Prepared for:

State of Maryland — Department of Information Technology

3-1-1 and Artificial Intelligence Feasibility Study

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1.0 Executive Summary

1.1 Purpose and Goals

This study evaluates the feasibility, potential challenges, risks, and benefits of implementing a consolidated statewide 3-1-1 portal with Artificial Intelligence (AI) integration for non-emergency government services, resources, and information to Maryland residents. The scope of this study is limited to discovery, with determinations regarding the adoption of the findings and recommendations to be subsequently evaluated by the Maryland Department of Information Technology (DoIT) as well as other key legislative and operational stakeholders.

Goals of this study include:

- Understanding national and market trends related to 3-1-1 municipal operations and vendors.
- Documenting challenges faced by existing 3-1-1 operations across Maryland.
- Assessing the feasibility, benefits, and risks associated with establishing a statewide 3-1-1 portal.
- Understanding applicable approaches and potential impacts of leveraging AI in creating and/or implementing a statewide portal.

The findings and recommendations of this study reflect data available at the time of analysis and within the discovery approach including:

- Interviews with executive and operational leadership across Maryland Emergency Management (MDEM) as well as 3-1-1 county and city operations.
- Detailed review of related Maryland legislative reports (e.g., *2021 NG9-1-1 Commission Annual Report, Appendix E*) and prior state bills (e.g., *2023 SB30, 2022 SB749*).
- Data analysis of publicly reported ticket-level 3-1-1 data within Maryland and comparable municipalities across the United States.
- Peer analysis of nine national peer municipalities' operational models and 3-1-1 service offerings.
- Market analysis of various technology vendors offering 3-1-1 solutions, focusing on reported, generally available AI capabilities.

1.2 Key Findings

Characteristics of 3-1-1 Services

- The nature and scope of 3-1-1 services are contingent on local factors (e.g., local governance structures, demographics, geography) and may differ materially at the county, city, and even district levels.
- The responsibility for resolving 3-1-1 issues often resides at the local level and may include electoral accountability at that level.
- 3-1-1 services differ from 9-1-1 services in the proportion of issues requiring the execution of a multi-stage, multi-jurisdictional service workflow for resolution versus an acute, mono-jurisdictional response. In that regard, 3-1-1 services are inherently less scalable than other government services.

- 3-1-1 operations often serve as a “front door” for services offered by departments, agencies, and businesses at the county, city, district, state, and commercial levels. A statewide system would involve integrating and maintaining networks with these systems across the state of Maryland and developing and implementing a consolidated 3-1-1 portal.
- 3-1-1 lacks a common, detailed set of standards to guide operational and technology development, leading each municipality to generate its own data classification, service delivery, and resource allocation approaches. This presents challenges to both consolidating and accurately comparing data across municipalities.

Peer Analysis

- No documented instances of statewide consolidated 3-1-1 operations in the U.S. were discovered; Maryland would be the first to implement such a system.
- Municipalities similar to the State of Maryland operate core 3-1-1 services through a dedicated 3-1-1 Office call center, web portal, and mobile application.
- Most municipalities offer an out-of-jurisdiction or hearing-impaired number and a non-emergency police number.
- Services mediated through self-serve conversational interfaces (e.g., chatbots, “smart” Interactive Voice Response (IVR)) are not widespread and, where present, provide only basic functionality or are still in testing.
- No universal operational model was observed across peer municipalities, with each differing by characteristics such as interaction channels, top services offered, ratio of information requests to service requests, and degree of integration with emergency services.

Maryland 3-1-1

- The presence of a 3-1-1 operation is highly correlated with population. The five most populous jurisdictions offer 3-1-1 services, covering approximately 58% of Maryland residents.
- MD 3-1-1 operations align operationally with peer municipalities across the U.S. and share common operational and business challenges, including:
  - The independent development and maintenance of complex and brittle integrations between 3-1-1 operations and those of county, city, state, federal, and commercial systems.
  - The independent development and maintenance of Geographic Information System (GIS) platforms to facilitate accurate jurisdictional routing.
  - Historical investments in 3-1-1 specialists, processes, and technology in these municipalities are commonly viewed as sunk costs, complicating the potential benefits of a statewide system for the majority of the state’s population.
  - Lack of public awareness of 3-1-1, services offered, and distinctions between related public services (e.g., 2-1-1, 9-8-8, non-emergency police).
  - Turnover, retention, and recruitment issues among 3-1-1 specialists.

1.3 Consolidation Criteria and Considerations

Feasibility Criteria

This study considered the following criteria in evaluating the feasibility of a consolidated statewide 3-1-1 portal:

1. **Data Integrity:** The standardization, completeness, and availability of data across 3-1-1 operations to facilitate accurate and reliable information exchange.
2. **Operational Scalability:** The adaptability and interoperability of 3-1-1 operations and processes, the impact of technology solutions on key business and operational problems, the existence and adoption of shared standards, and marginal benefits to scale.
3. **Governance and Accountability**: Mechanisms available for establishing decision rights, authority, responsibilities, and accountability to guide and oversee the implementation and ongoing operation of the system.
4. **Implementation Complexity:** Effort required to establish favorable preconditions for rollout, effective coordination mechanisms, shared requirements, and the necessary degree of coordination with implementation partners to manage the intricacies of system deployment.

Based on these criteria, the evidence examined by this study suggests a low feasibility of implementing a consolidated statewide 3-1-1 portal in Maryland at this time.

Path Forward

This study identified meaningful opportunities for Maryland to enhance 3-1-1 services across the state by developing shared solutions and making them available to existing 3-1-1 operations or municipalities without 3-1-1 capabilities. These potential solutions include:

- **Integration Platform:** Source and offer a statewide integration layer to facilitate resilient connections and data flows between systems related to 3-1-1.
- **GIS Location Tracking:** Develop an extensible GIS platform for adoption by municipalities without GIS access and maintain critical GIS data for existing 3-1-1 operations.
- **Conversational Interfaces:** Provide statewide self-service conversational interfaces to make information available in natural language interactions via digital channels and/or conversational IVR and to increase the accessibility of 3-1-1 services.
- **Channel Support:** Offer tooling to support a broad range of intake channels, including those unavailable to existing 3-1-1 operations, and to support service-level standardization across channels.
- **Standard Development:** Develop statewide definitions and standards for issue categorization, operational processes, service levels, and training, including a statewide non-emergency 9-1-1 equivalent option.
- **Public Outreach:** Facilitate and implement broad public awareness campaigns for 3-1-1 and other non-emergency services, including support for local community outreach organizations.
- **Adoption Models:** Develop interim hybrid adoption models with clear decision rights and accountability structures (e.g., what the State is accountable for versus the municipality).

The successful implementation of these solutions may increase the future feasibility of a statewide 3-1-1 portal; however, adopting these recommendations is not a guarantee of feasibility. Depending on which recommendations are adopted, the nature of the implementations, and the effects on

operational performance and business outcomes, the feasibility of a consolidated 3-1-1 portal may increase based on the criteria outlined above. Alternatively, the successful implementation of these solutions may produce many of the expected benefits of a potential consolidated, statewide solution, rendering further development of such a portal unnecessary.

2.0 Introduction

2.1 Overview of 3-1-1

A 3-1-1 operation is a non-emergency platform that directs residents to government services and handles general information and inquiries, such as trash pickup, snow removal, noise complaints, or permit requests. Unlike 9-1-1 or 9-8-8, there are no robust, widely adopted standards for 3-1-1, meaning that each 3-1-1 operation tends to arise from and reflect local community needs and priorities. As a result, 3-1-1 operations vary in complexity and service offerings according to local factors like governance structures, demographics, geography, and available funding. Simple 3-1-1 operations may only support a general 3-1-1 phone number. In contrast, more sophisticated programs may also host a call center with IVR support, a website, a mobile app, and complex integrations with jurisdictional entities.

An effective 3-1-1 operation provides a single point of entry for residents to access and receive information on a wide range of municipal services without navigating multiple phone numbers and departments. A typical resident engagement begins with a request made through a website, IVR, or contact center. If the request requires a service response, it is routed to the appropriate department without navigating through additional portals or channels. Additionally, the resident is informed of the request's status to reduce the need for follow-up calls. Some 3-1-1 operations give residents visibility on the status of other service requests made within a specified time frame. For example, if there is flooding on a particular street, or a noise complaint has been filed, residents with access to a portal (mobile app, website, etc.) may be informed of requests already logged for that issue and the resolution status. This reduces the need for the resident to contact 3-1-1 with an additional inquiry or engage the police for resolution. While this offering is not available within all 3-1-1 operations, it underscores the role of a 3-1-1 operation in providing a reliable, single-source platform for residents to engage with their local government regarding non-emergency issues.

As a result, 3-1-1 services encourage the diversion of non-emergency calls away from 9-1-1 emergency lines. The existence of a reliable non-emergency number allows residents to direct calls that may require a response (e.g., downed power line) while keeping emergency channels clear in case of an actual emergency (e.g., fire, car accident). Rerouting non-emergency calls allows 9-1-1 dispatchers to focus on responding to emergencies, enabling faster emergency response times and better public safety.

2.2 Legislative Background

The 2024 Maryland Senate Bill 1068 (SB1068) [1] is intended to evaluate the feasibility of creating a 3-1-1 portal utilizing artificial intelligence and prioritize the creation of the portal if feasible. Such a portal aims to consolidate county and statewide systems to improve efficiency and accessibility for residents. As originally written, the legislation aims to enhance Maryland's non-emergency information and referral infrastructure, with the potential to integrate both community services (2-1-1) and local government services (3-1-1).

Legislative activity predated SB1068. In chronological context, the Maryland Next Generation 9-1-1 (NG9-1-1) Commission first considered a statewide approach to 3-1-1. The 2021 NG9-1-1 Commission report [2] considered many implementation questions and two different models: a

statewide 3-1-1 operation and county-operated 3-1-1 operations within a state ecosystem that would establish technology, cybersecurity, and training standards.

Before SB 1068, two Senate bills addressed 3-1-1: SB0749 [3] in 2022 and SB0030 [4] in 2023. SB0749 was introduced in the 2022 session by Senators Kagan and Reilly. SB0749 proposed the creation of a statewide 3-1-1 Board in the Maryland Department of Emergency Management. It directed the Board to establish a statewide 3-1-1 operation and create requirements, procedures, and standards for that system and the county 3-1-1 operations. The bill largely followed the approach described in the appendix of the 2021 NG9-1-1 Commission report. The bill did not pass out of committee. SB0749 was cross-filed with HB1003 in the House.

SB0030 was introduced in the 2023 session, cross-filed with HB0138. This bill directed the Department of Legislative Services to conduct a study regarding a statewide 3-1-1 operation and set out some questions for the study to answer regarding cost, staffing levels, call volumes, and the possibility of merging 3-1-1 with the existing state 2-1-1 system. These bills both crossed over to the other chamber but did not pass.

SB1068 was introduced in the 2024 session, cross-filed with HB1141, and passed with amendments. The resulting bill directs the Maryland Department of Information Technology (DoIT) to evaluate the feasibility of creating a state 3-1-1 portal and to investigate how artificial intelligence might be utilized in that portal, if feasible.

2.3 Scope of Work

DoIT issued a task order to undertake this feasibility study to include the following content:

- Interviews and user research with relevant constituents, 3-1-1 specialists, relevant state and county officials, governing boards, and other stakeholders critical to understanding:

  a) the problems with the current systems, and

  b) the feasibility, desirability, pros, and cons of establishing a statewide 3-1-1 portal to solve those problems.
- Approaches to leveraging AI in developing a statewide 3-1-1 portal, efficiencies gained by doing so, and anticipated impact on 3-1-1 operations.
- Implications for city/county-level 3-1-1 operations if a statewide system is established.
- Cost predictions for creating a statewide 3-1-1 portal versus a “business as usual” scenario.
- Comparative analysis, market research, data analytics, and literature review to understand:
  - National trends in 3-1-1 operations
  - Current and anticipated uses of AI in these systems and their opportunities, potential impacts, and attendant risks (in particular, weighed against the AI principles established in a 2024 Maryland AI executive order)
  - Case studies on previous attempts to create state-level 3-1-1 operations, with outcomes, lessons learned, and implications for Maryland

The AI executive order mentioned in the scope is the EO titled “*Catalyzing the Responsible and Productive Use of Artificial Intelligence in Maryland State Government*,” [5] signed on January 8, 2024. The principles described in the order are:

- Fairness and Equity
- Innovation
- Privacy

- Safety, Security, and Resiliency
- Validity and Reliability
- Transparency, Accountability, and Explainability

2.4 Structure of the Study

The remainder of the study is organized into the following sections:

- **Section 3** is a current state analysis, describing the six 3-1-1 operations currently in operation in Maryland, some identified challenges (both current and related to consolidation), and stakeholder insights.
- **Section 4** describes national trends in 3-1-1 operations with a peer analysis of nine 3-1-1 operations outside of Maryland, a market scan of vendors selling 3-1-1 solutions, a discussion of AI use cases in contact center environments, and reviews examples of other studies related to 3-1-1 consolidation.
- **Section 5** is an overview of AI contact center technologies, real-world benefits, risks, and opportunities in 3-1-1 (or equivalent environments), and analysis at the use case level.
- **Section 6** outlines different consolidation models considered for this study and implications for Maryland.
- **Section 7** presents the criteria used by this study to assess feasibility and summarizes recommendations.
- **Section 8** discusses cost considerations for Maryland in the absence of other consolidation examples.
- **Section 9** contains appendices and cites references used in the creation of this study.

3.0 Comparative Analysis and Case Studies

3.1 National Trends

As of 2024, nearly 100 U.S. metro areas have implemented 3-1-1 operations [6]. Since 2010, the adoption of online portals and mobile apps for 3-1-1 services has become standard practice. These systems now offer multichannel access, allowing residents to interact via email, SMS, mobile apps, and social media, thereby making the services more accessible. Over the past decade, there has been a notable shift toward cloud-based 3-1-1 services [7]. The rise of artificial intelligence and automation has enhanced the handling of routine informational inquiries and service requests, with chatbots and virtual assistants providing instant responses and freeing human specialists to address more complex issues. Additionally, there is increased interagency collaboration, with 3-1-1 operations facilitating better coordination among city departments and agencies to ensure the efficient resolution of service requests [8].

Despite the growing prevalence for non-emergency services, several factors influence the adoption of 3-1-1 operations. Budget constraints can impact the implementation and expansion of these systems, particularly for municipalities. Larger cities often have more complex 3-1-1 operations to manage denser populations. Furthermore, local policy and regulation can drive the adoption of 3-1-1 technologies.

