

# Understanding EMS Economics

**Jerry Overton**  
President  
International Academies of Emergency  
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**'Broken system': Iowa's rural ambulance services strained**  
In some parts of Iowa, 911 callers can't be assured an ambulance will arrive

**Liam Halawith** **Emily Andersen**  
Nov. 5, 2023 5:30 am, Updated: Nov. 5, 2023 11:59 am


**Fort Worth (TX) Council OKs \$4.2 Million to Cover MedStar Shortfall**  
MedStar hasn't received funding from Fort Worth and the other member cities since 2010.

**Knox County's struggling ambulance service will change. What will that look like?**

**Why Pennsylvania paramedics say 'EMS is dying'**  
The state budget includes a \$20.7 million increase to subsidize reimbursement rates, but EMS agencies say much more is needed.

**Report Finds New Hampshire EMS System in 'State of Emergency'**  
Of the 100 EMS leaders surveyed in the report, 98% of them said the system is in urgent need of attention. More than 90% said the health and safety of residents is being impacted as a result.

**Colorado ambulance services are on the verge of collapse, government report finds**



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## The Old Axiom

“Nothing in life is free!”

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## The Past

What is a life worth?



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## *The Present!!!*

“Is this the best we can do with the financial resources available?”

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### EMS Finance Misconceptions

- Price (Rates) = Costs
- Component Costs = System Costs
- More Local Tax Support = Better Service
- Volunteers = Free Service

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### Total Cost of Providing Service

Emergency Medical Services  
Costs –  
*Definitions*

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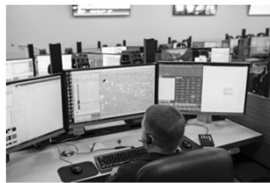
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### Cost Definitions

- Direct Costs
- Indirect Costs
- Fixed Costs
- Marginal Costs



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## Cost Definitions

- Direct Costs – A cost that can be traced specifically to a particular service of product
  - Paramedic Labor
  - Fuel
  - Medical Supplies



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## Cost Definitions

- Indirect Costs – A cost that cannot be traced to a particular service

- Administrative Overhead
- Information Technology
- Marketing
- Billing Service
- Legal and Accounting
- Insurance



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## Cost Definitions

- Fixed Cost – A cost that does not change in total for a given time or activity
  - Vehicles
  - Communication Infrastructure



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## Cost Definitions

- *Marginal Cost* – A cost that fluctuates in direct proportion to changes in activity
  - The addition of additional staffing (Unit Hours) to a schedule



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## Total Cost of Providing Service

Emergency Medical Services  
Costs –  
*General Principles*

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## General Principles

- *Cost of Readiness*
- *Productivity*



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## General Principles

- Before Proceeding
  - All Cost Centers Identified
  - All Costs Accurately Reported

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## General Principles

- *Cost of Readiness*



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## Cost of Readiness

- Strategically Deployed Distribution Network
- Production Capacity Must Exceed Supply and Demand
- Time Dependent Service Delivery

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## Cost of Readiness

- Fixed Costs
- NOT Volume Driven Unless Excess Capacity Exceeded
- Length of Trip has Little Effect

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## Special Considerations

- Urban
- Suburban
- Rural



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## General Principles

- Cost of Readiness
- *Productivity*



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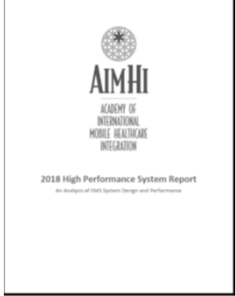
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**Cost Data Source**  
**Academy of Mobile Healthcare**  
**Integration**

- High Performance
- Sole Provider
- Flexible Deployment
- Dynamic Resource Management
- Revenue Maximization




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**Productivity**  
**Key Concepts**

- *Total System Cost per Capita*
- Cost per Unit Hour
- Unit Hour Utilization Ratio
- Cost per Transport

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**Total System Cost per**  
**Capita**

$$\frac{\text{Total System Cost}}{\text{Population Served}} = \text{Cost per Capita}$$

