Norman Police Department

Norman, Oklahoma

DDACTS Implementation

September 24, 2013

16th Annual OKSCAUG

Data Driven Approach to Crime and Traffic Safety

DDACTS is an operational model that uses the integration of location-based crime and traffic data to establish effective and efficient methods for deploying law enforcement and other resources.

DDACTS Model

- Utilize geo-mapping technology to identify high incident crime and crash areas
- Temporal & Spatial targeted enforcement
- Highly visible traffic enforcement strategies
- Start point for long-term change
- Decreasing social harm and improving quality of life

DDACTS Implementation

Seven Guiding Principles

- Partners and Stakeholder Participation
- Data Collection
- Data Analysis
- Strategic Operations
- Information Sharing and Outreach
- Monitoring, Evaluation and Adjustment
- Outcomes

DDACTS / Norman Goals

- **Our Mission**
  - To maintain and enhance the quality of life in the City of Norman by protecting life, liberty, property and keeping the peace.

- **DDACTS Goals**
  - Reduce crime and traffic incidents in the established DDACTS zones

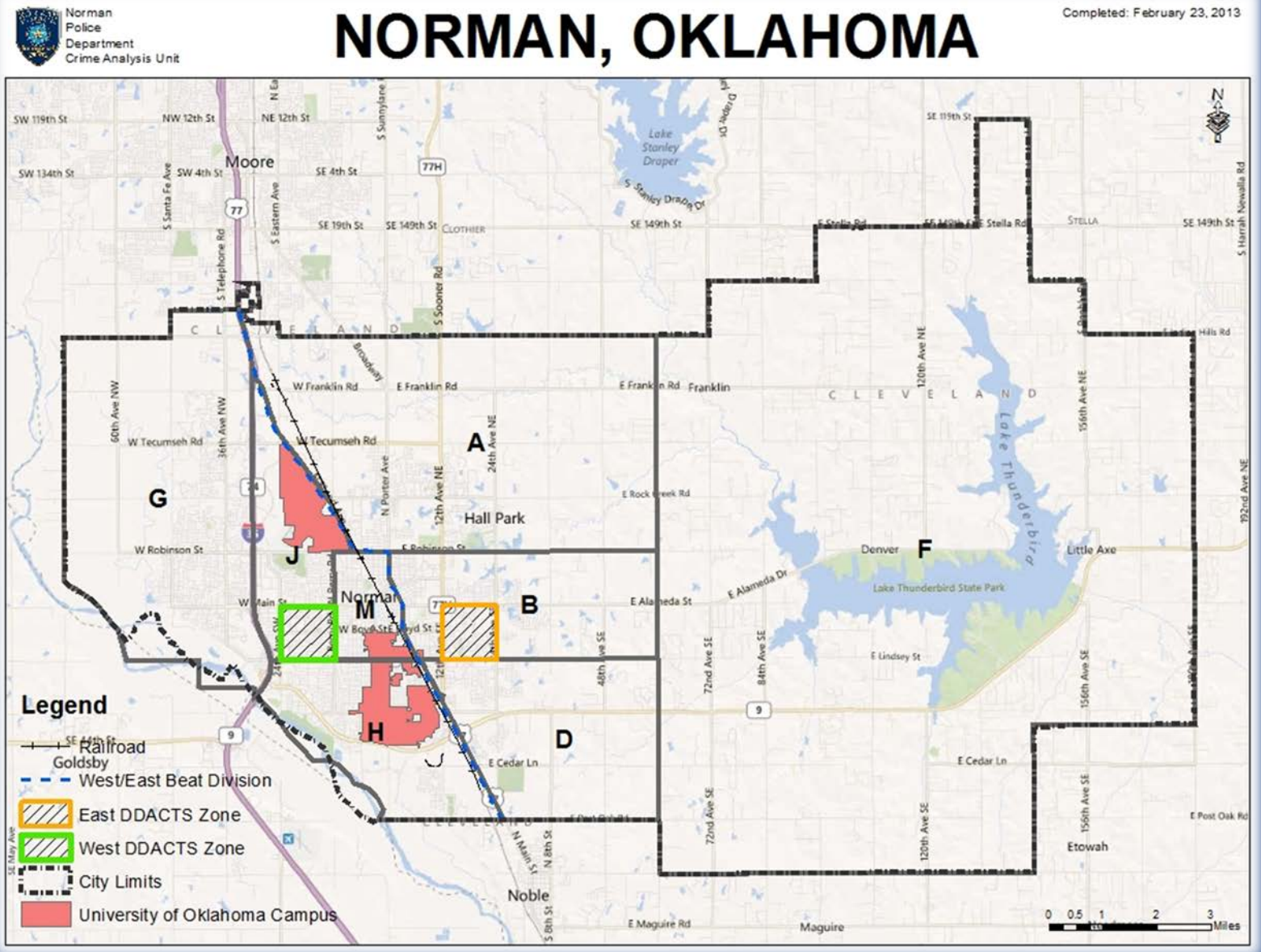
Norman Resources

- **Record Management System**
  - Global Records
- **Mapping Software**
  - ESRI ArcGIS 10.0 w/Spatial Analysis Extension
- **Other Software/Tools**
  - Python 2.6 / ArcGIS Model Builder
  - Microsoft Office 2010 (Excel, Access, etc)
  - GeoSafe Patrol Unit PC Software
  - Raids Online website
  - Analyst
    - 1 – Commissioned
    - 2 – Civilian (1 Grant Funded)

Dimension of Analysis

- **What**
  - Type of crash/crime
- **When**
  - Time of crash/crime
- **Where**
  - Location of crash/crime
- **How**
  - *Modus operandi* / Crash factors

Zones Selected



2012 Zone Stats

2012 Stats

CRIME	West	East	Zones Total	Outside Zone	Zones Percentage
Aggravated Assault	6	4	10	65	15.38%
Rape	2	5	7	62	11.29%
Robbery	6	5	11	54	20.37%
Burglary	37	74	111	682	16.28%
Larceny from Vehicle	60	63	123	926	13.28%
Motor Vehicle Theft	12	19	31	234	13.25%
ACCIDENTS (Excluded PP)	**West**	**East**	**Zones Total**	**Outside Zone**	**Zones Percentage**
All	244	184	428	2112	20.27%
Injury	49	56	105	600	17.50%
Non-Injury	195	128	323	1512	21.36%

Partners & Stakeholders

- Patrol Officers
- Criminal/Special Investigation Divisions
- Crime Free Multi Housing Officer
- Neighborhood Watch Officer
- Citizen Police Academy
- City Council Study Session
- District Attorney
- Norman Transcript local paper
- Raids Online
- Public Press Releases