The operational development of 3-1-1 operations also faces challenges. Cities often struggle to integrate new 3-1-1 platforms with existing legacy systems. Ensuring adequate training for both

employees and residents can be difficult. Additionally, as urban centers grow, scaling 3-1-1 operations to meet increasing demands poses another challenge.

Overall, the 3-1-1 solutions market in the United States is rapidly evolving, driven by both technological advancements and changing public expectations. Municipalities are increasingly seeking solutions that offer flexibility, integration capabilities, and robust data analytics to enhance service delivery and resident engagement.

To further understand these trends, this study benchmarked nine other 3-1-1 operations outside of Maryland by visiting their web portals, reviewing budget documents and local news articles about modernization efforts, and, where publicly reported, analyzing service request data for the trailing twelve months (January 2024 through December 2024).

Table 1: Publicly Reported 3-1-1 Operation Data for Nine Major U.S. Municipalities

City/County	Population	311 Office	311 Portal	Mobile App	311 Phone Number	Chatbot
Austin	980K	Yes	Yes	Yes	Yes	No
Houston	2.31M	Yes	Yes	Yes	Yes	No
Denver	716K	Yes	Yes	No - Website is Mobile Friendly	Yes	Yes
Washington, DC	679K	Yes	Yes	Yes	Yes	No
Boston	654K	Yes	Yes	Yes	Yes	No
Los Angeles	3.82M	Yes	Yes	Yes - MyLA311	Yes	Yes
Atlanta	511K	Yes	Yes	Yes - ATL311	Yes	Yes
New York City	8.26M	Yes	Yes	Yes	Yes	No
San Diego	1.39M	Yes	Yes	Yes	No	No

3.2 Peer Observations

Performance Metrics and Key Performance Indicators — Examining the peer set and corresponding budget documents, this study observed no consistent set of measures for 3-1-1 performance. Measures documented across the peer set include:

- Customer satisfaction score
- Time to answer — either as a percentage of calls answered within a target (e.g., 60 seconds) or a median or mean time to answer
- Number of calls — statistics such as calls queued, handled, and abandoned
- Average handling time of a call
- Number of service requests created
- Cost per customer contact

Overview of Contact Channels — Typical channels for contacting a 3-1-1 operation include voice, text, and requests generated by internal government or commercial entities. The 3-1-1 phone number was utilized in eight out of nine jurisdictions (with San Diego being the outlier). Most of the operations also offered an alternate phone number for callers outside the region (for example,

someone commuting to a job outside the jurisdiction). Additionally, some provided a dedicated interaction point for the hearing impaired.

Text-based channels represented a variety of technologies, with web portals, mobile applications, and chatbots being the most common. Other channels, such as text messaging, email, and social media are supported by several 3-1-1 operations in the peer set, though the volumes appear minimal. In some of the datasets examined by this study, there was a material (5% to 10% of requests) proportion of service requests generated by employees or city/county contractors and labeled as "Internal." Finally, there were operations that allowed service requests to be submitted by channels such as fax or in-person interactions.

Table 2 shows representative distributions from two 3-1-1 operations in the peer set and two 3-1-1 operations in Maryland, Baltimore City [9] and Montgomery County [10]. These numbers were derived from a 12-month sample of service request data in each jurisdiction. Boston is an outlier in the data, with just 31% of its requests coming in via voice [11].

Table 2: Comparison of 3-1-1 Interactions by Channel

311 Center	Voice	Web + App	Internal	Other	In-Person	Mail	Fax
Boston	30.60%	57.10%	12.20%	--	--	--	--
Denver	73.00%	13.00%	10.80%	2.10%	0.20%	--	0.90%
Baltimore City	58.39%	36.73%	4.14%	0.01%	--	0.73%	--
Mongomery County	76.64%	17.87%	5.20%	0.00%	0.28%	--	--

Variances in Mobile App Volume — 3-1-1 operations commonly support a mobile application on both Android and iOS platforms. CRM systems examined by this study often shared the same Application Programming Interface (API) for web and mobile applications, meaning there was no way to determine the specific channels (e.g., a mobile app) using the API. Of the three 3-1-1 operations in the peer set where that data was available, the variance was substantial: 1.36% of contacts in Austin; 12.65% of contacts in Denver; and a surprising 55.7% of contacts in Boston. Boston first launched their mobile app in 2009 and reported that in 2010, mobile was responsible for 6% of service requests, and by 2014 the mobile channel had grown to 28% [12]. One Maryland 3-1-1 director interviewed in this study maintained that, in their experience, a robust public awareness campaign to accompany a technology rollout is required to drive the successful adoption of mobile applications.

Chatbots and Use of Conversational AI — Four out of nine 3-1-1 operations in the peer set provided a chatbot as an optional interaction channel. Half of the chatbots offered utilized generative AI technology (Atlanta's *Ava* and Denver's *Sunny*) instead of systems powered by retrieval from logic trees. In Maryland, the Montgomery County 3-1-1 operation utilizes a generative AI-powered chat interface (Monty) to respond to basic information requests, but it does not currently execute service workflows. For reasons mentioned in the Overview of Contact Channels, it is difficult to determine how much traffic these chatbots handle. One Maryland 3-1-1 director interviewed in this study reported roughly 1% of interaction volume via chatbot. This study directly tested these available chatbots and found that none of them will directly create a service request, though they will redirect the user to a web form for making a request.

Non-Emergency Police Phone Number — Six out of nine peer jurisdictions offered a non-emergency police phone number. These numbers are used to report police matters that do not require an immediate dispatch (e.g., an overnight vehicle break-in or an abandoned vehicle). One Maryland Emergency Management director interviewed in this study noted a substantial impact on lowering non-emergency volume into 9-1-1 in municipalities with this option. Within its scope, this study did not uncover sufficient data to determine the effects to 3-1-1 call volumes but identified this

as an opportunity for further research, as these volumes may potentially impact the current understanding of 3-1-1 demand across the state if fielded by certain 3-1-1 operations in municipalities without this option.

Hours of Operation — Five out of nine jurisdictions operated a 24/7 call center. The others operated with extended hours longer than local city or county office hours – typically between 12 and 17 hours on weekdays, with shorter weekend hours.

Publishing Service Request Data — Eight of the nine jurisdictions in the peer group made their 3-1-1 service request data publicly available. Seven utilized the Open311 protocol [13], and one published a data dashboard to allow the public to query the 3-1-1 dataset. Open311 is an evolving initiative to develop a decentralized, open-source protocol for location-based collaborative issue tracking, but this study found that it lacked the robustness, stability, and adoption to be considered an equivalent standard to those set by state government or widely recognized standards bodies (e.g., NIST).

Taxonomy of Requests — This study found no common service request taxonomy across observed 3-1-1 operations, with each center choosing to organize in a way that makes sense for them based on local factors. The 3-1-1 datasets typically include a field such as *Case Title*, *Type*, or *Source* indicating the nature of the issue. When filtering those fields for unique issue categories, the number of categories typically varies between 100 and 300 types of interactions. Common categories include abandoned vehicles, lost animals, noise disturbances, potholes, billing complaints, parking complaints, trash pickup, sidewalk repair, and streetlight issues. Additional variance in 3-1-1 operations occurs when they further decompose those categories into tiers of sub-categories. The data often showed between 20 and 30 different subcategories of service requests related to trash pickup alone. The specifics of the jurisdiction also drive variance. For example, parking enforcement is the top issue for Boston, with over 22% of the contacts, while in Denver, illegal parking ranks below 40 other issues, with only 0.52% of the contacts.

Requests for Information versus Service Fulfillment Requests — A notable observation across 3-1-1 operations is the proportion of contacts requesting basic information, but the data is complicated by only certain 3-1-1 operations delineating service requests (SR) from informational requests (IR). This volume represents the potential for rapidly developing conversational interfaces (e.g., chatbots, advanced IVR) to help resolve these issues, though the nature of 3-1-1 services largely consists of compound, multijurisdictional issues requiring the execution of complex workflows.

Table 3: Comparison of Informational Requests to Service Requests

311 Operation	Information Requests (IR)	Service Requests (SR)	Ratio of IR vs. SR
Denver	212,302	452,430	46.9%
Baltimore City	307,677	1,024,624	30.0%
Montgomery County	281,057	533,425	52.7%

Language Assistance and Translation — Integrating AI-driven translation services into 3-1-1 web portals is a common practice. Some 3-1-1 call centers provide bilingual staff or translators, primarily for Spanish-speaking residents. Enabling greater accessibility through more robust language services represents an opportunity to enhance 3-1-1 services across municipalities.

Technology — All nine peer municipalities evaluated in this study use a Customer Relationship Management (CRM) system to receive and track service requests. The Vendor Market section of this study provides a more in-depth overview of 3-1-1 technology, and the technology used in the peer set was consistent with that market scan.

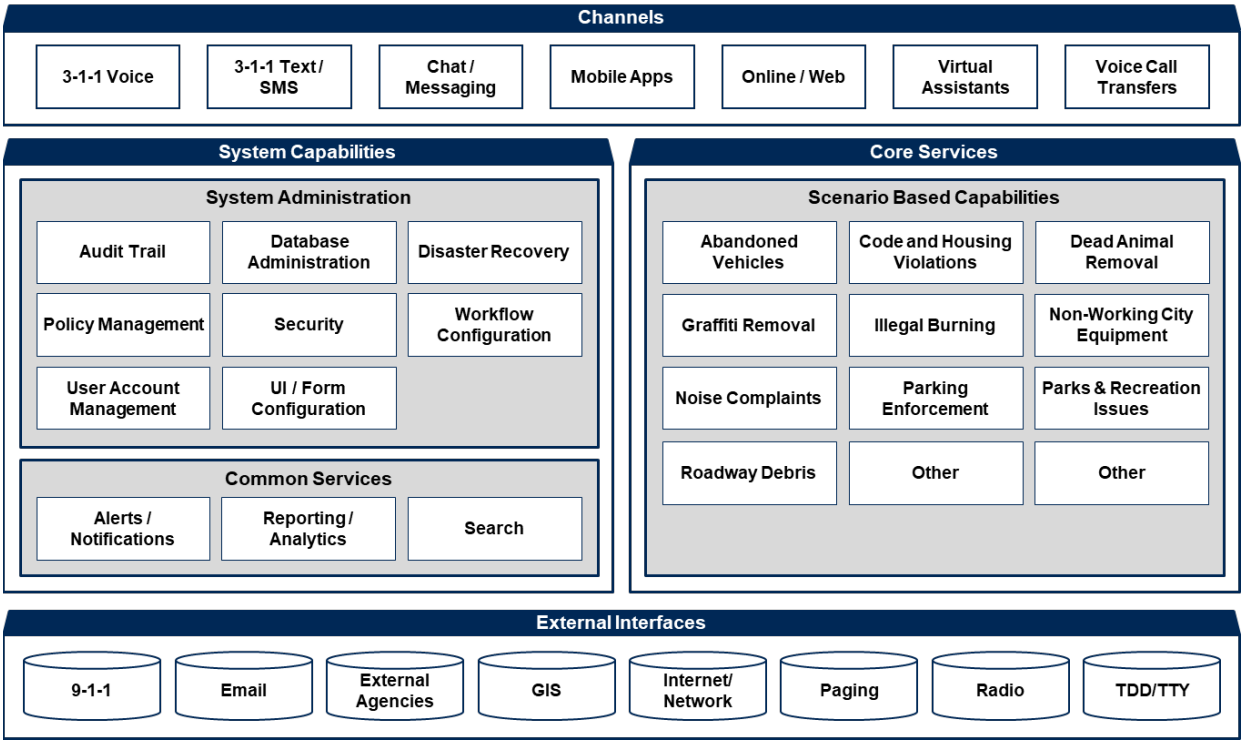
GIS Mapping — An effective 3-1-1 operation requires robust and well-maintained GIS data to determine jurisdiction, identify where specific services are offered, and route agency or commercial workers as needed. One Maryland 3-1-1 director estimated that two-thirds of their calls involved the need to track services to a specific location. Municipalities in the peer set also relied on the development and maintenance of their GIS systems to fulfill requests.

3.3 Vendor Market

To evaluate the technology market, this study examined a cohort of twelve prominent 3-1-1 vendors and their respective solutions. This sample group leverages Gartner research on CRM, CIM, 9-1-1, and 3-1-1 vendor markets, in addition to publicly available information and subject matter expert experience with vendor solutions. This study selected a cross-section of the market to include established legacy vendors and newer entrants with demonstrated technology deployments. The vendors considered in the sample group for this study were Accela, Catalis, CivicPlus, Comcate, Granicus, Motorola, Nebulogic, Oracle, Salesforce, Trimble, Tyler Technologies, and Verint. Vendors were selected to represent a representative cross-section of the market, and this list should not be considered exhaustive.

Findings from the vendor market scan are presented with respect to two models. The first is Gartner's *3-1-1 Solution Capabilities Model* (Figure 1), which describes the core functional capabilities and services required by a typical 3-1-1 solution and highlights functionality which represent differentiating capabilities for the vendors (Figure 3). Vendors included in this market scan provide solutions consistent with this capability model.

Figure 1: Gartner 3-1-1 Solution Capability Model (or 'Reference Framework')



Since the inception of the 3-1-1 operational concept in the 1990s and subsequent proliferation of 3-1-1 operations across the U.S., the 3-1-1 vendor market has grown and matured. Some vendors have been operating in the 3-1-1 market for less than a decade – many for much longer.

The marketplace is primarily comprised of vendors from other service domains such as 9-1-1, asset management, and CRM. This study finds this to be a representative cross-section in terms of the duration of their 3-1-1 solutions in the market, the scope of functionality offered, and the relative age of the core technical platforms and architectures of the solutions themselves. Newer entrants exhibit more contemporary architectures, which provide critical flexibility, among other technical advantages. In contrast, traditional solution architectures exhibit more maturity (considered “proven”) while simultaneously contending with the risks of legacy technologies in the marketplace.

Differentiation between vendors is evident primarily in their solution architecture for delivering key functionality or addressing common 3-1-1 issues. Contemporary architectures prioritize agility and scalability, often at the cost of increased complexity, while traditional architectures prioritize stability and familiarity, potentially lacking flexibility for rapidly evolving technology environments and dynamic customer needs.

