

# ALDOT MS4 IDDE Program

## 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 Municipal Separate Storm Sewer Systems (MS4s)

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

PERMIT NUMBER: ALS000006

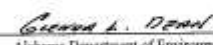
RECEIVING WATERS: The Waters of the State within MS4 Phase I and Phase II Areas

*In accordance with and subject to the provisions of the Federal Water Pollution Control Act, as amended, 33 U.S.C. §§1251-1379 (the "FWPCA"), the Alabama Water Pollution Control Act, as amended, Code of Alabama 1975, §§ 22-22-1 to 22-22-14 (the "AWPCA"), the Alabama Environmental Management Act, as amended, Code of Alabama 1975, §§22-22A-1 to 22-22A-15, and rules and regulations adopted hereunder, and subject further to the terms and conditions set forth in this permit, the Permittee is hereby authorized to discharge into the above-named receiving waters.*

ISSUANCE DATE: MARCH 21, 2013

EFFECTIVE DATE: APRIL 1, 2013

EXPIRATION DATE: MARCH 31, 2018

  
Gerald L. Dean  
Alabama Department of Environmental Management

# ALDOT MS4 Permit

## Permit No. ALS000006

- 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



# Permit No. ALS000006

- Major Outfalls
- Transportation Facilities
  - Closed conveyance (pipe) with cross-sectional area of  $7.07 \text{ ft}^2$
  - Open swale draining 50 acres or more
- Support Facilities
  - Closed conveyance (pipe) with cross-sectional area of  $0.79 \text{ ft}^2$
  - Open swale draining 2 acres or more



