



City of Belpre, City of Marietta,  
and Washington County

# Washington County 911 Dispatch Feasibility Study

June 2025



88 E. Broad St.  
Columbus, Ohio 43215

Phone: (614) 466-4514  
Toll Free: (800) 282-0370

[www.ohioauditor.gov](http://www.ohioauditor.gov)



**To the Washington County Sheriff's Office, City of Belpre, City of Marietta, and  
Citizens of Washington County:**

I am pleased to present this shared-services study to the residents of Washington County. This study was at the request of the Washington County Sheriff's Office, City of Belpre, and City of Marietta and provided at no cost.

Ohio has thousands of local government entities, which has the benefit of keeping government close to the people and responsible to their needs. But this means that there can be duplication of effort, facilities, equipment, and resources.

The Washington County Sheriff's Office, City of Belpre, and City of Marietta came together to ask the Ohio Performance Team to review their operations to discover opportunities related to the consolidation of emergency dispatching services.

This study identifies two consolidation scenarios for the communities to consider. While this study is tailored to the needs of the partner communities, shared services can be of use in all communities where government and citizens are looking for innovative ways to reduce costs and maintain services.

A public hearing will be held on Tuesday, July 1st from 5 to 7 p.m. to discuss the findings of the study. This hearing will be held in Marietta at the Armory, located at 241 Front Street.

This feasibility study can be accessed online through the Auditor of State's website at <http://www.ohioauditor.gov> and choosing the "Search" option.

Sincerely,

A handwritten signature in black ink that reads "Keith Faber".

Keith Faber  
Auditor of State  
Columbus, Ohio

June 3, 2025

**This page intentionally left blank.**

# Table of Contents

Citizen Summary .....	1
Current Operations.....	2
Summary of Study Findings .....	2
Introduction.....	3
Study Methodology.....	4
General County 911 Operations.....	5
Washington County .....	5
City of Marietta.....	5
City of Belpre.....	5
Financial Profile.....	6
Consolidation Options .....	9
Potential Governance Model.....	9
Consolidation Scenarios.....	11
Staffing and Workload .....	12
Background .....	12
Methodology and Analysis .....	15
Conclusion .....	20
Issue for Further Study: Data Driven Staffing Decisions .....	21
Equipment and Technology .....	22
Conclusion .....	26
Financial Implications of Consolidation.....	27
Client Response .....	29
Appendix A: Purpose, Methodology, Scope, and Objectives.....	33
Feasibility Study Purpose and Overview .....	33
Study Scope and Objectives.....	33
Audit Methodology .....	35
Appendix B: Additional Background .....	36
Appendix C: Staffing and Workload .....	41

**This page intentionally left blank.**

# Citizen Summary

A feasibility study identifies opportunities for public agencies to combine or share resources to deliver services in a more efficient, effective, and transparent manner. In Ohio, any local government or school may enter into an agreement with another political subdivision to provide a service that the contracting political subdivision is otherwise legally authorized to exercise, perform, or render, as provided for in Ohio Revised Code (ORC) § 9.482. The Ohio Auditor of State's Ohio Performance Team provides feasibility studies to local government entities using data-driven analyses to provide information regarding the potential impact of combining or sharing resources. This feasibility study, conducted at the request of Washington County and the cities of Belpre and Marietta in accordance with ORC §117.473, was focused on identifying the potential benefits of a consolidated 911 dispatching operation within the County.

911 dispatch operations are the backbone of emergency response, ensuring that police, fire, and medical services are quickly and efficiently dispatched to those in need. When an emergency call is received, dispatchers assess the situation, gather crucial information, and manage the coordination and deployment of first responders to the appropriate location. By integrating technology, data management, and logistical planning, dispatch operations play a vital role in optimizing emergency response efforts. Efficient and effective dispatch operations are crucial in minimizing response times and ensuring public safety.

The study reviews the current dispatching operations for the City of Belpre, the City of Marietta, and Washington County and assesses the feasibility of consolidating operations in terms of staffing and workload, equipment and technology, and location and facility needs. It also calculates the financial impact of dispatch consolidation on a sliding scale, based on various decisions made in relation to the potential consolidation of operations.

This report relies on data primarily from 2023 to calculate workload, staffing, and financial analyses. In December 2024, Washington County migrated to what is known as the Next Generation 911 (NG 911) system. This is an upgraded system that will replace traditional 911 services. Through NG 911, additional technologies such as text messaging and real-time location sharing can be leveraged by emergency responders. This information can help to improve the accuracy and efficiency of first responders in emergency events. While we are aware of this change and have considered its potential impact, it is important to understand that the processes and call data used in this study reflect operations prior to the implementation of NG 911. Considerations are noted where appropriate.<sup>1</sup>

---

<sup>1</sup> See previous [performance audit](#) on the Department of Administrative Services for more information on Next Generation 911.

## Current Operations

At the time the feasibility study was requested, three public safety answering points (PSAPs) were located and operating in Washington County. A PSAP, as defined by ORC § 128.01(P), is “an entity responsible for receiving requests for emergency services sent by dialing 9-1-1 within a specific territory and processing those requests for emergency services according to a specific operational policy that includes directly dispatching the appropriate emergency service provider, relaying a message to the appropriate emergency service provider, or transferring the request for emergency services to the appropriate emergency service provider.”

Each of the entities participating in the feasibility study operated one of the PSAPs in the county. The City of Belpre dispatches for the Belpre Police Department, Belpre Volunteer Fire Department, Belpre EMS and Barlow Township Fire Department while the City of Marietta dispatches for the Marietta Police Department.<sup>2</sup> Washington County Sheriff’s Office provides dispatching services for all other entities within the County, which include Washington County Sheriff, New Matamoras Police Department, Beverly Police Department, Lowell Police Department, and 17 Fire and EMS Departments across the County.

## Summary of Study Findings

Under the operating structure prior to the feasibility study, each of the entities has operated a PSAP and provided dispatch services. It is important to understand that when someone calls 911, the call is directed to the nearest PSAP. In some instances, the PSAP may be able to dispatch services directly. However, if there are multiple dispatch centers, the call may require a transfer prior to responders being dispatched. The cities could cease operating as a PSAP but maintain dispatch services for local police or fire. However, if either city chose to continue dispatching emergency calls, it would negate the efficiencies identified throughout this report. Our findings are based on the understanding that dispatch for all entities would be centralized under a singular PSAP.

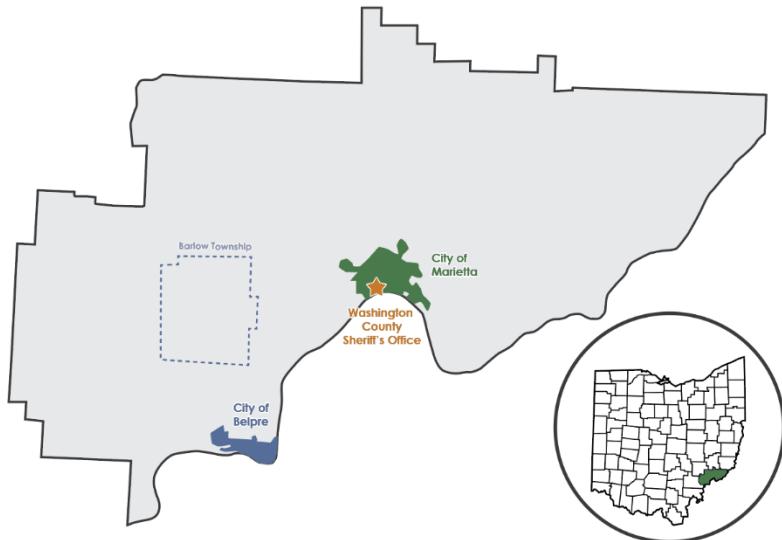
The consolidation of the three PSAPs and dispatch operations appears to be feasible in terms of staffing, equipment and technology, and facility resource needs. Overall, consolidation could result in a reduction of total expenditures related to dispatch operations. The extent of potential cost savings would be based on a variety of factors including contract negotiations and the method of consolidation. In addition to cost savings, consolidation could have the added benefit of improving response time through the reduction of emergency call transfers between dispatch centers and limiting the number of calls that are dropped between transfers.

---

<sup>2</sup> The City of Marietta dispatches for the Marietta Police Department. Prior to the implementation of NG 911, Marietta Fire Department dispatched for themselves. Following NG 911 implementation, the Washington County Sheriff’s Office dispatches all Marietta Fire Department calls.

# Introduction

Washington County is comprised of 640 square miles (632 land miles and 8 water miles) and had a population of approximately 59,000 people in 2022. Three PSAPs exist within Washington County: one in the Washington County Sheriff's Office (WCSO), one in the City of Belpre (Belpre), and one in the City of Marietta (Marietta). The map to the right shows the locations of Belpre and Marietta within Washington County along with the physical office location of the WCSO. In addition, Barlow township is outlined in blue as it has some emergency response services dispatched by Belpre.<sup>3</sup>



When a 911 call is placed from within Washington County, it is answered by one of these three PSAPs, depending on the origin of the call. 911 calls made from landlines are routed directly to the appropriate PSAP based on the location of the landline. In 2023, if the call originated from a wireless phone, it was first answered by the WCSO Dispatch.<sup>4</sup> Through conversation with the caller, the dispatchers then would determine the location of the emergency and, if needed, transfer the call to Belpre or Marietta. Once the call is received by the appropriate PSAP, either originally or by transfer, emergency services are dispatched. In addition, dispatchers in all three locations also answer calls from non-emergency lines. At times calls to these lines require dispatching emergency responders.

In 2024, this feasibility study was requested by Washington County, Belpre, and Marietta. The Ohio Auditor of State has discretion to provide feasibility studies to state agencies and local public offices with the goal of furthering their efforts towards more efficient and effective service provision. These studies are provided at no cost to the entities, in accordance with ORC §117.473.

<sup>3</sup> Belpre dispatches for the Barlow Township Fire Department while the WCSO provides law enforcement coverage for Barlow Township.

<sup>4</sup> After the upgrade to NG 911, wireless calls are routed based on Geographic Information System (GIS) data from the cell phone and may be directed to any of the three PSAPs.

The objective of this feasibility study<sup>5</sup> is to provide objective analysis, findings, and conclusions to assist those charged with governance and oversight with, among other things, improving program performance and operations, reducing costs, and facilitating decision making by parties responsible for overseeing the PSAPs in Washington County. The study examines the feasibility and potential benefits of combining the existing PSAPs. It seeks to determine whether combination is possible and, most importantly, beneficial to residents.

## **Study Methodology**

To determine the feasibility of consolidation, we conducted a thorough review of relevant laws and regulations to first determine if any legal barriers existed. Once we confirmed that it is legally possible to consolidate dispatch operations, we then determined the most effective and efficient manner of consolidation through detailed staffing and facilities analyses. Once these analyses were completed, we then calculated the financial impact of consolidation and potential cost savings to the community as a whole.

---

<sup>5</sup> The study was conducted in accordance with Generally Accepted Government Auditing Standards. See [Appendix A](#) for more details.

# General County 911 Operations

Currently the WCSO, Belpre, and Marietta each operate PSAP locations that provide dispatch services within specific areas of the County. The County is required to maintain a six-member 911 program review committee made up of voting members as defined in ORC § 128.06. This committee is responsible for maintaining a countywide 911 plan and updating the plan annually.

## Washington County

The 911 system has multiple forms of leadership at the County level. Ultimately the County Commissioners are responsible for the program. One of the commissioners chairs the committee required by ORC § 128.06 to govern the County 911 Plan. In addition, the 911 Director is hired by the Commissioners and oversees the implementation of the county-wide 911 plan.

The County PSAP is managed by an individual within the Sheriff's Office. WCSO's PSAP is located within the Sheriff's Office building, which is within the Marietta city limits. In 2024, the staff consisted of 10 full time dispatchers. Two or three dispatchers were on shift together, with a capacity of four stations. WCSO dispatches for 17 volunteer fire departments, 3 police departments, adult probation and parole, Marietta municipal court probation, and for all other areas not otherwise under the jurisdiction of another department. WCSO also notifies the local Ohio Department of Natural Resources (ODNR) office for calls related to ODNR's jurisdiction but does not dispatch for ODNR like other units or keep track of this call volume.

