



Microsoft Access and Excel for Data-Driven Crime Analysis: A 5-Part Series

Part 4: Automating Processes with Advanced Expressions

Welcome to **Part 4** of our 5-part analytical series. Today, we will explore how advanced expressions in Microsoft Access® can help automate complex calculations and reporting processes. This session builds upon the IADLEST and TxDOT partnership, which has been committed to streamlining law enforcement's approach to traffic and crime safety. The session will show you how to automate routine analysis and reporting tasks, saving you time and allowing you to focus on more strategic decision-making. With the tools shared in this session, you'll be able to create reusable templates that automate processes across multiple areas of your agency's workflow. This continued collaboration helps ensure that law enforcement agencies are equipped with the latest tools to improve efficiency, increase accuracy, and focus on reducing social harms and improving public safety.



Dawn Reeby

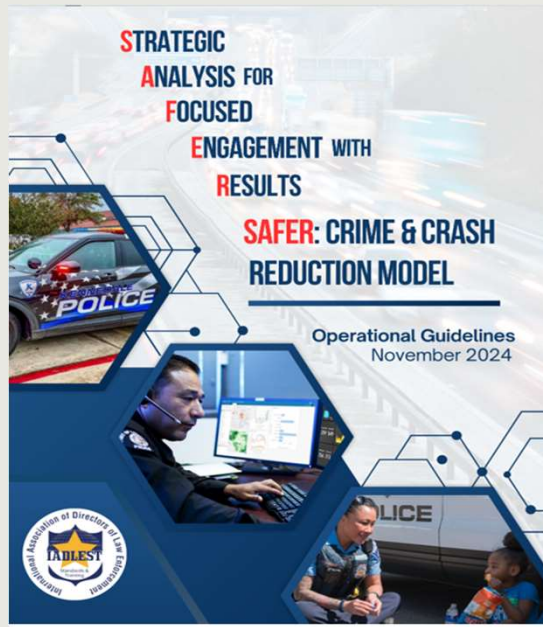
Senior Analytical Specialist

Welcome to **Part 4: Advanced Expressions and Automation Processes**

I'm Dawn Reeby, and I'm honored to guide you through this transformative training. With over 25 years in law enforcement analysis, I've spent nearly 14 of those years collaborating with IADLEST to deliver impactful analytical trainings, webinars, and technical assistance nationwide. Our work focuses on helping agencies implement smarter, data-driven strategies while fostering high-performing teams. As the author of *Bigger Than Data* and the *Building a Crime Analysis Legacy* books, my mission is to empower crime analysts and supervisors to strengthen their careers, build team capacity, and leave lasting legacies in the field.

In this session, we'll dive into tools and techniques that you can use to **streamline complex calculations and automate reporting processes**. I'm here to share my experience and insights with you, and I'm excited to help you take your analytical skills to the next level!

Let's get started!



The SAFER (Strategic Analysis for Focused Engagement with Results: Crime and Crash Reduction) model, developed by the International Association of Directors of Law Enforcement Standards and Training (IADLEST) and supported by the Texas Department of Transportation (TxDOT), integrates location-based crime and crash data to create long-term strategies for reducing social harms. It builds on the earlier DDACTS 2.0 model, initially supported by the National Highway Traffic Safety Administration (NHTSA). IADLEST offers a variety of resources, including workshops, literature, webinars, and training, to help law enforcement agencies implement data-driven models like SAFER for more effective crime and traffic safety analysis and deployment.

Part 3: Mastering Tables and Data Quality Cleaning Tips RECAP



In **Part 3** of our series, we dove into the critical importance of master tables in crime analysis. Master tables provide a centralized framework for organizing and consolidating data from various sources, such as CAD, RMS, and external databases, helping eliminate redundancies and standardize your datasets. By integrating these datasets into master tables, analysts can create a clean and efficient foundation for deeper analysis.

We explored how to structure master tables for flexible querying and analysis, emphasizing the importance of data cleaning techniques to resolve errors, standardize formats, and remove duplicates. We also discussed how validation processes play a key role in maintaining ongoing accuracy and consistency, ensuring the integrity of the data you rely on for crucial decision-making in law enforcement.

Remember, the strength of your analysis is directly linked to the quality of your data. By mastering the process of creating and managing master tables, you're setting yourself up for greater success in uncovering trends, identifying patterns, and generating actionable insights.

Now that you have a solid understanding of data management, **Part 4** will introduce advanced expressions and automation techniques to streamline your processes even further. Let's dive in!

Learning Objectives

1

Objective 1: Create advanced expressions in Microsoft Access® for more precise analysis.

2

Objective 2: Automate reports and processes to improve efficiency and reduce manual effort.

3

Objective 3: Design reusable templates to streamline repetitive tasks.

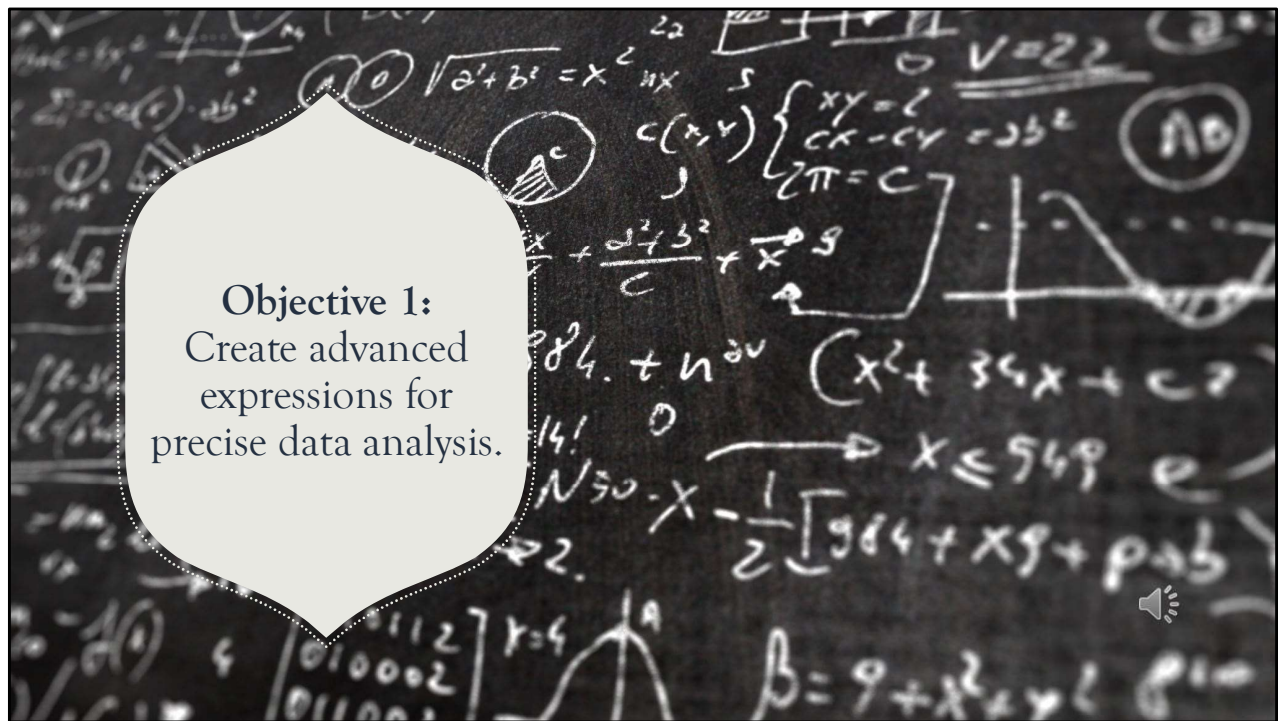


In this session, we'll dive into using **advanced expressions** in **Microsoft Access®** to enhance the precision of your analyses and streamline complex calculations. We'll also explore how to **automate reporting processes** to significantly improve efficiency and reduce the manual effort typically involved. Finally, we'll cover how to create **reusable templates** for those repetitive tasks, making your analysis and reporting more efficient and consistent.

