



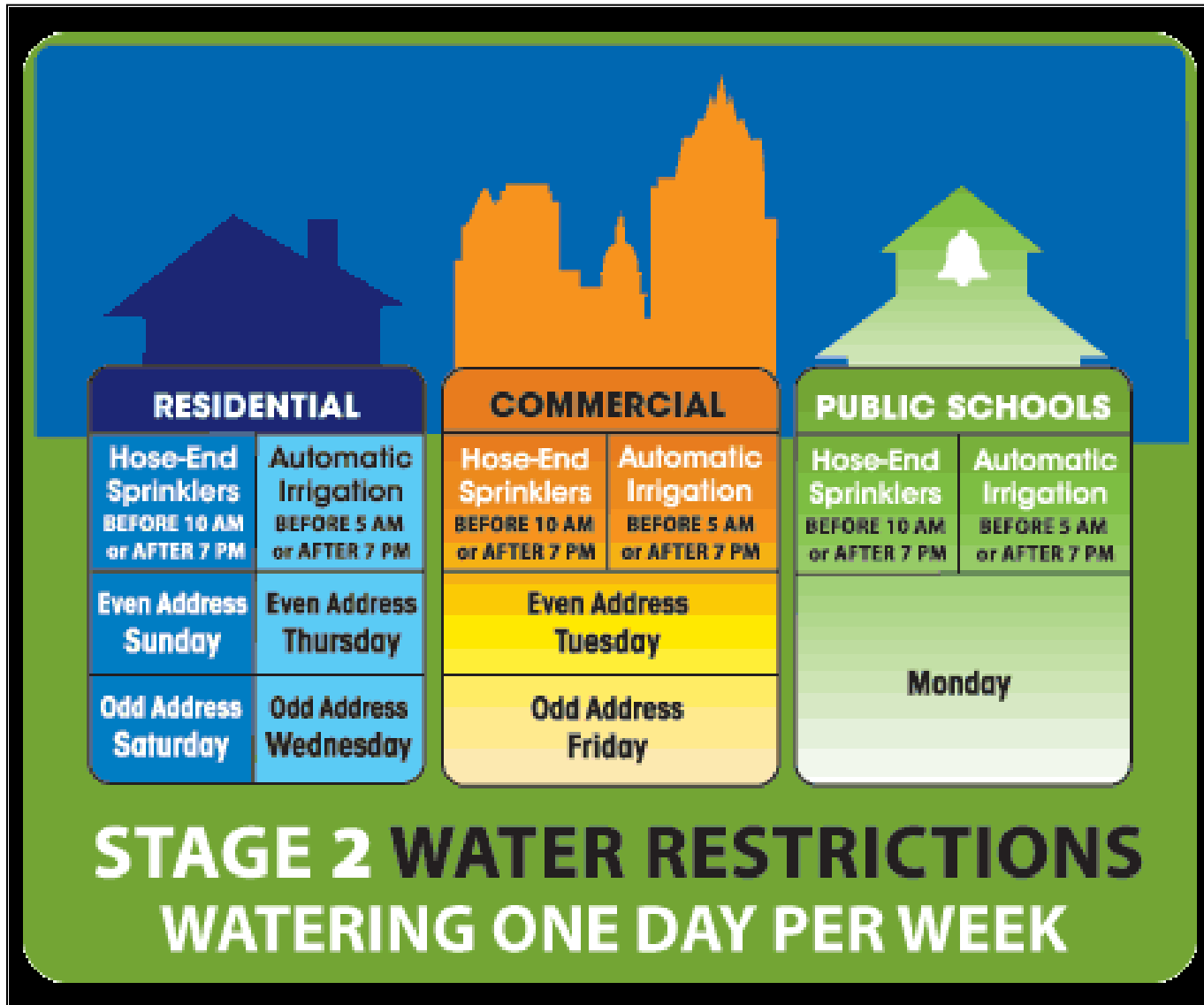
# **Using ArcGIS Online and Collector Application to monitor Water Conservation**

