



# CASE STUDIES

## HIGHLIGHTS

**Goal:** The Charlotte-Mecklenburg Police Department wanted to more effectively use data analytics to reduce crime, make more efficient use of police resources, and reduce costs.

**Solution:** Information Builders LEA Predictive Analytics Solution

**Results:** Police officers have more real-time information they can act upon, and supervisors can more effectively assign officers to areas with a higher likelihood of criminal activity. Crime has been reduced, and police resources are used more effectively. The police department will see a projected, cumulative three-year net benefit of \$7,772,486, with a return on investment of 529% and a payback period of five months.

## CUSTOMER PROFILE

### Charlotte-Mecklenburg Police Department

www.cmpd.org  
Charlotte-Mecklenburg Police Department serves Charlotte and the unincorporated areas of Mecklenburg County in North Carolina.

**Headquarters:** Charlotte, North Carolina

**Industry:** Law enforcement

## Charlotte-Mecklenburg Police Department Reduces Crime, Improves Efficiency, and Gains \$7.8 Million in Net Benefits with WebFOCUS Law Enforcement Analytics

Information Builders' LEA solution has had significant financial benefits not only for CMPD, but for the entire region of Charlotte and Mecklenburg County. Crime has high personal costs, as well as direct financial costs, for a community. In 2009, a RAND Corporation study found that the economic impacts of crime go well beyond law enforcement costs, such as expenses associated with police, jails, and courts. The true cost of crime, the report concluded, includes lost property, treatment for injuries, and wide-ranging crime avoidance costs, such as lost revenue, private security expenses, and the economic impact of reduced usability in certain areas.

The study found that the societal cost of a robbery is \$100,000, and that of a larceny from an automobile is \$7,000. If you use the cost per crime calculated in RAND Corporation's study, and apply it to the reduction in crime in Charlotte and Mecklenburg County attributable to WebFOCUS (83 fewer robberies and 412 fewer larcenies from automobiles), you can see that the solution has had significant financial benefits for the entire region—an estimated reduction of \$11,157,250 in costs from 2010 to 2011 due to fewer robberies and larcenies from automobiles.

### Benefits

Objective	Benefits Achieved
Reduce crime	Supervisors can target areas with a higher likelihood of crimes being committed, and officers have real-time information in patrol cars, leading to a reduction in crime.
Reduce costs	As a result of increased productivity and efficiency gains, CMPD will gain a projected, cumulative three-year net benefit of \$7,772,486.
Improve productivity and efficiency	Police officers can spend more time on patrol and less time in front of computers gathering data, and analysts can spend more time on value-added analytical work and less time on manual data gathering.



## Crime Mapping and Analysis:

### Reducing Crime, Increasing Productivity, and Reducing Costs

#### The Organization

The Charlotte-Mecklenburg Police Department (CMPD) serves the more than 700,000 citizens of Charlotte and the unincorporated areas of Mecklenburg County, North Carolina. The department employs 1716 police officers, as well as a civilian staff of 530.

#### The Strategy

Since joining the Charlotte-Mecklenburg Police Department, Chief Rodney Monroe has refocused the department on crime fighting and crime prevention through a more accountable organizational structure, new technology, and an enhanced strategy of community policing. To purchase the needed technology solutions, Chief Monroe sought funding through an Urban Area Security Initiative Homeland Security Grant.

One of the technologies the department deployed is Information Builders' Law Enforcement Analytics (LEA) solution. LEA provides an innovative predictive policing and business intelligence system for law enforcement. With its innovative predictive policing capabilities, LEA would better facilitate crime mapping and analysis for patrol officers. Since these professionals spend a great deal of their time on the street, they would reap the benefits of having up-to-date and comprehensive information as they patrol their assigned areas. Using the information culled from operational systems, patrol officers would be able to instantly spot trends in their areas, gain a better understanding of activity that has occurred during previous shifts, and develop a more global, macro view of significant developments that occur in outstanding cases. Before deployment of Information Builders' LEA solution, staff had to manually search out crime statistics data from numerous sources in an attempt to optimally assign patrol officers.