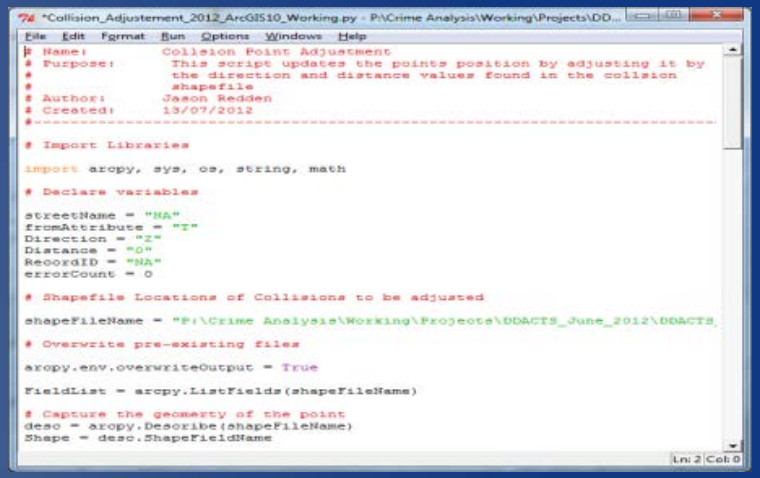
Data Collection

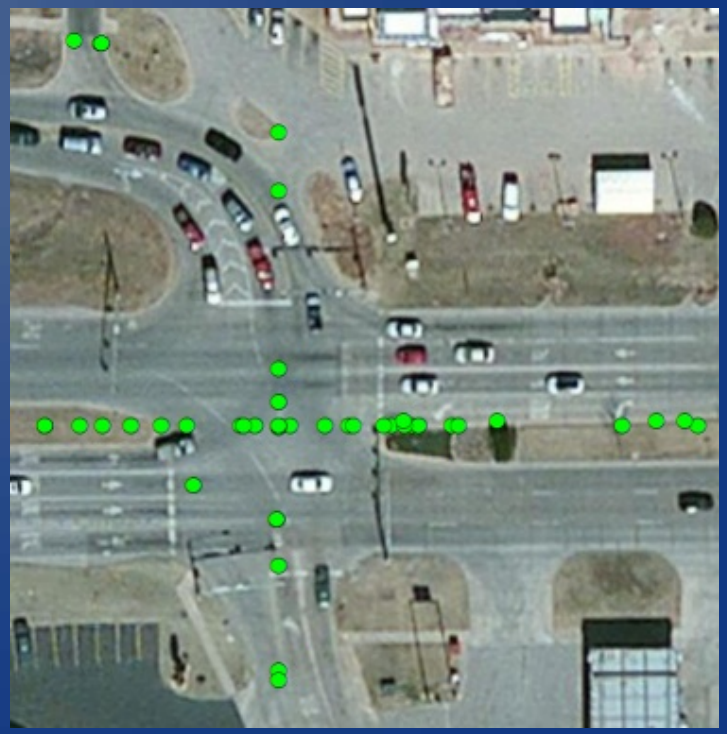
- 5 Year Base data extracted
  - Calculate mean, standard deviation and thresholds
- Traffic Data Obtained & Prepped for analysis
  - Python Traffic Adjustment tool
  - Contributing Factors Added
- Crime Data Obtained
  - Crimes filtered by UCR crime type
- Quality Controls
  - Weekly data review
  - 3 Month reviews

Python Traffic Adjustment

Accident Report Attributes

- From Intersection (A/F)
- Direction (W/E/S/N)
- Distance (FT)





Traffic Contributing Factors

Crash factors extracted from accident reports

Unsafe / Unlawful Contributing Factors

Unit 1	Unit 2
14	98

FAILED TO YIELD
01 From Stop Sign
02 From Yield Sign
03 Private Drive
04 County Road at Through Highway
05 From Signal Light
06 From Alley
07 To Pedestrian
08 To Vehicle on Right
09 To Vehicle in Intersection
10 To Emergency Vehicles
12 Other

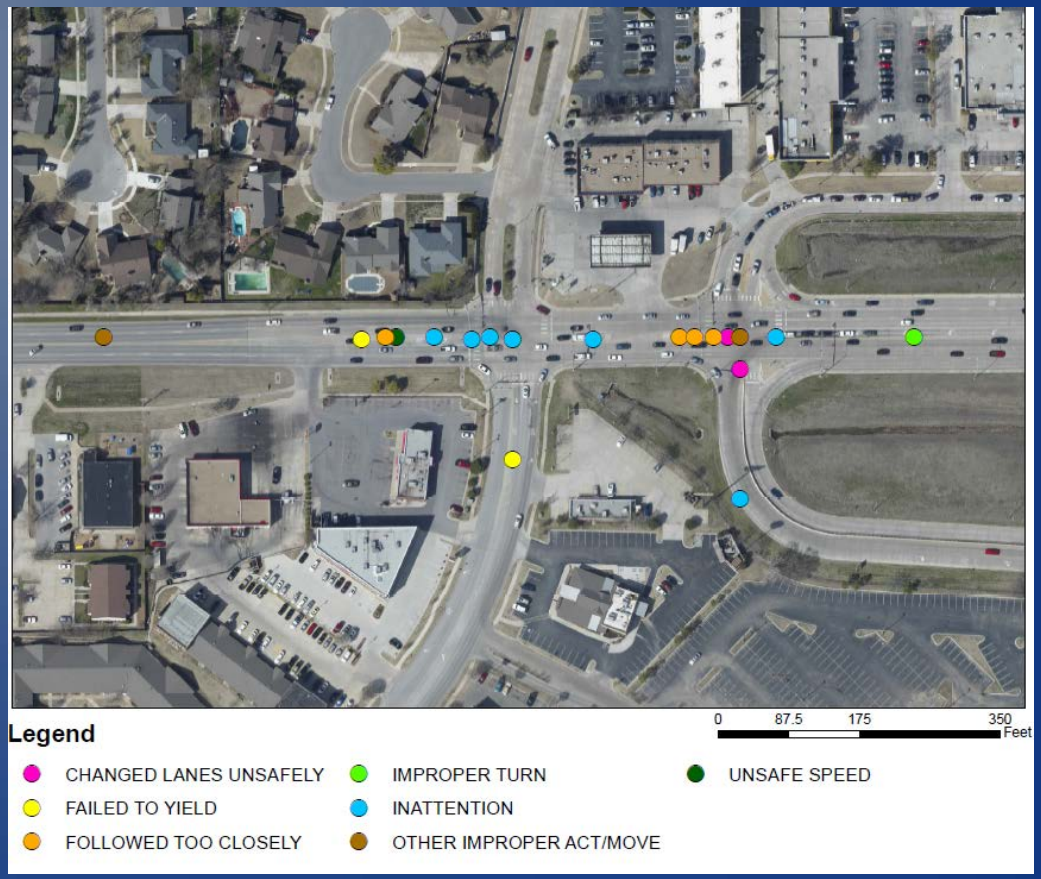
FOLLOWED TOO CLOSELY
13 Human Element
14 Traffic Condition
15 Weather Condition

