National Public Safety PARTNERSHIP

UNDERSTANDING TECHNOLOGY COST CONSIDERATIONS IN LAW ENFORCEMENT

INTRODUCTION

The daily integration of technology is vital for the 21st century law enforcement agency. Technology can improve public safety by supporting operations, aiding with enforcement strategies, detecting and responding to crimes, gathering and analyzing evidence, improving efficiency, and increasing officer safety.[1] While technologies bring great benefits, law enforcement executives must grapple with new strategic and fiscal responsibilities when determining which technology solutions are most cost-effective and appropriate to their agency's public safety goals.

Regardless of an agency's size or resources, many struggle to manage, estimate the cost of, prioritize, and adequately budget for existing and new technology. Findings from the 2015 Standish Group Chaos Report indicate that fewer than half of all information technology projects are delivered on time or on budget and only slightly over half are viewed as successful by the end user.[2] In some instances, municipalities do not consider or budget for these technology costs when hiring officers. Agencies can be challenged by:

- Estimating and understanding the full (lifetime) cost of a technology
- Identifying the per officer technology equipment costs (e.g., to inform hiring and budgeting decisions, to provide training on effective technology use)
- Planning technological investments and aligning them with strategic goals
- Identifying the far-reaching impacts of technology on agency budgets, structures, policies, procedures, and operations
- Identifying (and quantifying) how a technological investment will benefit an agency
- Justifying technological expenditures to decision-making entities (e.g., city councils)
- Sustaining long-term funding for technological investments (e.g., due to local government budget processes and turn-over of law enforcement executives and decision-makers)
- Prioritizing technology investments (i.e., deciding which technology to acquire and sustain over other available technologies)
- Prioritizing technology investments over other policing activities (e.g., surge operations)
- Understanding and implementing a logical sequence of technology (e.g., investing in an advanced/new technology only after first implementing a foundational technology needed to allow the advanced/new technology to work)
- Understanding the impact of technology on community engagement and community relations, and using technology effectively in this realm

1 https://www.bja.gov/Publications/violent-crime-reduction-operations-guide.pdf.
2 *The Chaos Report*, The Standish Group, 2015, https://www.standishgroup.com/sample_research_files/CHAOSReport2015-Final.pdf.

This document guides law enforcement agencies and leaders to undertake the complicated exercise of understanding and describing the costs of technologies for a law enforcement officer and an agency, as well as influencers of technology costs. We begin by defining "law enforcement technology," developing an understanding of that technology, and determining what costs are associated with technology. We then offer important considerations for planning technology investments and understanding how to determine the financial costs of technology. This document is informed by CNA's conversations with and information collected from more than 20 law enforcement agencies of various sizes throughout the country.

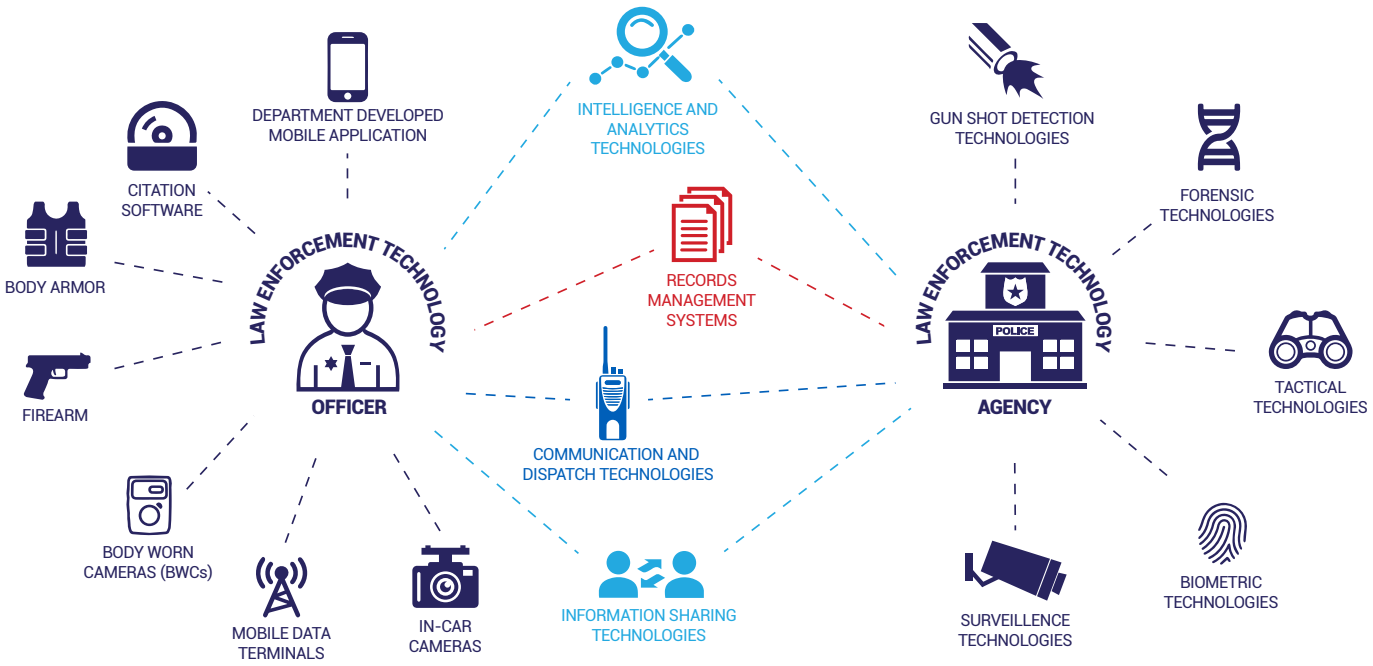
WHAT IS LAW ENFORCEMENT TECHNOLOGY?

