ 2,688,000</b>	<b>\$ 4,194,000</b>
	<b>Operating Cost</b>	<b>\$ 147,050</b>	<b>\$ 939,600</b>	<b>\$ 683,676</b>	<b>\$ 1,290,200</b>	<b>\$ 230,850</b>	<b>\$ 3,291,376</b>

**SECTION 6-IMPLEMENTATION SCHEDULE**

**YEAR 6-10**

No.	Recommendation	Year 6	Year 7	Year 8	Year 9	Year10	5-Year Total
1	Adjust Medic 5 & 8 coverage	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2	Add 9a-9p @12/7 ALS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3a	BLS for Non-Em transports @ 12/7	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3b	Staff BLS for NE transports @ 12/7	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4	Assess FD- MFR/RT requirements	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5a	Implement FD/MFR initiative	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5b	Add four (4) QRV's @ 12/7	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6	Add six (6) ALS Ambulances @ 12/7		\$ -	\$ 1,357,500	\$ -	\$ -	\$ 1,357,500
7	Hire Shift Supervisor; ALS @ 24/7	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8	Space Needs Assessment	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
9	Identify nine (9) base locations	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
10	Purchase sites/buildings	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
11	Design services- nine (9) bases	\$ 540,000	\$ -	\$ -	\$ 540,000	\$ -	\$ 1,080,000
12	Construction/Renovation	\$ -	\$ 2,688,000	\$ -	\$ -	\$ 2,688,000	\$ 5,376,000
12	Hire Data System Manager	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
14	Hire Training/QA Officer	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
15	Hire T/QA Officer	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
16	Schedule hiring/training for ne TC's	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
17	Hire 17 new Telecommunicators		\$ 323,190	\$ -	\$ -	\$ -	\$ 323,190
18	AVL hardware-new vehicles	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
19	LE & FD Software Orientation	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
		<b>\$ 540,000</b>	<b>\$ 3,011,190</b>	<b>\$ 1,357,500</b>	<b>\$ 540,000</b>	<b>\$ 2,688,000</b>	<b>\$ 8,136,690</b>
	<b>Capital/One-Time Cost</b>	<b>\$ 540,000</b>	<b>\$ 2,688,000</b>	<b>\$ 685,200</b>	<b>\$ 540,000</b>	<b>\$ 2,688,000</b>	<b>\$ 7,141,200</b>
	<b>Operating Cost</b>	<b>\$ -</b>	<b>\$ 323,190</b>	<b>\$ 672,300</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 995,490</b>

**SECTION 7-APPENDIX****Emergency Medical Services (EMS)**

- G. 10A NCAC 13P .0201; EMS System Requirements
- H. Orange County Grid Map; w/Number of EMS Calls & Average Response Times per Grid;  
Calendar years 2009-2011
- I. County EMS Agency Comparison Survey

**911/Communications Center**

- J. North Carolina 911 Board PSAP Operating Standards
- K. 911/Communications Center Response, Dispatch & Communications Process Maps:
  - Emergency Medical Dispatch (EMS)
  - Structure Fire (Fire Departments)
  - Domestic Violence/Disturbance (Law Enforcement)
- L. NFPA 450 Excerpt: Essential (Communications Center) System Analysis Components



# **Comprehensive Assessment of Emergency Medical Services & 911/Communications Center Operations Study**

**Presentation of Study Findings & Recommendations**

**To the  
Orange County Board of Commissioners**

**30 August 2012**

**Presented by:  
Solutions for Local Government, Inc.**

## **REPORT ORGANIZATION**

### **DOCUMENT FORMAT:**

**SECTION 1-INTRODUCTION**

**SECTION 2-EMERGENCY MEDICAL SERVICES**

**SECTION 3-COUNTY POPULATION**

**SECTION 4-911/COMMUNICATIONS CENTER**

**SECTION 5-PROBABLE COSTS**

**SECTION 6-IMPLEMENTATION SCHEDULE**

**SECTION 7-APPENDIX**

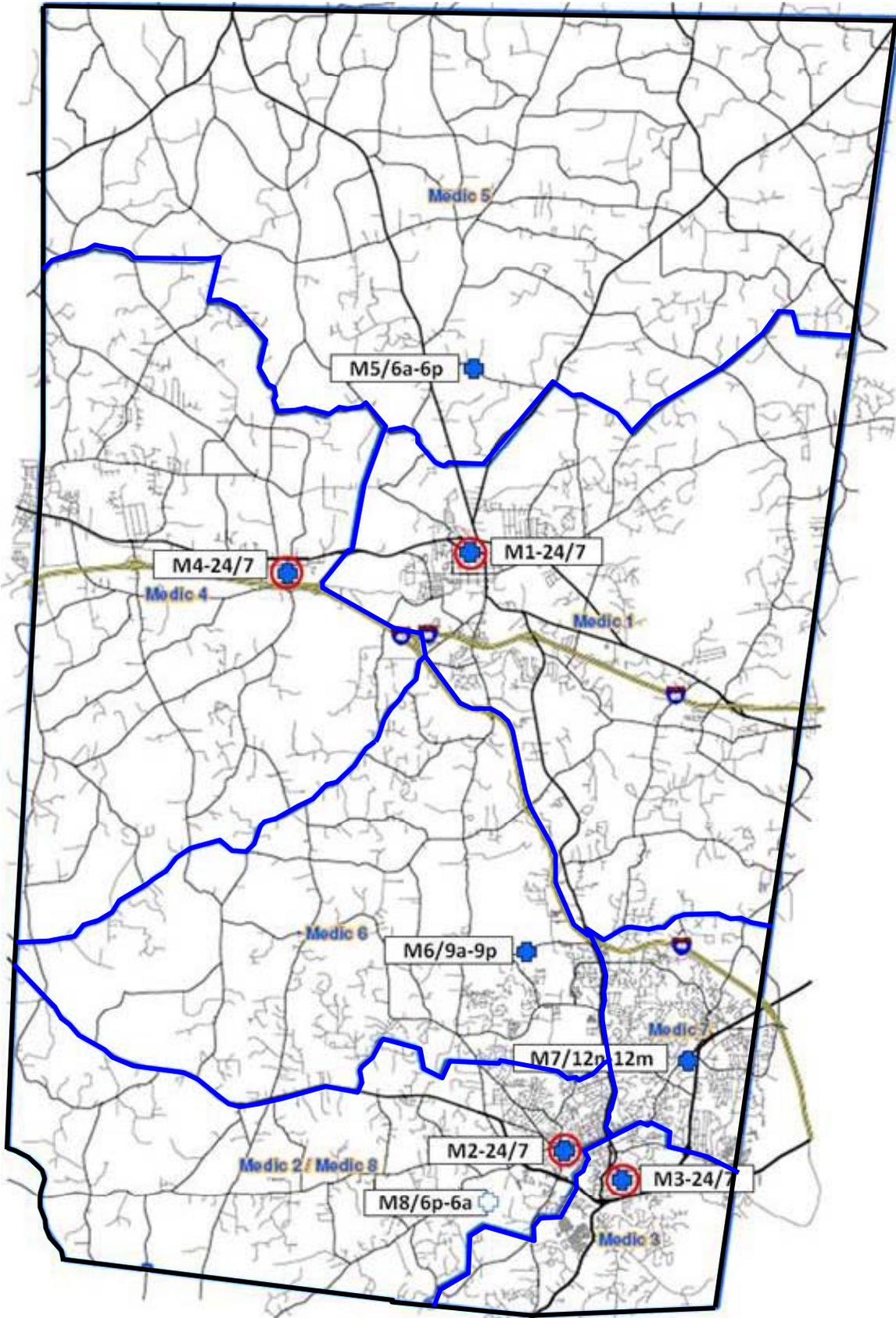
### **Chapter 2 & 4 format:**

- **Historic & Statutory References**
- **Current Operations**
- **Performance & Costs**
- **Issues of Concern**
- **Recommendations**

## EMERGENCY MEDICAL SERVICES (EMS)

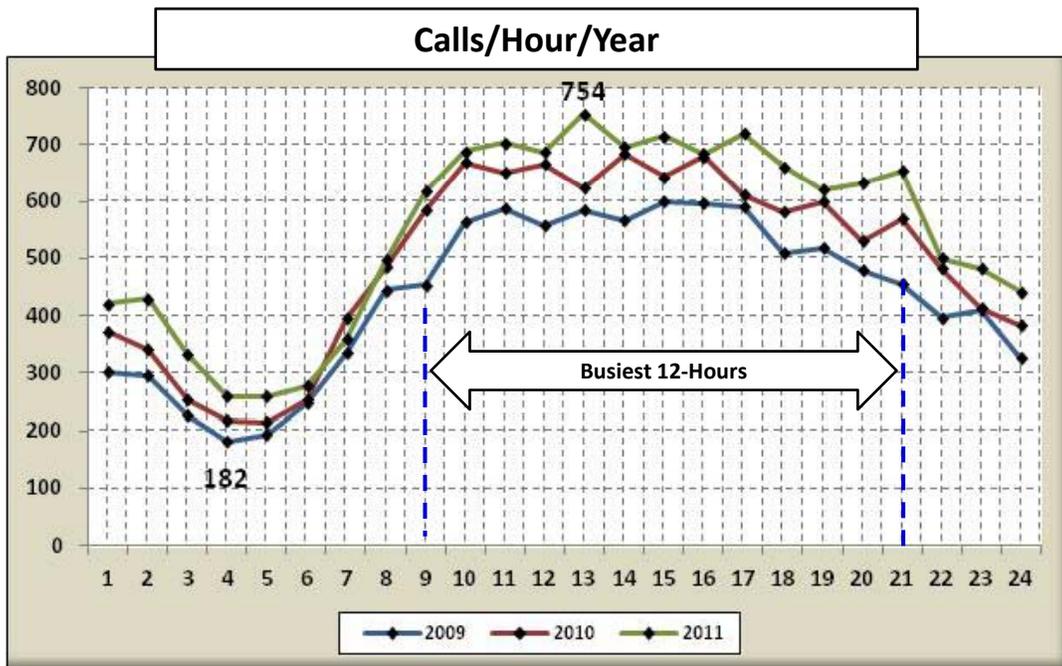
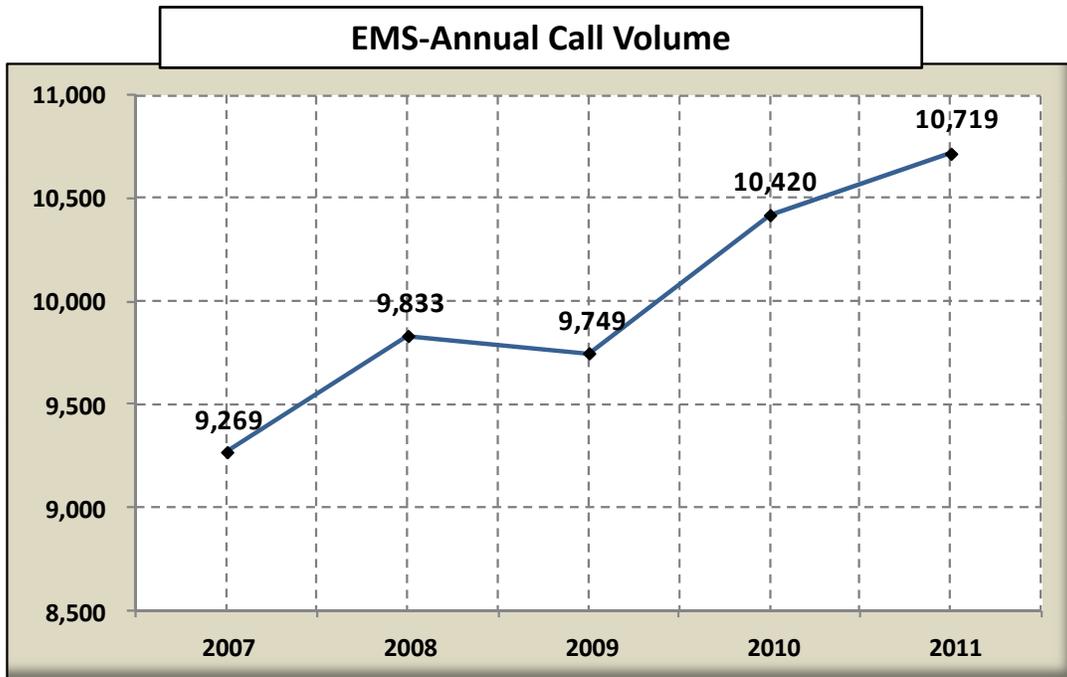
**NCAC .0102(25) EMS System-** a coordinated arrangement of local resources under the authority of the county government organized to respond to medical emergencies and integrated with other health care providers and networks.

# ORANGE COUNTY EMS



# EMERGENCY MEDICAL SERVICES (EMS)

## CURRENT OPERATIONS

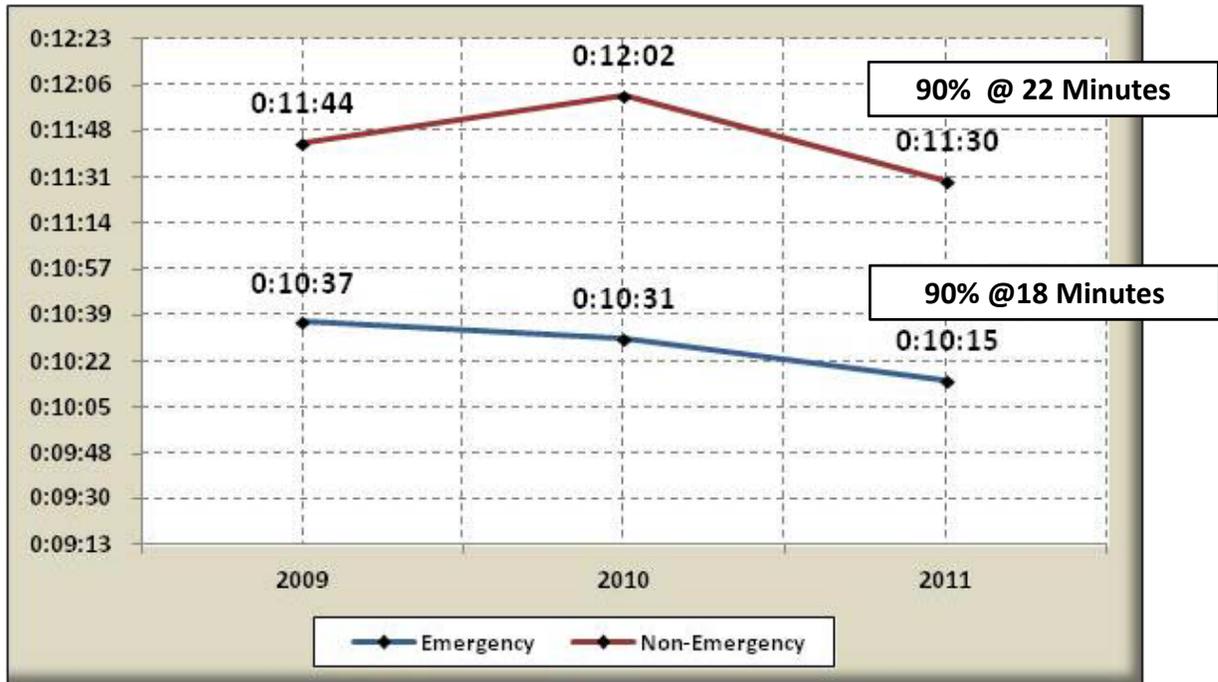


# EMERGENCY MEDICAL SERVICES (EMS)

## CURRENT OPERATIONS

Interval & Total Response Times				
Year	Total Units Dispatched	Turn-Out Time	Travel Time	Total Resp. Time
<b>2007</b>	<b>9,269</b>	1:41	7:41	<b>9:26</b>
<b>2008</b>	<b>9,833</b>	1:38	8:15	<b>9:56</b>
<b>2009</b>	<b>10,614</b>	1:29	9:15	<b>10:49</b>
<b>2010</b>	<b>11,893</b>	1:27	9:47	<b>11:14</b>
<b>2011</b>	<b>10,719</b>	1:16	9:30	<b>10:47</b>
<b>5 Year Average:</b>		0:01:30	0:08:53	<b>0:10:26</b>

**Emergency vs. Non-Emergency Response Times**



**EMERGENCY MEDICAL SERVICES (EMS)****CURRENT OPERATIONS****Average Event Duration Time**

## EMERGENCY MEDICAL SERVICES (EMS)

### CURRENT OPERATIONS

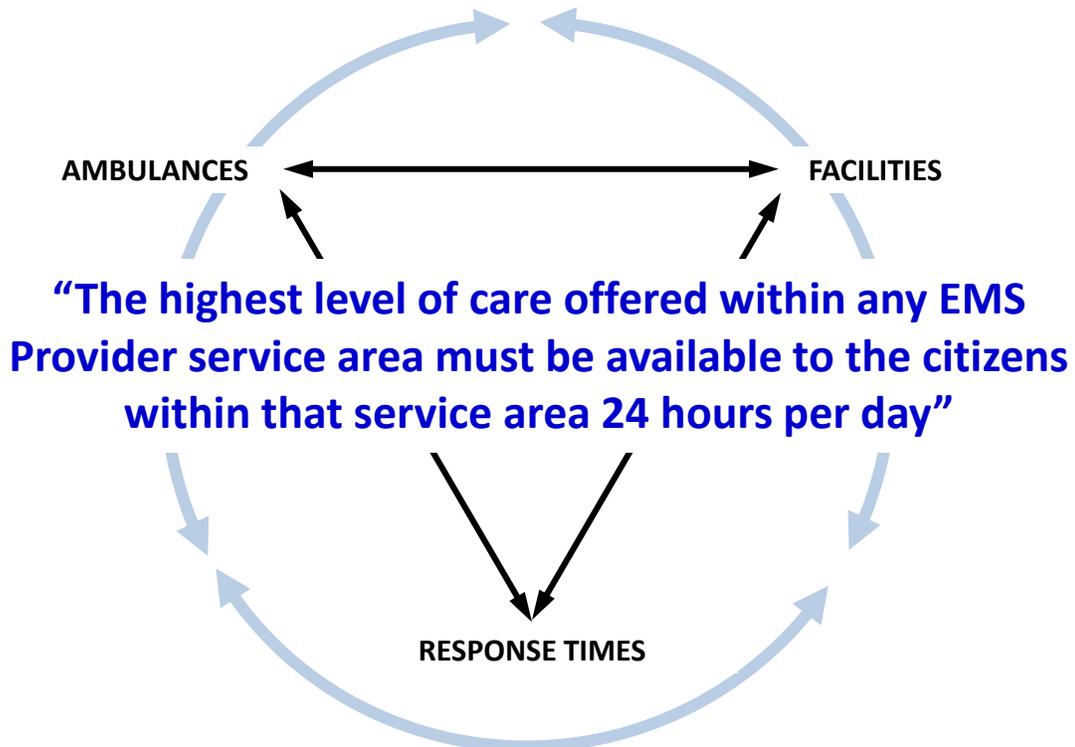
#### FY Annual Budget & Collections (Revenue)

Fiscal Year	Annual Budget	Collections	Collections (Revenue) as % of Budget
<b>FY 08-09</b>	\$ 3,848,591	<b>1,862,114</b>	<b>48.4%</b>
<b>FY 09-10</b>	\$ 3,462,804	<b>2,001,204</b>	<b>57.8%</b>
<b>FY 10-11</b>	\$ 3,468,819	<b>2,246,517</b>	<b>64.8%</b>
<b>FY 11-12</b>	\$ 4,711,683	<b>2,266,940</b>	<b>48.1%</b>

## EMERGENCY MEDICAL SERVICES (EMS)

### ISSUES OF CONCERN

1. Availability of Ambulances
2. Response Times
3. EMS Facilities



Source: 10A NCAC 13P .0201 EMS SYSTEM REQUIREMENTS  
.0201(a) County governments shall establish EMS Systems.

