



2022 Strategic Plan

Acknowledgements

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- Chief Kevin Vincel, South Adams County Fire Department



- Chief Stuart Sunderland, Adams County Fire Rescue



- Chief Brycen Garrison, Brighton Fire Protection District



- Chief David Ramos, North Metro Fire Rescue District



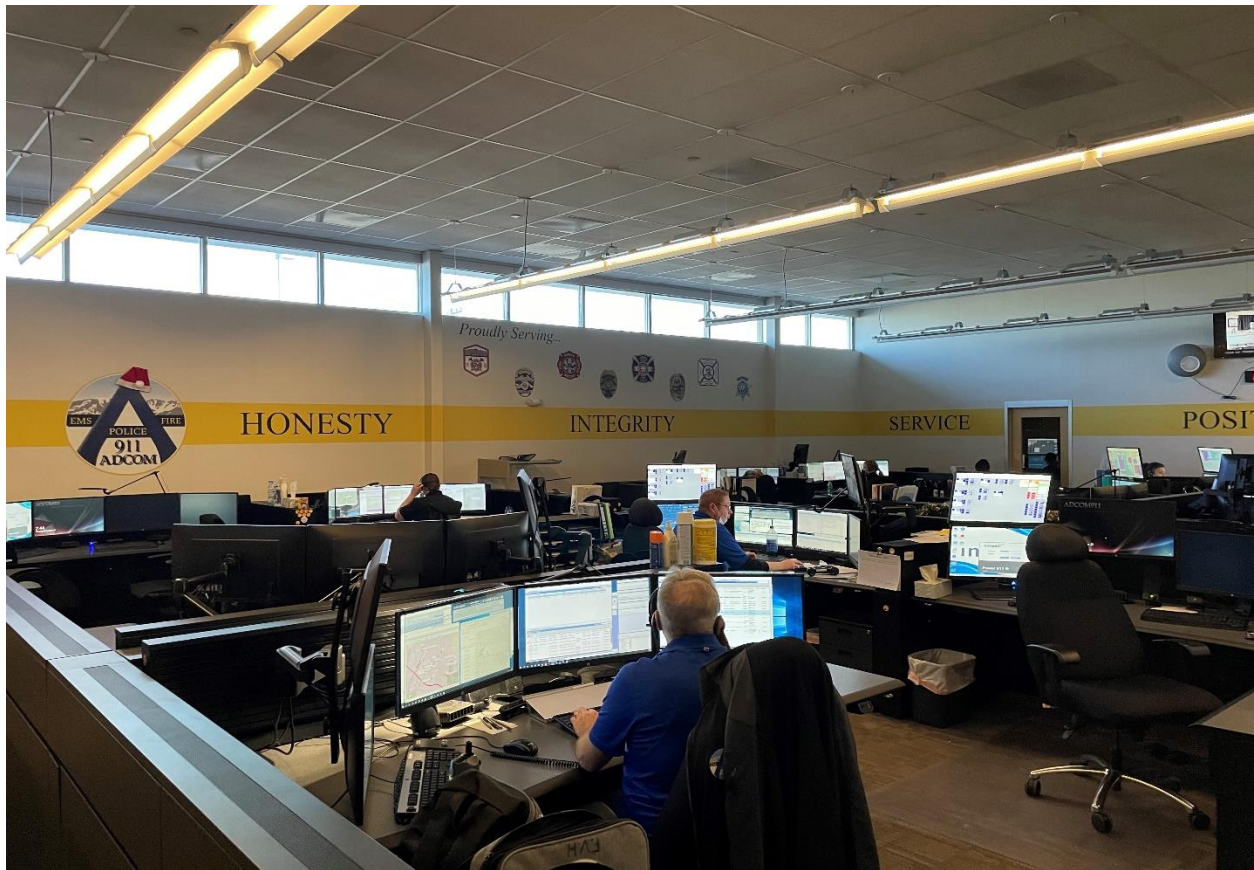
ADCOM's Vision Statement, Mission Statement, and Core Values

Vision Statement – ADCOM's vision is to become the premier, public-safety communications center in the State of Colorado.

Mission Statement - ADCOM's mission is to provide high-quality emergency communications, dispatch, and data services to its member agencies, the citizens it serves, and to any who call on ADCOM for help.

Core Values

- Honor
- Integrity
- Positivity
- Honesty
- Service



Impact of Next Generation 911 (NG911)

One of the most important and far-reaching technological innovations being phased in at Public Safety Answering Points (PSAPs) is Next Generation 911 (NG911). This technology will be referenced numerous times throughout this report, so a brief introduction to the technology and its implications is necessary.

The first phase in the process of transitioning to this new technology is the rollout of an Emergency Services IP Network (ESInet). This network is designed with NENA's i3 standard to support Next

Generation Core Services (NGCS) while carrying video, voice, and large amounts of data. This will improve service level while also providing additional resiliency and redundancy, but this enormous increase in data will put significant stress on PSAP resources.

While ADCOM connected to Colorado's ESInet last year, there are no core services currently available. It is expected that the core services will begin rolling out over the next two years, and these will include the functionality and bandwidth to handle video, photographs, and data from other transmitting devices such as wearable medical devices (often referred to as telemetry devices) or car computers. This is clearly a game changer for the 911 industry, but the full impact on PSAPs remains to be seen. Leaders in the 911 community agree that the following issues will need to be addressed:

- Data storage
- Increase in call volume as more "smart" devices are able to connect to 911
- Need for review of videos and images for evidentiary value
- Need for review of video and images for value to first responders (actionable, relevant)
- Updating/Upgrading current equipment
- Effects of real-time, disturbing images on dispatchers and call-takers

Each of the above items brings a unique set of challenges, but what they all have in common is the need for funding. Our current Customer Premise Equipment (CPE) has SIP (Session Initiated Protocol) capabilities, so it conforms to the NENA i3 standard. However, it will likely need to be upgraded to take advantage of all NG911 functionality, and the estimated cost for this is \$350,000.

The equipment issue will need to be addressed, but the bigger issue is staffing. At this time, it is unclear what additional staffing requirements might be necessitated by the transition to NG911, but many in the industry believe that PSAPs will evolve into a hybrid Emergency Communications Center/Real-Time Crime Center. Evaluating incoming photos and video to determine their value to first responders and investigators will require specially trained personnel. Whether these tasks will be carried out by current personnel with additional training or new positions will need to be created is yet undetermined.

At the very least, we expect our call volumes to increase as we begin processing communications from smart devices. Initially, vendors supplying these services will have a human acting as the "middleman" for these communications, but at some point, there is an expectation that the human will be replaced by an AI engine that will add another layer of complexity to processing these calls. In planning for the rollout of this new technology, ADCOM expects to hire additional staff to handle the call volumes, the storage issues, the content review and analysis, and the psychological impact of exposure to disturbing images that will likely be viewed in real-time.



Introduction and Background

In 2015, ADCOM developed its first Strategic Plan. This plan identified many deficiencies that needed correcting if ADCOM was going to achieve its vision of becoming the premier public-safety communications center in the State of Colorado. These deficiencies included the following:

- Staffing
- Failure to meet national standards
- Training
- Insufficient feedback from the public
- Lack of Quality Assurance
- Deficient documentation related to field assets
- Inability to hire and retain talent in IT
- Safety and security issues related to the lack of facility hardening
- Unrealistic or nonexistent Disaster Contingency/Recovery plans

Through the combined efforts of the ADCOM staff and member agencies, many of the above items have been addressed. Those that haven't are in the process of being addressed. It should be pointed out that this plan was developed without direct input from member agencies and that the various assessments employed to determine the deficiencies were carried out by ADCOM employees.