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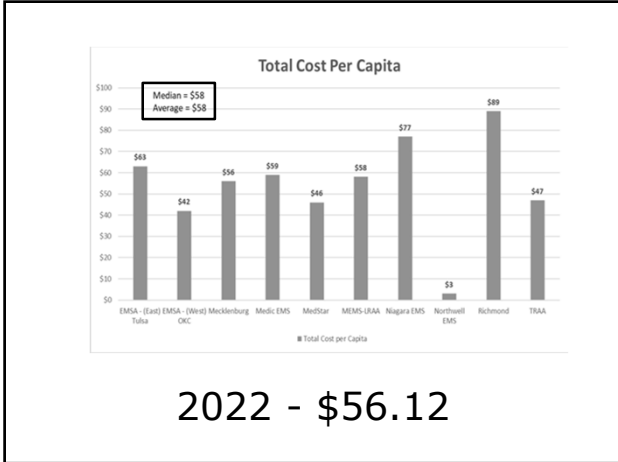
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### Productivity

- Total System Cost per Capita
- *Cost per Unit Hour*
- Unit Hour Utilization Ratio
- Cost per Transport

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### Cost per Unit Hour

Basic Terminology

**Unit Hour** - A fully equipped and staffed ambulance on a response or waiting for a response for one hour.



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### Unit Hour Costs

EMS does not manufacture accidents and illness.

EMS only manufactures Unit Hours and . . . then waits.

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### Unit Hour Costs

- Ranges from *Approximately* \$150-\$300 per Unit Hour
- Direct Labor Costs Comprise Over 75% - 80% of the Total Average Unit Hour
- Marginal Unit Hour Costs are 60 - 75% of total Unit Hour Costs

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## Cost per Unit Hour

$$\frac{\text{Total Costs}}{\text{Total Number of Unit Hours}} = \text{Total Unit Hour Costs}$$

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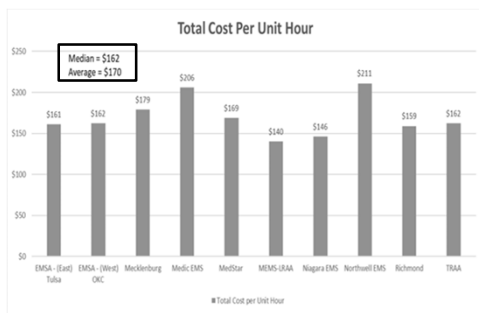
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2022 - \$208

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## Unit Hour Costs

- Unit Hour Costs are Powerfully Affected by Economies of Scale
- Far Less Money is Wasted in the Production of Unit Hours than is Wasted from Squandered Unit Hours




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## Unit Hour Costs

- Unit Hour Cost is:
  - A Poor Predictor of Cost per Transport
  - A Poor Predictor of Clinical Quality

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## Productivity

- Total System Cost per Capita
- Cost per Unit Hour
- *Unit Hour Utilization Ratio*
- Cost per Transport

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## Unit Hour Utilization

### Basic Terminology

**Utilization** -  
How frequently the unit hour is used



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## Unit Hour Utilization

- Measurements
  - Responses
  - *Transports*
  - Patients Treated (Treat and Release)
  - Work Load
    - Post to Post Moves
    - Equalization

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## Unit Hour Utilization Ratio

Basic Terminology

***Unit Hour Utilization*** - A measurement of the productivity of the system calculated by dividing the number of *transports* by the number of unit hours produced for a given period.

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## Unit Hour Utilization Ratio

The U/UH Ratio

$$\frac{U \text{ (Utilization)}}{UH \text{ (Unit Hours)}}$$

$$\frac{\text{Patients Transported During Period}}{\text{Unit Hours Produced During Same Period}}$$

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### Unit Hour Utilization Ratio

$$\frac{4 \text{ Transports}}{12 \text{ Unit Hours}} = .33 \text{ U/UH}$$

$$\frac{600 \text{ Transports}}{1800 \text{ Unit Hours}} = .33 \text{ U/UH}$$

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### Unit Hour Utilization Ratio



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### Productivity

- Total System Cost per Capita
- Cost per Unit Hour
- Unit Hour Utilization Ratio
- *Cost per Transport*

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### Cost per Transport

$$\frac{\text{Cost per Unit Hour}}{\text{Productivity (U/UH)}} = \text{Cost per Transport}$$

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### Cost per Transport

Example:

$$\frac{8,000 \text{ Patients}}{16,000 \text{ Unit Hours}} = .50$$

$$\frac{\$200}{.50} = \$400 \text{ per Transport}$$

$$\frac{\$200}{.51} = \$392 \text{ per Transport}$$

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### Cost per Transport

$$\$ 8 \times 10,000 \text{ Patients/Year} = \$80,000/\text{Year}$$

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## Combining Principles

- *Cost of Readiness*
- *Productivity*



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## Impact

Productivity is a far more powerful cost driver than cost per unit hour.