To discuss technology, one must understand the breadth of tools and resources defined as "technology," and how they are used by individual law enforcement officers and agencies.

There is no standardized definition of "law enforcement technology." Technologies typically used by law enforcement agencies include a variety of hardware, software, and equipment. Law enforcement technologies can include, but are not limited to, the following categories: ***records management technologies*** (e.g., records management systems [RMS]), ***communication and dispatch technologies*** (e.g., computer-aided dispatch [CAD]), ***intelligence and analytics technologies*** (e.g., crime analysis software), ***tactical technologies*** (e.g., firearms, electroshock weapons), ***information sharing technologies*** (e.g., tablets, social media), ***surveillance technologies*** (e.g., closed-circuit televisions [CCTV], unmanned aerial systems), ***biometric technologies*** (e.g., facial recognition software), and ***forensic technologies*** (e.g., DNA testing). Figure 1 provides additional examples.

Regularly used technologies include CAD, RMS, and surveillance technologies, which included in-car cameras, fixed cameras, interview room cameras, or body-worn cameras. Other common technologies include intelligence and analytics technologies(including crime mapping software), camera software, citizen online reporting software, data visualization software, scheduling software, word processing software, data management and database systems, pdf readers, and digital evidence management systems.

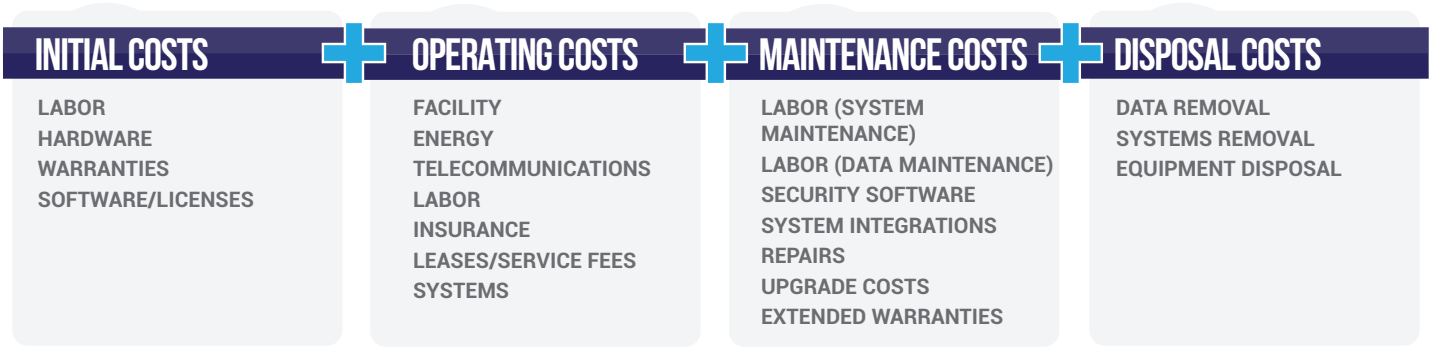
Figure 1. Examples of Officer and Agency Technology



WHAT COSTS ARE ASSOCIATED WITH TECHNOLOGY?