# ALDOT MS4 IDDE Program

- 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



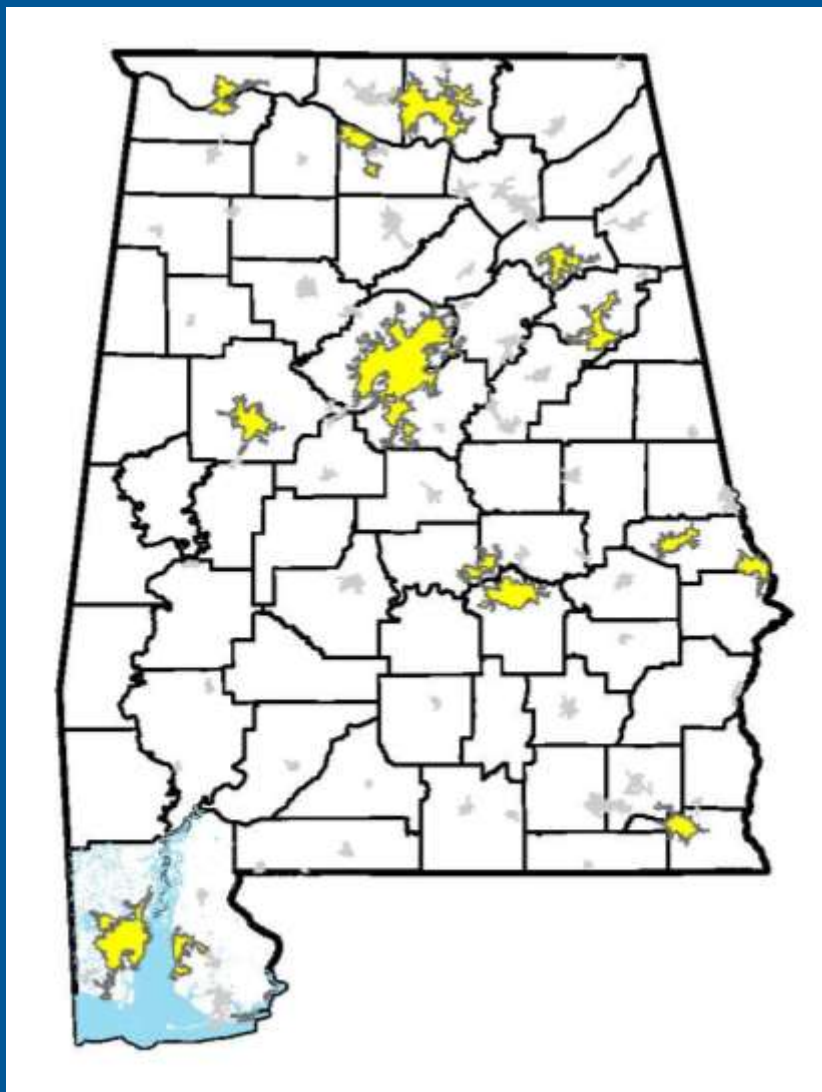
# ALDOT MS4 IDDE Program

- 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



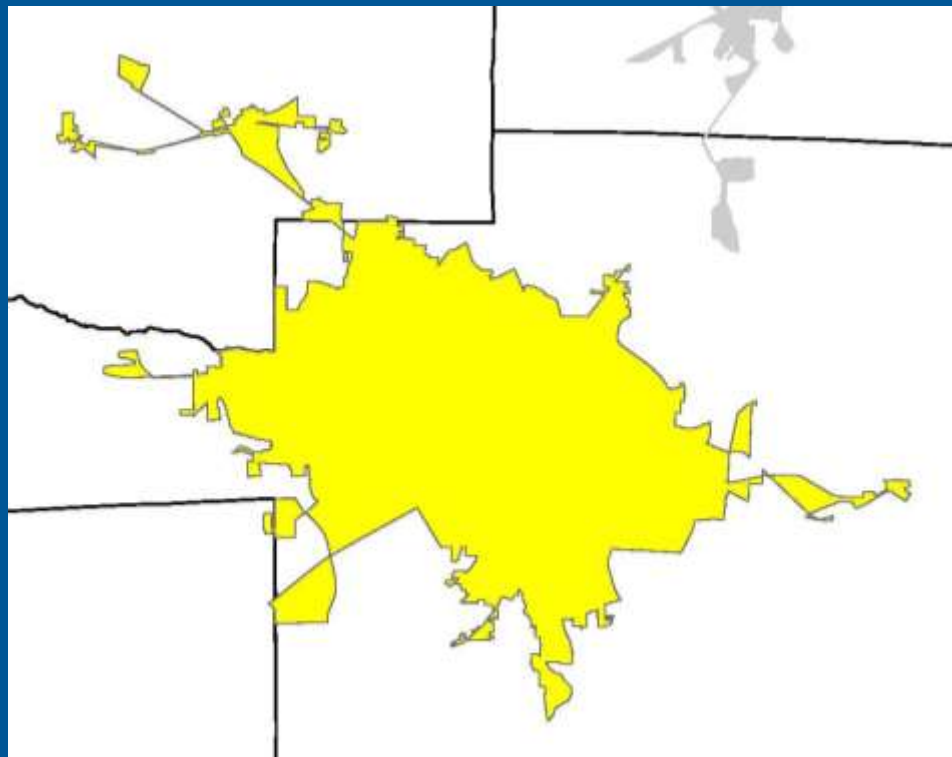
# ALDOT MS4 IDDE Program

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



# ALDOT MS4 IDDE Program

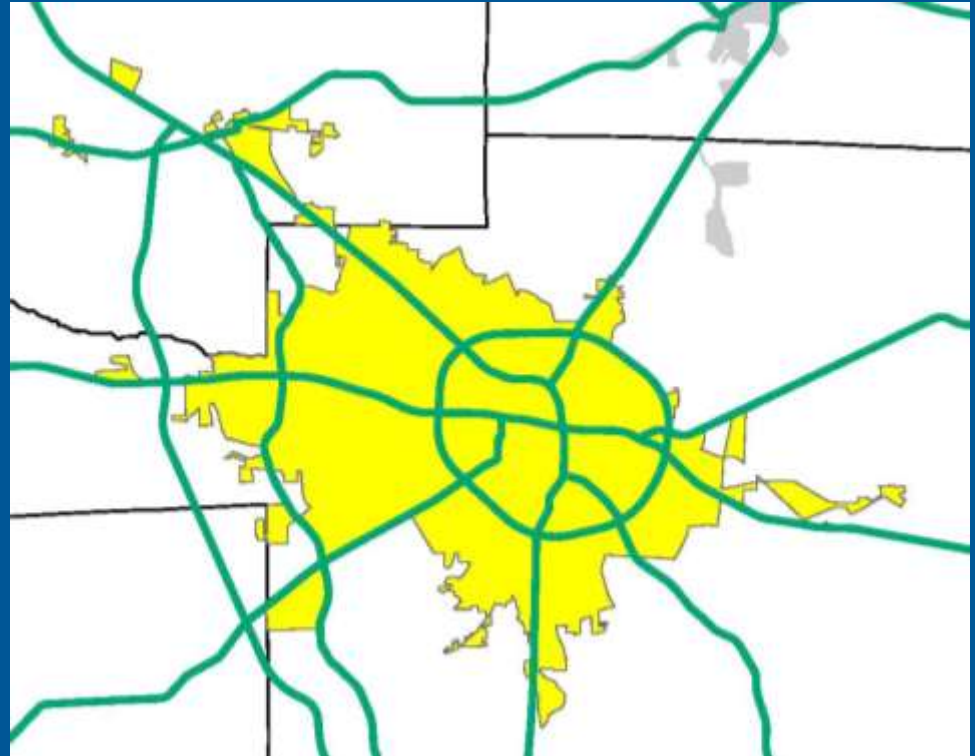
- Example – Dothan Urbanized Area





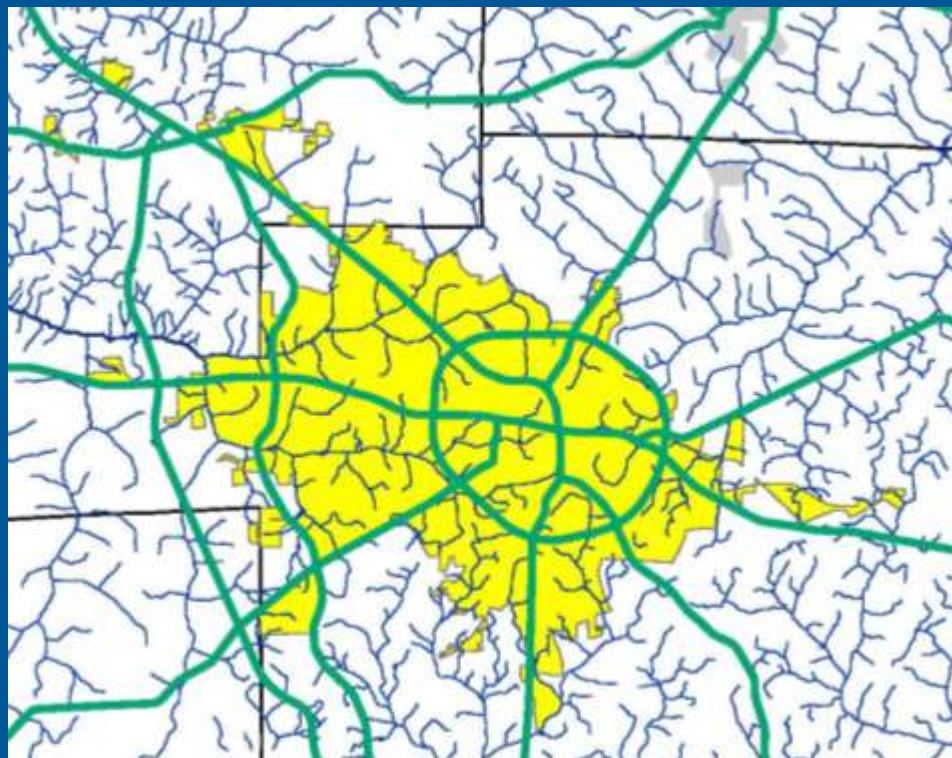
# ALDOT MS4 IDDE Program

- Example – Dothan Urbanized Area
- ALDOT Roads



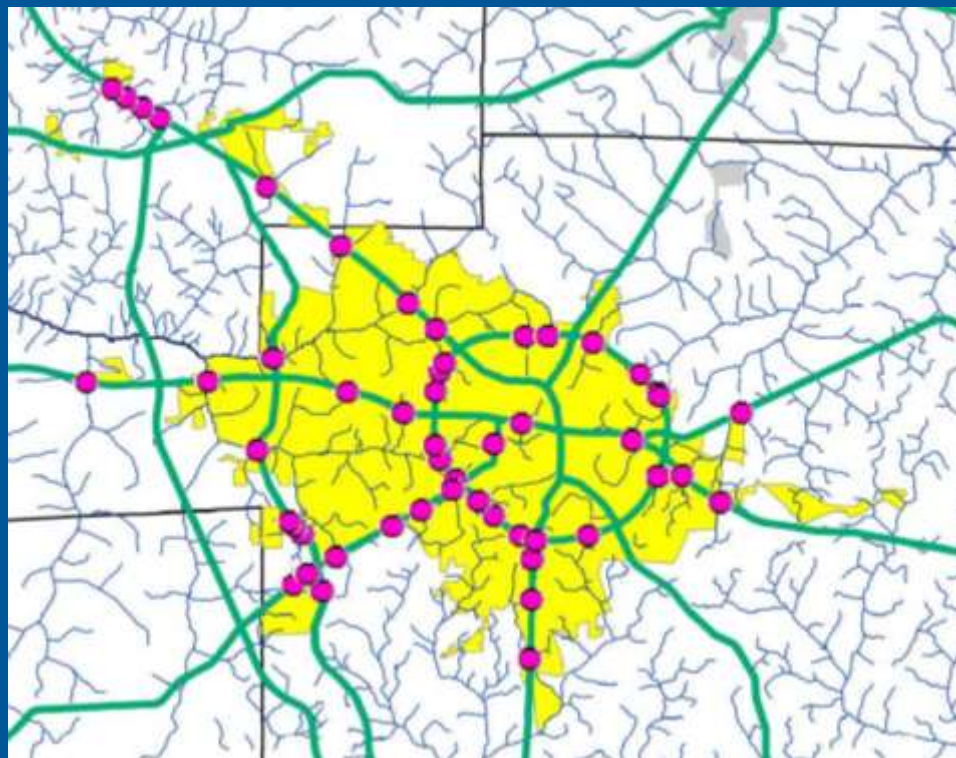