#### Overall Plan

- **Analyze information from disparate data sources more effectively.** The department had been collecting data for many years, but stored it in a variety of sources. Employees had to sift through data using a number of tools in order to analyze crime statistics, identify trends, and determine the best allocation of police resources. CMPD was looking for a solution that would integrate all the data, so it could be easily queried and analyzed.
- **Use data analytics to assign officers to areas with a higher likelihood of crime.** Supervisors and other staff wanted to be able to identify areas and times that had the greater likelihood of crimes being committed. The presence of officers could then deter crime, and if any crimes were committed, the perpetrators would be more likely to be caught.



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- **Provide officers with real-time information in the field in order to better fight crime.** If officers have the most timely, up-to-date information about crime and criminals, they would be more likely to find and arrest perpetrators. CMPD wanted to give officers better tools for more efficient crime-fighting.
- **Reduce costs.** CMPD continually looks for ways to make the most efficient use of its funding and resources. It wanted a solution that could not only provide better data analytics and help reduce crime, but also improve productivity and reduce expenses.

### Key Benefits

Information Builders' LEA solution includes a predictive analytics tool called WebFOCUS RStat that has empowered the Charlotte-Mecklenburg Police Department to perform in-depth analysis of historical crime data, and use it to make predictions about future criminal activity. Through more precise crime forecasting, CMPD can take a proactive and effective approach to keeping its community safe.

- 1) **Increased insight into crime patterns.** The department can now uncover patterns in criminal activity, and monitor those trends as they change. As a result, the department can better determine the likelihood of certain crimes, who is most likely to commit them, and when and where they have the highest probability of occurring.
- 2) **Enhanced information dissemination.** With LEA, CMPD can better communicate and share information across the organization.
- 3) **Improved efficiency.** With LEA, officers have vital crime-related information right at their fingertips. This eliminates the need for them to waste time collecting and compiling reports and statistics, so they can focus their efforts on proactively preventing crimes before they occur.

### Crime Mapping and Analysis in Action

With the Information Builders solution in place, command staff, crime analysts, and patrol officers have access to actionable, real-time information. Data is presented to users via predictive policing dashboards, which allow them to visualize which areas have the highest probability of crimes occurring during a four-hour window. Armed with that insight, the department can more intelligently allocate its resources, assigning officers to those locations where criminal activity is most likely to take place. LEA has helped reduce crime in a variety of ways. In one instance, an officer was assigned to an area where burglaries had a high probability of happening between 11 AM and 3 PM on weekdays. During his patrol, he received a call about a possible burglary in progress at a vacant house. Because he was already in the area, he was able to stop the crime and apprehend five suspects.



“The Information Builders LEA solution dashboards and predictive analytics software help us more accurately assign officers to areas that have the greater likelihood of criminal activity, and help us reduce our costs as well.”

Rodney Monroe, Chief of Police  
Charlotte-Mecklenburg Police Department

CMPD Chief of Police Monroe says that this is typical of the way in which LEA helps target crime. He explains, “The Information Builders system helps us focus our efforts. We can be very strategic and surgical when it comes to when and where we place our resources.”

Crystal Cody, CMPD systems analysis and programming manager, adds that LEA “not only helps the department to reduce crime, but also ensures that police officers’ time is used most effectively. The ability to target areas where crimes might occur allows us to deploy officers proactively, increase officer and citizen safety, and reduce the number of calls for service.”

Officers on patrol find the system particularly useful, especially the Priority Offender Report, which provides information about priority offenders on mobile units in patrol vehicles. Before the use of LEA, officers had to search multiple databases to get this information.

Chief Monroe says that the Information Builders system helps police officers prepare themselves at the beginning of their shifts, which helps them to better fight crime.

“Officers prepare themselves for duty in many ways—becoming aware of any crimes that have occurred in the previous shift, knowing whether to pay attention to certain businesses, or looking for stolen vehicles, for example,” he says. “The faster they can do that, the more productive they can be. With LEA, they don’t have to be sitting at a computer to get this information—they can gather it right from their patrol cars.”

As a result of this and other benefits, “Our response times have improved because officers have the information close at hand, and don’t have administrative down time.”

CMPD has also seen significant financial benefits from the solution, due to increased productivity and efficiency. Weekly statistics are now automatically created and sent to division commanders at the start of every week. Previously, a crime analyst had to manually prepare these reports using Excel spreadsheets and Access just before the weekly 9 AM meeting.

Summing up the benefits of LEA, Chief Monroe says it helps better protect citizens, and has helped CMPD to reduce costs.

