Officers’ Mobile “Toolbelt”

Facilitator:
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Presenters:
Charlton Martin, Sergeant, Felony Apprehension & Patrol (FAP Unit), K-9 Coordinator, Highway Patrol Division, Alabama Law Enforcement Agency
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Access to mobile devices, tools and technology that can assist Law Enforcement with Officer Safety as well as by streamlining processes, providing anywhere access, productivity gains as well as saving time and paper. Let’s discuss what’s in the car, how is it used, newest technology, tracking crashes and citations to identify “hot spots” in an effort to reduce injuries and fatalities from traffic crashes by saturating problem areas with law enforcement visibility.
Live System Demo with Charlton Martin, Sergeant, Felony Apprehension & Patrol (FAP Unit), K-9 Coordinator, Highway Patrol Division, Alabama Law Enforcement Agency
Advancing Technology for the Officer
June 22, 2015
Beau Elliott, CAPS
Kevin McQuary, CAPS
Outline

• Introduction to CAPS
• History of AL based systems
• Intro to LE mobile based systems
• AL Data Repository
• Using Data to make Enforcement Decisions
Center for Advanced Public Safety
- Started at UA in the early 2000’s

$10M in annual research expenditures

Initial focus areas:
- Traffic safety
- Public safety technology integration

Vision – Build a sustainable center without a major “center” grant
Roughly 135 people
- 25 faculty members
  - 12 disciplines
- 70 professional staff
  - Research engineers
  - Software developers
  - IT personnel
- 40 students
  - Graduate Research Assistants
  - Undergraduate interns

Faculty
- Computer Science and other disciplines

Developers
- Most have Masters in Computer Science

Students
- Interning with selected staff mentors

Skilled in MS .NET
Structure

- State agency
- Non-profit
- Contract and grant operation
- Funded by State and Federal agencies
- Collaborations with other University Centers
  - Mississippi State
  - Georgia Tech
  - Harding University
  - University of Puerto Rico
Partners & Sponsors

Federal Sponsors

- Federal Motor Carrier Safety Administration
- National Highway Traffic Safety Administration
- Federal Highway Administration
- Bureau of Justice Assistance
- Office of Justice Programs
- Department of Homeland Security
- Centers for Medicare and Medicaid Services
- National Science Foundation

State Sponsors

- Alabama
- Mississippi
- Arkansas
- New Mexico
- Puerto Rico
- Alaska
Partners & Sponsors

Alabama State Agency Sponsors

- Criminal Justice Information Center
- Department of Revenue – Motor Vehicle Division
- Economic and Community Affairs – Office of Highway Safety
- Department of Homeland Security
- Administrative Office of Courts
- Department of Transportation
- Department of Public Safety
- Department of Finance – Information Services Division
- Department of Human Resources
- Department of Public Health
Background Of Alabama Traffic Records
State of Alabama

- Traffic records modernization:
  - 13-year project started in 2001
- Effort has resulted in statewide change
  - Electronic citations
  - Electronic crash reporting
  - Electronic I/O reporting
  - Electronic specialized forms
- Larger municipalities have adopted independent commercial solutions
The Three C’s

• Citations, crashes and crime incidents
• State leaders for this project:
  • Alabama Law Enforcement Agency
  • AL Department of Transportation
  • AL Department of Economic and Community Affairs
Two Sides of the coin

Data Capture

Data Analytics
A Common Framework

• Data capture software
• Central collection server
• Analytics
• Technology support for the mobile officer
Mobile Officer Vision

Provide a comprehensive & uniform mobile information solution for every police officer in Alabama

Considerations

✓ Agency & User Support
✓ Lack of Mobile Data Units in Field
✓ Complexity & Technical Competency
✓ Existing Technology
✓ Aligning Local Objectives & Statewide Strategy
✓ Funding
2003 – project initiated
2005 – in production statewide
85,000 citations per month
Paper eliminated
Complete court e-filing integration
7 million citations to date
Widespread adoption
• 2008 – project initiated
• 2009 – in production with State Troopers
• 2010 – in production statewide (mandated)
• Commercial vehicle funded
• 10,000 crash reports per month
• Substantial improvement in crash data quality since the system went into production:
  – Improved edits
  – Improved timeliness
• 2012 – project initiated
• 2013 – Rollout to DPS
• 2014 – Rollout to Municipals
• “Multiple Form Application” for smaller forms
• Current Numbers:
  – 1450 Documents uploaded
  – Includes Motorists Assists, DL Revocation Form, Field Interview/SAR, DOT Engineering Request Form, DUI Report
Locating Events

- Events happen in the field (citations, crashes, crime, etc.)
- Officers need access to state approved location data
- Needs to be available in a disconnected environment
- Solution: MapClick – A program within the MOVE environment
Case Study Example

- Crash on Bryant Drive near Bryant-Denny Stadium in Tuscaloosa:
Consume the location
A Common Framework

- Data capture software
- Central collection server
- Analytics
Silos! Oh My!

