

CMPD's Predictive Crime Analytics Implementation

Harold Medlock Deputy Chief Charlotte-Mecklenburg Police Department



CHARLOTTE-MECKLENBURG POLICE DEPARTMENT Agency Background Information

- Estimated Population: 777,827
- Land Area: 438 square miles
- 1725 Sworn Officers
- 500 Non-sworn personnel



CHARLOTTE-MECKLENBURG POLICE DEPARTMENT Primary Project Goals

- Provide customized role-based delivery of crime data and predictive analytics to Officers and Command Staff
- Support resource deployment through the use of real-time information
- Achieve better visualization of crime patterns and trends



CHARLOTTE-MECKLENBURG POLICE DEPARTMENT Project Timeline

- June 2009 RFP issued
- November 2009 Contract awarded to IBI for Law Enforcement Analytics (LEA) Solution
- January 2010 Project began
- May 2010 Operational Data Store (ODS) live
- September 2010 Operational Dashboards live
- October 2010 Predictive Dashboard live



- Operational Data Store (ODS) Consolidates over a dozen major data sources to support real-time information delivery
- Command Level Reports Fourteen report packages automated and electronically distributed to Captains & Commanders to support Monday morning briefings and weekly CompStat sessions
- Electronic Monitoring Reports Crime scene correlation reports delivered daily to Detectives



1111.4

Operational Data Store





Command Level Report

% CHANGE AND RANK															
PART ONE CRIMES		QUARTER-TO-DATE									YEAR-TO-DATE				
Curr Qtr: 10/1/2010 - 10/17/2010 Prev Qtr: 10/1/2009 - 10/17/2009					Beat		Division	Patrol North/ Patrol		Beat		Division	Patrol North/ Patrol		
Curr Yr: 1/1/2010 - 10/17/2010				Beat	Rank	Division	Rank	South	Beat	Rank	Division	Rank	South		
Prev Yr: 1/1/2009 - 10/1//2009		Division	Beat	% Change	(1 to 39)	% Change	(1 to 13)	Rank	% Change	(1 to 39)	% Change	(1 to 13)	Rank		
= Top 5 beats and Top 1 division with highest decrea	ises		061 1	-21.8%	5				-2.6%	35					
= Top 5 beats and Top 1 division with highest increa	ses	Eastway	0612	15.2%	26	-16.4%	3	3	-6.9%	32	-10.8%	9	4		
			0613	-35.0%	1				-22.2%	6					
	Northeast		071 1	-20.6%	7	-19.9%			-7.3%	31			í I		
	Service	North Tryon	0/12	-20.0%	8		2	2	-11.8%	23	-10.6%	10	5		
	Area		0/13	-18.8%	9				-13.2%	19					
		Liniuoraity City	1411	-3.2%	27	8.7%	9	5	21.7%	3/	3.7%	13	6		
		University City	1413	12.9%	24				19.3%	39	-0.270				
		North	1111	-9.4%	15	4.2%	6	4	-13.4%	18		6	3		
			1112	28.6%	31				-17.8%	10	-14.0%				
			1113	1.7%	21				-10.7%	26					
	Northwest		021 1	-15.2%	11	-20.5% 11.5%	1	1	-10.8%	25		2			
	Service	Metro Freedom	0212	-18.2%	10				-13.0%	21	-17.2%		1		
	Area		0213	-25.0%	2				-24.4%	1					
			271 1	31.4%	33			6	-13.5%	16	-15.0%	5	2		
			2712	-10.5%	14		10		-22.7%	5					
			2/13	23.4%	30	39.6% 1	13		-7.3%	30	+	12	7		
		Hickory Grove	1211	2.6%	10			7	-21.5%	36	8.2%				
		Thickory Grove	1212	-2.0 % QD 5%	38		15	'	3.9%	34	-0.276				
			1711	48.5%	36	5.9%	8	4	-23.4%	3	-16.7%	3	2		
	Southeast Service	Independence	1712	-21.1%	6				-11.1%	24					
			1713	10.7%	23				-16.6%	13					
	Area		161 1	-9.3%	16				-16.8%	11					
		Providence	161 2	6.3%	22	0.7%	5	2	-13.4%	17	-10.5%	11	6		
			161 3	14.3%	25				1.1%	38					
			221 1	118.8%	39				-12.9%	22					
		South	2212	-24.5%	3	4.4%	7	3	-23.6%	2	-17.3%	1	1		
			2213	-11.5%	13				-13.1%	20					
		Control	0112	21.1%	20	12.0%	44	5	-10.4%	9	15 39/	4	2		
		Central	0112	22.2%	20	12.0%	11	5	-14.3%	27	-15.2%	4	3		
	Southwest	t Westover 261 261 261 261 211 Steele Creek 211	2611	29.5%	32				-5.3%	33			 		
	Service		e Westover 2612 2613	Westover 26	2612	-23.7%	4	-4.3%	4	1	-14.5%	14	-13.7%	7	4
	Area			261 3	-13.5%	12		-		-22.9%	4				
			2111	-7.7%	17		12	6	-16.7%	12	1	8	5		
			211 2	39.5%	35	18.7%			-8.1%	29	-11.3%				
			2113	38.3%	34				-9.3%	28					