Learning Objectives:

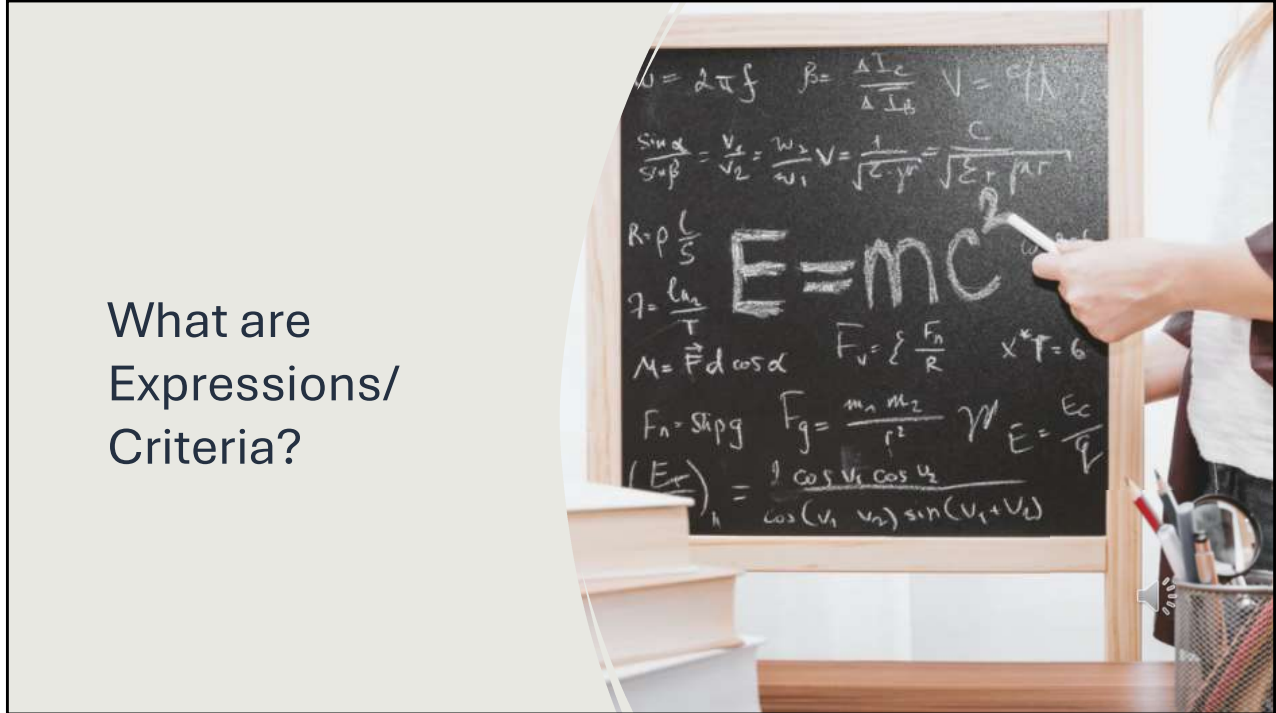
1. Create advanced expressions to conduct precise data analysis.
2. Automate reporting processes to enhance efficiency and accuracy.
3. Design reusable templates to streamline repetitive tasks.

By the end of this session, you'll be able to apply these tools to work smarter and faster.



Objective 1: Create advanced expressions to conduct precise data analysis.

What are Expressions/ Criteria?



In crime analysis, utilizing Microsoft Access to its fullest potential can significantly enhance the efficiency and accuracy of your work. One key feature we focus on is **criteria**, which are an essential part of creating meaningful queries and reports. Microsoft Support Office defines an **expression** as a combination of mathematical or logical operators, constants, functions, table fields, controls, and properties that evaluates to a single value. This concept is crucial for crime analysts because expressions allow you to **filter, calculate, and validate** data in ways that directly impact your analysis and reporting.

For example, using expressions in queries, you can isolate specific crimes based on certain conditions, such as **crime type, date range, or geographic location**, by applying logical operators. You can also automate calculations, such as **crime rates** over time or **patterns in suspect behavior**, to provide quick insights for law enforcement teams. Additionally, expressions in Access can be used to set default values, which can be helpful for filling in missing data or streamlining the data entry process, reducing errors and improving data consistency.

By understanding how to use expressions and criteria in Access, crime analysts can improve the quality of their analyses, make their processes more efficient,

and automate repetitive tasks—allowing for more time to focus on proactive and strategic problem-solving. In the upcoming sessions, we'll explore how you can apply these techniques to real-world crime data, automate key reporting tasks, and make your workflow more effective.

“Examples of Query Criteria.” Microsoft Support Office. Accessed December 2024. <https://support.office.com/en-us/article/examples-of-query-criteria-3197228c-8684-4552-ac03-aba746fb29d8>

Purpose of Expressions/ Criteria

- Minimize data storage and processing time
- Minimize data errors
- Validate data
- Set default values for mapping and analysis
- Analyze and count new fields
- Create keys for linking tables
- Optimize presentation
- Improve accuracy of data entry
- Create a database that has the capacity to answer many, many questions
- **Make your life EASIER!**
- **Dig deep into your data!**



So, why should we spend time working with expressions and criteria operators? The answer is simple: **efficiency** and **accuracy**.

First, expressions and criteria operators allow us to **minimize data storage and processing time**. By creating targeted queries and setting criteria, we ensure that our database only processes the relevant information, cutting down on unnecessary data.

Next, they help us **minimize errors** and **validate data**, ensuring that the analysis we provide to officers is accurate and **timely**. For example, expressions can automatically flag inconsistencies in the data, reducing the risk of mistakes in your reports.

Expressions also enable us to **set default values**, streamlining the mapping and analysis process. Whether you're mapping data for a geographical analysis or automating a report template, you can set defaults that save time and effort.

Additionally, expressions allow you to **analyze and count new fields**. For example, if your data only has the date of an event, but you're responsible for

generating quarterly reports, you can create an expression to count the occurrences in each quarter—no manual calculation needed!


They also help us **create keys for linking tables**, giving us the flexibility to **integrate additional data**. By linking data from different sources like pawns, probation reports, or citations, you can build a **more comprehensive analysis**.

Let's not forget about **optimization**. We all want to produce the most professional report in the least amount of time. Setting up expressions and criteria operators gives us the flexibility to **optimize presentation**, ensuring we can deliver polished reports quickly and efficiently.

Moreover, these tools **improve data entry accuracy**, and ultimately, they give you the power to **build a database that answers many, many questions**. Ultimately, the goal is to make your life **easier** and help you **dig deeper into your data** for more powerful, actionable insights.

Today, we're just scratching the surface, so for more exploration, challenge yourself with the **expressions and functions** provided in the handouts for this part of the series.