- In most states, maybe not the ones represented here have all the “important, shareable” data contained in silos
- Not accessible unless you have keys to kingdom
- No way to mix data for analytics
- No way to share
• Our approach:
  – Stand up a central data center as a collection point
  – Data center administered by a neutral party (CAPS-UA)
  – Forward “approved” records to the appropriate agency
• Central data center also holds a centralized data warehouse
  – Supports analytics across data sets
Alabama Approach

Administrative Office of Courts

Aladata.com

Court Info System

eCite
UCR
eCrash

CARE

ALEA

Crash Repository
• User management problem:
  – Federated infrastructure
  – Lots of different data and applications
  – Frequent new components

• Many agencies in a state:
  – Law enforcement
  – DOTs
  – MPOs
  – Highway Safety Office

• Each user accesses what he or she needs
• Access granted only to agencies that need it
Authentication/Authorization

Privilege Propagation

Central Authority

Agency A Administrator

Users in Agency A

Agency B Administrator

Users in Agency B

Agency C Administrator

Users in Agency C

Access privilege

eCite Owner

Visibility of app or data based on privileges assigned

No eCite privileges for users in Agency C

Electronic Citation App
A Common Framework

- Data capture software
- Central collection server
- Analytics
• Provides access to the data

• CARE:
  – Windows application with statistical functions
  – Data storage architecture

• ADVANCE:
  – Portal with statistical, record-level and GIS access
  – Uses the CARE data storage architecture
CARE

- Data mining for traffic accidents
- Projects in 12 states
- Major system in AL
- Evolved to Web-based portal with GIS
CARE Architecture

Desktop Clients

ArcGIS

CARE Analysis Engine

User defined Filters

Analysis Requests and Results

User defined Spatial Filters

Middleware CARE Data Loader

Data

Pre-defined Filters

OLAP Elements
- Crash Variables
- Feature Variables
- Location Variables

CARE Data Warehouse

OLTP Databases
- SQL
- Oracle
- ODBC

Crash Data Repository

Spatial and LRS Data

Roadway Features

Web Browser

Analysis Requests and Results

Intra or Internet

Web Server
Common Functions

• Independent of data type
• Common functions include:
  – Statistical widgets
  – CARE (filters, frequency, crosstab, IMPACT)
  – Standard reports
  – Drilldown
  – Rifle searches
  – GIS
• Law enforcement dashboard
  – eCite
  – eCrash
  – eWeight
  – Crime Reporting
• Deep Analysis & Search
• Mapping
• HTML 5 – Runs on any platform, including mobile
CRASH DASHBOARD
CRASH DATA POINTS
Data Driven Approaches to Crime and Traffic Safety

Look at various things together:
- Level of enforcement
- Crash history
- Criminal incident history

Deploy enforcement to problem areas:
- High crime
- Dangerous crash areas
CRIME HEAT MAP
CRASH HEAT MAP
• Overlay the heatmaps

• Combinations:
  – High crash – high crime = DDACTS
  – High crash – low citation = under-enforced
  – Low crash – high citation = fishing spot
  – Low crash – low crime = uninteresting?

• Parameters:
  – Time of day
  – Size of hotspot
  – Threshold

• Result: Square mile sectors that are hot or cold
DDACTS HOT SECTORS

UA CAMPUS:
High crime and crash after 12 AM
Mapping large point sets

- 3C's = Tend to generate lots of events
- Mapping large numbers of points can be very inefficient
- We have looked at approaches to client-side rendering:
  - ESRI server
    - Used to return points
  - Google maps tile server and API
    - Used to render the tiles and then insert the points and render on client side
Some Usage Statistics

- Mobile officer laptop suite (managed installs):
  - MOVE – 19,604
  - eCite – 16,159
  - eCrash – 17,951
  - eForms – 2,653
  - MapClick - 770
Thank you!

QUESTIONS?

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