The Evolution of Early Intervention Systems (EIS)

Charlotte-Mecklenburg Police Department

- Estimated Population: 802,080

- Land Area: 438 square miles

- 1,900 Sworn personnel

- 500 Non-sworn personnel

- 13 Patrol Divisions with 3 Response Areas per Division

EIS- Importance to CMPD

- Provides assurance the Department is being proactive in detecting undesirable behaviors and addressing them

- Supervision alone is not enough- we need other tools

- Allows us to hold ourselves accountable and take necessary action to remediate issues

- Used as opportunity to provide training and other interventions to prevent adverse interactions with citizens

- Original threshold-based system developed at CMPD in 2005

- Component of Internal Affairs System

- Began looking at enhancements in summer, 2014 such as:

- Adding additional alert categories

- Using a longer time period for alerts- years vs. days

- April, 2015- Partnered with University of Chicago to develop prototype for new EIS system

Legacy EIS System

Issues with legacy EIS System

- High number of false alerts

- Low Officer confidence in results

- Thresholds do not cover varied situations and timeframes

- Officers can modify behavior to avoid detection

- The system is not easily modified for new thresholds as we identify other causal factors

- The system targets high risk personnel vs. low risk personnel

- Getting Started:

  - Legal Agreement

    - Data sharing requirements

    - Background Checks

  - Officer Buy-in

  - Political Buy-in

  - Site Visit

    - Meet with IT Staff, Officers, Internal Affairs, Leadership

    - Participate in Patrol Ride-Alongs
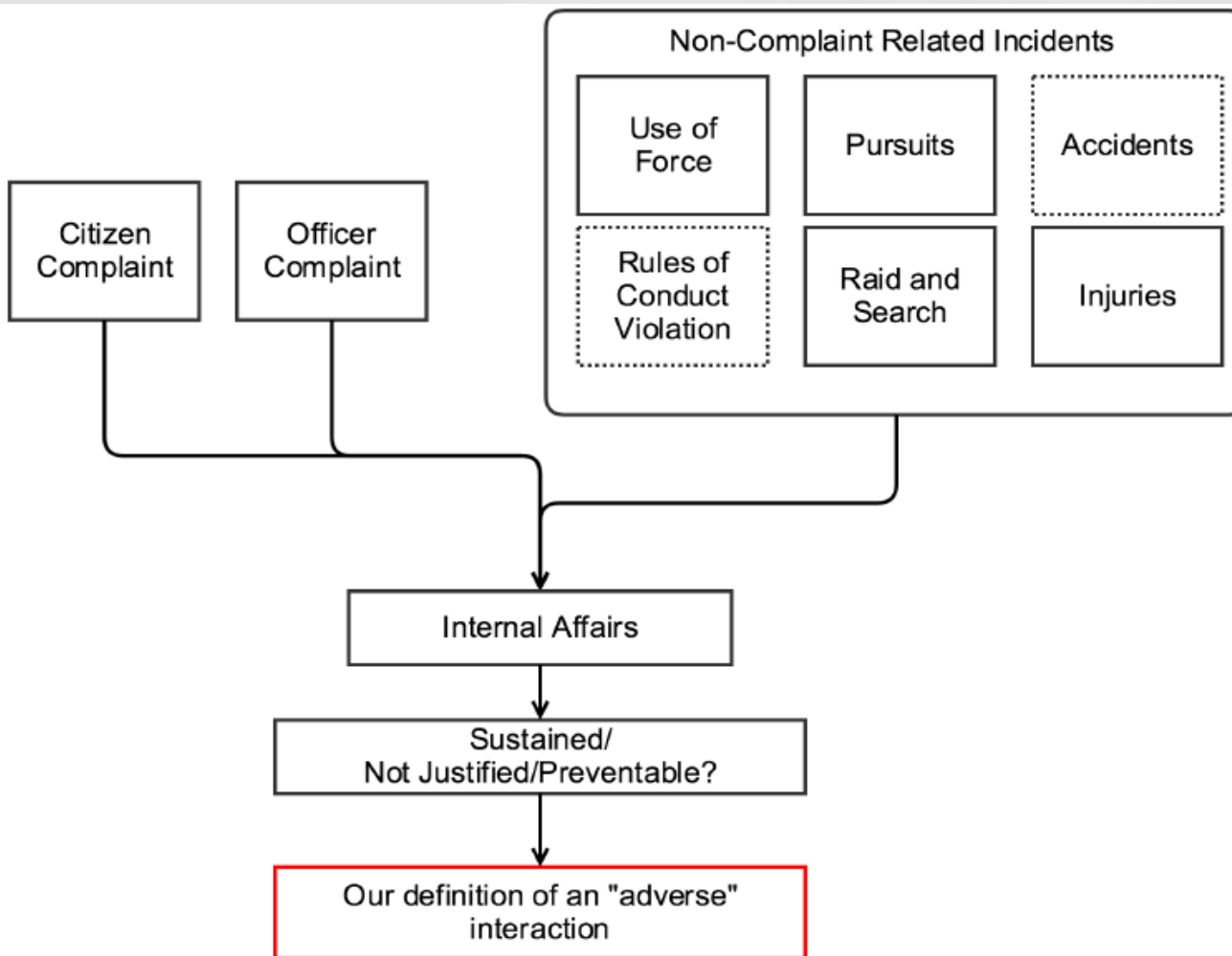
Machine Learning?