# Introduction

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- John Schulz
- GIS Analyst
- Austin Water Utility
- 850,000 customers Water, Wastewater, Reuse including Wholesale customers (MUDs)
- 3,672 Miles of Water Lines
- Severe Drought Conditions – Currently at Stage 2 with Stage 3 on the horizon.
- Current Stage 2 watering restrictions are in effect

# Stage 2 Watering Restrictions



RESIDENTIAL		COMMERCIAL		PUBLIC SCHOOLS	
Hose-End Sprinklers BEFORE 10 AM or AFTER 7 PM	Automatic Irrigation BEFORE 5 AM or AFTER 7 PM	Hose-End Sprinklers BEFORE 10 AM or AFTER 7 PM	Automatic Irrigation BEFORE 5 AM or AFTER 7 PM	Hose-End Sprinklers BEFORE 10 AM or AFTER 7 PM	Automatic Irrigation BEFORE 5 AM or AFTER 7 PM
Even Address Sunday	Even Address Thursday	Even Address Tuesday		Monday	
Odd Address Saturday	Odd Address Wednesday	Odd Address Friday			

**STAGE 2 WATER RESTRICTIONS**  
**WATERING ONE DAY PER WEEK**



# Stage 2 Continued....

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- **Your assigned watering day is determined by property type, type of irrigation used, and whether the street address ends in an even or odd number.**
- **Hose-end irrigation may take place between midnight and 10 a.m. and between 7 p.m. and midnight on your assigned watering day.**
- **Automatic irrigation systems may operate between midnight and 5 a.m. and between 7 p.m. and midnight on your assigned watering day.**
  - Please reduce system run times to fit within this schedule.
  - Please ensure that your system has a working rain sensor, or operate the system manually when rain is forecasted.
- **Watering with a hand-held hose or a refillable watering vessel, such as a bucket or a Tregator®, is allowed at any time on any day of the week.**
- **Drip irrigation is exempt from the schedule, due to increased efficiency.**
- **To water trees, soaker hoses may be used under the drip-line of the tree canopy or you may use your automatic tree bubblers. Irrigating trees in this manner is exempt from the watering schedule**
- **Watering a vegetable garden with a soaker hose is exempt from the watering schedule.**
- **Washing vehicles at home is prohibited. If you need to wash a vehicle, you may do so at a commercial carwash facility.**
- **Charity car washes are prohibited**
- **Fountains with either a fall or spray of water greater than four inches are prohibited; unless necessary to preserve aquatic life.**
- **Restaurants may not serve water unless requested by a customer**
- **Commercial properties (including restaurants and bars) may only operate patio misters between 4 p.m. and midnight.**

# The Problem

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- Initial way of recording watering violations was a paper based system with records being saved in Excel spreadsheet.
- Eventually a tracking system was designed to allow data to be stored in SQL database with a web interface for entering the data.
- Still paper based collection system.
- With the advent of tablet technology, Water Conservation began using Ipads with a Cloud based application to collect water violations.
- No set data forms – no ability to standardize the data. Basically field notes with some geospatial points.
- COA Policies on Cloud based technology are limited and evolving. Application use was discontinued due to these policies
- Water Conservation was looking at having to go back to the paper collection method.