## EMERGENCY MEDICAL SERVICES (EMS)

### ISSUES OF CONCERN

#### Availability of Ambulances

During 2011 ambulances were directed to “MOVE” 2,360 times from their identified staging area or location to another point in the County because:

a. The number of ambulances immediately available was down to one (1) and the subject ambulance was directed to move to a location (typically) near the center of the County in anticipation of being able to respond in any direction the call may direct.

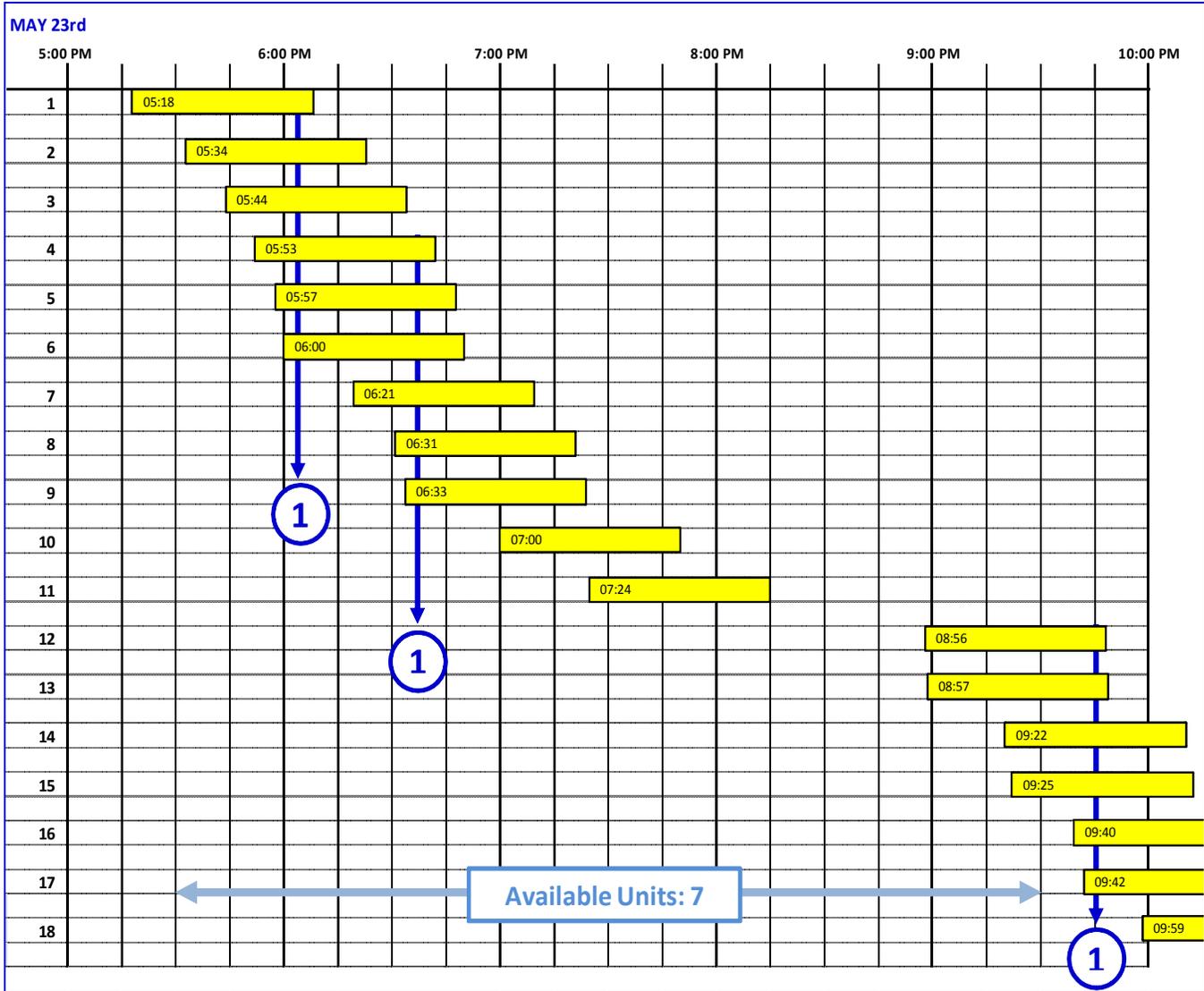
or

b. In tracking the status of multiple ambulances, the Communications Center and/or EMS Supervisor(s) noted significant area gaps in coverage and redirected movement of ambulance(s) accordingly.

# EMERGENCY MEDICAL SERVICES (EMS)

## ISSUES OF CONCERN

### Availability of Ambulances



## EMERGENCY MEDICAL SERVICES (EMS)

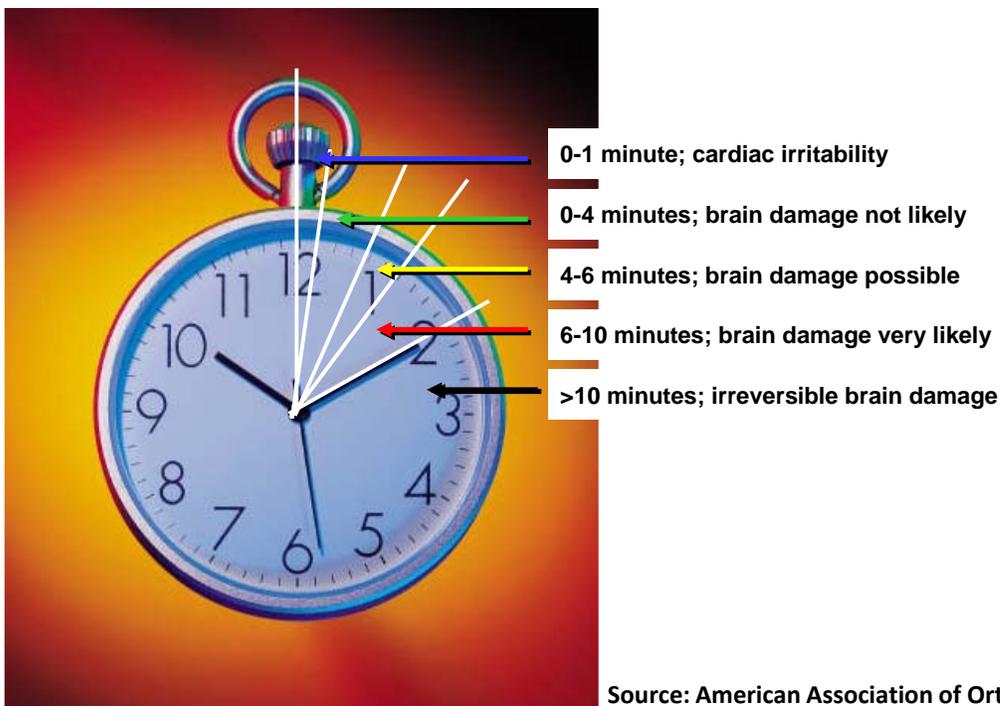
### ISSUES OF CONCERN

#### Response Time

*“The time from the initial alert or announcement by the Communications Center of the reported emergency, to the time that the service vehicle and appropriate personnel arrive on the scene.”*

The factors that most commonly impact response time include:

- The time required to access and engage the vehicle
- The speed at which the emergency vehicle is able to travel,
- The distance that must be covered to the incident dispatched, and
- Under what conditions.



## EMERGENCY MEDICAL SERVICES (EMS)

### ISSUES OF CONCERN

#### Response Time

*“ . . . Have recommend that EMS vehicles should respond to deliver **BLS (basic life support) skills within 3 to 4 minutes, with ALS (advanced life support) skills available within 6 to 8 minutes.** The ALS-within-8-minute concept was developed from research that showed the survival rate of cardiac arrest victims decreases significantly with each passing minute, and that optimal probabilities for survival increase when BLS has been provided within 4 minutes followed by ALS within 8 minutes.”*

**American College of Emergency Physicians**

**American Heart Association**

**American Association of Orthopedic Surgeons**

**National Fire Protection Association**

Orange County EMS: 2007-2011

Year	Total Units Dispatched	Turn-Out Time	Travel Time	Total Resp. Time
2007	9,269	1:41	7:41	9:26
2008	9,833	1:38	8:15	9:56
2009	10,614	1:29	9:15	10:49
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2011	10,719	1:16	9:30	10:47
<b>5 Year Average:</b>		0:01:30	0:08:53	0:10:26

## EMERGENCY MEDICAL SERVICES (EMS)

### ISSUES OF CONCERN

#### Response Time

OCEMS Agency Standards per System Plan:

*For Emergency Responses;*

..... a Paramedic on scene within 12 minutes 90% of the time

*For Non-Emergency Responses;*

..... A Paramedic on scene within 15 minutes 90% of the time

Although not acceptable to the referenced standards setting and professional organizations cited, concern can be off-set *somewhat* by effective and timely response from certified BLS responders; i.e. certified Medical Responders (MR) and Basic level Emergency Medical Technicians (EMT's).

In Orange County, these responders-per the OEMS System Plan -are comprised of members of the 12 municipal and community Fire Departments

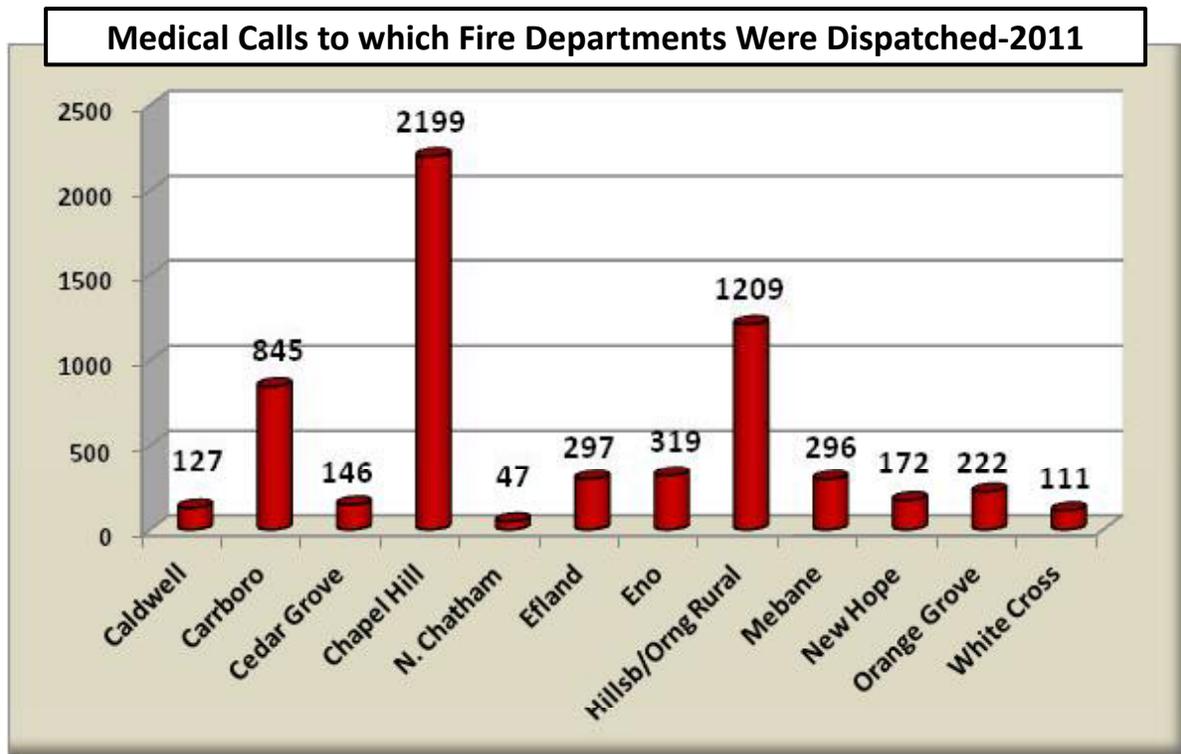
## EMERGENCY MEDICAL SERVICES (EMS)

### ISSUES OF CONCERN

Medical First Responders:

### Response Time

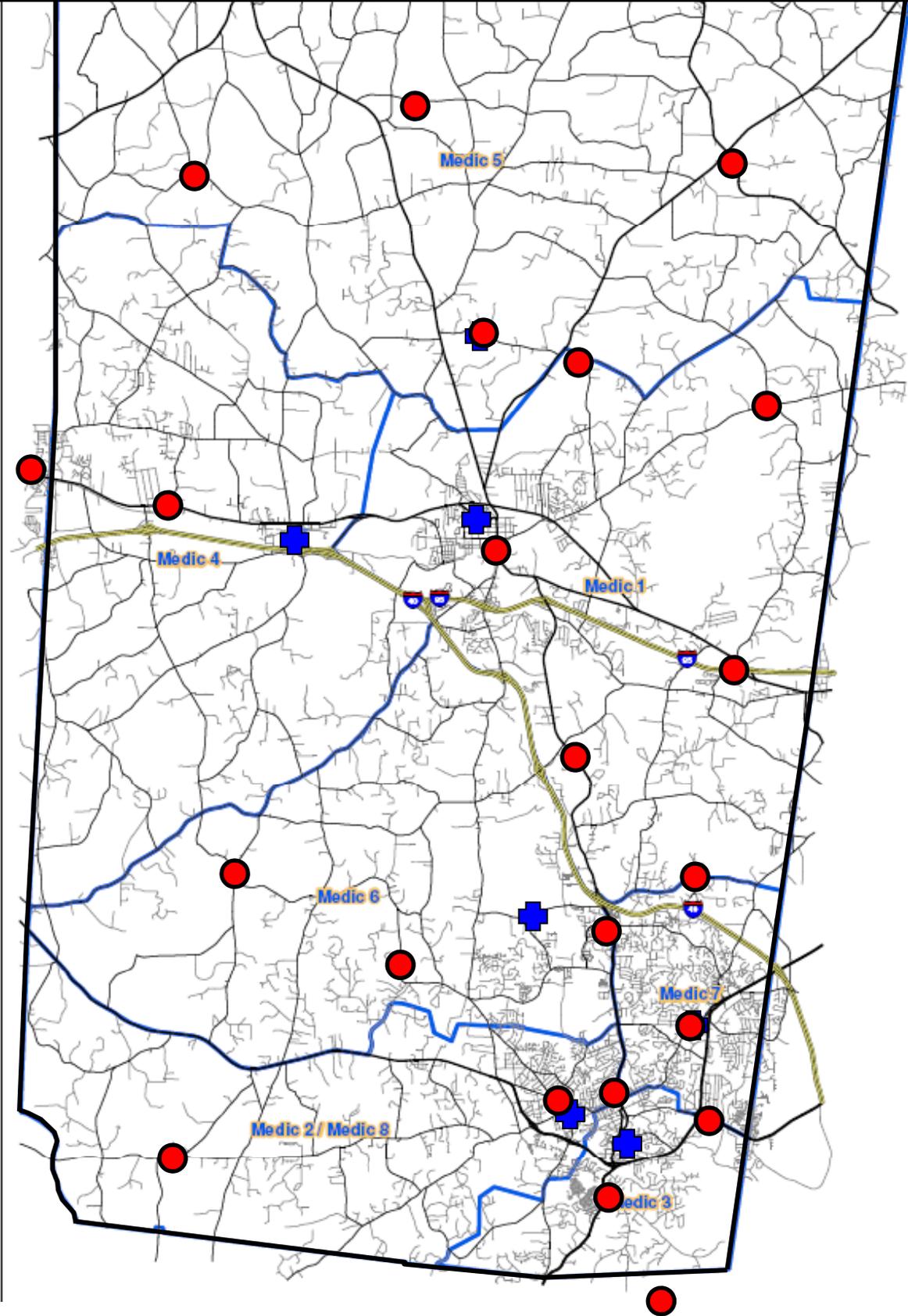
5,990 Medical Calls  
56% of all EMS calls dispatched