# ALDOT MS4 IDDE Program

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



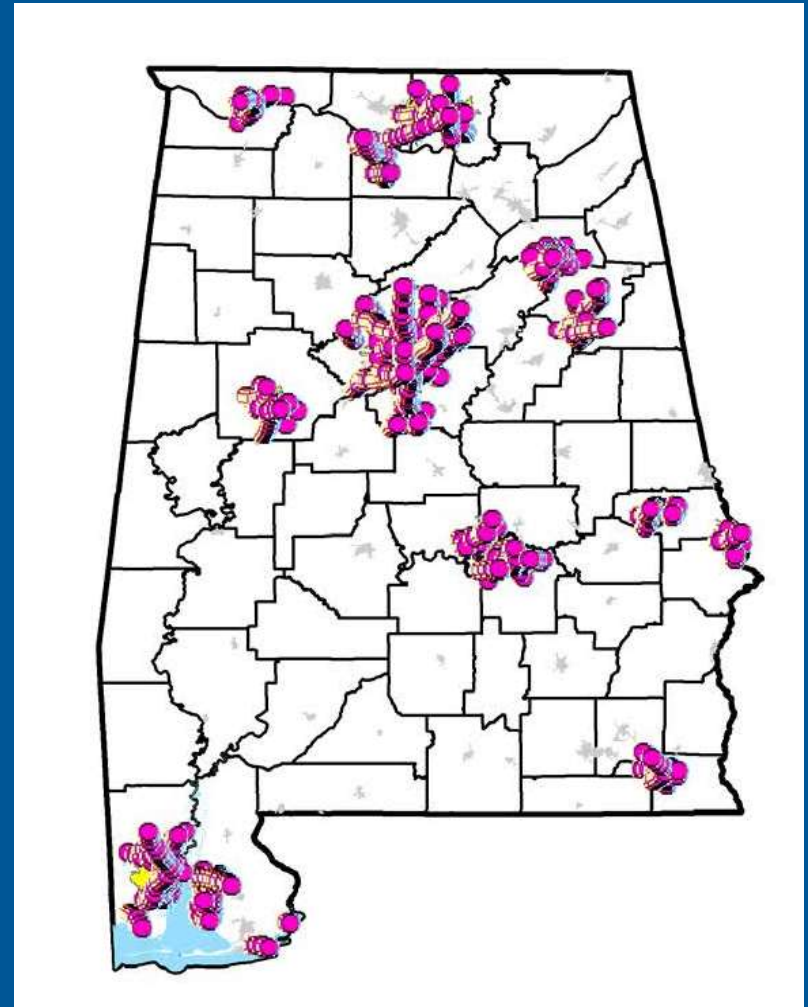
# ALDOT MS4 IDDE Program

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



# ALDOT MS4 IDDE Program

- 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

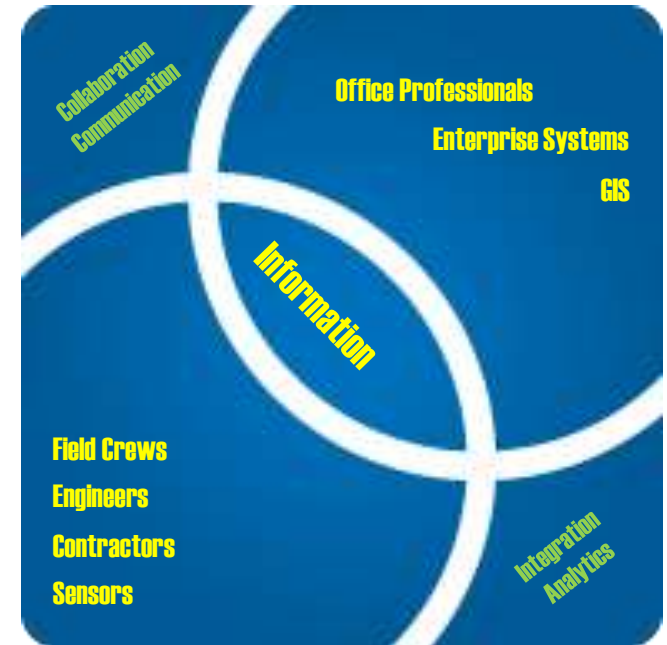
## Outfall Mapping

- 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



## Supporting Various Mobile Platforms

Leverage Trimble's rugged high accuracy GPS handheld devices OR bring you own device (BYOD)

Microsoft Surface Tablet



Apple iPhone®



Samsung Galaxy  