## City of Marietta

In Marietta, the Mayor appoints a Director of Public Safety and Service to oversee all safety and service departments. Both the Police Department and PSAP are managed by the Police Chief, who reports to the Director of Public Safety and Service. The Marietta PSAP is located within the City Hall building. In 2024, the staff consisted of 4 full-time dispatchers. One dispatcher was typically on shift, with a maximum capacity for two. The PSAP dispatches for the Marietta Police Department and, when necessary, transferred calls to the Marietta Fire Department and EMS prior to NG 911 implementation.

## City of Belpre

In Belpre, the Mayor appoints a Safety Service Director to oversee safety and service departments. Both the Police Department and PSAP are managed by the Police Chief, who reports to the Safety Service Director. The Belpre PSAP is located within the City Building. In 2024, there were 4 full time and 3 part time dispatchers for a total of 5 FTE dispatchers. One dispatcher was typically on shift, with station capacity for two. The PSAP dispatches for Barlow Volunteer Fire Department, Belpre Police Department, Belpre Volunteer Fire Department, and the City of Belpre EMS.

# Financial Profile

Washington County, the City of Marietta, and the City of Belpre each have unique accounting structures within their own financial systems. The County funds dispatch with Special Revenue, generated for the 911 system specifically. The cities fund their police departments with General Funds and include dispatching within this department. While the cities do not directly receive funding for dispatch operations, the County pays for or reimburses the cities for some county-wide aspects of the 911 system.<sup>6</sup> These complexities are not a barrier to consolidation and would be simplified in a consolidation because one entity would financially manage the system.

The differences in financial organization and overlap of some expenses do create challenges in comparing the current cost of dispatch at each entity. For example, the County pays for the 911 phone system that is used at each PSAP, but we were unable to accurately attribute portions of the cost to the cities. Comparing entities as if the cities do not rely on this expenditure for operation would be misleading. The following revenue and expenditure information outlines the money flowing from each entity individually. It should not be used for direct comparison or collective cost of the three entities.

## Revenue

Of the three entities, only Washington County receives revenue specifically for the purpose of 911 operations. Most of the funding was voted on by residents of the County, including voters in the city limits. The city PSAPs are able to request reimbursement or use of these funds from the County. Those sources are:

- **911 Landline Surcharge [ORC § 128.37]** – \$0.50 per line charge on landline phone bills, passed as a continuous levy in November 2001.
- **911 Levy [ORC § 128.35]** – 0.35-mill levy. This levy has been in place for several years and was most recently renewed for a five-year period in November 2021.
- **Sheriff's Sales Tax [ORC § 5739.026]** – half-cent (\$0.005)/dollar sales tax passed in November 1989, with less than 5 percent of the revenue from this source used for dispatch.

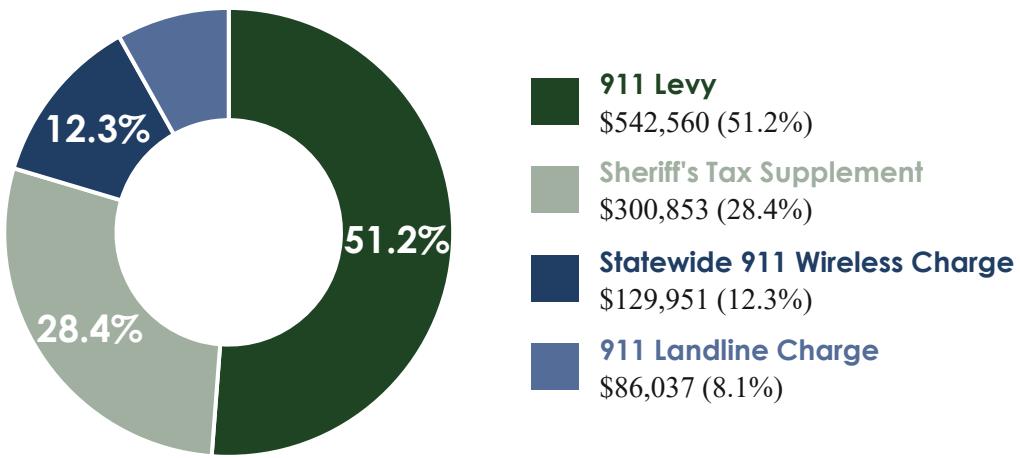
In addition to the voted funds, there is a statewide fee applied to wireless carrier bills (ORC § 128.41). The revenue generated from the 911 Wireless Charge is distributed to County treasurers per ORC § 128.55. While this funding is not shared with the cities, it does contribute to services like the 911 phone system used by all three PSAPs. Below is a breakdown of County revenues dedicated to 911, including only the supplement from the Sheriff's Sales Tax. In 2023, this revenue accounted for 0.6 percent of the County's total revenue of \$186,250,801.

---

<sup>6</sup> Washington County covers the cost of the Computer Aided Dispatch, Records Management System, 911 Phone System, dispatch internet connections, and connection to NG911 for all three PSAPs.

## Washington County 2023 Dispatch-Related Revenue

**Total: \$1,059,401**



Source: Washington County

While the County has just over \$1 million in revenue dedicated to dispatch, the Cities do not have similar specialized revenue streams. Instead, the municipal revenue generated by various taxes in Marietta and Belpre is directed to the City's General Fund. The revenue necessary to pay for dispatch related expenditures is appropriated through the General Fund.

## Expenditures

Washington County separates dispatch expenditures in their accounting system. The cities each include dispatching in police department expenditures, with no specific designation for dispatch. In consultation with city officials, we isolated known dispatch expenditures from each city's financial data. Each entity's expenditures were categorized into the common operational buckets of Salaries & Wages, Benefits, Purchased Services, Materials & Supplies, Travel & Training, and Miscellaneous.

In a consolidation scenario that results in fewer staff members, entities would experience cost reductions in personnel, training, potentially purchased services, and per-station technology. Regardless of staffing levels, consolidation would result in the reduction of duplicative technology costs, which span the categories of Purchased Services, Materials & Supplies, and Miscellaneous. The following chart shows a comparison of expenditures for each entity broken down by category.

## 2023 Dispatch Expenditure Comparison

Efficient

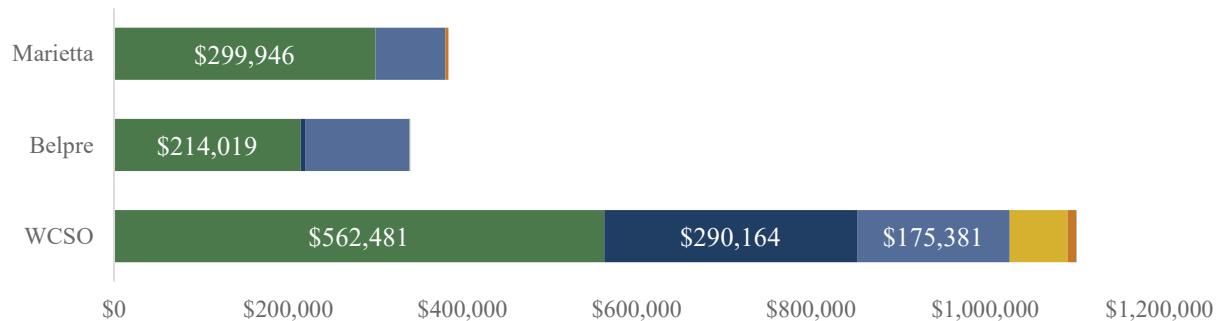
•

Effective

•

Transparent

■ Salaries & Wages ■ Purchased Services ■ Benefits ■ Materials & Supplies ■ Miscellaneous ■ Travel & Training



Source: WCSO, City of Belpre, and City of Marietta

### Washington County

The County pays for dispatch with three Special Revenue funds dedicated to the 911 system. Currently, these funds do not cover the full cost of operation. The personnel costs of four dispatchers are temporarily being supplemented from the General Fund. Specifically, the supplement is provided through a General Fund set-aside for WCSO. In total, the dispatch expenditures accounted for 0.5 percent of the County's 2023 expenditures across all funds.

In 2023, WCSO spent approximately \$1.1 million on dispatch. Over 65 percent of these expenditures were for Salaries & Wages and Benefits. An additional 26.3 percent were for Purchased Services. The remaining 7 percent of costs are for supplies, various fees, and training.

### City of Belpre

We identified \$340,026 of dispatch expenditures for the year 2023. Over 97 percent of these expenditures were for personnel costs. Another 2 percent was spent on Purchased Services which includes contracted IT labor, as well as auditing and antenna usage. All identified dispatch expenditures account for 8 percent of all General Fund expenditures in 2023.

### City of Marietta

We identified approximately \$384,000 of dispatch expenditures for the year 2023. Most expenditures were related to salaries and benefits of employees, with the two categories combining to total 99 percent of all dispatch related expenditures that were isolated during our review of financial data. All identified dispatch expenditures account for 2.9 percent of all General Fund expenditures in 2023.

In FY23, Marietta also estimated \$4,000 from the Capital Outlay fund for one-time computer upgrades and \$164,000 from the Local Fiscal Recovery Special Revenue fund to upgrade radio consoles. These costs are not recurring operational expenditures. Similar expenditures in previous fiscal years totaled approximately \$4,000 (FY 2021) and \$0 (FY 2022) relating to IT and telecommunication upgrades.

# Consolidation Options

When determining the feasibility of consolidating necessary and required services, it is critical to first determine if it is allowable by law. A review of the Ohio laws and administrative codes relevant to dispatching operations did not find any clear impediments to consolidation. While the County and both cities currently meet legal requirements for operating a PSAP, such as mandatory minimum staffing levels and technology needs, implementation of any consolidation efforts between the Washington County, the City of Belpre, and the City of Marietta should include verification of continued compliance with these laws and administrative codes.<sup>7</sup> In addition, consolidation may require an amendment of the countywide 911 system final plan in accordance with ORC § 128.06 and § 128.12.

## Potential Governance Model

Currently, dispatch services are managed independently by Washington County, Belpre, and Marietta. If consolidation occurs, a governance model will need to be chosen and agreed upon by all three entities. Dispatch consolidation efforts in Ohio have had their own unique circumstances in terms of existing staff, equipment, technology, and physical space, as well as community needs and expectations. There are various models adopted by governments in Ohio that can be considered when consolidating dispatch operations.

### Contract For Service

Under the contract for service model, one entity is responsible for the equipment, facilities, and employees. The primary host then contracts with the other entities. This model results in a direct reporting structure for the director and staff. The PSAP also has access to the consolidating entity's administrative support such as human resources, facilities, and computer and network support. The drawback of this model for the contracting entities is a loss of control over decision making. Dispatching services, however, are conducive to contracting as service levels are not dependent upon physical location, and do not directly impact citizen accessibility. In a consolidation between a city (or cities) and a county, there are three entities that could serve as the primary host: the county sheriff, the county commissioners, or a city.

### Advisory Board

Under a contract for service model, it would be most logical to use Washington County as the service provider as it receives dedicated statewide funding for dispatch services. In addition,

---

<sup>7</sup> Including, but not limited to, OAC 5507-1-05 regarding minimum staffing levels, OAC 5507-1-18 regarding minimum answering standards, OAC 5507-1-11 regarding the security of the location, and OAC 5507-1-12 regarding the minimum number of 911 lines.

using existing Washington County facilities would not require renovations. However, under this model, Marietta and Belpre would be paying Washington County for a service and would not have direct authority over operational or service delivery decisions.

According to DAS, it is considered a best practice to have an advisory board with representatives from the county and municipalities within the county. Such a board is typically informed of and advises on financial and operational decisions associated with 911 dispatch services. While the contracted provider is ultimately responsible for making final decisions, the advisory board allows for greater representation from the entities involved.

## **Regional Council of Governments**

ORC § 167.01 establishes the authority of multiple local governments to create a Council of Governments (COG) for the purposes of performing functions and duties that its members can perform individually and addressing problems of mutual concern.