Looking for additional perspective, ADCOM commissioned Mission Critical Partners (MCP) to conduct a complete assessment of ADCOM's position with regard to all critical areas in the spring of 2016. This included staffing, technology, facilities, funding, and training. Their findings were consistent with those of the 2015 Strategic Plan, but MCP also identified other areas of concern. Those areas, along with a brief synopsis of their current standing, are as follows:

- GIS Data – ADCOM did not have a reliable means for ensuring proper updates to GIS data when new roads, developments, etc. were planned or installed. ADCOM brought on a GIS coordinator who receives regular updates from the county that are incorporated into the CAD system.
- Operations Floor Space Limitations – The operations floor renovation project carried out in 2017 addressed this issue for the short term but the long-term solution will require a larger footprint.
- Emergency Medical Dispatch Program – ADCOM was using an antiquated card set developed by the State of Colorado. We have since upgraded to the PowerPhone EMD solution.
- Policies and Procedures – ADCOM staff has nearly completed work on updating the policy manual. In addition, procedure manuals for both fire operations and police operations have been completed.
- Funding – In 2016, ADCOM successfully petitioned the PUC to get the 911 Authority Fee increased from \$.70/line to \$1.50/line resulting in a revenue increase of over \$2.5 million annually. In 2022, the Adams County E911 Authority will increase this amount to \$1.81/line. This will bring the total annual revenue raised by the E911 Authority to approximately \$7.2 million, all of which will be available to ADCOM. In addition, the E911 Authority voted to automatically increase the fee each year to the limit set by the PUC.

Wishing to build on the numerous successes outlined above, ADCOM’s Board of Directors initiated a comprehensive process to update the Strategic Plan in the summer of 2017. This was a process whereby board members and ADCOM staff would work together to evaluate all facets of ADCOM, paying particular attention to operational proficiency, customer orientation, and innovation.

Process

The process began with a strategic planning and goal setting session. This included two SWOT (Strengths, Weaknesses, Opportunities, and Threats) analyses, one by the board and the second by ADCOM staff. The results were compared to find points of agreement and to reconcile areas of disagreement. After some debate and discussion, the following chart was developed to capture a summary of ADCOM’s current position:

SWOT SUMMARY

<p>STRENGTHS</p> <ul style="list-style-type: none"> • Talented staff • Leadership and commitment to success • Strong 911 Authority support and funding • Member agency relationships 	<p>WEAKNESSES</p> <ul style="list-style-type: none"> • Facility size (too small) • Defining and meeting standards • Reliability and efficiency of core technological systems • Interoperability
<p>OPPORTUNITIES</p> <ul style="list-style-type: none"> • Member collaboration and relationships • Financial stability • Regional interoperability 	<p>THREATS</p> <ul style="list-style-type: none"> • Cost of technology • State/federal changes to LTE • Loss of member agencies • Employee retention

The second step in the process included an exercise to identify ADCOM’s strategic focus. This exercise concentrated on three areas: operational proficiency, customer orientation, and innovation. After completing the exercise, the group selected Operational Proficiency as ADCOM’s strategic focus.

Guiding Principles

With ADCOM strategic focus identified, guiding principles were established to ensure goals and objectives would be correctly targeted. They are as follows:

- Timely processing and dispatching of emergency calls is ADCOM’s primary goal
- First responder safety must share an equal status to timely call processing and dispatching goals.
- Invest in stable, proven, reliable software and hardware technologies; focus on the proven reliability of a product vs. being the leader in onboarding new technology still in beta production.
- ADCOM’s focus will be 911 dispatching (including animal control). Avoid expanding service to non-emergency areas.
- Focus on building and maintaining positive relationships between member agencies.

Goal Establishment

Industry or national standards were selected as goals when available. In their absence, however, goals would be based upon industry norms or national averages. With the Guiding Principles acting as the lens through which goals would be identified, each goal was assigned a specific timeframe for implementation and achievement.

The ADCOM board identified six high-level goals for tracking and improvement:

- Meet or Exceed NENA/ NFPA /APCO/ANSI Standards for Receiving and Processing 911 Calls
- Reduce Non-Emergency Calls Received and Processed by ADCOM
- Recruit, Develop and Retain a Strong Workforce
- Ensure Mission-Critical Systems Remain Operational 24/7
- Develop and Maintain Robust Interoperability of Regional Communication and Technology Systems
- Develop Long-Term Plan for Facility Replacement or Remodel to Address Our Growing 911 Call Load and Potential Space Needed for Additional Employees

Along with the above goals, the ADCOM management team identified one additional goal for this updated plan:

- ADCOM Will Develop and Maintain a Comprehensive Plan to Ensure Continuity of Operations During any Situation

Each of these goals is highlighted in bold in the next section and followed by a description of ADCOM's status in 2018. A short synopsis describing where things stand today is also provided. This is followed by an overview of ADCOM's strategy to improve upon its current status, and challenges to making the desired improvements.

Update on Strategic Plan Goals Set in 2018

Meet or Exceed NENA/ NFPA /APCO/ANSI Standards for Receiving and Processing 911 Calls

- This section is broken into two subheadings, Call Answering and Call Processing

The Standard for 911 Call Answering

In 2018, the National Emergency Number Association (NENA) had established that 90% of all 911 calls arriving at the PSAP shall be answered within ten seconds during the busy hour (the hour each day with the greatest call volume, as defined in the NENA Master Glossary) and 95% of all 911 calls should be answered within 20 seconds. In that same year, the National Fire Protection Association (NFPA) had a different goal established in their Standard 1221. According to NFPA, the 911 answer time should be 95% within 15 seconds and 99% within 40 seconds.

In 2019, NENA and NFPA worked together to establish a joint standard in which they declared that 90% of all 911 calls handled in the PSAP shall be answered in 15 seconds or less and 95% shall be answered within 20 seconds.

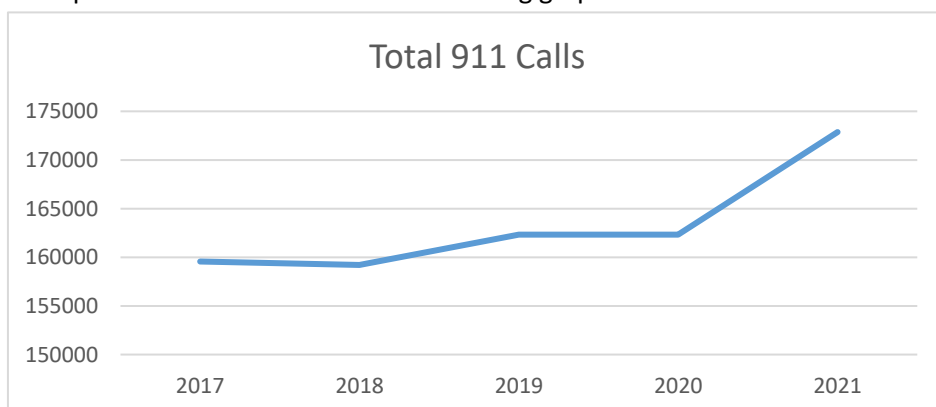
Where We Were in 2018

The chart below illustrates the fluctuation in call volumes and answer times during the five years preceding 2018 while applying the 2018 standard:

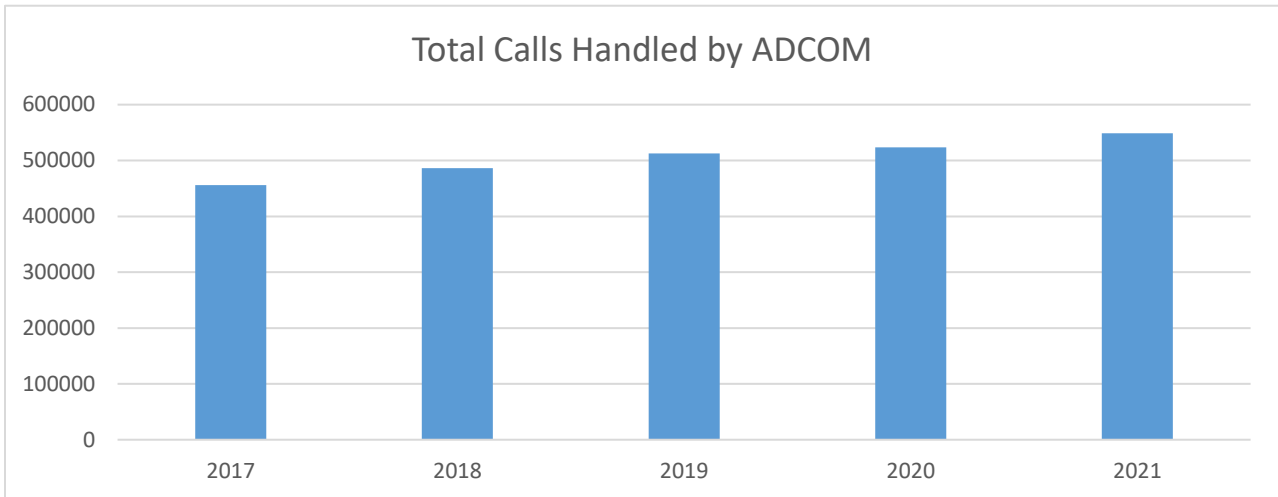
	2013	2014	2015	2016	2017	% Increase Over 5 years
911 Calls	150,439	159,365	188,323	169,896	159,573	6%
10-digit Calls	157,283	163,441	168,553	179,335	181,231	15%
Outgoing Calls	98,117	102,452	108,799	103,954	115,038	17%
Totals	407,852	427,272	467,690	455,201	457,859	12%
% Answered within 10 sec	51%	52%	52%	61%	68%	17%

Where We Are Today

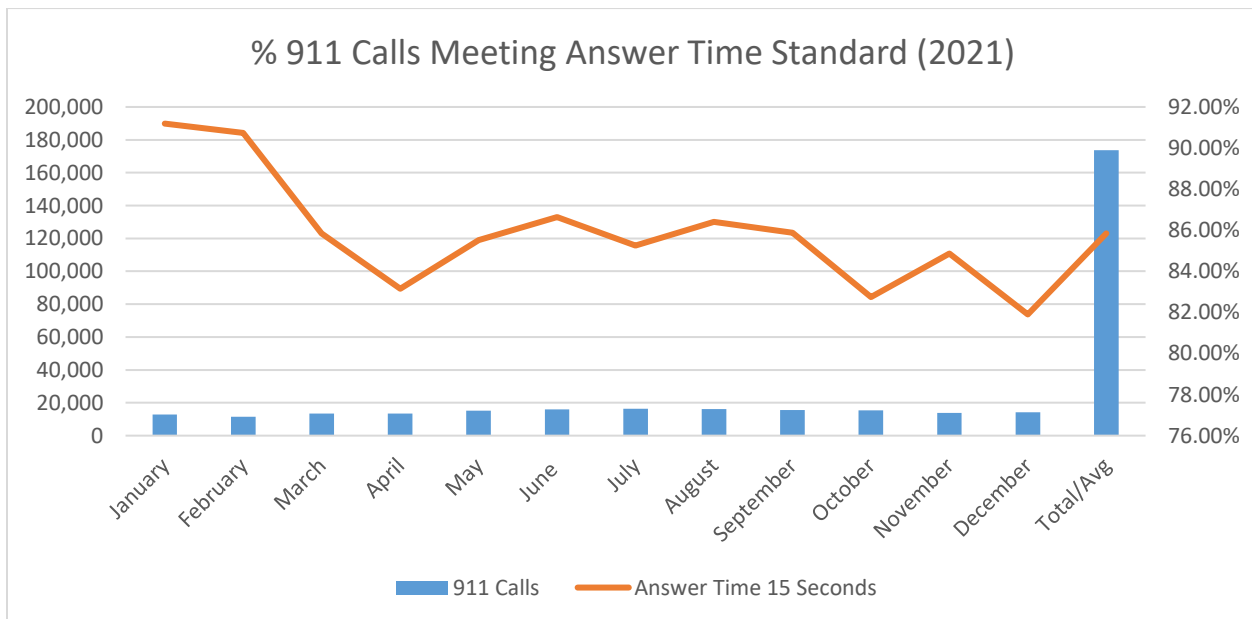
911 call volumes made a steep drop from 2016 to 2017, but since then they have shown a steady trend upwards as can be seen in the following graph:

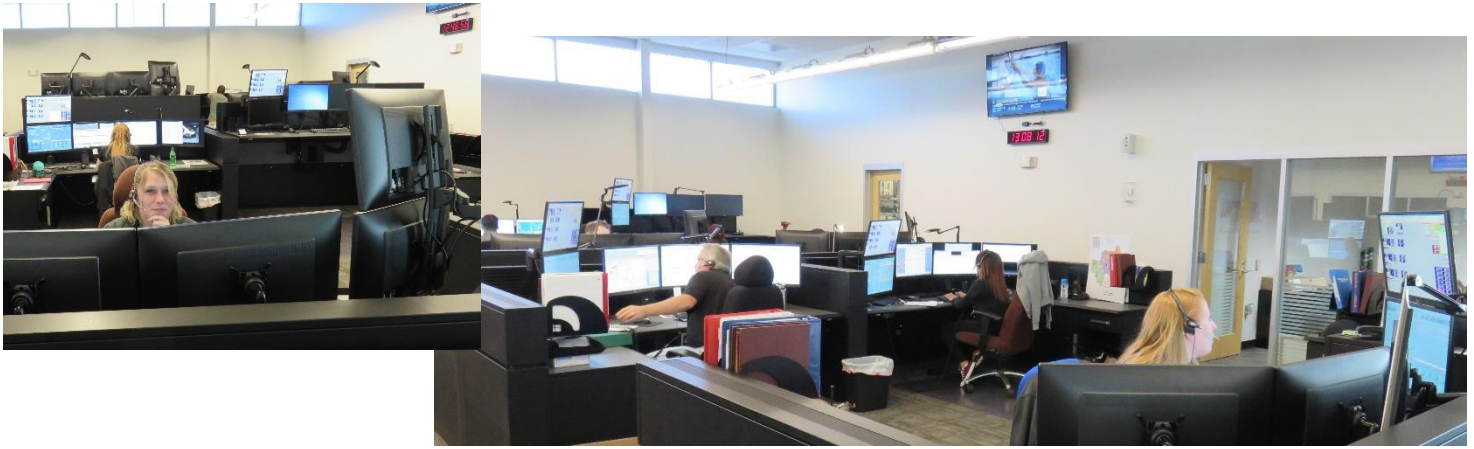


Overall call volumes followed a similar, but somewhat more gradual, trend:



From 2020 to 2021, 911 call volume rose by more than 6.5% while overall call volume rose by 5%. These increases are twice what was projected in 2018 when determining the need for future call-takers. As demand for ADCOM's services continues its inexorable rise, turnover created by the Covid pandemic has left ADCOM's call-taker resources severely depleted, further compromising service delivery. Meeting the national standard in this environment has proven to be difficult as can be seen in the following chart (as stated earlier, the old standard was 90% of calls answered within 10 seconds and the new standard is 90% answered within 15 seconds):





Strategy for Improvement

- Continue promoting public awareness and encouraging the use of the 10-digit lines for non-emergency situations. This campaign began in mid-2017 and employed a multi-pronged approach consisting of press releases, social media, and notices posted to agency web sites.