Electronic Monitoring Reports

Electronic Monit 20101018 to 20101019	oring P	otential Hits									EM H	lits by Beat for Area Commar	Response Iders
BEAT: 0213												/	
COMPLAINT#:	2010101	8-1620-04											
INCIDENT TYPE:	Auto The	eft		DATE TIME F	FROM: 10/	18/2010 162	0	BEAT: 02	13				
ADDRESS:	2601 W	ILKINSON BV		DATE TIME 1	FO: 10/	18/2010 162	0				K		
INVESTIGATOR:				CLEARANCE	STATUS: Op	en							
		DATE HIT	0.00	MINIMUM	MAXIMUM		CLOSEST	CLOSES	ST FUR	THEST			
Maxwell, Jasmine	32	10 CALCULATED	CMPD	1 10/18/2010 1	1623 10/18/2010 1	: 623 10	0/18/2010 1623	DISTAN 198	CE DIST	ANCE 198	-		
COMPLAINT#:	2010101	9-1817-00											
INCIDENT TYPE:	Resident	ial Burglary		DATE TIME F	FROM: 10/	19/2010 163	0	BEAT: 02	13				
ADDRESS.	1301 E			DATE TIME	10 10	19/2010 181	/						
	7	INCIDENT	TYPE	: Auto The	ft								
	/	COMPLAINT#	:	20101018-094	1-03								
/		INCIDENT TYP	PE:	Auto Theft			DAT	TE TIME FROM	Λ:	10/17/201	0 2300	BEAT: 1113	
		ADDRESS:		3101 FINCHE	R BV		DAT	TE TIME TO:		10/18/201	0 0700		
			R:	Cherry Jr. J.M.	(000768)		CLE	EARANCE STA	TUS:	Open			
					DATE HIT			MINIMUM	ΜΑΧΙ	мим	CLOSEST	CLOSEST	FURTHEST
EIVI HILS DY		OFFENDER NAM	E	PID	CALCULATED	ORG	PINGS	DATE TIME	DATE	TIME	DATE TIME	DISTANCE	DISTANCE
Crime Type fo	or	Smith, Alphonso		228816	10/20/2010	CMPD	229	10/17/2010 2240	10/18/2	010 0719	10/18/2010 0231	19	495
Detectives													
		COMPLAINT#	:	20101018-162	0-04								
		INCIDENT TYP	PE:	Auto Theft			DAT	TE TIME FROM	Л:	10/18/201	0 1620	BEAT: 0213	
		ADDRESS:		2601 WILKIN	SON BV		DAT	TE TIME TO:		10/18/201	0 1620		
		INVESTIGATO	R:				CLE	EARANCE STA	TUS:	Open			
					DATE HIT			MINIMUM	MAXI	мим	CLOSEST	CLOSEST	FURTHEST
		OFFENDER NAM	E	PID	CALCULATED	ORG	PINGS	DATE TIME	DATE	TIME	DATE TIME	DISTANCE	DISTANCE
		Maxwell, Jasmin	e	320906	10/20/2010	CMPD	1 1	10/18/2010 1623	10/18/2	010 1623	10/18/2010 1623	198	198