In this context, contemporary solution architectures are considered those leveraging some or all of the following attributes:

- **Cloud-Native:** Created to optimally leverage or implement cloud characteristics. Those cloud characteristics are part of the original definition of cloud computing, and include capabilities delivered as a service. Cloud computing characteristics also include scalable and elastic, shared, metered by use, service-based, and ubiquitous by means of internet technologies.
- **AI-Enabled:** Core systems designed from the beginning to leverage a broad range of artificial intelligence capabilities, rather than simply “bolt-on” or augment those capabilities with AI later.
- **Edge Computing:** Part of a distributed computing topology where information processing is located close to the “edge” (e.g., on a device such as a mobile phone), at the endpoints where other systems and people produce or consume that information.
- **Event-Driven:** A design paradigm in which a software component executes in response to receiving one or more event notifications. Event driven architecture is more loosely coupled than the client/server paradigm because the component that sends the notification doesn’t know the identity of the receiving components at the time of compiling.
- **Domain-Driven:** Systems designed to support and operate people and processes necessary to solve business problems specific to a particular industry or sub-industry.

Table 4: Solution Architecture Considerations

	Advantages	Challenges
Contemporary Architectures	**Scalability:** Easily scale up or down based on demand using cloud-based services, enabling efficient resource allocation. **Agility:** Quick development cycles and rapid deployment of new features due to modular design and automation. **Flexibility:** Ability to integrate diverse technologies and adapt to changing business needs through microservices and APIs. **Cost-efficiency:** Pay-as-you-go cloud model can reduce infrastructure costs by only utilizing needed resources. **Innovation:** Leverage cutting-edge technologies like AI, machine learning, and big data analytics.	**Complexity:** Managing distributed systems with multiple components can be challenging. **Vendor lock-in:** Reliance on specific cloud providers can limit flexibility and portability. **Security concerns:** Increased attack surface due to the distributed nature and reliance on cloud services. **Learning curve:** Requires expertise in new technologies and development practices.
Traditional Architectures	**Stability:** Proven design patterns and technologies with a strong track record of reliability. **Maintainability:** Familiar codebases and well-documented processes can simplify maintenance. **Legacy integration:** Easier integration with existing systems and databases. **Security maturity:** Established security practices and controls are often well-defined.	**Limited scalability:** Difficulty in scaling to meet rapidly changing demands without significant re-architecture. **Slow development cycles:** Longer time to market due to rigid design patterns and complex deployment processes. **Inflexibility:** Difficulty adapting to new technologies and business requirements. **Potential for high cost:** Maintaining legacy infrastructure can be expensive

Figure 2 presents this study's perspective of the 3-1-1 Vendor Market using a sample group of vendors plotted against Gartner's dimensions of perceived quality of Products and Services offerings and the overall Company Maturity and Vision**.**

"Products and Services" describes the solutions provided to the 3-1-1 market and considers three categorizations of these solutions: 1) Foundational; 2) Differentiating and Proven; and 3) Transforming and Strategic.

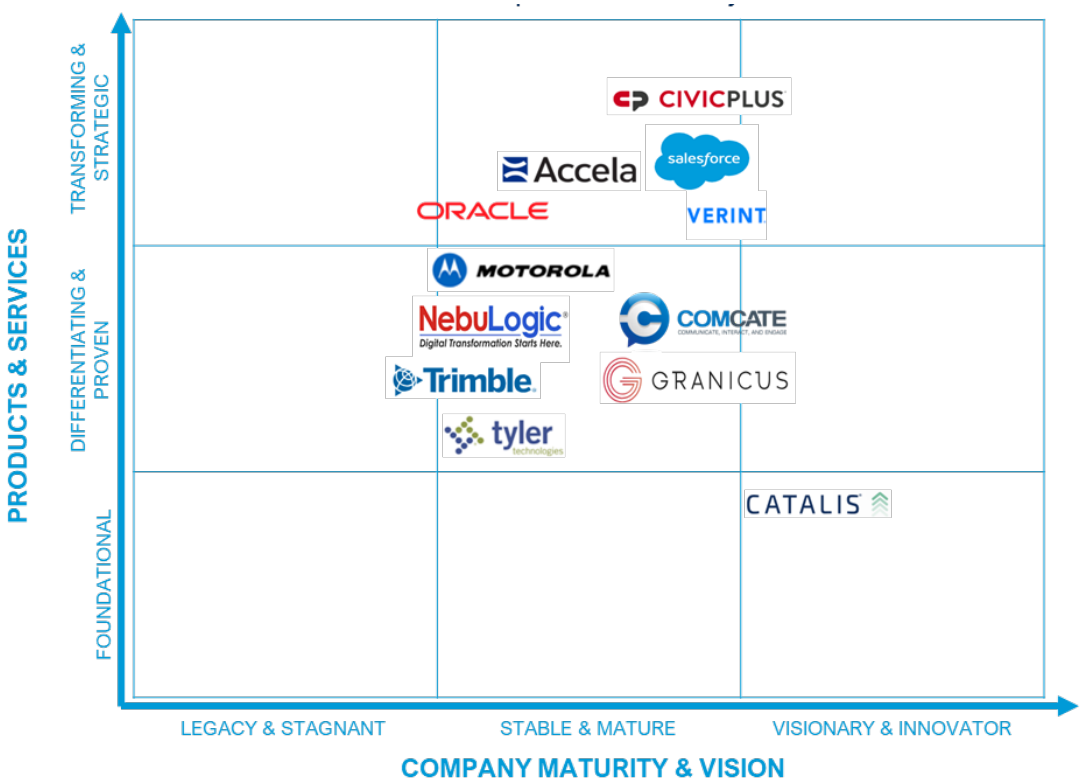
"Company Maturity and Vision" describes a vendor's position in the market over time as it relates to their solution offerings in the 3-1-1 market and considers them as 1) Legacy and Stagnant, 2) Stable and Mature, or 3) Visionary and Innovator.

Most vendors are perceived to be Stable and Mature, with distinctions between "Differentiating and Proven" and "Transforming and Strategic" products and services.

- Vendors that are considered to be "Differentiating and Proven" have solutions with known reliability and offer a subset of unique features that contribute to business value.

- Vendors considered to be “Transforming and Strategic” provide business value while advancing the growth of the industry by investing in emerging capabilities to address future needs. These vendors place a greater emphasis on AI and IoT technology within their solution approach.
- The sole vendor within the “Visionary and Innovator, Foundational” segment received this placement due to its recent entry into the marketplace and its focus on providing a broad range of resident engagement capabilities to address municipal business needs.

Figure 2: 3-1-1 Vendor Market Comparison (Sample Group)

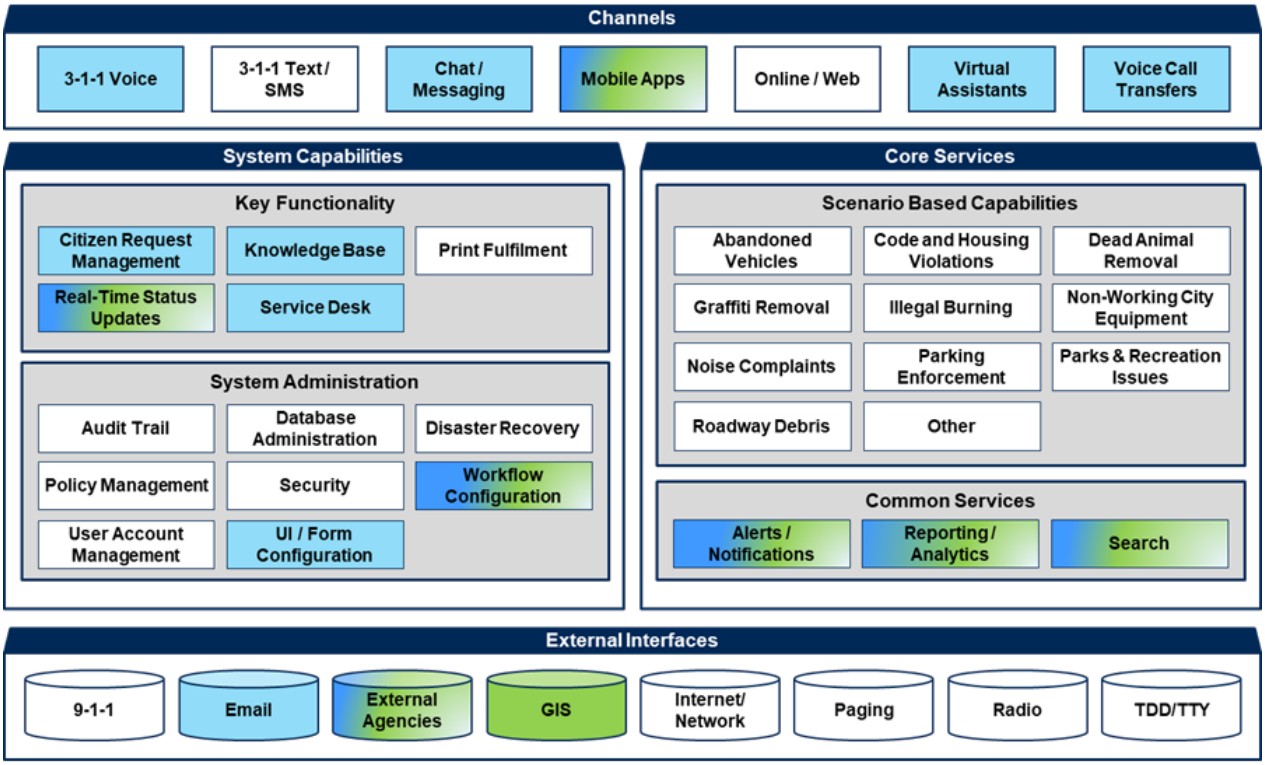


Vendors with roots in asset management address 3-1-1 operations with an ‘asset first’ approach. These vendors optimize workflow so service requests are received, recorded, and dispatched accurately for fast resolution times. Differentiators within this space are automated workflows, dispatching, GIS integration, geo-tagging, and predictive maintenance.

Vendors with a historical specialization in CRM are focused on the overall customer experience. Their differentiating capabilities in 3-1-1 tend to be Chatbot integration, omni-channel communication, real-time alerts/notifications, various agent assist tools, Call Transcription/Summary creation, Knowledge Base Management, and automated call routing.

Selecting a 3-1-1 solution requires aligning the organization’s needs with the vendor’s strengths and capability offerings. Understanding the core focus of the solution and its architectural framework is essential for choosing a vendor that aligns with operational priorities and long-term strategic goals.

Figure 3: Gartner 3-1-1 Solution Capability Model, Differentiating Capabilities



CRM Differentiating Capabilities

Asset Management Differentiating Capabilities

3.4 Review of Prior 3-1-1 Consolidation Studies

While statewide 9-1-1 operations exist, it is primarily governing bodies for strategy, standards, funding, and providers of the backbone statewide 9-1-1 telephony and IP networks. There is still local control and autonomy at the municipal level, at the 9-1-1 center level (or 'Public Safety Answering Point – PSAP). For example, the State 9-1-1 board is often responsible for providing the statewide 9-1-1 telephony (legacy) and IP (Next Generation/NG9-1-1) networks to the various municipal and regional 9-1-1 centers, but each 9-1-1 center is primarily locally funded, owned, and operated. In some examples, the state might provide a common 9-1-1 call-taking system that the local 9-1-1 centers can use or they may procure their own. For the dispatching solution (or Computer Aided Dispatch – CAD), the local PSAPs often have full control over the vendor solution they wish to procure. In essence, the state level provides overall governance, some degree of centralized funding, and provision of the backbone. The 9-1-1 centers are in control beyond that.

Similarly, there are no examples of statewide 3-1-1 operations; however, the State of MD could consider a centralized function like the State 9-1-1 board that could be responsible for overall 3-1-1 strategy, governance, standards, some degree of centralized funding, and potentially a consolidated IT team of subject matter experts, vendor contract managers, and other IT support personnel.

Scale is not the primary issue – the New York City 3-1-1 operation serves over eight million residents, which is larger than many states. Instead, it appears that 3-1-1 operations are intertwined with local government problems and operations and combining 3-1-1 operations introduces sufficient added complexity and integrations to offset potential economies of scale.

The National Center for Public Performance E-Governance Institute at Rutgers-Newark published a statewide 3-1-1 feasibility study in 2007 titled "*Developing a Statewide 311 System in New Jersey*" [14]. The study concluded that a statewide 3-1-1 system, which would service all municipalities, counties, and state agencies in New Jersey, was feasible. The study considered three implementation options: building the 3-1-1 operation on the existing 2-1-1 platform; an entirely new 3-1-1 operation; and developing a Newark based 3-1-1 and then adding other cities, counties, and state agencies.

The study surveyed 14 existing 3-1-1 operations: Chattanooga, TN; Hampton, VA; Louisville, KY; Austin, TX; Orlando, FL; Somerville, MA; Rochester, NY; Riverside, CA; San Jose, CA; Akron, OH; Minneapolis, MN; Houston, TX; San Antonio, TX; and Birmingham, AL. At the time of the study, New Jersey had no existing 3-1-1 operations; the City of Newark considered developing one.

The study provides a market scan of existing vendors, and an analysis of the 14 centers surveyed using four categories of system performance: usability, service, operations, and system measures (metrics). This was used to determine "what good looks like" and establish functional requirements for a statewide implementation. The study also lays out criteria for successful implementation across usability (seven criteria), system measures (13 criteria), and leadership (seven criteria).

The budget estimate was built using budget data and 3-1-1 call volumes to determine an average 3-1-1 call volume (calls per capita, per month) and the average per capita annual cost share. The study estimated that (in 2007) start-up costs would range from $1 to $12 million, depending on whether it was implemented statewide or in the City of Newark, and the annual operating expenses would be $26 million, or about $3 per resident. Ultimately, no statewide 3-1-1 operation was developed or implemented in New Jersey.

A 2008 report by the Director of Process Improvement for DeKalb County, Georgia titled "*Call Routing for 311: The Issues and Solutions*" [15] highlighted barriers to effective routing of 3-1-1 calls across the state of Georgia, inhibiting statewide initiatives. Notable issues with jurisdictional routing, lack of practical funding models, and geopolitical complications lead to the conclusion that "connecting residents to their call center sometimes requires more forethought" than existing processes allow.

The International City/County Management Association (ICMA) published an instructive 2017 report titled "*Customer Service and 311 Technology in Local Governments: Lessons on Connecting with Citizens*" [16] which surveyed 2,287 local governments on the nature and maturity of their 3-1-1 operations. The survey found momentum toward consolidating services 3-1-1 offered by local municipalities to the city or county level but did not mention statewide consolidation examples.

The lack of documented instances of other statewide 3-1-1 consolidations indicates that the perceived benefits of such a consolidation (e.g., improved service, more efficient resource allocation) have not been determined to outweigh the costs of the extensive operational, technological, and governance requirements. Maryland would be the first state to develop and implement such a system in the United States.