- Examples of Machine learning:

    - Netflix

    - Banking transactions

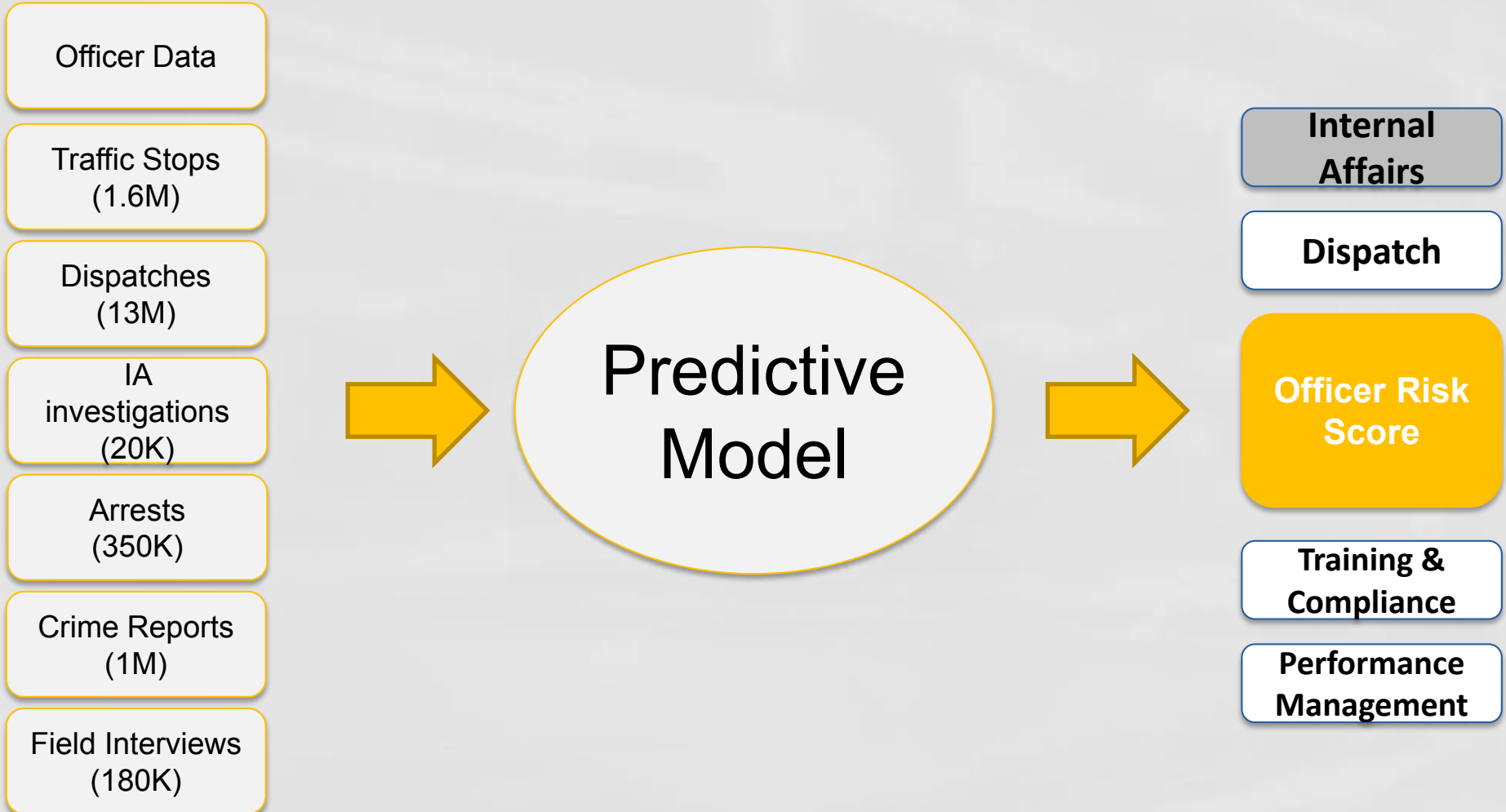   - Facebook news feed/ friend suggestions