Numerous factors influence the total cost of a technology to a law enforcement agency and the cost is not limited to the amount paid to a vendor. The same technology implemented in different agencies can vary widely in itemized and overall cost to an agency. Figure 2 shows the essential costs related to technology including one-time and recurring costs over the full life span (life cycle) of a technology: initial costs for acquisition and deployment, operating costs for ongoing use, maintenance costs for repairs or upgrades, and disposal costs for removal or end of ownership.

Figure 2. Examples of Technology Costs



While the types of costs for a technology can be defined, fully estimating and managing these costs is more complicated. Some law enforcement agencies do not have specific budget line(s) designated for technology costs and some rely on other entities (e.g., the city, a private vendor/contract, or a regional agency) for technologies. When determining costs, account for other stakeholders' expenses and support.

COST CONSIDERATIONS FOR POLICING TECHNOLOGIES

To overcome the aforementioned challenges with costing and budgeting for technology—for both current and new technology investments—consider the following six critical considerations that can affect the total cost of a technology to an agency.

1. Learn which technologies are available and which are needed for your officers to do their job efficiently.

Learn about the wide array of equipment, tools, and solutions that are available to the 21st century agency and officer. Trendy or emerging technologies can be highly desirable investments for an agency; however, if the agency is ill equipped in essential and well-established technologies necessary for officer's duties, well-being, and safety, they can be misused investments and result in the inability to capitalize on truly valuable technologies. Foundational technologies begin with compatible CAD and RMS to inform tactical and strategic analysis and extend to information technology hardware and software.[3]

Ensure that technology solutions align with the agency's short-term and long-term strategic goals and with a capital investment plan. Agencies can build technological capabilities over time, prioritizing present and future needs, and determining what they can do without. This approach can also help avoid—or at least adequately budget for—the costs associated with a technological commitment to a specific technology ecosystem (i.e., being forced to procure future, more expensive technologies from a specific vendor due to a lack of interoperability with other vendors' solutions).

Use the agency's overarching strategic plan (or developing such a plan) to inform a technology strategy This technology strategy should be followed by policy development and impact review, technology identification and implementation, an ongoing evaluation of the strategy, and (if needed) revisions to the strategy. This approach will maximize the benefit of technology investments and can minimize unanticipated future costs (e.g., from translating data between systems that are not interoperable).

3 Additional examples and further discussions about foundational technologies are available in the Violent Crime Reduction Operations Guide, 2018, Major Cities Chiefs Association and the Bureau of Justice Assistance, https://www.bja.gov/Publications/violent-crime-reduction-operations-guide.pdf.