4.0 Current State Analysis

4.1 Overview of Existing Systems

Six 3-1-1s were identified across Maryland's 23 counties and one independent city. Those counties with existing 3-1-1 operations are Baltimore City, Prince George's County, Montgomery County, Anne Arundel County, Baltimore County, and St. Mary's County. Table 5 lists comparable attributes of these centers.

Table 5: Maryland 3-1-1 Operation Summary*

City/County	Population	311 Office	311 Portal	Mobile App	311 Phone Number	Chatbot?	Budget	Headcount	Annual Call Volume
Baltimore City	565K	Yes	Yes	Yes	Yes	No	$5,767,825	61	561,672
Prince George's County	947K	Yes	Yes	Yes	Yes	No	$2,326,500	31	322,000*
Montgomery County	1.058M	Yes	Yes	No	Yes	Yes	$5,092,414	43.7	258,000*
Anne Arundel County	594K	No	Yes	Yes	Yes	No	N/A	N/A	46,800*
Baltimore County	845K	No	Yes	Yes	Yes	No	$688,968	---	83,576*
St. Mary's County	115K	No	Yes	No	No	No	N/A	N/A	N/A

**Note: Rather than Annual Call Volume directly, some municipalities track different measures of volume (e.g., calls answered, requests generated)*

This study also considered three Maryland Counties that do not have 3-1-1 services to determine how uniform the resident experience would be. Howard County, with a 2023 Census estimated population of 336,000, does not have a 3-1-1 service but does have a common services portal. There is no central phone number; rather Howard publishes a phone directory and a "Tell HoCo" app on its website. Washington County, with a population of 155,000, has a central phone number and a consolidated list of services on its website. The services utilize a mix of different technologies. Worcester County, with a population of 54,000, does not have a common services portal; it does have a central phone number and extensive information on the website. This study found that even if a county does not have a dedicated 3-1-1 operation, it might still possess attributes of a 3-1-1 jurisdiction.

Maryland 3-1-1 operations do not receive regular state or federal funding. Examining the 2025 budgets for each of these municipalities, the 3-1-1 operation is either operating as an agency/office or, in some cases, embedded in the county's IT function.

The existence of a 3-1-1 operation is highly correlated with population. Five of the six Maryland 3-1-1 operations are in the five most populous municipalities: Montgomery County, Prince George's County, Baltimore County, Anne Arundel County, and Baltimore City. The one outlier is St. Mary's County. These counties cover 67% of Maryland's population [17].

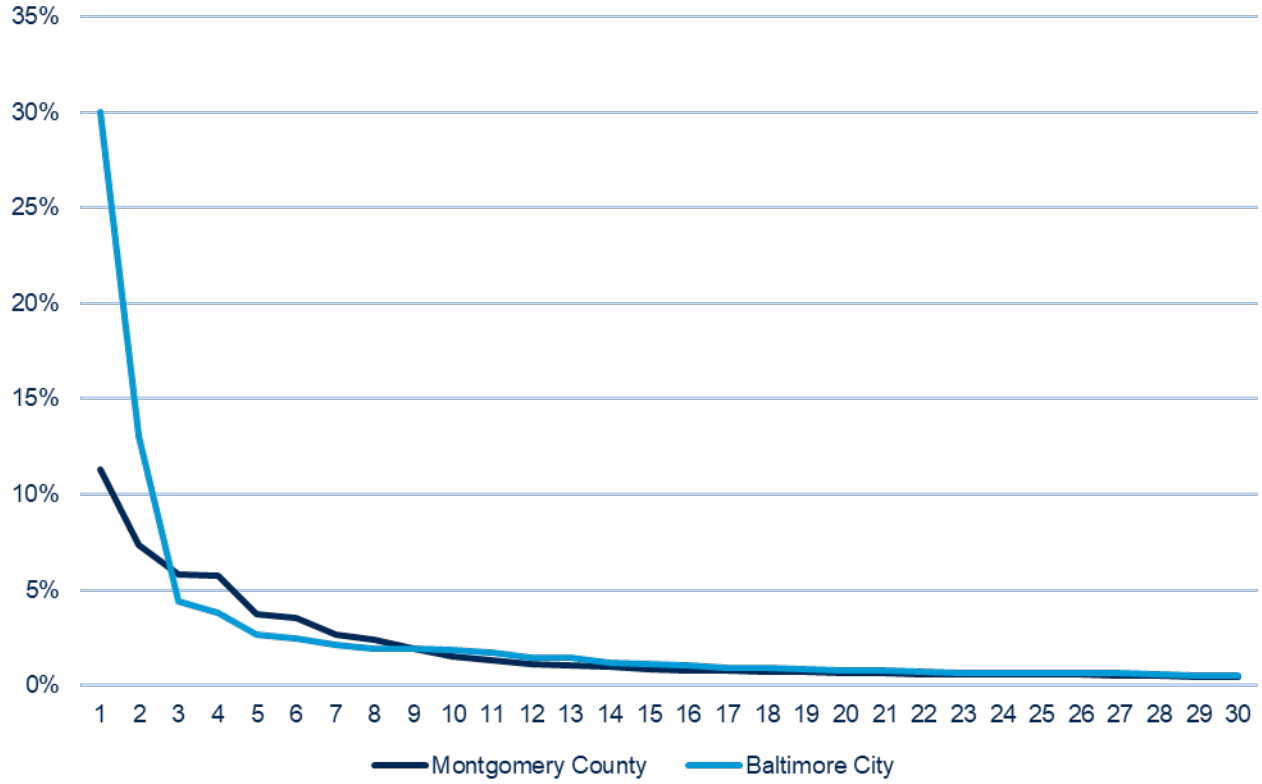
Montgomery County and Baltimore City both publish their 3-1-1 service request data publicly. This study analyzed service requests for Baltimore City covering the calendar year 2023 (January 1 through December 31) and requests for Montgomery County for the 12-month period from December 1, 2023, through November 30, 2024. Details of how the service requests are distributed by channel are highlighted in Table 2.

Of note is that both 3-1-1 operations receive the majority of their requests by voice (phone call): 76.7% for Montgomery County and 58.4% for Baltimore City. Both centers generated nearly 4% of their requests from internal sources (e.g., city/county employees and contractors). The conclusion is that the CRM systems for both centers are tightly integrated with agency systems, and requests are moving in both directions. This tight integration complicates potential consolidation approaches, as the alternative to breaking the integrations is to build and maintain new integrations.

As was found with the peer group 3-1-1 operations, a large portion of the requests were for basic information. For Montgomery County, 52.7% of the requests in the dataset were identified as information requests; for Baltimore City, 30% of requests were informational. Information requests are good candidates for a consolidation approach, as they can potentially be resolved through self-service. Challenges include maintaining the hundreds or thousands of knowledge base articles that might support a single locality, and that even basic informational requests might require location tracking via a GIS map to resolve.

Another commonality with the peer group 3-1-1 operations was the diversity of service request types. Baltimore City maintains 289 unique service request types in its CRM system, while Montgomery County maintains 330 unique service request types. The Open311 data protocol does not provide a clear taxonomy of service request types. To determine commonality, this study sampled the 30 most frequent requests from Baltimore and Montgomery. Both data sets had long tails of infrequently requested services, as shown in Figure 4. Comparing the specific service requests in the top thirty samples did not yield a discernible pattern. Solid waste (trash) occurred frequently in both jurisdictions' top 30, but the specific service requests varied in frequency and detail. Some requests appearing on one list did not seem to have an equivalent on the other list. The conclusion is that there is no canonical list of 3-1-1 services that applies across multiple jurisdictions; there are many similar services, but the specifics of the service will be unique to each jurisdiction (e.g., the process of ordering a new trash can).

Figure 4: Frequency of Most Common Service Requests*



**Note: This figure charts the frequency of the 30 most common service types in publicly reported 3-1-1 data. For example, the most frequently occurring service request in Baltimore City (1) makes up ~30% of all service requests, the second most frequent (2) makes up ~13%, and the third most frequent (3) makes up ~4%. This visual illustrates the long tail of different service requests found in the data.*

4.2 Identified Challenges

3-1-1 operations require the active engagement and coordination of multiple local departments and service providers to be responsive to their constituency. Given that 3-1-1 operations are governed locally, each program is distinct and may face unique challenges.

This study conducted a series of interviews with executive and operational leadership across Maryland Emergency Management (MDEM) and 3-1-1 operations at both the county and city levels to gain a direct understanding of the state of Maryland's 3-1-1 operations. Common challenges include, but are not limited to:

Call Intake and Resident Engagement

U.S. residents have several three-digit numbers available to them; 9-1-1 is the best known, and other common services that may overlap with 9-1-1 and 3-1-1 include 2-1-1 and 9-8-8. Many jurisdictions also operate a non-emergency police phone number.

9-1-1 service was implemented in the U.S. in the late 1960s [18] and is supported at the federal level by the National Telecommunications and Information Administration (NTIA) and the Federal Communications Commission (FCC) [19]. At the state level, models vary from strong statewide governance and funding of 9-1-1 systems to federated 9-1-1 coordination with locals across the state or region. The most common model is the state having 9-1-1 authority for planning,

coordination, and funding with local jurisdictions. This is the model adopted by Maryland, with 9-1-1 systems in all 24 counties and independent cities [20].

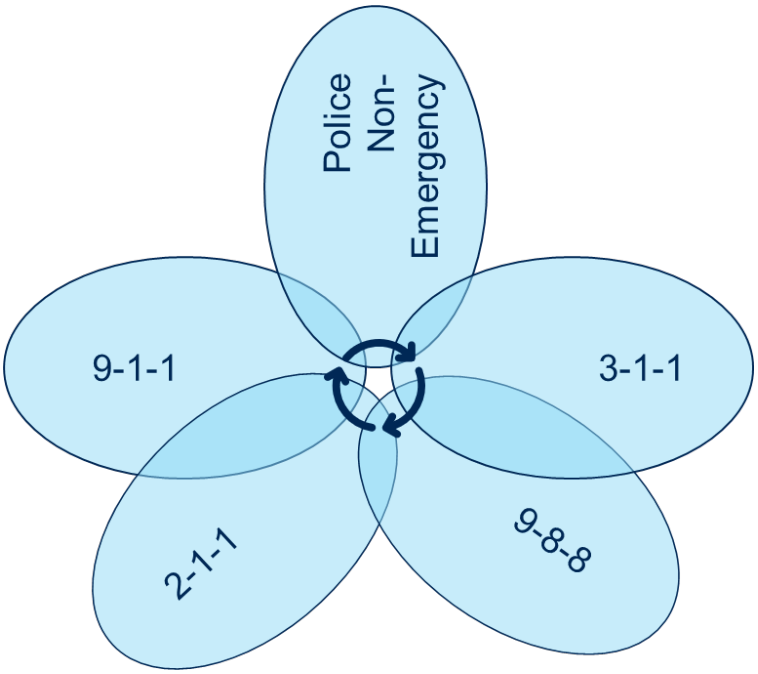
3-1-1 is a more recent, specialized number providing access to non-emergency city or county services. The first 3-1-1 operation was implemented in Baltimore, Maryland, in 1996. 3-1-1 does not have the same support structure as 9-1-1; it is locally governed and funded. Six 3-1-1 operations operate in Maryland across its 24 counties and independent cities.

2-1-1 is a number for connecting with community and human services. Originating at a similar time to 3-1-1, the first 2-1-1 system was implemented by the United Way of Metropolitan Atlanta in 1997. It quickly grew into a national service with roughly 200 local agencies across the country responding to 21 million requests each year [21]. In Maryland, 2-1-1 is operated as a statewide service by the Maryland Information Network, a 501(c)(3) nonprofit.

9-8-8 is a number for suicide prevention called the *9-8-8 Suicide & Crisis Lifeline*. 9-8-8 was launched in 2022. Since launching, 9-8-8 centers have received over 6.4 million calls, 1.4 million chats, and 1.6 million texts [22]. The Maryland Department of Health is tasked with managing the 9-8-8 program and administering a trust fund for the program.

The overall question of “who should I call?” can be further complicated by non-emergency police lines intended for police matters that do not require an immediate dispatch, such as reporting an overnight car break-in. The graphic in Figure 5 represents the overlap between these services.

Figure 5: Common Government Service Numbers



The individual services have defined scopes. One slogan used to represent this is “*Burning building? Call 9-1-1. Burning question? Call 3-1-1*”. However, not every situation is clearly defined. In interviews conducted by this study, Maryland 9-1-1 directors described high volumes of calls to the 9-1-1 service that were not emergencies. One director speculated that the call volume was, in part, driven by the reliability of connecting to a person when contacting 9-1-1. The inverse problem was also noted – calls or emails to 3-1-1 for emergent issues that should have gone to 9-1-1 for an immediate response.

3-1-1 specialists understand the need to refer calls to other services and either advise the caller on whom to call or will facilitate a warm transfer to the correct service. This relies on the 3-1-1 specialist having a sound understanding of when to refer those calls, where to send them, and which tools to use to do so effectively.

This study attempted to measure the overlap of 3-1-1 calls with the other three-digit services, especially 9-1-1 – calls that came into 3-1-1 and were then referred to other services. The 3-1-1 data sets do not have standardization of service request types; two of them included referrals to 9-1-1 or non-emergency police. The numbers here are included as an indicator of the potential significance of this problem. The City of Denver dataset included 38 variations of a 9-1-1 referral, which accounted for 11.69% of the 3-1-1 calls. The City of Denver also tracked 2-1-1 referrals, which accounted for

just a fraction of one percent – 69 referrals out of 452,430 service requests. The City of Austin dataset tracks non-emergency referrals to the Austin Police Department, accounting for 16.85% of the service requests. Austin and Denver both have dedicated police non-emergency numbers.

Jurisdiction (Private Property, Federal, State, Commercial)

3-1-1 service requests are often tied to a location – even requests for information might need an exact location (e.g., what day of the week is my trash pickup?). The location is also important for determining what entity is responsible for the issue/request or whether a particular service is offered at that address. This requires a detailed GIS map specific to a city or county, which may not exist. In interviews, 3-1-1 directors explained that this is a different map layer than what is used for 9-1-1, and an existing 9-1-1 GIS map isn't interchangeable with a 3-1-1 map. A consolidation requirement would have, as a prerequisite, a GIS project in each county to determine what GIS data already exists, what gaps there might be between existing maps, and what effort would be required to bridge those gaps.