**FIREWORKS
ARE ILLEGAL
IN COMMERCE CITY**

Call 303-288-1535 to report
fireworks violations

Fines start at \$500



Most common
animal violations



- Pets off-leash/running loose
- Barking dog complaints
- Pets left in hot vehicles/neglect
- Too many household pets (limit of 4)
- Possession of pit bulls

To report non-emergency
animal control issues,
call 303-288-1535



- Continue to increase the Call-Taking staff based on the shift upward in call volumes and turnover in the call-taker ranks. Recalculating ADCOM's call-taker needs considering the rising call volumes, along with turnover, results in the need for five additional call-takers. This brings the total complement for call-takers to 28, and this will likely rise given the current surge in call volumes and the projected demand created by Next Generation 911.
- Automatic Call Distribution (ACD) – When ADCOM has hired a sufficient number of call-takers, it will investigate the reconfiguration of its call handling equipment to provide for Automatic Call Distribution. An ACD will disburse the calls automatically to the next available 911 Call Taker, or if there is not one available it will answer the 911 call and place it in a que for the next available Call Taker. This can improve the speed in answering the incoming 911 calls drastically as it evenly distributes the workload to the available call-takers.

Challenges

The main obstacle to reaching the desired goal is funding. On average, one call-taker costs ADCOM \$65,000/year. The ACD system will also help, but it requires a reconfiguration of the call-handling system that will also incur significant costs. Assuming the current call-volume projections are accurate, the space restrictions imposed by our operations floor might also limit ADCOM's efforts until additional space is procured.

Goal Attainment: 2022

The Standard for Call Processing Times

Call processing times differ from call answering times, because this metric takes into account the total time required to handle a call from the moment it hits our call-handling equipment to the moment the call is dispatched. This includes the time it takes for the call-taker to answer the call, receive the information necessary to determine the nature of the call, input this information into the CAD system, and dispatch the call. Since law enforcement often holds low priority calls and “cold calls” (calls for service where the incident being reported occurred at some point in the past), this metric is only applied to fire and EMS calls.

Where We Were in 2018

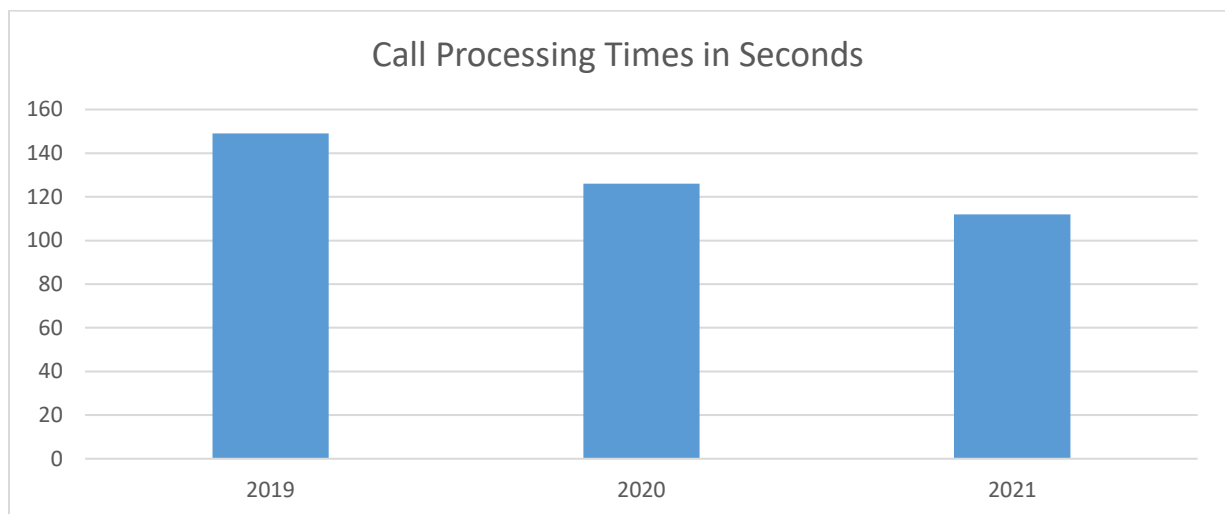
In 2018, ADCOM was not tracking this metric. As ACFR began its work to achieve accreditation, it became clear that this oversight would need to be corrected. ADCOM began working with our Fire Task Force to create a goal for this metric in 2018.

Where We Are Today

After reviewing the recommendations from the National Fire Protection Association (NFPA), it was decided that the standards for call processing would be:

- Answer to Dispatch Queue – 60 seconds or less
- Dispatch Queue to 1st Unit assigned – 30 seconds or less for all Priority 1 Fire and EMS calls

Combining these two goals results in a total call-processing time goal of 90 seconds. Since 2019, ADCOM has made great improvements in its call processing times. In 2019, the average call-processing time was 149 seconds, and in 2021 that number was reduced to 112 seconds. This remarkable improvement of over 30 seconds is captured in the following graph:



Although this improvement is commendable, it does not reach the stated call-processing goal of 90 seconds.

Analysis of the two components of this goal revealed that most of the excessive time spent to process these calls was attributable to the first phase of the process, Answer to Dispatch Queue. Much of this is/was due to staffing issues, but we also looked deeper and found that a training issue with call-

takers was contributing to the problem. When this was corrected in 2020, the improvement was quickly noticeable. However, 2020 was also the year that the COVID pandemic struck. The pandemic forced PSAPs to adjust their call-taking protocols to include a new line of questioning related to pandemic precautions, and this adds to call-processing times. The additional line of questioning remains in place today, and it's unclear if it will be going away. After more data is collected and analyzed, ADCOM may find the goals established in 2019 are now unrealistic.

Strategy for Improvement

Addressing the issues that impact this metric will require the following:

- Achieve full staffing
- Implement a fully functional QA program to track and address training issues
- Conduct further analysis on data to determine if the current goal is realistic

Challenges

The key challenges to achieving this goal are funding, hiring and retaining qualified personnel, and space limitations. We expect the funding issue to be addressed with the increase in 911 fees anticipated later in 2022, and the space limitations should be addressed with the construction of the new administration building in 2023. Hiring and retaining qualified personnel, especially in the COVID environment, will likely remain a significant challenge.

Meet or Exceed NENA/APCO/ANSI Standard for Quality Assurance



What the Standard Is

There is no established standard for this goal, but NENA makes the following recommendation in their guidelines:

- 2% of all calls answered should be reviewed. Where the 2% factor would not apply or be overly burdensome due to low or excessively high call volumes, agencies must decide on realistic levels of case review.
- All cases involving catastrophic loss and/or high-acuity events should be reviewed as soon as possible after the receipt of the call and/or following the radio dispatch or at least within five (5) days.

