INTEGRATED 9-1-1 CALL HANDLING AND MANAGEMENT WITH A LOW TOTAL COST OF OWNERSHIP

The Business Case for a Guardian 9-1-1 Solution

SOLACOM

Key Purchase Considerations for an Integrated 9-1-1 Call Handling Solution

Functionality, reliability, and cost are the biggest considerations for Public Safety Answering Points (PSAPs) looking to upgrade or replace aging call handling and management systems. A new solution must support legacy functionality and enable a smooth transition to next-generation 9-1-1 requirements. Once the transition is achieved, the solution must provide reliable call handling and management in any situation. Most importantly, the ideal solution must address all requirements within the constraints of increasingly tight budgets.

But sorting through the available 9-1-1 call handling and management solutions can be frustrating. From IP-based features in the backroom controller to the graphical user interface (GUI) at the call taker's desktop, there's a lot to think about. Complicating the issue is the fact that any system installed today should also be engineered to support emerging trends[1], including:

- Text-to-911 and text-from-911 call management capabilities[2]
- Geo-location and advanced mapping functions
- Future enhancements that may include video management, big data analytics and reporting, and cybersecurity features

Most solution providers will claim they have the ideal solution at the right price that will deliver the next generation of call handling as prescribed by the National Emergency Number Association (NENA). But evaluating available solutions on initial cost alone can be difficult because all vendors package their solutions to include a different set of basic features and functions. And a direct price comparison of additional features can be confusing because of the many variables associated with adding enhancements that contribute to overall costs.

Ultimately, PSAPs searching for the best value in a call handling and management solution must look beyond initial budget outlay to total cost of ownership (TCO) over the projected life of the solution. The lowest TCO will be delivered by a solution that provides the right balance of functionality, reliability, and cost. And that balance will be defined by what the solution provides immediately and how it will evolve to support expected and unexpected changes.

The Solacom **Guardian 9-1-1 Solution** provides the ideal balance of functionality, reliability, and cost for any PSAP — from two-position PSAPs to complex multi-PSAP environments. This purpose-built, standards-compliant, and flexible solution

delivers the best value based on a low TCO over the full life of the solution by:

- Enabling backward and forward compatibility
- Providing an evolutionary path to new technology
- Allowing simple customization
- Eliminating the need to replace legacy equipment for upgrades and enhancements

Baseline Criteria for Total Cost of Ownership

As with all capital outlays, the true value of a call handling and management solution cannot be based on the initial purchase price. Since all vendors compete aggressively on price to get the initial sale, the value of a solution should be determined based on the costs a PSAP will face to get the most efficient 9-1-1 call handling and management possible from the date a solution is installed to the end of its practical life.

All solutions are built on a combination of hardware and software that enables call management in the backroom where calls come into the PSAP and call handling at the call-taker desktop. Typically, the backroom system includes switches, servers, and software that manage incoming call traffic and move it to call-taker positions. Each call-taker position includes desktop hardware — a computer, display screen, keyboard, and other accessories — and the call handling software that enables call takers to answer calls, locate callers on a map, and collect critical information.

Hardware at both locations is based on commercial off-the-shelf products and optimized by the solution provider for PSAP operations. The software that determines the functionality of backroom and desktop hardware is usually proprietary to the supplier and is the key differentiator among all solutions. The more integrated and future-ready this critical combination of hardware and software is, the more efficient the call handling and management process will be, and the more effective the response by call takers will be to all emergency calls.

The TCO of a complete solution for all PSAPs is affected by the same variables:

- Functionality costs
- Ongoing maintenance costs
- Training costs
- Growth costs

The TCO of a complete solution is determined based on the cost of the hardware and software combination needed to support a specific number of call-taker positions over a projected lifespan for the solution. The size of PSAPs and number of call-taker positions varies based on the geography and population density being served. Most small PSAPs operate with a couple of call-taker positions, while larger PSAPs in major urban centers can have as many as 25 or more positions. The average PSAP will have between two to five positions. Regardless of the size, the TCO of a complete solution for all PSAPs is affected by the same variables:

- The features and functions the solution offers to address immediate needs
- The cost of upgrading the platform to support future requirements and standards
- Ongoing maintenance costs
- Software support
- Hardware support
- Training costs that affect operations
- Growth costs

Based on the variables listed above, we can look at some of the costs that will affect the TCO of a complete Solacom call handling and management solution, which will evolve to meet new requirements for a typical PSAP over a five-year period. For this analysis, we can work with PSAPs that have two, five, and 10 call-taker positions.