CHARLOTTE-MECKLENBURG POLICE DEPARTMENT Operational Dashboards

- Virtual Roll Call Dashboard Allows Patrol Officers to share information through BLOGS and APB's
- Subjects of Interest Dashboard Highlights priority offenders and warrants for Patrol Officers
- Current Crime Events Dashboard Allows Officers to monitor calls for service and crime activity in real-time
- CompStat Dashboard Allows Supervisors to monitor Beat Goals and visualize Officer Initiated Activities in relation to Part 1 crimes



Welcome, Crystal Cody

CHARLOTTE-MECKLENBURG POLICE DEPARTMENT

Virtual Roll Call

Teeter on Central. the car was later found a few blocks away.

In reference to the armed robbery from

CMPD PREDICTIVE CRIME ANALYTICS

PERSON

ARMED ROBBERY

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20101015-1950-00

Whetzel, Ryan

CMPD Portal										
Virtual Roll Call Subjects of Interest Current Crime Events Crime Analysis CMPD Live										
Filter Division Independence Division -		🔲 Set Defaul	lt Filter Refr	resh				Refresh E	Every 30 - Minutes]
New BLOG Entry		List of Stole	n Vehicles for 10/16 t	o 10/18		A				
Independence Division News Briefs		Make	Model	<u>Color</u>	Year	Tag/State	e	Beat	Complaint #	
>=10/18		CHEVROLET	CAPRICE CLASSIC	BLUE	1990	U22350 / SC		1211	20101018-1126-06	^
Subject		DODGE	INTREPID	SILVER	2004	YWR2968 / 1	NC		20101018-1126-05	
(!) RA1 - ZONE CHECK 6300 E. INDEPENDENCE	*	SUZUKI	DR200SET	BLACK	2009	3Y7951 / NC		1113	<u>20101018-1014-01</u>	Ξ
		KAWASAKI	BRUTE FORCE	GREEN, DARK	2006				20101018-0941-03	
RAZ - ZONE CHECK 7000 HOMMINGBIRD LANE		YAMAHA	WARRIOR 350	BLUE, DARK					20101018-0941-03	
PA2 ZONE CHECK PEE LEA'S		MITSUBISHI	ECLIPSE	WHITE	2001	ZVE7287 / N	С	2713	20101018-0814-06	
RA2 - ZONE CHECK REF. EFA3	-	HONDA	CIVIC	WHITE	1996	TREVP / VA		1713	20101018-0636-01	
RAL - ZONE CHECK 7316 WALLACE ROAD		FORD	F250	BLUE	2004	ZXD8571/N	С	0211	20101017-1801-02	
RA1 - ZONE CHECK 5040 CORONADO DR		FORD	EXPLORER	WHITE	2002	YTH2853 / N	С	2112	20101017-1518-01	-
RA3 - LFA LOCATIONS		All Points B	ulletin Independ	lence Division	New	APB				
RA2 - LFA LOCATIONS	1	Туре	Offense	Complaint No	C	ontact			Detail	
RA1 - LFA LOCATIONS		(!) PERSON		20100812-1157-02	2 Whitwo	rth, James	MUR	DER OCCURF	RED IN THE METRO	-
RA3 - ZONE CHECK 7330 BRIARDALE DRIVE	1						DIVI	SION AT 1215	EFFINGHAM ROAD ON	Ξ
RA2 - ZONE CHECK 512 WRYE FOREST COURT							08/1 OUT	STANDING O	ER WARRANTS N SUSPECT:THOMAS	
RA1 - B&E BOLO ASHLEY PLACE APARTMENTS							LEE 5'6"	DAVISB/M 200 LBSTR	DOB 3/10/1969 ANSIENTCont	
		(!) PERSON	ARMED ROBBERY	20100912-2033-02	Sloop, I	lichael	Arm	ed Robbery /	Kidnapping Subject hid	1