In 2019, the Lucas County Commissioners and the other subdivisions located within the County formed the Lucas County 911 Regional Council of Governments. The purpose was to create a partnership of county, municipal and township governments to operate a safe, effective and efficient 911 system for Lucas County and all of the subdivisions within its jurisdictional territory. The COG is governed by a Board of Directors which includes representation from the Sheriff as well as police and fire chiefs of other municipalities within Lucas County. Operational costs are calculated on an annual basis among Lucas County and its subdivisions based upon the proportional share of dispatch usage.

## **Additional Considerations**

Dispatchers in Washington County, Belpre, and Marietta are currently employed under three separate collective bargaining agreements (CBAs) with their respective employer. The current CBAs do not have comparable pay scales, insurance offerings, paid time off, or overtime pay. The decision to consolidate operations must include discussions on how a new contract would be negotiated. Any projected financial savings are subject to these negotiations. For a detailed comparison of the current salary schedules of dispatchers within Washington County, Belpre, and Marietta, see [Appendix B](#).

When determining whether or not to consolidate dispatch operations, Washington County and the cities of Belpre and Marietta should consider the benefits and drawbacks of each governance model and develop a strategy to mitigate any potential significant challenges that may arise during the decision-making process. All three entities should ensure consensus among key stakeholders before deciding on a governance model. Finally, any changes to operations may require contract negotiations within each of the entities.

# Consolidation Scenarios

After review and analysis, we determined that it is feasible to consolidate the dispatch operations of Washington County, Marietta, and Belpre. Using available data, we determined that two scenarios would offer the most efficient method of consolidation and offer the opportunity for the highest amount of potential cost savings. In both scenarios, Washington County would host the PSAP and Belpre and Marietta would contract with the County for services.

**Scenario 1: Operate the consolidated dispatch operations from the Washington County Sheriff's Office.** The current WCSO has adequate space to house the staffing and equipment for a County-wide consolidated dispatch operation. This location is already fitted for dispatch and would not require renovations.

**Scenario 2: Create a virtual consolidation of technology with a single PSAP being operated from two physical locations.** Dispatch would be managed under one consolidated operation (management, technology, policies and procedures) but dispatchers would be in two physical locations, one in WCSO and the other in the City of Belpre. During discussions with the two cities, both expressed concern with covering administrative phone calls if dispatchers were no longer there to answer the administrative phone lines. In addition, the City of Belpre expressed a desire for 24/7 coverage of its administrative building. After reviewing the history of dispatch consolidation in Ohio, other counties have consolidated dispatch operations by connecting various locations via internet-protocol (IP) allowing them to answer 911 calls from multiple physical locations. This scenario provides an option for the County to derive benefits from a consolidated dispatch operation while continuing to have dispatchers work within the City of Belpre. However, it should be noted that this scenario would be more costly to maintain and would require additional negotiations and considerations relating to staffing.

Both Scenario 1 and Scenario 2 provide a consolidated operation where dispatchers, regardless of physical location, have access to the same data and technology when deploying first responders to emergencies.

The subsequent sections of this report evaluate the potential impact of consolidation on staffing levels as well as technology and equipment need. In the following sections, Staffing and Workload and Equipment and Technology, location consolidation Scenario 1 and Scenario 2 are presented, each with respective detailed staffing options, technology needs, and potential savings, respectively. While other options may exist regarding the physical location of a consolidated dispatch in Washington County, these two scenarios were determined to be most feasible in the current state. Therefore, we based our conclusions and financial impact as reported throughout this study on these scenarios.

# Staffing and Workload

The personnel costs, including salaries and benefits for dispatchers, account for the largest portion of the expenses in running a dispatch operation. As a result, they represent the majority of potential savings in the event of consolidation. However, it is crucial to maintain an adequate number of dispatchers to meet service demands in a consolidated operation. This ensures continued quality service for users, prompt responses to emergency calls, and, ultimately, the safety of residents.

Therefore, any consolidation plan must include a strategy for determining the necessary staffing levels for dispatchers. To establish these requirements, we first analyzed current staffing and call volume for Washington, Belpre, and Marietta. We also considered other potential impacts of a consolidated operation including, but not limited to, the reduction of transfers and the aid of new technology. Based on this information, we projected the total number of 911 calls a consolidated operation would likely receive at various times and on different days. Finally, we calculated the number of dispatchers required to handle projected calls within response time standards expected in the industry.

## Background

In 2024, WCSO employed 10.0 Full Time Equivalents (FTEs) dispatchers who each work 80 hours over a two-week pay period.<sup>8</sup> The WCSO dispatch center operates with two or three dispatchers at a time, depending on the time of day. Belpre employs 5.0 FTE dispatchers, which is comprised of individuals that work either on a full-time or part-time basis. Belpre's full-time dispatchers work 84 hours over a two-week pay period.<sup>9</sup> Marietta employs 4.0 FTE dispatchers who, like WCSO, work 80 hours over a two-week pay period.<sup>10</sup> Belpre and Marietta typically have one or two dispatchers working at a time.<sup>11</sup> [Appendix C](#) includes a comparison of calls per FTE at each of the three locations in 2023.

To determine the number of dispatchers needed in a consolidated operation, several factors are considered. First, the historical call volume and types of calls received by each PSAP provides context to potential future demand. In 2023, the three PSAPs received just over 87,000 calls in total. These included emergency calls made by dialing 911, transfers from one PSAP to another, as well as calls made to the administrative phone lines and answered by the dispatchers at all

---

<sup>8</sup> WCSO dispatchers work six 12-hour shifts and one 8-hour shift over a two-week pay period.

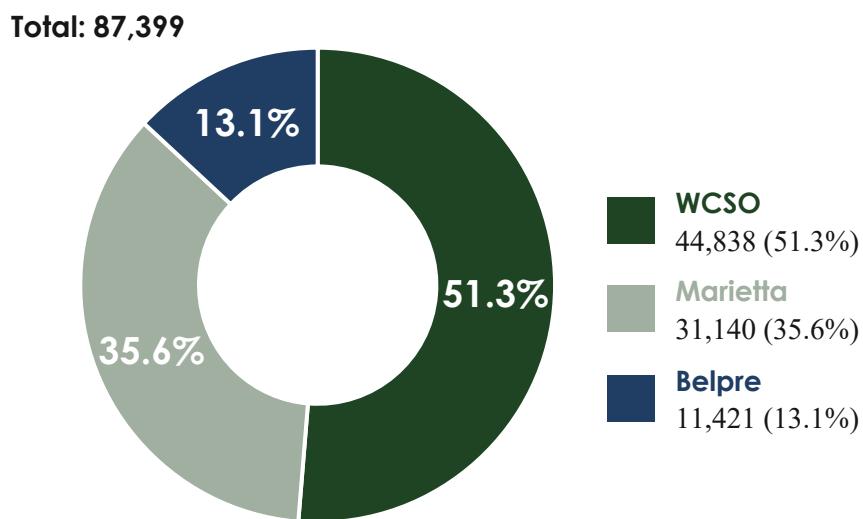
<sup>9</sup> Belpre's dispatchers work 36 hours one week and 48 hours the other week, within a two-week pay period. Hours exceeding 80 are paid out at 1.5 times the hourly rate.

<sup>10</sup> Dispatchers in Marietta work 36 hours one week and 44 hours the next week, within a two-week pay period. Hours exceeding 40 hours in any one week are paid at 1.5 times the hourly rate.

<sup>11</sup> OAC 5507-1-05 states that “[a] minimum of two telecommunicators must be on duty and available to receive and process calls at all times. For 9-1-1 systems with automatic rollover to a secondary PSAP, the secondary PSAP fulfills this obligation.” Belpre and Marietta can operate with one dispatcher and still fulfill this requirement because unanswered calls automatically rollover to WCSO.

three dispatch centers. Administrative phone lines are the 10-digit phone number associated with the police or fire, often referred to as “non-emergency” lines. While many of the calls made to these lines are likely for administrative purposes such as obtaining a permit or asking a general administrative question, it is possible that some calls made to these numbers do require emergency services. Because of this, we considered the impact of administrative calls at each location where appropriate in our analysis. The chart below shows the distribution of total calls from 911 between the WCSO, Belpre, and Marietta PSAPs in 2023.

### 2023 Call Volume by PSAP



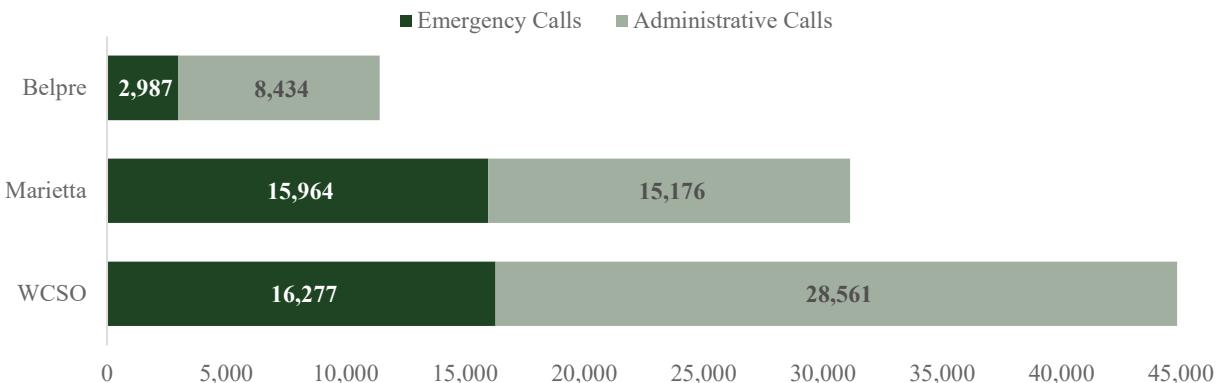
Source: WCSO, City of Belpre, City of Marietta

Note: Calls do not include the 10,398 calls made directly to the Marietta Fire Department 10-digit emergency line as they were not directed to a PSAP.

WCSO received the majority, 51.3 percent, of all PSAP calls made in 2023 followed by Marietta with 35.6 percent and Belpre with 13.1 percent. As mentioned, these calls include both emergency and administrative calls. See [Appendix C](#) for a summary of all emergency calls received by the three PSAPs and the Marietta Fire Department.

In the event of a consolidation, only the administrative calls of the site(s) where the PSAP remains located would be answered. This is an important consideration when determining the potential future call volume. The following chart shows the breakout of emergency and administrative calls by PSAP in 2023.

## 2023 Emergency vs Administrative PSAP Calls

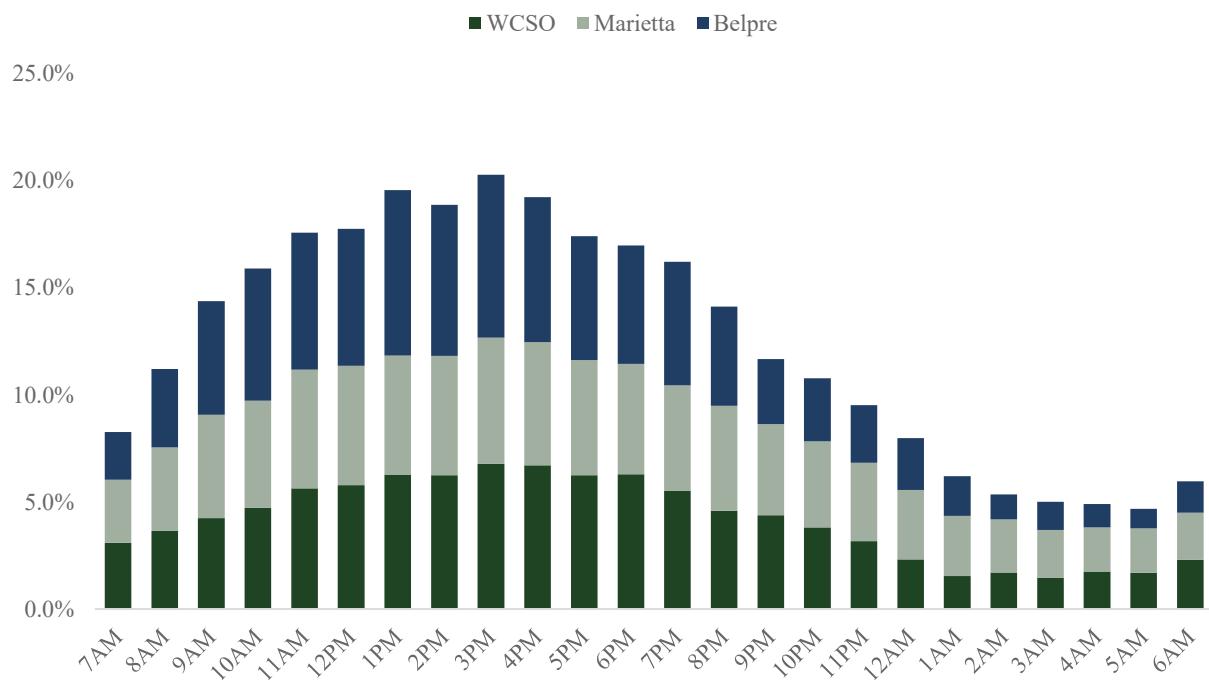


Source: WCSO, City of Belpre, City of Marietta

Note: Calls do not include the 10,398 calls made directly to the Marietta Fire Department 10-digit emergency line.