# The Solution

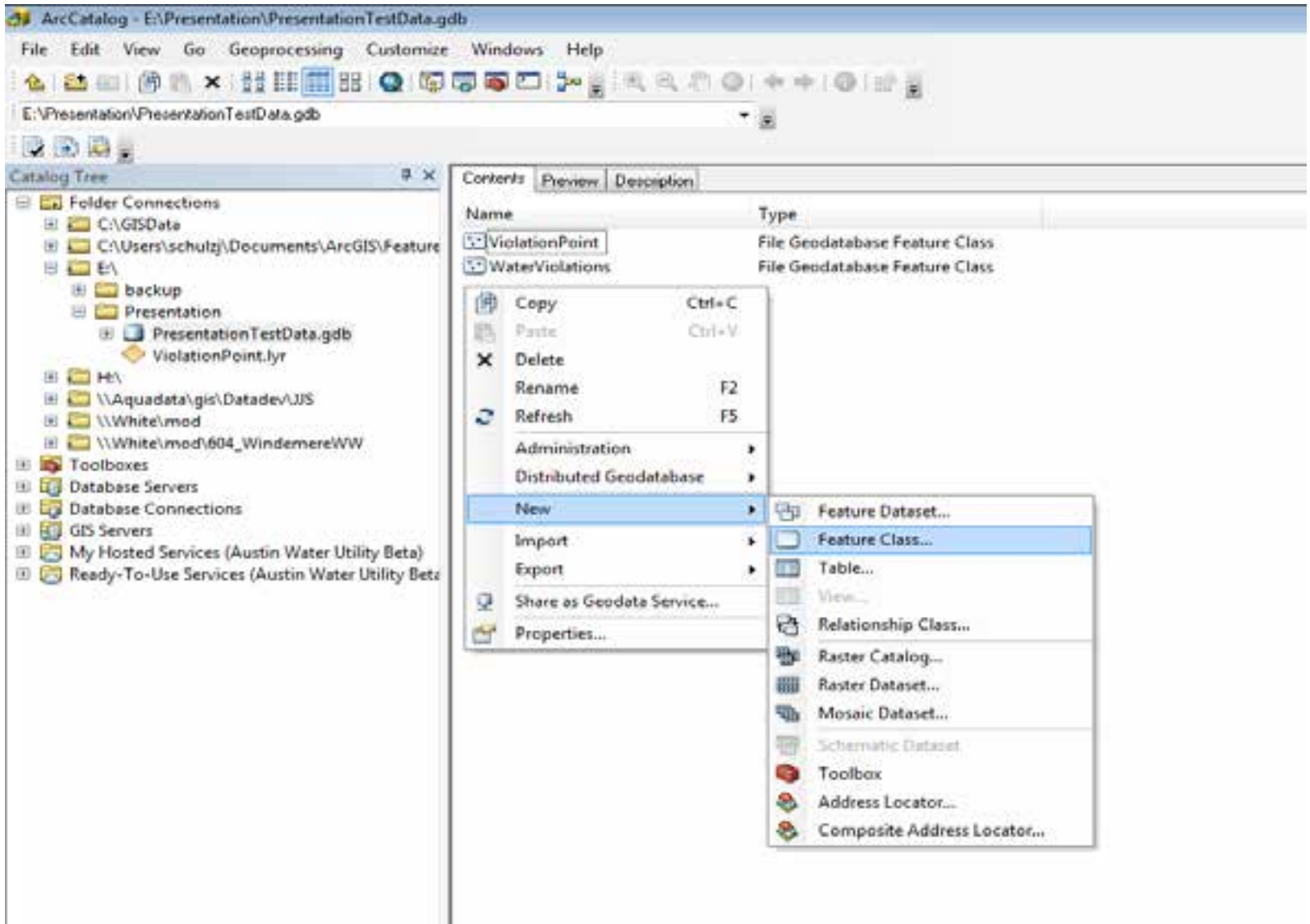
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- We had just implemented our ArcGIS Online Organizational site about the time that Water Conservation abandoned the Cloud based application.
- In a short amount of time we were able to develop a solution for the Water Conservation group with off the shelf software and no custom programming required.
- New features included different base maps
  - Aerial Images
  - Service Territory Maps
  - GIS Address Points
  - Water Utility features
  - MUDs (Municipal Utility Districts)
- Ability to standardize the data thru pick lists by using domain values in the geodatabase.
- Near real-time updates.
- Multi users using the data simultaneously (Editing)
- Ability to add attachments in the field. Pictures, Videos, and PDFs
- Can use the Collector App or ArcGIS Online App as well as the browser version application.
- Capability to re-use services in many web maps at the same time

# Creating Features

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- **Creating data in ArcMap is the most efficient way to publish features.**
- ArcGIS 10.1 or 10.2 have a function to share data as a feature service either to Arcserver or to ArcGIS Online. If using older version you will have to use shapefiles and directly import them into the web application to create a feature service.
- **Design your data in ArcMap. Create a file GDB or use an existing one.**
  - **Using file GDB lets you create a spatial index on your data which helpful if your using a large data set.**
- If creating a new feature from scratch, choose your feature type— point, line, or polygon.
- Create your necessary fields, choose appropriate data types. If using domains or subtypes create necessary data.
- **Choose symbology— Pick something simple but representative of what the feature is.**
- Create some test points before publishing to AGOL to make sure data looks right. Make sure pick lists work according to plan. No way fix in AGOL without re-publishing the feature.