“Information Builders LEA dashboards and predictive analytics software allow staff at every level of the police department to deal with facts in real time,” he says. “We are better equipped to optimally assign officers to response areas with the highest likelihood of criminal activity, resulting in reduced crime and lower operating costs.”



- Charlotte-Mecklenburg Police Department’s bottom line for the project: a projected, cumulative three-year net benefit of \$7,772,486, driven by increased productivity and cost avoidance. The project will have an ROI of 529%, and a payback period of five months.

### Bottom Line Results

CMPD was able to achieve a significant return on its investment in Information Builders technologies due to productivity improvements and savings—a projected, cumulative three-year net benefit of \$7,772,486 with a return on investment of 529% and a payback period of five months. (For more details, see the sections Project Costs and Calculating the Return on Investment.)

The following chart provides a detailed, three-year analysis.

Project Summary					
ROI	529%				
Payback Period (in months)	5				
Cumulative Net Value	\$7,772,486				
Average Annual Benefit	\$3,080,987				
Average Annual Total Cost of Ownership	\$490,158				
Net Present Value	\$6,314,463				

Project Costs	Start Up	Year 1	Year 2	Year 3	Total
Investment	\$75,000				\$75,000
Maintenance		\$1,230,628	\$82,423	\$82,423	\$1,395,474
<b>TOTAL PROJECT COSTS</b>	<b>\$75,000</b>	<b>\$1,230,628</b>	<b>\$82,423</b>	<b>\$82,423</b>	<b>\$1,470,474</b>

Benefits	Start Up	Year 1	Year 2	Year 3	Total
Total Officer Productivity Savings		\$2,669,423	\$2,802,894	\$2,943,039	\$8,415,356
Total Crime Analysis Savings		\$262,523	\$275,649	\$289,432	\$827,604
<b>TOTAL BENEFITS</b>		<b>\$2,931,946</b>	<b>\$3,078,543</b>	<b>\$3,232,471</b>	<b>\$9,242,960</b>

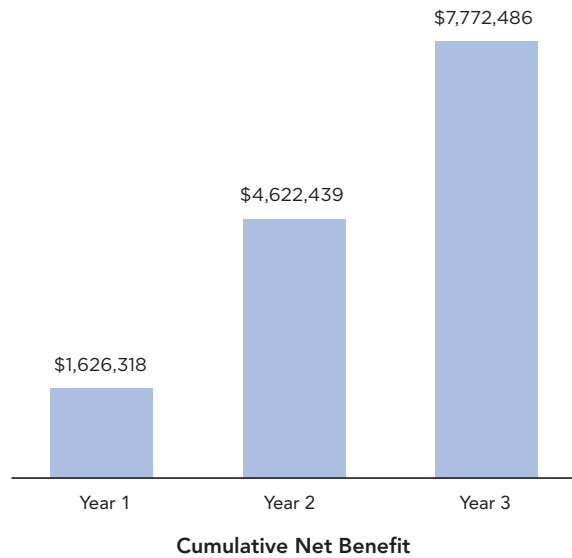
Financial Analysis	Start Up	Year 1	Year 2	Year 3	Total
Net Value	-\$75,000	\$1,701,318	\$2,996,120	\$3,150,048	\$7,772,486
Cumulative Net Value	-\$75,000	\$1,626,318	\$4,622,439	\$7,772,486	

### Project Costs

The project cost CMPD \$1,470,474 over three years—\$287,117 for software, \$861,088 for consulting services, \$247,269 for maintenance, and \$75,000 for the expenses that CMPD had to bear internally for the work required to switch to a new system.

### Calculating the Return on Investment

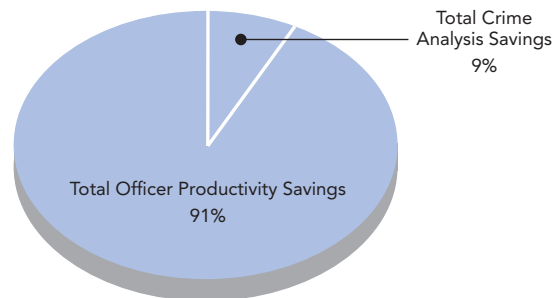
Police officer productivity has been improved considerably, leading to substantial financial benefits. With LEA, police officers, response area commanders, and patrol command staff spend less time gathering and analyzing data at the start of shifts, and during daily and weekly reviews. At the start of shifts, 1,300 police officers in the department save approximately 15 minutes per day each in gathering and analyzing data. Given an average salary of \$68,000, that results in a saving of \$2,071,875 in the first year, \$2,175,469 in the second year, and \$2,284,242 in the third year.