Integration with County/City Systems

In interviews with 3-1-1 directors, a common technical architecture was to use a central CRM system to handle the initial request intake and then pass the service request to the office or department that would fulfill the request. Those recipients were either using the CRM system to work on the request, or the request was passed into a department-specific system to be worked and then passed back to the CRM system. Both scenarios create challenges for a consolidated model. In the case of employees working requests inside the CRM, the county would still need a CRM system. Then it would need to integrate it with the consolidated system (assuming the consolidated system is creating service requests). For employees working requests inside a line of business system, integration would also need to be developed to pass tickets to the consolidated system. These integrations can be complex even inside a single county; one of the counties interviewed was running a project to implement an enterprise service bus to manage all of their existing integrations better. In either case, the resulting system would have more potential points of failure than a county-specific system.

Police Non-Emergency Lines

A special case of the integrations described above is the potential existence of a dedicated line for police non-emergencies. Examples of issues that might go to a non-emergency line include reporting burglary or vandalism where the suspect is not present, nuisance complaints like barking dogs or noise complaints, and administrative matters like requesting a report for an insurance claim. There is no standard set of criteria for which types of calls should go to a police non-emergency line, and not every jurisdiction has a non-emergency line. In a consolidation scenario, there could be a mix of counties with and without non-emergency lines, each with different sets of requests that the non-emergency line would handle. In at least one of the 3-1-1 datasets this analysis looked at, the non-emergency line/service was integrated and able to accept service requests that originated in the 3-1-1 center.

Governance, Responsibility, and Accountability

Currently, 3-1-1 operations are managed at the local level. A consolidated model would require an additional level of governance above the county level to coordinate decision-making. Maryland has a robust 9-1-1 governance structure that could be a model for setting this up. This was considered in the 3-1-1 discussion in Appendix E of the 2021 NG9-1-1 Commission Annual Report [23].

Funding Models

3-1-1 operations are also funded at a local level. A consolidated model would require an additional funding stream, perhaps appropriated at the state level. For reasons described below, there are unlikely to be material savings at the county level for existing 3-1-1 centers, so a consolidated model should not anticipate being funded out of existing county 3-1-1 spend.

Investments in Existing 3-1-1 Centers

For counties with an existing 3-1-1 center, as described above, tight integrations with departments would require that most or all of the infrastructure remain supported and in production.

Public Awareness and Education

This study was unable to quantify the impact of 3-1-1 marketing campaigns on service usage through publicly available data. Anecdotally, 3-1-1 directors stated that public awareness campaigns were an important part of driving adoption of the service and making the public aware of other channels, such as mobile applications, and that these campaigns produced a high return on investment when conducted. This would be especially important in a consolidated model, as the state would create a new model for delivering 3-1-1.

5.0 AI Integration Opportunities

5.1 AI In the Contact Center

Evolution of Contact Center Technologies

Among competing communication methods in the 1930s, advances in voice communication represented the leading edge of technology innovations when Homer Dudley, a researcher at Bell Laboratories, debuted his Voder machine at the 1939 World's Fair. An electronic device controlled by a human operator, the Voder was the first device capable of mimicking the human voice to create a recognizable form of synthetic speech [24].

Too coarse to integrate into telephony systems, Bell Laboratories built on Dudley's creation to develop other methods of making voice communication more efficient, including the first dual-tone multi-frequency (DTMF) system with the familiar four-column keypad we use today, supplanting rotary dials [25]. Launched publicly in 1963 under the trademark *Touch-Tone*, DTMF allowed callers to interact with automated response systems by cycling through a menu of options and making selections using their phone's keypad, the precursor to what would become early rule-based voice recognition known as Interactive Voice Response (IVR) in the 1970s.

Also in the 1960s, advances in Natural Language Processing led to the release of ELIZA in 1966, a rule-based chatbot developed by Joseph Weizenbaum at MIT and widely regarded at the first computer program capable of conducting a human-like, text-based conversation. ELIZA generated some controversy, as several researchers in the field regarded it as the first technology capable of passing the "Turing Test", a measure of whether or not a human user could correctly determine if they were interacting with a machine or another person [26].

By the 1970s, early database systems, such as those developed by Oracle, were commonly used by organizations to digitize customer information and manage contacts. Tom Siebel left Oracle in 1993 to found Siebel Systems and build his own Sales Force Automation (SFA) product, which led a host of upstart competitors aiming to serve the growing e-commerce market into developing what would become known as Customer Relationship Management (CRM) systems [27].

Innovations like DECIPHER, developed at the Stanford Research Institute, offered users the option of basic voice interactions with a computerized system via products such as Nuance Speech Recognition, adopted by Charles Schwab & Co. in 1996 to allow customers to receive stock quotes [28].

The new millennium saw the development and proliferation of transformative technologies such as cloud computing, which allowed for the digitization and cost-effective hosting of information at an unprecedented scale. Likewise, advances in semiconductor technology allowed for efficient processing of that data on a similarly unprecedented scale, enabling breakthroughs in machine learning research such as Long Short-Term Memory (LSTM) [29], which introduced a new era of machine translation, sentiment analysis, text generation, and natural language understanding.

Contemporary contact center systems represent the convergence of these technologies into unified solutions, available through varying commercial models and degrees of functionality and customization. These systems enable sophisticated text-based conversational interactions, advanced voice features, highly capable contact management, and even end-to-end workflow automation in a single product.

Real World Benefits

The first major study in the present decade on the effects of contemporary AI systems in a customer service environment, *Measuring the Productivity Impact of Generative AI*, was published by The National Bureau of Economic Research (NBER).Researchers Erik Brynjolfsson, Danielle Li, and Lindsey R. Raymond studied its effects on customer service outcomes across nearly 5,000 agents at a Fortune 500 company between November 2020 and February 2021 [30]. The AI tool was intended to support the work of human customer support agents, offering them potential responses to customer queries. The agents in the treatment group could choose to take those suggestions or ignore them and enter their own responses.

Among the many insights, the study found that, "*agents using an AI tool to guide their conversations saw a nearly 14 percent increase in productivity, with 35 percent improvements for the lowest skilled and least experienced workers, and zero or small negative effects on the most experienced/most able workers*" and that, "*agents utilizing the AI tool increased the number of customer issues resolved per hour by 13.8 percent*." The researchers attributed the increase to three factors: agents, who could participate in multiple chats at once, spent about 9 percent less time per chat, handled about 14 percent more chats per hour, and successfully resolved about 1.3 percent more chats overall. Customer satisfaction measures showed no significant change, suggesting that the productivity improvements did not come at the expense of interaction quality.

The researchers also noticed that customers were more likely to express positive sentiments and less likely to request help from a supervisor when interacting with agents using AI assistance than when interacting with those who were not. Perhaps reflecting the improved tenor of the exchanges, attrition rates among agents with access to the AI tool were 8.6 percent lower than the comparable rates for agents without such access [31].

The conclusion is that there are real benefits to end-users (residents in the case of 3-1-1) *and employees* (3-1-1 Specialists) from the effective implementation of contemporary AI tools in a contact-center context.

In what has become a recognized study of real-world outcomes from applied AI, *Navigating the Jagged Technological Frontier: Field Experimental Evidence of the Effects of AI on Knowledge Worker Productivity and Quality* [32], researchers from Harvard Business School and the Wharton School at the University of Pennsylvania studied the outcomes of access to advanced AI tools on 758 management consultants performing 18 realistic consulting tasks related to so-called "knowledge work", focusing on tasks involving skills such as creative problem solving and quantitative analysis.

Researchers found that those, "*using AI were significantly more productive (they completed 12.2% more tasks on average, and completed tasks 25.1% more quickly), and produced significantly higher quality results (more than 40% higher quality compared to a control group).*" Similarly to the NBER study, the study found that users, "*across the skills distribution benefited significantly from having AI augmentation, with those below the average performance threshold increasing by 43% and those above increasing by 17%,*" compared to an established baseline.

The conclusions are that there are also benefits across a range of work tasks outside of the context-center context and that Maryland should consider enhancements to resident-facing interactions and internal ways of working as an important outcome to target from the application of AI to 3-1-1.

Since these studies, thousands of AI deployments have occurred by commercial organizations and state and local governments. Two recent examples from New York supported the modernization of aging technology infrastructure at the Department of Motor Vehicles [33], involving the synthesis of disparate and poor-quality datasets and consolidation of a wide range of integrated legacy technology systems, and enhanced resident interactions with a County Clerk's office to better understand what information residents are seeking and how to provide that information as quickly and automatically as possible, involving only two county employees and resulting in a decrease in incoming calls of nearly two-thirds within four months of launching the tool [34]. Other examples across state and local government are published frequently, demonstrating that well executed AI deployments can lead to myriad tangible and intangible benefits, such as (but not limited to) increased accessibility of government services (e.g., 24/7 availability, adaptable modalities), enhanced quality of outputs, and step-function improvements in resident satisfaction with government services.

The conclusion is that it is possible for a state government to deploy both local and statewide AI solutions safely and effectively, involving some of the same complications and goals of a statewide 3-1-1 portal, if barriers are effectively identified and addressed. According to Gartner's *2025 CIO Agenda* survey of 3,186 Chief Information Officers and IT Directors including 136 State and Provincial Government IT executives, 52% of State and Provincial respondents expect to have AI deployments in production in 2025 (including Generative AI), with those planning AI deployments by 2027 rising to 93% of respondents [35], underscoring the commitment of State and Provincial leaders to invest in overcoming these challenges to improve government services.

Substantial Risks

Deploying AI solutions, especially those used to interact with residents, involves identifying and mitigating a wide range of risks. The demand for Generative AI solutions in the contact center context, leveraging Large Language Models (LLMs), introduces unique risks that have become even more challenging due to the rapid development of Generative AI technologies.

Unlike descriptive machine learning models that specialize in performing specific tasks on existing data (e.g., classification, prediction), Generative AI is designed to generate new data applicable to a wide range of tasks and use cases. Generative models do so probabilistically, iteratively determining the highest-likelihood word in a sequence (next-token prediction) given what it has learned from its training data (pretraining) and the words provided to the model to "prompt" a response (context).

The probabilistic nature of Generative AI means that these models rely on common, predictable words or patterns that they have frequently encountered in their training data, leading to a lower probability of accurately sampling the correct information in cases where that information represents a small proportion of their training data or is absent altogether. In the absence of sufficient data, generative models are more likely to produce a response that does not align with the goals or content of the prompt, leading to what have been colloquially referred to as "hallucinations."

It is important to note that Generative AI differs from traditional software in that it does not reliably produce the same exact responses every time. Rather, the fact that Generative AI *generates* a net-

new response every time it is prompted for one means that there will *always* be a possibility that the model could produce an inaccurate response, particularly in instances of out-of-sample or missing data. In the context of 3-1-1, this study found that publicly reported 3-1-1 data exhibits a long tail of infrequent and widely dispersed issue types (Section 4.1, Figure 4), highlighting the importance of this issue in the 3-1-1 domain.

Techniques used to increase the accuracy of generative model outputs by "grounding" its responses in specific information include experimentation with different prompting strategies (where additional context is given, typically by the user, in the prompt to guide the model), Retrieval Augmented Generation (RAG), where proprietary organizational information is provided to the model from a database to enhance the fidelity of its output, and Fine Tuning (FT), which enhances the model by further training it on high-quality, organization-specific information that updates the model's weights to perform better on specific tasks. It has been noted that most successful Generative AI deployments utilize a combination of these techniques to achieve desired performance levels.

There are many other substantial risks involved in the application of AI including:

- **Security**: New and evolving attack vectors for cybersecurity incursions.
- **Ethics**: Risks to users and organizations from improper use of AI technologies.
  - Privacy: Risk of exposure of personal or proprietary organizational information.
  - Data: Risk of inadvertent use of copyright, illicit, or harmful information hidden in a model's training data.
  - Trust: Reputational risk from a suboptimal deployment of an AI tool.
- **User**: Risks from users blindly accepting model outputs without critical evaluation or actively applying sound judgment.
- **Governance**: Risks from inadequate oversight of AI deployments or ongoing operations.
- **Maintenance**: Risks from failing to account for sufficient resources needed to properly maintain and operate AI deployments on an ongoing basis (e.g., AIOps), including internal knowledge bases.
- **Third-Party**: Risks from actions or failures by third-party vendors such as implementation partners in deploying and maintaining AI solutions.

Though this is far from an exhaustive list of potential risks, resources such as Gartner's Trust, Risk, and Security Management (TRiSM) framework help organizations identify and mitigate these risks to deploy AI tools safely and effectively [36]. Additionally, resources such as *MIT's AI Risk Repository* of over 1000 AI risks and corresponding mitigations [37] and the *National Institute of Standards and Technology's AI Risk Management Framework* (NIST AI RMF) [38] are helpful inputs in designing and enhancing effective risk mechanisms.

5.2 AI Adoption in Maryland

The state of Maryland has taken important steps to support the adoption of AI technologies. In January 2024, Governor Wes Moore issued an executive order entitled *Catalyzing the Responsible and Productive Use of Artificial Intelligence in Maryland State Government*, to promote the adoption of AI while "*respecting individuals, employees, and civil rights, as AI technologies are developed and evolve*" [39]. This executive order establishes the following principles for AI deployment in Maryland:

- Fairness and Equity
- Innovation
- Privacy

- Safety, Security, and Resiliency
- Validity and Reliability
- Transparency, Accountability, and Explainability

The order also establishes an AI subcabinet tasked with ensuring that the State's adoption of AI aligns with these principles and with developing an AI Action Plan to implement them statewide.

In January 2025, the AI subcabinet released the memo *2025 Maryland AI Enablement Strategy & AI Study Roadmap* [40], outlining concrete actions the State will take to "*build momentum*", "*clarify operating models*", and "*increase the pace of experimentation, iteration, and adoption*" of AI within the State.

The Study Topics and 2025 Roadmap outlined in the memo include topics such as Critical Infrastructure and Public Safety, both relevant to the domain of 3-1-1. Consistent with these study topics, AI applications in the 3-1-1 domain covered in this study must align with the operating models, procurement standards, risk management processes, and other findings from related studies and the AI subcommittee.

5.3 Potential AI Applications in 3-1-1 Operations

Nationwide, 3-1-1 operations vary significantly by jurisdiction. Some programs include a mix of a call center, website, social media accounts, and phone numbers with IVR trees, while others may offer just one 3-1-1 option, such as a dedicated 3-1-1 phone line.

Regardless of the offerings, the primary role of a 3-1-1 operation is to handle non-emergency calls, provide resident resolutions to inquiries, route calls to appropriate agencies, and create and ensure the completion of service work orders. These capabilities require strong coordination with other agencies and departments, encouraging the 3-1-1 operation to stay proactive about changes and trends within the jurisdiction to remain responsive to resident needs. Effective internal and external communication is essential for a successful 3-1-1 operation, both to address immediate needs and enhance the municipality's long-term operational effectiveness.