### South Orange Rescue Squad (SORS):

- 57 certified EMT's
- 36 on OEMS Roster w/NCOEMS
- Share duties w/OEMS on Medic 8
- 3-4-3-4-3 alternating schedule
- Includes use of SORS' 2-BLS ambulances

# EMERGENCY MEDICAL SERVICES (EMS)



# EMERGENCY MEDICAL SERVICES (EMS)

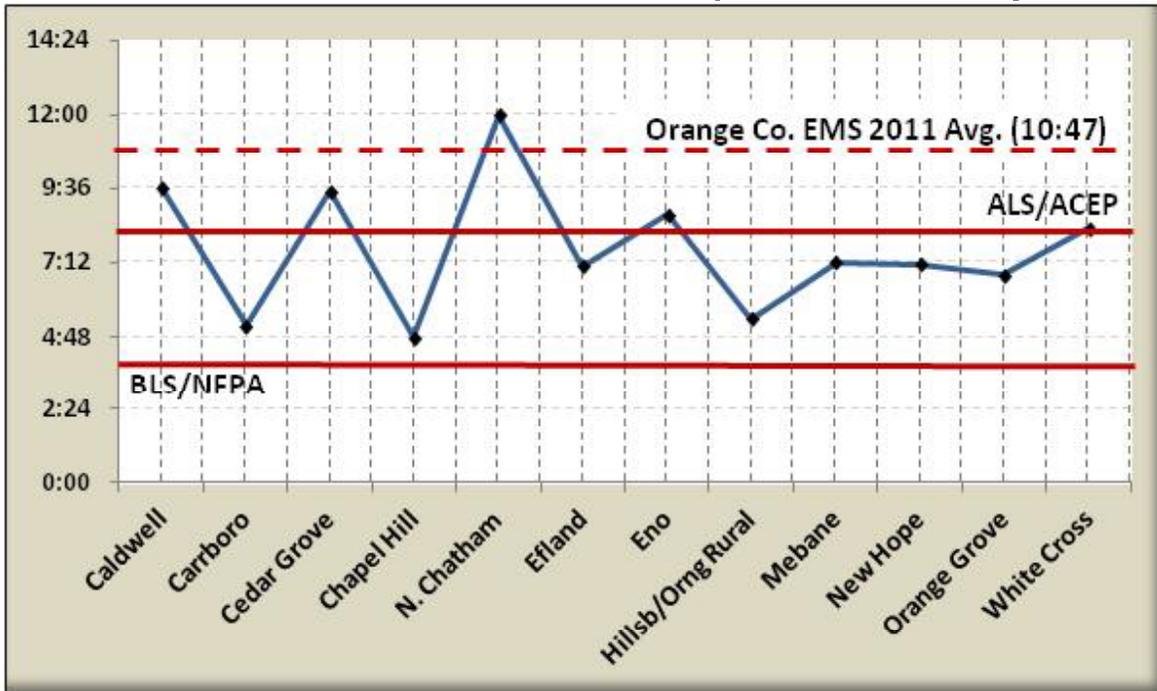
## ISSUES OF CONCERN

### FD Average Response Times-2011

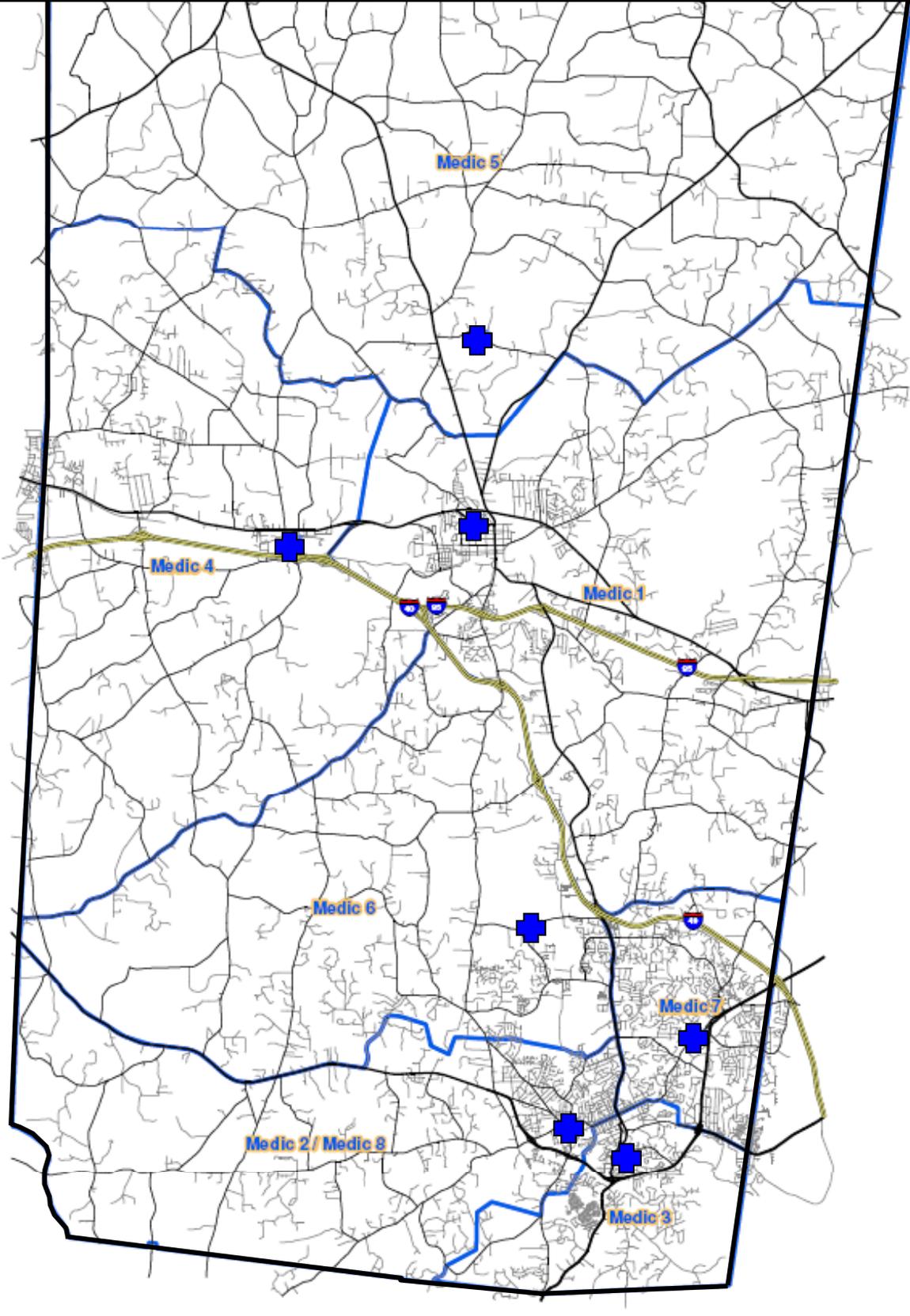
### Response Time

<b>ALL</b>	<b>0:05:53</b>
<b>VOL</b>	<b>0:07:59</b>
<b>Career</b>	<b>0:05:02</b>

Department	Avg. RT
Caldwell	9:38
Carrboro	5:10
CedarGrove	9:31
Chapel Hill	4:48
N. Chatham	12:00
Efland	7:05
Eno	8:46
Hillsb/Orng. Rural	5:24
Mebane	7:12
New Hope	7:10
Orange Grove	6:49
White Cross	8:19