Android Phone



Trimble Ranger 3  
Rugged Handheld



Trimble Geo7®  
(Centimeter level accuracy  
Optional Laser Rangefinder)



Trimble Yuma® 2 Tablet



Trimble JunoT41®  
(Enhanced 1M - 2M accuracy)







# Managing Work From One Location

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



# Trimble Unity Benefits

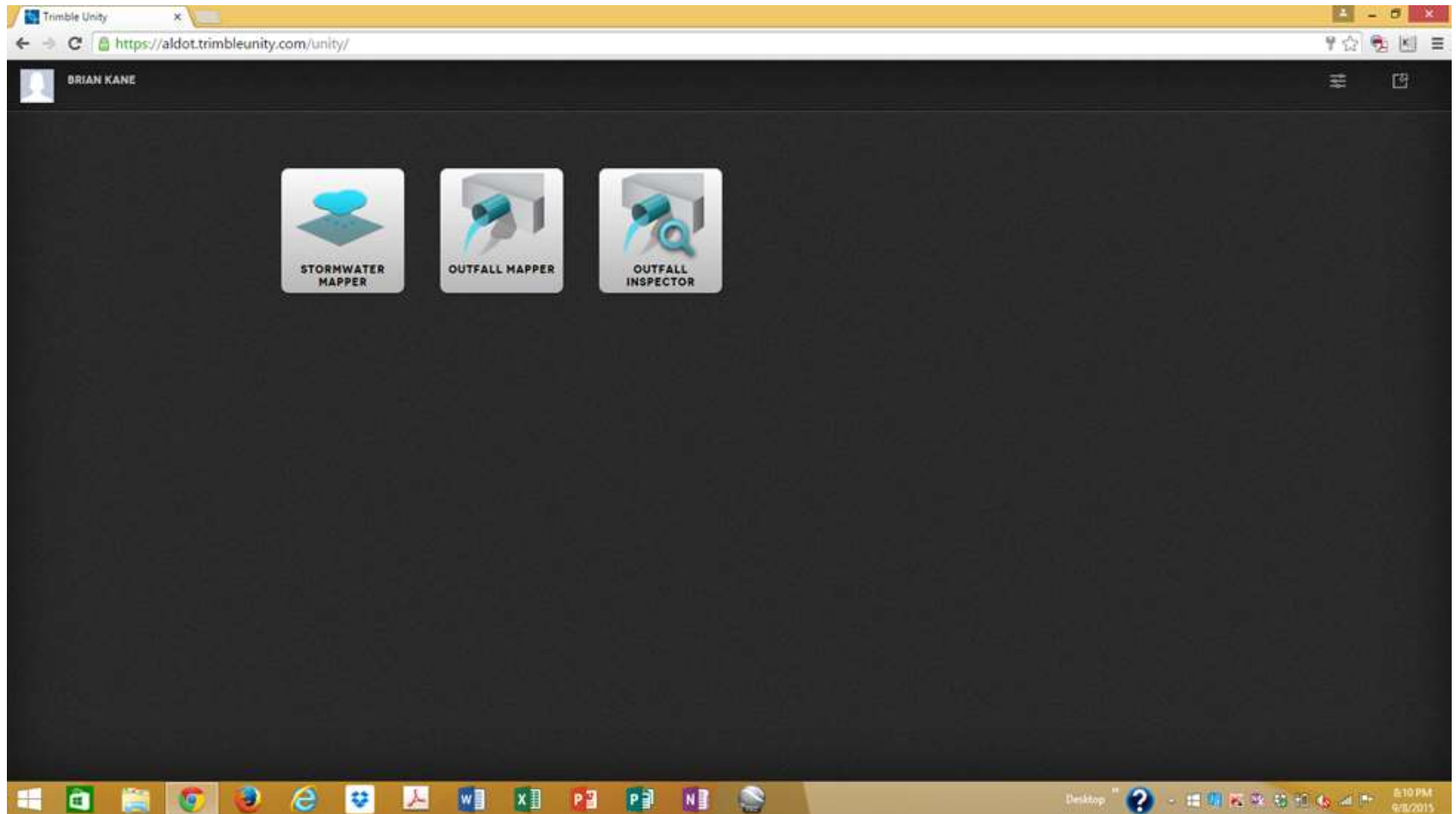
- Standardize and automate field work.
- Eliminate paper and manual data entry.
- Streamline field data collection activities through intelligent workflows and data collection forms.
- Seamless flow of data between the field and office.