Key Cost of Ownership Variables

Functionality Costs

The ideal 9-1-1 call handling and management solution is one that provides the features and functions to support immediate needs and future requirements. Cost of ownership for immediate and future functionality is determined by the cost of upgrades and enhancements to the hardware and software combination in the backroom and at the desktop call-taker positions.

The Solacom Guardian 9-1-1 Solution provides a low cost of ownership because it offers the ideal balance between price and performance in the backroom and at the desktop right out of the box — and as a PSAP's needs grow. To ensure a perfect fit, the software in the backroom controller and at all call-taker desktops is designed to support all current and emerging standards. The call management and control system in the backroom supports legacy inbound and outbound communications from authorized carriers, as well as other PSAPs and public safety agencies. It provides native connectivity of Session Initiation Protocol (SIP) trunking into the system without the need of any external protocol conversion or expensive ongoing licensing. And it also integrates easily with all legacy and IP-based equipment and database systems, including:

- Automatic Location Information (ALI) databases
- i3 databases (LIS/LDB)
- Mapping systems

> Backwards and forwards compatibility reduces cost of ownership by eliminating the need for PSAPs to overhaul or replace an entire communications infrastructure to support NG9-1-1 today and as requirements change.

- Computer-aided dispatch (CAD) systems
- Voice recording systems
- Video systems
- Short Message Service (SMS)
- Instant Messaging (IM)
- Other data sources

This backwards and forwards compatibility eliminates the need for PSAPs to overhaul or replace an entire communications infrastructure to support next-generation 9-1-1 requirements. New functionality can be added and integrated with the Guardian solution cost effectively, and PSAPs can continue to leverage legacy investments.

To deliver the required functionality, the modular software can be configured to meet every PSAP's unique needs in the backroom and at call-taker positions. This

Table 1: Costs of upgrades and enhancements to a Solacom Guardian 9-1-1 Solution

Functionality	Software Cost	Explanation
Backward compatibility	$0	Included in ongoing initial purchase price and with ongoing software updates
Forward compatibility	$0	Included in initial purchase price and with ongoing software updates
Functional software upgrades	$0	Included in ongoing software updates
Additional Guardian products (e.g., Guardian Map)	One-time cost for Guardian product and module and integration	Plug-and-play into existing systems No forklift upgrade needed to underlying system

means each PSAP gets the features that provide the functionality it really needs from day one, rather than paying for a one-size-fits-all solution. After deployment, new features and functions can be added easily to meet new operational and regulatory requirements.

For example, if a PSAP wants to add text-to-911 capabilities — Solacom's **Guardian Text** — the feature is enabled on the existing software platform in the backroom and at all call-taker desktops. Likewise, if the PSAP wants to add enhanced mapping capabilities with Solacom's **Guardian Map**, the new module is enabled in the backroom controller and at all call-taker positions as an added function to the existing software platform. The PSAP only pays for the new product module rather than a completely new software platform to support it (Table 1).

The modular software architecture also lowers the cost of ownership of the hardware. Since upgrades and enhancements to the software can be added at any time, the underlying hardware does not need to be replaced to enable new functionality. This protects a PSAP's initial investment in the hardware in the backroom and at call-taker positions, extends the life of the hardware, and reduces ownership costs over the life of the solution.

Maintenance Costs

The backwards and forwards compatibility engineered into the software and hardware platform also helps to keep maintenance costs relatively stable over the course of a Guardian solution's lifespan (Figure 1).

Maintenance costs are stable because, unlike some competitive offerings, ongoing incremental and version updates required to ensure the backroom and desktop software continue to operate as intended are included in pre-established annual maintenance costs. New features and functions, such as text-to-911, can be activated and enabled at any time without replacing the underlying infrastructure. This approach lowers the total cost of ownership over the entire lifespan of the product.