# EMERGENCY MEDICAL SERVICES (EMS)



## EMERGENCY MEDICAL SERVICES (EMS)

### ISSUES OF CONCERN

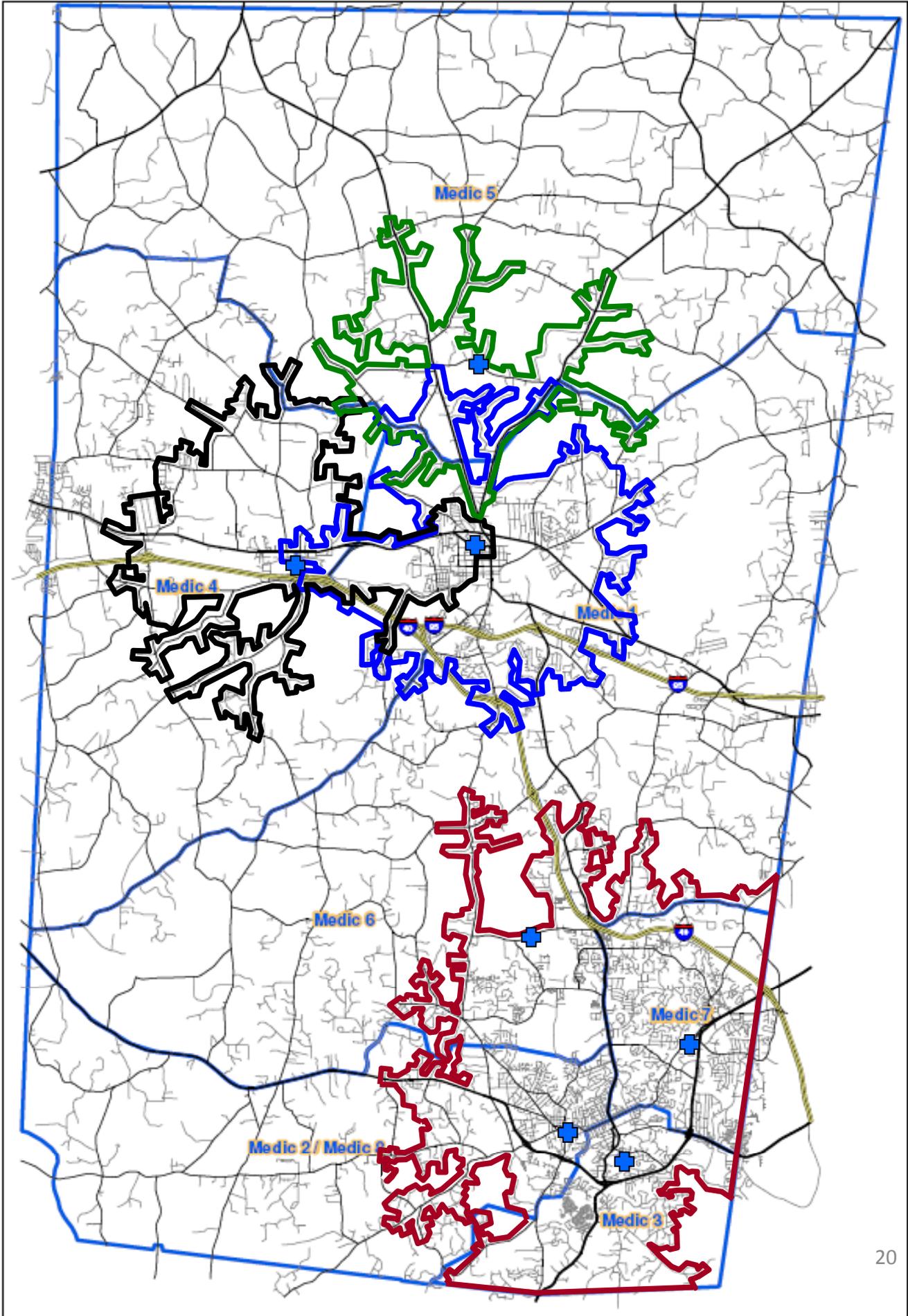
#### Response Time

Emergency Vehicle Speed & Distance

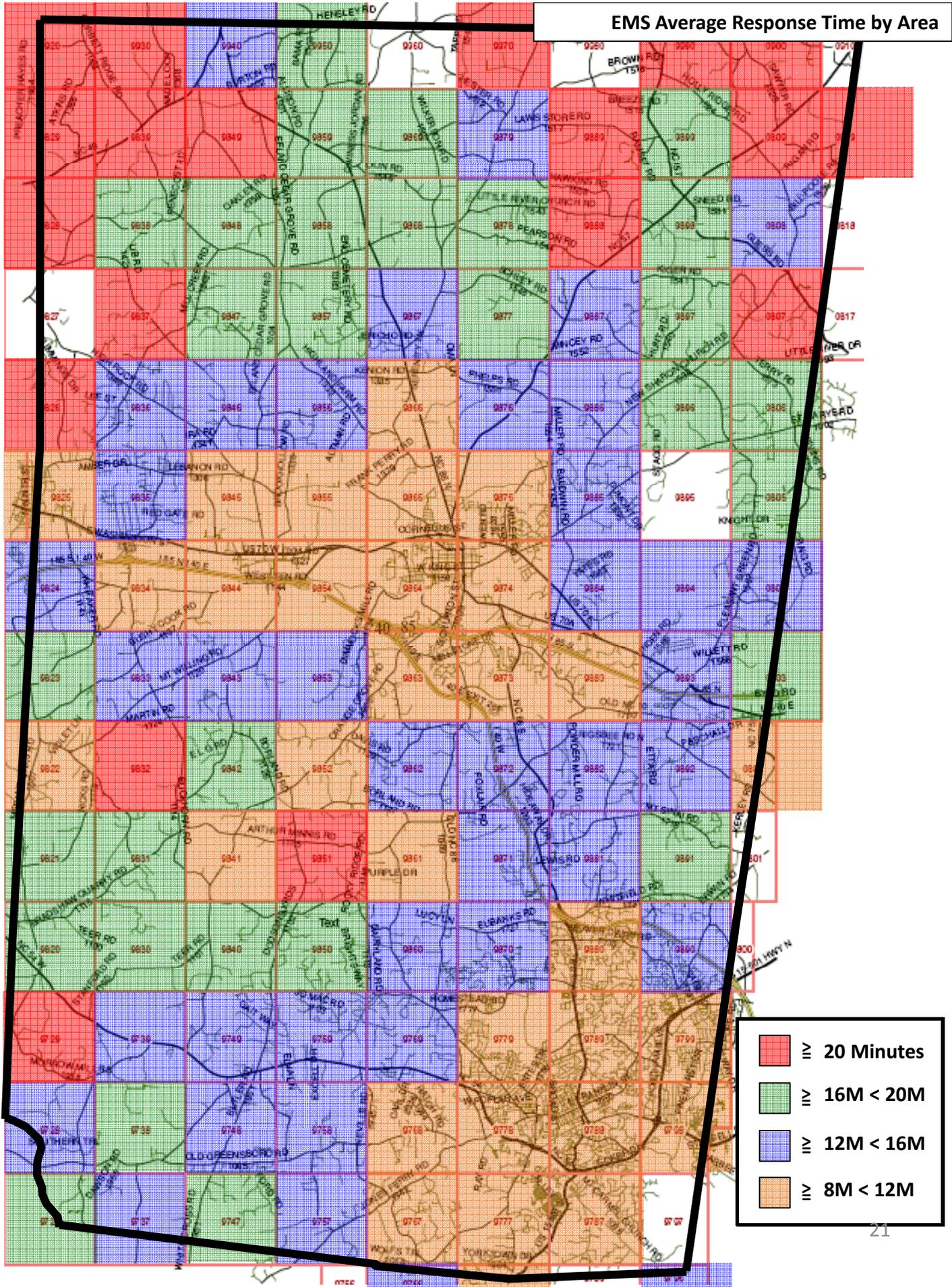
**1.7 x Distance + 0.65 = Travel Time**

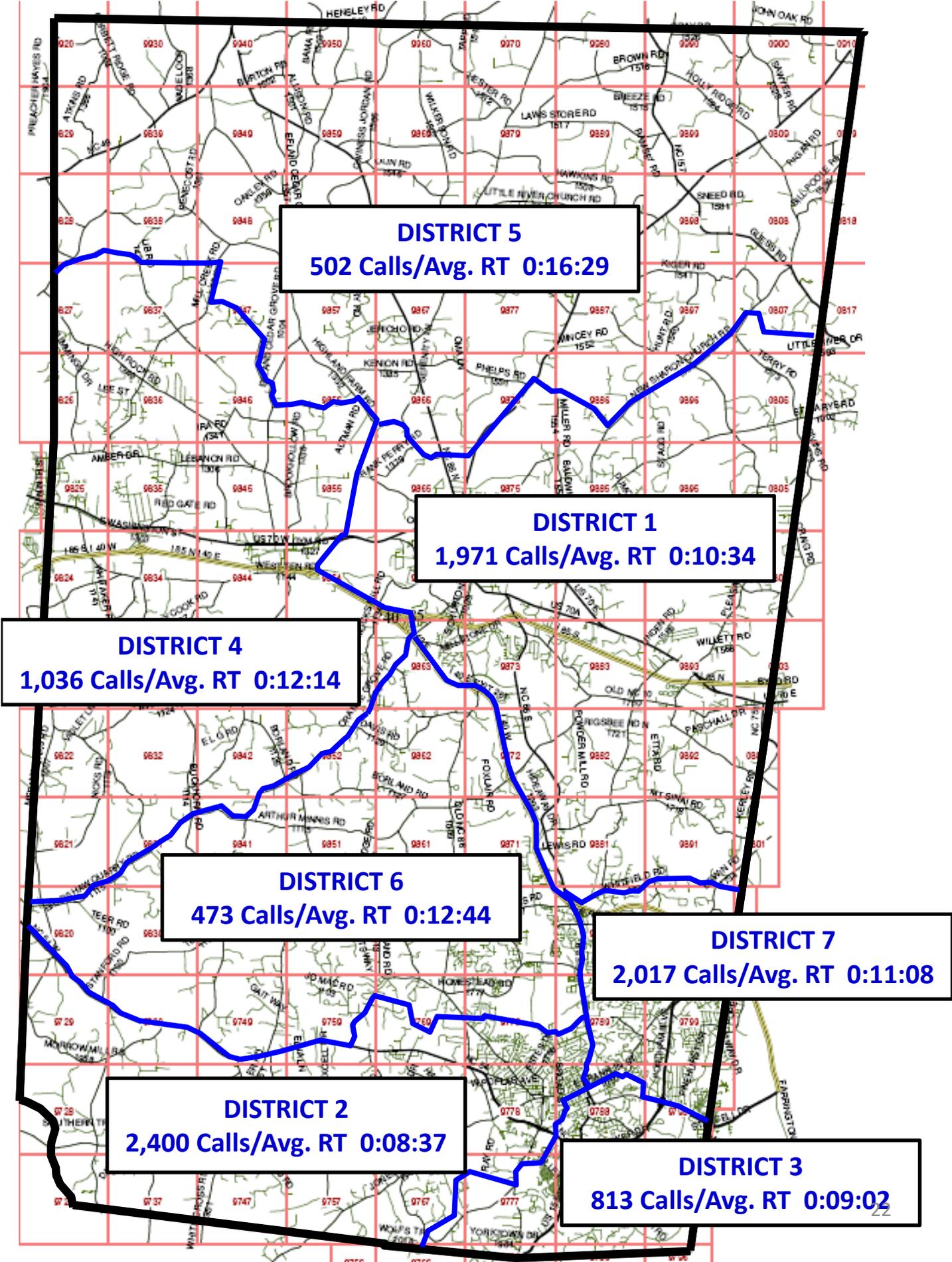
**EMS: 8 minutes → 4.32 miles**

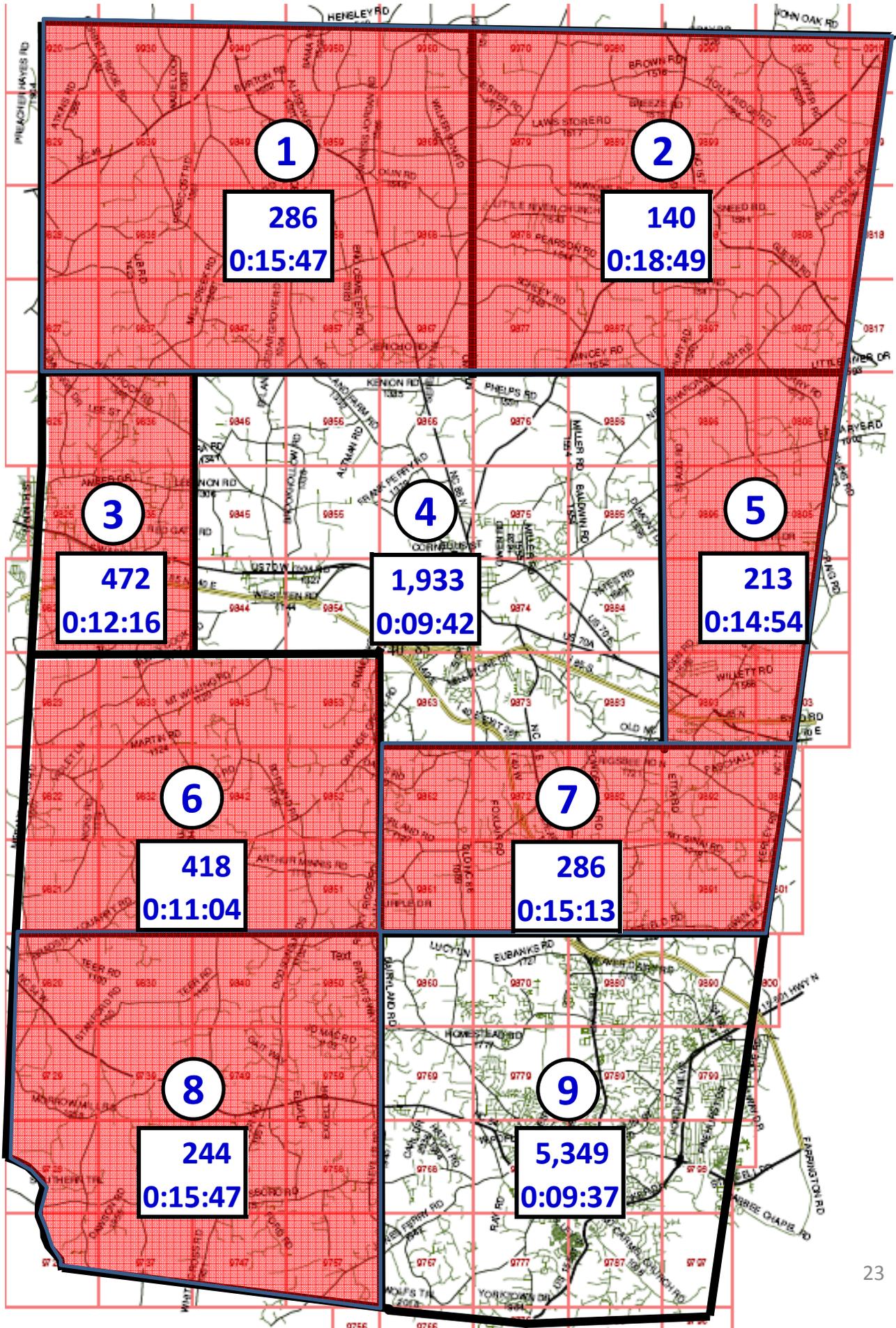
Source: NFPA 1720



### EMS Average Response Time by Area







## EMERGENCY MEDICAL SERVICES (EMS)

### ISSUES OF CONCERN

#### Response Time

#### Average vs. Fractile Response Time Performance Criteria

*Given what has been learned about the need for an eight-minute response to maximize survivability from cardiac arrest, an **average** eight-minute response, by definition, means that one-half, or more, of the service's patients are not reached within that critical time.*

Many high-performance emergency ambulance services use a different methodology to measure response times to ensure service equality to all patients: **fractile distribution**; in most instances as suggested by NFPA and others, **reported at the 90<sup>th</sup> percentile**.

*.0201(a) County governments shall establish EMS Systems. Each EMS System shall have:*

***“The highest level of care offered within any EMS Provider service area must be available to the citizens within that service area 24 hours per day”***

## EMERGENCY MEDICAL SERVICES (EMS)

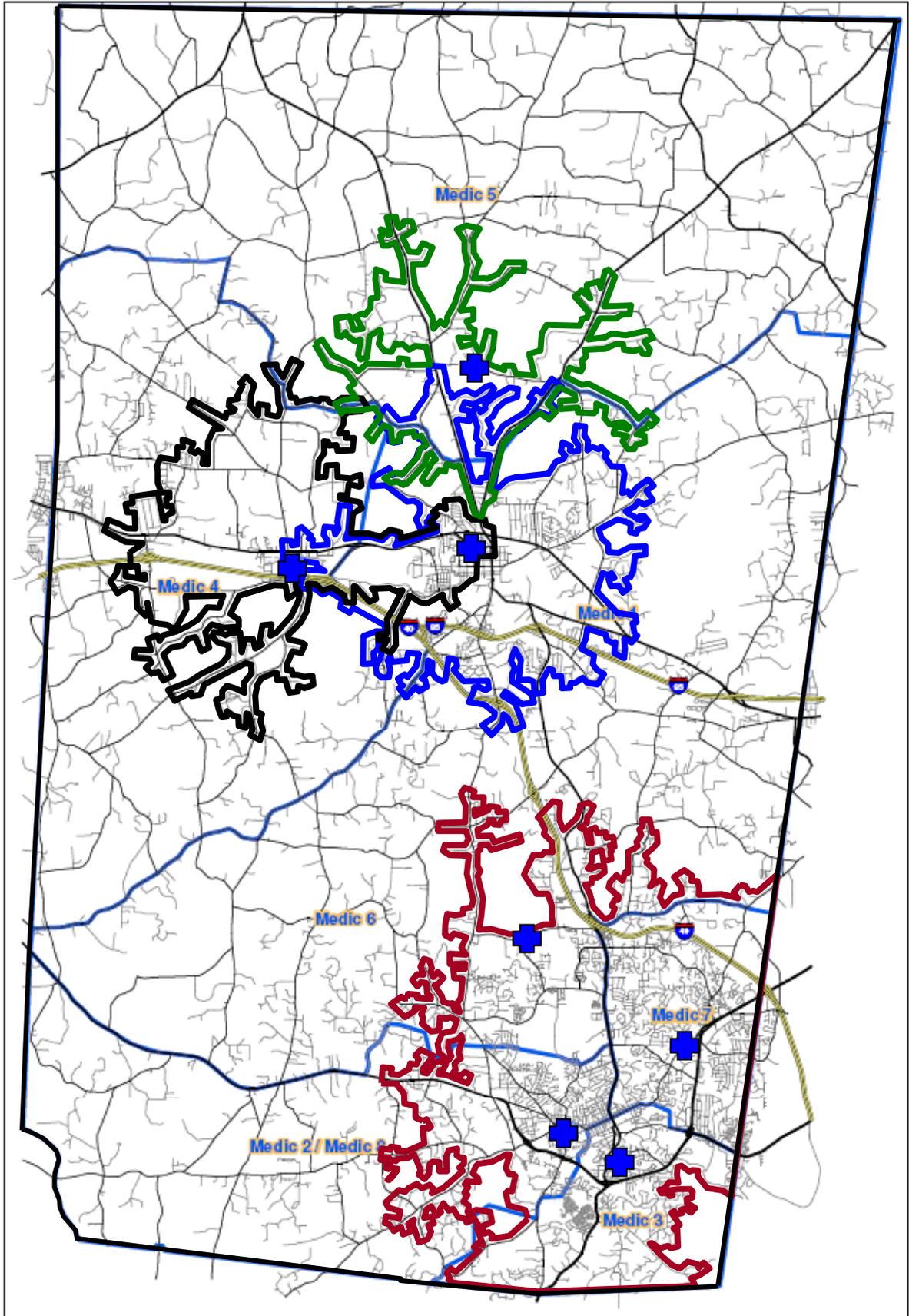
### ISSUES OF CONCERN

#### EMS Base Facilities

... EMS “staging” locations

Orange County EMS, like Law Enforcement, is an on-going and at times almost continuous service, that functions 24 hours a day throughout the entire County. Its services are far from occurring on a “periodic” or “sporadic” basis.

*This concern (facilities) must be addressed as a long term issue. And, it must dovetail with the Ambulance Availability and Response Time issues previously addressed.*



## EMERGENCY MEDICAL SERVICES (EMS)

### ISSUES OF CONCERN

#### EMS Base Facilities

An EMS facility must include at least, the following type of spaces:

- Indoor, temperature controlled vehicle bays with exhaust ventilation and recharging stations
- Secure equipment, materials and medication storage
- Special storage for certain narcotics and refrigerated medical supplies
- Decontamination showers for personnel
- Decontamination/wash areas for equipment
- Space for air drying decontaminated equipment after washing
- Storage accommodations for contaminated clothing, waste, sharps, etc.
- Accommodations for the handling of medical gases (oxygen)
- Laundry facilities
- Food preparation and dining space
- Common/dayroom space
- Multipurpose storage space
- Staff Restrooms
- Technology to permit wireless internet capabilities, phone, radio, and pager communications
- Public entrance and space to accommodate meetings w/visitors

## EMERGENCY MEDICAL SERVICES (EMS)

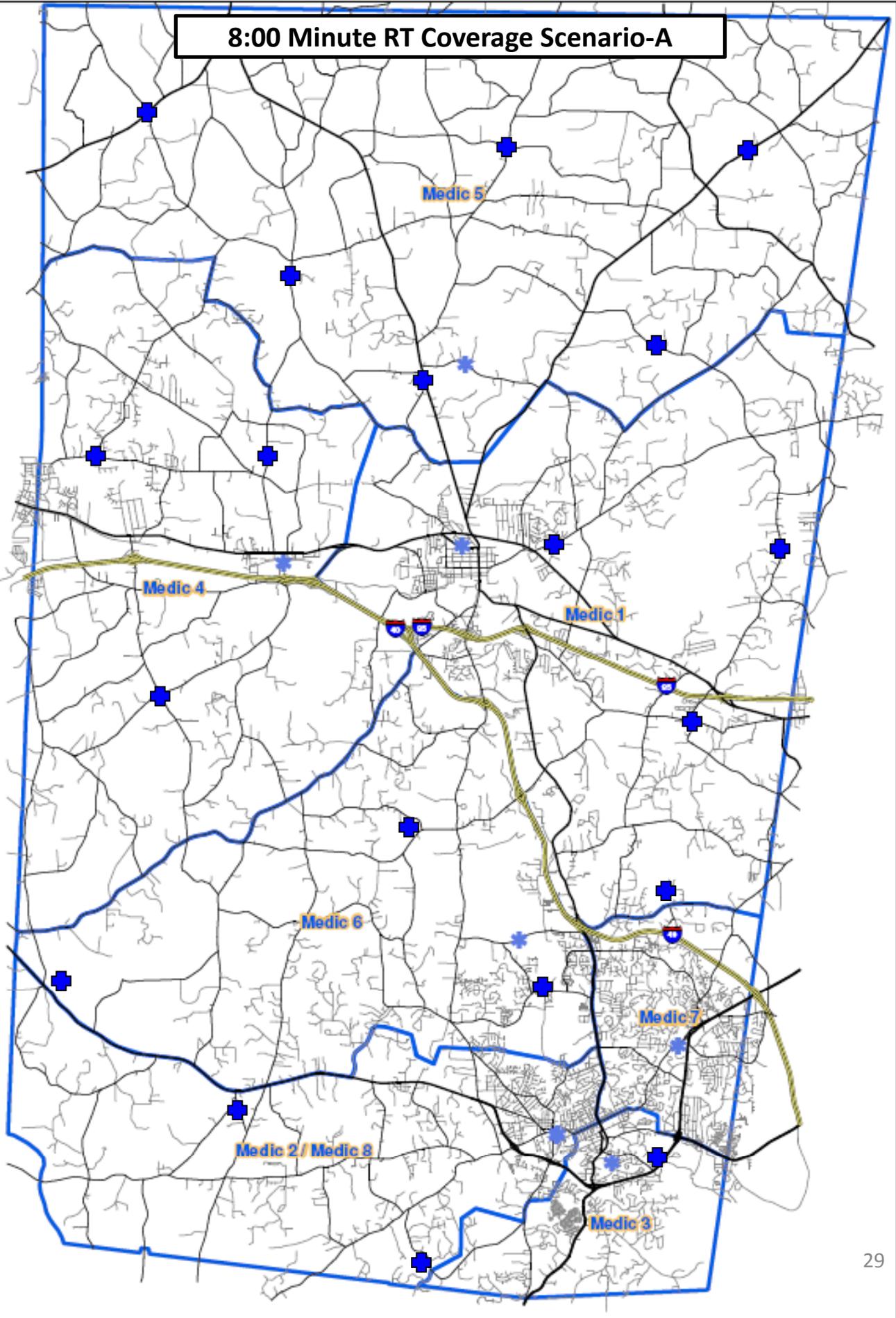
### ISSUES OF CONCERN

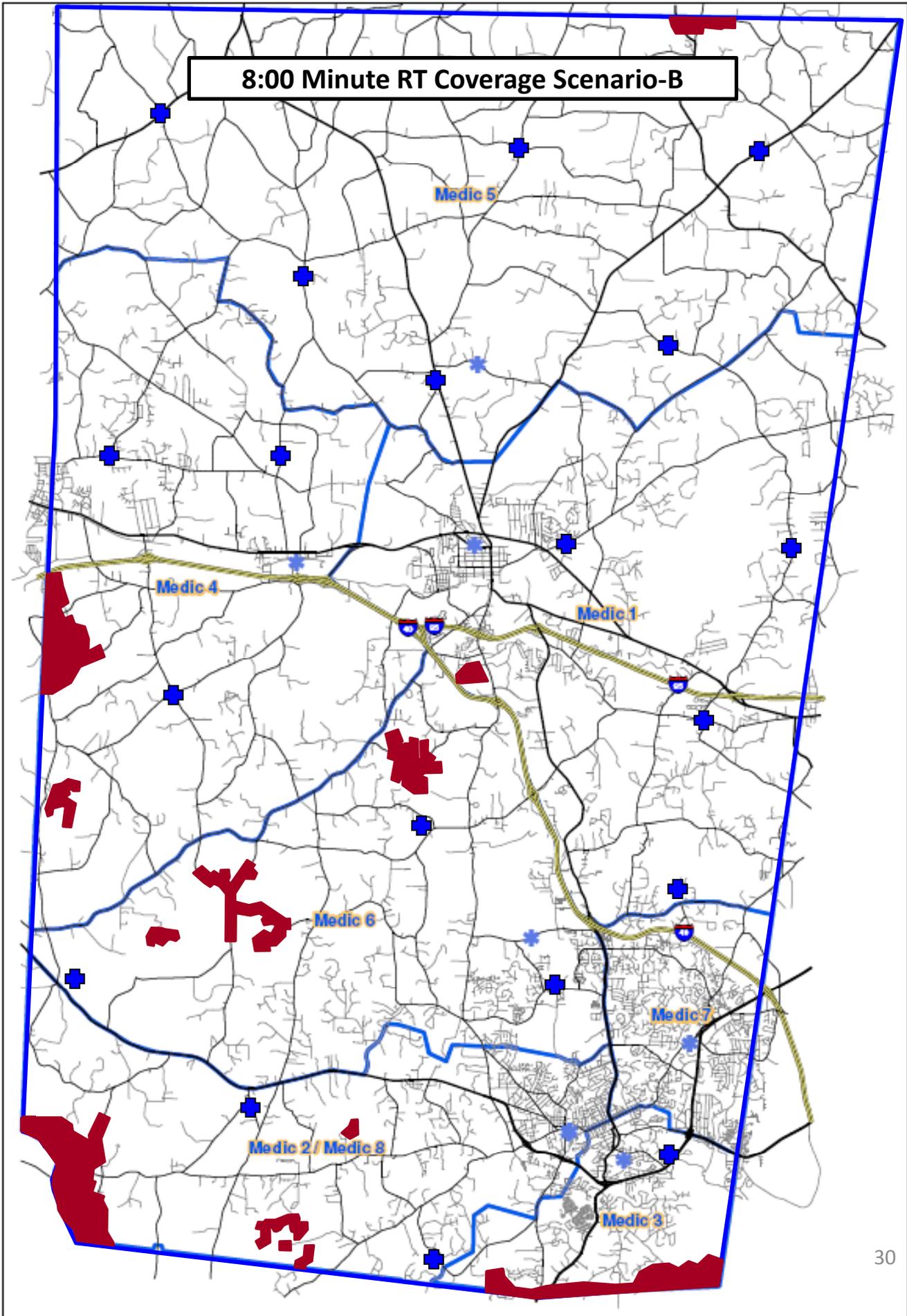
#### EMS Base Facilities

The actual issue of Fire and EMS “sharing” facilities is more complex:

