

Uses of Innovative Technology for Outfall Mapping and Screening

Richard Klinger, P.E. – ALDOT Brian Kane, P.E. - Trimble

ALDOT MS4 Permit

Permit No. ALS000006

- New MS4 Permit
 Effective 1 April 2013
- Applies to Phase I and Phase II MS4 areas within state
- Applies to Waters of State within Phase I and Phase II MS4 areas



NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT INDIVIDUAL PERMIT

PERMITTEE: Alabama Department of Transportation (ALDOT)

DISCHARGE AUTHORIZED: Storm Water Discharges from Alabama Department of Transportation's

Manicipal Separate Storie Sower System (MS4s)

AREA OF COVERAGE: The Areas of the State within MS4 Plant I and Phase It Areas

PERMIT NUMBER: ALSO00006

RECEIVENG WATERS: The Waters of the State within MS4 Phase I and Phase II Areas

In secondance with and adjust to the printisms of the Federal Water Pollation Central Act, as amended, 33 U.S.C. 55333-1379 the "FFFCA", the Alabases Water Pallation Control Act, as seconded, Code of Alabases 1975, \$27-274 to 1922-24-10 feet "Alabases 1975, \$27-274 to 1922-24-10 feet and interest Environment Interestantial Interestantial Interestantial Interestantial Interestantial Code of Alabases 1975, \$522-274 to 27-224-10, and rules and regulations adopted Research, and adjust further to the terms and conductors as furth in this permit, the Permittee in hurshy authorized to the theory with the Orient Section Interestantial Code (Section 1975).

ESSLIANCE DATE

MARCH 21, 2013

EFFECTIVE DATE:

APRIL 1, 2013

EXPRATION DATE.

MARCH 31, 2018







ALDOT MS4 Permit

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- Illicit Discharge Detection and Elimination (IDDE) **Program**
- ALDOT will develop dry weather screening program of all major outfalls within applicable areas
- Screening of major outfalls each five-year permit period

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- Major Outfalls
- Transportation Facilities
 - Closed conveyance (pipe) with cross-sectional area of 7.07 ft²
 - Open swale draining 50 acres or more
- Support Facilities
 - Closed conveyance (pipe) with cross-sectional area of 0.79 ft²
 - Open swale draining 2 acres or more

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- ALDOT required to establish outfall mapping program to get major outfall inventory
- Decided to map all outfalls in designated areas and determine if major or minor
- Needed to streamline mapping process to make field work efficient
- Support facilities are located
- Transportation facilities needed location determination prior to mapping visit



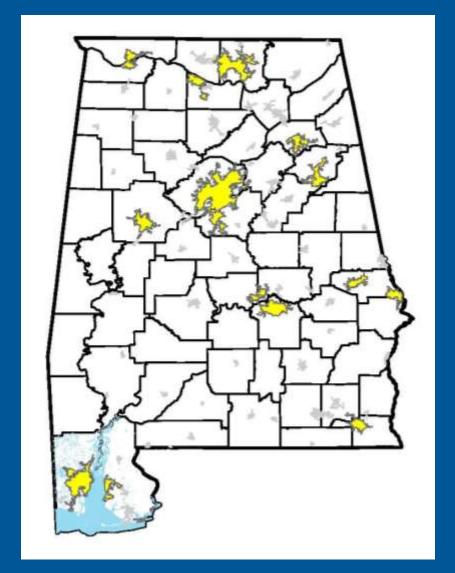


- GIS Analysis needed to determine where Transportation Facilities are located.
- ALDOT has information, but needed to develop an algorithm to efficiently determine locations
- This would save time from manually looking for each location
- ALDOT established algorithm to use information from different GIS layers to pinpoint locations





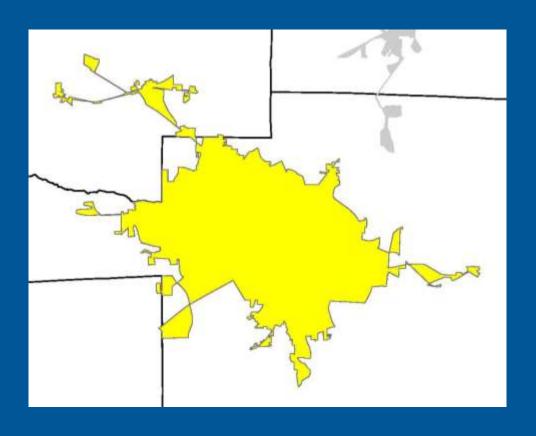
- Begin with Phase I and Phase II
 MS4 areas throughout the state.
- Data from 2010
 U.S. Census