Another important factor to consider when staffing a dispatch center is the number of calls received per hour throughout the day. This data can be used to identify peak periods and when additional personnel may be utilized. The chart below illustrates the percentage of total emergency calls by hour and shift in 2023.

## 2023 Hour by Hour Distribution of Emergency Calls



Source: WCSO, City of Belpre, City of Marietta

In both consolidation Scenario 1 and Scenario 2, some level of non-emergency administrative calls would also be handled by the PSAP. When examining the number of non-emergency administrative calls per hour in 2023, the pattern of peak periods is similar to that of emergency calls as shown above. See [Appendix C](#) for the chart illustrating the hour-by-hour summary of non-emergency administrative calls received in 2023.

## **Methodology and Analysis**

We used historical call data, minimum answering standards, and a common industry formula to estimate number of dispatchers needed in a consolidated operation for both Scenario 1 and Scenario 2.

The National Emergency Number Association (NENA) sets standards for 911 call answering times to ensure quick emergency response. According to NENA's call answering standards, 90 percent of all 911 calls should be answered within 15 seconds and 95 percent of all 911 calls should be answered within 20 seconds. These standards are designed to minimize delays in and ensure efficient and effective emergency response.

Some states, including Ohio, have adopted NENA's standards. According to OAC 5507-1-18, PSAPs are required to answer 90 percent of 911 calls within 15 seconds and 95 percent of 911 calls within 20 seconds, consistent with NENA's recommendations. These measures ensure that Ohio's emergency response system remains efficient and responsive to public needs.

To identify the number of dispatchers needed in Washington County to meet NENA standards, we used a common formula used by call centers known as the Erlang C formula. This formula, which dates back to 1917, is to estimate the number of agents, or dispatchers, needed to handle incoming calls efficiently. The formula calculates the probability that a caller will have to wait in a queue for service. Inputs to this formula include the average number of calls per hour, the average handling time, and the number of agents, or dispatchers. See [Appendix C](#) for more information and detail on the Erlang C formula.

Finally, this analysis also considers a shift relief factor. This shift relief factor is a metric used to determine the number of dispatchers needed to cover a shift, accounting for factors like paid leave, training, and other absences. It is calculated by dividing the total number of hours required to cover a shift over a specified period (such as a year) by the number of hours an average employee is available to work. Incorporating this shift relief factor ensures that the appropriate number of staff are hired to meet operational needs.



We use two assumptions to calculate the shift relief factor for a consolidated dispatch: an 80-hour bi-weekly schedule and the use of full-time employees only. The total hours needed to cover one 12-hour shift over a year is 4,380. Dispatchers are scheduled to work 80 hours each pay period, or 2,080 hours a year.<sup>12</sup> In 2023, the dispatchers in WCSO, Belpre, and Marietta averaged 213 hours of leave per year.<sup>13</sup> Dividing the total hours required to cover a shift by the average number of hours available to work results in a shift relief factor of 2.35. This means it requires 2.35 FTE dispatchers on the payroll to ensure proper coverage for each 1.0 FTE position throughout the year.

### Estimated Call Volume in a Consolidated Operation

In consolidation Scenario 1, a single PSAP would be located at WCSO with all dispatchers working from the WCSO dispatch center. To estimate call data used in Scenario 1, all 911 calls placed to the three PSAPs in 2023 as well as the WCSO's non-emergency administrative calls are included. This assumes that the single PSAP would handle all 911 calls in the County as well as the administrative calls placed to the WCSO. The City of Belpre and the City of Marietta would need to determine how to handle non-emergency calls placed to their cities.

#### Estimated Call Volume - Consolidation Scenario 1

	<b>WCSO</b>	<b>Marietta</b>	<b>Belpre</b>	<b>Total</b>
Emergency Calls	16,277	26,362	2,987	45,626
Non-Emergency / Administrative Calls	28,561	N/A	N/A	28,561
<b>Total Calls</b>	<b>44,838</b>	<b>26,362</b>	<b>2,987</b>	<b>74,187</b>

Source: WCSO, City of Belpre, City of Marietta

Detailed call data was provided by WSCO, Belpre, and Marietta. Using this data, we analyzed the duration of each call and calculated a weighted average handling time of 1 minute and 23 seconds per call. We then used this information to estimate call volume under a consolidated operation. The estimated call volume in Scenario 1 is 74,187 calls, which includes all emergency

<sup>12</sup> Assuming this schedule eliminates the need for automatic overtime. This schedule is effectively being used by WCSO.

<sup>13</sup> The average leave excludes employees who were not full-time employees for the entirety of CY2021 - CY2023 because the total available hours for these employees could not be determined.

calls as well as WCSO administrative calls. This translates to an average of 8.5 calls per hour over the course of the year

In consolidation Scenario 2, a single PSAP would be operated by the WCSO. However, dispatchers would be located at both WCSO and the City of Belpre. This would be accomplished by consolidating technology, allowing dispatchers to communicate and have access to the same information systems. The only difference from Scenario 1 would be the physical location of where the dispatchers are working. Scenario 2 would allow the City of Belpre to have a dispatcher onsite and available to answer the non-emergency administrative phones lines while also allowing for a 24/7 building presence, concerns that were expressed by City management during the course of this study.

To estimate call data used in Scenario 2, all 911 calls placed to the three PSAPs as well as the WCSO and the City of Belpre's non-emergency administrative calls are included.<sup>14</sup> This assumes that the single PSAP would handle all 911 calls in the County as well as the non-emergency calls placed to WCSO and the City of Belpre. The City of Marietta would still need to determine how to handle its non-emergency calls.

### Estimated Call Volume - Consolidation Scenario 2

	<b>WCSO</b>	<b>Marietta</b>	<b>Belpre</b>	<b>Total</b>
Emergency Calls	16,277	26,362	2,987	45,626
Non-Emergency / Administrative Calls	28,561	N/A	8,434	28,561
<b>Total Calls</b>	<b>44,838</b>	<b>26,362</b>	<b>11,421</b>	<b>82,621</b>

Source: WCSO, City of Belpre, and City of Marietta

The estimated call volume in Scenario 2 is 82,621 calls, which includes all emergency calls as well as WCSO and the City of Belpre non-emergency administrative calls. This translates to an average of 9.4 calls per hour over the course of the year. Detailed call data was provided by WCSO, Belpre, and Marietta. Using this data, we analyzed the duration of each call and calculated a weighted average handling time of 1 minute and 47 seconds per call.

### Dispatchers Needed in Consolidated Operation (Erlang C)

Call centers use a mathematical formula known as Erlang C (See [Appendix C](#) for more details) to calculate the probability a customer call will wait in line to be answered. This formula is useful to determine the number of call center operators necessary to meet a certain standard of customer service. We used this formula to determine the probability a call would wait longer than 15 seconds to be answered by dispatch with 2.0 operators working at any given time during

---

<sup>14</sup> Detailed data on a per-hour basis was missing for roughly 35 percent of Belpre's total non-emergency administrative calls in 2023. There was nothing to indicate that the missing calls would be distributed differently than the rest of the calls.

the day. Using historical call volume and the average handling time of calls, the Erlang C formula yields the probability that a call will wait longer than the set target. In this scenario, that target is set to 90 percent of calls being answered within 15 seconds or less.

After calculating the probability that a call would take longer than 15 seconds to be answered, we used the service level formula (see [Appendix C](#) for more details) to determine the estimated percentage of calls that would be answered within 15 seconds or less. The number of dispatchers was raised by 1.0 FTEs until the expected service level met or exceeded the target service level. With this calculation, we determined it would be expected that 98.7 percent of calls in Scenario 1 and 97.3 percent of calls in Scenario 2 would be answered within 15 seconds with two dispatchers working per shift.

In both scenarios, the level of service would exceed the NENA and OAC standard of answering 90 percent of emergency calls within 15 seconds.

Erlang C typically relies on average annual call volume on an hourly basis. While the annual average was used as the basis of our analysis, we also had detailed historic data for each hour of the day throughout the year. Using this data, we analyzed staffing needs on an hour-by-hour basis for both scenarios. The results of this analysis showed that there is not a time within the average day where more than 2.0 FTE dispatchers are needed to meet the NENA and OAC standards. See [Appendix C](#) for the expected percentage of calls answered within 15 seconds for each hour of an average day. In some instances, we found that NENA and OAC standards for timeliness answering could be met with 1.0 FTE dispatchers; however, that would not meet minimum staffing requirements set by law.

Our analysis determined that both consolidation scenarios would meet standards with 2.0 FTE dispatchers working on each 12-hour shift. To determine how many total dispatch employees this staffing level would require, we considered the shift relief factor explained above. The visual below illustrates the impact shift relief has on the total number of dispatchers needed.

Dispatchers (one shift)	Shift Relief Factor	Dispatchers Needed with Shift Relief (one shift)	Total Staffing Needed (two shifts)
 (2.0)	x 2.35	 (4.70)	 (10.0)

As seen in the chart above, based on historical call volume, a consolidated dispatch center would need 10 FTE employees to meet staffing needs. At the time of our analysis, the three entities employed a total of 19 FTE dispatchers, indicating that there is potential for a reduction in staffing through consolidation.

## Current Call Handling

In 2023, 19.0 FTE dispatchers within the three PSAPs handled 87,399 calls. These calls included both emergency and administrative calls at WCSO, Belpre, and Marietta. The breakdown of the average workload of a dispatcher who handles calls is shown below.

### 2023 Calls per FTE Dispatcher

PSAP	Dispatcher FTEs	Calls	Call per FTE
WCSO	10.0	44,838	4,484
Belpre	5.0	11,421	2,284
Marietta	4.0	31,140	7,785
<b>Total</b>	<b>19.0</b>	<b>87,399</b>	<b>4,600</b>

Source: WCSO, City of Belpre, City of Marietta

In 2023, dispatchers handled an average of 4,600 calls per year. Using the Erlang C methodology, our analysis suggests that 10.0 FTE dispatchers would be needed to meet the expected service level, as described earlier. If consolidation occurs and staffing is adjusted according to this analysis, it will result in a reduction of 9.0 FTEs across the three PSAPs.

To better understand the impact this staffing reduction may have on efficiency and call handling, the following table attempts to compare the number of dispatchers needed based on the current calls per FTE to the number of dispatchers needed as suggested by the results of the Erlang C analysis. The dispatcher FTEs needed for the current state is calculated by dividing the average calls per FTE by the estimated calls for each scenario.

### Current State and Consolidation Call Handling per FTE Comparison

	Current State	Erlang C	Difference	Percent Difference
<b>Scenario 1:</b>				
Calls	74,187	74,187	N/A	N/A
Dispatcher FTEs Needed	16.1	10.0	(6.1)	(38.0%)
Calls per FTE	4,600	7,419	2,819	61.3%
<b>Scenario 2:</b>				
Calls	82,621	82,621	N/A	N/A
Dispatcher FTEs Needed	18.0	10.0	(8.0)	(44.3%)
Calls per FTE	4,600	8,262	3,662	79.6%

Source: WCSO, City of Belpre, City of Marietta

In both consolidation scenarios, an individual dispatcher would be handling more calls per year on average than in the current state operation. The percentage increase of calls per FTE for Scenario 1 and Scenario 2 may seem extreme at 61.3 percent and 79.6 percent, respectively.

