EMC 445 EMS SYSTEMS MANAGEMENT

Unit 1: EMS System Design

Introduction to System Design

- If you believe that "paramedics save lives," no amount of paramedic skill will save anyone if the EMS system cannot deliver them to the scene in a timely fashion.
- What's a life worth?
  - EMS lags behind many other programs directed at improving health care, such as prenatal care, cancer screening, diabetes control, and injury prevention, in terms of the impact on health care per dollar invested.
  - EMS is a very expensive public service.
- Am I doing the best I can with the resources I've been given?

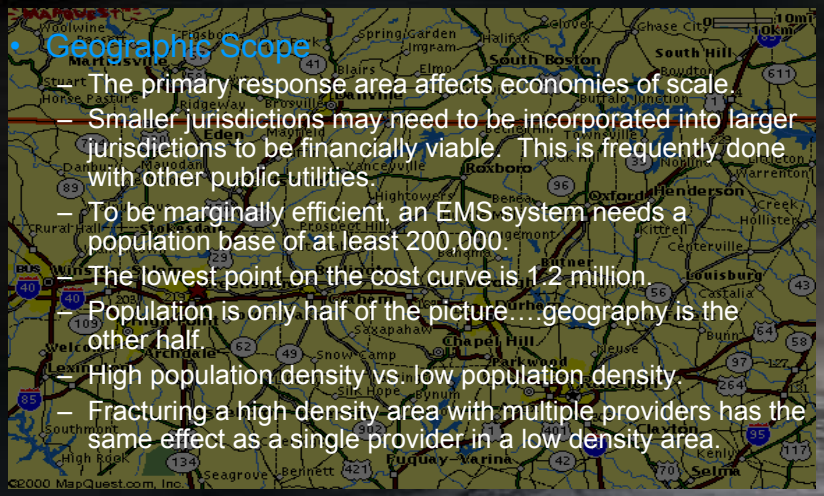
Introduction to System Design continued

- Most aspects of an EMS system are given and not amenable to change by the EMS administrator:
  - Salaries
  - Cost of vehicles
  - Demand for service
- System design and deployment strategies are the only factors of efficiency and effectiveness that are completely controlled by the EMS administrator.
- Increased tax subsidies are not a solution to an ill-conceived system design. Smaller systems may need tax subsidies. Other systems consume tax subsidies because it is "easy money."

The Nature of the EMS Industry

- Natural Monopoly
  - Similar to other natural monopolies such as utility company, water and sewer, and in some cases, cable television
  - The market can economically support only one provider of services.
  - Requires large infrastructure.
  - Natural monopolies typically require governmental oversight to protect the consumer

What System Design Determines



- Geographic Scope
  - The primary response area affects economies of scale.
  - Smaller jurisdictions may need to be incorporated into larger jurisdictions to be financially viable. This is frequently done with other public utilities.
  - To be marginally efficient, an EMS system needs a population base of at least 200,000.
  - The lowest point on the cost curve is 1.2 million.
  - Population is only half of the picture….geography is the other half.
  - High population density vs. low population density.
  - Fracturing a high density area with multiple providers has the same effect as a single provider in a low density area.

What System Design Determines continued

- Economies of Scale
  - Large EMS systems can achieve economies of scale, i.e., the average cost of running an ambulance call declines with the more calls they run…up to a point.
  - The reason for this is that the overhead costs (fixed costs such as administration, insurance, and to some extent, labor costs, etc.) are spread out over more calls.
  - Similar to other public utilities, EMS markets can support only a single, large, provider.
- Standards Setting and Enforcement
  - Establishing, monitoring, and enforcing performance standards (e.g., response time) and clinical performance is the most important aspect of EMS system design.

What System Design Determines continued

- Division of functions
  - First responder services
  - Technical rescue services
  - Dispatch and communication
  - Private ambulance BLS transport
  - All these factors affect revenues, accountability, and costs

What System Design Determines continued

- Production strategies
  - Concept of matching supply with demand. Because of tax subsidies, most EMS systems never tackle this principle of economics.
  - Flexible production (all ALS) vs. specialized production strategy
  - System status management vs. fixed deployment plan
  - These affect total system costs more than any other factor.

What System Design Determines continued

- Market Allocation
  - Determines who will provide what services and to whom.
  - Dividing up market incorporates inefficiencies into the system.
  - Few EMS systems use competitive bid process to award contracts.