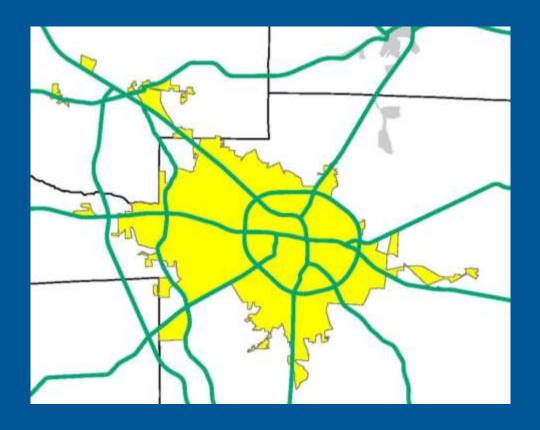
 Example – Dothan Urbanized Area







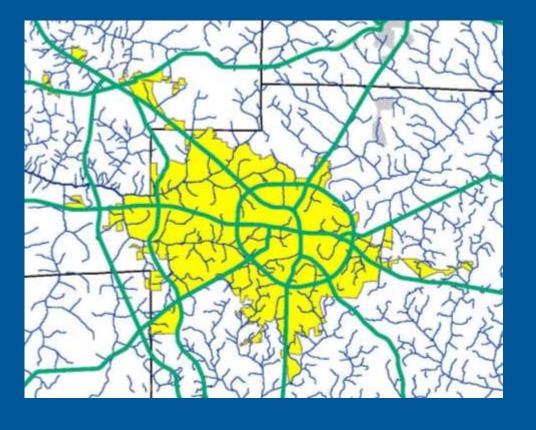
- Example Dothan Urbanized Area
- ALDOT Roads







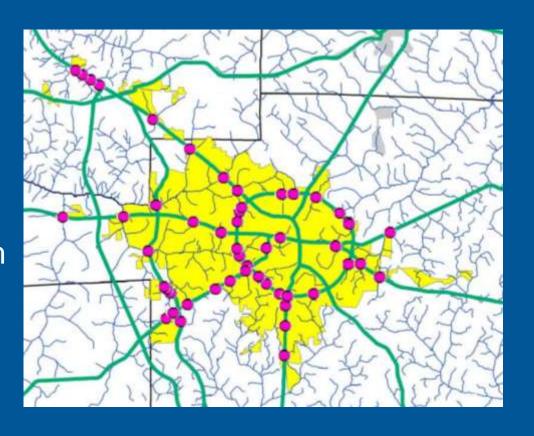
- Example Dothan
 Urbanized Area
- ALDOT Roads
- National Hydraulic Dataset







- Example Dothan Urbanized Area
- ALDOT Roads
- National Hydraulic Dataset
- Intersection of each layer

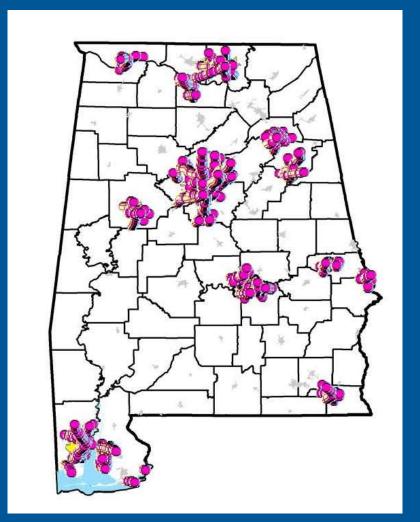






- After algorithm identified locations, QA/QC of locations was required
- Vast majority of the locations were useable
- Used GIS to create a temporary identifier for each location
- Final total of 1,352 locations





ALDOT MS4 Program

Outfall Mapping

- ALDOT established locations for outfall mapping
- ALDOT needed all locations mapped prior to end of five-year permit cycle
- ALDOT asked Trimble to develop process to efficiently:
 - Capture information in the field
 - Reduce post-processing time
 - Deliver information in a timely manner for possible further investigations
 - Deliver information compatible with ALDOT GIS (Roadmap)





ALDOT MS4 Program

Outfall Mapping

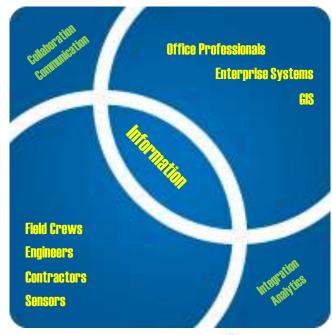
- Trimble determined an electronic form for information capture would be more efficient than paper forms
- Would prefer cloud-based information capture which would be easily GIS convertible
- Inquired if **Trimble** Unity could be formatted to fit ALDOT's needs
- Trimble Unity previously used for Water, Wastewater, and Stormwater mapping and work order functions