However, when considering the average calls per day and average handling time per call, this increase is not that significant. The average minutes on the phone per hour per dispatcher would increase from 4.2 minutes to 5.9 minutes in Scenario 1 and from 4.2 minutes to 8.4 minutes in Scenario 2. These consolidation scenarios would provide adequate time for dispatchers to complete other duties throughout the day as assigned.

## Conclusion

Salaries and benefits for dispatchers account for the largest portion of the expenses in running a dispatch operation and represent the majority of potential savings in the event of consolidation. This analysis supports the feasibility of consolidation scenarios that would allow for a reduced number of dispatchers while continuing to ensure quality service for users, prompt responses to emergency calls, and, ultimately, the safety of residents. It will be critical for the County to ensure it maintains an adequate number of dispatchers to meet service demands in a consolidated operation, as call volume may not remain stagnant. For this reason, financial savings are presented on a sliding scale from the reduction of no FTEs (maintaining current staffing levels) to a reduction of 9.0 FTEs.

### Potential Financial Implication from Staffing Reduction

<b>FTEs Employed</b>	<b>FTEs Reduced</b>	<b>Total Cost Savings</b>
19	0	\$0
18	1	\$59,236
17	2	\$140,145
16	3	\$221,223
15	4	\$304,570
14	5	\$385,649
13	6	\$466,568
12	7	\$550,489
11	8	\$584,640
10	9	\$678,821

Our cost savings identified in the table above are based on the salaries and benefits of the least-tenured individuals.

## **Issue for Further Study: Data Driven Staffing Decisions**

If the decision is made to consolidate dispatch operations, Washington County should continue to monitor future changes in call volume and adjust dispatch staffing levels based on data-driven decisions. One significant change may be a decrease in call transfers, as consolidation will result in a single call center handling all calls instead of three separate centers transferring calls to each other. This assumes that both Belpre and Marietta stop dispatching calls for their local emergency responders in addition to ceasing PSAP operations. A decrease in the number of transfers could lower the overall call volume for dispatchers. Advancements in technology, such as tree branching systems recently implemented at both Belpre and Marietta, must also be considered. These systems provide the caller an opportunity to be directed to an appropriate department, reducing the number of administrative calls that need to be answered by a dispatcher and streamlining the overall process. Finally, enhanced capabilities of the NG 911 system will result in changes in call volume since wireless calls will now be directed to the appropriate PSAP based on the caller's GIS coordinates. Monitoring call volume and using data to drive staffing decisions will ensure proper staffing levels in the future and provide an effective and efficient service delivery.

# Equipment and Technology

As dispatching is a telecommunication service, equipment and technology are primary components of the operation. WCSO, Marietta, and Belpre run independent PSAPs, resulting in duplication of required equipment and technology. In the case of full or partial consolidation, some of these resources could be reduced or eliminated.

Technologies used for dispatching support the primary functions of call taking, scene locating, responder dispatching, and record keeping. Some of the technology is also used by the police department and courts. Other technology is exclusive to operations in a PSAP and are primarily used to support these systems and individual workstations.

Examples of cross-department assets are:

- Computer-Aided Dispatch (CAD), for tracking responders and response status
- Records Management System (RMS), for keeping call and response logs
- Mapping systems, for showing call locations and response routes
- Law Enforcement Automated Data System (LEADS), for access to shared information such as warrants and criminal records

Examples of assets exclusive to a PSAP are:

- Internet connections, supplying additional coverage to PSAPs
- Phone lines, both 911 and non-emergency
- Backup power supplies, providing uninterrupted power in outages
- Office furniture and equipment, from filing cabinets to dispatch workstations
- Computer accessories, from cameras to additional monitors

There are some common technologies provided by (or reimbursed by) the County for all three PSAPs. One example of this is the 911 Phone System. The system is provided by WestTel and covers all dispatch centers in the County. The County also reimburses costs for CAD and RMS through county-wide 911 funds. Methodology and Analysis

In consultation with Information Technology managers representing each PSAP, we determined necessary equipment and technology for dispatching and identified which assets are shared with other departments. Costs compared are limited to dispatch specific costs, meaning those which could be reduced or eliminated in the absence of a dispatch operation. We obtained payment information to calculate annual recurring costs for technology. The PSAPs use equipment that is not paid for annually because it has a useful life of more than one year. We calculated annualized costs for these assets using the Ohio Department of Administrative Services' useful life values and the County's replacement life cycle. Total costs were then calculated for the current state of three locations and two different consolidation scenarios.

## Current State Annual Technology and Equipment Costs

	<b>WCSO</b>	<b>Marietta</b>	<b>Belpre</b>	<b>System Wide</b>
<b>Technology</b>				
PSAP Firewalls	\$14,343			\$14,343
Main Internet Connections	\$26,400			\$26,400
2nd Internet Connections	\$8,826			\$8,826
NextGen 911 Connection	\$7,200			\$7,200
<b>County Paid Sub Total:</b>	<b>\$56,769</b>			<b>\$56,769</b>
Servers	\$8,340	--	\$3,815	\$12,154
911 Phone System	\$38,460	--	\$1,680	\$40,140
Admin Phone Lines	\$148	\$196	--	\$344
Microsoft	\$73	\$150	\$200	\$423
Anti-Virus	\$101	--	\$432	\$533
Dispatching Software	\$734	N/A	\$734	\$1,468
IT Labor (contracted only)	N/A	N/A	\$3,240	\$3,240
<b>Technology Total:</b>	<b>\$104,626</b>	<b>\$346</b>	<b>\$10,101</b>	<b>\$115,073</b>
<b>Equipment</b>				
Backup Power	\$3,400	\$571	N/A	\$3,971
Office Furniture	\$7,008	\$2,092	\$447	\$9,546
Computers & Accessories	\$10,888	\$4,991	\$2,255	\$18,134
Office Equipment	\$2,826	\$1,111	\$318	\$4,254
<b>Equipment Total:</b>	<b>\$24,121</b>	<b>\$8,765</b>	<b>\$3,020</b>	<b>\$35,906</b>
<b>Technology &amp; Equipment Total:</b>	<b>\$128,748</b>	<b>\$9,111</b>	<b>\$13,121</b>	<b>\$150,980</b>

Source: WCSO, City of Belpre, City of Marietta

The current technology and equipment costs for dispatch total \$150,980 across the system of three PSAPs. Washington County pays \$56,769 in technology that is used across all three PSAPs, reducing the cost responsibility of the city PSAPs; however, the City PSAPs could not operate without these assets and would assume a portion of these costs in the absence of the County funding.

### Consolidation Scenarios

If the entities consolidate operations, there will be a reduction in the amount of equipment necessary to operate efficiently. Our analysis was based on maintaining four workstations for both scenarios as that would support staffing levels and operational needs. The scenarios exclude technology and equipment costs to retain non-dispatching staff at a location. If staffing choices require more stations or retain non-dispatching staff, the additional per station or per employee costs would need to be considered by the consolidated entity. These costs are described following the two scenarios.

**Scenario 1:** Full physical consolidation in one location. This scenario uses WCSO costs because all primary 911 equipment paid for by the County would need to be used regardless of where the physical location is maintained.

### Scenario 1: One Location Annual Technology and Equipment Costs

	Current State	One Location	Difference	% Difference
<b>Technology</b>				
PSAP Firewalls	\$14,343	\$8,606	(\$5,737)	(40.0%)
Main Internet Connections	\$26,400	\$15,840	(\$10,560)	(40.0%)
2nd Internet Connections	\$8,826	\$1,799	(\$7,028)	(79.6%)
NextGen 911 Connections	\$7,200	\$7,200	\$0	0.0%
Servers	\$12,154	\$8,340	(\$3,814.710)	(31.4%)
911 Phone System	\$40,140	\$38,460	(\$1,680)	(4.2%)
Admin Phone Lines	\$344	\$148	(\$196)	(56.9%)
Microsoft	\$423	\$73	(\$350)	(82.7%)
Anti-Virus	\$533	\$101	(\$432)	(81.0%)
Dispatch Software	\$1,468	\$734	(\$734)	(50.0%)
IT Labor	\$3,240	\$0	(\$3,240)	(100.0%)
<b>Technology Total:</b>	<b>\$115,073</b>	<b>\$81,302</b>	<b>(\$33,772)</b>	<b>(29.3%)</b>
<b>Equipment</b>				
Backup Power	\$3,971	\$3,400	(\$571)	(14.4%)
Office Furniture	\$9,546	\$7,008	(\$2,538)	(26.6%)
Computers & Accessories	\$18,134	\$10,888	(\$7,246)	(40.0%)
Office Equipment	\$4,254	\$2,826	(\$1,429)	(33.6%)
<b>Equipment Total:</b>	<b>\$35,906</b>	<b>\$24,121</b>	<b>(\$11,785)</b>	<b>(32.8%)</b>
<b>Technology &amp; Equipment Total:</b>	<b>\$150,980</b>	<b>\$105,423</b>	<b>(\$45,556)</b>	<b>(30.2%)</b>

The annual technology and equipment costs in a full physical consolidation total \$105,423, which is \$45,556 less than the annual current state costs. The savings from this consolidation scenario are realized through \$23,325 in cost reductions for countywide firewalls and internet connections, \$10,447 in reductions related to duplicative expenses at individual PSAPs (servers, phone lines, software, and IT labor), and \$11,785 in cost avoidance related to equipment (generators, desks, computers, monitors, printers, etc.). This is a 30.2 percent overall cost reduction from the current state.

**Scenario 2:** Physical consolidation of WCSO and the Marietta locations, with a virtual consolidation component for the Belpre location. This means the entity would operate as one PSAP from two locations, where any call could be answered and dispatched from either location using shared technology and operating procedures governed by one body. This differs from the

current relationship between the WCSO PSAP and the Belpre PSAP because in the current state, locations do not access the same information or follow one set of guidelines (i.e., Belpre cannot see WCSO calls, WCSO does not receive Belpre's calls, and information is recorded differently in CADs).

### Scenario 2: Two Location Annual Technology and Equipment Costs

	<b>Current State</b>	<b>Two Locations</b>	<b>Difference</b>	<b>% Difference</b>
<b>Technology</b>				
PSAP Firewalls	\$14,343	\$11,474	(\$2,869)	(20.0%)
Main Internet Connections	\$26,400	\$21,120	(\$5,280)	(20.0%)
2nd Internet Connections	\$8,826	\$7,798	(\$1,028)	(11.6%)
NextGen 911 Connections	\$7,200	\$7,200	\$0	0.0%
Servers	\$12,154	\$12,154	\$0	0.0%
911 Phone System	\$40,140	\$40,140	\$0	0.0%
Admin Phone Lines	\$344	\$148	(\$196)	(56.9%)
Microsoft	\$423	\$273	(\$150)	(35.4%)
Anti-Virus	\$533	\$533	\$0	0.0%
Dispatch Software	\$1,468	\$1,468	\$0	0.0%
IT Labor	\$3,240	\$3,240	\$0	0.0%
<b>Technology Total:</b>	<b>\$115,073</b>	<b>\$105,550</b>	<b>(\$9,523)</b>	<b>(8.3%)</b>
<b>Equipment</b>				
Backup Power	\$3,971	\$3,400	(\$571)	(14.4%)
Office Furniture	\$9,546	\$7,455	(\$2,092)	(21.9%)
Computers & Accessories	\$18,134	\$13,143	(\$4,991)	(27.5%)
Office Equipment	\$4,254	\$3,144	(\$1,111)	(26.1%)
<b>Equipment Total:</b>	<b>\$35,906</b>	<b>\$27,141</b>	<b>(\$8,765)</b>	<b>(24.4%)</b>
<b>Technology &amp; Equipment Total:</b>	<b>\$150,980</b>	<b>\$132,692</b>	<b>(\$18,288)</b>	<b>(12.1%)</b>

The annual technology and equipment costs in a mixed, physical and virtual, consolidation total \$132,692, which is \$18,288 less than the annual current state costs. The savings from this consolidation scenario are realized through \$9,177 in savings from reduced countywide firewalls and internet connections, \$346 in reductions related to duplicative expenses at individual PSAPs (phone lines and software), and \$8,765 in cost avoidance related to equipment (generators, desks, computers, monitors, printers, etc.). This is a 12.1 percent overall cost reduction from the current state.