AI is increasingly utilized to address the challenges of managing a 3-1-1 operation, with adoption growing across the marketplace due to its ability to improve efficiency and responsiveness. This study groups potential uses of AI in the 3-1-1 space into the following categories, highlighting the most prevalent, industry-leading solutions from Gartner research in the following categories [41]:

- Customer Relationship Management (CRM) and Customer Experience (CX) Enhancements
- Call and Contact Center Optimization
- Operational Enhancements

5.3.1 Customer Relationship Management (CRM) and Customer Experience (CX) Enhancements

Use cases within this category focus on AI applications that assist residents before engaging with a live 3-1-1 specialist. These use cases promote self-service for questions and the resolution of information requests to reduce call volume. In addition, these offerings promote accessibility by providing support to residents 24/7 during hours when call centers or service departments are unavailable.

Table 6: CRM & CX Enhancement Use Cases

Use Case	Description	Value
Chatbot for Self-Service	Virtual agent, available on web, text, or mobile applications that allows customers to ask routine questions about government services. Responses derive directly from government content. Add-ons are available to enhance user experience (e.g., translation services, service request handling, etc.).	**Mission impact:** Enhances government accessibility due to 24/7 availability. Users can navigate to one source to resolve most questions. **Efficiency:** Reduces the number of calls/emails the contact center or government department receives. **Risk management:** The chatbot is trained solely on government-approved content and is adaptable to adjust to growing agency needs. **Non-financial:** Promotes government accessibility, transparency, and community participation.
Step-by-Step Services	Provides a guide for users to complete various government tasks such as completing forms or detailing different procedures. This can also be paired with translation services to provide guidance to non-native speakers. It can be offered in replacement of a digital form, used as a set of instructions for a digital or physical form, and serve as a QA check prior to document submission.	**Mission impact:** Increases clarity on government processes and procedures. Allows more accurate processing of information. **Efficiency:** Reduces resident errors in filling out forms, reduces call volume, and administrative back-end processing. **Risk management:** It reduces the risk of form incompletion and reprocessing. It reduces contact center wait times, lines at administrative offices and paperwork processing. **Non-financial:** Improved customer experience in completing government forms and improved form quality.
Smart Escalation	The ability for a chatbot or IVR solution to know when a situation needs to be escalated directly to a live agent and accurately route the call. In cases of emergency, the call can be routed to the 9-1-1 line.	**Mission impact:** This may have a marginal mission impact as most users are more likely to contact 9-1-1 for emergencies than 3-1-1. The number of emergency calls received by 3-1-1 operations should be determined before implementing the solution to determine the cost-benefit. **Efficiency:** It may provide better customer experience, however, if other AI tools are not well implemented, it can result in users manipulating the feature to reach a live agent faster. **Risk management:** Emergency calls will promptly be routed to the 9-1-1 service line. When paired with a transcript/post-call summary, it can provide a 9-1-1 agent with enough context to provide a faster dispatch and response time. **Non-financial:** Emergency calls will be routed to the correct jurisdiction.

Use Case	Description	Value
Interactive Voice	A virtual agent that can service calls and derive context through natural language. The virtual agent can understand intent and acknowledge customer context to direct the customer to the appropriate channel.	**Mission impact:** Promotes self-service technology, engagement, and accessibility while reducing the need for live agent support and IVR usage. **Efficiency:** Can provide a more tailored experience for customer, serving as an enhanced "search" feature through conversation to directly identify the need without listening to IVR call menus, searching various websites or talking to a live agent. **Risk management:** A more accessible customer service feature. **Non-financial:** Promotes self-service technology for answering information-related questions without routing to an agent or utilizing IVR. Can be paired with translation services to provide additional self-service support for non-native speakers.

5.3.2 Call & Contact Center Optimization

Use cases within this category focus on improving the contact center experience for callers in addition to 3-1-1 specialists. These use cases focus on simplifying the interaction between the resident and agent, facilitating efficient and effective call handling, standardizing processes, and improving workflow by eliminating arduous tasks and incorporating process automation.

Table 7: Call & Contact Center Optimization Use Cases

Use Case	Description	Value
IVR – Call Transcript and Summary Creation	The generation of a transcript and summary after a customer leaves a self-service platform, such as Chatbot Voice or IVR, to provide insights for a live agent.	**Mission impact:** Supports live agents in understanding the context of calls prior to engaging with the customer, providing a faster and more seamless customer experience. Reduces call time as it limits the amount of repeated information the customer must provide. The agent will be able to provide more efficient and tailored support for customers. **Risk management:** Quality assurance processes must be enabled to sample transcripts for accuracy, errors, or other quality issues or liabilities. **Non-financial:** The agent will have the opportunity to research answers to unknown questions prior to customer engagement and could route calls accordingly.

Use Case	Description	Value
Translation Services	AI can provide real-time translation for customer service representatives, improving support for non-native language speakers.	**Mission impact:** Improves service delivery to marginalized communities. **Efficiency:** Reduces handoff of calls with language issues. **Risk management:** Performance in out-of-sample languages may be sub-standard relative to human translation. **Non-financial:** Improves accessibility of services for non-native language speakers.
Real-Time Agent Advisor	A tool that processes live calls and provides recommendations or suggestions to the agent. This can include providing information such as contact details and department hours, as well as insightful data to be aware of (road closures, traffic conditions, etc.).	**Mission impact:** Increases serviceability and integration across platforms. Data provided by an AI tool can ensure accurate data is being shared with callers as it relates to recent changes that may be difficult for the agent to access. **Efficiency:** It provides additional support for the live agent, enabling accurate information to be shared with the caller and faster issue resolution and call times. **Risk management:** While the AI tool will improve with time, errors can still occur. Quality control of AI responses and training of the system is required to determine which suggested information requires human validation. Similarly, the agent must be trained to discern and validate what is appropriate to share with the caller. **Non-financial:** Improves customer experience by providing accurate, real-time responses. Enhances workforce support and training for the agents.
Emotion Detection	Uses effective computing to analyze the customer's emotional state via computer vision, audio/voice input, sensors, and/or logic.	**Mission Impact:** Offers minimal impact for the mission of a 3-1-1 operation but provides insight into user satisfaction and potential. **Efficiency:** There are no short-term efficiencies to highlight, but continuous feedback may result in long-term process changes that can make the 3-1-1 operation more efficient. **Risk management:** This can be utilized to determine user satisfaction and highlight potential internal process improvements or training opportunities/support for customer service agents.

Use Case	Description	Value
		Non-financial: Provides real-time feedback from the customer.
Live Calls — Post Call/Conversation	A tool that provides notes at the end of the call for a record of the conversation.	**Mission Impact:** Supports the back-end administrative process of maintaining accurate call records. **Efficiency:** Reallocates the time a live agent spends writing notes after a call. **Risk management:** Provides a more accurate record for calls. Logs are recorded in standardized English, reducing spelling and grammar errors and increasing the quality of all call notes. **Non-financial:** Provides additional support to live agents, potentially increasing workplace satisfaction as mundane tasks are optimized.
Agent Training Feedback	AI can be used to develop training plans and materials based on real-world simulations based on previous customer behavior.	**Mission impact:** Training and AI-generated feedback utilizing real-world scenarios will enhance the employee training and onboarding process, improving customer service and supporting the workforce. **Efficiency:** Improves the efficiency and service quality of staff in training. **Risk management:** Training scenarios will be updated more frequently, allowing for more realistic contextualization based on changes in the community. **Non-financial:** The training experience will be improved by regular updates that prevent content from becoming dated or stale.

5.3.3 Operational Enhancements

Use cases within this category focus on improving the operational systems that support a 3-1-1 operation. These use cases primarily identify opportunities related to the service request life cycle, programmatic workflows, and program communications to make a 3-1-1 successful and effective.

Table 8: Operational Enhancement Use Cases

Use Case	Description	Value
Ticket Status	An AI agent can look up and provide the status of a previously issued service request. Upon call generation, a note is added to the previous ticket to alert the responding agency of the request.	**Mission Impact:** Increase transparency within the organization on response times for service requests. The tool can update the public on the status of requests and/or increase intergovernmental collaboration. **Efficiency:** It increases oversight and awareness of status requests without the need to contact a live person, which may reduce call volume. **Risk management:** Allows the governing agency to run reports and assess if serviceability performance metrics are being met. **Non-financial:** Success depends on a high adoption rate. Agencies must be responsive to updating the status of orders. There may be resistance as implementation may be seen as invasive of individual county or departmental autonomy.
Service Request Handling	The ability to generate and submit a service request to the appropriate agency. The service request is compiled either through the self-service platform (Chatbot or IVR) or drafted after call resolution with a customer service representative and sent upon live agent confirmation.	**Mission impact:** Enables non-emergency requests to be documented and submitted without human intervention 24/7. **Efficiency:** Reduces the number of non-emergency calls to the 9-1-1 emergency line due to after-hours service requests. This limits the back-end processing for the agent and agency staff, as no callbacks are necessary, and the agent will have less documentation to fill out. **Risk management:** Controls must be instituted to ensure service requests are routed to and received by the appropriate agency. If executed well, faster service request processing is expected. **Non-financial:** Users can make requests outside of normal business hours and may opt to submit requests via self-service, allowing resources to be allocated to higher priorities. Due to faster processing times, responding agencies will be more responsive to community needs.

Use Case	Description	Value
Call Routing	Uses predictive methods to determine and route the customer to the best department resource to service their request.	**Mission Impact:** Allows customers to reach the correct agency or agent for quicker problem resolution. **Efficiency:** Both the agency and customer save time as the right people connect. **Risk management:** When linked to a shared HCM system/platform, information can be kept current without manual intervention. However, if there is no central system to track this, frequent oversight is required to ensure data is kept current, so calls are appropriately routed. **Non-financial:** Builds community trust and reduces confusion and frustration associated with attempting to contact the appropriate department.
FOI Requests	AI can be used to draft freedom of information (FOI) responses and confirm that correct and current data is being provided.	**Mission impact:** Assists in meeting transparency obligations within diligent response times. **Efficiency:** Reduces administrative effort in delivering FOI responses. **Risk management:** Reduced risk in failing to meet regulatory requirements for timely response to FOI requests. **Non-financial:** Improved response times.
Suggest updates/notifications and messaging to external facing platforms and websites	AI can be used to create draft multimedia and social media content for announcements and community awareness on public-facing platforms.	**Mission Impact:** When connected to agency systems (CRM, CAD, etc.), it can streamline governmental communications by automatically generating draft communications for finalization. **Efficiency:** The system can be trained to follow specific formats and rules, enhancing consistency, compliance, reducing spelling errors, time spent, and expedite the approval process. **Risk management:** Relevant and important updates will be communicated more efficiently, increasing public awareness. **Non-financial:** Will bolster governmental responsiveness and resident awareness

Use Case	Description	Value
		of important issues without the need to directly engage with the 3-1-1 operation.
Predictive Maintenance and Analytics	Use predictive measures to identify potential service needs or process improvements.	**Mission Impact:** Provide suggestions and proactive support among government agencies to protect, notify, or service impacted governmental infrastructure or the public prior to an escalated event. **Efficiency:** Utilizes data from ticketing data, work orders, prior calls, and other sources to identify potential service needs prior to occurrences. It can strengthen budget forecasting, response times, and service costs, as well as reduce future service calls. **Risk management:** Assists in preventing escalated service requests and increasing government response times. **Non-financial:** Assists in the oversight and management of future needs.

6.0 Consolidation and Integration

When consolidating or integrating 3-1-1 services, agencies must consider both operational and technical approaches. These approaches are not mutually exclusive and can be adopted in various combinations to create a tailored solution that is effective and sustainable for the State. Consolidation approaches may require a degree of technical consolidation, integration, or other form of rationalization. Each approach presents a range of strategies to consider, from collaborative policies and procedures to a degree of technical integration to full consolidation of operations and/or supporting technologies.

The terms “consolidation” and ”integration” have important differences. “Consolidation” generally refers to two or more discrete entities merging or replacing one another, such as multiple 3-1-1 operations consolidating into one center. “Integration” refers to two or more discrete entities (typically IT/technology systems) creating a link or bridge between one another to achieve a specific outcome, such as data sharing. These approaches, together with relevant planning considerations and other related insights, are discussed in this section.

6.1 Operational Approaches

Operational approaches to achieving greater statewide 3-1-1 standardization and overall improvements are primarily concerned with introducing changes to the 3-1-1 operations (people, process, and organizational elements) without necessarily making significant changes to the application functionality, systems, or underlying IT capabilities that support those operations.

While technological improvements may be necessary to support certain operational changes, typically, these initiatives focus less on the technological solutions offered and prioritize the ‘how’ the services are being delivered. At the highest level, the operational approaches considered for

achieving statewide improvements to its 3-1-1 capabilities are via collaborative models and consolidated models.

6.1.1 Collaborative Operational Approaches

A collaborative approach is when a state tries to promote and increase standardization across the various 3-1-1 operations. This approach requires greater statewide consistency without making any fundamental changes to the existing 3-1-1 operations, data facilities, or technologies.

Below are potential areas the State could explore in a collaborative model:

- **Standardize Definitions and Protocols**
  - The State can review and mandate the standardization of terms relating to a 3-1-1 operation, notably identifying what is 'non-emergency' and delineating when 3-1-1, 9-8-8, 2-1-1 or 9-1-1 should be utilized. Creating business standards will help build collective understanding within existing programs, enabling easier cross-training and development of performance standards.
- **Marketing and Outreach / Public Education**
  - Currently, the jurisdictions are responsible for marketing the different 3-1-1 operations. Under this model, in coordination with the jurisdictions, the state would sponsor the outreach of the 3-1-1 operations to local communities and provide education materials for the public to understand the 3-1-1 resources available to them.
  - This campaign would inform the public of the definitions 3-1-1, 9-1-1, 9-8-8, 2-1-1, or the non-emergency number and the appropriate use cases of when to utilize each platform. For this effort to be successful, the state will need to work closely with local jurisdictions to standardize the definitions and use cases of a 3-1-1 service.
- **Process and Workflow (e.g., Scripts and Prompts for Specialists)**
  - Working with current 3-1-1 operations, the state could standardize the scripts and prompts for specialists who service the call centers.
  - Consistent prompts will assist in training efforts while providing consistent user experience for all residents.
- **Branding (e.g., Look and Feel)**
  - The state could lead the 3-1-1 marketing effort for public awareness by creating a general 3-1-1 image agnostic to the jurisdiction.

6.1.2 Operational Consolidation Approaches

For over two decades, consolidation efforts have been a prevalent trend within the 9-1-1 space. While 9-1-1 and 3-1-1 serve distinct purposes, observing the strategies within the 9-1-1 space can provide valuable insights and best practices to inform the development and consideration of potential 3-1-1 integration strategies.