Thirty-nine response area commanders each save an hour per day during their daily reviews, because they no longer need to spend time manually gathering and analyzing data. Given an average salary of \$73,936, that results in savings of \$360,438 for the first year, \$378,460 for the second year, and \$397,383 for the third year.

Twenty patrol command staff members each save an hour per day during daily and weekly reviews, because the need to manually gather and analyze data has been eliminated. Given an average salary of \$94,844, that results in savings of \$237,110 during the first year, \$248,966 during the second year, and \$261,414 during the third year.

All these savings, when totaled, result in a three-year cumulative cost savings of \$8,415,356.



**3-Year Net Benefit = \$7,772,486**

CMPD will also see substantial savings because crime analysts no longer need to perform a variety of manual tasks. This frees them up to focus on higher-value activities. Eleven crime analysts each save 90 minutes per day through automated report and data processing with the Information Builders' solution.



Given an average salary of \$59,890, that results in savings of \$123,523 for the first year, \$129,699 for the second year, and \$136,184 for the third year.

In addition, because of productivity improvements, CMPD will avoid having to hire two additional crime analysts, for a savings of \$139,000 in the first year, \$145,950 in the second year, and \$153,248 in the third year.

These savings, when totaled, result in an additional three-year cost saving of \$827,604.

In all, CMPD will see \$9,242,960 in savings. When the project costs of \$1,470,474 are subtracted from that, the CMPD will gain \$7,772,486 in benefits over a three-year period.

### Defining the Numbers

**Return on Investment (ROI)** is the percentage return expected over a period of time. In this instance, we are measuring ROI over a three-year period. ROI is the total benefit divided by the total costs. CMPD achieved a three-year ROI of 529%.

**Payback Period** is the time it took for the CMPD project to yield a positive cumulative cash flow. Expressed simply, it is the time it takes for the financial benefits to exceed the cost of the project. In this instance, the Payback Period was five months.

**Cumulative Net Value** shows the total benefits achieved by the project—the total benefit minus the project costs. For this project, the Cumulative Net Value is \$7,772,486.

**Net Present Value** is an easy way to determine if a project has generated a profit, and if so, how much. It shows the ongoing benefit of a project in terms of today's money. It is calculated by taking the cumulative present value of the expected return of a project over a specified period of time minus the initial costs of the project. The Net Present Value for this project is \$6,314,463.

**Average Annual Benefit** is the annual benefit divided by the number of years, regardless of costs. In this instance, it is \$3,080,987.

**Average annual Total Cost of Ownership** is the total costs divided by the number of years in the project. For this project, it is \$490,158.



#### **About Charlotte-Mecklenburg Police Department**

The Charlotte-Mecklenburg Police Department is the primary police department of the City of Charlotte and Mecklenburg County, in the state of North Carolina. The department employs over 1,716 officers and 530 civilian staff, and covers an area of 438 square miles with a population of more than 713,455.

#### **About Information Builders**

Information Builders' award-winning combination of business intelligence and enterprise integration software has been providing innovative solutions to more than 12,000 customers for the past 35 years. WebFOCUS is the world's most widely utilized business intelligence platform. It provides the security, scalability, and flexibility needed at every level of global extended enterprises. Its simplicity helps create executive, analytical, and operational applications that reach dozens to millions of users.

Information Builders' iWay Software suite provides state-of-the-art, multi-purpose, pre-built integration components that address all SOA, application, data and information management requirements. Its integration adapters have been adopted by the leading software platform providers. Information Builders also offers solutions in the performance management, business activity monitoring, and enterprise search markets. The company's comprehensive enterprise product offerings give Information Builders' customers the ability to grow and innovate according to their needs.

Information Builders' customers include most of the Fortune 100 and U.S. federal government agencies. Headquartered in New York City with 90 offices worldwide, the company employs 1,450 people and has more than 350 business partners.

#### **About Case Study Forum**

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