The maintenance costs associated with hardware are also contained. The pre-established annual maintenance fees cover all hardware updates required to ensure the Guardian solution is operating at peak performance. As a result, unexpected hardware upgrade costs are eliminated. Additional capital outlays for hardware are confined to hardware refresh cycles for servers and switches, which Solacom typically recommends take place every five years to replace aging components and avoid potential failures.

Figure 1: Yearly maintenance costs over five years for a Solacom Guardian 9-1-1 Solution
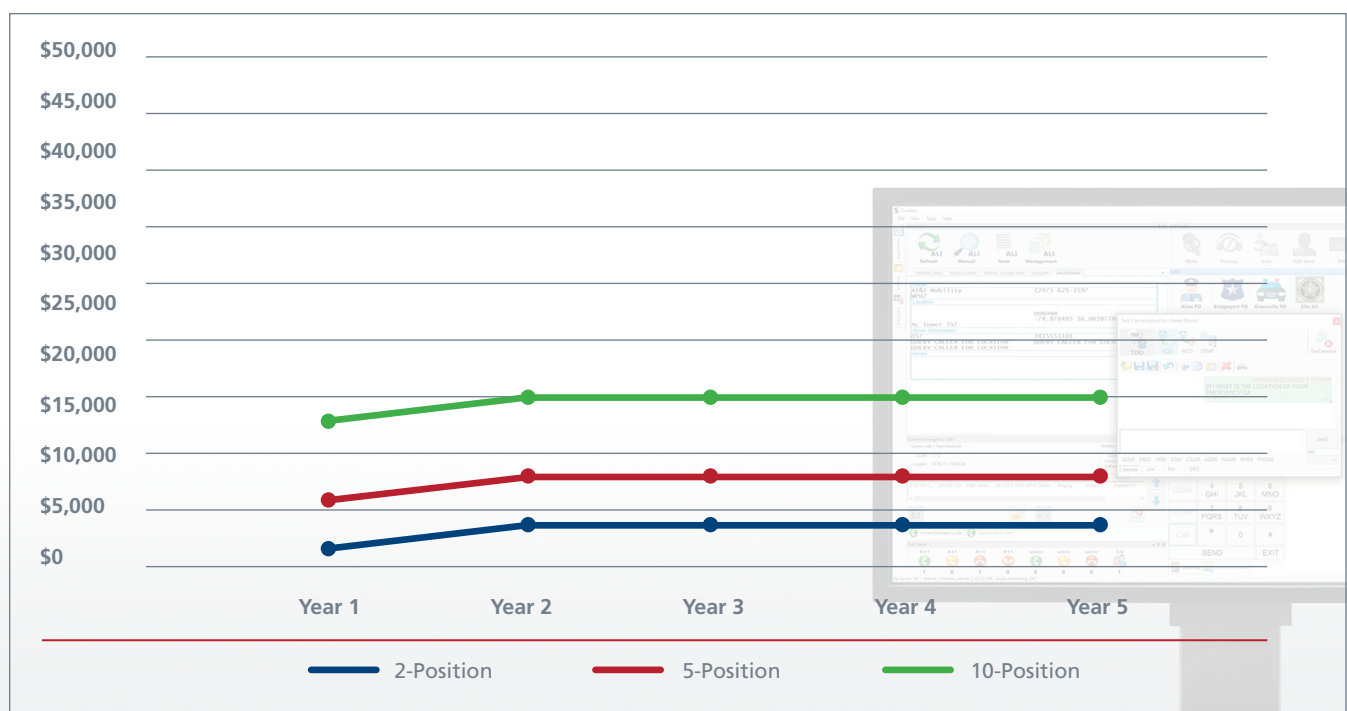
Training Costs

One of the key variable costs that must be considered with any call handling and management solution is the cost of training call takers to leverage the capabilities a new solution has to offer. With most solutions, the addition of new features and functions requires call takers to be trained to use the new software. This takes valuable time away from the call handling process and adds another incremental cost to the overall cost of ownership every time a new feature or function is added. For solutions that require a complete overhaul of the underlying hardware and software, the training time is considerably longer as call takers get accustomed to the new system.