**Feature Class Properties**

General Editor Tracking XY Coordinate System Domain, Resolution and Tolerance

Fields Indexes Subtypes Feature Extent Relationships Representations

Field Name	Data Type
OBJECTID	Object ID
SHAPE	Geometry
Date_Time	Date
Type	Text
Violation	Text
Location	Text
Address	Text
Notes	Text
Process_Status	Text

Click any field to see its properties.

**Field Properties**

Alias	Type	
Allow NULL values	Yes	
Default Value		
Domain	Notice_Type	
Length	50	

Import...

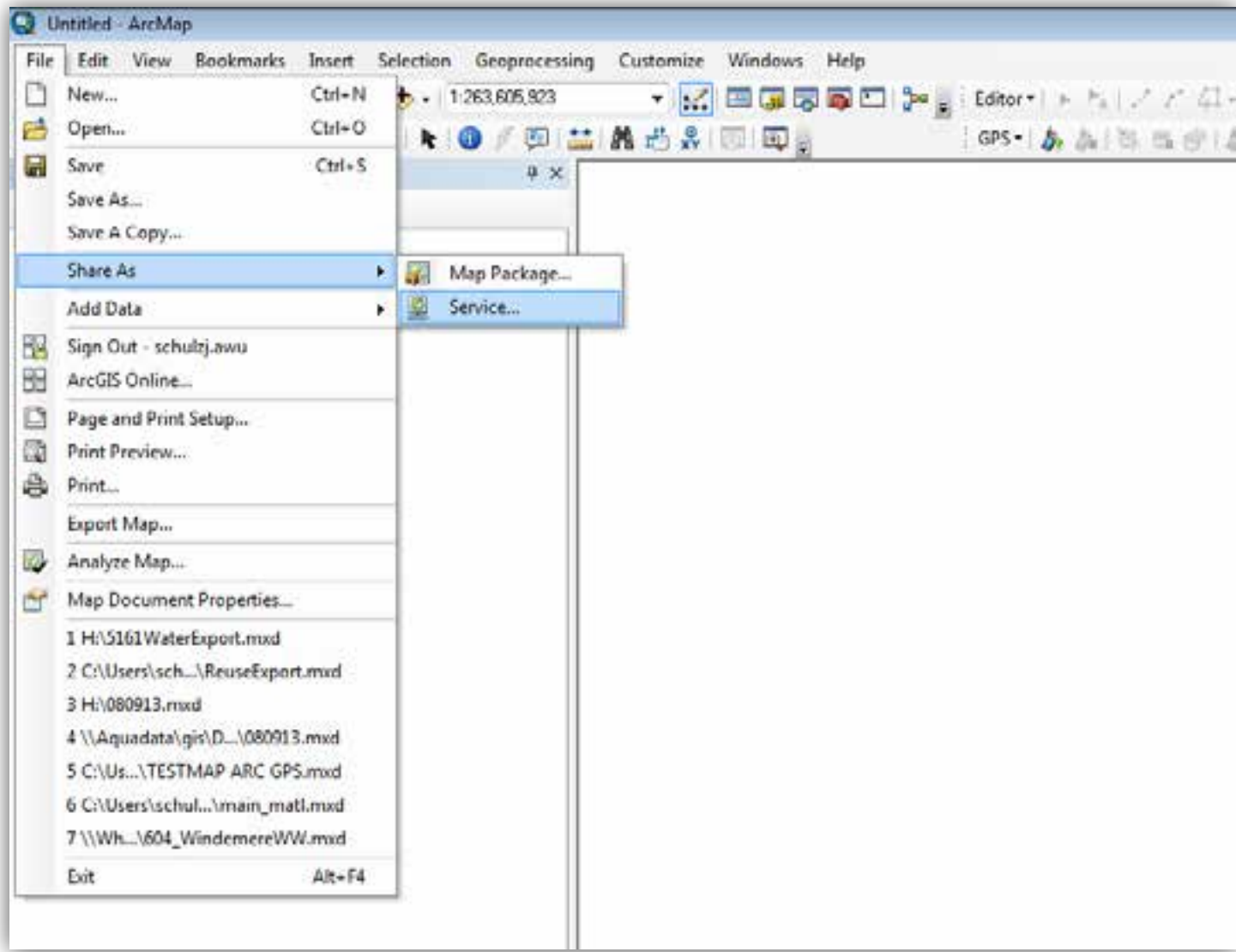
To add a new field, type the name into an empty row in the Field Name column, click in the Data Type column to choose the data type, then edit the Field Properties.