UNSAFE SPEED
49 Tires
50 Suspension
51 Headlights
52 Tail Lights
53 Stop Lights
54 Wheel
55 Exhaust System
56 Windshield Wipers
57 Other Mechanical Defects

LEFT OF CENTER
58 In Meeting
59 No Passing Zone (Unmarked)
60 Marked Zone
61 Other

IMPROPER OVERTAKING
62 In Marked Zone
63 On Hill/Curve
64 At Intersection
65 Without Sufficient Clearance
66 Other

IMPROPER PARKING

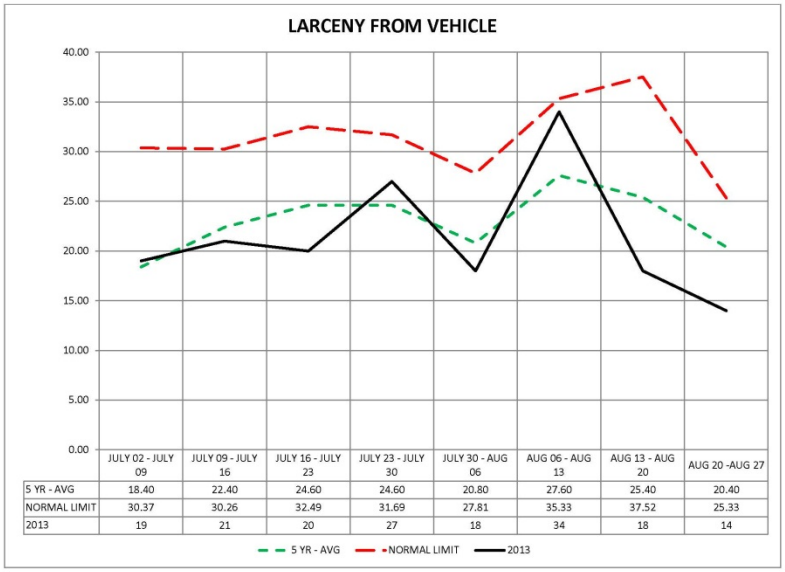


Data Analysis

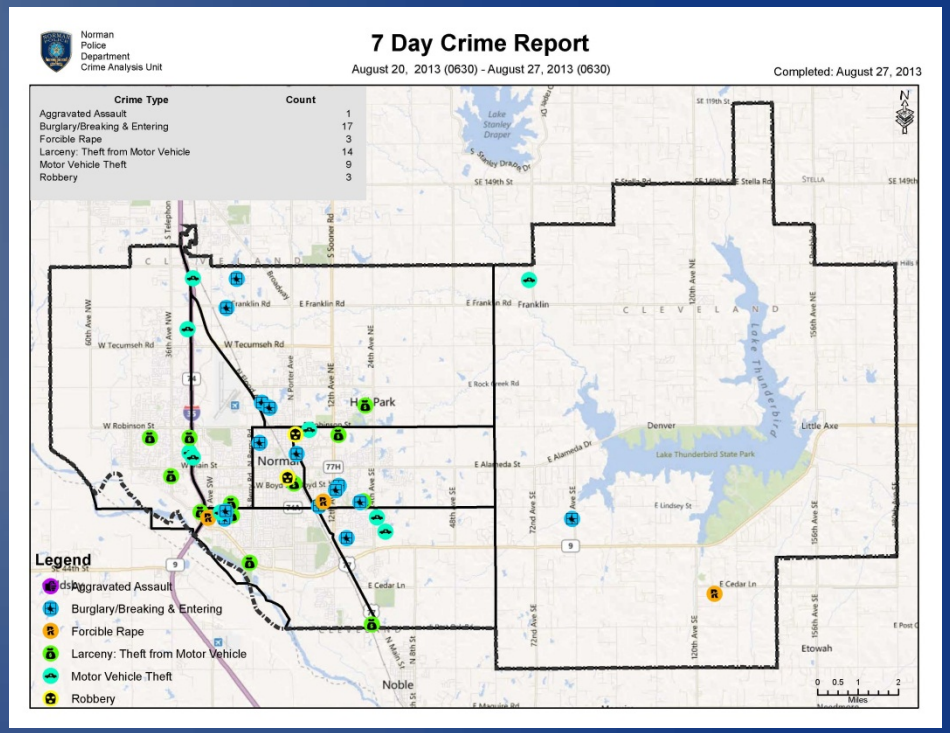
- **Reporting Procedures**
  - Weekly Crime Overviews
  - Monthly Crime Briefing
- **Automation**
  - Model Builder tools
- **Actionable Products**
  - Weekly Crime Reports
  - Monthly RECON Packets
  - Ad hoc crime trends/series/patterns

Weekly Crime Reports

- Quality Control Step
  - Crime Coding checked
- Threshold Monitoring
  - High/Low



	JULY 02 - JULY 09	JULY 09 - JULY 16	JULY 16 - JULY 23	JULY 23 - JULY 30	JULY 30 - AUG 06	AUG 06 - AUG 13	AUG 13 - AUG 20	AUG 20 -AUG 27
5 YR - AVG	18.40	22.40	24.60	24.60	20.80	27.60	25.40	20.40
NORMAL LIMIT	30.37	30.26	32.49	31.69	27.81	35.33	37.52	25.33
2013	19	21	20	27	18	34	18	14