Through a Unified Suite of Applications

- Unified Cloud-based and Mobile Collaboration Suite of Applications for Smart Water Management, integrating:
 - Mobile workers and office professionals
 - Field and back office enterprise systems
 - GIS and field operations
 - Utilities with their contractors
- Focus on workflow and business process improvement with the added benefit of better information for decision making and regulatory compliance



Trimble Unity



Supporting Various Mobile Platforms



Managing Work From One Location

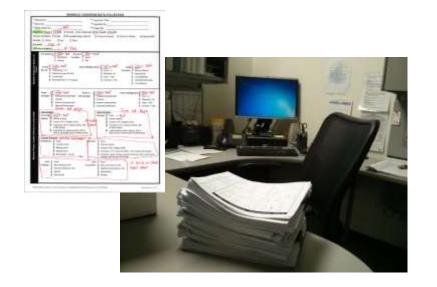
Login from anywhere from a web browser to interact with latest GIS data, dispatch work and manage <u>field</u> operations.



Trimble Unity Benefits

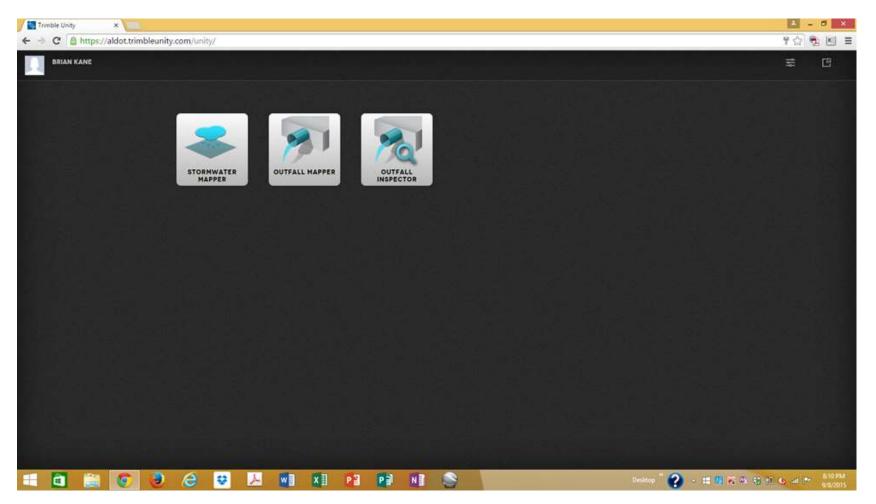
- Standardize and automate field work.
- Eliminate paper and manual data entry.
- Streamline field data collection activities through intelligent workflows and data collection forms.
- Seamless flow of data between the field and office.





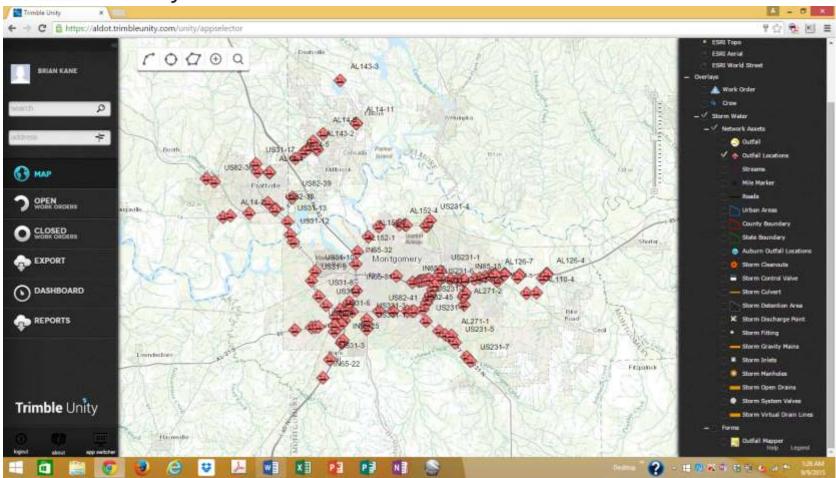
- Improve accuracy of field collected
 GIS and asset data.
- Keep your GIS up-to-date and locate hard to find assets.
- Connect to your back office systems and manage work on one platform.
- Measure performance through standard and configurable dashboards.