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## Cost per Transport

Example:

$$\frac{\$200}{.33} = \$606 \text{ per Transport}$$

$$\frac{\$200}{.25} = \$800 \text{ per Transport}$$

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## Cost per Transport

\$194 X 10,000 Patients/Year =  
\$1,940,000/Year

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## Rural Costs Structures

- Fewer Transports to Spread Fixed Costs
- Greater Geographic Coverage
- "Centralized" Transports

Table 3: Relative Cost Per Trip for Full Cost Ambulance Providers, 1998

Providers' average number of total trips per day (range)	Cost per trip relative to the average for providers with 9 to 12 trips per day
3 or fewer	1.94
4 to 8	1.30
9 to 12	1.00

Source: Project HOPE.

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## Factors Affecting Productivity

- Population Density
- Road Systems and Barriers
- Location of Health Care Facilities
- Hospital Diversions
- Seasons

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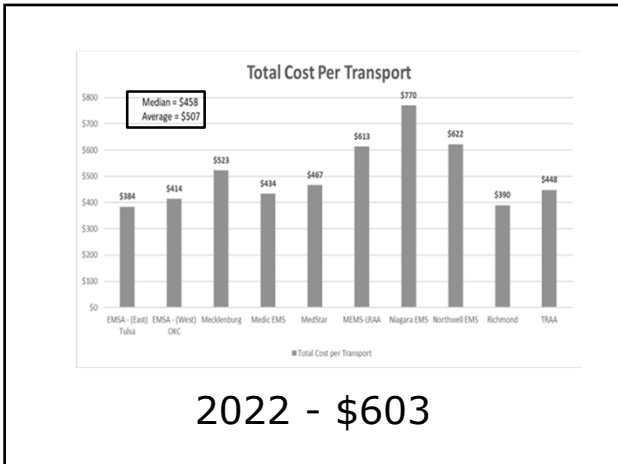
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2022 - \$603

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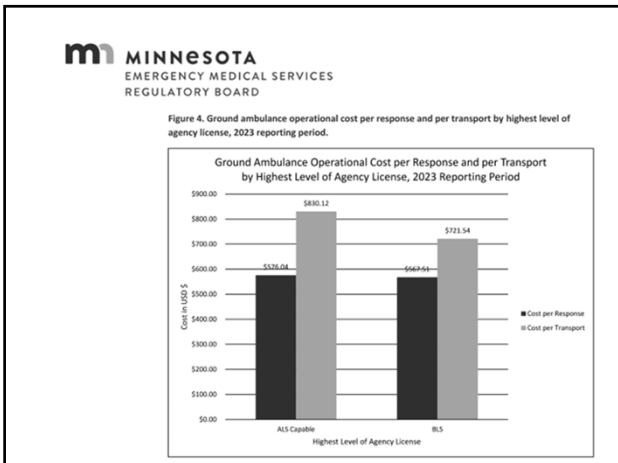
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## Cost per Transport The "Real World"

	Exclusive	Non-Exclusive (Subsidy Constant)	Non-Exclusive (Total Bill Constant)
Unit Hour Cost	\$99.75	\$99.75	\$99.75
Unit Hour Utilization	0.47	0.42	0.42
Transport Frequency (hour)	2.13	2.37	2.37
Cost Per Patient Transport	\$212.23	\$237.50	\$237.50
Less: Subsidy Per Transport	\$58.14	\$58.14	\$83.41
Sub-Total	\$154.09	\$179.36	\$154.09
Collection Percentage	40%	40%	40%
Total Bill	\$385.24	\$448.40	\$385.23

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## EMS Economics is No Longer This . . .




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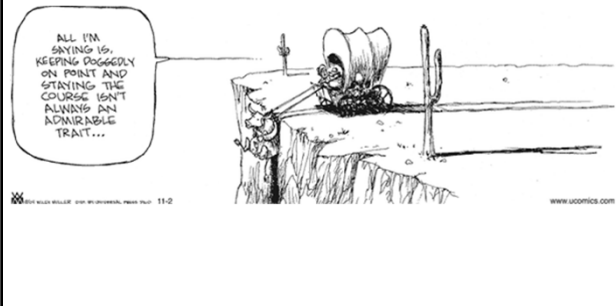
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## But This




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