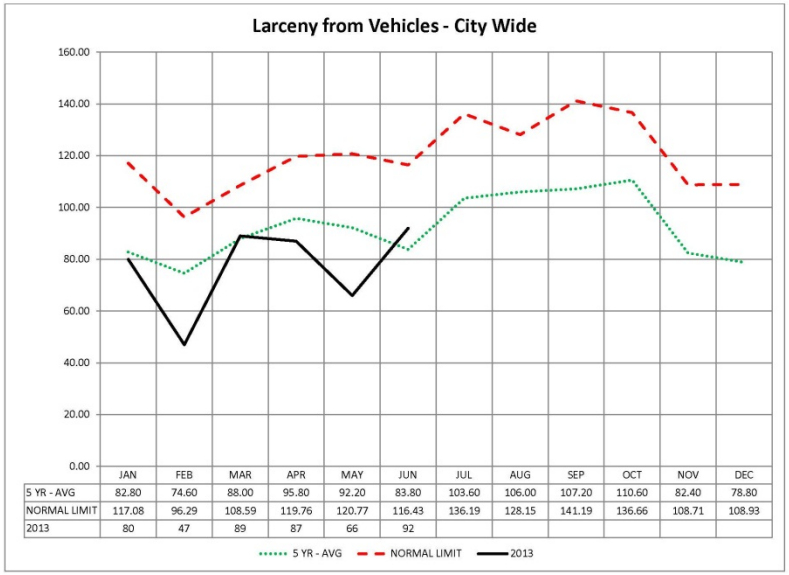


Situational Awareness

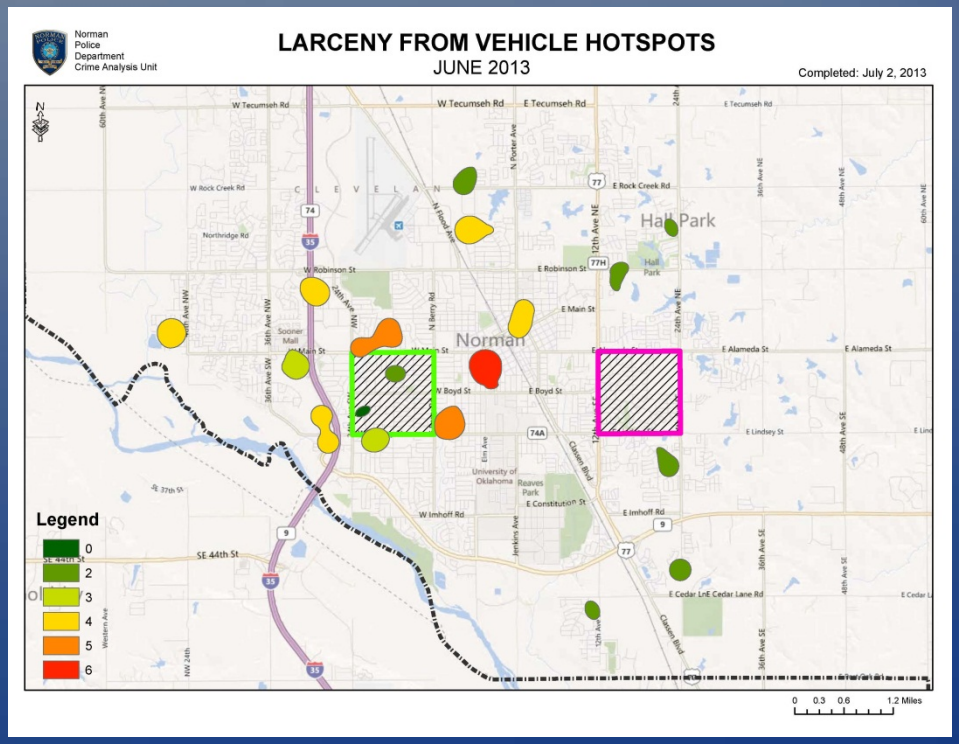
- Current patterns\hotspots
- Current expected trends

Monthly Staff Reports

- Monthly Hotspots
- Monthly Counts/Threshold
- Monthly 5 Year Patterns



	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
5 YR - AVG	82.80	74.60	88.00	95.80	92.20	83.80	103.60	106.00	107.20	110.60	82.40	78.80
NORMAL LIMIT	117.08	96.29	108.59	119.76	120.77	116.43	136.19	128.15	141.19	136.66	108.71	108.93
2013	80	47	89	87	66	92						

