**911 Call Analytics Report for Baltimore City – 2021**

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**Table of Contents**

1. **Executive Summary**…………………………………………………….......2
2. **Introduction**…………………………………………………………………..2
3. **Key Findings**………………………………………………………………….3
   * Daily Call Patterns
   * Weekly Call Patterns
   * Monthly Call Volume Trends
   * Call Priority Distribution
   * Top Incidents by Call Volume
   * Geographic Call Distribution
   * Police District Analysis
   * Neighborhood Insights
   * Call Volume by Area
4. **Recommendations**…………………………………………………………14
5. **Conclusion**…………………………………………………………………..16
6. **Executive Summary:**

This report presents a comprehensive analysis of the 911 call data for Baltimore City during the year 2021. The analysis aims to provide insights into call patterns, priorities, incidents, and geographic distribution. The findings offer a deeper understanding of the trends and characteristics of emergency calls within the city, enabling more informed decision-making for public safety enhancements and resource allocation.

1. **Introduction:**

Effective performance management helps government entities use technology and data to openly set goals, hold participants accountable, connect to stakeholders, track progress, and achieve results. Analyzing 911 call data is crucial for enhancing public safety, optimizing resource allocation, and improving emergency response times. This report examines the 911 call data for Baltimore City in 2021 to identify key patterns and provide actionable insights.

The data used for this analysis was sourced from the Baltimore City Open Data portal, specifically from the [911 Call Data dataset](https://data.baltimorecity.gov/datasets/f382af447fc84817906719ed3721d614_8/explore) . and [Police Districts geographical data](https://data.baltimorecity.gov/datasets/baltimore::police-districts-2023/explore). This dataset includes detailed records of 911 calls made throughout the city, covering various attributes such as call date, time, priority, incident type, and geographic location.

1. **Key Findings:**

**Daily Call Patterns**

The area plot below illustrates the number of 911 calls throughout different hours of the day for Baltimore City in 2021. This visualization helps in understanding the daily fluctuations in call volumes, identifying peak hours, and potential periods of heightened emergency activity.

**Visualization:**A graph with lines and numbers

Description automatically generated

**Findings:**

* **Midnight (12:00 AM):** The highest call volume occurs at midnight with 80,244 calls.
* **Early Morning (1:00 AM - 5:00 AM):** Call volumes gradually decrease after midnight, reaching a low at 6:00 AM with 19,302 calls.
* **Morning to Evening (6:00 AM - 5:00 PM):** Call volumes start to increase again, peaking at several points throughout the day, such as 7:00 AM (73,334 calls) and 5:00 PM (64,986 calls).
* **Evening (6:00 PM - 11:00 PM):** There is a significant rise in call volumes during the evening hours, peaking at 10:00 PM with 78,758 calls.

This trend indicates that emergency call volumes are highest during the late-night and early-morning hours, which could be associated with nightlife activities, late-night incidents, and early-morning emergencies. Understanding these patterns can help in optimizing resource allocation and emergency response strategies during peak hours.

**Weekly Call Patterns:** The area plot below illustrates the number of 911 calls throughout different days of the week for Baltimore City in 2021. This visualization helps in understanding the weekly fluctuations in call volumes

**Visualization:A chart with different colored layers

Description automatically generated**

**Findings:**

* **Monday:** 188,901 calls
* **Tuesday:** 188,129 calls
* **Wednesday:** 197,015 calls
* **Thursday:** 202,135 calls
* **Friday:** 201,449 calls
* **Saturday:** 200,121 calls
* **Sunday:** 200,694 calls

This trend indicates that call volumes are relatively consistent throughout the week with slight variations. Understanding these patterns can help in optimizing resource allocation and emergency response strategies for different days of the week.

**Monthly Call Volume Trends**

The area plot below illustrates the number of 911 calls per month for Baltimore City in 2021. The data reveals significant trends and variations in call volumes throughout the year.

**Visualization:A graph of a number of people

Description automatically generated with medium confidenceFindings:**

* **January:** The highest call volume was recorded in January with 133,074 calls.
* **February:** The call volume decreased to 121,117.
* **March:** There was an increase to 128,461 calls.
* **April to December:** The call volumes show fluctuations with a gradual decrease, reaching the lowest in December at 104,118 calls.

This trend indicates that the beginning of the year experienced the highest number of emergency calls, possibly due to post-holiday incidents and winter-related emergencies. The gradual decline in call volumes in the subsequent months suggests a normalization of incidents as the year progressed.

**Call Priority Distribution**

The pie chart below illustrates the distribution of 911 calls by priority for Baltimore City in 2021. This visualization helps in understanding the proportion of calls classified under different priority levels, indicating the urgency and nature of incidents reported.