Example: Optimize Presentation



| IBRcode | CountOfInch |
|---------|-------------|
| 09A | 35 |
| 100 | 4 |
| 11A | 1320 |
| 11D | 57 |
| 120 | 193 |
| 13A | 1021 |
| 13B | 6386 |
| 13C | 2006 |
| 200 | 413 |
| 220 | 8979 |
| 23C | 810 |
| 23D | 2621 |
| 23F | 802 |
| 23H | 1029 |
| 240 | 186 |
| 250 | 6275 |
| 26A | 481 |
| 26D | 680 |
| 35A | 182 |
| 40A | 576 |

| Crime Category | CountOfInch |
|--------------------------------------|-------------|
| ARSON | 413 |
| ASSAULT OFFENSES | 9413 |
| BURGLARY / BREAKING AND ENTERING | 8979 |
| COUNTERFEITING / FORGERY | 6275 |
| CURFEW/LOITERING/VAGRANCY VIOLATIONS | 12807 |
| DISORDERLY CONDUCT | 1034 |
| DRIVING UNDER THE INFLUENCE | 525 |
| DRUG/NARCOTIC OFFENSES | 182 |
| FAMILY OFFENSES, NONVIOLENT | 2025 |
| FRAUD OFFENSES | 1161 |
| HOMICIDE OFFENSES | 35 |
| KIDNAPPING / ABDUCTION | 4 |
| LARCENY/THEFT OFFENSES | 5262 |
| MOTOR VEHICLE THEFT | 186 |
| PROSTITUTION OFFENSES | 576 |
| ROBBERY | 193 |
| SEX OFFENSES, FORCIBLE | 1377 |
| WEAPON LAW VIOLATIONS | 4330 |

When discussing the use of **expressions** and **criteria operators**, one key application is the use of **library tables** to link IBR codes to their full descriptions. This is a great example of how expressions can simplify and enhance your crime analysis work.

In many databases, crime data is stored using **IBR codes**, which are often numeric or abbreviated identifiers for crime types. Without expressions, these codes may remain in their raw form, which can be difficult for non-analysts to understand or interpret quickly. However, by using expressions in Microsoft Access®, you can link these IBR codes to a **library table** that contains the full text descriptions, allowing you to automatically convert these codes into readable data.

Using an expression, you can create a query or report that translates the IBR code from your data table into a descriptive field pulled directly from the library table. For example, if the data table contains the code **430**, the expression can pull the corresponding description of **Robbery** from the library table.

This process serves several important functions:

1. **Automating the translation** of codes into descriptions without manual intervention, saving you time and reducing the chance of human error.
2. **Improving data accuracy**, since the expression ensures that the correct description is always linked to the correct code.
3. **Streamlining analysis and reporting**, making your findings easier to understand and present to a broader audience, from officers to supervisors.
4. **Ensuring consistency**, as the descriptions pulled from the library table will always be standardized, avoiding the discrepancies that can arise from manually entering text.

In essence, using **expressions** with **library tables** for IBR code translation helps make your data both more **accessible** and **professional**, enhancing the overall efficiency and clarity of your crime analysis reports.

Example: Dig Deeper into Data

| WITHOUT Expressions | | | WITH Expressions | | |
|---------------------|------|--------------|------------------|------|------------------|
| DateOfRepoi | StNo | Street1 | DateOfRepoi | StNo | Address |
| 1/1/2023 | 250 | Main St | 1/1/2023 | 250 | 250 Main St |
| 1/1/2023 | 198 | Haverhill St | 1/1/2023 | 198 | 198 Haverhill St |
| 1/1/2023 | 254 | Lowe St | 1/1/2023 | 254 | 254 Lowe St |
| 1/1/2023 | 182 | Milhender Pl | 1/1/2023 | 182 | 182 Milhender Pl |
| 1/1/2023 | 140 | Highgate St | 1/1/2023 | 140 | 140 Highgate St |
| 1/1/2023 | 200 | Termine Ave | 1/1/2023 | 200 | 200 Termine Ave |
| 1/1/2023 | 496 | Broadway | 1/1/2023 | 496 | 496 Broadway |
| 1/1/2023 | 184 | Agassiz Rd | 1/1/2023 | 184 | 184 Agassiz Rd |
| 1/1/2023 | 182 | Willers St | 1/1/2023 | 182 | 182 Willers St |
| 1/1/2023 | 640 | Main St | 1/1/2023 | 640 | 640 Main St |
| 1/1/2023 | 218 | Charles St | 1/1/2023 | 218 | 218 Charles St |
| 1/1/2023 | 184 | Lorraine Ter | 1/1/2023 | 184 | 184 Lorraine Ter |
| 1/1/2023 | 186 | India Wharf | 1/1/2023 | 186 | 186 India Wharf |
| 1/1/2023 | 420 | Mallon Rd | 1/1/2023 | 420 | 420 Mallon Rd |
| 1/1/2023 | 280 | Hillsboro Rd | 1/1/2023 | 280 | 280 Hillsboro Rd |
| 1/1/2023 | 446 | Addison St | 1/1/2023 | 446 | 446 Addison St |
| 1/1/2023 | 730 | Main St | 1/1/2023 | 730 | 730 Main St |

One of the most powerful uses of **expressions** and **criteria operators** in Microsoft Access® is for streamlining addresses, especially when it comes to analysis and mapping. Addresses in raw form can be complex, with multiple components like street names, numbers, city names, and zip codes often stored in different fields or inconsistent formats. By using **expressions** and **criteria**, you can automate the process of preparing these addresses for deeper analysis or mapping.

For example, let's say you're working with a database that includes crime incident addresses stored in separate fields like **Street Number**, **Street Name**, **City**, and **Zip Code**. While this data is useful, it's not immediately ready for analysis or mapping without combining those components into a single, usable address field. This is where **expressions** come in.

Using an expression in Microsoft Access®, you can combine these separate fields into one cohesive, standardized address format. For example, you can create a new field that concatenates **Street Number**, **Street Name**, **City**, and **Zip Code** into a single address string. The expression might look something like this:

FullAddress: [Street Number] & " " & [Street Name] & ", " & [City] & ", " & [Zip Code]

This expression takes the individual components and merges them into one field, making it easier to search, analyze, or map the data. But the power of expressions doesn't stop there. You can also apply **criteria operators** to ensure consistency across addresses. For instance, if some records contain incomplete address data or discrepancies, you can create criteria to identify and flag missing or inconsistent fields.

This process has several benefits for your crime analysis work:

- 1.Simplifies analysis** – Combining address components into one field makes it easier to analyze crime data geographically and identify trends.
- 2.Optimizes mapping** – Once the addresses are streamlined, they're ready for integration with mapping software, providing more accurate visualizations.
- 3.Improves data quality** – Criteria operators help filter out incomplete or inconsistent data, ensuring that the addresses used for analysis and mapping are reliable.
- 4.Saves time** – By automating the address formatting with expressions, you eliminate the need for manual data cleaning, allowing you to focus on deeper analysis.

In summary, using **expressions** and **criteria operators** to streamline addresses makes your crime data more structured, more usable, and ready for advanced analysis or mapping. It simplifies complex data, enhances the quality of your reports, and helps you present clear, actionable insights to your department or stakeholders.