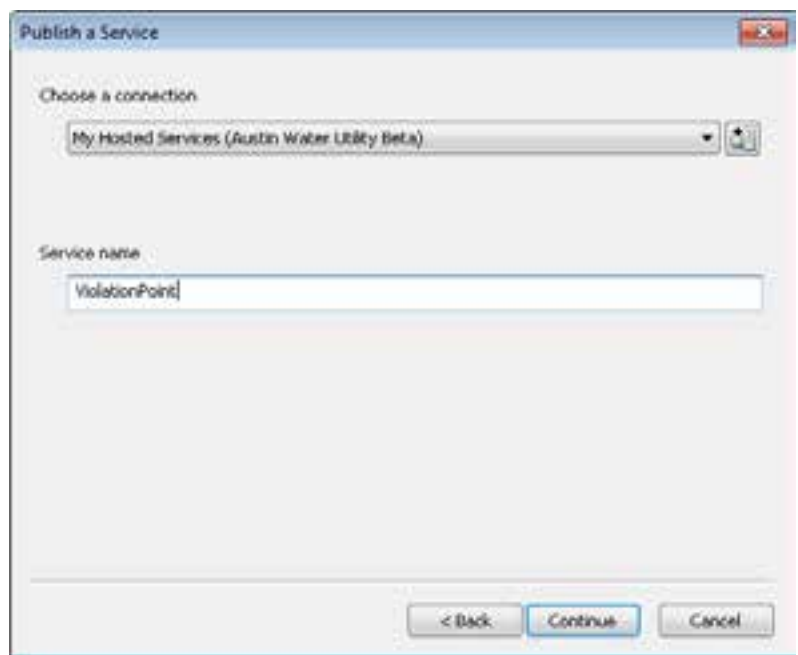
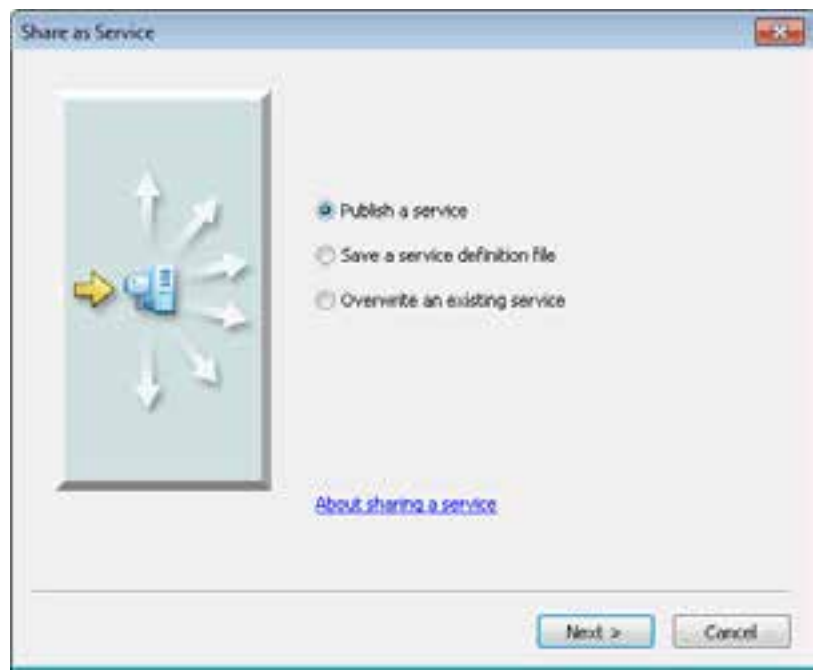
OK Cancel Apply