- 5 Basic Steps

    - Collect the data

    - Prepare the data

    - Train a model

    - Evaluate the model

    - Improve the performance of the model
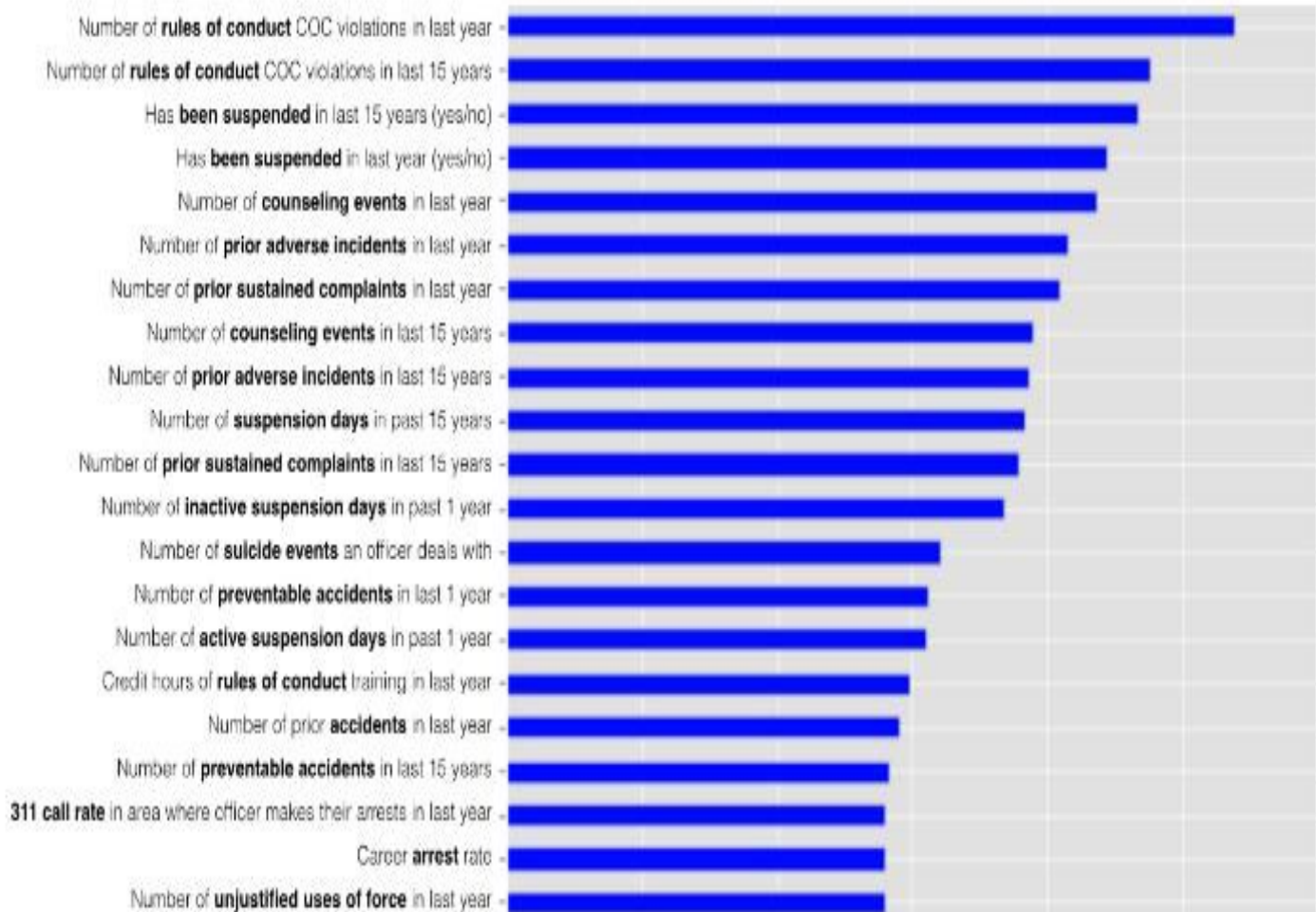
Definitions- Setting a baseline