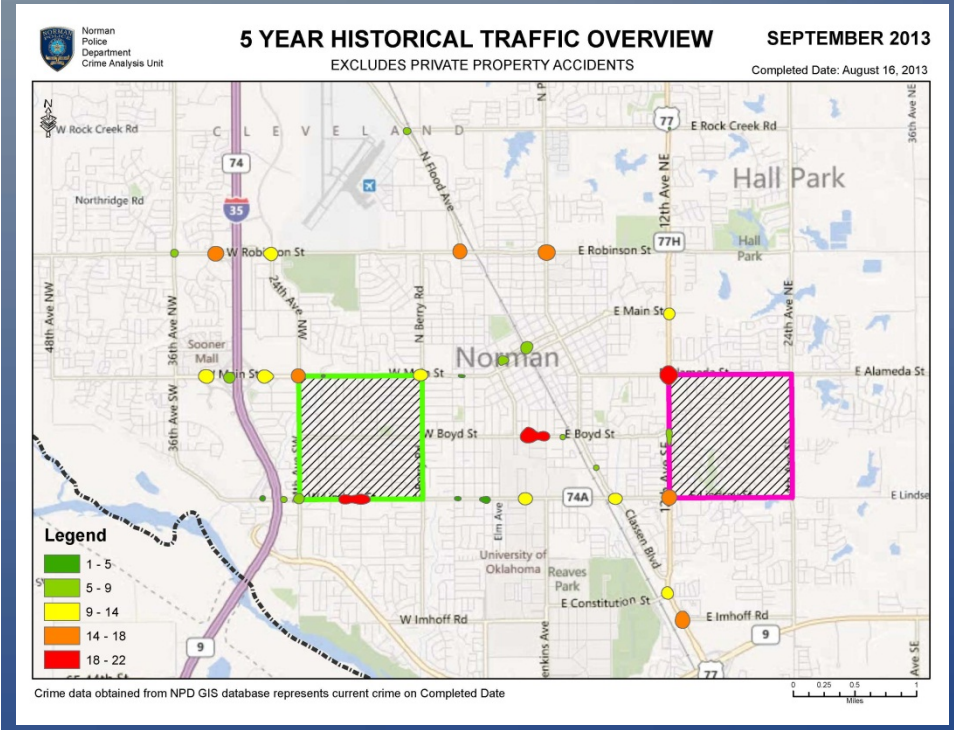


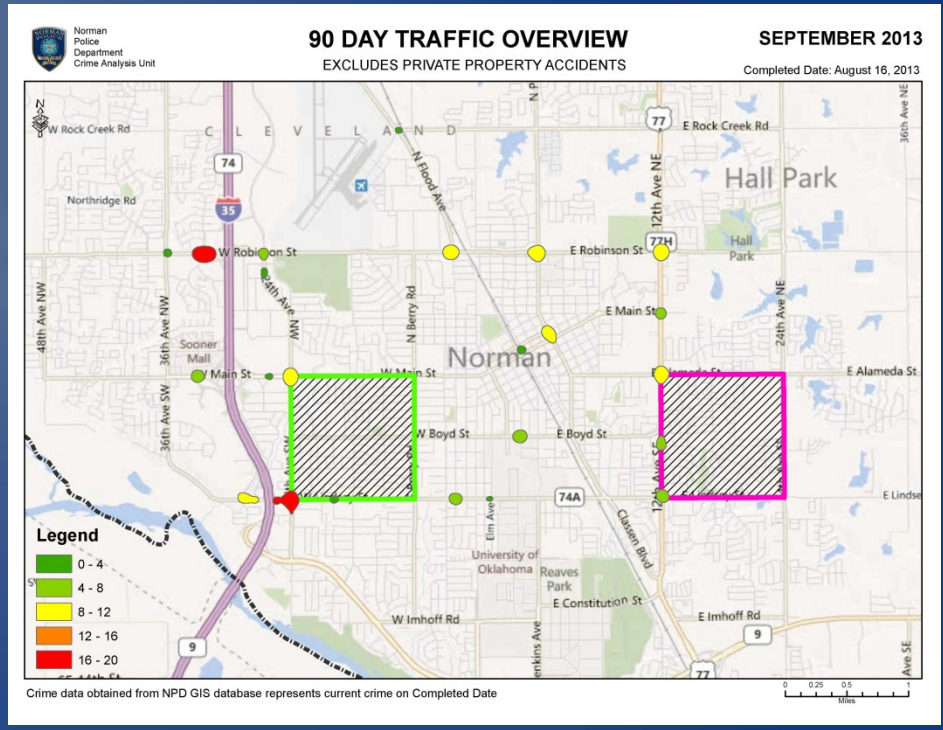
Situational Awareness

- Current patterns\hotspots
- Current expected trends

RECON PACKET

Overview of Next Month Crime and Accident locations based on 5 year historical data and 90 day data





RECON PACKET

90 day review of top traffic locations & Zone crimes

Norman Police Department Crime Analysis Unit

E Alameda St & 12th Ave SE

September DDACTS - 90 Day Traffic Overview

Completed: August 14, 2013

Legend

- FAILED TO YIELD
- INATTENTION
- OTHER IMPROPER ACT/MOVE
- FOLLOWED TOO CLOSELY
- NO CAUSE
- alcohol-DUI/DWI

Accident Event Stats

CONTRIBUTING FACTOR	COUNT	Factor %	DOW	COUNT	DOW %	TOD	COUNT	TOD %
alcohol-DUI/DWI	1	7.69%	Sunday	0	0.00%	0000-0300	0	0.00%
FAILED TO YIELD	**4**	**30.77%**	Monday	2	15.38%	0300-0600	0	0.00%
FOLLOWED TOO CLOSELY	2	15.38%	Tuesday	2	15.38%	0600-0900	2	15.38%
INATTENTION	**4**	**30.77%**	Wednesday	2	15.38%	0900-1200	2	15.38%
NO CAUSE	1	7.69%	Thursday	2	15.38%	**1200-1500**	**3**	**23.08%**
OTHER IMPROPER ACT/MOVE	1	7.69%	**Friday**	**4**	**30.77%**	**1500-1800**	**4**	**30.77%**
			Saturday	1	7.69%	1800-2100	1	7.69%
						2100-2400	1	7.69%
TOTAL # ACCIDENTS:	**13**							

** Accident data was retrieved from NPD GIS Database and locations adjusted based on Officer reports.
** Accident locations are relative to their actual location
** The % column for each catagory is a ratio of the item value / the total value.
** Does NOT include Private Property accidents

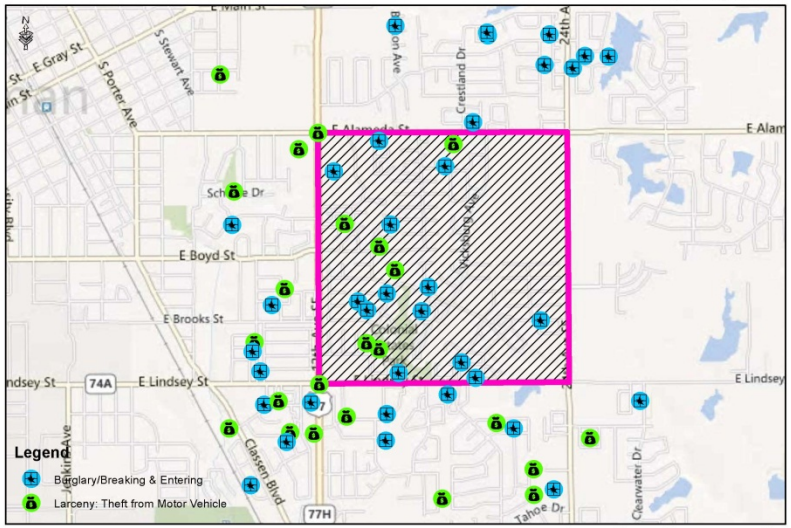
Not all symbols may be visible if accidents occur at the same location

Norman Police Department Crime Analysis Unit

EAST DDACTS ZONE
90 DAY CRIME OVERVIEW

SEPTEMBER 2013

Completed: August 15, 2013



Crime data obtained from NPD GIS database represents current crime at time extracted

M.O.	COUNT	Factor %	DOW	COUNT	DOW %	TOD	COUNT	TOD %
VEHICLE UNLOCKED	**16**	**27.12%**	Sunday	12	14.81%	**0000-0300**	**24**	**19.83%**
VEHICLE WINDOW	3	5.08%	**Monday**	**16**	**19.75%**	**0300-0600**	**21**	**17.36%**
VEHICLE PARTS	3	5.08%	Tuesday	9	11.11%	0600-0900	15	12.40%
RESIDENCE FRONT DOOR	**17**	**28.81%**	**Wednesday**	**18**	**22.22%**	0900-1200	14	11.57%
RESIDENCE BACK DOOR	5	8.47%	Thursday	10	12.35%	1200-1500	10	8.26%
RESIDENCE GARAGE DOOR	4	6.78%	Friday	5	6.17%	1500-1800	7	5.79%
RESIDENCE WINDOW	**6**	**10.17%**	Saturday	11	13.58%	1800-2100	10	8.26%
UNLAWFUL ENTRY	5	8.47%				**2100-2400**	**20**	**16.53%**
TOTAL # CRIMES:	**59**							

Strategic Operations

- Resource deployment meetings
  - Meet with Patrol Major/Captains
  - Discuss areas of concern and resources needed
- Define analysis products to accomplish goals
  - Produce additional products as needed for operations

WEST Zone Operation

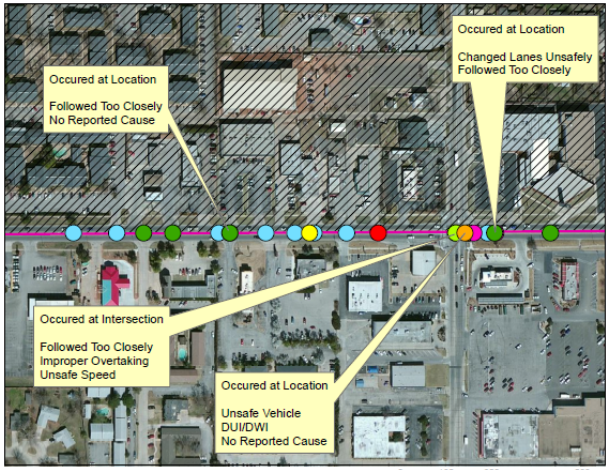
- Identified Traffic Hot Spot
- Traffic Overview Sheet
- Patrol Units Deployed

Norman Police Department
Crime Analysis Unit

W Lindsey Str & McGee Dr.

