
Performance Measurement

APPENDIX B

This appendix briefly describes how we measured the performance of public safety answering points (PSAPs). We first explain the importance of performance measurement and how it can be useful to PSAPs. Then we list the measures of performance we used in this review. In evaluating their performance, PSAPs may choose to use these measures or develop ones of their own.

THE VALUE OF PERFORMANCE MEASUREMENT

Developing goals, objectives, and performance measures allows a PSAP to evaluate the level of services it provides. The yardsticks a PSAP uses to measure its performance provide quantifiable information on its impact, efficiency, and effectiveness. Information from measuring performance allows PSAPs to make strategic, more informed decisions about their own operations. In other words, performance measurement provides a record to show what value a PSAP is getting for the dollars it spends on dispatching.

Used over time, performance measures can help PSAPs identify both achievements and areas needing improvement. Measures can also help PSAPs justify spending requests by demonstrating their real needs with actual data on workload, personnel, and other resources used in dispatching. Moreover, with the information gained from measuring their workload and effectiveness, PSAPs are better equipped to communicate the actual results of their work to elected officials and the public.

We wish to neither underestimate the enormous task involved with measuring the performance of governmental functions nor imply it can be done quickly. Performance measurement can be particularly difficult when the results of a program are not readily quantifiable and cannot be easily

measured. In addition, the use of some measures in isolation could actually lead to unintended consequences. A PSAP interested in measuring only efficiency, for instance, might have a relatively high number of calls per dispatcher but be lacking in the quality of its service.

To be useful, the process generally requires an initial investment of time to develop suitable measures. It also requires ongoing resources to measure actual results over time and manage appropriate responses to them. Support from agency leadership is crucial. Without the backing of PSAP management, performance measurement will likely have less meaningful impact as a tool for helping set direction. At the same time, involving dispatchers in the process is important because they are the individuals who are most directly affected by changes in practice or procedure that could result from performance measurement.

DEFINING THE MISSION, GOALS, AND OBJECTIVES

Typically, the first step in measuring performance is articulating the PSAP's mission. The mission defines the fundamental purpose of the agency and its programs. The mission provides a foundation from which the PSAP's goals, objectives, and performance indicators flow.

The next step is setting goals. Goals are broad statements that describe outcomes the PSAP hopes to achieve. For instance, one goal might be to process 9-1-1 calls in a timely manner. Together, the mission and goals determine the priorities for a PSAP. Developing the mission and goals can be a time-intensive process, not reflected in the brief attention we give it here.

Once it adopts a mission and goals, a PSAP can set objectives to describe what results it expects to

achieve and by when. Objectives are usually very specific and measurable, targeted to particular programs or efforts, and relate directly to the PSAP's mission and goals. They describe how the PSAP intends to meet its goals. As an example, in line with the goal of processing calls in a timely manner, an objective might be to increase by two percent annually the percent of 9-1-1 calls answered within 5 seconds.

Goals and objectives are likely to vary with each PSAP although some things, such as the goal to provide 24-hour per day availability for receiving 9-1-1 and other public safety calls, may be common to all. Similarly, PSAPs may find useful some but not all of the performance measures we describe below. They may want to supplement these examples of measures with others that more closely fit their own mission, goals, and objectives.

PERFORMANCE MEASURES

We identified numerous performance measures related to the two goals and seven actions described in Chapter 2. All of the measures are based on recommendations of professional groups in the public safety industry, such as the National Emergency Number Association, or on state statutes or rules.

Some of the measures are important outputs—counts of services that a PSAP provides or uses. The number of 9-1-1 calls a PSAP processes annually is an example of an output. Sometimes output measures simply indicate the existence of a certain desirable characteristic, such as the use of standard operating procedures, without also measuring the degree of that characteristic's effectiveness.

Other measures describe the outcomes, or actual results, of a PSAP's actions. Outcome measures indicate the actual impact of PSAP actions. An example is the percentage of calls dispatched to the appropriate emergency response unit.

Still other indicators measure efficiency by examining costs per unit of output. Efficiency can be measured in terms of dollars, time, or personnel. For instance, the amount of expenditures per 9-1-1 emergency call is one indication of efficiency.

Cost-effectiveness measures look at costs per unit of outcome. These measures indicate the capacity to produce desired results with minimal expenditures of time, energy, money, or other resources. Cost per call dispatched to the appropriate emergency response unit is one measure of cost-effectiveness.

Not all of the following performance measures are easy to measure. In fact, we were unable to use all the measures listed below because of the lack of data. We include several measures that individual PSAPs may find important to measure despite our observation that few currently collect the information.