Example: Analyze/Count New Fields

WITHOUT Expressions

| Crime Category | IncNum | DateOfReport |
|--------------------------------------|---------------|--------------|
| ASSAULT OFFENSES | 2023-01011541 | 1/1/2023 |
| CURFEW/LOITERING/VAGRANCY VIOLATIONS | 2023-01011541 | 1/1/2023 |
| ASSAULT OFFENSES | 2023-01011541 | 1/1/2023 |
| ASSAULT OFFENSES | 2023-01011541 | 1/1/2023 |
| FAMILY OFFENSES, NONVIOLENT | 2023-01011541 | 1/1/2023 |
| COUNTERFEITING / FORGERY | 2023-01011541 | 1/1/2023 |
| ASSAULT OFFENSES | 2023-01011541 | 1/1/2023 |
| ASSAULT OFFENSES | 2023-01011541 | 1/1/2023 |
| CURFEW/LOITERING/VAGRANCY VIOLATIONS | 2023-01011541 | 1/1/2023 |
| LARCENY/THEFT OFFENSES | 2023-01011541 | 1/1/2023 |
| DRIVING UNDER THE INFLUENCE | 2023-01011542 | 1/1/2023 |
| WEAPON LAW VIOLATIONS | 2023-01011542 | 1/1/2023 |
| ASSAULT OFFENSES | 2023-01011542 | 1/1/2023 |
| FAMILY OFFENSES, NONVIOLENT | 2023-01011542 | 1/1/2023 |
| CURFEW/LOITERING/VAGRANCY VIOLATIONS | 2023-01011542 | 1/1/2023 |
| CURFEW/LOITERING/VAGRANCY VIOLATIONS | 2023-01011542 | 1/1/2023 |
| CURFEW/LOITERING/VAGRANCY VIOLATIONS | 2023-01011542 | 1/1/2023 |
| CURFEW/LOITERING/VAGRANCY VIOLATIONS | 2023-01011542 | 1/1/2023 |
| BURGLARY / BREAKING AND ENTERING | 2023-01011542 | 1/1/2023 |
| BURGLARY / BREAKING AND ENTERING | 2023-01011542 | 1/1/2023 |
| DISORDERLY CONDUCT | 2023-01011543 | 1/1/2023 |

WITH Expressions

| IncNum | DateOfReport | DOW |
|---------------|--------------|-----|
| 2020-00000100 | 7/2/2020 | Thu |
| 2020-00000111 | 7/3/2020 | Fri |
| 2020-00000127 | 7/9/2020 | Thu |
| 2020-00000142 | 7/16/2020 | Thu |
| 2020-00000171 | 7/17/2020 | Fri |
| 2020-00000186 | 7/19/2020 | Sun |
| 2020-00000187 | 7/23/2020 | Thu |
| 2020-00000190 | 7/24/2020 | Fri |
| 2020-00000199 | 7/24/2020 | Fri |
| 2020-00000201 | 7/28/2020 | Tue |
| 2020-00000209 | 7/31/2020 | Fri |
| 2020-00000212 | 8/6/2020 | Thu |
| 2023-01011541 | 1/1/2023 | Sun |
| 2023-01011541 | 1/1/2023 | Sun |

Using expressions and criteria in Microsoft Access® can greatly enhance your ability to analyze time-related data, such as the **day of the week** a crime occurred. Instead of manually extracting this information from date fields, expressions allow you to automatically pull and standardize the **day of the week** for each incident.

This approach offers several benefits:

- 1.Data Standardization:** Automatically converts raw date data into a clear day name, making it easier to analyze.
- 2.Pattern Identification:** Quickly spot trends, like which days see higher crime rates, helping to allocate resources effectively.
- 3.Improved Reporting:** Streamline reports by including the day of the week, providing more actionable insights.
- 4.Enhanced Automation:** Simplify repetitive tasks, saving time and improving consistency in your analysis.

By using these tools, you can transform complex datasets into more useful and actionable insights for your department.

Common Criteria Operators

- **Exact matches** – searches for specific fields
- **> <** - searches for fields above or below certain values
- **Between** – searches for fields between two values
- **Like *** - searches for texts with a wild card
- **Or** - searches for multiple values or combinations
- **And** - searches for more than one value
- **Not** - negates any of the above criteria; looks for opposite



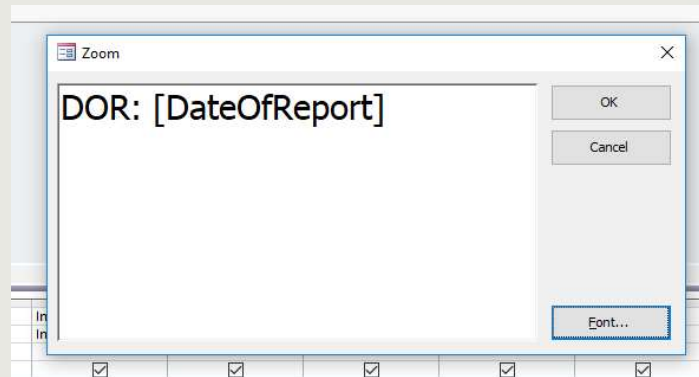
GO TO YOUR VIDEO LIBRARY: "CRITERIA OPERATORS"

Next, we are going to go step-by-step through a series of helpful criteria. These can be used alone or in conjunction with each other to be even more sophisticated.

- Exact matches – searches for specific fields
- > < -searches for fields above or below certain values
- Between – searches for fields between two values
- Like * - searches for texts with a wild card
- Or - searches for multiple values or combinations
- And - searches for more than one value
- Not - negates any of the above criteria; looks for opposite

Rename Existing Fields

Create a new field. Select Zoom



Here's an example of how to rename a query field without altering the data it stores. If you don't like the name "DateOfReport" and want to change it to "DOR," the easiest method is to create a new field. To do this, navigate to the blank field space in the design view of your query. By scrolling to the far right of the design grid, you'll find empty fields where you can enter new information. Simply type:


DOR: [DateOfReport]

This creates a new field called "DOR" without changing the underlying data. The format consists of the new field name "DOR," followed by a colon, and then the original field "DateOfReport" enclosed in brackets. This allows you to reference the existing data while displaying it under a new name.

Renaming a field in this way is helpful for analysis because it allows you to present data in a more concise or meaningful way without altering the original data source. For example, shortening "DateOfReport" to "DOR" makes reports and queries easier to read, especially when dealing with large datasets. This approach can also help streamline your analysis process by making field names more intuitive or aligned with your agency's terminology, improving

communication and reducing the chance for confusion. Additionally, this technique maintains the integrity of the original data, ensuring that no information is lost or changed during the renaming process.

Rename Existing Fields



| IncidentType | DateOfReport | DOR |
|-------------------|--------------|------------|
| Directed Patrol | 12/31/2023 | 12/31/2023 |
| MV Accident | 12/31/2023 | 12/31/2023 |
| Directed Patrol | 12/31/2023 | 12/31/2023 |
| Alarm | 12/31/2023 | 12/31/2023 |
| Road Conditions | 12/31/2023 | 12/31/2023 |
| Alarm | 12/31/2023 | 12/31/2023 |
| MV Accident | 12/31/2023 | 12/31/2023 |
| Public Service | 12/31/2023 | 12/31/2023 |
| Alarm | 12/31/2023 | 12/31/2023 |
| Directed Patrol | 12/31/2023 | 12/31/2023 |
| Traffic Complaint | 12/31/2023 | 12/31/2023 |

GO TO YOUR VIDEO LIBRARY: "RENAMING EXISTING FIELDS"

The output is the new field with the same data as in the selected field. Nothing else happens to the selected field.