April Traffic Overview

Completed: March 13, 2013



Legend

- CHANGED LANES UNSAFELY
- FOLLOWED TOO CLOSELY
- IMPROPER OVERTAKING
- FAILED TO STOP
- FAILED TO YIELD
- INATTENTION
- UNSAFE SPEED
- UNSAFE VEHICLE
- DUI/DWI-alcohol
- No Reported Cause

Not all symbols may be visible if accidents occur at the same location

Accident Event Stats

CONTRIBUTING FACTOR	COUNT	Factor %	DOW	COUNT	DOW %	TOD	COUNT	TOD %
INATTENTION	8	**33.33%**	Sunday	1	4.17%	0000-0300	0	0.00%
FOLLOWED TOO CLOSELY	6	**25.00%**	Monday	0	0.00%	0300-0600	0	0.00%
CHANGED LANES UNSAFELY	2	8.33%	Tuesday	1	4.17%	0600-0900	1	4.17%
No Reported Cause	2	8.33%	Wednesday	3	12.50%	0900-1200	3	12.50%
DUI/DWI-alcohol	1	4.17%	**Thursday**	7	**29.17%**	1200-1500	4	16.67%
FAILED TO STOP	1	4.17%	**Friday**	9	**37.50%**	**1500-1800**	10	**41.67%**
FAILED TO YIELD	1	4.17%	Saturday	3	12.50%	**1800-2100**	5	**20.83%**
IMPROPER OVERTAKING	1	4.17%				2100-2400	1	4.17%
UNSAFE SPEED	1	4.17%						
UNSAFE VEHICLE	1	4.17%						
TOTAL # ACCIDENTS:	24							

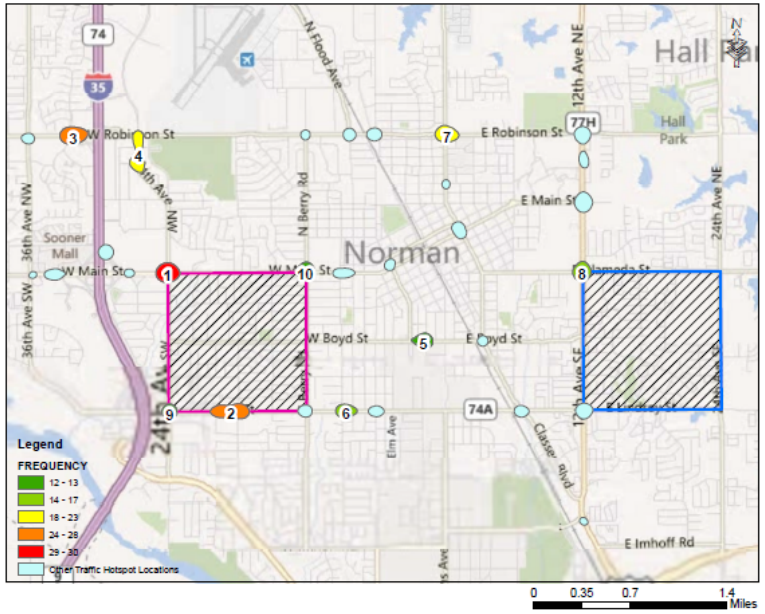
** The above data includes ALL accident data for the month of April for the years 2008 - 2012.
** Accident data was retrieved from NPD GIS Database and locations adjusted based on Officer reports.
** Accident locations are relative to their actual location
** The % column for each catagory is a ratio of the item value / the total value.
** Does NOT include Private Property accidents

Norman Police Department
Crime Analysis Unit

April 2013 High Traffic Accident Areas

April Traffic Overview

Completed: March 14, 2013



TOP 10 HIGH ACCIDENT LOCATIONS (BASED ON 2008-2012 DATA)	
RANK	LOCATION
1	W Main St & 24th Ave NW
2	W Lindsey St & McGee Dr.
3	E Robinson St & Crossroads Blvd
4	W Robinson St & 24th Ave NW
5	W Boyd & Asp Ave
6	W Lindsey St & S Flood Ave
7	E Robinson St & N Porter Ave
8	E Alameda St & 12th Ave SE
9	W Lindsey St & 24th Ave SW
10	W Main St & N Berry Rd

** The above data includes ALL accident data for the month of April for the years 2008 - 2012.
** Accident data was retrieved from NPD GIS Database and locations adjusted based on Officer reports.
** Accident locations are relative to their actual location

Resource Deployment

April 2013 West Zone Traffic Operation Data

Section 1: Enforcement Data

Monthly Enforcement Operation Data

Total Hours of Enforcement:	26.5
Total Number of Citations:	57
Total Number of Warnings:	101
Total Number of FI:	6
Total Number of Criminal:	6
Total Number of Contacts:	170

Enforcement Data for April 2013

Period	TOD	# Hours	# Officers	Citations	Warnings	FI	Criminal	TOTAL CONTACTS
4/4/2013	1500-1700	2	3	2	20	0	0	22
4/5/2013	1530-1630	1	4	5	4	0	0	9
4/6/2013	2300-0300	4	2	5	2	4	0	11
4/11/2013	1530-1730	2	5	10	7	0	1	18
4/12/2013	1530-1730	2	5	11	21	0	1	33
4/13/2013	2300-0700	8	3	2	14	0	4	20
4/18/2013	1600-1700	1	2	4	5	0	0	9
4/24/2013	0100-0400	3	3	0	3	2	0	5
4/25/2013	1530-1730	2	5	18	5	0	0	23
4/26/2013	1600-1730	1.5	3	0	20	0	0	20
TOTALS		**26.5**		**57**	**101**	**6**	**6**	**170**

Operation Accident Data

Section 2: Accident Data

All Accidents Data (Excluding Private Property)

Total Number of Accidents in 2013:	23
Monthly 5YR Average:	25.6
Total Number of Accidents in 2012:	24
Change from 2013 and 5YR Average:	-10.16% Decrease
Change from 2013 and 2012:	-4.17% Decrease

All Accidents Data (Excluding Private Property)