- The ultimate purpose (mission) of each is different
- Fire Department service areas are specific and limited
- EMS’ service area is the entire County
- The schedules of each are different
- EMS may run continuously for extended period(s) of time
- Fire will more often respond to “periodic” incidents
- The work habits of each are different
- The facility requirements of each are different
- Fire Departments are visible within their respective communities
- Existing Fire station locations are not strategically located to adequately address the deployment of EMS vehicles
- To push the “sharing” of these facilities would simply continue a practice that has already worn out its welcome.

### 8:00 Minute RT Coverage Scenario-A





## EMERGENCY MEDICAL SERVICES (EMS)

### ISSUES OF CONCERN

#### EMS Base Facilities

<b>8:00 Minute RT Coverage</b>
--------------------------------

**19 Stations**

**204 FTE's**

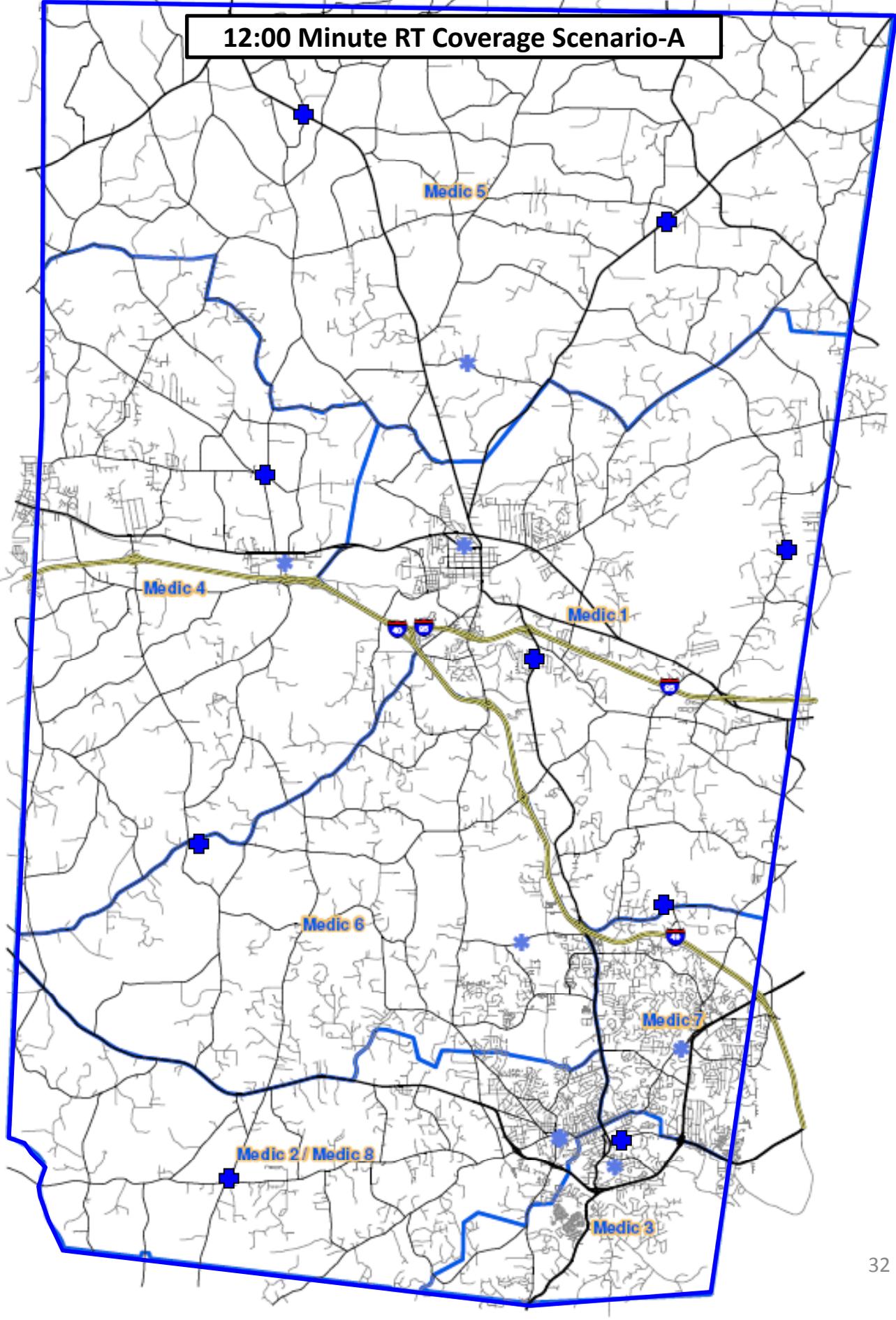
**vs.**

**6 Locations**

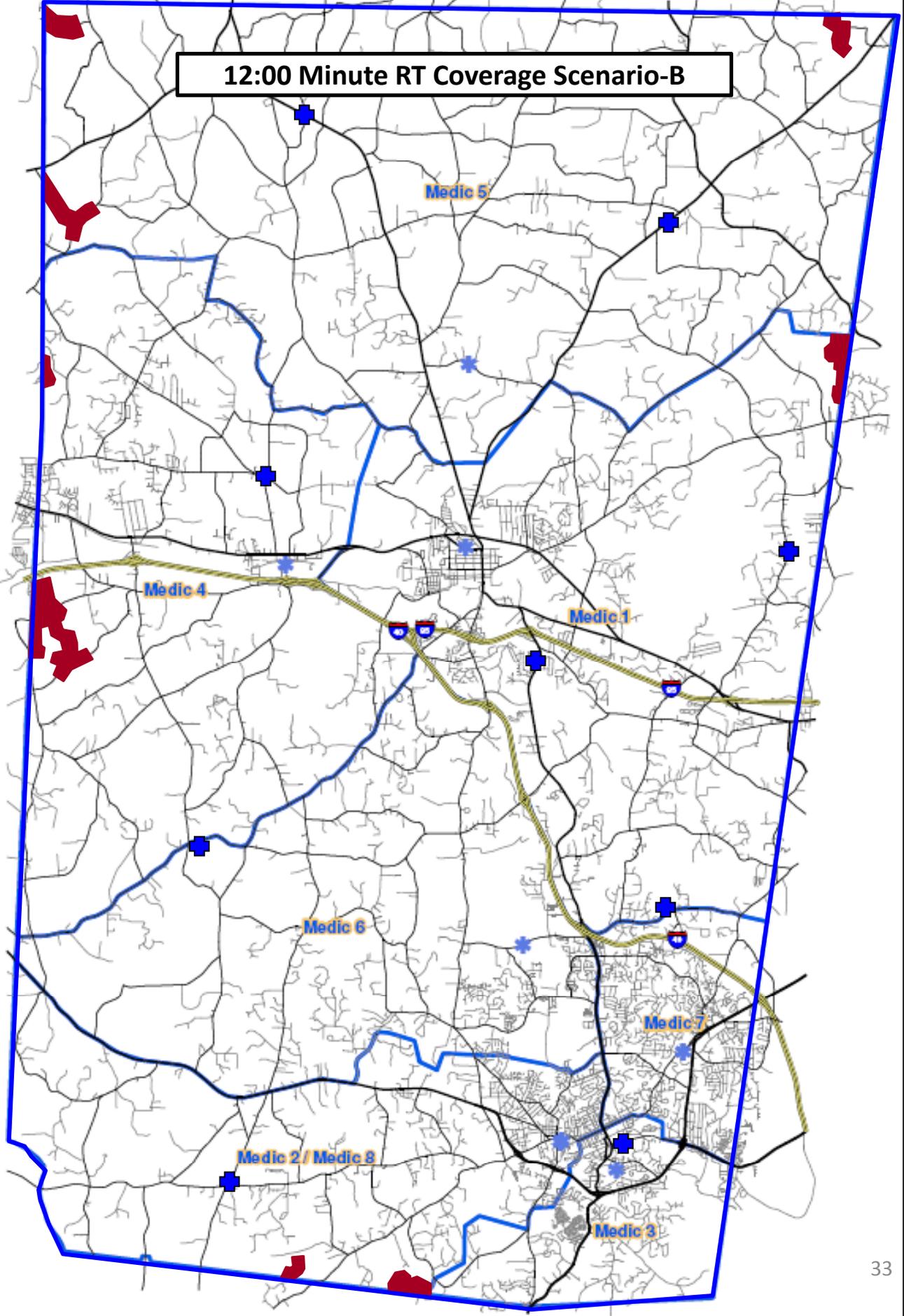
**63 FTE's**

<b>Total Personnel Cost</b>	<b>\$ 10,135,975.82</b>	
<b>Less Existing Budget Pers. Cost</b>	<b>\$ (3,703,295.00)</b>	
<b>Less Est. Overtime Savings</b>	<b>\$ (200,000.00)</b>	[1/2]
<b>Total Net Cost Addt'l. Personnel</b>	<b>\$ 6,232,680.82</b>	

# 12:00 Minute RT Coverage Scenario-A



**12:00 Minute RT Coverage Scenario-B**



## EMERGENCY MEDICAL SERVICES (EMS)

### ISSUES OF CONCERN

#### EMS Base Facilities

12:00 Minute RT Coverage

<b>9 Stations</b>	<b>vs.</b>	<b>97 FTE's</b>
<b>6 Locations</b>		<b>63 FTE's</b>

<b>Total Personnel Cost</b>	<b>\$</b>	<b>4,818,233.16</b>	
<b>Less Existing Budget Pers. Cost</b>	<b>\$</b>	<b>(3,703,295.00)</b>	
<b>Less Est. Overtime Savings</b>	<b>\$</b>	<b>(200,000.00)</b>	<b>[1/2]</b>
<b>Total Net Cost Addt'l. Personnel</b>	<b>\$</b>	<b>914,938.16</b>	

# EMERGENCY MEDICAL SERVICES (EMS)

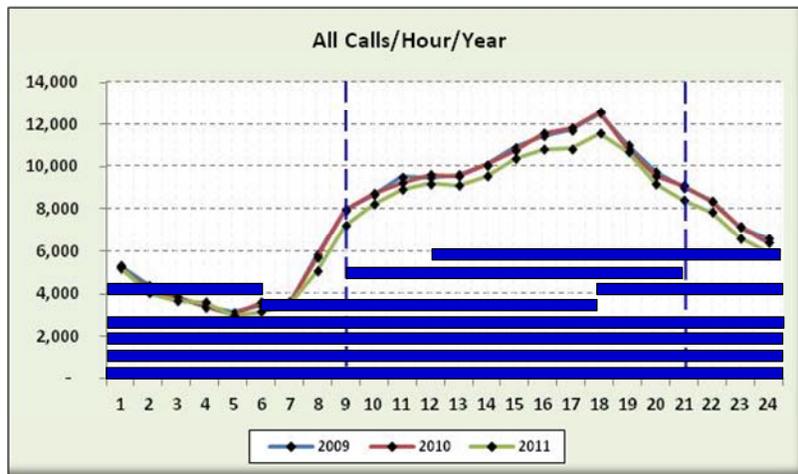
## RECOMMENDATIONS

### Issue: Availability of Ambulances

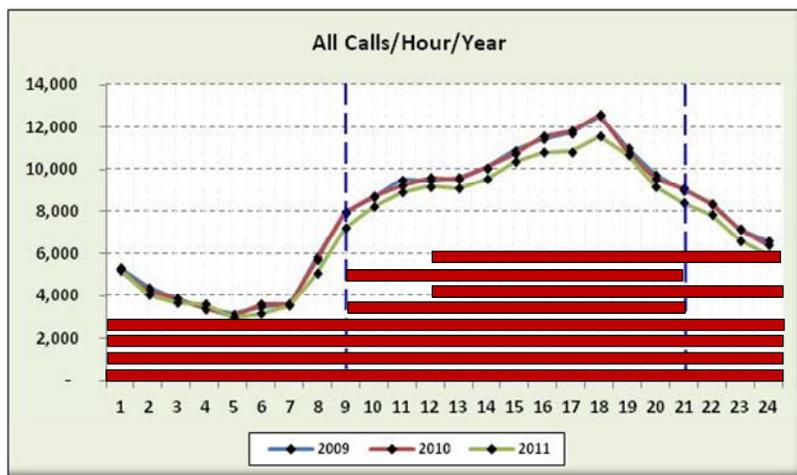
#### R-1. Adjust Medic 5 & Medic 8 Coverage Hours

- Move Medic 5 from 6:00am-6:00pm to 9:00am-9:00pm
- Move Medic 8 from 6:00pm-6:00am to 12:00pm-12:00 am

Before



After



## EMERGENCY MEDICAL SERVICES (EMS)

### RECOMMENDATIONS

#### Issue: Availability of Ambulances

R-1. Move Medic 8 from 6:00 am-6:00 pm to 9:00 am-9:00 pm; and Medic8 from 6:00 pm-6:00 am to 12:00 pm-12:00 am.