# Creating Features Continued...

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- Click on the Share as a Service option under FILE. Choose the ArcGIS Online option. Name your service and continue to Metadata phase.
- **Create the Metadata for your feature. Provide adequate information about the feature service you are creating.**
- If using not using tiled services, uncheck the box under Capabilities. If you intend to edit data you should check the feature access box.
- **Click on the analysis button on the dialog box. Fix any errors that will keep the service from publishing. (Note You must have at least a publisher level account in AGOL in order to publish a feature service)**





Service Editor

Connections: My Home Services - Service Name: ViolationPoints

Input | Apply | Preview | Publish

- Features
- Conditions
- Field Mapping
- Caching
- Advanced Settings
- Item Description**
- Sharing

### Item Description

Header (required):  
the test data

Tags (max 10):  
two data  
[Choose Your Tags](#)

Description:  
the test data

Allowed user capabilities:  
Description Date

Credits:  
created by J.S. Hall

Update existing variables in datasets based on this description.

Service Editor

Connections: My Home Services - Service Name: ViolationPoints

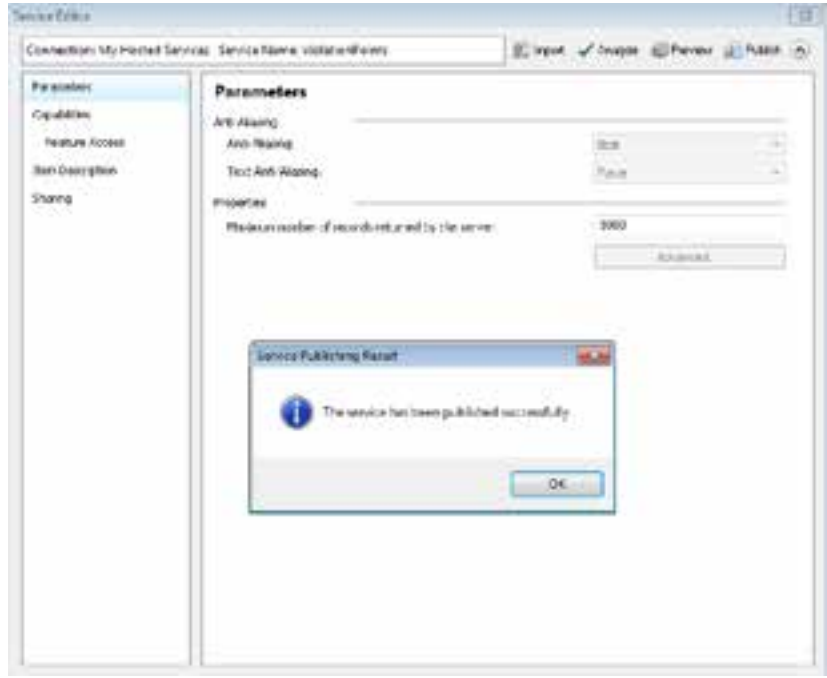
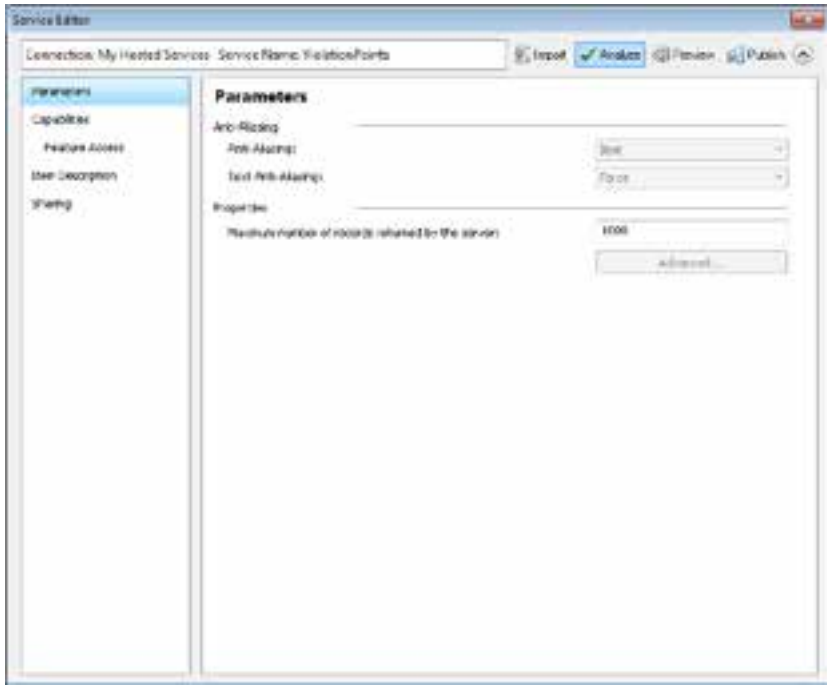
Input | Apply | Preview | Publish