Check-In Question #1

What is the primary purpose of using advanced expressions in Microsoft Access® for crime analysis?


- a) To simplify data entry by automatically filling in fields
- b) To optimize database storage and reduce processing time
- c) To improve database aesthetics by adding colors and styles
- d) To validate personal data such as addresses and phone numbers

Check-In Question #1

What is the primary purpose of using advanced expressions in Microsoft Access® for crime analysis?

- a) To simplify data entry by automatically filling in fields
- b) To optimize database storage and reduce processing time**
- c) To improve database aesthetics by adding colors and styles
- d) To validate personal data such as addresses and phone numbers

Calculating Dates for Analysis



| IncidentType | DateOfReport | Year |
|---------------------|--------------|------|
| Directed Patrol | 12/31/2023 | 2023 |
| MV Accident | 12/31/2023 | 2023 |
| Directed Patrol | 12/31/2023 | 2023 |
| Alarm | 12/31/2023 | 2023 |
| Road Conditions | 12/31/2023 | 2023 |
| Alarm | 12/31/2023 | 2023 |
| MV Accident | 12/31/2023 | 2023 |
| Public Service | 12/31/2023 | 2023 |
| Alarm | 12/31/2023 | 2023 |
| Directed Patrol | 12/31/2023 | 2023 |
| Traffic Complaint | 12/31/2023 | 2023 |
| Assist Other Agency | 12/31/2023 | 2023 |
| Directed Patrol | 12/31/2023 | 2023 |
| Fire | 12/31/2023 | 2023 |
| Alarm | 12/31/2023 | 2023 |
| MV Accident | 12/31/2023 | 2023 |
| OUI | 12/31/2023 | 2023 |

GO TO YOUR VIDEO LIBRARY: "DATE FUNCTIONS"

The output or result is the year in the form of 4 numbers – 2023.

Concatenate
(aka smush
together)

| StNo | Street1 |
|------|-----------------|
| 214 | Service Rd |
| 182 | Wilcutt Rd |
| 300 | Milhender Pl |
| 680 | Westcott St |
| 89 | Pearl Pl |
| 226 | Tuckerman St |
| 360 | Parker Hill Ave |
| 378 | Matchett St |
| 300 | Milhender Pl |
| 300 | Milhender Pl |



GO TO YOUR VIDEO LIBRARY: "CONCATENATING FIELDS"

In crime analysis, concatenating fields can be incredibly beneficial for streamlining data and making the analysis more efficient. For instance, when mapping crime incidents, many mapping tools require the address to be in a single field. If the street number and street name are stored in separate fields, mapping software won't recognize them as a complete address. By using concatenation, you can combine the street number and street name into one field, allowing your mapping software to process and visualize the data correctly. This makes it easier to perform geospatial analysis, identify crime hotspots, and ensure that the mapping process is both accurate and efficient. Using concatenation in this way can also save time, reduce data entry errors, and improve the overall quality of your analysis, making your reports and insights more actionable for law enforcement officers and other stakeholders.

Here are three examples of when concatenating fields would be useful in crime analysis:

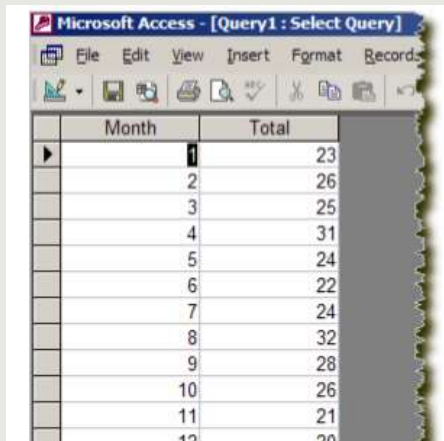
1.Mapping Crime Locations: If your crime data stores the street number in one field and the street name in another, concatenating them into a single address field will allow mapping software to accurately place crimes on the map. This is crucial for visualizing patterns, such as crime

hotspots or identifying areas that need more attention.

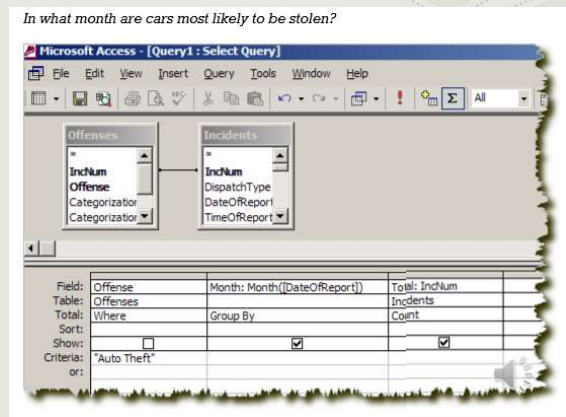
2. **Combining Victim Information:** When analyzing crime data, you might have separate fields for a victim's first and last name. By concatenating these into one field (e.g., "Full Name"), you can simplify reporting, create more comprehensive victim profiles, and improve the ease of linking related data across multiple systems.

3. Combining Date and Time for Analysis: If your crime records store the date and time of an incident separately, concatenating them into a single "DateTime" field can help streamline analysis. This enables you to analyze crime trends by specific time periods, such as shifts or days of the week, and can also make it easier to automate time-based reports.

Aggregate Queries



| Month | Total |
|-------|-------|
| 1 | 23 |
| 2 | 26 |
| 3 | 25 |
| 4 | 31 |
| 5 | 24 |
| 6 | 22 |
| 7 | 24 |
| 8 | 32 |
| 9 | 28 |
| 10 | 26 |
| 11 | 21 |
| 12 | 20 |



In what month are cars most likely to be stolen?

| Field | Offense | Month | Month([DateOfReport]) | Total | Incidents |
|-----------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| Table: | Offenses | | | | Incidents |
| Total: | Where | | | | Count |
| Sort: | | | | | |
| Show: | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| Criteria: | 'Auto Theft' | | | | |
| or: | | | | | |

GO TO YOUR VIDEO LIBRARY: "AGGREGATE QUERIES"

Aggregate queries are essential for summarizing and analyzing large sets of data, allowing analysts to calculate totals, averages, counts, and other statistics. In crime analysis, for example, an aggregate query could be used to count the number of incidents by month, helping you spot trends over time.

The power of aggregate queries lies in the **design view**, where you can define specific questions or criteria for your data—such as how many crimes occurred in each month—by grouping data based on a field like the "Date of Report." After running the query, you can switch to **datasheet view** to see your results neatly summarized, providing a quick overview of your analysis.

This approach is also helpful for **data quality**, as mentioned earlier. By aggregating data, you can easily identify anomalies or inconsistencies, such as unusually high or low counts in a specific period, which might indicate missing or incorrect data.

Beyond data quality, aggregate queries provide several other benefits for analysts:

1. Trend Identification: Quickly identify crime trends over different

periods, such as monthly or yearly patterns, which can help in resource allocation or strategic planning.

