

Virginia Traffic Records Electronic Data System (TREDS)

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Award-winning System

- Governor's Technology Award for Virginia
- National Best Practice Award in Traffic Records
- Microsoft Technical Case Study for Government Solutions



System Attributes

- Flexible architecture allows for system integrations, reporting, and analysis
- Automates and centralizes Virginia's crash and highway safety-related data



Background

- Manual reporting
 - 45 minutes to complete a crash report
- Manual processing
 - 120,000 reports annually
- Three highway safety data warehouses
 - Department of Motor Vehicles (DMV)
 - Virginia Department of Transportation (VDOT)
 - Virginia State Police (VSP)



Background

- Lack of inter-agency data sharing
- Data availability was 8-12 months
- Data quality was incomplete, inconsistent, and inaccurate
- Received a rating of RED from the U. S. Federal Motor Carrier Safety Administration (FMCSA)



Background

- Selected by FMCSA as pilot to improve collection of commercial motor vehicle (CMV) crash data
- Created multi-agency team (DMV, VSP, and FMCSA)
- Designed new CMV crash report
- Virginia first in U. S. to achieve 100% compliance with FMCSA criteria
- Received U. S. National Highway Traffic Safety Administration (NHTSA) funding for new reporting system



TREDS Development

- 2004 – assigned project manager and assembled project team
- Reorganized the Traffic Records Coordinating Committee
- Redesigned Police Crash Report to meet national standards
- Solicited law enforcement feedback on new form
- Trained law enforcement on use of form



TREDS Development

- Designed new traffic safety database
- Decommissioned 25-year old mainframe crash reporting system
- Launched TREDS in 2009



TREDS Features

- Virginia Tech University partnership
 - Imports crash location data submitted by law enforcement
 - Identifies accurate crash locations on every roadway in Virginia – 120,000 annually
- System identifies specific medical terms such as seizure, illness, etc.
 - TREDS exports driver crash data to DMV's medical review office for review and action



Data Enhancements

- Motorcycle student training rosters
- Emergency Medical Services
- Click It or Ticket seat belt citation and survey data
- DUI/Checkpoint Strikeforce citation data
- Blood Alcohol Content (BAC)
- Ignition interlock tracking system – 1st DUI offenders



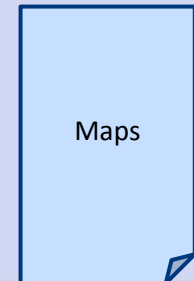
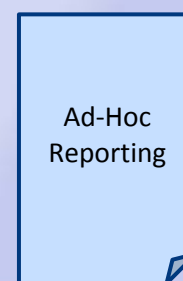
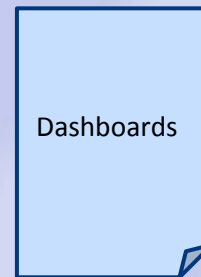
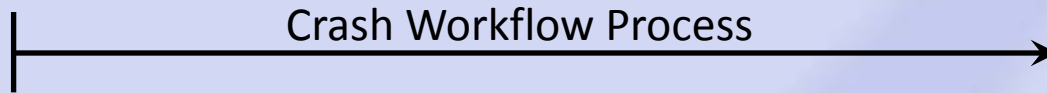
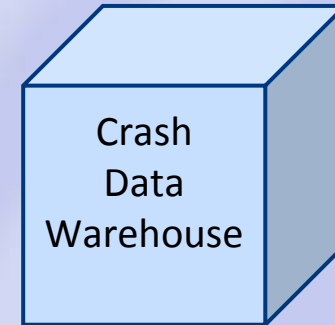
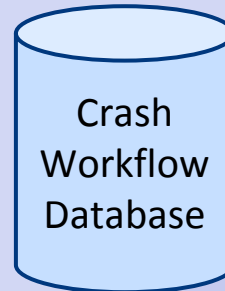
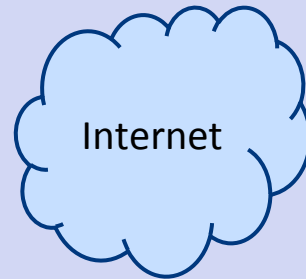
TREDS Demonstration