There is a \$27,269 difference in savings between the two consolidation scenarios. This is due to the retention of firewalls and internal connections at an additional location (\$14,148), retention

of Belpre PSAP servers, 911 Phone System redundancies, and software duplication (\$10,101), and retention of equipment for workstations and continuous power (\$3,020).

## **Conclusion**

Operating three individual PSAPs results in higher system-wide technology and equipment costs due to duplication compared to the assets required in either consolidated scenario. Maximum efficiency of technology and equipment costs can be realized in a consolidation in a single physical location. This scenario could save the system \$45,556 annually. Alternatively, a consolidation at two physical locations, with a virtual connection, could result in savings of \$18,288 annually.

In the event a city elects to retain staff for non-dispatching responsibilities, certain equipment would still need to be retained for administrative operations. This equipment would reduce the overall cost savings. We estimate that based on necessary software and equipment, Marietta would have approximately \$6,600 in technology expense associated with retaining these employees. Similarly, Belpre would have approximately \$3,400 in technology expense associated with retaining employees.

# Financial Implications of Consolidation

Consolidating dispatch operations could result in mutually beneficial cost savings to WCSO, Marietta, and Belpre. The degree to which savings could be realized depends on the specific combination of staffing and operations. These decisions ultimately need to be agreed upon by all three parties.

The current estimated cost of dispatch staffing, technology and annualized equipment is approximately \$1.7 million across the three entities. These expenses are presented by entity in the graphic below.

Estimated Annual Costs of Dispatch Operations: No Consolidation

	<b>WCSO</b>	<b>Belpre</b>	<b>Marietta</b>	<b>Total</b>
 <b>People</b>	\$835,389	\$373,676	\$328,963	\$1,538,018
 <b>Technology &amp; Equipment</b>	\$128,748	\$9,111	\$13,121	\$150,980
 <b>Total</b>	\$964,137	\$382,787	\$342,084	\$1,688,998

Source: WCSO, City of Belpre, and City of Marietta

Note: The costs presented reflect estimates made by OPT using the 2024 and 2025 financial data provided and conversations with each of the three entities. These estimates were made using the current salaries and benefits of dispatch personnel, technology necessary to operate each PSAP as discussed with each entity, and the replacement cost of equipment annualized over its expected useful life.

As mentioned previously, the actual amount of cost savings is dependent on the decisions that are made by the entities and are subject to contract negotiations. We estimated potential cost savings based on the two scenarios outlined throughout the report. The tables on the following page show the potential cost savings with each of the scenarios.

The first table assumes operating a single PSAP from the current WCSO (Scenario 1) and the second table assumes operating a single PSAP from WCSO and Belpre using a virtual consolidation of technology (Scenario 2). In each of the scenarios, we identified the potential

cost savings that could be achieved across all entities. As noted in the tables, if consolidation occurred, there would be cost savings even without a reduction in personnel. However, according to the analysis, a consolidated dispatch center could reduce up to 9 FTE positions, from 19 FTEs to 10 FTEs. The tables identify the cost savings associated with the reduction of FTEs in increments of 1.0 FTE up to the maximum calculated cost savings.

### Estimated Annual Costs Scenario 1: Consolidation in One Location

<b>FTEs Employed</b>	<b>FTEs Reduced</b>	<b>Wage &amp; Benefit Costs</b>	<b>Equipment &amp; Tech Costs</b>	<b>Total Future State Costs</b>	<b>Total Cost Savings</b>
19	0	\$1,538,018	\$105,275	\$1,643,293	\$45,705
18	1	\$1,478,782	\$105,275	\$1,584,057	\$104,941
17	2	\$1,397,874	\$105,275	\$1,503,149	\$185,849
16	3	\$1,316,795	\$105,275	\$1,422,070	\$266,928
15	4	\$1,233,448	\$105,275	\$1,338,723	\$350,275
14	5	\$1,152,369	\$105,275	\$1,257,644	\$431,354
13	6	\$1,071,450	\$105,275	\$1,176,725	\$512,273
12	7	\$987,529	\$105,275	\$1,092,804	\$596,194
11	8	\$953,379	\$105,275	\$1,058,654	\$630,344
10	9	\$859,197	\$105,423	\$964,620	\$724,378

### Estimated Annual Costs Scenario 2: Consolidation in Two Locations

<b>FTEs Employed</b>	<b>FTEs Reduced</b>	<b>Wage &amp; Benefit Costs</b>	<b>Equipment &amp; Tech Costs</b>	<b>Total Future State Costs</b>	<b>Total Cost Savings</b>
19	0	\$1,538,018	\$132,692	\$1,670,710	\$18,288
18	1	\$1,478,782	\$132,692	\$1,611,474	\$77,524
17	2	\$1,397,874	\$132,692	\$1,530,566	\$158,432
16	3	\$1,316,795	\$132,692	\$1,449,487	\$239,511
15	4	\$1,233,448	\$132,692	\$1,366,140	\$322,858
14	5	\$1,152,369	\$132,692	\$1,285,061	\$403,937
13	6	\$1,071,450	\$132,692	\$1,204,142	\$484,856
12	7	\$987,529	\$132,692	\$1,120,221	\$568,777
11	8	\$953,379	\$132,692	\$1,086,071	\$602,927
10	9	\$859,197	\$132,692	\$991,889	\$697,109

Consolidation of dispatch services is a feasible option for Washington County. In the tables above, estimated cost savings are determined based on the County operating one PSAP and handling dispatch services for all three entities along with the other areas of the county. The estimates illustrate total cost savings. Actual savings realized for each of the three entities would be dependent on a cost-sharing agreement. In addition to cost savings, the County would likely see improved operations from the reduction in dropped calls and transfers.

# Client Response

Audit standards and AOS policy allow clients to provide a written response to an audit. The letters on the following pages are the Washington County Sheriff's Office and City of Marietta's official statements in regards to this feasibility study. The City of Belpre was offered a chance to provide a written statement but declined to do so.

Throughout the course of the study, staff met with officials from all three entities to ensure substantial agreement on the factual information contained in the report. When an entity disagreed with information presented and provided supporting documentation, revisions were made to the audit report.

# Washington County



223 Putnam Street  
Marietta, Ohio 45750  
740-373-6623

# Commissioners

Eddie D. Place / ext. 2013 / [eplace@wcgov.org](mailto:eplace@wcgov.org)  
Charlie L. Schilling / ext. 2014 / [cschilling@wcgov.org](mailto:cschilling@wcgov.org)  
James W. Booth / ext. 2012 / [jbooth@wcgov.org](mailto:jbooth@wcgov.org)  
**Fiscal Manager/Clerk**  
Ben Cowdery / ext. 2011 / [bcowdery@wcgov.org](mailto:bcowdery@wcgov.org)

May 19, 2025

**Mr. Keith Faber**

Auditor of State  
88 East Broad Street  
Columbus, OH 43215

Dear Auditor Faber,

On behalf of the Washington County Board of Commissioners, the Washington County Sheriff's Office, and the Washington County 911 Office, we wish to express our appreciation for the work and expertise provided by your staff in conducting the *Washington County 911 Dispatch Consolidation Feasibility Study*. We commend the Ohio Performance Team for its comprehensive and data-driven analysis, and for the valuable insights presented throughout the draft report.

After careful review of the study, we agree with its central conclusion: that a consolidated 911 Public Safety Answering Point (PSAP) in Washington County is feasible. Furthermore, we support the position that such consolidation would produce operational efficiencies, reduce duplication of services, and ultimately provide a better use of taxpayer resources. We remain committed to continuing collaborative efforts to bring the County and local municipalities together under a unified 911 dispatch system.

The report's financial and staffing analysis offers a valuable framework for planning a transition toward a consolidated PSAP. However, as the report also acknowledges, dispatcher duties go well beyond call answering. We believe that additional considerations are necessary to fully determine the number of full-time equivalents (FTEs) required to serve the public safely and effectively. Dispatchers in Washington County are responsible not only for handling emergency calls, but also for administrative call management, radio traffic coordination, information entry into law enforcement databases, and situational monitoring during incidents. These operational responsibilities must be considered alongside call volume metrics when evaluating staffing levels.

In addition to the financial benefits, we firmly believe that a combined 911 center would enhance emergency response across the County. Specifically, consolidation would eliminate the need for in-county call transfers, improve response times, standardize operational protocols, and allow for more effective coordination between responding agencies. It would also raise the standard of care provided to callers and support greater interoperability and information sharing during multi-agency events.

Although we fully support the goal of a consolidated 911 center in Washington County, progress has been significantly hindered by a lack of adequate funding. Despite the Ohio General Assembly implementing a \$0.40 fee on wireless devices effective January 1, 2024, Washington County has only received approximately one-tenth of the operational funding that would be necessary to run a consolidated 911 center—and that does not account for the additional costs related to facilities, equipment, or long-term maintenance. To truly support consolidation efforts across the state and ensure high-quality emergency services, we believe the State should explore increasing the wireless 911 fee and adopting a more equitable distribution model among Ohio's 88 counties. Enhanced and stable funding is essential to building and sustaining the infrastructure, staffing, and technology required to provide the best possible service to our citizens.

We recognize the complexity of this endeavor and appreciate the Auditor of State's partnership in guiding our jurisdictions toward a more integrated and efficient public safety communication system. Washington County remains committed to working in good faith with the cities of Belpre and Marietta to develop a governance model and implementation plan that reflects the interests of all stakeholders and the safety of all residents.

Sincerely,

**Charlie L. Schilling**  
President, Washington County Board of Commissioners

**Mark A. Warden**  
Sheriff, Washington County Sheriff's Office

**Douglas I. Moore**  
Director, Washington County 911



# City of Marietta

## OFFICE OF THE MAYOR

Joshua D. Schlicher  
Mayor

**Founded in 1788**  
America's Start of the Northwest Territory

May 19, 2025

The Honorable Keith Faber  
Auditor of State  
88 East Broad Street  
Columbus, Ohio 43215

Dear Auditor Faber,

On behalf of the city of Marietta and the Police Department and Fire Department, I would like to extend my sincere thanks to you and your office for conducting and publishing the Centralized 9-1-1 Feasibility Study.

We greatly appreciate the thoroughness, transparency, and insight presented in the report. This study provides a valuable roadmap to evaluate potential efficiencies, cost savings, and service improvements that a centralized 9-1-1 system could bring to our communities. Your efforts have equipped local leaders and stakeholders with the critical data and analysis needed to make informed decisions about the future of emergency communication services in Ohio.

The commitment of your office to support local governments through thoughtful and data-driven initiatives is truly commendable. We look forward to continued collaboration as we explore next steps and assess how best to serve the safety and well-being of our residents.

Thank you once again for your leadership and dedication to public service.

Sincerely,

Joshua D. Schlicher

Mayor

CC: Chief K. Warden, MPD

Chief C.W. Durham, MFD

Safety-Service Director Steven A. Wetz

# Appendix A: Purpose, Methodology, Scope, and Objectives

## Feasibility Study Purpose and Overview

This study is intended to provide objective analysis to assist management and those charged with governance and oversight to improve program performance and operations, reduce costs, facilitate decision making by parties with responsibility to oversee or initiate corrective action, and contribute to public accountability.

This feasibility study was conducted according to performance audit standards. Generally accepted government auditing standards (GAGAS) require that a performance audit be planned and performed so as to obtain sufficient, appropriate evidence to provide a reasonable basis for findings and conclusions based on audit objectives. Objectives are what the audit is intended to accomplish and can be thought of as questions about the program that the auditors seek to answer based on evidence obtained and assessed against criteria.