The indicators of performance listed in this appendix can serve as tools for PSAPs to track their own achievements and assess the quality of their service delivery. We list some measures that are compared to a median statewide ranking calculated from our survey data, such as the "number of calls per dispatcher is at or above the state median." Individual PSAPs using these measures would instead compare the measures to their own baseline data.

To the extent possible, we grouped the measures into categories linked to the actions we recommend in Chapter 2 for effective and efficient dispatching. We begin with measures of a general nature that apply to most or all actions taken by a PSAP and that are not tied specifically to one of the seven actions we recommend. Following that we list measures for each of the recommended actions. We do not list separately the action related to considering opportunities for cooperative dispatching. Determining whether cooperative efforts will improve services or lower costs requires using all the performance measures listed here.

General

These measures apply to most or all actions for effective and efficient dispatching.

Output Measures

- Number of emergency calls (9-1-1 and other) received and processed annually

- Number of nonemergency calls (9-1-1 and other) received and processed annually
- Number of calls requiring the dispatching of public safety or other response units

Outcome Measures

- Not more than 1 call out of 100 incoming calls is blocked or receives a busy signal during the busy hour of an average week of a busy month
- At least 90 percent of calls are answered within 10 seconds, with no more than 3 rings, during the busy hour of an average week of a busy month
- At least 95 percent of outgoing calls are transferred to the appropriate location
- High percentage of calls are dispatched to the appropriate emergency response unit
- High percentage of citizens are satisfied with PSAP performance

Efficiency Measures

- Total calls per full-time equivalent dispatcher is at or above the state median
- Emergency calls per full-time equivalent dispatcher is at or above the state median
- Calls per total full-time equivalent staff at PSAP is at or above the state median
- Cost per 9-1-1 call is at or below the state median
- Cost per other calls (non-9-1-1) is at or below the state median
- Cost per all calls is at or below the state median
- Cost per capita is at or below the state median

- Cost per answering position per call is at or below the state median

Cost-Effectiveness Measures

- Cost per call at minimal level of service (at least 90 percent of calls answered within 10 seconds, with no more than 3 rings, during the busy hour of an average week of a busy month) is at or below the state median
- Cost per capita at minimal level of service (at least 90 percent of calls answered within 10 seconds, with no more than 3 rings, during the busy hour of an average week of a busy month) is at or below the state median
- Cost per call transferred to the appropriate location is at or below the state median
- Cost per call dispatched to the appropriate emergency response unit is at or below the state median
- Cost per citizen satisfied with PSAP performance is at or below the state median

Develop and Use Standard Operating Procedures

These measures apply to our first action listed in Chapter 2 for effective and efficient dispatching, including standard operating procedures, disaster recovery plans, and emergency medical dispatching.

Output Measures

- Availability of written standard operating procedures for PSAP functions
- Availability of written disaster recovery plans
- Availability and testing of backup and emergency procedures and facilities

- In PSAPs that provide emergency medical dispatching, availability of prearrival instructions, an emergency medical priority response system approved by a medical director, medical protocol prompts on flip cards or computer, appropriate dispatcher training, and a quality assurance program

Outcome Measures

- High percentage of calls received and dispatched according to PSAP standard operating procedures
- High percentage of dispatchers satisfied with PSAP standard operating procedures
- High percentage of emergency response agency personnel satisfied with PSAP standard operating procedures
- High percentage of effective medical instructions provided via phone to callers at scene of medical emergencies

Support a Trained and Qualified Work Force

These measures apply to our second action for effective and efficient dispatching, related to selecting, hiring, and training dispatchers.

Output Measures

- Availability of hiring and selection practices that include realistic job previews, background checks, testing before hiring, and probation periods
- Availability of training for new employees that meets or exceeds the Association of Public Safety Communications Officers (APCO) minimum training standards in eight subject areas
- Availability of professional development for PSAP managers and administrators

- Availability of ongoing training targeted to employees' individual needs
- Availability of written personnel policies and procedures
- Employee performance evaluations conducted at least annually
- Employee performance evaluations that include goal setting, incentives to encourage good performance, and use of corrective or disciplinary actions when warranted
- Availability of stress management practices

Outcome Measures

- High percentage of dispatchers with training that meets APCO training standards
- High percentage of dispatchers with certification for use of automated criminal justice information systems
- High percentage of PSAP managers and administrators with professional certification
- High percentage of dispatchers reach objectives of their personnel evaluation
- Low percentage of dispatchers with stress-related illnesses that are left unmanaged
- High percentage of shifts with adequate dispatcher staffing
- At least 75 percent employee retention rate over five years

Efficiency Measure

- Cost per dispatcher of training that meets APCO training standards is at or below the state median for such training

Maintain Adequate Communications and Network Equipment

These measures apply to our third action for effective and efficient dispatching, including adequate equipment and features, routine equipment maintenance, database maintenance, and other support functions.