Data Collection and Analysis



Crash Processing Lifecycle

Law Enforcement
Data Collection



Law Enforcement Data Collection

- Data is collected by electronic and paper reports
 - Police Crash Report (FR300)
 - 81% electronic
 - 19% paper
 - Preliminary location data
 - Alcohol and fatality data



Other Data Collection

- Medical Examiner's Office
- Colleges and universities
- Local and state law enforcement
- Other state agencies



Data Collection Methods

- Secure web service
 - Authenticated
 - Collect data offline and send when online
- Enforce crash validation rules
 - Improve quality from time of collection
- File transfer for non-crash data
 - Data sent at regular intervals
 - Correlated with crash data



Crash Workflow Process

- Law enforcement crash event
 - Collection
 - Electronically converted to XML
 - Validation
 - Submission
- Back-office crash processing TREDIS
 - Crash validation rule enforcement
 - Combined with driver record
- Locating
 - Latitude/Longitude
 - Functional class
 - Standardized route name



Crash Data Warehouse

- Analyze data by multiple factors
- Over 150 dimensions and growing – year, month, day, hour
- Crash event factors – weather, light condition, road condition, surface type
- Driver factors – alcohol, speed, driver distraction
- Demographic factors – age, gender
- Measures – crash, person, vehicle



Timely Reporting

- Making data accessible and consumable – on demand
 - Highway Safety Office
 - Public – www.dmvNOW.com
- Export to commonly used application types – Excel, TIFF, PDF
- Data refreshed nightly
- Data available in multiple formats – standard, custom, GIS, and alternative graphical reports



Standard Reports

- Accessible to the public
- Pre-defined fields
- Dynamic data based on user parameters
- Parameters can be changed by the end-user
- Examples:
 - Tabular – fatal crashes by month and year
 - Graphical – fatal crashes by month and year
 - Scheduled and delivered via email – dashboard



Custom Reports

- Highway Safety Office staff access
- Available from anywhere
- Role-based security protects personally identifiable information
- Tabular example – vehicle body type by alcohol relation
- Graphical example – alcohol-related crashes by age group



GIS Reports

- Accessible to Highway Safety Office staff and public
- Geographic Information System (GIS)
 - Timeline – snow-related crashes – winter 2011-2012
 - Standard – 2014 fatalities
 - Heat map – street-level problem identification



Alternative Graphical Reports

- Improved presentation and visualization
- Examples
 - Google motion – chart
 - Google gauge – chart
 - Google timeline – chart



Outcomes

- Improved data quality
 - Crash rule enforcement during collection
 - Further crash rule enforcement during back-office processing
 - Less year-end quality control effort – fewer corrections



Outcomes

- Improved data efficiency (from crash to law enforcement submissions to TRENDS)
 - Paper reports are ready for back-office processing in 124 days on average
 - Electronic reports are ready for back-office processing in 8 days on average
 - Data is ready for reporting and analysis more quickly



Outcomes

- Improved resource efficiencies
 - Save an estimated \$550,000 annually in personnel costs
 - 15 minutes – average time to electronically complete crash report compared to 45 minutes manually



Outcomes

- Importance of correctly locating crashes
 - Street-level problem identification
 - Law enforcement resource allocation
 - Enforcement techniques



Outcomes

- Behavior modifications
 - Speed
 - Drinking
 - Distractions
- Roadway modifications
 - Improve roadway signage and visibility
 - Timely repair of damaged roadway safety equipment such as damaged guardrails



Outcomes

- Accuracy
 - Intuitive system prevents the entry of invalid data
- Timeliness
 - Electronic collection of data eliminates paper and manual entry
 - Electronic reports available in TRENDS 6 hours after receipt by DMV



Outcomes

- **Completeness**
 - Crash report 100% compliant with FMCSA data field requirements
- **Uniformity**
 - All state and local law enforcement agencies report using the same form



Outcomes

- Accessibility
 - Data is accessible through the DMV website which is updated nightly
- Integration
 - Electronic data sharing with colleges, universities, local and state law enforcement, Medical Examiner's Office, and other state agencies



Outcomes

- Since implementation of TREDS, Virginia has experienced:
 - 4% increase in registered vehicles
 - 6% increase in licensed drivers
 - 10% decrease in crashes
 - 10% decrease in fatalities



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