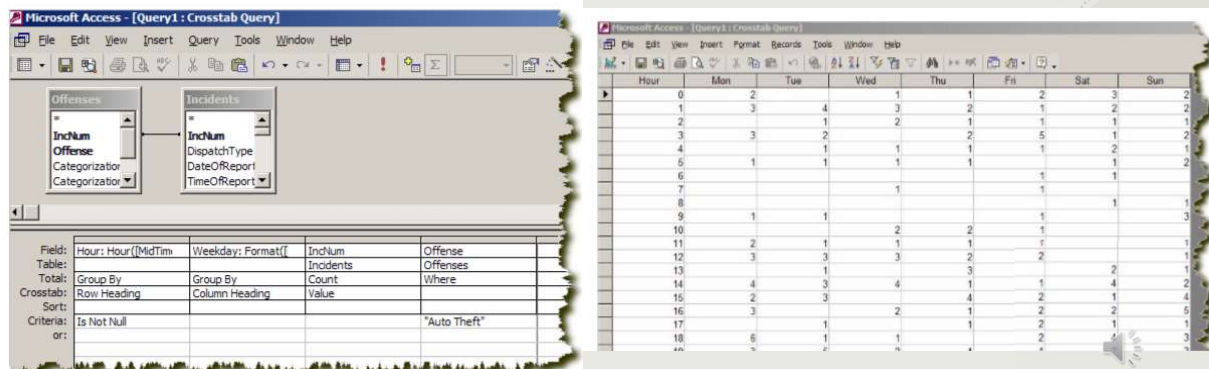
2. **Data Summarization:** Simplify complex datasets by summarizing large volumes of data into actionable insights—such as total offenses, arrests, or other important metrics.

3.Improved Reporting: Aggregate queries allow analysts to generate concise, high-level reports that focus on key statistics, making it easier to communicate findings to stakeholders like detectives or patrol officers.

4.Data Segmentation: By grouping data based on specific variables (like offense type or location), you can uncover more specific patterns and insights that may be missed in raw data.

Crosstab Queries

How does hour of the day relate to the day of the week?



GO TO YOUR VIDEO LIBRARY: "CROSSTAB QUERIES"

Crosstab queries are incredibly powerful for analyzing patterns within groups of data. In this example, we're looking at auto thefts and examining not just the time they occur, but also the specific days, like weekends. The goal is to dig deeper and understand more than just the time of day—by combining both the day of the week and time of day, we can pinpoint patterns, like whether auto thefts are more frequent during certain hours on weekends or weekdays.

This type of analysis can help us answer critical questions, such as: **Do we have enough officers on duty during peak crime times? Are our shift changes aligned with crime activity? When are most traffic crashes happening—on weekends or weekdays?** Crosstab queries allow us to go beyond just counting incidents; they help us uncover relationships among variables. For example, **Are cars stolen at different times of day depending on the day of the week? Do offenders' ages correlate with specific towns they come from? Are certain car models more likely to be stolen in specific locations?**

By using crosstab queries, we can identify these types of patterns, which is crucial for strategic planning, resource allocation, and even predictive policing. This deeper insight into crime trends allows you to make data-driven decisions

that can help reduce crime and improve patrol strategies.

Check-In Question #2

What is the primary benefit of concatenating fields in crime analysis?

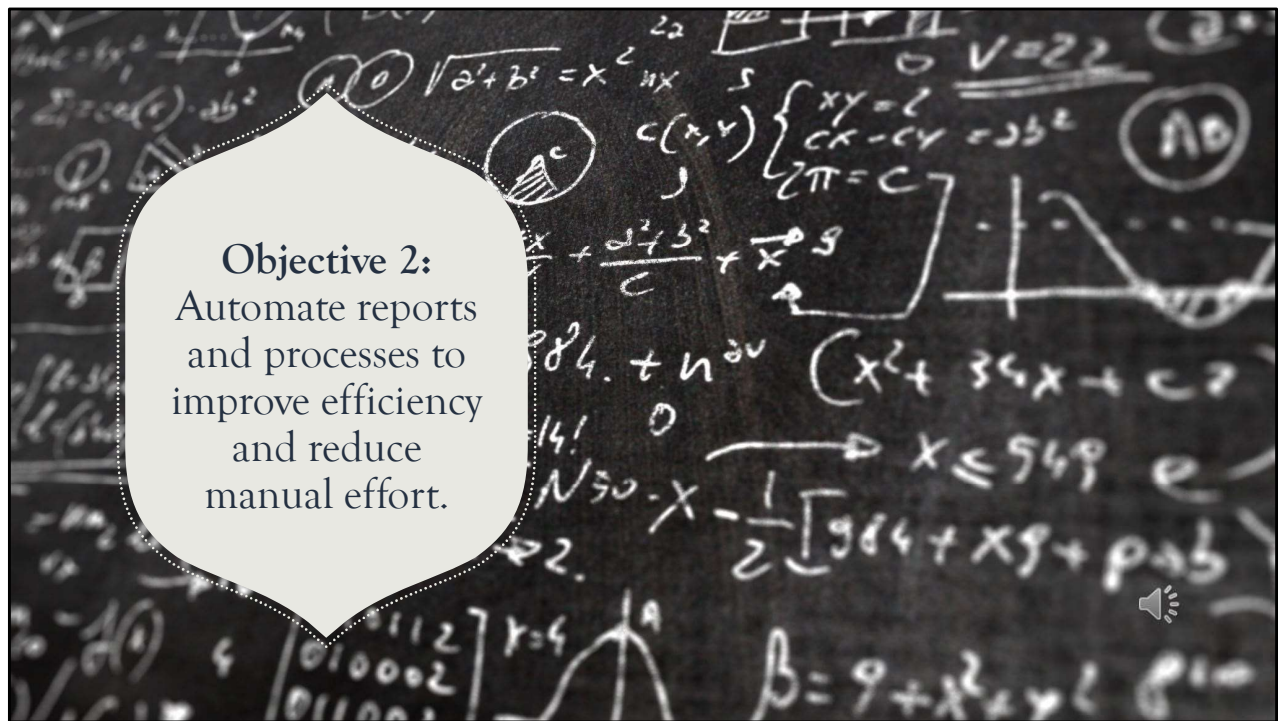
- a) To enhance data security
- b) To streamline data and improve analysis efficiency
- c) To organize data by type
- d) To store data more securely



Check-In Question #2

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Objective 2:
Automate reports
and processes to
improve efficiency
and reduce
manual effort.

Objective 2: Automate reporting processes to enhance efficiency and accuracy.

In the next section, we will focus on how to **automate reports and processes** to significantly improve your efficiency and reduce manual effort. As crime analysts, we're often tasked with repetitive reporting tasks, such as summarizing crime data, generating monthly reports, or tracking trends. By automating these processes, we can streamline our workflow, reduce the risk of human error, and free up more time for in-depth analysis.

We'll explore the tools and techniques in Microsoft Access that allow us to create automated reports, set up recurring queries, and schedule tasks to run at specific times. This will enable us to deliver timely and accurate reports without having to manually run queries or compile data each time. Automation is not just about saving time—it's about creating a more efficient, reliable process that ensures consistency across all your reports and analyses.

By the end of this section, you'll have the skills to build automated workflows that support ongoing analysis, reporting, and data management, allowing you to focus more on critical thinking and strategic insights.

REPORTS (automated)

Reports offer you an effective way to present data in a structured format similar to a bulletin, with layouts, text formatting, images, and charts. Data that is displayed in a report comes from an underlying table or query.



In Part 2, we took an introductory look at **Reports**—how they help us organize and display our data. Now, we’re going to take that a step further by exploring how reports can be used as tools to **automate information sharing**.