Output Measures

- Availability of speed dial library, last number redial, three-way conferencing, and distinctive ring tone for 9-1-1 calls
- Availability of selective, alternate, and default routing
- Availability of automatic number identification and automatic location identification or local location identification
- Availability of logging recorder with automatic second deck or second drive
- Availability of emergency weather reports
- Availability of uninterruptible power supplies and backup generators
- In PSAPs with computer-aided dispatch (CAD), availability of interface between CAD and other systems, providing automatic number and location identification and answering position identification
- Availability of system to track calls for management information on caseload, transferred calls, length of call, etc.
- Availability of system for monitoring the location of vehicles in the field
- Availability of ergonomic features at answering positions, such as individually-controlled lighting, self-adjustable seating, or height-adjustable consoles
- Availability of telecommunications devices for the deaf (TDD)
- Availability of TDD detection device
- Availability of interpreter services for non-English speaking callers
- Availability of features to maintain secure communications, such as portable and cellular phones, mobile data terminals, scramblers, or trunked radio communications system
- Availability of written contracts for responsibility and maintenance of all databases
- Availability of 24-hour per day and 7-day per week access for resolving 9-1-1 problems
- Availability of equipment inspection and routine maintenance
- Availability of equipment replacement plan
- Availability of remote maintenance capabilities
- Availability of master clock to synchronize internal clocks and provide consistent time stamps to event records and voice recordings
- Availability of audible signal simultaneous with trunk seizure on incoming 9-1-1 call

Outcome Measures

- At least half of 9-1-1 trunks and answering positions remain operational in the event of a single equipment component failure
- 100 percent of PSAP electrical equipment is properly grounded and expected to function in the presence of electric stress conditions

- 100 percent of electrical and physical interfaces of PSAP equipment meets state and local requirements
- Number of radio frequencies is sufficient for the radio traffic
- Number of trunks and equipment are sufficient to ensure not more than one call in 100 attempts is blocked during the busy hour of an average week of the busy month
- At least 90 percent of locations within PSAP service area have reliable radio coverage between the center and either mobile or hand-held radio units
- Hearing- or speech-impaired callers receive the same level of service as other callers
- High percentage of satisfaction with security of radio communications
- High percentage of locatable addresses in the PSAP service area
- High percentage of incidents where radio and other communications equipment allow PSAP and emergency response units to communicate with each other
- All calls are automatically alternately routed if PSAP 9-1-1 trunks are busy
- No calls in progress are interrupted, nor are incoming calls blocked, due to power disruptions

Efficiency Measures

- Cost of capital equipment per call, over five years, is at or below the state median for a particular level of service (fully enhanced, local location identification, automatic number identification only, or basic service)
- Cost of annual equipment maintenance per call is at or below state median
- Cost and time of database maintenance per record is at or below state median

Keep Records and Measure Performance

These measures apply to our fifth action for effective and efficient dispatching, related to maintaining the records necessary to evaluate PSAP performance.

Output Measures

- Availability of a formal process of setting goals and measurable objectives or a peer review process for measuring PSAP performance
- Availability of systematic data collection and information management systems
- Availability of systematic documentation of citizen complaints and their resolution
- Availability of systematic documentation of emergency response agency complaints and their resolution
- Availability of questionnaires, surveys, or focus groups to measure citizen satisfaction

Outcome Measures

- 100 percent of calls for service recorded, date and time stamped by a master clock, and 9-1-1 call records retained for a minimum of 31 days
- High percentage of citizen complaints resolved by PSAP
- High percentage of emergency response agency complaints resolved by PSAP
- Ongoing improvements in service over prior year

Promote Information Exchange Among Public Safety Response Agencies

These measures apply to our sixth action for effective and efficient dispatching, regarding systematically soliciting feedback on PSAP operations from emergency response agencies.

Output Measure

- Availability of regular meetings between PSAP employees and other public safety personnel for feedback on PSAP operations

Outcome Measures

- High percentage of PSAP employees satisfied with PSAP operations
- High percentage of other public safety response personnel satisfied with PSAP operations

Educate the Public on the 9-1-1 System and Services

These measures apply to our seventh action for effective and efficient dispatching, pertaining to public outreach programs.

Output Measure

- Availability of techniques used to communicate information on 9-1-1 services to the public

Outcome Measures

- High percentage of citizens knowledgeable about 9-1-1 services
- High percentage of calls received by PSAP are appropriate in nature, as determined by the PSAP

Efficiency Measure

- Cost per capita of public education program is at or below the state median

Cost-Effectiveness Measure

- Cost per capita of public education program in areas with high percentage of citizens knowledgeable about 9-1-1 services is at or below the state median