We conducted this feasibility study in accordance with GAGAS. Those standards require that we plan and perform the study to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

## Study Scope and Objectives

In order to provide the Cities and County with appropriate, data driven, conclusions, the following questions were assessed within each of the agreed-upon scope areas:

### Summary of Objectives and Conclusions

Objective	Conclusion
<b>Background</b>	
What are the current operating environments of the dispatch services for Washington County and the cities of Marietta and Belpre?	<b>Background</b>
<b>Staffing and Workload</b>	
What level of staffing is required for the consolidated dispatch operation in order to satisfy current and projected service demand?	<b>Staffing and Workload</b>

<b>Equipment and Technology</b>	
What equipment and technology assets are required for the consolidated dispatch operation in order to satisfy current and projected service demand?	<b>Equipment and Technology</b>
<b>Location and Facility Needs</b>	
What are feasible options for the physical location of the consolidated dispatch operation based on the facility capacity and space required to accommodate necessary equipment and personnel?	<b>Location and Facilities</b>
<b>Financial Implication of Consolidation</b>	
What is the financial impact of consolidating dispatch operations for the two cities and the County?	<b>Financial Impact of Consolidation</b>

Although assessment of internal controls was not specifically an objective of this study, internal controls were considered and evaluated when applicable to scope areas and objectives. The following internal control components and underlying principles were relevant to our study objectives<sup>15</sup>:

- Control environment
  - We assessed the exercise of oversight responsibilities by the Cities and County in regard to detecting improper payroll reporting and benefits administration.
  - We assessed the exercise of oversight responsibilities by the Cities and County in regard to detecting improper data entry in the dispatch system and call logs.
- Risk Assessment
  - We considered the activities by the Cities and County to assess fraud risks.
- Information and Communication
  - We considered the use of quality information by the Cities and County in relation to financial, payroll, staffing, and dispatch data.
- Control Activities
  - We considered compliance by the Cities and County with applicable laws and contracts.

No internal control deficiencies were identified during the course of the study.

---

<sup>15</sup> We relied upon standards for internal controls obtained from *Standards for Internal Control in the Federal Government* (2014), the U.S. Government Accountability Office, report GAO-14-704G

## **Audit Methodology**

To complete this feasibility study, auditors gathered data, conducted interviews with numerous individuals associated with the areas of City and County operations included in the audit scope, and reviewed and assessed available information. Assessments were performed using criteria from a number of sources, including:

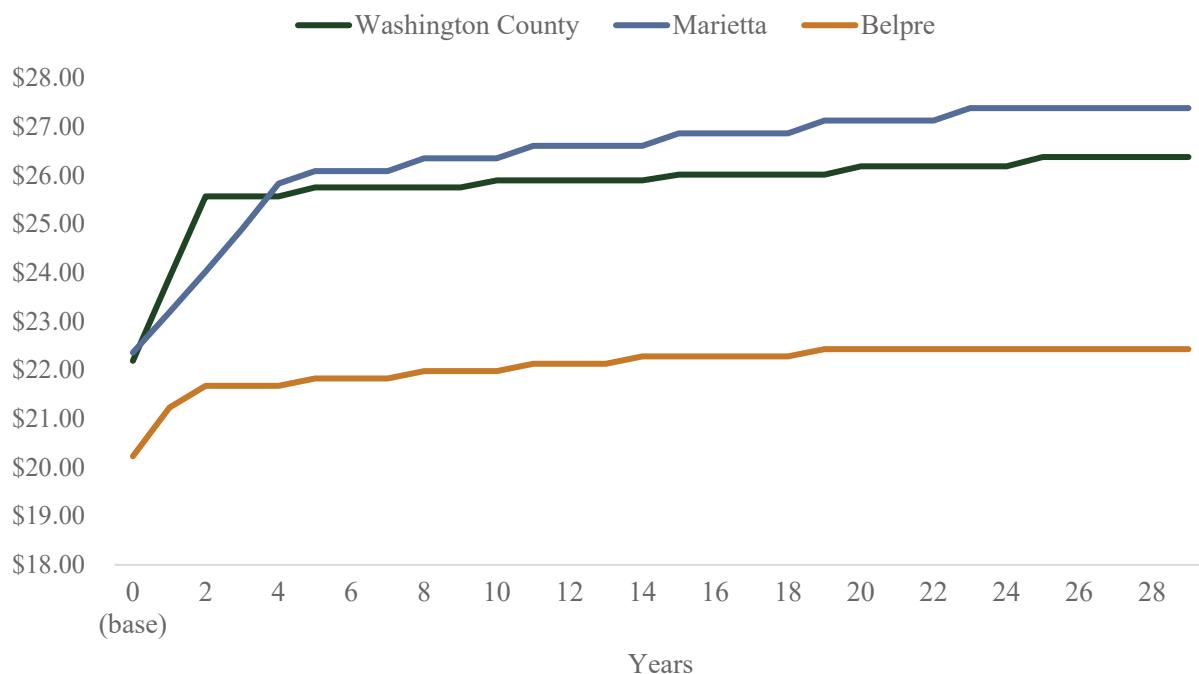
- Industry Standards;
- Leading Practices;
- Expert Testimony;
- Past Practices;
- Statutes; and
- Policies and Procedures.

# Appendix B: Additional Background

## Compensation Comparison

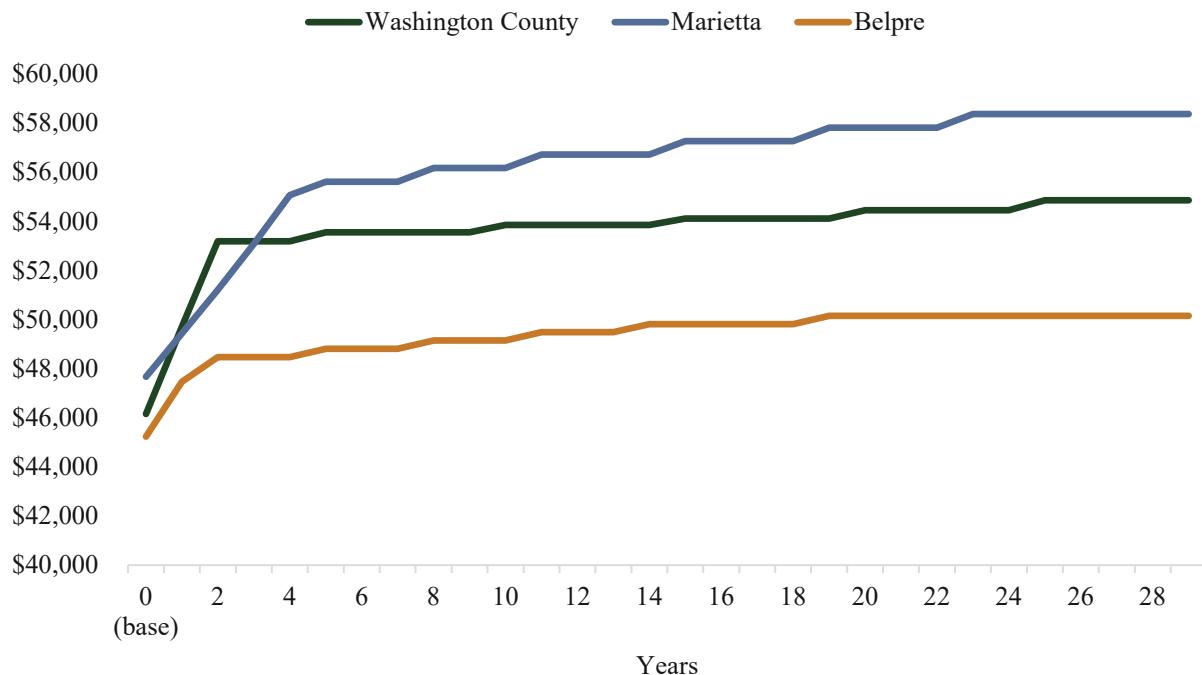
We considered the 2024 hourly and annual pay for dispatchers within the two cities and the County. As shown in the following charts, dispatchers in Marietta are compensated slightly higher than dispatchers at WCSO, while dispatchers in Belpre are paid significantly less on an hourly and annual basis. In a future state consolidation, consideration will have to be given as to the level of pay the consolidated dispatchers would receive, in addition to other benefits that would be provided.

### 2024 Hourly Pay Comparison | Dispatchers



Source: CBAs

## 30-Year Career Compensation | Dispatchers



Source: CBAs

## Insurance Comparison

We also analyzed employee health insurance benefits, including the cost sharing of premiums and plan design. As with compensation, consideration will have to be given to employee benefit packages in a consolidated operation.

### 2024 Monthly Medical Insurance Costs – PPO

		WCSO		Marietta		Belpre	
		Costs	% Share	Costs	% Share	Costs	% Share
<b>Single Medical</b>	Employer	\$656.80	80.0%			\$1,567.20	95.3%
	Employee	\$76.80	20.0%			\$76.80	4.7%
<b>Family Medical</b>	Employer	\$1,970.72	80.0%	\$1,609.55	85.0%	\$1,455.60	88.5%
	Employee	\$492.68	20.0%	\$284.05	15.0%	\$188.40	11.5%

Source: Schedules of Benefits and CBAs

Note: Marietta provides only one plan option to employees; therefore, this is reflected as part of the family comparison only.

Generally, WCSO offers the most generous plan with lower copayments and a lower deductible, as shown in the table below. Marietta offers the lowest out-of-pocket maximum of the three entities and covers more medical costs in comparison to Belpre. A consolidation whereby all

Efficient

•

Effective

•

Transparent

dispatchers were employed by one entity would require an alignment of these plans or agreement that a current plan would be adopted by all dispatchers.

### Insurance Plan Design Elements Comparison

	Washington County	City of Marietta	City of Belpre
<b>Copayments</b>			
Office Visit	\$15	\$20	\$25
Urgent Care Visit	\$35	\$45	\$30
<b>Coinsurance</b>			
<i>Network</i>			
ER Visit	100%	100%	80%
<i>Non-Network</i>			
Office Visit	60%	70%	50%
Urgent Care Visit	60%	70%	100%
ER Visit	90%	100%	80%
<b>Deductible</b>			
<i>Network</i>			
Single	\$0	\$100	\$400
Family	\$0	\$200	\$800
<i>Non-Network</i>			
Single	\$0	\$300	\$800
Family	\$0	\$600	\$1,600
<b>Out-of-Pocket Maximum</b>			
<i>Network</i>			
Family	\$2,000	\$1,500	\$6,000
<i>Non-Network</i>			
Family	\$4,000	\$2,500	\$12,000

Source: WCSO, City of Marietta, City of Belpre

## Collective Bargaining Agreement Comparison

A consolidated operation would require negotiation of a new collective bargaining agreement (CBA), or potentially a renegotiation of a current agreement in which all new employees would be covered. Therefore, a third consideration to be made if consolidation occurs is the difference in key provisions that currently exist in the three separate CBAs. Below is a comparison and explanation of the key differences.

### Collective Bargaining Agreements

Provision	Washington County	Marietta	Belpre
Annual Sick Days (12-hour shift)	10	10	7
Vacation Days (30-Years)	680	640	615
Holidays per Year	11	12	10
Max Severance Days	240	960	240
Uniform Reimbursement	\$0	\$650	\$225

Source: CBAs

**Sick Leave:** The City of Belpre offers fewer sick days than Marietta and WCSO.

**Vacation Days:** WCSO offers the most vacation days. The Sheriff's Office is also the only entity of the three that begins vacation accrual prior to a full year of service.

**Holidays:** ORC § 325.19 governs the minimum holidays a county government must offer. WCSO offers the minimum of 11 holidays per year. Marietta and Belpre are not bound by this ORC Section. Marietta offers 1 more holiday than WCSO while Belpre offers one less.

**Severance:** Marietta offers a far larger severance as shown in the table above.

**Uniform Reimbursement:** Marietta offers a uniform reimbursement that is nearly three times greater than that offered by Belpre. Unlike Belpre and Marietta, WCSO does not offer any uniform reimbursement.

### Additional Provisions Compared

**Overtime:** While Marietta and WCSO are on the same shift schedule, the three entities take different approaches in handling overtime. Section 17.2 of the CBA between the City of Marietta and the Fraternal Order of Police states that Unit C (established to be dispatchers in section 2.1), “will work a thirty-six (36) / forty-four (44) hour schedule over a fourteen (14) day cycle and will be eligible for overtime when working more than forty (40) hours per week.” This is in contrast to WCSO which also operates on a 36/44 bi-weekly schedule but does not pay out overtime until more than 80 hours are worked in that biweekly period. In Belpre, the CBA states that dispatchers will work 36 hours one week and 48 the next. It also states that “4 hours of overtime will be included in the pay period.”