Historically, 9-1-1 consolidation has primarily occurred at the municipal level. As discussed earlier in this document, statewide 9-1-1 models have proven to be largely governing bodies, custodians of some level of centralized funding, and in some cases, offering 9-1-1 centers/PSAPs with a common 9-1-1 call taking solution, the PSAPs can opt into or out of. For example, California provides a statewide 9-1-1 call handling solution but allows each PSAP the option to participate or utilize their own system. Whereas in Indiana, all PSAPS are required to use the statewide 9-1-1 call handling solution. However, in each case, the State allows each PSAP to procure its own Computer-Aided Dispatch (CAD) system.

Other operational models focus on the co-location of operational services. For example, New York City houses its 9-1-1 operations for the police and fire department within the same building, enabling shared call handling and dispatch abilities while continuing to utilize separate technologies and networks. Additional co-location models, such as in Aurora, Colorado and Calgary, Alberta have similarly integrated their police and fire call operations and dispatching, while also shifting their resource model so civilian personnel monitor the operation so sworn officers can be utilized on the field.

Another common consolidation approach seen within the 9-1-1 space is for a large PSAP to provide call-handing and dispatch services for smaller jurisdictions, while allowing the smaller jurisdictions to maintain operational control, often referred to as regional 9-1-1 consolidation.

Although the scale and operational requirements of a 3-1-1 operation differ from those of 9-1-1, the consolidation use cases shown within the 9-1-1 space provide relevant considerations for considering a more integrated 3-1-1 operation for the state.

Leveraging the trends seen within 9-1-1, potential 3-1-1 operational consolidation models could be:

- **Regional 3-1-1 Expansion of Call Center Services:**
  - Like the 9-1-1 scenario, the State of Maryland would potentially stand up a 3-1-1 call center solution with the option for jurisdictions to opt-in, procure their own solution, or encourage larger jurisdictions, such as Montgomery County or the City of Baltimore, to provide 3-1-1 call center and dispatch services for the smaller neighboring cities.
- **Consolidation of Physical Locations:**
  - This model focuses on the co-location of physical spaces that support the various 3-1-1 operations within the state. Locations such as call centers, training facilities or data centers are consolidated and housed within the same building(s), but the technological solutions and networks for the individual programs remain separate.
- **Consolidation and Reconciliation of Staffing/Personnel/Roles:**
  - In this model, the State would centralize IT support and be responsible for maintaining the various systems and portals.

Operational consolidation could also consider consolidating and reconciling IT capabilities (resources, staffing, roles) across the state, whereby the 3-1-1 operations themselves remain operational but are serviced and maintained by a central state 3-1-1 IT function.

Operational consolidation requires a level of technical consolidation or integration with the front-end (software, channels, applications) and back-end (hardware, technical facilities) systems. Depending on the approach, these integrations may vary in terms of solutions required, work effort (development, operational, physical), and ongoing maintenance, which can impact consolidation cost.

Planning Considerations

Operational integration/consolidation approaches can provide several advantages for a state-supported 3-1-1 operation including:

Cost: Among the primary benefits is the potential for cost efficiencies, as consolidating operational personnel, IT functions, or physical facilities could reduce expenses for individual 3-1-1 operations.

Customer Service and Operational Improvements: By establishing a consistent 3-1-1 operation across the state through uniform policies, practices, branding, and communication, there will be improvements in the resident service quality and experience interacting with any 3-1-1 center. This

may also improve personnel training and reduce misdirected calls to 9-1-1 or other service lines due to greater public awareness and understanding.

Improved Reporting: Standardized processes and workflows would enable improved reporting, allowing the state to monitor performance, set expectations through established key performance indicators, and make data-driven decisions.

Extend Service Offerings: Many of the integration strategies could increase 3-1-1 coverage across Maryland due to the state covering the costs for additional capabilities. Operational integrations/ consolidation approaches also present challenges that must be kept in mind for implementation success, such as:

- **Governance:** Many integration strategies necessitate the creation of an effective framework for decision-making, policy development, planning, responsibility allocation, and ongoing maintenance. Counties will need to collaborate on how data will be owned, managed and maintained. Additional coordination will also be required with state stakeholders, a workflow process that was previously unnecessary.
- **Near-Term Customer Service Impacts:** Transitioning to a new operating model may temporarily disrupt service levels for existing 3-1-1 operations. This may place an additional strain on present resources and external stakeholders like 9-1-1, 9-8-8, and 2-1-1. To reduce impact, the state must develop and execute an organizational change management strategy plan, ensuring all stakeholders are informed of operational changes and potential impacts.
- **Operational Continuity:** Significant operational changes will require a re-evaluation and update to any business continuity plans to ensure that the operation remains uninterrupted and affected throughout and beyond the transition period.
- **Cost:** Some of the integration/consolidation approaches involve significant upfront implementation costs for necessary technological solutions, which may require the use of capital funds and increase state operating costs.

6.2 Technical Approaches

Technical strategies focus on additive features and new capabilities that the state could employ to support the multiple 3-1-1 operations that exist. Potential 3-1-1 technical approaches that can be considered include:

- **Statewide 3-1-1 Portal**
  - Integration between local 3-1-1 operations and a new statewide 3-1-1 portal would provide a common, consistent, customer-facing 3-1-1 portal.
  - The portal could direct residents to their relevant 3-1-1 operation or other relevant government agency or provide more advanced capabilities as discussed below (such as a Unified Chatbot or an AI Virtual Assistant).
  - The 3-1-1 portal could be supported by a central domain/website (e.g., MD311.gov) that links to the existing 3-1-1 operations within Maryland. The scale of this solution is flexible, ranging from a single website that serves as a routing function to the portal eventually providing a standardized intake process for the local 3-1-1 operations.
- **Statewide 3-1-1 IVR**
  - Similar in concept to the statewide 3-1-1 portal, a statewide 3-1-1 interactive voice response (IVR) solution would provide a common, consistent, customer-facing 3-1-1 portal and could function simply as a means of directing residents to their relevant 3-1-1 operation or other relevant government agency.

  - A statewide 3-1-1 IVR could also provide more advanced capabilities with voice recognition technology, as discussed below (such as a Unified Chatbot or an AI Virtual Assistant).

- **Unified Chatbot**
  - The state can offer a unified Chatbot solution that all jurisdictions can opt into, whether they have a formal 3-1-1 operation. A chatbot designed to work across jurisdictions can answer general questions, provide basic information, and direct users to primary sources such as phone numbers and websites when it cannot resolve an inquiry.
  - Integrating a chatbot with GIS would further enhance its functionality by recognizing jurisdictional boundaries. For example, they can inform a resident that their inquiry is a state or federal matter rather than a local one and provide the appropriate contact information. This solution would encourage residents to rely on the chatbot instead of navigating through webpages or calling multiple numbers to find the right point of contact.
  - A well-designed chatbot that accurately routes questions and requests will help residents efficiently navigate their needs, expand public accessibility to government services and reduce the need for live interaction, which will save time for both the public and public workers.
- **AI Virtual Assistant**
  - A virtual AI Assistant could significantly enhance the efficiency and effectiveness of a 3-1-1 center. By leveraging AI, the 3-1-1 operation can provide faster responses to residents and improve resident satisfaction.
  - The AI Assistant could be integrated into a 3-1-1 portal (such as the statewide option described above) to support functionality such as automating routine inquiries or providing updates on service requests/tickets logged previously.
  - Integration with the telephony system could reduce call waiting times and support effective call routing, increasing resident satisfaction through efficiency gains and customer experience improvements.
  - The AI Assistant could also be integrated to support the IVR scenario described above, recognizing speech and providing intelligent responses to verbal inquiries.

Technical Consolidation

This involves reducing the technological footprint of the different 3-1-1 operations within the State. The approach has several sub-options, specifically:

Statewide 3-1-1 Solution with a Single Vendor

- The State procures and maintains a 3-1-1 solution and mandates that all existing 3-1-1 operations within the State utilize it to run their operations.
- This approach could allow the individual 3-1-1 operations to continue operating their own call centers if they utilize the state-provided back-end system.
- This model would require each 3-1-1 operation to migrate to a common application that controls some or all of their 3-1-1 channels (call center, website, phones), but each center maintains jurisdictional control over the 3-1-1 operation itself.
- Like the 9-1-1 comparison, the state would need to determine if the single 3-1-1 solution would be mandatory, or if an opt-in/opt-out model is preferred.

Data Center Centralization / Rationalization

- This effort would centralize all hardware and infrastructure supporting one or more 3-1-1 operations across the State's 3-1-1 operations.
- The State would define the current 3-1-1 technical landscape, conduct an inventory assessment, develop a target architecture and facilities design, and then execute a phased migration plan. After successfully consolidating target assets, a period of monitoring and optimization would be followed by decommissioning old equipment and facilities no longer needed.

Application Rationalization

- This concept would assess all the applications supporting the 3-1-1 operations and determine which could be retained, consolidated, modernized, decommissioned, or replaced.
- In the 3-1-1 environment, the state could host a variety of applications under a single licensing agreement. This effort may reduce operational costs for an individual jurisdiction, consolidate contract management oversight, and promote integration and interoperability between the various 3-1-1 operations. Additionally, the State would have oversight of the applications being used within the State, supporting strategic initiatives as it relates to the future of Maryland's IT environment.
- Potential applications that would be assessed are email platforms, helpdesk support, contact management, training vehicles/portals and CRM tools.

Payment Methods and Payment Portals

- Consolidating 3-1-1 payment options provided across the state into a single payment platform/gateway.
- This could have many benefits, ranging from improved customer experience through consistent user experience across all payment types and points of business/transactions across the state to the potential for cost savings via eliminating duplicate payment functionality, consolidation of payment contracts, and reduced service fees.
- This could be implemented in parallel to any 3-1-1 consolidation initiatives or on its own with the existing 3-1-1 operational landscape.

Planning Considerations

Technical integration/consolidation of a statewide 3-1-1 system offers several advantages that can enhance the state's efficiency and flexibility. Some of the key benefits are:

- **Cost:** One key benefit of technical integration/consolidation is the potential cost savings through application rationalization. Identifying, streamlining, and consolidating the IT applications used throughout the state can significantly reduce the total statewide cost of running a 3-1-1 operation.
- **Flexibility:** By adopting a more unified and standardized IT framework, established systems will be better able to adapt to the state's changing needs and integrate new features and technologies.
- **Enhanced Data Sharing:** A standardized framework can enhance data interoperability and data sharing between jurisdictions, promoting better facilitation and more transparency on statewide 3-1-1 trends and needs. The exchange of data will promote data-driven decisions on a state level, support benchmarking efforts, and increase collaboration between jurisdictions.

Technical integrations/consolidation approaches also present challenges that must be kept in mind for implementation success, such as:

- **Cost:** While technical integration/consolidation can lead to long-term cost savings, consolidating disparate systems requires a significant upfront investment. Additionally, the state may reduce the overall IT infrastructure statewide, which would lower the operating costs for local jurisdictions, but the unified model may lead to higher ongoing operational expenses at the state level. *Table 9* below highlights the relative cost for each proposed technical approach.
- **Disaster Recovery:** When undergoing any technical approach, investment is required to ensure there are strategies and systems in place to restore the functionality and access to data centers in case of disruption or emergency. This would require identifying redundant systems, conducting regular tests, and ensuring a robust disaster recovery plan is in place to address potential threats and vulnerabilities.
- **Cybersecurity:** Any technical consolidation effort increases the risk associated with a system vulnerability. To mitigate the risk of a cybersecurity attack, robust security measures such as encryption, access controls, and system monitoring must be implemented.

Integration Challenges: Undergoing any technical approach will require collaboration among the different jurisdictions to understand their business rules and needs. The identified solution must be interoperable with the different systems and technologies of each 3-1-1 operation.

6.3 Approach Comparisons

Table 9 provides a high-level comparison between the consolidation and integration options presented earlier in this section.

Table 9. Comparison Between Potential 3-1-1 Improvement Approaches

	Planning Implications / Impact				Relative Assessment		
Approaches	People	Process	IT	Org.	Complexity	Cost	Benefit Potential
Standardize Definitions & Protocols	High	Medium	Low	Medium	Low	$	Low
Marketing, Public Outreach & Education	High	Medium	Low	Low	Low	$	Medium
Process and Workflow	Medium	High	Medium	Medium	Medium	$$	Medium
Branding, Look and Feel	Low	Low	Low	Low	Low	$	Medium
Regional 3-1-1 Expansion of Call Center Services	High	High	High	High	Medium	$$$	High
Consolidation of Physical Locations	Medium	Medium	High	Medium	High	$$$$$	High
Consolidation of 3-1-1 IT Support Personnel	High	Medium	Low	Medium	Medium	$$$	Medium
Statewide 3-1-1 Portal	Medium	Medium	High	Medium	Medium	$$$$	Low-Medium
Statewide 3-1-1 IVR	High	High	High	High	High	$$$$	Medium
Unified Chatbot	Medium	Medium	High	Medium	High	$$$	Medium
Virtual AI Assistant	Low	High	Medium	Low	High	$$$	Medium-High
Single 3-1-1 Solution	High	Low	High	Medium	Medium	$$$$$	Medium-High
Data Center / IT Consolidation	Low	Medium	High	Low	High	$$$$$	High
Payment Methods and Payment Portals	Low	Medium	High	Medium	High	$$$$$	Medium-High

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Legend for Ratings and Sample Indicators					
	Low		**Medium**		**High**
People	No or minor changes to existing roles / duties		Role changes, impacts to working routines and work environment		Hiring, attrition, retention issues, changes to job structures, union involvement
Process	Memo or instructional change needed		Augmentation to existing working practices		Major / wholesale new working practices
IT	Limited end user impact		System upgrades or functional changes		Major systems migrations and/or replacements
Organization	Minor changes to daily roles / routines		Some organizational realignment		Major structural changes and/or hiring required
Complexity	Work that can assumed within ongoing daily operations		Project oriented, multiple work streams, requires staffing, vendor procurement, etc.		Program oriented, larger scale.
Cost	$ Operational or sunk costs Time / FTE	$$ Capital funded study or initiative X < $1m	$$$ Capital funded project $1m - $5m	$$$$ Capital funded project $5m – $10m	$$$$$ Capital funded project $10+
Benefits	Intangible e.g. Qualitative user / customer satisfaction		Tangible e.g. Quantitative process efficiencies		Tangible e.g. Quantitative cost efficiencies

6.3.1 Existing 3-1-1 Operations

There are several ways that existing 3-1-1 operations would benefit from some level of integration and/or consolidation. One of the primary benefits is the potential for the State to absorb some of the costs associated with operating and maintaining 3-1-1 services, freeing up funds for local municipalities. Additionally, integration/consolidation efforts may offer the opportunity to leverage the latest technologies to expand on new capabilities and drive efficiencies in resource allocation, process and workflow, and IT Support. In turn, this can expand 3-1-1 service response times and improve customer experience regarding availability, service reliability, and portal usability.