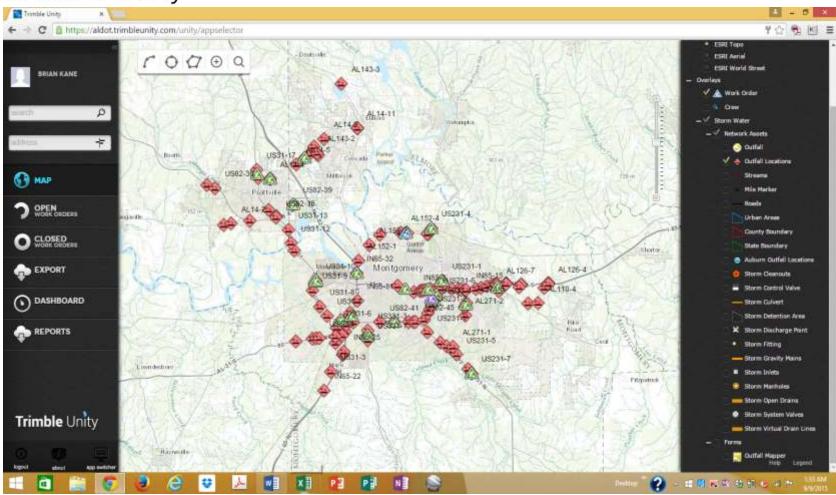






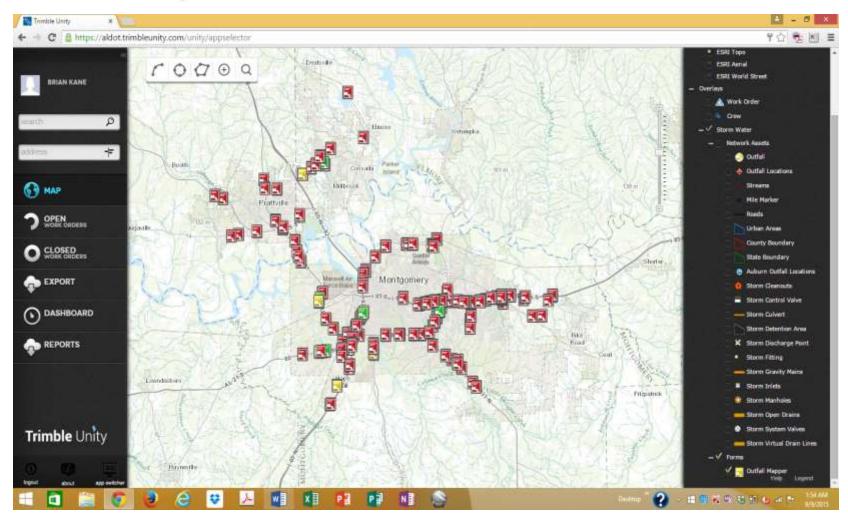






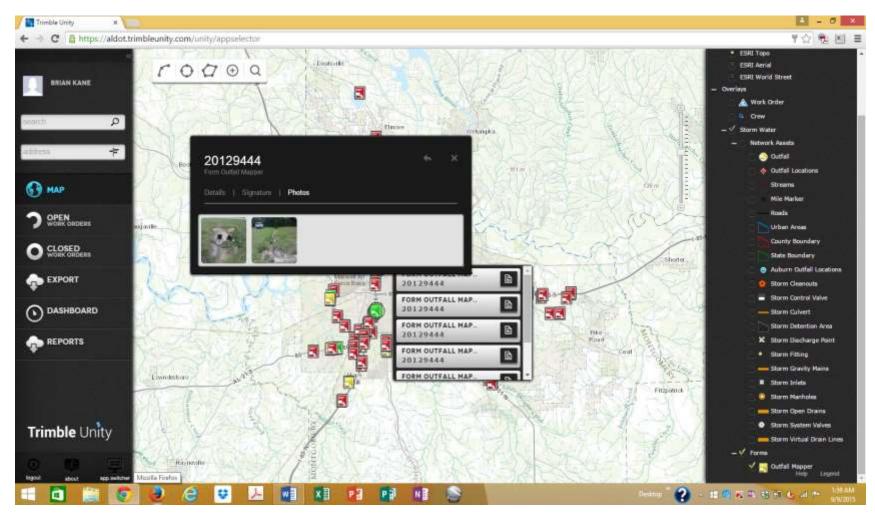






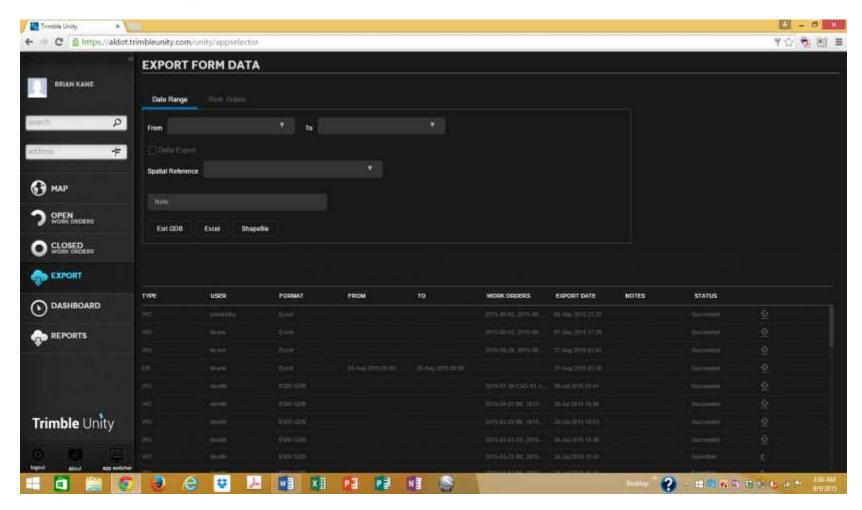












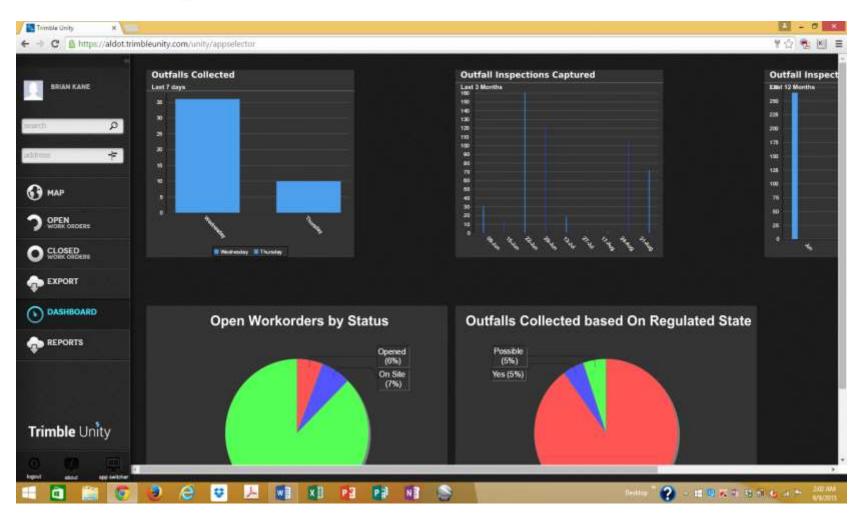




- Can export data into different file types
 - Geodatabase
 - Shapefile
 - Excel
 - Others if needed
- Pictures are attached in the Geodatabase