**Visualization:**A pie chart with a number of different colored parts

Description automatically generated

**Findings:**

* **Non-Emergency:** Most calls (857,435) were classified as non-emergency, making up the largest portion of the total call volume.
* **Medium Priority:** There were 231,022 medium-priority calls.
* **Low Priority:** 218,107 calls were categorized as low priority.
* **Emergency:** A small number of calls (222) were classified as emergencies.
* **Out of Service:** There were 191 calls marked as out of service.

This distribution indicates that most 911 calls are for non-emergency situations, highlighting the need for efficient management of these calls to ensure resources are available for higher-priority incidents.

**Top Incidents by Call Volume**

The bar chart below illustrates the top incidents by call volume for Baltimore City in 2021. This visualization helps identify the most frequent types of incidents reported to 911, providing insights into common emergency and non-emergency situations.

**Visualization:A screenshot of a graph

Description automatically generated**

**Findings:**

* **Business Check:** The most frequent incident type with 335,548 calls.
* **Directed Patrol:** The second most common incident type with 255,403 calls.
* **Disorderly:** 80,717 calls were made for disorderly conduct incidents.
* **911/No Voice:** Calls with no voice communication accounted for 63,011 calls.
* **Traffic Stop:** This type of incident had 43,578 calls.
* **Auto Accident**: Approximately 34,843 calls were related to auto accidents.
* **Foot Patrol:** 39,241 calls were recorded for foot patrol incidents.
* **Common Assault:** 31,981 calls were related to common assault.
* **Repairs/Service:** 29,989 calls were made for repair or service requests.
* **Silent Alarm:** The least common of the top incidents with 27,327 calls.

This distribution shows that business checks and directed patrols are the most common incidents reported, indicating areas where police resources are frequently deployed. Other significant incident types include disorderly conduct and auto accidents.

**Geographic Call Distribution**

The map below illustrates the geographic distribution of 911 calls by ZIP code for Baltimore City in 2021. This visualization helps in understanding the spatial patterns of emergency calls, identifying areas with higher call volumes that may require more resources and attention.

**Visualization:**A map of the world

Description automatically generated

**Findings:**

* **ZIP Code 21215:** This area had the highest call volume with 150,593 calls.
* **ZIP Code 21217:** Recorded 125,126 calls.
* **ZIP Code 21223:** Showed 98,986 calls.
* **ZIP Code 21230:** Downtown area recorded 55,288 calls.
* **ZIP Code 21224:** 105,948 calls.
* **ZIP Code 21206:** 44,171 calls.
* **ZIP Code 21205:** 92,559 calls.

The map indicates that the central and northwestern parts of Baltimore have the highest concentration of calls, suggesting these areas might have more incidents or a higher population density. These insights can assist in resource allocation and emergency response planning.

**Police District Call Analysis**

The map below illustrates the number of 911 calls by police district for Baltimore City in 2021. This visualization helps in understanding the distribution of emergency calls across different police districts, indicating areas with higher call volumes that may require more police resources and attention.

**Visualization:** A map of a city

Description automatically generated

**Findings:**

* **Northwestern District:** This district had the highest number of calls with 169,042 calls.
* **Southeastern District:** The second-highest number of calls with 170,717 calls.
* **Southern District:** Approximately 164,266 calls were recorded in this district.
* **Eastern District:** This district had around 147,266 calls.
* **Northern District:** Recorded approximately 147,232 calls.
* **Western District:** This district had around 146,643 calls.
* **Central District:** Approximately 141,471 calls were made.
* **Southwestern District:** This district had around 135,229 calls.
* **Northeastern District:** The least number of calls among the major districts with around 134,102 calls.

The distribution indicates that the Northwestern, Southeastern, and Southern districts experience the highest call volumes. This insight can guide the allocation of police resources and strategic planning for emergency response efforts in these areas.

**Neighborhood Insights by Priority:**

The bar chart below illustrates the insights by common neighborhood for Baltimore City in 2021. This visualization helps in understanding the distribution of emergency calls across different neighborhoods by priority.

**Visualization:A screenshot of a graph

Description automatically generated**

**Findings:**

* **Downtown:** 24,075 calls with 8,120 low priority and 2,247 emergencies.
* **Sandtown-Winchester:** 24,524 calls with 3,447 low priority and 2,654 emergencies.
* **Brooklyn:** 16,174 calls with 5,509 medium priority and 3,819 high priorities.
* **Central Park Heights:** 18,989 calls with 2,373 medium priorities.
* **Frankford:** 10,504 calls with 5,269 medium priority and 5,399 low priorities.
* **Upton:** 13,209 calls with 4,947 medium priority and 2,823 high priorities.

This distribution indicates the priority level of calls across various neighborhoods, providing insights for better resource allocation and emergency response planning.