**R-2. Add ALS Ambulance 9:00am – 9:00pm @ 12 hrs/7 days**

**R-3a. Utilize available SORS/BLS ambulance for non-emergency transports; the basis being to free-up ALS units to reduce travel time to/from medical facilities and be available sooner to respond to emergency status calls.**

**R-3b. OEMS to staff a BLS ambulance to be available for non-emergency transports; the basis being the same as 3a, however in the event that SORS/BLS ambulance is not available.**

**EMERGENCY MEDICAL SERVICES (EMS)****RECOMMENDATIONS****Issue: Response Time**

**R-4. Assess Fire Department capabilities necessary to meet MFR Response Time objectives; via independent assessment of call volume, roster, paid vs. volunteer personnel, vehicles, base location(s), past call locations, included map grids, existing funding, and anticipated performance requirements.**

**R-5a. Schedule and implement Fire Department MFR initiative with included performance objectives.**

**R-5b. Staff & equip four (4) EMS/QRV's for assignment 12 hours/7 days; with shift start/end times to be determined by EMS.**

**R-6. Staff & equip six (6) 12 hour/7 day ALS ambulances at appropriate staging/base facility locations proximate to (1) Zones 1 & 2, (2) Zones 7 & 5, and (3) Zones 6 & 8.**

**R-7. Hire Paramedic Level Shift Supervisor @ 24/7.**

## EMERGENCY MEDICAL SERVICES (EMS)

### RECOMMENDATIONS

#### Issue: EMS Base Facilities

**R 8. Prepare a detailed Space Needs Assessment that addresses the essential building and site requirements to accommodate a stand-alone, functional, code compliant EMS base facility that can serve as a prototype for all future facilities.**

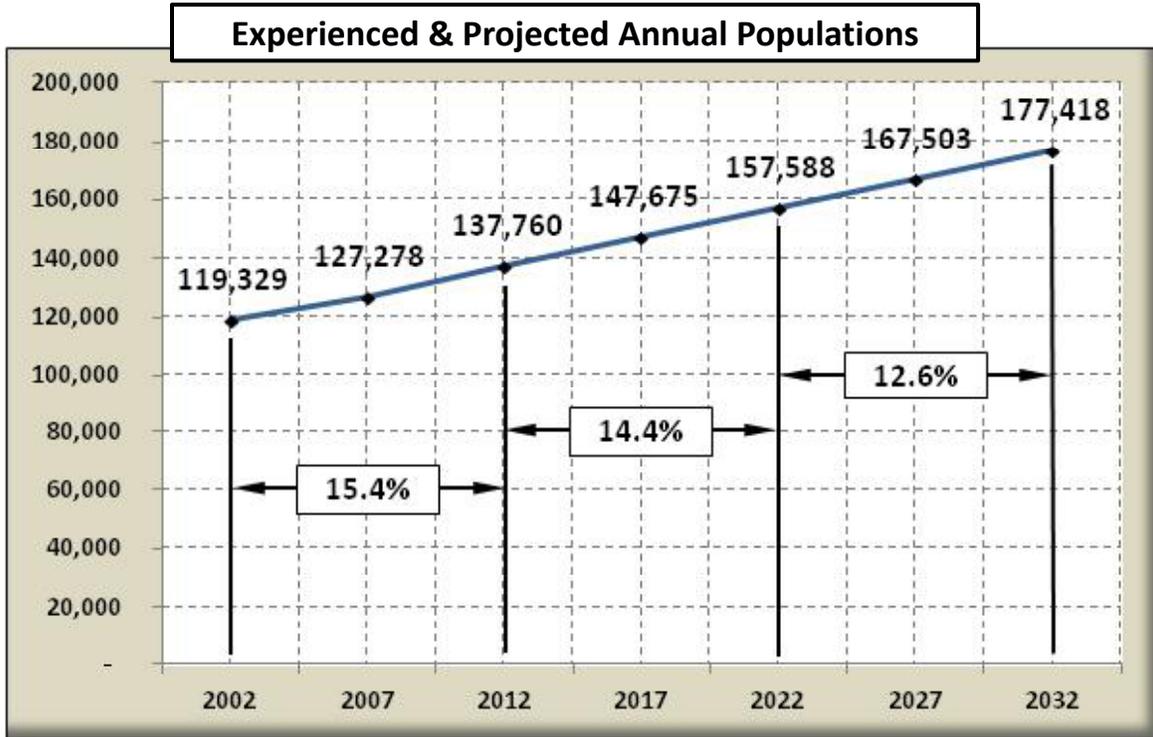
**R 9. Identify a minimum of nine (9) strategic locations, preferably no less than one (1) location within each major Zone for the potential location in each of a future EMS base.**

**R 10. County to purchase/obtain identified sites (and/or buildings) for development.**

**R 11. Procure EMS base planning and design services.**

**R 12. Advertise, bid, and commence construction on designated EMS base facilities.**

# COUNTY POPULATION



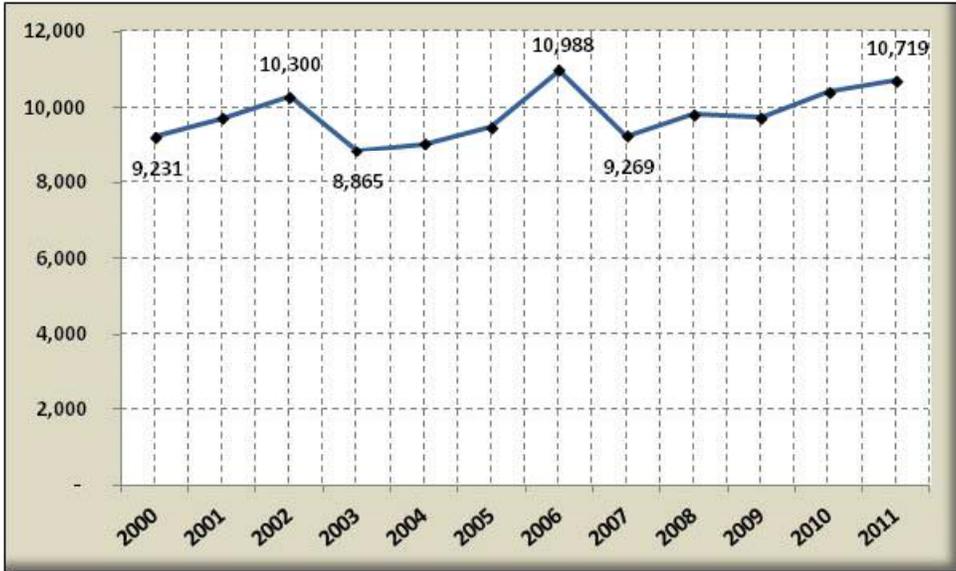
Source: NC Office of Budget & Management

**Adjacent County Populations**

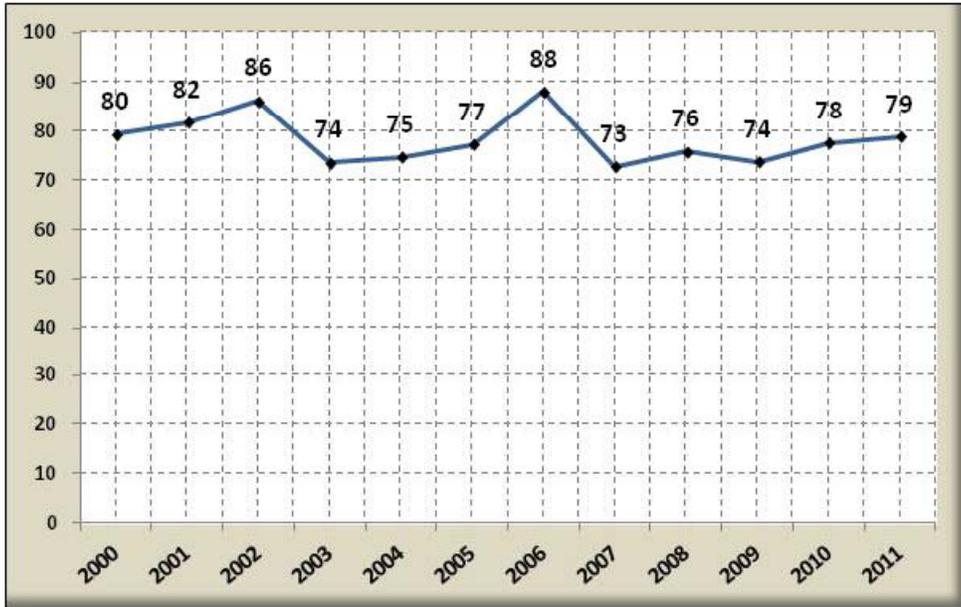
County	Jul-12	Jul-22	% Change	Jul-32	% Change	Total % Change
Alamance	153,498	163,168	6.30%	172,841	5.93%	12.23%
Caswell	23,727	23,733	0.03%	23,756	0.10%	0.12%
Chatham	65,814	78,411	19.1%	91,011	16.1%	35.21%
Durham	275,946	312,265	13.2%	348,584	11.6%	24.79%
<b>Orange</b>	<b>137,760</b>	<b>157,588</b>	<b>14.4%</b>	<b>177,418</b>	<b>12.6%</b>	<b>26.98%</b>
Person	40,247	45,010	11.8%	49,776	10.6%	22.42%

# COUNTY POPULATION

**Experienced EMS Call Volume 2000-2011**

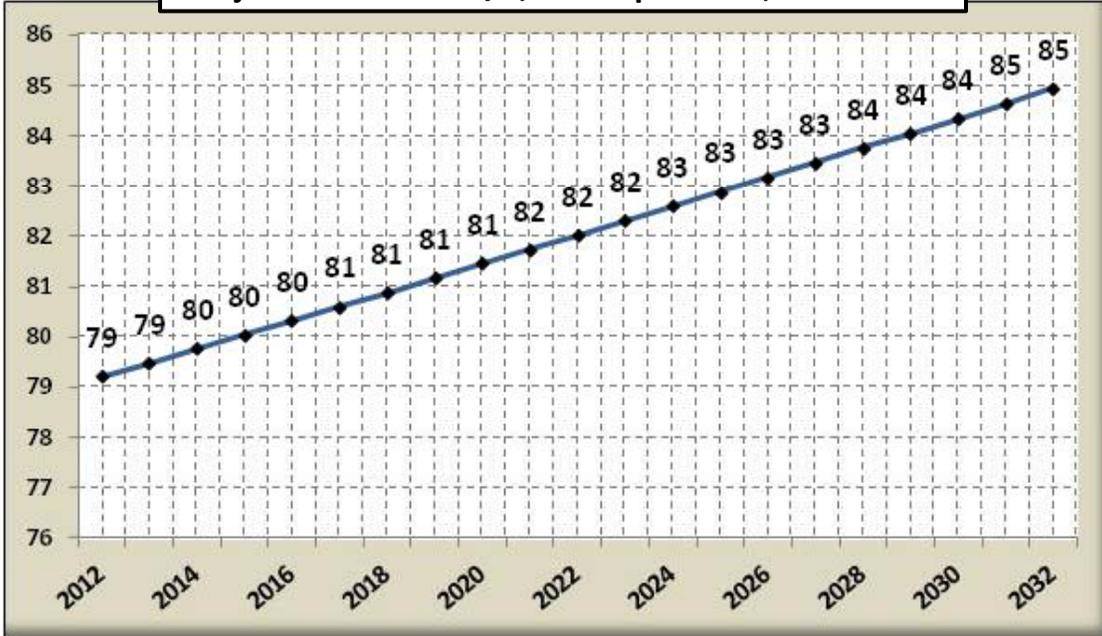


**Annual EMS Calls/1,000 Population**

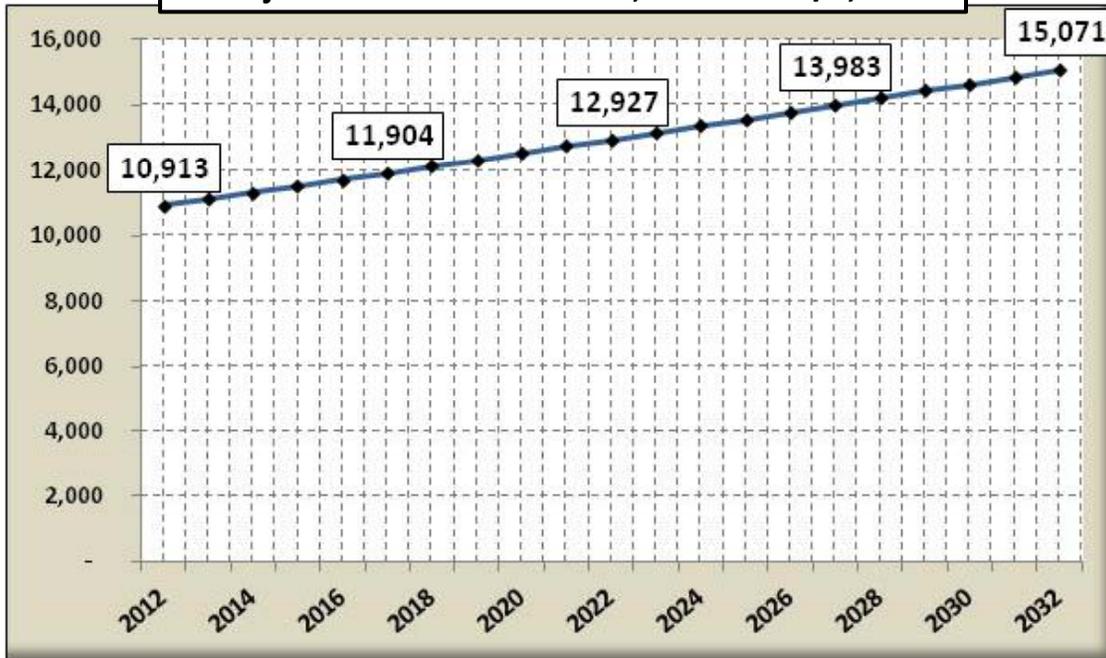


# COUNTY POPULATION

**Projected EMS Calls/1,000 Population; 2010-2032**



**Projected Annual EMS Calls; 2012-2032/1,000**



## COUNTY POPULATION

### Projected 10-Year & 20-Year EMS Calls & County Population

Factor	2012	% Change	2022	% Change	2032
Co. Population	137,760	14.4%	157,588	12.6%	177,418
EMS Calls	10,913	18.5%	12,927	16.6%	15,071

#### Significant Age-Group Demographic:

Age Group 65 yrs. & older-2012      10.6% of County Population

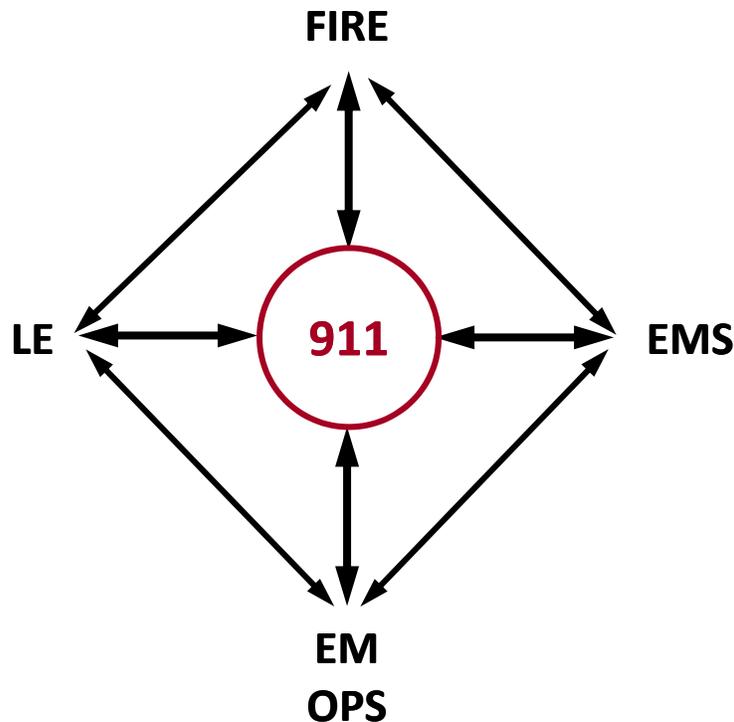
Age Group 65 yrs. & older-2032      18.2% of County Population

**Increase = 121%**

Source: NC Office of Budget & Management

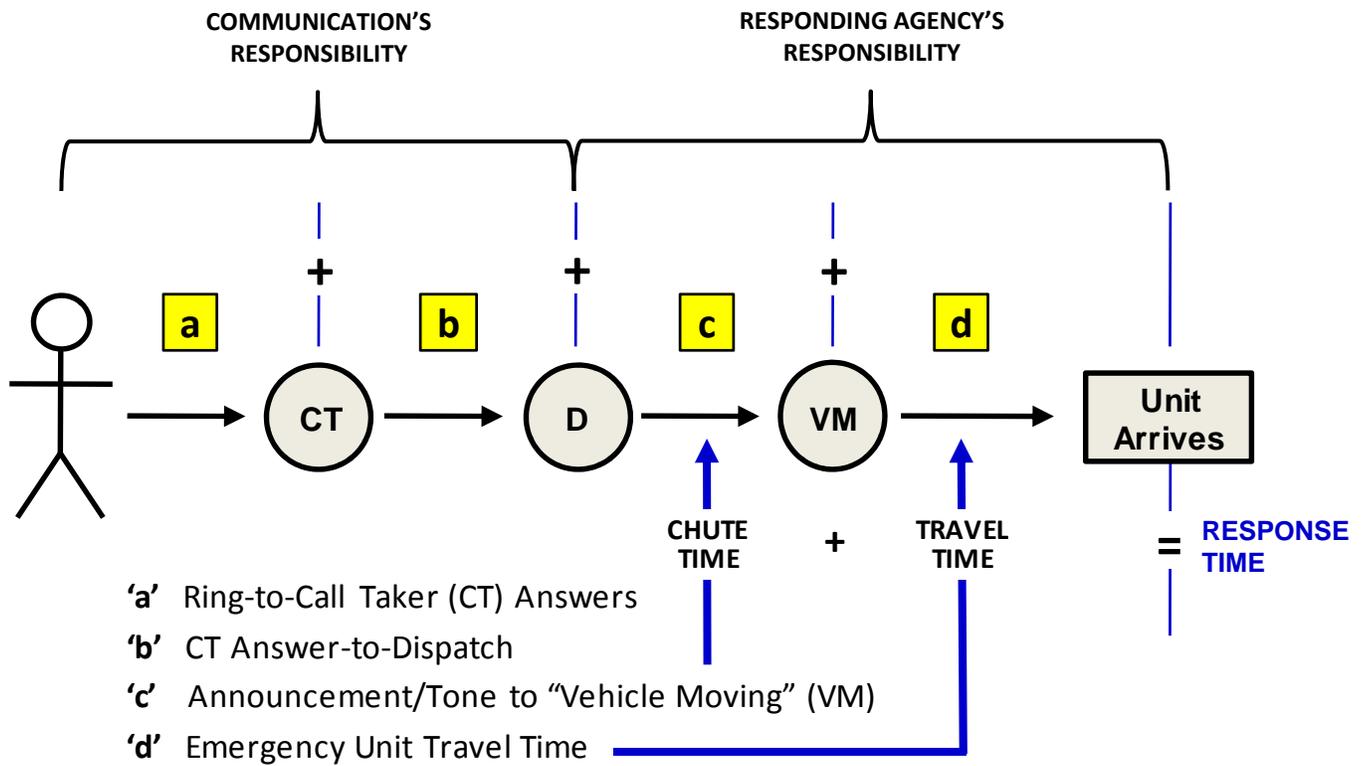
**911/COMMUNICATIONS CENTER**

**Orange County's emergency services network, which includes virtually all of the public safety agencies operating in the County, could not exist; i.e. *could not begin to approach the general public's expectations of it, without a sophisticated emergency communications system.***