The guidelines define the recommended minimum components of a QA/QI program within a public safety communications center "to ensure a consistent, effective, and efficient level of service" and includes 1) the necessity of reviewing recordings and CAD documents to evaluate calls processed 2) the establishment of a record keeping system 3) recommendations for improvement or a QI process.

Where We Were in 2018

In 2018, ADCOM handled over 400,000 calls, so 2% equated to 8000 calls or 667 calls per month. With no full-time QA personnel, the responsibility for conducting quality assurance fell on supervisors who averaged approximately 100 calls/month. This labor-intensive process requires reviewing and scoring the calls and then meeting with the call-takers to discuss the findings. On average, this process takes about 30 minutes per call.

Where We Are Today

Due to ADCOM's space limitations, nothing has changed since 2018 (except for the total call volume increasing by approximately 20%). Current projections call for the new Admin building to be completed in June 2023, so we will be looking to add QA personnel shortly thereafter.

Strategy for Improvement

Establishing a Quality Assurance Team: Based on 2020 statistics, to meet the 2% standard ADCOM would have to review over 10,000 phone calls annually. This figure does not include the catastrophic loss and/or high-acuity events. It is impossible to meet these standards by having the on duty supervisory staff complete the quality assurance audits in addition to their daily responsibilities. The trend in Public Safety Dispatch is to have a specific position to conduct the QA/QI process. Examples of other PSAP's that have implemented this are El Paso County, Weld County, and Longmont Police; and ADCOM has a higher call volume than each of them. For ADCOM, this would require a team of 3 – 5 auditors whose only responsibility would be to handle QA audits.

Challenges

- Space Considerations - There is currently no office space available to bring on full-time QA personnel. We expect this to be addressed in 2023.
- Cost – According to the agencies who currently employ full-time QA personnel, the average rate of pay for these positions is approximately \$65,000/year. After factoring in benefits, the total cost to ADCOM would be \$85,400/position or between \$256,000 and \$427,000/year.
- Technology – Next Generation 911 will be rolling out additional functionality within the next year that will include the ability to handle telemetry data, photos and video coming into the PSAP. Processing this information will add another layer of complexity to the QA program that will likely require additional staff.

Goal Attainment: 2024



Reduce Non-Emergency Calls Received and Processed by ADCOM

What the Standard Is

There is no current standard for this goal

Where We Are Today

In 2018, ADCOM and its member agencies began a public awareness campaign designed to educate the public on the proper use of the 911 system and thereby reduce the number of 911 calls for non-emergency incidents. This effort included social media outreach, flyers circulated at public safety events, and ADCOM staff providing information at community events such as fairs. In 2021, ADCOM handled 172,867 911 calls and 371,052 non-emergency calls. This compares to 162,315 911 calls and 361,877 non-emergency calls in 2020.

One source of non-emergency calls, alarm-monitoring centers, creates a disproportionately large impact on emergency communications centers. Over the last two years, ADCOM handled over 25,000 of these calls. New technology, known as ASAP to PSAP, is available to alleviate much of this call load. The Automated Secure Alarm Protocol (ASAP) is a national service that is the next generation for the processing of information from alarm monitoring stations needing a public safety response. It is designed to increase the efficiency and reliability of emergency electronic signals from monitoring companies to emergency communications centers. ASAP uses ANSI standard protocols to deliver critical information about life safety events directly to the CAD system in seconds through the Nlets (National Law Enforcement Telecommunications System) network. The use of data communications ensures that complete and accurate information is transmitted to the emergency communications center.

Strategy for Improvement

- Continue the 911 public awareness campaign – This campaign, initiated in mid-2017, appeared to have a noticeable effect on reducing the number of 911 calls. Unfortunately, the increase in non-emergency calls coming into the PSAP, along with outgoing calls, more than offset the decrease, so ADCOM experienced a net gain in calls processed from 2016 to 2017.
- Implement a 311 System – Those jurisdictions who have implemented a 311 system have seen a substantial decrease in non-emergency calls to the PSAP.
- ADCOM will deploy ASAP to PSAP solution in 2022.

Challenges

Unfortunately, there is no way currently to tag incidents in the 911 system that are considered non-emergencies. Even if it were possible to tag such calls, there is often disagreement regarding what constitutes an emergency. Nevertheless, continuing our efforts to reduce non-emergency calls to 911 through public awareness poses no significant challenges. Implementing a 311 system, however, poses myriad challenges that are likely insurmountable. Identifying a host, finding a suitable location, and securing funding are the most obvious hurdles that would need to be overcome if such an endeavor were contemplated.

*Goal Attainment: **Undetermined***

Recruit, Develop and Retain a Strong Workforce

What the Standard Is

Although there is no national standard for this goal, the average turnover rate for large PSAPs is 17% according to the Association for Public Safety Communications Officials (APCO) comprehensive research entitled “Project RETAINS”. ADCOM’s goal is to reduce turnover to 12% or less.

Where We Were in 2018

A stable, talented workforce is critical to the success of any organization, and in 2018, ADCOM recognized that turnover was contributing to its inability to meet national standards for call-taking. PSAPs have historically struggled to retain key personnel for a variety of reasons, including compensation, shift work, an unforgiving work environment, and employees who see public safety dispatching as a steppingstone to other careers in public safety (law enforcement, fire, and EMS). ADCOM was not immune to these issues, experiencing an average turnover rate of 16.5% over the four- year period ending in 2017.

ADCOM initiated a number of strategies to reduce turnover in 2018, including:

- Improving Selection Process to Ensure Best Fit – Up until January 2018, ADCOM employed several antiquated testing instruments in the selection process for new hires. There was no data to support the use of these instruments, and no correlation could be drawn between a candidate’s test scores and their success rate after hire. ADCOM has now begun utilizing a new testing instrument designed specifically for public safety dispatchers.
- Ensuring Competitive Compensation Package – In 2019, ADCOM hired an outside consultant to survey the other large PSAPs in the Denver Metro area and determine if ADCOM’s pay and benefits package was competitive. The consultant’s research revealed that ADCOM was last in both pay and benefits compared to the eight agencies surveyed. Since then, ADCOM has aggressively pursued increases in pay and benefits in order to reach the median as determined by the consultant’s research.
- Improving Training – ADCOM set a goal of attaining APCO P33 Training Certification in 2018. Delays caused by turnover and COVID postponed achievement of this goal until 2021.
- Developing a Peer Support Program – In 2019, ADCOM began working with the Building Warriors program so that we would have staff trained and on site to assist ADCOM employees when needed
- Conducting employee surveys to ensure input from all levels.

Where We Are Today

Despite adopting all of the above strategies, ADCOM saw its turnover rate increase over the latest four-year period by 2.5% on average.

2018	19%
2019	21%
2020	16%
2021	20%

Strategy for Improvement

ADCOM will continue moving forward with the strategies listed above, but will also add the following:

- Develop a Mentor Program – These programs have proven successful in PSAPs around the country when looking at retention of new employees.
- Conduct a New Compensation Survey in the Denver Metro market – Although ADCOM increased salaries and benefits at an accelerated rate in 2020, 2021, and 2022, this only served to bring ADCOM up to the median identified in 2019. There is reason to believe ADCOM is still lagging the Denver Metro market.

Challenges

The two primary challenges with implementing these strategies are money and time. Staying competitive in the tight, Metro Denver job market will require a willingness to pay market rates for salaries and benefits. Conducting salary/benefit surveys, employee surveys, and mentor programs all require a time commitment that ADCOM's busy HR staff will find difficult to accommodate.