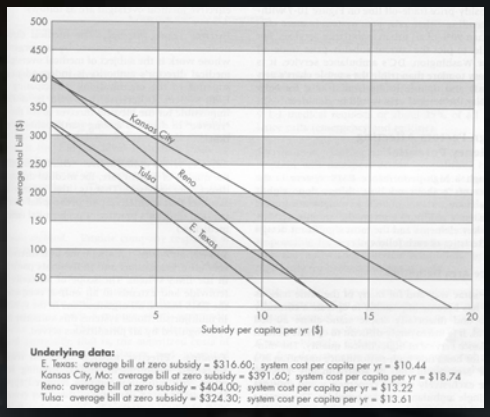
Evaluating an EMS System Design

- Clinical Performance
  - 911 or E-911
  - EMD
  - Injury Prevention
  - Research
  - First Responders
  - EMT-D
  - Equipment
  - Certification Requirements
  - Hiring Standards
  - Quality Improvement
  - Medical Control (paid?)
  - Sophisticated Protocols
  - Supply Inventory
  - Staffing Levels
  - Outcome Assessments
  - Public Education
    - CPR
    - PAD

Evaluating an EMS System Design continued

- Response Time Performance
  - Emergency
  - Non-emergency
  - Fractiles vs. means
  - Response time begins at the onset of injury of illness (dispatch delay, chute times, queue delay, volunteer delay)
  - Does the QRV stop the "paramedic clock"
  - Equitable distribution of resources and "fudging the numbers"

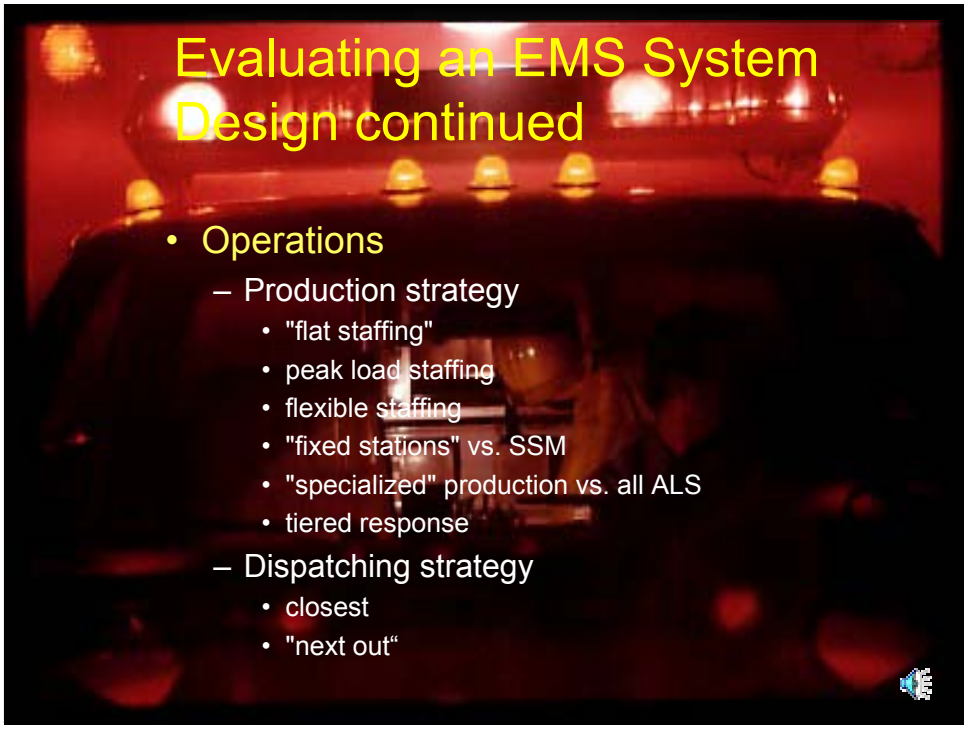
Evaluating an EMS System Design continued



- Financial Stability
  - equipment replacement funds
  - price/subsidy tradeoff
  - utilization ratios (U/UH)
  - utilization rates (% busy)

Evaluating an EMS System Design continued

- Operations
  - Production strategy
    - "flat staffing"
    - peak load staffing
    - flexible staffing
    - "fixed stations" vs. SSM
    - "specialized" production vs. all ALS
    - tiered response
  - Dispatching strategy
    - closest
    - "next out“