2. Understand the total cost of ownership of a technology.

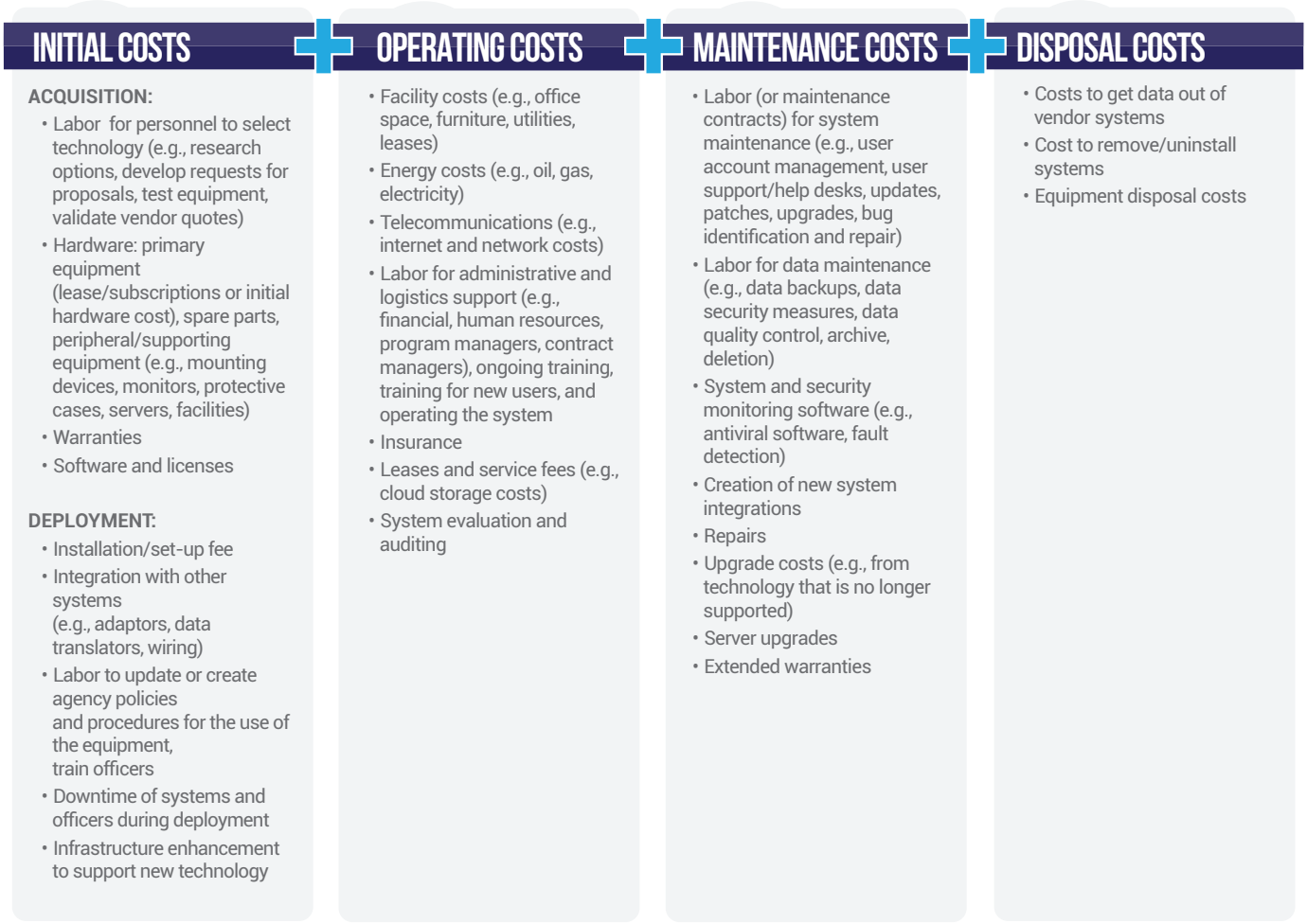
Estimate and track costs for each stage of the life-cycle. Regardless of how the technology is acquired (e.g., lease, buy), the price paid to the vendor does not reveal the total cost of the technology to the agency.

Conduct a life-cycle cost analysis to estimate the ***total cost of ownership:*** the sum of *initial* costs (acquisition and deployment) plus *operating, maintenance, training,* and *disposal* costs. Figure 3 provides examples of the costs incurred over the life cycle of a technology.[4]

Initial purchasing costs are attainable from vendors through solicitations or quote requests, and can vary dramatically based on factors such as volume of purchase, existing vendor agreements, the need to procure from locally or state approved suppliers, and contractual arrangements. Other life-cycle costs, such as *operating* and *maintenance costs* for upkeep or training may not be fully understood until after purchasing equipment. In some cases, operational costs can exceed initial costs, particularly when considered over the usable lifetime of the technology.

The total cost of a technology can be daunting, particularly with new technologies. Time and competition can drive down costs. Consider the age and maturity of the technology of interest the experiences of peer agencies with the technology, and the impact that those factors will have on the overall cost. By estimating the total cost of ownership for technology options, executives can make a more accurate assessment of the financial impact of a technology and ensure that they will have the funds to sustain the technology for its full lifetime.

Figure 3. Example Costs for the Life Cycle of Law Enforcement Technology[5]



4 This list should not be viewed as comprehensive. Rather, it includes a number of commonly incurred expenses. The specific expenses incurred will depend on the specific technology, the structure of the agency, the existing technological environment, and other factors unique to the agency.

5 Labor calculations are influenced by the structure of the workforce—internal (sworn/civilian/volunteer/intern) or external (city/contracted/vendor/partners) and full or part-time—supporting the system and should include salaries and benefits for agency employees.