Statistical Model Overview

CHARLOTTE-MECKLENBURG POLICE DEPARTMENT

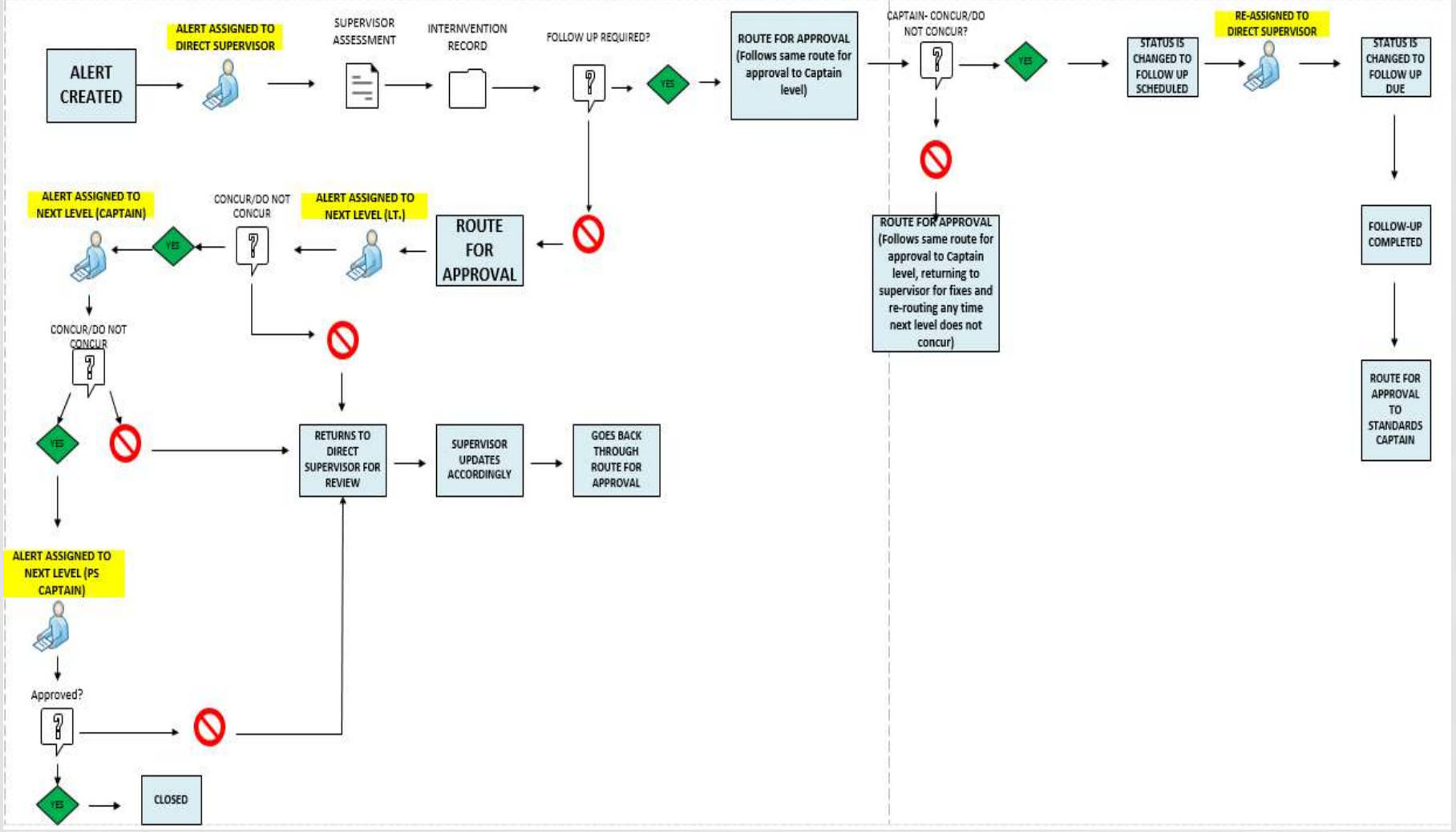|					
Officer 1	High number of prior adverse incidents in last 15 years	Officer was suspended in last 15 years	High number of counseling interventions after special investigations	IA noted concerns with communication	High number of special investigations correctives written in last 15 years	...
Officer 2	High number of arrests in last year	High number of rule of conduct violations in last 15 years	High number of prior adverse incidents in last 15 years	IA noted concerns with tactics	High number of sustained complaints in the last 15 years	...
Officer 3	High number of prior adverse incidents in last 1 year	High number of rule of conduct violations in last 15 years	Officer was suspended in last 15 years	Officer uses pepper spray often	High number of sustained complaints in the last 15 years	...
Officer 4	High number of accidents in last 1 year	IA noted concerns with communication	High number of accidents in last 15 years	Officer has dealt with high number of suicide incidents	High number of preventable accidents in last 1 year	...
Officer 5	Officer has dealt with high number of domestic violence incidents	High number of preventable accidents in last 1 year	Officer uses weapons often	Officer was suspended in last 15 years	High number of prior adverse incidents in last 15 years	...

Highest Impact Variables

- Contracted with DSaPP for paid engagement to transition model to production environment

- Installed database and Risk Rating Engine at CMPD

- Completed ETL processes to load Postgres tables

- Designed EIS Risk Review Dashboard and EIS System for processing alerts

- Developed and tested applications and data flows

- Trained Officers and Supervisors

- The system was placed into production use in November, 2017

- The team closely monitors performance and system usage to make modifications as needed to the model and system workflows.

- The predictive model is run daily and results are fed into the EIS Dashboard

- The Professional Standards Captain reviews the Top 5% highest risk ranks of CMPD officers in the dashboard

- Based on the Captain's review, the risk is either dismissed or an alert is created in the EIS system and assigned to the Officer's direct Supervisor

- The Supervisor completes an assessment and recommends the appropriate action/intervention to be performed.

- The completed alert is routed through the Officer's chain of command for approval of the action suggested by the direct Supervisor.

- The alert is routed to the Professional Standards Captain for final review and close out.

- All results are fed back into the model daily to allow for improvement over time.