As crime analysts, we frequently need to present our findings to stakeholders, whether that’s management, detectives, or the public. Reports allow us to organize and present data clearly and professionally, often with text formatting, images, and charts. The data displayed in these reports comes from an underlying table or query, and the power of reports lies in their ability to be both **automated and customized**.

In **Design View**, we can lay out how the report will look—what data will be included, how it will be formatted, and how it will flow. Then, in **Report View**, we can see and print the results. By automating these reports, we can generate them at regular intervals without needing to manually run queries and reformat data each time. This streamlines our workflow, reduces errors, and ensures that the most current data is always available.

In crime analysis, this is incredibly helpful for sharing consistent, up-to-date

crime trends, weekly or monthly summaries, or even real-time updates on specific investigations. Automation ensures these reports are ready when needed and saves you valuable time, allowing you to focus on deeper analysis rather than repetitive tasks.

For more on Reports, see:

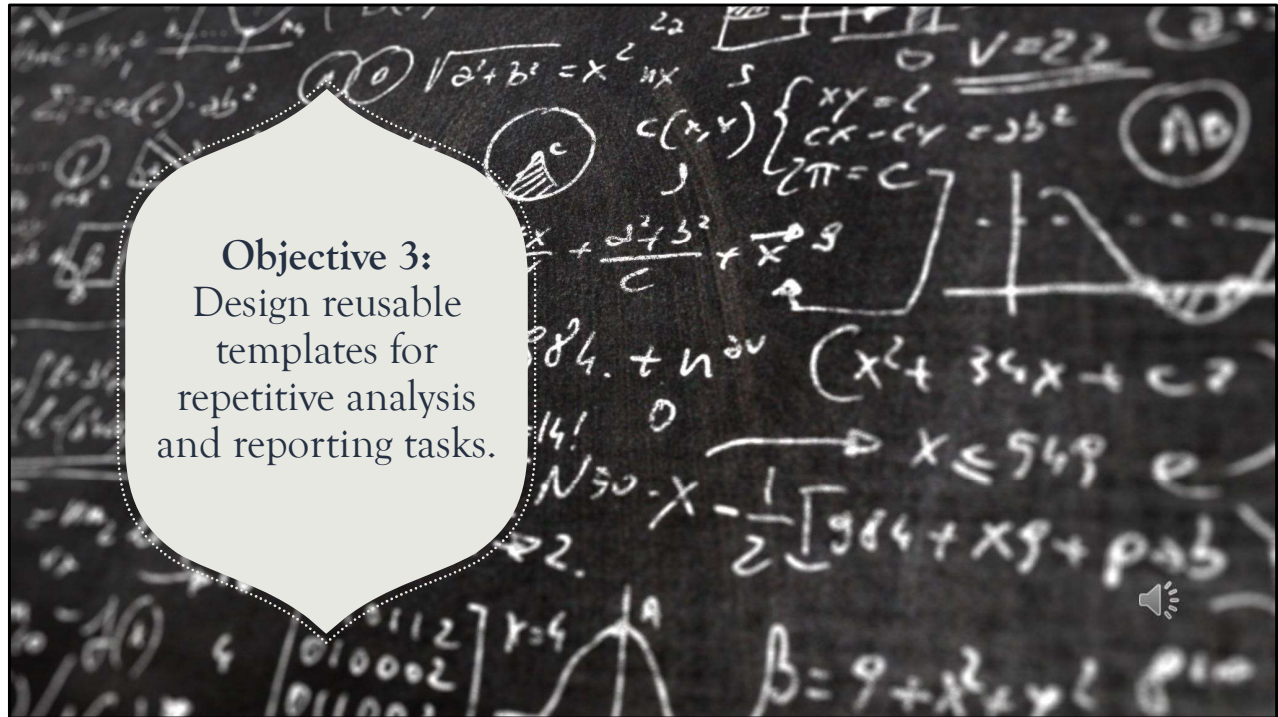
1. “Microsoft Access 2016 Tutorial: Creating and Modifying Reports. 2017.” Accessed February 2023. https://www.youtube.com/watch?v=ve_opOuLNil
2. “Microsoft Office Online Support - Reports.” Accessed 2020. <https://support.office.com/en-us/article/Introduction-to-reports-in-Access-E0869F59-7536-4D19-8E05-7158DCD3681C>

REPORTS (automated)

| Robbery Report | | | | |
|----------------|---------------|---------|------------------------------|---|
| Date | IncNum | Offense | Address/Location | Story |
| 2/19/2025 | 2003-02192593 | ROBBERY | 108 HAYES ST BANK | 33-year-old white male, bald, 5'6", 200 lbs., entered Fleet Bank. He sauntered up to the counter and flashed a smile at the young female clerk behind it. She gave him a demure grin in return. The suspect clasped his hands. "I'm terribly sorry to bother you," he said. "But I fear I must ask you to relinquish the contents of your cash drawer. Otherwise, I shall be impelled to commit acts of horrific violence." The clerk nodded sagely, then began unbuttoning... (see full report for further details.) |
| 4/10/2025 | 2003-04105080 | ROBBERY | 262 NW EASTMAN PKWY BANK | 18-year-old white male entered the Bank of America wearing a heavy coat. He went up to a clerk and made a motion in his coat as if he had a gun, then said, "All the money!" An off-duty police officer tackled him and he was arrested. Suspect had no gun. |
| 6/24/2025 | 2005-06241706 | ROBBERY | 110 E PIONEER AVE BANK | Black male in his 20s wearing a jean jacket and baseball cap entered the bank, shoved a handgun, and demanded cash. Manager gave him \$5000 from a deposit bag and suspect fled in a beat-up Dodge Durango. |
| 8/1/2025 | 2005-08014481 | ROBBERY | 320 INTERURBAN AVE S BANK | White male in his 40s gave a clerk a handwritten note that said "I have a bomb. Give me all the money." Clerk screamed and ducked down behind the counter and suspect fled on foot. |
| 8/4/2025 | 2005-09077103 | ROBBERY | 108 HAYES ST BANK | White male, 30-40, with a hooded sweatshirt, shaking and nervous, gave clerk a note. "I have a bomb. Give me all your money." Clerk passed \$2500 and suspect fled out the door. May have driven away in older-model Toyota. |

Here's an example of an automated report. This analyst drafts a short story in the table, which we will be doing in just a bit. The analyst runs a query into this report, which spits out a pretty picture of the activity at hand. This could be very helpful for a detective who is conducting an investigation and has a suspect in the interrogation room. Information on hand will assist in questioning. This can also be helpful during a meeting with staff regarding a series. Folks could easily access and understand the details of the series at hand. A quick review of the available data may present opportunities for additional data collection and/or analysis.

The analyst can use his or her queries and reports to begin to organize the data for further analysis. Because the analyst spends little time performing administrative tasks, the automated reports do that work for him, the analyst can dive into the data and produce quality analyses. For instance, if this were a CompStat report, the analyst could change the dates and simply run the report again.



Objective 3: Design reusable templates to streamline repetitive tasks.