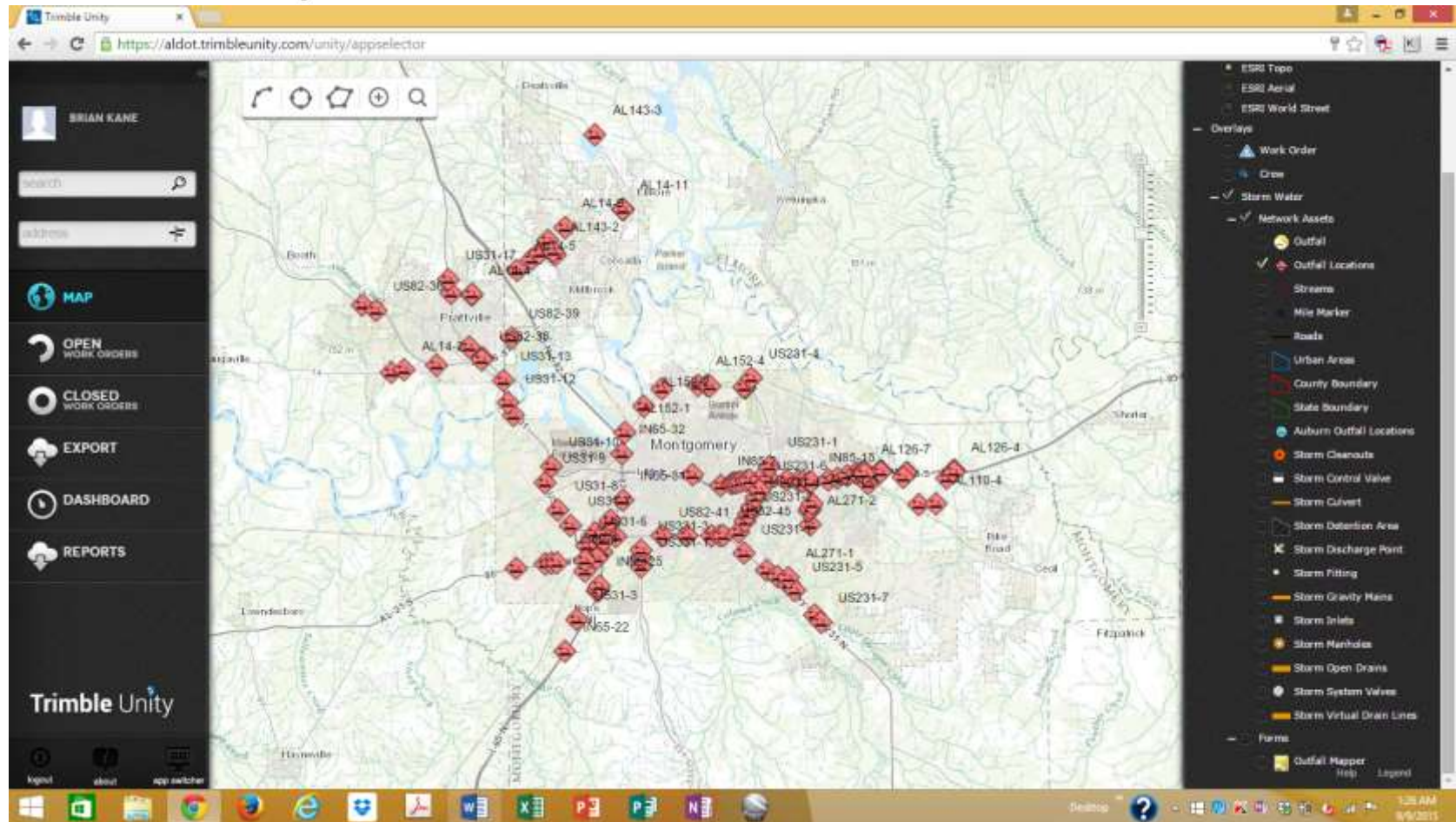
- Improve accuracy of field collected GIS and asset data.
- Keep your GIS up-to-date and locate hard to find assets.
- Connect to your back office systems and manage work on one platform.
- Measure performance through standard and configurable dashboards.