Goal Attainment: 2024



Develop and Maintain Robust Interoperability of Regional Communication and Technology Systems

What the Standards Are

The most widely accepted standard related to public safety interoperable radio systems is Project 25 (P25). This is actually a suite of standards that identifies service and facility specifications, ensuring that any manufacturers' compliant subscriber radio has access to the services described in such specifications. In addition, the P25 suite of standards provides an open interface to the radio frequency (RF) subsystem to facilitate interlinking of different vendors' systems that is typically referred to as an ISSI connection.

In preparation for the cutover to Next Generation 911, NENA has developed the i3 standard for interconnecting PSAPs and public safety agencies. NENA describes the standard as follows:

The i3 solution supports end-to-end IP connectivity; gateways are used to accommodate legacy wireline and wireless origination networks that are non-IP. NENA i3 introduces the concept of an Emergency Services IP network (ESInet), which is designed as an IP-based inter-network (network of networks) that can be shared by all public safety agencies that may be involved in any emergency. The i3 Public Safety Answering Point

(PSAP) is capable of receiving IP-based signaling and media for delivery of emergency calls conformant to the i3 standard.

NENA-STA-010.2-2016 (originally 08-03)

There is currently no industry standard for interoperable CAD.

Where We Were in 2018

Radio: ADCOM met the standard by operating a P25 radio system in conjunction with its partners in the Front Range Communications Consortium (FRCC).

- At the system level, interoperability was (and continues to be) achieved through ISSI connections to both the City of Westminster and the state's Digital Trunked Radio (DTR) system. Denver also expressed an interest in connecting to the FRCC through an ISSI connection and this is planned to go live in 2022.
- At the console level, we have had the ability to patch non-ADCOM talk groups to ADCOM talk groups, provided they have been pulled over to our consoles through ISSI. Metronet (for console-to-console communications between disparate systems), Airnet (for communications with Flight for Life and Airlife), and the Network First talk groups (allow metro agencies to communicate on different systems through a Denver based gateway) are on our consoles. These were brought over through ISSI from DTR.
- At the agency level, radios were programmed with all 21 DTR Regional MAC talk groups, as well as the fire, PD, and federal Network First talk groups (Blue NE, Red NE, etc.). These Network First talk groups allow us to interoperate with most Denver Metro non-FRCC agencies.

911: The transition to Next Generation 911 was in the planning stage, with CenturyLink in negotiations with the PUC to deploy an ESInet throughout the state.

CAD: Interoperability was limited by proprietary technology, network issues and CJIS restrictions. ADCOM began the process of procuring a CAD-to-CAD solution to overcome these obstacles and allow for near real-time sharing of CAD information with other agencies.

Where We Are Today

Radio: ADCOM continues to operate a P25 radio system with ISSI connections to Westminster and DTR. Denver has purchased a new radio system causing interoperability issues when ADCOM units move onto their system, or their units move onto our system. We will be connecting directly to their system via ISSI in 2022 which should alleviate these problems.

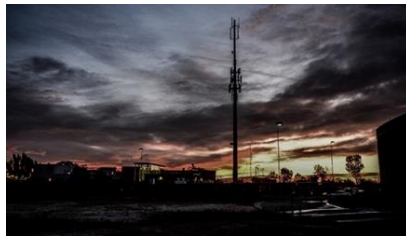
911: The ESInet was rolled out in 2020 and ADCOM successfully connected to it in June. Applications are expected to be available in late 2022. These applications should allow for real-time data sharing between PSAPs.

CAD: The work on the CAD-to-CAD system is nearly complete and this will allow real-time sharing of CAD data between the four PSAPs that will initially connect. Other PSAPs are expected to join later.

Strategy for Improvement

Adding new members to the FRCC is the easiest way to improve radio interoperability from a purely technical standpoint, but the costs and political considerations make this difficult. Westminster's radio system will be going out of support in 2024, and they have expressed an interest in joining the FRCC. Westminster is currently going through some leadership changes, and once those have been resolved we expect to engage them in discussions regarding the benefits of the FRCC.

When looking to connect disparate radio systems, the best option has been through an ISSI connection. The FRCC currently has one ISSI slot available, and ADCOM and Denver have initiated discussions to connect their two systems via this method. Aurora has also expressed some interest in connecting to the FRCC.



Critical Connect, one of the most promising interoperability technologies for radio, was introduced by Motorola in 2020. This technology is essentially an ISSI connection in the cloud. It requires users to purchase a subscription and software, but it allows any subscriber to connect to any other subscriber no matter where they are located. This technology has several shortcomings in its current state, but ADCOM will continue to monitor Motorola's progress as it makes improvements with an eye towards adopting it as Motorola considers ending support on traditional ISSI in five to six years.

The CAD-to-CAD solution will improve interoperability by providing near real-time asset location and availability information to dispatchers for improved response times. The effectiveness of this system can be improved by adding new agencies, so a strong marketing campaign should be developed to coincide with the launch of the new system.

PSAP interoperability, the ultimate goal of Next Generation 911, is on the horizon and being tested at various locations across the country. For ADCOM, staying current on our 911 platform will ensure our PSAP is positioned to take advantage of the improved functionality made available by the ESInet and the new application ecosystem currently in development.

Challenges

The two major challenges with improving interoperability are political issues and money. Many jurisdictions are reluctant to "give up control" of resources or allow other jurisdictions access to their resources, especially when dealing with limited capacity. Having to pay for additional interfaces or system upgrades can also be a significant impediment. An additional ISSI connection, for instance, costs approximately \$300,000. ADCOM estimates that a move to Critical Connect would run approximately \$200,000 in initial setup costs and from \$10,000 – \$30,000 per year in subscription costs, depending on the level of functionality desired.

Goal Attainment: CAD to CAD, ISSI connection to Denver, and NG911 launch in 2022

Ensure Mission-Critical Systems Remain Operational 24/7

What the Standard Is

There is no national standard for mission-critical systems availability, but most in the industry set a goal of five 9's or 99.999% uptime. This equates to approximately 5 ½ minutes of downtime per year. It is important to distinguish between planned downtime for system maintenance and upgrades versus unplanned downtime due to system failure.

Where We Were in 2018

The three mission-critical systems in a PSAP are the 911 system, the radio system, and the CAD system. The 911 system has proven to be quite stable with no unplanned downtime in 2017. In fact, the system has been down only twice in the last five years. In 2016, the system was down for approximately four hours due to a cable cut by a construction company doing waterline repair work in the vicinity of ADCOM. The second time was due to the power outage discussed below.

The CAD system experienced 1.5 hours of unplanned downtime in 2017, which equates to 99.98% uptime. The downtime was split between two incidents, but both were caused by a configuration error on the server that caused the log files to fill up and shut down the server. In 2018, this system went down also as a result of the power outage.

The radio system had no unplanned downtime in 2017 but did go offline in 2016 for nearly 45 minutes during a power loss caused by a snowstorm. The UPS transfer switch failed to move the system over to generator power, taking down the core. In 2018, the power outage took down ADCOM's prime site, rendering the system inoperable for approximately forty-five minutes.

On May 5, 2018, each of these systems was taken offline when ADCOM lost all power due to a lead becoming disconnected in the generator transfer switch. The transfer switch was inspected, along with the generator, on April 4, 2018, and found to be in proper working order. A second inspection was conducted on May 7, 2018 and this inspection found the detached lead. This inspection determined that the lead wasn't crimped properly which resulted in it becoming loose over time and eventually detaching from the sensing unit.