EMS SYSTEM DESIGNS

- Public Utility Model
  - All paramedic ambulances (although they may be staffed with 1 paramedic and 1 EMT)
  - Centralized dispatch
    - Operated by the ambulance service
    - Controls dispatch and SSM of the system
    - Provides emergency and non-emergency dispatch
  - No call screening and no EMS refusal to transport based on ability to pay
  - No on-scene collection of fees-for-service

EMS SYSTEM DESIGNS continued

- Public Utility Model continued
  - Medical Control
    - Contractual arrangement with medical community
    - Legal responsibility for certification, training, monitoring, and enforcing all clinical aspects
  - Single EMS Provider
    - Selected competitively
    - Performance-based contract (e.g., response times)
    - Equitable performance in all communities
    - Provider determines how to provide service (SSM, EMD, etc.)
    - Penalties established for failure to perform

EMS SYSTEM DESIGNS continued

- Public Utility Model continued
  - Performance Security
    - Security bond provides for continuation of service in the event of default by the contractor
    - Equipment, accounts receivable, facilities, licenses and other aspects of infrastructure are “owned” by the public domain (e.g., EMS Authority)
  - Financial Stability
    - With or without tax subsidies
    - Responsible for financing of replacement equipment
    - Rate structure set by EMS authority
    - EMS authority responsible for billing and collections, and all collections funneled through the authority to the contractor.

EMS SYSTEM DESIGNS continued

- Public Utility Model continued
  - Political Stability
    - EMS authority responsible for business and public protection aspects of EMS service delivery
    - EMS authority is a quasi-governmental agency established through local legislation
    - Allows physicians to be responsible for clinical performance, EMS contractor to focus on service delivery, and EMS authority takes care of business and political concerns
  - First Responder Services
    - May be provided free of charge by paid/volunteer fire and rescue agencies
    - Others charge the EMS authority on a per-response basis

EMS SYSTEM DESIGNS continued

- Retail Competition
  - "Shopper's Paradise"
  - Multiple firms compete within the market at the retail level
  - Municipal ordinances may set minimum standards
  - Typically, expensive and inefficient
  - Some markets evolve into monopolies
  - Other markets evolve into oligopolies with firms establishing "submarkets" and pricing arrangements at the risk of antitrust and collusion violations.

EMS SYSTEM DESIGNS continued

- Non-transporting Fire Department Paramedic
  - "Johnny and Roy"
  - Several variations
    - Single or multiple private BLS transport
    - Single or multiple private ALS transport
    - Emergency, non-emergency, or combination transport markets
    - Public fire tax offsets charges to medical insurers
    - Transport fees are lucrative for private providers who are not responsible for initial paramedic level care
    - Multiple agencies create inefficiencies
    - Some economies of scale by incorporating into FD

EMS SYSTEM DESIGNS continued

- Public Emergency/Private Non-emergency
  - FD or 3rd Service provides emergency paramedic level service and transport
  - Multiple private firms compete for non-emergency market at the retail level.
  - Variations
    - All ALS or tiered ALS/BLS response
    - Single private firm for non-emergency market
  - Private providers are "cream-skimming"
  - Public tax subsidy depresses insurance reimbursement
  - Local taxpayers must bear the cost of taxes as well as higher cost for transport due to depressed prevailing rates.

EMS SYSTEM DESIGNS continued

- Fully Socialized System
  - FD or 3rd service provides emergency and non-emergency services, including transport.
  - Variation includes tiered response.
  - Tiered response adds inefficiency.
  - Unless billings reflect true cost and are not reduced by tax subsidy, local tax dollars are being given to medicare, medicaid, and private insurers.
  - Recent trend toward municipal government exiting the EMS business and contracting services out to private companies or hospitals.

EMS SYSTEM DESIGNS continued

- Emergency-Only Exclusive Franchise
  - Single private firm is exclusively contracted or franchised to provide emergency service, while multiple private firms compete at the retail level for non-emergency work.
  - Variation includes ability of contractor for emergency market to also compete in non-emergency market with some restrictions
  - Inherent inefficiency of multiple providers.
  - Better prevailing rates for reimbursement.
  - Generally lacks the performance controls and reliability of the PUM.

EMS SYSTEM DESIGNS continued

- Full-Service Exclusive Franchise
  - Single private firm is selected to provide all emergency and non-emergency services in a community.
  - Variations
    - Contractor may or may not be selected by competitive process.
    - May or may not be tiered response.
    - Failsafe Franchise Model
      - Contractor is always selected competitively
      - Some portions of infrastructure are held in the public sector
      - Possesses some components of the Public Utility Model
    - One of the more efficient system designs when managed well.