3. Identify acquisition needs and requirements appropriate to your agency when adopting new technologies.

Consider elements of the acquisition process that will impact the costs of acquiring and upgrading the technology. Such variables include: system, stakeholder, and procurement requirements; cost structures and service agreements; and acquisition vehicles.

- **System, stakeholder, and procurement requirements**
  - *System requirements* may include end user access, frequency of use, business processes, security, and legal compliance requirements. These requirements should be clearly defined in a vendor- and technology-agnostic manner. First identify what a technology needs to do, not how it needs to be done; this will allow for full examination of all options that meet the need. Prioritize requirements as needs versus wants to inform decisions on what to procure and how much to spend. Funding sources can also influence system requirements, how the system is to be used, and who has access to the system, and thus influence cost.

  - Determine *stakeholder requirements* in the identification process. Stakeholders should not only include end-users and may include: agency leadership, agency personnel (sworn and non-sworn), the public, political leaders, partner agencies (e.g., prosecutors, courts, fire departments, public safety agencies), city personnel, regional partners, and unions. If a technology system does not meet the needs of the users and stakeholders, it likely will not be used as desired (if at all) or agencies may face unanticipated future expenses to modify or procure a system.

  - *Procurement requirements* can often influence technology cost. Many agencies have set processes for acquiring new technology, especially if the technology is over a certain monetary value. Usually an agency must follow a city's or county's procurement policy, but the process can also be dictated by the funding source.[6] For example, federal and state grants have established procurement processes for acquiring a new technology. Be mindful that long procurement processes can change the final price of the acquisition as vendors' quotes expire, vendors phase out old models, and an agency's requirements change over time.

- **Cost structures and service agreements:** How a technology solution is acquired—custom built, leased, provided as a service, outsourced, or purchased—can influence cost. Consider the following impacts to cost structures and service agreements:
  - Internal agency capabilities (e.g., skilled system administrators and support staff),
  - Existing technological environment (e.g., current systems),
  - Frequency of use (e.g., daily operations, emergency response, catastrophic event),
  - Partnerships and nearby capabilities (e.g., capabilities of the state police lab),

6 Law enforcement agencies fund technology through a variety of sources such as the police agency's operating budget (sometimes through a specific line-item for technology), general funds, unclassified supply funds, one-time budget requests, capital budgets, asset forfeitures, bond authorizations, special revenues, pass-through monies, grants (public and private), foundations and philanthropic partnerships, state funds, city/county general funds, city/county information technology budgets, and city/county capital improvement budgets.

- Rate of technology change and service life, and
- Type of funding (i.e., one-time or recurring funding).

Attempt to validate vendor quotes by asking them to itemize costs in bundled packages and then comparing quotes from competitors, prior quotes, published prices, and peers. Many vendors also offer "packaged" solutions that combine hardware, software, services, and support. Negotiate for the "package" the agency needs and can afford, to include training.

- **Acquisition vehicles:** Agencies may influence the cost of technology through bargaining power or negotiations. Technologies that involve the following can result in lower or more cost-effective solutions:
  - Partnering with local or regional agencies on a larger acquisition;
  - Engaging in cooperative bids;
  - Piggybacking on available contracts (e.g., state contracts); and
  - Leveraging blanket agreements with technology vendors.

4. Remember to plan for non-equipment-related technology costs

Life-cycle costs extend past costs directly associated with the equipment procurement, maintenance, and upkeep. Include and document non-equipment costs such as training, personnel, and cloud storage when obtaining technology.

Budget for initial training for newly acquired technology as well as refresher training for existing technology. Agencies can provide training for some technologies in cost effective approaches (digitally or during roll call); however, some technologies will incur greater training costs due to requiring extensive in-person training at remote sites. Staff may also require time to transition from previous technology solutions or vendors, provide IT or other support services for the new technology, or brief external stakeholders such as city councils, community members, or accountability task forces. Some of these requirements may necessitate hiring new personnel or reassigning personnel, and many may incur backfill or overtime costs if executed using existing agency resources. Finally, as information storage and processing demands increase, law enforcement agencies are frequently turning to and budgeting for cloud storage (e.g., with the collection and retention of body-worn camera footage).

5. Continuously evaluate and monitor technology use and cost.

Once an agency implements a technology, appropriate personnel should regularly evaluate and monitor its use and associated costs. This evaluation should include a process and impact evaluation. Process evaluation is aimed at understanding how implementation of the technology is proceeding, and addresses questions such as"

- Is the technology functioning as it is supposed to?
- Is technology being used according to written policies? and
- What challenges are associated with complete implementation or use of this technology?