Set Up Automated Reports

CrashReport

Cool Town Police Department Crash Report

| DISPO | CALLDATE | IncNum |
|---------|------------|----------|
| | 3/20/2020 | 20125257 |
| | 9/2/2020 | 20404159 |
| | 9/27/2020 | 20447028 |
| | 10/18/2020 | 20480756 |
| | 10/22/2020 | 20488365 |
| | 11/18/2020 | 20531119 |
| ADVISED | | |
| | 3/5/2020 | 20101556 |
| ARREST | | |
| | 1/22/2020 | 20033232 |

GO TO YOUR VIDEO LIBRARY: "CREATE 3 REPORTS"

Next, we are going to set up **three automated reports** that will help you streamline your analysis and reporting processes:

- 1. Medical Report
- 2. Directed Patrol Report
- 3. OUI/Drunkenness Report

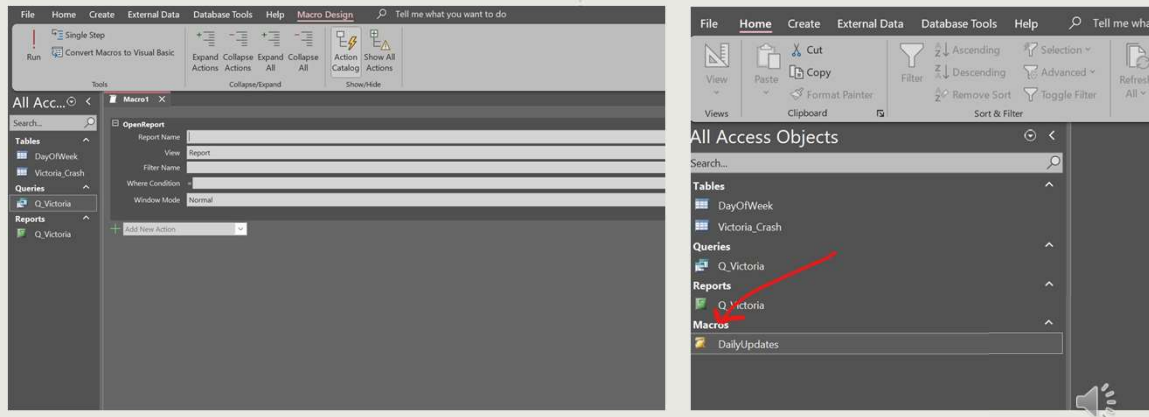
These reports are common in crime analysis, and setting them up to be automated will maximize your time and minimize effort. By creating templates for these reports, you’ll be able to **reuse** them regularly with minimal modifications. For example, once the structure and design of each report are established, you can simply switch out a few parameters—like the date range, specific locations, or officers involved—and generate a fresh report without having to recreate the layout and data every time.

This approach is incredibly efficient for crime analysts. It saves you the effort of manually compiling the same information repeatedly and ensures consistency across reports. For instance, whether you're generating a weekly medical report, a monthly directed patrol update, or an OUI-related incident summary, you'll

have a ready-made template that can be easily customized and repurposed for each new task.

In the video here, we'll walk through setting up these automated reports step-by-step so you can implement this approach in your own work and streamline your reporting workflow.

Benefits of Automation in Access



GO TO YOUR VIDEO LIBRARY: "CREATING MACROS"

When it comes to **crime analysis**, automating processes through **macros** in Microsoft Access can be incredibly beneficial, especially for tasks that you perform on a daily or weekly basis. For example, instead of manually generating routine reports, updating datasets, or performing repetitive calculations, you can create macros to handle these tasks automatically. This means less time spent on routine data entry and report generation, allowing you to focus more on the **analysis** itself.

A key benefit of using macros is **consistency**. By automating tasks, you eliminate the risk of human error, ensuring that your data remains accurate and reliable. This is particularly important in crime analysis, where accurate data is essential for making informed decisions. For instance, reports used to guide patrols, investigations, or resource allocation need to be precise and consistent every time.

Moreover, macros enable you to **streamline your workflow**, making your efforts more efficient and effective. Whether it's automating the extraction of data, generating weekly crime trend reports, or updating case logs, the use of macros minimizes manual intervention and improves productivity. With less time spent

on routine tasks, you can dedicate more time to **deep analysis**—identifying crime patterns, making predictions, and providing actionable insights that will help law enforcement respond more effectively to community needs.

Check-In Question #3

What is one key benefit of automating reports in crime analysis?

- a) It ensures that reports are always accurate
- b) It reduces the need for deep analysis
- c) It eliminates the need for data validation
- d) It minimizes manual effort and ensures timely delivery of reports




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Recap of Key Takeaways

-  Create advanced expressions in Microsoft Access® for more precise analysis.
-  Automated reports and processes to improve efficiency and reduce manual effort.
-  Created reusable templates for repetitive analysis and reporting tasks.

The tools and techniques we’ve covered today aren’t just time-savers—they’re **game-changers** for how you approach crime analysis.

Let’s take a moment to reflect on why these are so essential:

- Advanced Expressions for Precise Analysis:** Every decision in crime analysis is rooted in data. Having **accurate expressions** means you're making decisions based on the most precise information. These expressions allow you to dive deeper into your data, spot patterns, and uncover insights that could otherwise go unnoticed. This is especially critical when you're working with complex crime trends or shifting patterns in your jurisdiction.
- Automation to Improve Efficiency: Repetitive tasks** are not only time-consuming—they can also lead to burnout and mistakes. By automating **reports** and **calculations**, you’re freeing up your time to focus on higher-level analysis. Less time spent on manual work means **fewer errors**, and a more **consistent output**, ultimately improving the overall effectiveness of your agency’s operations.
- Reusable Templates for Consistency:** Crime data is dynamic and always changing, but consistency remains key. **Templates** that you can

reuse ensure you're applying the same rigorous standards across all your reports and analyses. This boosts both **efficiency** and **reliability**, which is essential when presenting data that supports critical law enforcement decisions.

In summary, mastering these tools isn't just about speeding up your workflow—it's about working **smarter**. These strategies will help you deliver **more accurate, timely** insights that directly influence crime-fighting strategies. By using these techniques, you'll elevate the quality of your analysis, empower your department's decision-making, and stay ahead in an ever-evolving landscape.

Next Steps: Z-Scores, Statistical Significance in Excel, and Integrating Excel with Access



In Part 5: **Z-Scores, Statistical Significance in Excel, and Integrating Excel with Access**, we will dive into statistical techniques that will take your crime analysis to the next level. Specifically, we'll focus on Z-scores and how to apply statistical significance techniques in Excel to enhance your ability to analyze crime patterns and trends. This session will provide you with practical tools to identify outliers and assess the relevance of crime data, giving you a deeper understanding of the patterns you're working with.

By mastering these techniques, you will not only improve your ability to make data-driven decisions, but you'll also be equipped to integrate Excel with Access, streamlining your workflows and ensuring that your analyses are both efficient and accurate.

As a crime analyst, the skills gained in this final session will be vital to your success, allowing you to confidently apply advanced statistical methods, automate processes, and integrate multiple data sources—key in the ever-evolving landscape of law enforcement. This will be an invaluable session, so don't miss out on the chance to sharpen your skills and elevate your crime analysis expertise.

IADLEST is proud to support law enforcement agencies with a variety of resources designed to promote the implementation of data-driven operational policing. In addition to this training series, IADLEST offers in-person and virtual workshops, literature, webinars, and other valuable resources aimed at enhancing the effectiveness of law enforcement through data-driven strategies. We encourage you to explore these opportunities to continue your professional development and further strengthen your agency's ability to make informed, impactful decisions based on reliable data. Thank you for your participation in this session, and we look forward to seeing you in **Part 5**.