CMPD

Velcome, Crystal Cody

CHARLOTTE-MECKLENBURG POLICE DEPARTMENT

Virtual Roll Call - APB Detail

CMPD PREDICTIVE CRIME ANALYTICS

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A REAL PROPERTY AND

Subjects of Interest





Current Crime Events





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Calls for Service Activity

Call for Service Activity LARCENY FROM VEHICLE

Current Time -4 Hours

20100928-1005-05

LA-VEHC

LARCEN

	Type	<u>Type</u>	Sub-Type			D :
<u>Complaint #</u>	Code	Description	Code	Location	Beat	Disposition
20100928-0529-01	LA-VEHC	LARCENY FROM VEHICLE	REPORT	3201 FORESTBROOK DR 1	2711	00/CASE
20100928-0555-00	LA-VEHC	LARCENY FROM VEHICLE	JST-OCC	6035 NATIONS FORD RD 102	2612	00/CASE
20100928-0748-00	LA-VEHC	LARCENY FROM VEHICLE	REPORT	3308 TULIP TREE LN	2111	00/CASE
20100928-0757-00	LA-VEHC	LARCENY FROM VEHICLE	REPORT	7833 CALIBRE CROSSING DR	1712	00/CASE
20100928-0910-02	LA-VEHC	LARCENY FROM VEHICLE	REPORT	419 ORCHARD TRACE LN 8	0713	
20100928-0934-03	LA-VEHC	LARCEN	1	•	1	l l
20100928-0959-01	LA-VEHC	LARCEN				

	Event Details
Complaint No:	20100928-0529-01
Location:	3201 FORESTBROOK DR 1
Event Type:	LA-VEHC REPORT LARCENY FROM VEHICLE
Disposition:	OO/CASE

Entry Remarks

- 1 ALT# 828-855-5169 -080.91827 +35.23719 SEE REF SOMEONE BROKE INTO HER RED CHEVY COBALT SOMETIME OVER THE NIGHT...STOLE HER GPS
- 2 05:29:52
- 3 ALARM TIMER EXTENDED: 0



and the second

CompStat



Officer Initiated Activities





CHARLOTTE-MECKLENBURG POLICE DEPARTMENT Predictive Dashboard

Created predictive dashboard for the following major crime categories:

- Commercial Robbery
- Personal Robbery
- Aggravated Assault
- Residential Burglary
- Commercial Burglary
- Auto Theft
- Larceny from Auto



CHARLOTTE MECKLENBURG POLICE DEPARTMENT Predictive Dashboard (Continued)

Built predictive models based on a series of inputs:

- Historical geographic crime patterns
- Recent criminal activity (within past 24-48 hours)
- Day of week and time of day
- Weather conditions
- Recent call for service activity
- School holidays
- Special Events



CHARLOTTE-MECKLENBURG POLICE DEPARTMENT Example Auto Theft Model Factors



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Predictive Crime Analytics







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Predictive Crime Analytics





Results

- Real-time Hotspot location information is now at the fingertips of frontline officers and commanders
- Synchronizes jurisdiction-level resource deployment
- Increased arrests
- Increased communication and collaboration between frontline officers and analysis team
- Increased accountability across the board
- Liberates analysts to do other activities that drive down crime
- Single version of the TRUTH... Everyone is on the same page

CMPD

CHARLOTTE-MECKLENBURG POLICE DEPARTMENT Measure of Success

"When the system indicated a strong probability of burglaries within the Valleydale Corridor neighborhoods on weekdays between 11 am and 3 pm, I immediately assigned an officer to this area, with backup from the division's Burglary Suppression Unit and response area coordinators. Soon after, the officer received a call regarding a possible burglary at a vacant house in this targeted zone. The team moved in and quickly apprehended five subjects inside that residence."

-- Sergeant Lisa Carriker, RA2, Freedom Division, CMPD



Laureate & Finalist 2011 ComputerWorld Honors Award





CHARLOTTE-MECKLENBURG POLICE DEPARTMENT Next Steps

- Implement Additional Operational Dashboards to Better Allocate Officers based on Overtime/Offtime and Current Call Level Activity
- Implement Additional Predictive Models for Violent Crimes
- Implement "Top 10" Alerts that give Patrol Officers Real-Time Insight into Potential Threats on Current CFS
- Explore Real-Time Integration with Pawn Data, License Plate Readers & Video Surveillance System
- Explore Citizen-Facing Applications for Better Transparency



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Questions?

Comments?



Inførmation

Builders