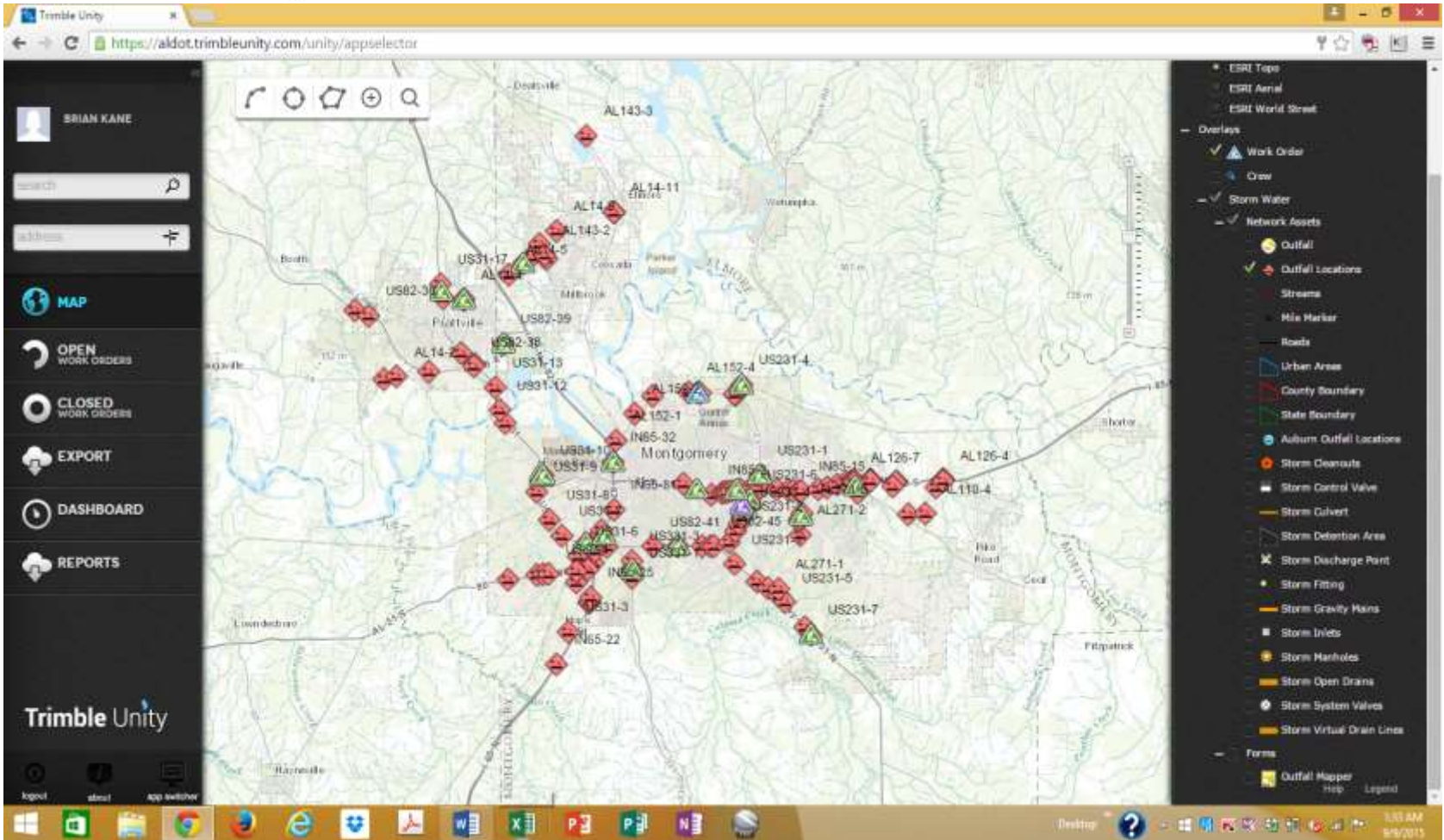
# Trimble Unity



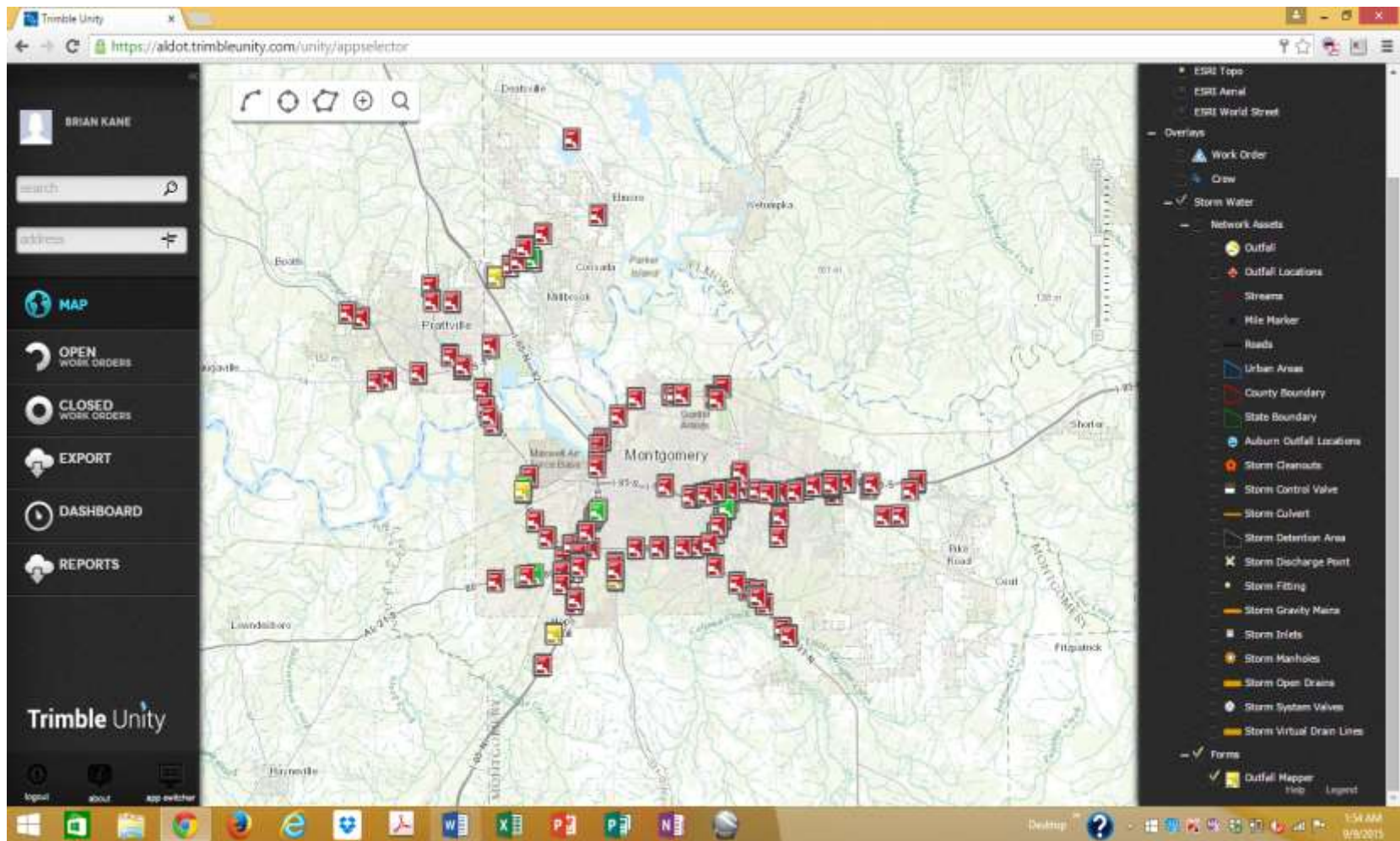
# Trimble Unity







# Trimble Unity





# Trimble Unity

The screenshot displays the Trimble Unity web application interface. The browser address bar shows the URL <https://aldot.trimbleunity.com/unity/appselector>. The user is logged in as BRIAN KANE. The left sidebar contains navigation options: MAP, OPEN WORK ORDERS, CLOSED WORK ORDERS, EXPORT, DASHBOARD, and REPORTS. The main map area shows a topographic map of Alabama with various overlays. A pop-up window for '20129444 Farm Outfall Mapper' is open, displaying details, signature, and photos. A table of 'FORM OUTFALL MAP.. 20129444' is also visible. The right sidebar lists various overlays and network assets, including ESRI Topo, ESRI Aerial, ESRI World Street, Work Order, Crew, Storm Water, Network Assets, Outfall, Outfall Locations, Streams, Mile Marker, Roads, Urban Areas, County Boundary, State Boundary, Auburn Outfall Locations, Storm Cleanouts, Storm Control Valve, Storm Culvert, Storm Detention Area, Storm Discharge Point, Storm Filling, Storm Gravity Mains, Storm Inlets, Storm Manholes, Storm Open Drains, Storm System Valves, Storm Virtual Drain Lines, and Forms. The bottom of the screen shows the Windows taskbar with various application icons and the system clock indicating 1:58 AM on 9/9/2015.