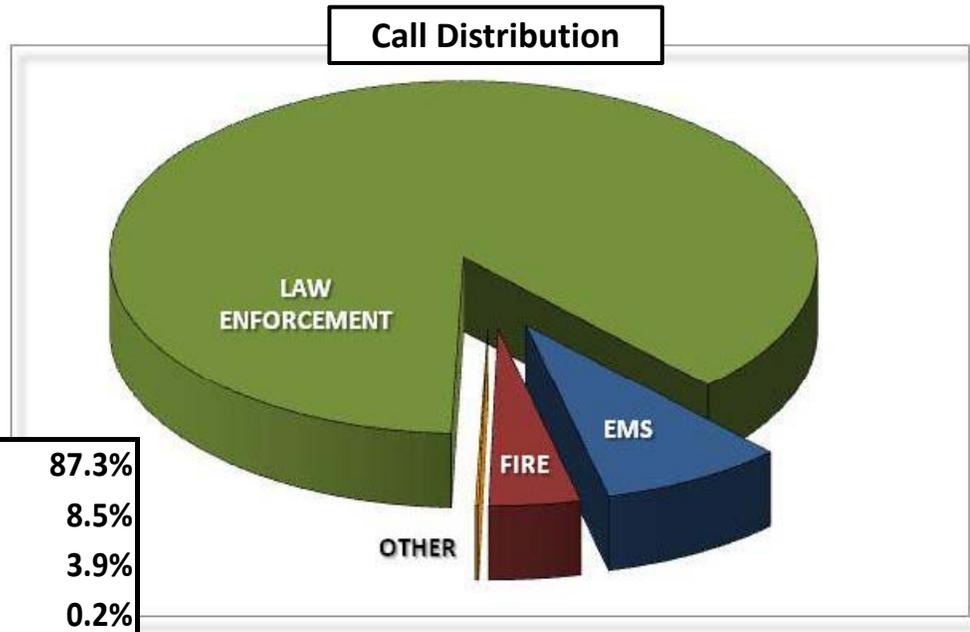
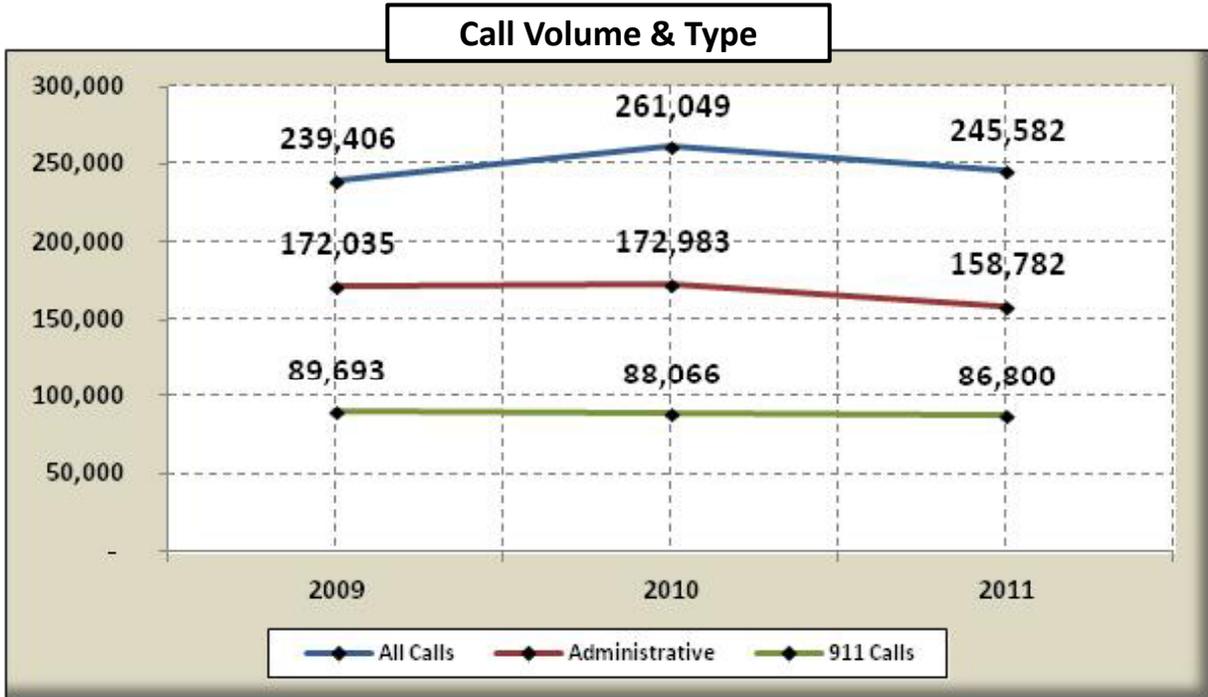
# 911/COMMUNICATIONS CENTER

## THE PROCESS



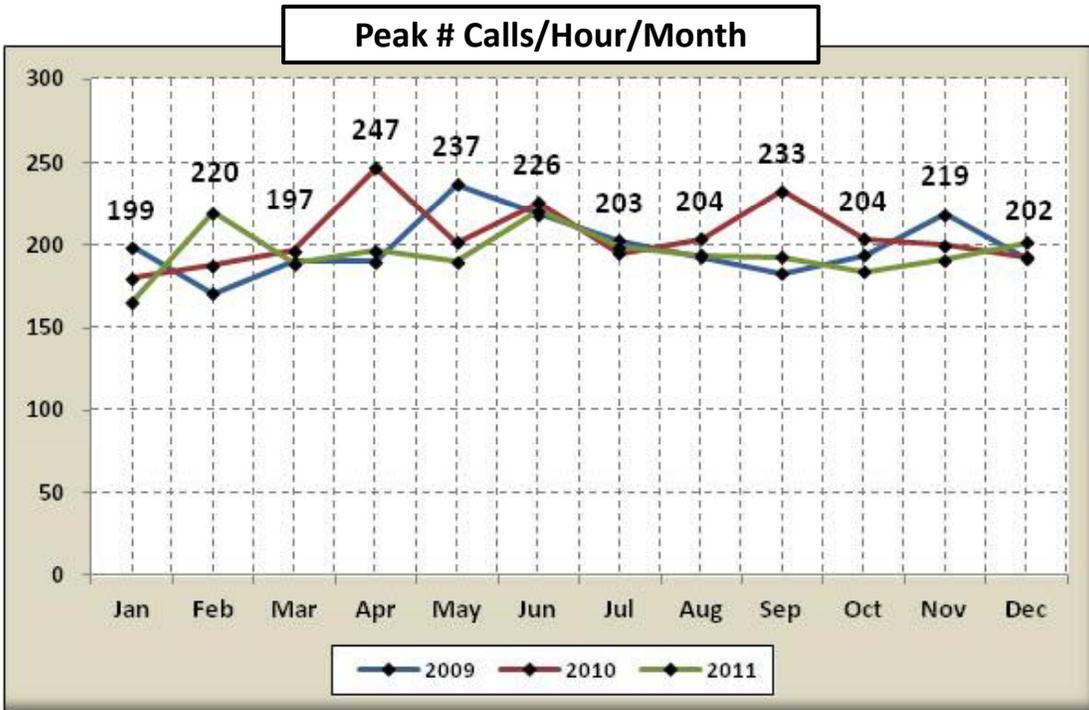
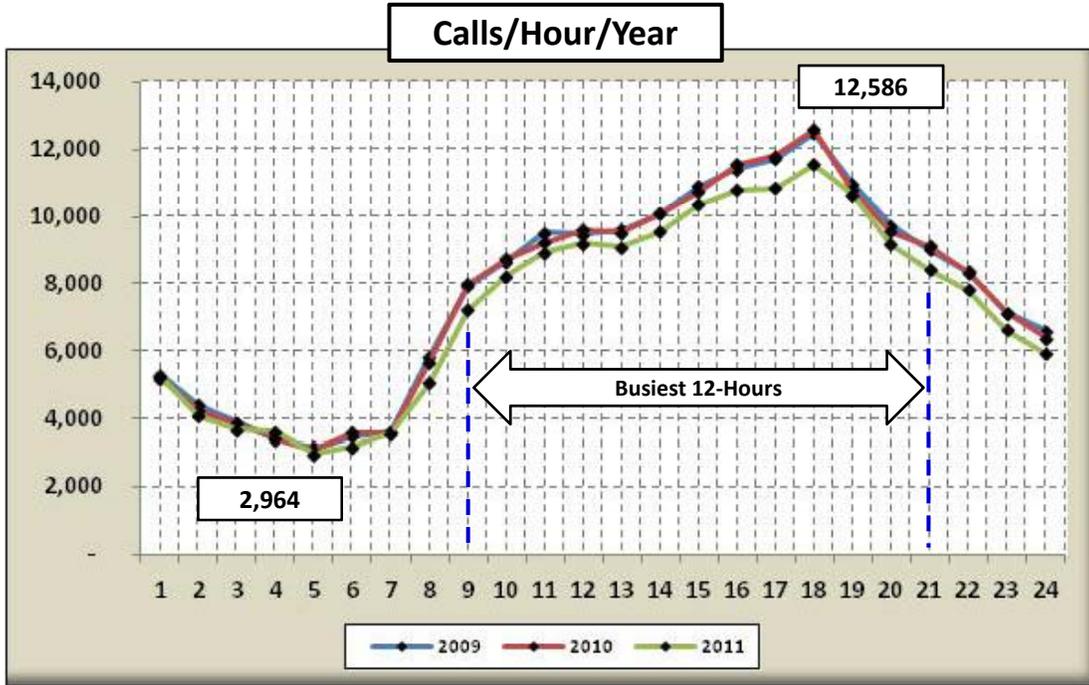
# 911/COMMUNICATIONS CENTER

## CURRENT OPERATIONS



# 911/COMMUNICATIONS CENTER

## CURRENT OPERATIONS



# 911/COMMUNICATIONS CENTER

## CURRENT OPERATIONS

<b>Call Ring-to-Call Answer</b>				
Month	#911	0-7 sec.	7-14 sec.	< 15 sec.
January	6,472	90.3%	8.6%	<b>98.9%</b>
February	6,376	88.8%	9.8%	<b>98.6%</b>
March	6,989	95.9%	3.8%	<b>99.7%</b>
April	7,343	96.0%	3.6%	<b>99.6%</b>
May	7,507	96.2%	3.7%	<b>99.9%</b>
June	7,261	95.3%	4.2%	<b>99.5%</b>
July	7,275	96.1%	3.6%	<b>99.7%</b>
August	7,714	96.0%	3.7%	<b>99.7%</b>
September	7,586	96.2%	3.5%	<b>99.7%</b>
October	7,750	95.6%	4.1%	<b>99.7%</b>
November	7,376	95.6%	4.0%	<b>99.6%</b>
December	7,201	96.1%	3.7%	<b>99.8%</b>
<b>Total Answered</b>	<b>86,850</b>		<b>Total Avg. @</b>	<b>99.5%</b>

<b>Call Answer-to-Dispatch</b>		
Year	Average	90%
<b>2009</b>	<b>0:00:55</b>	<b>0:03:00</b>
<b>2010</b>	<b>0:00:56</b>	<b>0:02:54</b>
<b>2011</b>	<b>0:00:53</b>	<b>0:02:42</b>

### Prevailing Performance Standards

<b><u>NFPA 1221, Section 7.4.1</u></b>	
<b>Ring-to-Answer</b>	95% < 15 seconds 99% < 40 seconds
<b>Answer-to-Dispatch</b>	95% < 60 seconds 99% < 90 seconds

**Ring-to-Answer 90% < 10 seconds**  
**95% < 20 seconds**

## 911/COMMUNICATIONS CENTER

### CURRENT OPERATIONS

#### Budget (Expense) & Revenue

Year	Budget	Revenue	as % of Budget
<b>FY 08-09</b>	\$ 1,940,423	\$ 659,799	<b>34.0%</b>
<b>FY 09-10</b>	\$ 1,898,823	\$ 658,184	<b>34.7%</b>
<b>FY 10-11</b>	\$ 1,714,018	\$ 657,050	<b>38.3%</b>
<b>FY 11-12</b>	\$ 1,778,092	\$ 554,787	<b>31.2%</b>

## 911/COMMUNICATIONS CENTER

### ISSUES OF CONCERN

#### Staffing

*During the course of study, the Communications Center:*

- *Total allocation of **30** full-time positions*
- *Plus one (1) Operations Manager; **31 total***

*During that time:*

- *Nine (9) of those positions were either vacant (5)*
- *Or in training (4) and therefore unavailable.*

## 911/COMMUNICATIONS CENTER

### ISSUES OF CONCERN

#### Staffing

If you “know”:

- The number of positions to be filled
- The hours/year each needs to be in service
- The hours/year a single employee is available

You can:

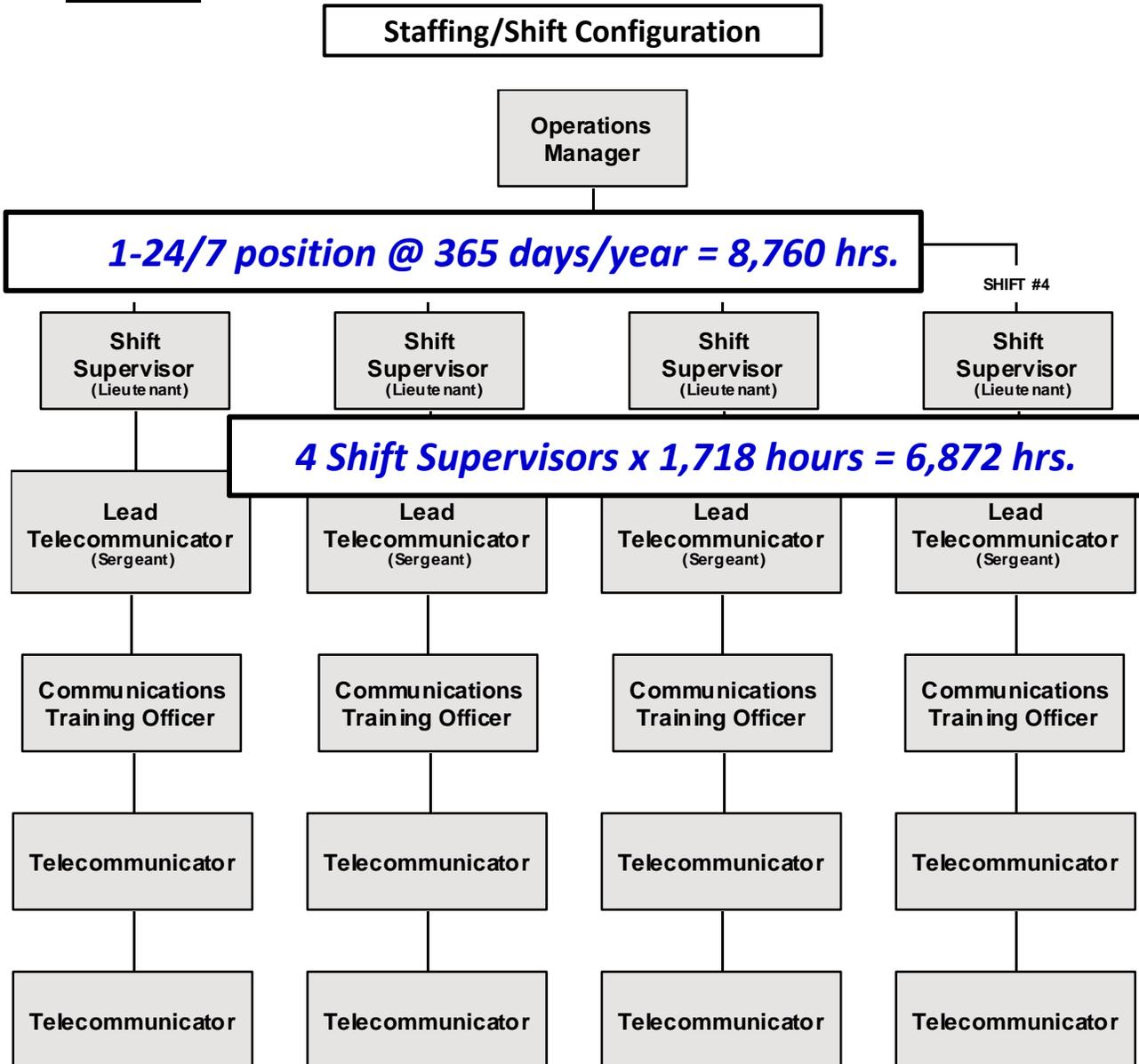
- Calculate the Position “Relief Factor” used to
- Determine total staff required

Position Coverage	Annual Hours Required/Position	Hours Available/Yr. Per Employee	Relief Factor
24 Hrs./7 Days	8,760	1,718	5.10
12 Hrs./7 Days	4,380	1,718	2.50

**911/COMMUNICATIONS CENTER**

**ISSUES OF CONCERN**

**Staffing**



**911/COMMUNICATIONS CENTER****ISSUES OF CONCERN****Staffing**

If you *want to* determine the *number of post* positions to be filled based on workload:

The number of *positions* needed to adequately handle the call volume can be calculated based upon a formula matrix which utilizes:

<b>Average Call Duration:</b>	<b>102 seconds</b>
<b>Peak Call Rate/Hr.</b>	<b>236/hour</b>

# 911/COMMUNICATIONS CENTER

## ISSUES OF CONCERN

### Staffing

**Average Call Duration @ 102 seconds**

Required Call-Takers	Average Call-Taker Busy Time, In Seconds																		
	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120
1	16	13	11	9	8	7	6	6	5	5	5	4	4	4	4	3	3	3	3
2	77	64	54	47	42	37	34	31	28	26	24	23	21	20	19	18	17	16	16
3	157	131	112	98	87	78	70	64	59	55	51	48	45	42	40	38	36	34	33
4	247	206	177	154	137	123	111	102	94	87	81	76	71	67	64	60	57	55	52
5	343	287	248	215	191	171	156	142	131	122	113	106	100	94	89	85	80	77	73
6	443	371	318	278	247	222	202	185	170	158	147	138	130	122	116	110	105	100	95
7	545	457	393	344	306	275	250	229	211	196	182	171	161	154	152	136	130	124	214
8	650	545	469	411	365	329	299	274	252	234	218	205	192	182	172	163	155	148	142
9	756	635	546	479	426	384	349	319	295	273	265	239	225	212	201	191	181	173	165
<b>10</b>	864	726	625	548	488	439	399	366	338	313	292	274	258	243	<b>230</b>	219	208	199	190
11	973	818	705	618	550	496	451	413	381	354	330	309	291	275	260	247	235	224	214
12	1082	911	785	689	614	553	503	461	425	395	368	345	325	307	290	278	262	250	239
13	1193	1005	866	761	678	611	555	509	470	436	407	382	359	339	321	305	290	277	265
14	1304	1099	948	833	742	669	608	558	515	478	446	418	393	371	352	334	318	303	290

**Peak Call Rate @ 236/hour**

Source: US Department of Justice

**10 Telecommunicators @ Relief Factor of 5.10 = 51 Bodies**

- Meals
  - Breaks
  - Training
  - Short Shifting
  - Overtime
- ?