Solacom call handling and management solutions are engineered to reduce training requirements at initial installation and virtually eliminate training throughout the life of the solution. Training time and costs are reduced because the Solacom **Guardian 9-1-1 Call Handling** solution is purpose-built for emergency call management and not packaged together from multiple disparate components originally designed for other communications applications. If needed, the Guardian user interface can also be customized to mimic a call taker's existing interface and provide a familiar operation, screen layout, and call flow.

The purpose-built design, ease of use, flexibility, and customizability of a Solacom Guardian 9-1-1 Call Handling solution reduce training time and costs required on the initial system and for future enhancements.

At the desktop, the Solacom solution is optimized for call takers based on human-centered design (HCD) principles for comfortable ergonomics, intuitive usability, and efficient call processing. The Guardian 9-1-1 Call Handling solution also provides the highest level of flexibility to fit the unique and individual workflow of each call taker. The modular screen layout that call takers work on can be customized to fit individual preferences with:

- Customized icons and buttons
- Buttons sized for touch-screen operation
- Mute, privacy, and hold buttons
- Intelligent transfer buttons that allow call takers to select the type of outgoing call based on the type of incoming call
- Buttons sized for call takers with visual disabilities
- Text-to-911 capabilities that allow call takers to initiate text conversations
- Multimedia interfaces for non-voice communications, instant messaging, and telecommunications device for the deaf (TDD/TTY)

Of course, the PSAP administrator has complete control over the level of customization allowed. An administrator can choose to set the interface to a standard configuration for all users and enable minor customization by each call taker. Regardless of the approach the PSAP takes, or the configuration associated with a specific desk, once call takers have established

individual configurations they can log into any position in the PSAP, access their profile, and work as though they were sitting at their regular desktop.

Ultimately, the purpose-built design, ease of use, and flexibility make it easier for call takers to adapt the solution to how they work, rather than having to adjust their work process to fit the solution. This reduces training time and costs required on the initial system. Likewise, when new features and functions are added, the underlying platform stays in place so call takers do not have to adapt to a new process or interface to get the new function into their workflow. The new feature is easily integrated into existing configurations, and significant investments in training are not needed.

Growth Costs

For some PSAPs, cost of ownership must also take into consideration future growth. In these situations, a Solacom Guardian 9-1-1 Solution provides significant cost of ownership savings because the backroom hardware and software platform that provides call management capabilities — the controller — does not have to be replaced. It can be easily expanded to support hundreds of positions. This reduces the per-position cost of the overall solution as a PSAP grows. For example, a PSAP growing from two positions to 10 positions after five years would

experience an approximate 53 percent decrease in its per-position cost with a Solacom Guardian solution (Figure 2).

Calculating Total Operating Costs

Obviously, the specific impact the variables discussed in this document will have on cost of ownership may vary from one PSAP to the next. Also, there may be other variable costs that will affect the TCO of a complete solution for each PSAP. But for all PSAPs, functionality costs, ongoing maintenance costs, training costs, and growth costs should be examined carefully when weighing the pros and cons of a 9-1-1 call handling and management solution.

The Solacom Guardian 9-1-1 Solution provides a low cost of ownership because it offers the ideal balance between price and performance in the backroom and at the desktop right out of the box — and as a PSAP's needs grow. With a Guardian solution, PSAPs get the broadest possible range of options to configure a call handling and management process the way they want it. Compatibility and cost-effective technology upgrade paths are built in. After deployment, new features, functions, and performance can be added to meet new operational and regulatory requirements — quickly and cost effectively without replacing the underlying infrastructure.