Trimble Unity

https://aldot.trimbleunity.com/unity/appselector

**BRIAN KANE**

search

address

MAP

OPEN WORK ORDERS

CLOSED WORK ORDERS

EXPORT

DASHBOARD

REPORTS

Trimble Unity

login about app selector

## EXPORT FORM DATA

Date Range Work Orders

From To

☐ Data Export

Spatial Reference

Note

Earl GDB Excel Shapefile

TYPE	USER	FORMAT	FROM	TO	WORK ORDERS	EXPORT DATE	NOTES	STATUS
WQ	admin@bka	Excel			2015-09-23, 2015-09-23	04-Sep-2015 23:30		Succeeded
WQ	admin	Excel			2015-09-05, 2015-09-05	07-Sep-2015 17:25		Succeeded
WQ	admin	Excel			2015-08-28, 2015-08-28	27-Aug-2015 02:42		Succeeded
CR	admin	Excel	24-Aug-2015 00:00	26-Aug-2015 00:00		27-Aug-2015 02:39		Succeeded
WQ	admin	ESRI GDB			2015-01-29 CRG-01, L...	26-Jul-2015 23:44		Succeeded
WQ	admin	ESRI GDB			2015-04-27 SR, 2015-	26-Jul-2015 15:56		Succeeded
WQ	admin	ESRI GDB			2015-03-25 SR, 2015-	26-Jul-2015 15:53		Succeeded
WQ	admin	ESRI GDB			2015-03-03 SR, 2015-	26-Jul-2015 15:49		Succeeded
WQ	admin	ESRI GDB			2015-03-25 SR, 2015-	26-Jul-2015 15:45		Succeeded