Date: APRIL 2013
Application Area: WEST DDACTS Zone with 500 FT Buffer

INSIDE DDACTS APPLICATION AREA

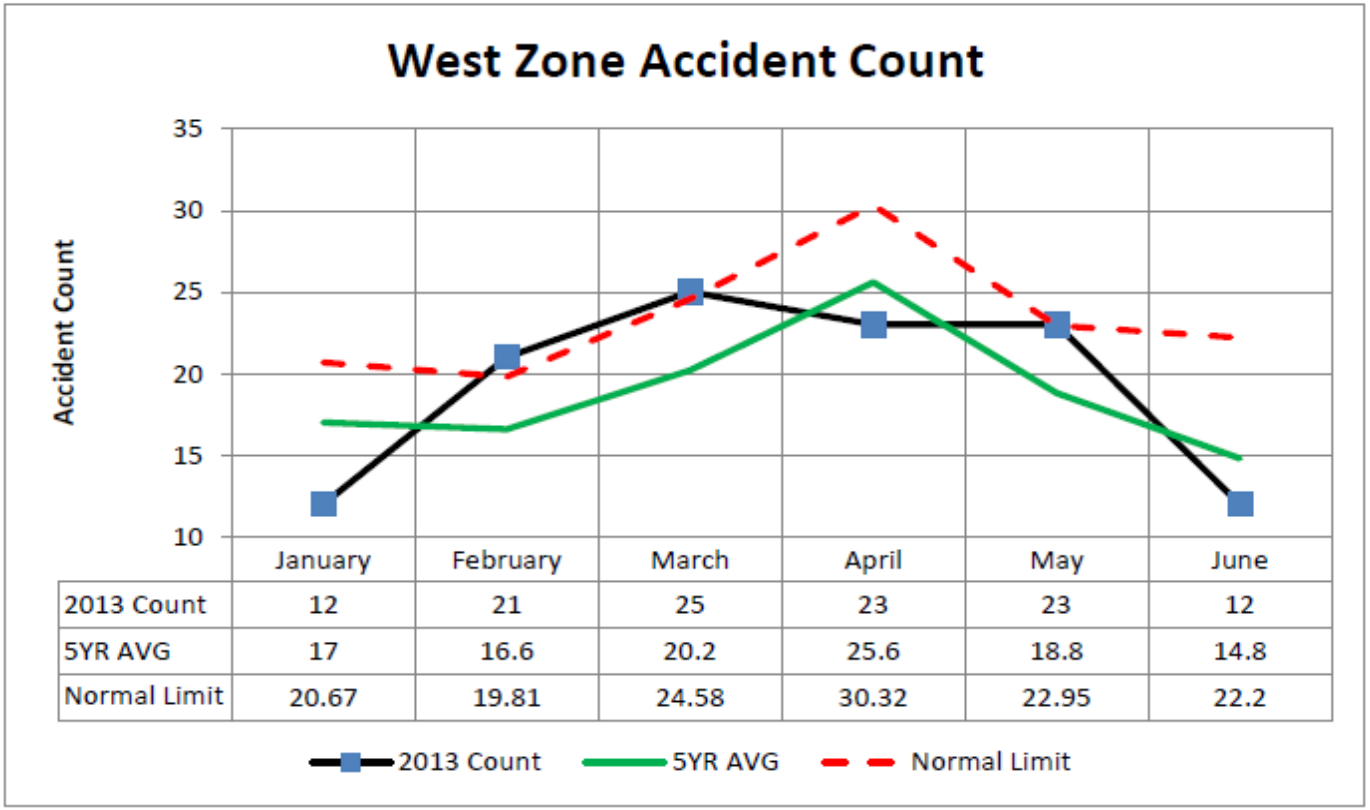
Category	2008	2009	2010	2011	2012	5YR AVG	STDEV	2013	Z-Score	Sign.	Change from 5YR AVG	Change from 2012
Injury Accidents	7	6	4	14	4	7	4.12	7	0.00	0.50	0.00%	75.00%
Non-Injury Accidents	16	18	19	20	20	18.6	1.67	16	-1.55	0.06	-13.98%	-20.00%
All Accidents	23	24	23	34	24	25.6	4.72	23	-0.55	0.29	-10.16%	-4.17%

OUTSIDE DDACTS APPLICATION AREA

Category	2008	2009	2010	2011	2012	5YR AVG	STDEV	2013	Z-Score	Sign.	Change from 5YR AVG	Change from 2012
Injury Accidents	68	60	68	55	51	60.4	7.64	56	-0.58	0.28	-7.28%	9.80%
Non-Injury Accidents	142	137	150	135	129	138.6	7.89	152	1.70	0.96	9.67%	17.83%
All Accidents	210	197	218	190	180	199	15.23	208	0.59	0.72	4.52%	15.56%

Operation Results

Section 3: Accident Trend based on Five Year Data



	January	February	March	April	May	June
2013 Count	12	21	25	23	23	12
5YR AVG	17	16.6	20.2	25.6	18.8	14.8
Normal Limit	20.67	19.81	24.58	30.32	22.95	22.2

Difference between 5 Year Average, 2013 Accident Counts and Observed Differences

Data	January	February	March	April	May	June
2013 Count	12	21	25	23	23	12
5 YR AVG	17	16.6	20.2	25.6	18.8	14.8
Difference	-5	4.4	4.8	-2.6	4.2	-2.8

Information Sharing & Outreach

- **Monthly Staff briefings**
- **Monthly RECON product to DA**
- **Weekly crime reports to Police personnel**
- **Attend Patrol shift briefings**
  - Gather Intel
  - Educate Officers
- **Get away from the Office**
  - Attend division meetings
  - Ride along with Patrol
  - Spend time with Officers & Command (Customers)

Monitoring, Evaluation and Adjustments

- Monitor deployment of project
- Evaluate monthly operations
- Officer feedback on analysis products
- Adjust as needed

Outcomes

- 6 Month Results – City Wide Stats

CITY WIDE STATS												
Category	2008	2009	2010	2011	2012	5YR AVG	STDEV	2013	Z-Score	Significance	Change from 5YR AVG	Change from 2012
Injury Accidents	383	351	328	314	339	343	26.20	334	-0.34	0.37	-2.62%	-1.47%
Non-Injury Accidents	851	823	826	821	900	844.2	33.46	887	1.28	0.90	5.07%	-1.44%
All Accidents	1234	1174	1154	1135	1239	1187.2	47.10	1221	0.72	0.76	2.85%	-1.45%
Forcible Rape	29	25	23	37	36	30	6.32	41	1.74	0.96	36.67%	13.89%
Robbery	26	33	16	41	35	30.2	9.58	33	0.29	0.62	9.27%	-5.71%
Aggravated Assault	40	34	33	38	28	34.6	4.67	52	3.73	1.00	50.29%	85.71%
Burglary	383	355	397	334	392	372.2	26.83	432	2.23	0.99	16.07%	10.20%
Larceny from Vehicle	417	508	479	604	578	517.2	75.52	461	-0.74	0.23	-10.87%	-20.24%
Motor Vehicle Theft	158	92	91	91	116	109.6	29.09	142	1.11	0.87	29.56%	22.41%
All Crimes	1053	1047	1039	1145	1185	1093.8	66.70	1161	1.01	0.84	6.14%	-2.03%