Figure 2: Total cost of a Solacom Guardian 9-1-1 Solution by number of positions for five years
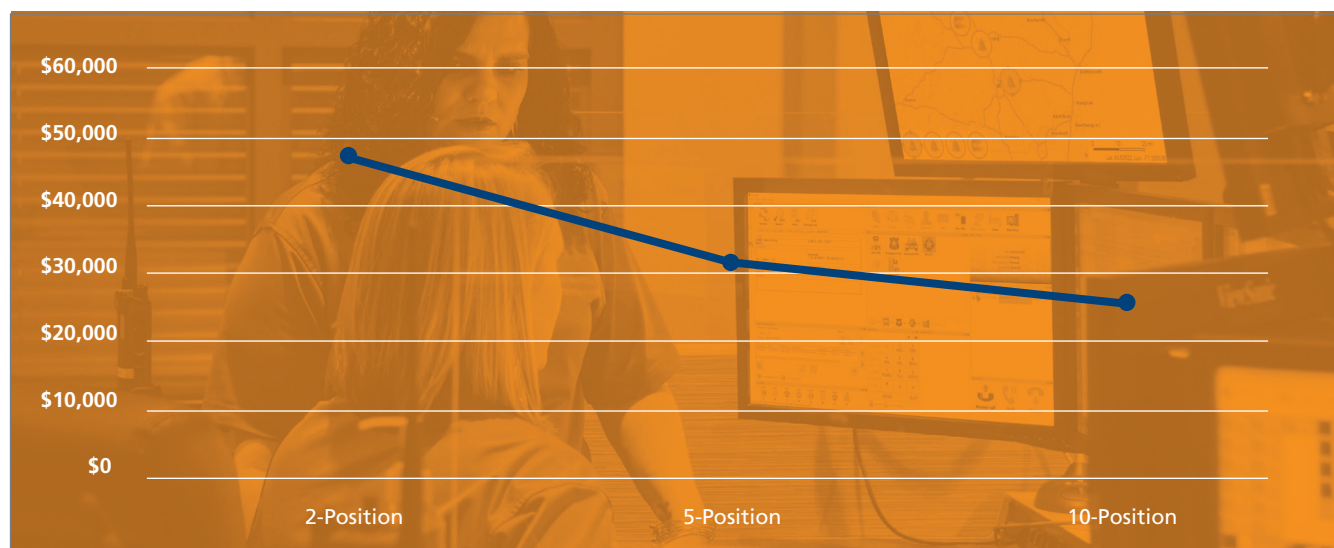
Costs are also contained because the flexible, user-centric, customizable design of a Solacom call-taker desktop system reduces the need for extensive ongoing training as new features and functions are added. In addition, a Solacom solution offers predictable year-over-year maintenance costs that include immediate access to incremental and version updates that ensure the backroom and desktop software continue to operate as intended at all times. Finally, when a PSAP is ready to grow, a Solacom solution does not have to be replaced. It can be easily expanded to support hundreds of positions.

By enabling backward and forward compatibility, an evolutionary path to new technology, simple customization, an easy upgrade and growth path, and eliminating the need to replace legacy equipment, a Solacom Guardian 9-1-1 Solution will deliver a low total cost of ownership for any PSAP.

Acronyms

CAD	computer-aided dispatch
GUI	graphical user interface
HCD	human-centered design
IM	Instant Messaging
NENA	National Emergency Number Association
PSAP	Public Safety Answering Point
SMS	Short Message Service
TCO	total cost of ownership
TDD/TTY	telecommunications device for the deaf/teletypewriter

Notes:

All dollar amounts in this document are presented as USD.

References:

[1]See the Solacom brief, "5 Trends Affecting 9-1-1 Call Handling and How to Prepare for Them," at solacom.com/5-trends-to-consider.
[2]See the Solacom white paper, "Text-To-9-1-1: Getting It Right the First Time," at solacom.com/text-to-911-white-paper.

Additional Information

Click here for more information about how Solacom can help you make the move to fully integrated NG9-1-1 call handling and management solution for your PSAP.

Contact Us

Solacom 9-1-1 call handling and management solutions are built on more than 30 years of research and innovation in the application of advanced hardware and software technologies for public safety. Today, Solacom Guardian 9-1-1 solutions support thousands of agencies affecting millions of lives annually — from dense urban environments to statewide deployments.

Contact us today to discover how our Guardian solutions can help your PSAP streamline 9-1-1 call handling and management processes and enable more efficient collection of critical information in emergency situations.

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