**Synchronization of Call Needs:** A notable observation is that nearly all calls require synchronization, emphasizing the importance of efficient communication and coordination in emergency response scenarios.

The following dashboards provide a comprehensive visualization of the 911 call data analysis for Baltimore City in 2021.

**Figure 1** illustrates the number of 911 calls per month and the number of calls in a day. provides insights by common neighborhood, number of calls by police district. The trends show significant fluctuations throughout the year and during different hours of the day.

A screenshot of a data presentation

Description automatically generated

**Figure 2** Illustrates the number of calls by ZIP code, distribution of calls by priority, and the number of calls per weekday. These visualizations help identify high-call-volume areas, frequent incident types, and priority levels of calls.

A screenshot of a data report

Description automatically generated

1. **Recommendations:**

Based on the analysis of the 911 call data for Baltimore City in 2021, the following recommendations are proposed to enhance public safety, optimize resource allocation, and improve emergency response times:

1. **Resource Allocation**
   * **High-Call Volume Areas:** Increase resource deployment in high-call-volume ZIP codes such as 21215, 21217, and 21223. This includes additional police patrols, emergency response units, and community outreach programs.
   * **Peak Hours Coverage:** Allocate more resources during peak call hours, especially around midnight and early morning. Enhancing night shifts with additional personnel can help address the surge in calls during these times.
2. **Community Engagement and Prevention Programs**
   * **Frequent Incident Types:** Implement targeted community engagement and prevention programs for the most frequent incident types, such as business checks and directed patrols. Collaborate with local businesses and community leaders to address underlying issues.
   * **Public Awareness Campaigns:** Conduct public awareness campaigns to educate residents about the appropriate use of 911 services, especially for non-emergency situations. This can help reduce the volume of non-emergency calls and ensure that critical resources are available for high-priority incidents.
3. **Technology and Data Integration**
   * **Enhanced Data Systems:** Invest in technology to improve data integration and real-time analysis of 911 calls. This can include upgrading call center software, implementing predictive analytics for resource allocation, and integrating Geographic Information System (GIS) mapping for better visualization of call patterns.
   * **Synchronization and Coordination:** Enhance synchronization and coordination among different emergency response units to ensure efficient communication and resource sharing. Implementing advanced communication systems and protocols can improve the overall response time and effectiveness.
4. **Training and Capacity Building**
   * **Emergency Responders Training:** Provide specialized training for emergency responders to handle high-priority incidents effectively. This includes crisis management, de-escalation techniques, and first-aid training.
   * **Call Center Staff Training:** Train call center staff to categorize calls accurately and efficiently. This can help in prioritizing calls correctly and ensuring that resources are allocated appropriately.
5. **Regular Review and Feedback**
   * **Performance Metrics:** Establish performance metrics and conduct regular reviews of 911 call data to identify trends, gaps, and areas for improvement. Use this data to continuously refine strategies and optimize resource allocation.
   * **Stakeholder Feedback:** Engage with stakeholders, including community members, emergency responders, and local authorities, to gather feedback on current practices and areas for enhancement. Incorporating stakeholder insights can lead to more effective and community-centered solutions.

By implementing these recommendations, Baltimore City can improve its emergency response capabilities, enhance public safety, and ensure that resources are utilized efficiently to address the needs of its residents.

1. **Conclusion:**

The analysis of the 911 call data for Baltimore City in 2021 provides valuable insights into the patterns and characteristics of emergency calls. By examining monthly trends, daily patterns, call priorities, top incidents, geographic distribution, and police district call volumes, we have identified key areas that require attention and optimization.

**Summary of Findings**:

* **Monthly Call Volume Trends**: The highest call volumes were observed at the beginning of the year, with a gradual decline in subsequent months.
* **Daily Call Patterns**: Emergency call volumes peak during the late-night and early-morning hours, indicating the need for increased resources during these times.
* **Call Priority Distribution**: The majority of calls are classified as non-emergency, highlighting the need for efficient management of these calls to ensure resources are available for higher-priority incidents.
* **Top Incidents by Call Volume**: Business checks and directed patrols are the most common incidents, indicating areas where police resources are frequently deployed.
* **Geographic Call Distribution**: Central and northwestern parts of Baltimore have the highest concentration of calls, suggesting these areas may have more incidents or higher population density.
* **Police District Call Analysis**: The Northwestern, Southeastern, and Southern districts experience the highest call volumes, necessitating targeted resource allocation and strategic planning.

By addressing these key areas, Baltimore City can enhance its emergency response capabilities, improve public safety, and ensure that resources are utilized efficiently to meet the needs of its residents. The insights gained from this analysis can guide decision-makers in implementing effective policies and practices to better serve the community.