Where We Are Today

ADCOM now includes a more thorough inspection of the transfer switch during the annual generator inspection. Also, the transfer switch is now updated with a new generator detector control module that will allow for automatic alerts to be sent out to ADCOM staff if any unusual circumstances are detected. The unit has been tested thirteen times during power outages over the past year, and each time it has performed as required.

The radio system has experienced no system-wide outages over the past two years. There have been outages linked to specific sites due to generator failures or other issues, but these have caused minimal disruptions. ADCOM follows APCO's guidelines for eliminating single points of failure in mission-critical systems, leading us to upgrade the system with a backup radio core in 2018. Motorola named this product Dynamic System Resilience (DSR). The geo-redundant DSR was located in Weld County and includes redundant network paths to all sites. In 2019, ADCOM signed a System Upgrade Agreement (SUA) with Motorola that guarantees our system will be kept current with the latest software and hardware. 2021 uptime is captured in the following chart:

<i>UEM Alias</i>	<i>IP Address</i>	<i>Site Name</i>	<i>Planned Outage</i>	<i>Outage Seconds</i>	<i>Outage Time</i>	<i>% Availability</i>
UEM5Main	192.168.100.141	Site 101 at zone5	No	3,753	01:02:33	99.9880%
UEM5Main	192.168.100.141	Site 102 at zone5	No	3,774	01:02:54	99.9879%
UEM5Main	192.168.100.141	SIMULCAST	No	1,366	00:22:46	99.9956%
UEM5DSR	10.5.237.20	SIMULCAST	No	0	00:00:00	100.0000%
UEM5DSR	10.5.237.20	Site 25 at zone5	No	0	00:00:00	100.0000%
UEM5Main	192.168.100.141	Site 25 at zone5	No	61,792	17:09:52	99.8024%
UEM5Main	192.168.100.141	Site 27 at zone5	No	1,183	00:19:43	99.9962%
UEM5DSR	10.5.237.20	Site 27 at zone5	No	0	00:00:00	100.0000%
UEM5DSR	10.5.237.20	Site 30 at zone5	No	0	00:00:00	100.0000%
UEM5Main	192.168.100.141	Site 30 at zone5	No	558	00:09:18	99.9982%
UEM5Main	192.168.100.141	Site 36 at zone5	No	81,750	22:42:30	99.7386%
UEM5DSR	10.5.237.20	Site 36 at zone5	No	0	00:00:00	100.0000%
UEM5DSR	10.5.237.20	BENNETT	No	0	00:00:00	100.0000%
UEM5Main	192.168.100.141	BENNETT	No	20,319	05:38:39	99.9350%
UEM5Main	192.168.100.141	HOYT	No	42,525	11:48:45	99.8640%
UEM5DSR	10.5.237.20	HOYT	No	0	00:00:00	100.0000%
UEM5DSR	10.5.237.20	KCNC	No	0	00:00:00	100.0000%
UEM5Main	192.168.100.141	KCNC	No	23,856	06:37:36	99.9237%
UEM5Main	192.168.100.141	FED HEIGHTS	No	998	00:16:38	99.9968%
UEM5Main	192.168.100.141	Site 55 at zone5	No	22,832	06:20:32	99.9270%
UEM5DSR	10.5.237.20	Site 55 at zone5	No	0	00:00:00	100.0000%
UEM5DSR	10.5.237.20	Site 58 at zone5	No	0	00:00:00	100.0000%
UEM5Main	192.168.100.141	Site 58 at zone5	No	564	00:09:24	99.9982%
UEM5Main	192.168.100.141	Site 60 at zone5	No	1,027	00:17:07	99.9967%
UEM5DSR	10.5.237.20	Site 60 at zone5	No	0	00:00:00	100.0000%
UEM5DSR	10.5.237.20	Site 61 at zone5	No	0	00:00:00	100.0000%
UEM5Main	192.168.100.141	Site 61 at zone5	No	631	00:10:31	99.9980%

The CAD system has proven to be quite stable with unscheduled total downtime of 7 minutes 45 seconds during the past two years. This equates to 99.9998% uptime. The CAD system was also affected by the RMS upgrades which causes CAD to lose its ability to issue case report numbers while also limiting access to the system. We have reported these issues to CentralSquare who is investigating the cause and will be making recommendations to avoid such issues in the future.

The 911 system has experienced no systemwide outages since 2018. There were issues with misrouted 911 calls after the ESnet was brought online, but most of these have been corrected. We still get an occasional misrouted call, but these have become far less frequent.

With the transition to the ESnet in 2020, the 911 system now has significantly more resiliency. The ESnet automatically reroutes 911 traffic to our alternate PSAP, Arapahoe, if it detects a marked decrease in ADCOM's capacity to accept 911 calls. This then allows for ADCOM to determine the best course of action based on the circumstances causing the capacity loss. If the situation is caused by a temporary spike in 911 calls due to a major incident, no action will be taken. If the problem is a service disruption where the outage is expected to last for an extended period, ADCOM could send personnel to the Weld Backup Center and then reroute our calls there.

Strategy for Improvement

ADCOM will continue to keep the CAD system updated with necessary patches and upgrades. Any recommendations received from CST that will improve uptime will be implemented. ADCOM will also look to hire additional staff as necessary to ensure this system, along with the many other systems we support, will be available when needed.

ADCOM has made a number of improvements to the radio system to ensure its resiliency. We will continue to seek out and eliminate single points of failure with the focus now on the possibility of adding of a redundant prime site to ensure continuity of operations if our prime site ever went down due to some unforeseen event.

ADCOM's plan for the new Admin building includes a new generator and transfer switch that will function in parallel with the current generator and have sufficient capacity to run both the new building and ADCOM's current building in the event of a power failure. This will add an extra layer of redundancy that will significantly reduce the likelihood of an incident such as that experienced in 2018.

Challenges

The greatest challenge associated with meeting the goal of 99.999% uptime is identifying and eliminating single points of failure. The May 2018 power outage exemplifies this issue. Because the generator and transfer switch receive regular maintenance, consideration was never given to the possibility of a single wire (lead) becoming detached and taking ADCOM offline. The cost of adding another layer of redundancy to prevent such outages is another impediment.

Goal Attainment: Ongoing

Focus On Using ADCOM's Current Resources/Equipment/Technology Efficiently and to the Best Potential

What the Standard Is

Although there is no national or industry standard for this goal, basic business practices dictate that all resources are used in a manner that ensures maximum efficiency and effectiveness.

Where We Were in 2018

ADCOM was operating a lean organization with minimal wasted resources. Room for improvement was identified in the areas of process streamlining and maximizing technological utility.

Where We Are Today

To ensure management was focused on efficiency, ADCOM enrolled our HR Specialist in *Lean Six Sigma* training so that she could instruct the management team in strategies for improvement in this area.

In 2021, ADCOM investigated and implemented a CAD/Radio Interface that allows for more rapid dispatch of fire resources by initiating the dispatch automatically without the need for action on the part of the dispatcher. Although we have only limited data since initiating this improvement, early reports suggest an average time-savings of 10 seconds/dispatch.

Strategy for Improvement

- Adopt a Tiered Dispatch System for Fire Dispatch – Tiered dispatch systems have been used to handle EMS calls for over forty years. These systems incorporate a pre-scripted protocol to assess the needs of callers and ensure they receive the proper response (ALS or BLS) in the proper manner (“Hot” or “Cold”). These systems improve efficiency by eliminating the dispatch of unnecessary resources while also improving public safety by sending “hot” resources only when required, thus creating fewer traffic problems and crashes.