Impact evaluation helps agencies understand what effect the technology is having in the short and long term and addresses questions such as:

- How is implementation of this technology affecting crime rates or community satisfaction?
- Is the technology improving or better supporting law enforcement officers' functions and duties? and
- What benefits is this technology providing for the agency?

Impact evaluation can also include cost-benefit analyses. Benefits can come from impacts such as avoided costs, increases in productivity, decreases in workload, automation of manual work, and social impacts (e.g., reductions in response time for calls for service, violent and non-violent crime, and victimization). For example, a cost-benefit analysis of the Las Vegas Metropolitan Police Department's body-worn camera program estimated a net annual savings of $4.1 to $4.4 million resulting from a reduction in the number of complaints against officers and in the amount of time required to resolve complaints.[7]

Carefully consider which elements of an evaluation the agency can successfully implement using internal personnel and resources, and external evaluators when appropriate. External evaluators often have specialized skill sets and can increase perceptions of objectivity and accountability. Local universities and professional groups can help agencies identify appropriate evaluators. Regular evaluations, combined with life-cycle cost information, can help agencies determine when to upgrade, replace, or discontinue the use of certain technology.

6. Explore and understand funding options to support technology costs.

The daily demands of operating a law enforcement agency consume a significant amount of an agency's financial resources, leaving limited monies to support technology costs. A majority (96 percent) of law enforcement and corrections funding is spent on operational cost (salaries and benefits, administrative expenses), and only 4 percent is directed for capital outlays (fixed assets such as facilities, equipment, and technology).[8] However, public expenditures on law enforcement and corrections over the past few decades has more than quadrupled, and organizations outside of local law enforcement are offering financial support,[9] to include support for technology. Executives can seek financial support from federal, state, and local agencies, academia, and nonprofit organizations to adopt, implement, and deploy

7 Anthony A. Braga et al., *The Benefits of Body-Worn Cameras: new findings from a randomized controlled trial at the Las Vegas Metropolitan Police Department*, CNA, Sep. 28, 2017, https://www.cna.org/cna_files/pdf/IRM-2017-U-016112-Final.pdf.

8 "Police and Corrections Expenditures," Urban Institute, https://www.urban.org/policy-centers/cross-center-initiatives/state-local-finance-initiative/state-and-local-backgrounders/police-and-corrections-expenditures.

9 According to the U.S. Department of Justice's Bureau of Justice Statistics, public expenditure on policing in the United States more than quadrupled between 1982 and 2006. Brian A. Reaves and Matthew J. Hickman, *Police Departments in Large Cities*, 1990-2000, U.S. Department of Justice, Bureau of Justice Statistics, May 2002, NCJRS, NCJ 175703, http://bjs.ojp.usdoj.gov/content/pub/pdf/pdlc00.pdf.

existing and emerging technologies and tools. While many agencies are familiar with federal funding sources such as from Bureau of Justice Assistance (BJA) grants, few regularly access private funding through national or local foundations.

CONCLUSION

When appropriately planned for and implemented, existing and emerging technologies can be a force multiplier for police agencies, allowing them to do more with less, to provide public safety more effectively, to enhance officer safety, to increase transparency, and even to help reduce crime. But when agencies implement technology without proper planning or without understanding the full cost of that technology over time, the result may be inadequately equipped officers, overrun budgets, or inefficient use of already limited funding.

Law enforcement executives can take the next step to improving their technology planning and budgeting by addressing each of the cost considerations noted above, combining life-cycle cost calculations with technology decision support and information about funding and evaluation in a responsive solution tailored to their particular technology needs, uses, and resources.

Equipping the 21st century police department is very expensive and most law enforcement budgets do not account for all of the costs described in this document. It is important to develop a technology budgetary strategy that provides your agency with the upfront and ongoing maintenance costs, per officer, per technology to properly and responsibly use technology. With every new hire, this per officer technology cost should be included in the salary and benefits package so that the agency has the ability to properly equip officers with the technology, technical support and technology maintenance and upgrades required to do the job. If that type of budget line item is not present and this discussion does not occur, law enforcement agencies will not be able to maintain and grow their technological assets to serve and protect.