**Unused Vacation Leave:** WCSO offers a generous provision that is not offered by Marietta or Belpre. This provision allows employees who voluntarily leave the sheriff's office after at least one year of service to be paid out on any unused vacation leave.

**Sick Leave Conversion:** WCSO also offers their employees to transfer up to two sick days into personal days which must be used in that following year. This is also a provision that is not seen in either of the other two entities.

**Sick Leave Bonus:** The City of Belpre offers a sick leave bonus of \$400 to anyone who does not take any sick leave for the entire year. This is a provision only offered by Belpre.

**Retirement:** WCSO offers retirement after 15 years of service per their CBA.

## Appendix C: Staffing and Workload

In 2023, WCSO, Marietta, and Belpre PSAPs handled 87,399 calls, averaging 4,600 calls per FTE. The table below shows the total calls and the calls handled per FTE at each of the three PSAPs.

### 2023 Call per FTE

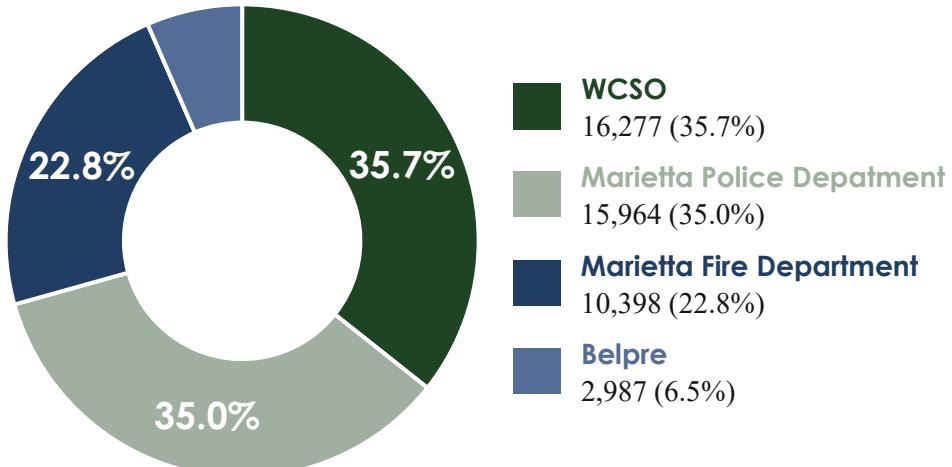
Entity	Dispatcher FTEs	Calls	Calls per FTE
WCSO	10	44,838	4,484
Marietta	4	31,140	7,785
Belpre	5	11,421	2,284
<b>Total</b>	<b>19</b>	<b>87,399</b>	<b>4,600</b>

Source: WCSO, City of Belpre, City of Marietta

The following chart shows the number of total countywide emergency calls received, including those received by the Marietta Fire Department, whose calls have not historically been answered by the Marietta PSAP.

### 2023 Call Volume (Emergency Calls)

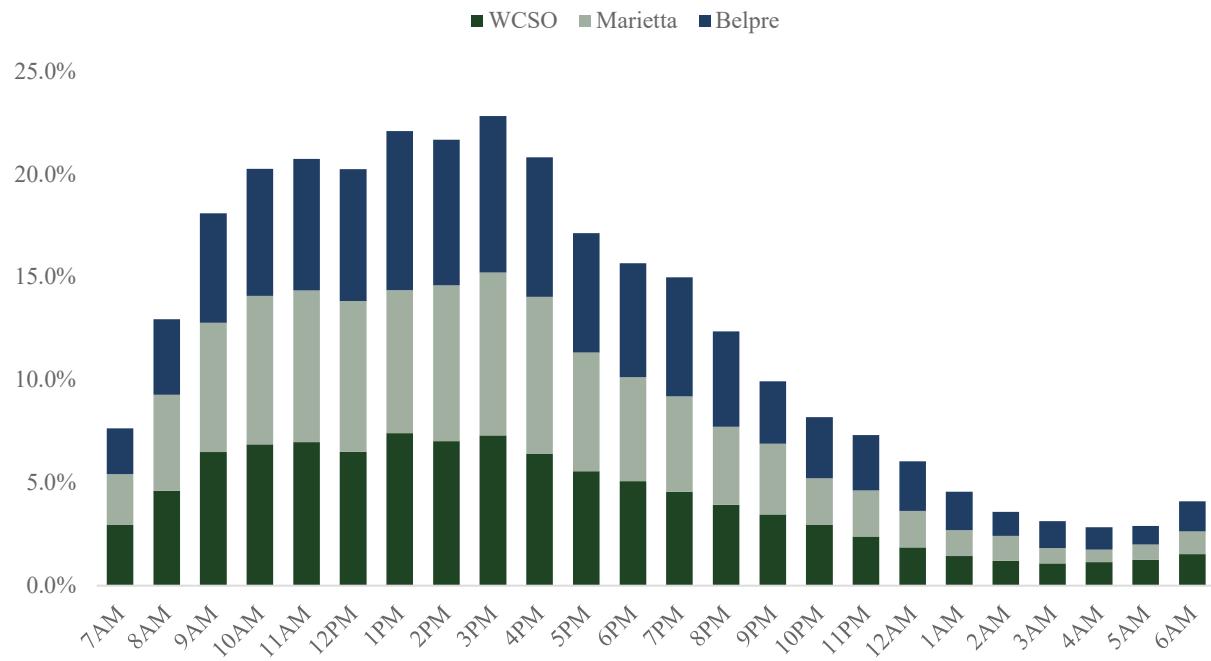
**Total: 45,626**



Source: WCSO, City of Belpre, City of Marietta

The chart below illustrates the hour-by-hour summary of non-emergency administrative calls received in 2023. When examining the number of non-emergency administrative calls per hour in 2023, the pattern of peak periods is similar to that of emergency calls.

## Hour by Hour Summary – Administrative Calls



Source: WCSO, City of Belpre, City of Marietta

Efficient



Effective



Transparent

Although the NENA and OAC call answering standards do not require consideration of hourly call volume, we looked at the average call history by hour to determine if there were times in the day when 3.0 FTE dispatchers would be required to meet these standards. As shown below, there was never a time in the day when the projected call volume of a consolidated dispatch center would require a third dispatcher to ensure that 90 percent of calls would be answered within 15 seconds.

### Hourly Required Service Level – Scenario 1

Time	Service Level-1 Agent	Service Level- 2 Agents	Agents Needed
	<i>Does not meet OAC</i>	<i>Meets OAC and NENA</i>	
12:00 AM	83.0%	98.7%	2
1:00 AM	88.2%	99.4%	2
2:00 AM	88.2%	99.4%	2
3:00 AM	88.8%	99.4%	2
4:00 AM	91.3%	99.6%	1*
5:00 AM	91.7%	99.7%	1*
6:00 AM	90.2%	99.6%	1*
7:00 AM	86.9%	99.2%	2
8:00 AM	77.3%	97.8%	2
9:00 AM	70.2%	96.4%	2
10:00 AM	67.6%	95.8%	2
11:00 AM	65.1%	95.1%	2
12:00 PM	64.8%	95.1%	2
1:00 PM	63.4%	94.7%	2
2:00 PM	64.3%	95.0%	2
3:00 PM	61.6%	94.2%	2
4:00 PM	62.9%	94.6%	2
5:00 PM	67.0%	95.6%	2
6:00 PM	69.3%	96.1%	2
7:00 PM	71.2%	96.6%	2
8:00 PM	73.5%	97.0%	2
9:00 PM	73.6%	97.1%	2
10:00 PM	78.6%	98.0%	2
11:00 PM	79.3%	98.1%	2

Source: WCSO, City of Belpre, City of Marietta

\* While the analysis shows only 1 raw agent needed during certain hours, OAC and NENA dictate that at least 2 dispatchers be available at all times.

Additionally, there was never a time in a day when the projected call volume of a dispatch center that is consolidated in two locations (Scenario 2) would require a third dispatcher to ensure that 90 percent of calls would be answered within 15 seconds.

### Hourly Required Service Level – Scenario 2

Time	Service	Service	Agents Needed	
	Level-1 Agent	Level- 2 Agents		
	<i>Does not meet OAC</i>		<i>Meets OAC and NENA</i>	
12:00 AM	81.6%	98.5%	2	
1:00 AM	87.3%	99.3%	2	
2:00 AM	87.4%	99.3%	2	
3:00 AM	88.0%	99.3%	2	
4:00 AM	90.9%	99.6%	1*	
5:00 AM	91.3%	99.6%	1*	
6:00 AM	89.4%	99.5%	2	
7:00 AM	86.1%	99.1%	2	
8:00 AM	75.3%	97.4%	2	
9:00 AM	67.6%	95.8%	2	
10:00 AM	64.4%	95.0%	2	
11:00 AM	61.7%	94.3%	2	
12:00 PM	61.8%	94.3%	2	
1:00 PM	59.8%	93.8%	2	
2:00 PM	60.8%	94.0%	2	
3:00 PM	58.3%	93.3%	2	
4:00 PM	59.4%	93.6%	2	
5:00 PM	64.4%	95.0%	2	
6:00 PM	66.5%	95.5%	2	
7:00 PM	68.2%	95.9%	2	
8:00 PM	71.1%	96.5%	2	
9:00 PM	59.9%	93.6%	2	
10:00 PM	76.8%	97.7%	2	
11:00 PM	77.8%	97.9%	2	

Source: WCSO, City of Belpre, City of Marietta

\* While the analysis shows only 1 raw agent needed during certain hours, OAC and NENA dictate that at least 2 dispatchers be available at all times.

## Erlang C

Erlang C is a mathematical formula used in queueing theory, particularly in call center management and operations. This formula first appeared in A.K. Erlang's 1917 "Solution of Some Problems in the Theory of Probabilities of Significance in Automatic Telephone Exchanges." The primary purpose of this mathematical formula is to calculate key performance metrics, including the probability that callers will have to wait in a queue. Erlang C can be a valuable tool for staffing decisions in environments where incoming tasks, like 911 calls, arrive randomly and need to be handled by dispatchers.

The Erlang C formula shown below uses two key inputs: the number of call-taking agents (N) and the call intensity (A). Call intensity is calculated by multiplying the average handling time by the number of calls received. The number of agents is increased until the probability that a call will wait (Pw) is low enough to meet the desired service level.

$$P_w = \frac{\left[ \frac{A^N}{N!} \times \frac{N}{(N-A)} \right]}{\left[ \sum_{i=0}^{N-1} \frac{A^i}{i!} + \frac{A^N}{N!} \times \frac{N}{(N-A)} \right]}$$

Source: Call Centre Helper

This service level, as shown below, is calculated by utilizing the same inputs used in the Erlang C formula. Generally, this comes out to roughly 1 - Probability that a call will wait (Pw). However, it also factors in Euler's Constant which is the base for natural logarithms. Euler's Constant is used to show the natural growth and decay of exponential formulas such as Erlang.

$$Service\ Level = 1 - \left[ P_w \times e^{-\left[ (N-A) \times \left( \frac{Target\ Time}{AHT} \right) \right]} \right]$$

Source: Call Centre Helper

The desired service level used in this study is based on NENA and OAC standards. The benchmark states that 90 percent of calls be answered in 15 seconds or less and 95 percent of calls be answered in 20 seconds or less. For the purposes of the analysis completed within this study, we utilized the standard of 90 percent of calls being answered in 15 seconds or less.

# OHIO AUDITOR OF STATE KEITH FABER



## WASHINGTON COUNTY 911 DISPATCH FEASIBILITY STUDY

### AUDITOR OF STATE OF OHIO CERTIFICATION

This is a true and correct copy of the report, which is required to be filed pursuant to Section 117.26, Revised Code, and which is filed in the Office of the Ohio Auditor of State in Columbus, Ohio.



Certified for Release 6/3/2025

65 East State Street, Columbus, Ohio 43215  
Phone: 614-466-4514 or 800-282-0370

This report is a matter of public record and is available online at  
[www.ohioauditor.gov](http://www.ohioauditor.gov)