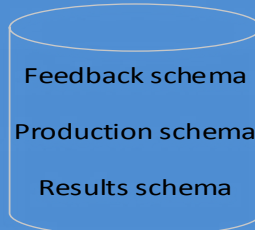# Early Intervention System Workflow

EIS System Dataflow

EIS Proper

Src_table_01

Src_table_02

iDM ETL

+ others ---->

Risk_rankings

Risk_factors

iDM ETL

Risk_up_down_trxns

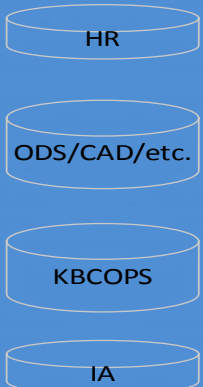New_alert_trxns

PostgreSQL

Feedback schema

Production schema

Results schema

Risk Rating Engine

U Chicago / DSSD

Risk scoring
algorithms in Python:
model_01
model_02
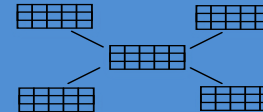model_03

EIS Application Dashboard

Commit transactions

Supervisor Initiated Alerts/Dashboard

Drill Down to Summary Report
(detailed context for a given Officer)

Other data sources

HR

ODS/CAD/etc.

KBCOPS

IA

iDM ETL

EIS_DM   Data Mart

SQL 2012
Database: EIS_DM
Schema: EIS_RR

EIS Dashboard

EIS Dashboard

Employee Summary Report

PDF Download

Employee Division/Rank
Employee Code Number
DOB
Race
Gender

Redacted

Military Status — No Military Service
Years of Service — 5
Current As Of — 08/16/2017

Redacted

Risk Factors and Score Officer Activities

Overall Risk Rank 1

Risk 1 - Total number of IA Reported incidents of type complaint over the past 5 years
Risk 2 - Total number of Complaints against officer by source of type internal over the past 5 years
Risk 3 - Total number of Dispatches Types of type disorder over the past month
Risk 4 - Average number of IA Reported incidents of type complaint over the past 5 years
Risk 5 - Average number of IA Sustained incidents of type complaint over the past 5 years

Comments

Reason for Dismissal

○ Create Alert   ○ Dismiss Risk Rank   Submit

Officer Activities for past 12 Months

Officer	Division	CAD				Citizen Contacts					KBCOPS	Arrests		
		On Duty Squad	On Duty Shift	Citizen Initiated	Officer Initiated	Traffic Stop	Citizen Contact	Field Interview	Knock and Talk	Raid and Search	Incident Report	Adult (Prim)	Adult (Sec)	Juvenile
Redacted		2nd Shift	816	356	159	32	35	3	4	56	24	34	1	

EIS System Screen Capture

CMPD · CMPD.ORG

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Early Intervention System
Charlotte-Mecklenburg Police Department

Welcome

EIS Home Page
Risk Review Dashboard

Search Employee EIS History:

Last Name: ___ First Name: ___ Code No: ___ | Search |

Create a Supervisor-Initiated alert: | Create |

The following employees assigned to you have alerts:

Action Required	Early Intervention Record	Name-Assignment	Alert Type Reason	Date Closed	Date Opened	#Days Open	Status	Assigned To	#Days Assigned	Action Taken
	EI-18-0001	Redacted	Risk Review		1/4/2018 4:23:34 PM	7	In Progress	Redacted	7	
🚩	EI-17-0025		Risk Review		12/7/2017 10:06:16 AM	35	Follow Up Scheduled		28	Counseling, EAP
	EI-17-0024		Risk Review		11/10/2017 12:51:42 PM	62	Follow Up Due		62	
	EI-17-0023		Risk Review		11/9/2017 3:01:59 PM	63	Pending Closure		0	No Intervention Required
🚩	EI-17-0021		Risk Review		11/9/2017 10:53:39 AM	63	Submitted for Approval		0	Counseling, Training, Other
	EI-17-0020		Risk Review		11/9/2017 10:35:49 AM	63	In Progress		0	Counseling

Questions? Comments?
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