ADCOM has utilized a tiered dispatch system for EMS calls for many years (Emergency Medical Dispatch or EMD). The Fire Task Force group has recommended that a similar approach be taken for all fire calls. ADCOM will work with Fire Task Force to bring this to fruition in 2022.

- Seek greater input from Fire and Police Task Forces with regard to operational processes.
- Investigate idle functionality in current technology that may be utilized to improve service level.
- Ensure all technological systems are optimized.

Challenges

Other than the cost for training, there are no significant challenges to implementing the improvement strategies listed above.

Goal Attainment: 2022

Develop Long-Term Plan for Facility Replacement or Remodel to Address Our Growing 911 call

Load and Potential Space Needed for Additional Employees

What the Standard Is

There is no national standard for space requirements in a PSAP. However, the industry standard for 911 call-answering times is 90% of 911 calls shall be answered in 15 seconds or less according to NENA. Sufficient space must be available, therefore, to accommodate the number of call-takers required to meet this standard while also providing for dispatchers, supervisors, and all other support personnel.

Where We Were in 2018

In 2017, ADCOM completed a remodel of its operations floor that added 2 new dispatch positions for a total of sixteen. That remodel consumed all available space, so further expansion was no longer possible. The sixteen positions are assigned as follows:

- 4 Law Enforcement Dispatch Positions
- 1 Animal Control Position
- 3 Fire Dispatch Positions
- 2 Supervisor Positions
- 4 Call-Taker Positions
- 2 Training Positions



The two training positions can function as call-taking positions when there are no trainees. Also, ADCOM generally staffs two Fire Dispatchers so the third can function as a training position or a call-taker position when available. As stated earlier, meeting the NENA standard with ADCOM's current call volumes requires 23 full-time call-takers. These call-takers would be assigned based on historical call-volume data, with busiest times requiring six call-takers and slow times needing only two. As can be seen in the above breakdown of positions, six call-takers working concurrently would put ADCOM at maximum capacity.

Where We Are Today

In 2018, ADCOM added an HR Generalist and Wireless Engineer but had no office space to accommodate either. Both positions found a home in their bosses' offices. Now, the Support Services Manager and the Wireless Manager are doubled up with their subordinates in offices designed for a single individual.

In 2019, ADCOM began negotiating with Adams County to purchase the plot of land just north of our current building. This property had previously housed the county's detox center, but those services were moved to Thornton. ADCOM completed the negotiations and took ownership of the property in early 2020.

Since then, ADCOM has secured \$6.75 million in funding via the marketing of Certificates of Participation (COPs), worked with an architectural firm (Allred Associates) to develop building plans, and selected a construction contractor (Golden Triangle Construction) to handle the construction of the new building. This building will be the new home for administrative, technical, and wireless personnel. Moving these positions into the new building will allow for expansion of the operations floor in the current building so that eight additional consoles can be added, and possibly more. Unfortunately, the cost for construction has increased dramatically due to the COVID pandemic and supply chain issues, resulting in the estimated price of \$5.75 million in 2018 jumping to \$8.6 million today.

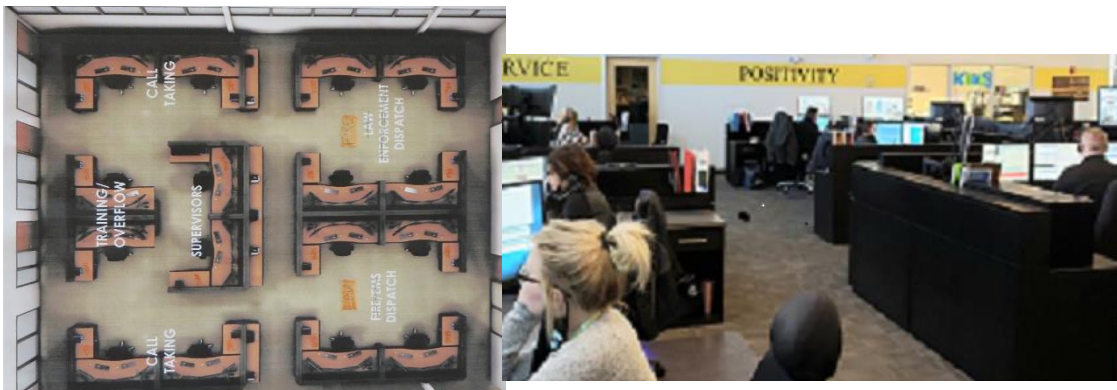
Strategy for Improvement

ADCOM expects the new building to be completed in June 2023. Once the new building is occupied, we will begin planning for the expansion of the current building.

Challenges

The main challenge for achieving this goal is funding. The cost for construction has increased markedly over the past two years, and industry experts don't expect these costs to drop going forward. ADCOM is working with the Adams County E911 Authority to increase revenue via the 911 fee in an effort to offset the steep rise in costs.

Goal Attainment: 2023 for new building, 2024 for expansion of operations floor in current building





ADCOM Will Develop and Maintain a Comprehensive Plan to Ensure Continuity of Operations During any Situation

What the Standard Is

The goal for emergency communications centers, like all public safety agencies, is to be operational and capable of providing services 100% of the time. FEMA states that Continuity of Operations (COOP), as defined in the National Continuity Policy Implementation Plan (NCP/IP) and the National Security Presidential Directive 51/Homeland Security Presidential Directive 20 (NSPD-51/HSPD-20), is an effort within individual executive departments and agencies to ensure that Primary Mission Essential Functions (PMEFs) continue to be performed during a wide range of emergencies, including localized acts of nature, accidents and technological or attack-related emergencies. Primary Mission Essential Functions (PMEFs) are defined as those that enable a public entity to provide vital services, exercise civil authority, maintain public safety, and sustain the economic base.

Where We Are Today

ADCOM developed its original Continuity of Operations Plan (COOP) a number of years ago. Although it addresses staffing levels and some basic processes, it has not been updated to include the evacuation of the center, the process for moving to the Weld Backup Center (WBC), or the plans for bringing the Disaster Recovery (DR) site online.

Strategy for Improvement

ADCOM will review its current COOP and update the plan as necessary to address the following:

- Evacuation of our building
- Moving to the WBC
- Bringing the DR site online
- Ensure regular testing and upgrades are completed on the WBC and DR site
- Any other shortcoming or failings of the current document

Challenges

There are no identifiable challenges associated with achievement of this goal

Goal Attainment: 2022



Summary

Tremendous progress has been made since the release of the 2018 Strategic Plan:

- Call answering times and processing times have seen significant improvement
- Improvements in system reliability and availability
- The new Admin building is slated for construction in 2022
- Interoperability improvements in CAD and Radio
- The Weld Backup Center and the Disaster Recovery site are now operational
- ADCOM's work internally and with the Task Force groups has resulted in improved processes and greater efficiency
- Improved critical systems resiliency through added redundancies (DSR), upgraded networks, and reducing single points of failure

Despite these many advancements, ADCOM recognizes the need to continue to address its shortcomings. These include:

- Reducing the number of non-emergency calls to 911
- Reducing turnover
- Continue to improve interoperability
- Continue to improve system availability and resiliency
- Continue to improve call-processing times

This plan identifies a number of strategies to address these shortcomings while continuing to build on the successes ADCOM has enjoyed over the last three years.