## 911/COMMUNICATIONS CENTER

### ISSUES OF CONCERN

#### Staffing

*In addition*, and currently *missing* from the Communications Center; i.e. one having this level of Telecommunicator staffing and annual call volume:

1. FT Data System Manager
2. FT Quality Assurance Officer
3. FT Training Officer

The need is **CRITICAL!**

## 911/COMMUNICATIONS CENTER

### ISSUES OF CONCERN

#### Data

The Communication Center's; i.e. the County's; technical capabilities were not up to speed, nor have they been up to speed in the eyes of the agencies it serves.

**The information is there!**

Its accessibility & the format in which it exists has been a problem.

**It's 20 years old!**

**OSSI**

Open Software Solution Inc.

**ECaTS**

Emergency Call Tracking System

**911/COMMUNICATIONS CENTER****RECOMMENDATIONS****Issue: Staffing**

**R 13. Hire a full-time, dedicated Data System Manager to be located as close as possible, preferably adjacent to the Communications Center, and answerable *first to the* Communications Center Operations Manager.**

**R 14. Hire a full-time, dedicated Training/Quality Assurance Officer to be located as close as possible, preferably adjacent to the Communications Center , and answerable *first* to the Communications Center Operations Manager.**

**R 15. Anticipating increasing responsibilities due to the number of personnel forthcoming, hire an additional fulltime Training/Quality Assurance Officer no later than the end of year-3.**

**R 16. Prepare a schedule for the hiring and training of the identified Telecommunicator positions and identify date to begin solicitation of applications.**

**R 17. Hire the 17 new, full-time Telecommunicators.**

**911/COMMUNICATIONS CENTER****RECOMMENDATIONS****Issue: Data**

**R 18. Purchase necessary AVL vehicle hardware for each new EMS vehicle purchased to enable compatibility with newly purchased CAD software and existing AVL system hardware.**

**R 19. Following the installation of recently purchased Communications Center software and the training of in-house personnel; organize and provide informational meetings to emergency service system users, particularly Fire Departments and Law Enforcement, with regards to the system's capabilities and the information that will be available to them for their use.**

## PROBABLE COSTS

### EMERGENCY MEDICAL SERVICES (EMS)

#### Issue: Availability of Ambulances

#### RECOMMENDATIONS

1	Adjust Medic 5 and Medic 8 coverage hours
2	Add ALS ambulance 9a-9p @12 hrs/7 days
3a	Utilize available BLS ambulance for non-emergency transports
3b	Staff BLS ambulance for non-emergency transport @ 12 hrs/7 days

REC	Personnel	Equipment	Prof. Services	Construction	Other	Total
1	n/a	n/a	n/a	n/a	n/a	\$ -
2	\$ 224,100	\$ 228,400	n/a	TBD	TBD	\$ 452,500
3a	n/a	n/a	\$ 300,000	n/a	\$ 105,000	\$ 405,000
3b	\$ 205,876	(existing)	n/a	TBD	TBD	\$ 205,876

## PROBABLE COSTS

### EMERGENCY MEDICAL SERVICES (EMS)

Issue: Response Time

#### RECOMMENDATIONS

4	Assess FD capabilities necessary to meet MFR-RT requirements
5a	Implement FD/MFR initiative w/performance objectives
5b	Add four (4) QRV's @ 12 hrs/7 days
6	Add six (6) 12 hrs/7 days ALS ambulances; Zones 1/2, 7/5, 6/8
7	Hire Shift Supervisor; ALS @ 24/7

REC	Personnel	Equipment	Prof. Services	Construction	Other	Total
4	n/a	n/a	\$ 8,000	n/a	n/a	\$ 8,000
5a	TBD	TBD	n/a	n/a	TBD	TBD
5b	\$ 484,650	\$ 220,000	n/a	TBD	TBD	\$ 704,650
6	\$ 1,344,600	\$ 1,370,400	n/a	TBD	TBD	\$ 2,715,000
7	\$ 321,300	\$ 45,000	n/a	n/a	TBD	\$ 366,300

## PROBABLE COSTS

### EMERGENCY MEDICAL SERVICES (EMS)

Issue: EMS Base Facilities

#### **RECOMMENDATIONS**

<b>8</b>	<b>Conduct detailed Space Needs Assessment</b>
<b>9</b>	<b>Identify minimum of nine (9) strategic locations</b>
<b>10</b>	<b>Purchase identified site and/or building</b>
<b>11</b>	<b>Procure base design &amp; construction services</b>
<b>12</b>	<b>Construction; nine (9) EMS Bases</b>

REC	Personnel	Equipment	Prof. Services	Construction	Other	Total
8	n/a	n/a	\$ 16,000	n/a	TBD	\$ 16,000
9	n/a	n/a	n/a	n/a	n/a	\$ -
10	n/a	n/a	n/a	n/a	TBD	TBD
11	n/a	TBD	\$ 1,620,000	n/a	TBD	\$ 1,620,000
12	n/a	TBD	n/a	\$ 8,064,000	n/a	\$ 8,064,000

**PROBABLE COSTS**

**EMERGENCY MEDICAL SERVICES (EMS)**

Issue: Staffing

**RECOMMENDATIONS**

13	Hire Full-time Data System Manager
14	Hire full-time Training/Quality Assurance Officer
15	Hire full-time Training/Quality Assurance Officer
16	Prepare schedule for hiring/training of new Telecommunicators
17	Hire 17 full-time Telecommunicators

REC	Personnel	Equipment	Prof. Services	Construction	Other	Total
13	\$ 74,250	n/a	n/a	n/a	n/a	\$ 74,250
14	\$ 64,800	\$ 8,000	n/a	TBD	TBD	\$ 72,800
15	\$ 64,800	\$ 8,000	n/a	TBD	TBD	\$ 72,800
16	n/a	n/a	n/a	n/a	n/a	\$ -
17	\$ 784,890	TBD	n/a	n/a	TBD	\$ 784,890

**PROBABLE COSTS**

**911/COMMUNICATIONS CENTER**

Issue: Data

**RECOMMENDATIONS**

18	Purchase AVL hardware-new vehicles
19	LE & FD Software Orientation

REC	Personnel	Equipment	Prof. Services	Construction	Other	Total
18	n/a	\$ 60,000	n/a	n/a	n/a	\$ 60,000
19	n/a	TBD	n/a	n/a	n/a	TBD

## IMPLEMENTATION SCHEDULE

### YEARS 1-5

No.	Recommendation	Year 1	Year 2	Year 3	Year 4	Year 5	5-Year Total
1	Adjust Medic 5 & 8 coverage	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2	Add 9a-9p @12/7 ALS	\$ -	\$ 452,500	\$ -	\$ -	\$ -	\$ 452,500
3a	BLS for Non-Em transports @ 12/7	\$ -	\$ -	\$ 405,000	\$ -	\$ -	\$ 405,000
3b	Staff BLS for NE transports @ 12/7	\$ -	\$ -	\$ 205,876	\$ -	\$ -	\$ 205,876
4	Assess FD- MFR/RT requirements	\$ 8,000	\$ -	\$ -	\$ -	\$ -	\$ 8,000
5a	Implement FD/MFR initiative	TBD	\$ -	\$ -	\$ -	\$ -	\$ -
5b	Add four (4) QRV's @ 12/7	\$ -	\$ 704,650	\$ -	\$ -	\$ -	\$ 704,650
6	Add six (6) ALS Ambulances @ 12/7	\$ -	\$ -	\$ -	\$ 1,357,500	\$ -	\$ 1,357,500
7	Hire Shift Supervisor; ALS @ 24/7	\$ -	\$ -	\$ -	\$ 366,300	\$ -	\$ 366,300
8	Space Needs Assessment	\$ 16,000	\$ -	\$ -	\$ -	\$ -	\$ 16,000
9	Identify nine (9) base locations	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
10	Purchase sites/buildings	\$ -	TBD	TBD	TBD	TBD	\$ -
11	Design services- nine (9) bases	\$ -	\$ -	\$ -	\$ 540,000	\$ -	\$ 540,000
12	Construction/Renovation-9 bases	\$ -	\$ -	\$ -	\$ -	\$ 2,688,000	\$ 2,688,000
12	Hire Data System Manager	\$ 74,250	\$ -	\$ -	\$ -	\$ -	\$ 74,250
14	Hire Training/QA Officer	\$ 72,800	\$ -	\$ -	\$ -	\$ -	\$ 72,800
15	Hire T/QA Officer	\$ -	\$ -	\$ 72,800	\$ -	\$ -	\$ 72,800
16	Schedule hiring/training for ne TC's	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
17	Hire 17 new Telecommunicators	\$ -	\$ 230,850	\$ -	\$ -	\$ 230,850	\$ 461,700
18	AVL hardware-new vehicles	\$ -	\$ 40,000	\$ -	\$ 20,000	\$ -	\$ 60,000
19	LE & FD Software Orientation	\$ -	TBD	\$ -	\$ -	\$ -	\$ -
		\$ 171,050	\$ 1,428,000	\$ 683,676	\$ 2,283,800	\$ 2,918,850	\$ 7,485,376
	<b>Capital/One-Time Cost</b>	<b>\$ 24,000</b>	<b>\$ 488,400</b>	<b>\$ -</b>	<b>\$ 993,600</b>	<b>\$ 2,688,000</b>	<b>\$ 4,194,000</b>
	<b>Operating Cost</b>	<b>\$ 147,050</b>	<b>\$ 939,600</b>	<b>\$ 683,676</b>	<b>\$ 1,290,200</b>	<b>\$ 230,850</b>	<b>\$ 3,291,376</b>

## IMPLEMENTATION SCHEDULE

### YEARS 6-10

No.	Recommendation	Year 6	Year 7	Year 8	Year 9	Year10	5-Year Total
1	Adjust Medic 5 & 8 coverage	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2	Add 9a-9p @12/7 ALS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3a	BLS for Non-Em transports @ 12/7	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3b	Staff BLS for NE transports @ 12/7	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4	Assess FD- MFR/RT requirements	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5a	Implement FD/MFR initiative	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5b	Add four (4) QRV's @ 12/7	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6	Add six (6) ALS Ambulances @ 12/7		\$ -	\$ 1,357,500	\$ -	\$ -	\$ 1,357,500
7	Hire Shift Supervisor; ALS @ 24/7	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8	Space Needs Assessment	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
9	Identify nine (9) base locations	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
10	Purchase sites/buildings	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
11	Design services- nine (9) bases	\$ 540,000	\$ -	\$ -	\$ 540,000	\$ -	\$ 1,080,000
12	Construction/Renovation	\$ -	\$ 2,688,000	\$ -	\$ -	\$ 2,688,000	\$ 5,376,000
12	Hire Data System Manager	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
14	Hire Training/QA Officer	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
15	Hire T/QA Officer	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
16	Schedule hiring/training for ne TC's	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
17	Hire 17 new Telecommunicators		\$ 323,190	\$ -	\$ -	\$ -	\$ 323,190
18	AVL hardware-new vehicles	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
19	LE & FD Software Orientation	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
		\$ 540,000	\$ 3,011,190	\$ 1,357,500	\$ 540,000	\$ 2,688,000	\$ 8,136,690
	<b>Capital/One-Time Cost</b>	<b>\$ 540,000</b>	<b>\$ 2,688,000</b>	<b>\$ 685,200</b>	<b>\$ 540,000</b>	<b>\$ 2,688,000</b>	<b>\$ 7,141,200</b>
	<b>Operating Cost</b>	<b>\$ -</b>	<b>\$ 323,190</b>	<b>\$ 672,300</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 995,490</b>



**QUESTIONS/COMMENTS**



# **Comprehensive Assessment of Emergency Medical Services & 911/Communications Center Operations Study**

**Presentation of Study Findings & Recommendations**

**To the  
Orange County Board of Commissioners**

**30 August 2012**

**Presented by:  
Solutions for Local Government, Inc.**

**ORANGE COUNTY  
BOARD OF COMMISSIONERS**

**ACTION AGENDA ITEM ABSTRACT**

**Meeting Date:** August 30, 2012

**Action Agenda  
Item No.**   3  

**SUBJECT:** Report on Paperless Agendas

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**DEPARTMENT:** Information Technologies

**PUBLIC HEARING: (Y/N)**

No

**ATTACHMENT(S):**

**INFORMATION CONTACT:**

Todd Jones, 919-245-2280

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**PURPOSE:** To inform the Board of progress on providing a paperless agenda process for Board of Commissioners' meetings.

**BACKGROUND:** During the 2010 retreat, the Board of County Commissioners expressed interest in pursuing paperless agendas for its meetings. In discussions with the Board, the following goals were advanced for such a process:

- Reduce the amount of paper consumed in conducting BOCC meetings
- Provide Board members, staff and the public a convenient electronic option for viewing meeting materials
- Realize efficiencies in the agenda preparation process

Based on this input, staff researched various third party options for agenda automation. Research included site visits to peer governments using third party solutions, consulting with vendors and peers on solutions, and evaluating their strengths and shortcomings. Of the third party solutions, two vendors, Sire Technologies and Granicus, Inc., were identified as having the most complete products for agenda automation. These two vendors provided demonstrations to the BOCC at the May 3, 2012 work session.

After these demonstrations, there was a discussion between Board members and staff on the merits of these products and their suitability within the organization. It became clear that the full benefits of these two vendor systems could be realized only by applying firm deadline rigor to agenda submissions, and that requests to add items after those deadlines would cause the County to lose any efficiency gains otherwise achieved through automation. Further, it was clear that holding parties to strict deadlines could compromise the ability to include items on agendas in a timely manner.

A third solution, an in-house solution, was proposed. The third solution would involve staff assembling agenda items electronically, using low cost software from Adobe Systems, creating a hyperlinked Table of Contents (called "bookmarks" in the viewing software) which Board members and staff could use from computers, tablets or SmartPhones. This solution allows private comments to be inserted into the electronic files to ensure Commissioners could interact with the electronic agenda before, during and after meetings.

While this approach does not have all the features and deadline-based workflow of the third party solutions, it meets all the goals set forth in the original request. Further, the electronic agendas would be quicker to download than the current scanned files, the resolution of text and images would be crisper and the agendas would be fully searchable.

Lastly, this in-house approach can be achieved with very modest investments in software. This means this solution is well suited for short-, medium, or long term use. One caveat provided by staff is that electronic media be considered the default format over paper, with any formatting conflicts being resolved in electronic format's favor.

The Board requested staff pursue this third approach, the in-house solution. Since that request, staff from the Manager's Office, Information Technologies and the Clerk to the BOCC have been collaborating to refine the production, distribution and Board member review processes. Staff is initially encouraged with the results, which promise time savings in production, cost savings in distribution, a reduction in paper consumption and, in time, greater efficiencies for the Board, staff and the public.

Information Technologies is meeting with each Board member interested in training on the paperless agenda process. It is anticipated that each Commissioner will begin using the new system as they become comfortable with the technology and the process. Refinements will be continually made as feedback is gathered on the new system.

**FINANCIAL IMPACTS:** There is no cost to receiving this report. A modest investment of less than \$1,000 has given staff the tools to assemble the electronic agenda materials. Cost savings from this initiative will depend on adoption levels, but staff anticipates long term savings from reduced printing costs and reduced driving costs for delivering hard copy.

**RECOMMENDATION(S):** The Manager recommends that the Board receive the report and provide any comments, solicit any feedback from staff, or provide additional direction to staff.