- Can be imported into GIS systems such as ALDOT's Roadmap

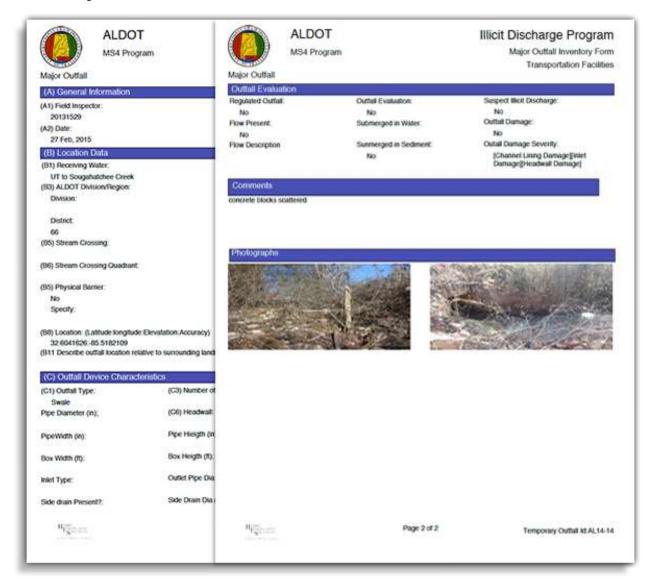
















Mapping Statistics

Urbanized Area	Locations	Outfalls Mapped	Two Crew Work Days
Dothan	52	253	14
Auburn/Columbus, GA	68	321	12
Montgomery	125	599	9
Tuscaloosa	98	531	9
Totals	343	1,704	44







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