Existing 3-1-1 operations will serve as critical stakeholders to inform the State what integration/consolidation strategies would be most advantageous. They can also serve as primary stakeholders in establishing benchmarking and operational best practices.

However, any integration or consolidation effort will include challenges. One challenge is the need to adjust for additional coordination with state stakeholders. Jurisdictions will need to determine new business rules and governance models as it relates to data ownership and the management and maintenance of shared infrastructure.

Another potential challenge is the notion that statewide integration/consolidation efforts may result in a risk of “losing local knowledge,” which can have a direct impact on front-line personnel and an indirect impact on the public. This risk can be mitigated by ensuring the involvement and participation of 3-1-1 operation stakeholders throughout the decision-making process.

With time, 9-1-1 consolidation has proven to be advantageous from an operational and technical perspective, primarily in terms of resource efficiencies and the associated cost efficiencies across IT, vendor management, and facilities. Leveraging some of the best practices from that space to help guide potential approaches for 3-1-1 may prove advantageous and reap similar results.

6.3.2 Counties Without 3-1-1 Operations

Jurisdictions that currently do not have a formal 3-1-1 operation would benefit significantly if the State explored a potential integrated/consolidated 3-1-1 model. While the distinct benefits would vary depending on the solution approach, typical benefits would include:

1) Improved Customer Experience of Existing Services

2) Expansion of Capabilities

3) Opportunity to Create a 311 Program

Some of the proposed strategies would immediately improve the service capacity on the local level. For example, a statewide ‘MD311’ website or chatbot would assist the public in being routed to the correct local jurisdiction to request assistance or place a service request. A statewide 3-1-1 public awareness campaign would help inform the public about 3-1-1, the different resources available, and when to call the 3-1-1 hotline versus 9-1-1. Additionally, standardizing the definition of an “emergency” and requiring standardized reporting would allow all local jurisdictions to use the same definitions for public transparency. These improvements may result in higher serviceability on the local level and an improved resident experience without significant local investment or operational change.

Additionally, many of the strategies, if implemented, would by default expand the capabilities of all localities regardless of whether they have a formal 3-1-1 operation. Local jurisdictions could leverage state-provided platforms, such as a centralized 3-1-1 website, chatbot and branding, without the need to develop, maintain or fund their own systems. Jurisdictions could utilize the branding to direct inquiries to either the chatbot or website, with no additional investment in new technology or infrastructure required to maintain a standalone 3-1-1 operation.

Furthermore, statewide integration and consolidation may provide local jurisdictions without 3-1-1 operations the support needed to either establish their own program or join a larger jurisdiction for a shared 3-1-1 service model. This support can be the State providing capital investment, IT support, or the technology to make the solution feasible. In turn, the local jurisdiction will have the choice to leverage the statewide solution to expand their 3-1-1 service capabilities.

However, some of the proposed statewide solutions would require a robust governance model to be effective. A clear governance model will provide a level of accountability, ensure stakeholder collaboration and increase user adoption to the new solution. These factors are important to reduce the risk of redundancies and silos, inefficiencies and non-compliance.

7.0 Conclusion & Recommendations

7.1 Conclusions of this Study

Feasibility Criteria

To determine the feasibility of implementing a statewide 3-1-1 solution/approach, the scope of the approach must be defined along with the criteria on which a determination of feasibility can be examined, and conclusions can be drawn. As described in section 2.2, the legislation directing this feasibility study asked that the Department of Information Technology "evaluate the feasibility of creating a 3–1–1 portal utilizing artificial intelligence" and "...generally relating to artificial intelligence and the 3–1–1 system." In section 6, this report considered a number of models and initiatives for how 3-1-1 might be reorganized to achieve statewide economies of scale. Some of those options were mutually exclusive, such as procuring a single vendor to operate one system or rationalizing existing applications and infrastructure. Some options were additive in nature or could be tackled as

a stand-alone project including marketing, central governance, standardization of requests, and a front end virtual assistant. Based on Gartner research and the experience of subject matter experts involved in this study, the following criteria were developed for evaluating the feasibility of a statewide 3-1-1 portal.

Data Integrity

This criterion refers to the standardization, completeness, and availability of data across 3-1-1 operations to facilitate accurate and reliable information exchange. As noted above, analysis of publicly available 3-1-1 data and insights from interviews show substantially differing issue taxonomies and a lack of access to data in municipalities without robust data aggregation, analysis, and reporting capabilities.

There are three specific areas where data standardization and availability will be a challenge for each jurisdiction brought into a consolidated system. First, the organization of standard service requests, previously discussed in section 4.1. Based on 3-1-1 data sets examined, it was not uncommon for jurisdictions to have hundreds of standardized requests that were specific to the jurisdiction. When sorted by frequency of request, there were many defined but infrequently requested services. Keeping the service requests separated by jurisdiction would dilute the value of consolidating, while trying to rationalize the service requests into a common set would require a significant time investment for a jurisdiction.

Second, it was common for 3-1-1 centers to use a CRM system to manage a (non-informational) request across its life cycle. Agencies would either update the request in the CRM system or for complex agency applications, pass it to another system to be worked on and then resubmit it to the CRM system. When a new jurisdiction is onboarded to a centralized system, it brings with it a number of agency integrations that need to be coded, tested, and maintained.

Third, it was also common for 3-1-1 centers to use GIS layers to identify whether a given service location was the jurisdiction's responsibility, or for certain services (like trash pickup) whether the service address was eligible. GIS data with this extra meta information may not exist for certain jurisdictions and need to be created. If the scope of the system were limited to informational requests, some benefit could be achieved without the GIS data or the integrations back into local agency systems. For a consolidated system covering informational and service requests, the challenge of the service request taxonomy, integrations to existing systems, and GIS data would be significant for each jurisdiction brought into the system.

Operational Scalability

This criterion refers to the adaptability and interoperability of 3-1-1 systems and processes as well as the degree to which the application of technology solutions to key business and operational problems might lead to the increased volumes of issues being solved with the same or fewer resources (marginal benefits to scale). 3-1-1 involves a substantial proportion of service requests that must be resolved at the local level and include complex interrelations between 3-1-1 systems and those of state, county, city, and commercial entities across multiple jurisdictions, making 3-1-1 inherently less scalable than other government services where issues can be mediated and resolved at the state level. Another key aspect of this criterion is the existence, or lack, of clear standards and definitions to coordinate and efficiently execute processes at scale, which, as of the creation of this study, do not currently exist in Maryland or any other state.

Governance and Accountability

This criterion examines mechanisms available for establishing decision rights, authority, responsibilities, and accountability across municipalities and jurisdictions to guide and oversee the implementation and ongoing operation of a statewide system. Shared standards and definitions

define the “rules of the road” and facilitate the creation of clear roles and responsibilities for all entities involved in executing 3-1-1 operations.

This study identified no governing board responsible for organizing, developing, and aligning the numerous municipalities and jurisdictional entities required to implement and operate a statewide 3-1-1 system.

Implementation Complexity

This criterion examines evidence about the effort required to establish favorable preconditions for rollout, including effective coordination mechanisms, the development of shared requirements, and the degree of coordination required with implementation partners (e.g., vendors, system integrators, state and local IT departments) to manage the intricacies of system development and deployment. As noted in this study, interviews revealed a geometric increase in implementation complexity of a statewide 3-1-1 system when accounting for the many state, county, city, and commercial databases, CRMs, workflow platforms, payment systems, GIS platforms, and telephony platforms across the state into which a consolidated 3-1-1 system would need to integrate, including the maintenance of those integrations.

There are two specific challenges worth noting individually. First, the "ticket passing" challenge mentioned in the Data Integrity subsection. The Data Integrity discussion addressed the specific challenges around managing a large number of disparate APIs. In a consolidated statewide system, those API calls would traverse networks, firewalls, and systems that might be down for maintenance or otherwise unavailable. A common enterprise solution for this type of environment is an integration hub or an API gateway, which introduces new technology and skill sets.

Second, any project to consolidate those functions would have to account for individual jurisdictions, the life cycle of the existing technology investments that jurisdictions have already made and the effort to either integrate existing technology into a new statewide 3-1-1 system or migrate off existing tools.

Study Conclusion

Based on these criteria, specifically challenges around data integrity (standardization) and implementation complexity, the evidence examined by this study suggests a low feasibility of implementing a consolidated statewide 3-1-1 portal in Maryland at this time.

7.2 Strategic Recommendations for Existing 311 Operations

This study identified meaningful opportunities for Maryland to enhance 3-1-1 services across the state by developing shared solutions and making them available to existing 3-1-1 operations or municipalities without 3-1-1 capabilities who might provide 3-1-1 services given the resources. These potential enhancements include:

Integration Platform

A key operational challenge of any 3-1-1 system is the development and maintenance of integration between core 3-1-1 systems (e.g., telephony, CRM) and those related to delivering the range of services offered. Both municipalities with existing 3-1-1 operations and those without would benefit from a robust integration layer (e.g., Boomi, MuleSoft) to capture, manage, and effectively use data and metadata within resilient connections and data flows between systems.

GIS Location Tracking

Detailed location determination and tracking are involved in the vast majority of 3-1-1 service requests and even many basic information inquiries. Each municipality currently must develop and maintain its own GIS location tracking platform, with some municipalities lacking this capability altogether. The provision and maintenance of an extensible GIS platform for adoption by municipalities would relieve a key operational burden and make this critical capability available to municipalities as a key value-added resource from the state.

Conversational Interfaces

Self-service, natural language tools (e.g., chatbots, “smart” IVR voice assistants) are not yet widely adopted for use in the context of 3-1-1 service delivery to address informational inquiries or assist 3-1-1 specialists. Operations across the state would benefit from the availability of self-service conversational interfaces to make information available in natural language interactions via digital channels. These tools also have the potential to increase accessibility of 3-1-1 services for residents of different abilities, with primary languages other than English, and outside of standard operating hours. Additionally, these tools have been demonstrated to aid support agents (3-1-1 specialists, in this case), increasing job satisfaction, improving training outcomes, and aiding in recruitment, retention, and decreased turnover.

Channel Support

Residents engage 3-1-1 services from a wide range of intake channels, including phone, web portal, mobile application, texting, social media, fax, mail, and in-person interactions. Interviews conducted by this study revealed that not all 3-1-1 operations are able to support more than a few of these channels and that service levels vary across each. Provision of a tool to improve service-level standardization across the variety of ways residents wish to engage with 3-1-1 would benefit both existing and future 3-1-1 operations across the state.

Standard Development

There are currently no international, national, statewide, or regional standards or widely adopted definitions available to 3-1-1 operations for elements like data/issue categorization, service levels, training, operational processes, or information sharing. One example is the inconsistent availability of a 9-1-1 non-emergency police channel. Developing and sharing standards across these topics would provide material coordination benefits, such as shared technical and operational requirements.

Public Outreach

Municipalities researched by this study are highly attuned and responsive to their local communities – a great strength of 3-1-1 operations across the state. However, limited budgets and technology resources do not always allow local community outreach organizations (e.g. Office of Public Relations) to conduct the broad public awareness campaigns necessary to educate residents about the nature of available non-emergency services and may contribute to non-emergency volume appropriate for 3-1-1 being instead directed to 9-1-1, 2-1-1, 9-8-8, and other origination points. Greater support for such public awareness would benefit both 3-1-1 operations and residents and has shown high returns on investment when conducted.

Adoption Models

A key barrier to consolidation of 3-1-1 services across municipalities is the lack of clear adoption models to define responsibility, accountability, and decision rights, particularly given that 3-1-1 service requests are fulfilled at a local level and local governments have direct electoral accountability to their constituents. Clear models specifying viable hybrid approaches to state/local 3-1-1 collaboration, including what the state will be responsible for versus the municipality would increase the practicality of more centralized direction of 3-1-1 services.

The successful implementation of these solutions may increase the future feasibility of a statewide 3-1-1 portal; however, the adoption of these recommendations is not a guarantee of feasibility. Depending upon which recommendations are adopted, the nature of the implementations, and the resulting effects on operational performance and business outcomes, the feasibility of a consolidated 3-1-1 portal may increase based on the criteria outlined above. Alternatively, successful implementation of these solutions may produce many of the expected benefits of a potential consolidated, statewide solution, rendering the further development of such a portal unnecessary.

8.0 Cost Considerations

The scope of this report is meant to include cost considerations and present a cost-benefit analysis of a statewide 3-1-1 portal, *if feasible*, as well as cost impacts from the use of AI in creating and operating the statewide 3-1-1 portal. Given the conclusions of this study and the low feasibility of a statewide 3-1-1 portal as determined, the recommendations focus on other ways that state efforts can contribute to supporting 3-1-1 service delivery across Maryland, including hybrid (opt-in) adoption models for existing 3-1-1 operations. Section 6 discusses potential operational and technical approaches and provides high-level cost guidance based on complexity; however, establishing credible cost estimates for options other than a statewide 3-1-1 portal is both outside the scope of this study and contingent on several unknowable factors such as:

- How the state chooses to fund and implement any recommendations made by this study, including budgets, operating models, build versus buy decisions, state licensing agreements, procurements & vendor selection, and governance agreements with county, city, and local jurisdictions.
- The number of existing 3-1-1 operations (e.g., Montgomery County, Baltimore County) choosing to adopt and use technical or operational services provided by the state, and to what degree they might utilize those services by type.
- Outcomes from other in-flight studies described in Maryland's Study Topics and 2025 Roadmap to the AI Subcommittee.

This study recommends further investigation into credible cost estimates by a committee or task force formed to take appropriate action on the evidence and recommendations of this study.

9.0 Appendices

9.1 Interview Summary

Interviews conducted by this study included representatives from the following organizations:

Position Title	Organization
Legislative Director	MD Department of Information Technology
Chief of Staff	MD Department of Information Technology
Senior AI Advisor	MD Department of Information Technology
MDEM 911 Board Exec. Director	MD Emergency Management
Chief Development Officer	MD Emergency Management
MDEM 911 Board Co-Chair	MD Emergency Management
MDEM 911 Board Deputy Director	MD Emergency Management
Senator	Maryland State Senate
Director of 311	Baltimore City 311
Director of 311	Baltimore County 311
Assistant Chief Admin. Officer	Montgomery County Emergency Management
Director of 311	Prince George's County 311

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