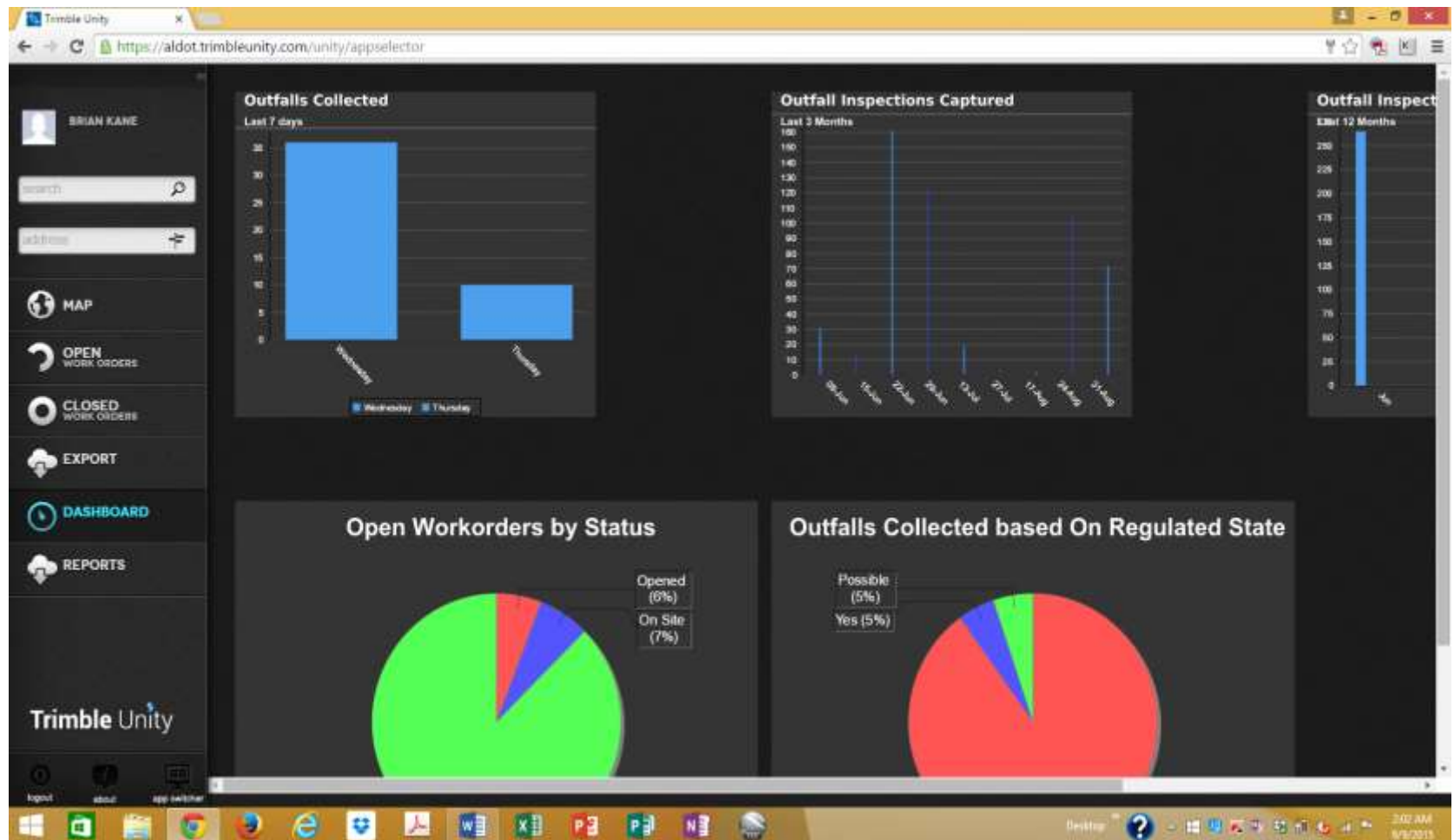
Desktop ? 2:00 AM 9/9/2015











- 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





 <b>ALDOT</b> MS4 Program		 <b>ALDOT</b> MS4 Program		<b>Illicit Discharge Program</b> Major Outfall Inventory Form Transportation Facilities	
Major Outfall		Major Outfall			
<b>(A) General Information</b>		<b>Outfall Evaluation</b>			
(A1) Field Inspector: 20131520		Regulated Outfall: No	Outfall Evaluation: No	Suspect Illicit Discharge: No	
(A2) Date: 27 Feb, 2015		Flow Present: No	Submerged in Water: No	Outfall Damage: No	
		Flow Description	Submerged in Sediment: No	Outfall Damage Severity: [Channel Lining Damage][Inlet Damage][Headwall Damage]	
<b>(B) Location Data</b>		<b>Comments</b>			
(B1) Receiving Water: UT to Sogahatchee Creek		concrete blocks scattered			
(B3) ALDOT Division/Region: Division:					
District: 66					
(B5) Stream Crossing:					
(B6) Stream Crossing Quadrant:					
(B5) Physical Barrier: No Specify:					
(B8) Location: (Latitude, longitude, Elevation, Accuracy) 32.6041626 -85.5182109					
(B11) Describe outfall location relative to surrounding land:					
<b>(C) Outfall Device Characteristics</b>		<b>Photographs</b>			
(C1) Outfall Type: Swale	(C3) Number of	 			
Pipe Diameter (in):	(C6) Headwall:				
Pipe Width (in):	Pipe Height (in):				
Box Width (ft):	Box Height (ft):				
Inlet Type:	Outlet Pipe Dia:				
Side drain Present?:	Side Drain Dia:				
				Page 2 of 2 Temporary Outfall MSAL14-14	



# 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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