- Accidents
  - - 1.45% change from 2012
- Crimes
  - - 2.03% change from 2012
  - Larceny from Vehicle – 20.24% change from 2012

WEST Zone Stats

WEST ZONE DDACTS STATS												
Category	2008	2009	2010	2011	2012	5YR AVG	STDEV	2013	Z-Score	Significance	W Change from 5YR AVG	Change from 2012
Injury Accidents	25	31	20	38	17	26.2	8.47	31	0.57	0.71	18.32%	82.35%
Non-Injury Accidents	77	94	93	114	123	100.2	18.29	97	-0.17	0.43	-3.19%	-21.14%
All Accidents	102	125	113	152	140	126.4	20.11	128	0.08	0.53	1.27%	-8.57%
Forcible Rape	0	0	0	1	1	0.4	0.55	1	1.10	0.86	150.00%	100.00%
Robbery	2	2	1	1	2	1.6	0.55	4	4.38	1.00	150.00%	100.00%
Aggravated Assault	0	1	4	4	2	2.2	1.79	4	1.01	0.84	81.82%	100.00%
Burglary	25	16	22	22	17	20.4	3.78	9	-3.01	0.00	-55.88%	-47.06%
Larceny from Vehicle	16	45	24	24	44	30.6	13.11	12	-1.42	0.08	-60.78%	-72.73%
Motor Vehicle Theft	6	3	7	2	7	5	2.35	6	0.43	0.67	20.00%	-14.29%
All Crimes	49	67	58	54	73	60.2	9.73	36	-2.49	0.01	-40.20%	-50.68%

- **Accidents**
  - **- 8.57% change from 2012**
- **Crime**
  - **- 50.68% change from 2012**
  - **Larceny from Vehicle: - 72.73% change from 2012**
  - **Burglary: - 47.06%**
  - **Motor Vehicle Theft: - 14.29%**

EAST Zone Stats

EAST ZONE DDACTS STATS												
Category	2008	2009	2010	2011	2012	5YR AVG	STDEV	2013	Z-Score	Significance	E Change from 5YR AVG	Change from 2012
Injury Accidents	30	35	33	31	24	30.6	4.16	31	0.10	0.54	1.31%	29.17%
Non-Injury Accidents	69	63	70	71	84	71.4	7.70	71	-0.05	0.48	-0.56%	-15.48%
All Accidents	99	98	103	102	108	102	3.94	102	0.00	0.50	0.00%	-5.56%
Forcible Rape	0	2	3	1	3	1.8	1.30	5	2.45	0.99	177.78%	400.00%
Robbery	4	3	1	5	3	3.2	1.48	4	0.54	0.71	25.00%	300.00%
Aggravated Assault	9	9	5	2	1	5.2	3.77	5	-0.05	0.48	-3.85%	400.00%
Burglary	46	25	34	30	28	32.6	8.17	30	-0.32	0.38	-7.98%	7.14%
Larceny from Vehicle	33	22	29	36	31	30.2	5.26	16	-2.70	0.00	-47.02%	-48.39%
Motor Vehicle Theft	19	10	9	9	8	11	4.53	9	-0.44	0.33	-18.18%	12.50%
All Crimes	111	71	81	83	74	84	15.87	69	-0.94	0.17	-17.86%	-6.76%

- **Accidents**
  - **- 5.56% change from 2012**
- **Crime**
  - **- 6.76% change from 2012**
  - **Larceny from Vehicle: - 48.39% change from 2012**
  - **Burglary: + 7.14% change from 2012**
  - **Motor Vehicle Theft: + 12.50% change from 2012**

Outside Zone Stats

OUTSIDE DDACTS STATS												
Category	2008	2009	2010	2011	2012	5YR AVG	STDEV	2013	Z-Score	Significance	C Change from 5YR AVG	Change from 2012
Injury Accidents	335	298	284	251	305	294.6	30.68	277	-0.57	0.28	-5.97%	-9.18%
Non-Injury Accidents	835	793	774	759	835	799.2	34.83	866	1.92	0.97	8.36%	3.71%
All Accidents	1170	1091	1058	1010	1140	1093.8	63.74	1143	0.77	0.78	4.50%	0.26%
Forcible Rape	29	23	20	36	34	28.4	6.88	35	0.96	0.83	23.24%	2.94%
Robbery	20	28	14	35	29	25.2	8.23	25	-0.02	0.49	-0.79%	-13.79%
Aggravated Assault	31	24	24	32	24	27	4.12	43	3.88	1.00	59.26%	79.17%
Burglary	312	314	338	282	347	318.6	25.43	393	2.93	1.00	23.35%	13.26%
Larceny from Vehicle	368	441	426	542	503	456	67.96	433	-0.34	0.37	-5.04%	-13.92%
Motor Vehicle Theft	133	79	75	80	101	93.6	24.24	127	1.38	0.92	35.68%	25.74%
All Crimes	893	909	897	1007	1038	948.8	68.42	1056	1.57	0.94	11.30%	1.73%

- **Accidents**
  - **+ 0.26% change from 2012**
- **Crime**
  - **+ 1.73% change from 2012**
  - **Larceny from Vehicle: - 13.92% change from 2012**
  - **Burglary: +13.26% change from 2012**
  - **Motor Vehicle Theft: +25.74% change from 2012**

Zone Comparison

6 Month Results Change from 2012

Category	West Zone	East Zone	Outside Zone
Accidents	- 8.57%	- 5.56%	+ 0.26%
All Crime	- 50.68%	- 6.76%	+ 1.73%
Larceny From Vehicle	- 72.73%	- 48.36%	- 13.26%
Burglary	- 47.06%	+ 7.14%	+ 13.26%
Motor Vehicle Theft	- 14.27%	+ 12.5%	+ 25.74%
Zone Monthly Ops (6 Months)	3 Months	2 Months	NA
Enforcement Hours (6 Months)	82.5	99	NA
Total Contacts (6 Months)	350	467	NA

Questions

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"The only thing necessary for the triumph of evil is for good men to do nothing"
Edmund Burke

Norman Police Department

Norman, Oklahoma

DDACTS Implementation

September 24, 2013

16th Annual OKSCAUG