- Features
- Conditions**
- Field Mapping
- Item Description
- Sharing

### Capabilities

Choose the capabilities you want to be enabled for this service:

- Field Mapping
- Feature Access





# Feature Setup in AGOL

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- Log into ArcGIS Online. Go to My Content. The new feature will be in your default folder.
- Open the service, Click on the Edit button.
- Make changes to Metadata if necessary, make sure editing is enabled if you want editing ability, choose additional options as appropriate. Enable Track Edits if necessary. SAVE

## ViolationPoint



This is test data for viewing purposes.  
Features (hosted) by schultz, awu  
Source: Feature Service  
Last Modified: October 9, 2013  
0 ratings, 21 views

- OPEN
- SHARE
- EDIT
- DELETE
- MOVE
- CHANGE OWNER
- USAGE

### Description

Watering Violations. This is test data for viewing purposes

### Access and Use Constraints

AWU and Water Conservation Personnel Only

### Layers

ViolationPoint (1)

### Properties

Shared with	The item is not shared.
Tags	Watering Violations
Credits	created by J. Schultz
Size	1 KB



### Access and Use Constraints

**B I U** | | | | Font: Verdana Size:

AWU and Water Conservation Personnel Only

### Properties

Tags:

Credits:

Extent: Left: -160 Right: 180 Top: 90 Bottom: -90

Editing:  Enable editing and allow editors to:  
 Add, update, and delete features  
 Update feature attributes only  
 Add features only

Export Data:  Allow others to export to shapefile, CSV, geodatabase, or KML.

Sync:  Enable Sync (disconnected editing with synchronization).

Track Edits:  Keep track of who created and last updated features.  
 Editors can only update and delete the features they add.



# Configuring the Web Map

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- Select a base map
- Add layers to map
  - Choose services you have created or other services from your organization
  - You can also use services from AGOL that open to the public.
  - You can use services published from ArcServer.
  - Set the order of the layers in the Table of Contents.
  - Set Symbology as necessary.
  - Configure your feature popups as needed.
- Save Web Map.
- Share Web Map and feature services it uses to a group. Only the members of this group will be able to access this web map. Map can be shared to multiple groups.
- Test Map out. Make sure popups and symbology works appropriately.

HOME - ViolationPoint

Details Add Edit Save map Save Share Print Directions Measure Bookmark

### Pop-up Properties

Pop-ups display information about features in the layer. Define the pop-up below.

Pop-up Title  
ViolationPoint: (OBJECTID)

Pop-up Contents

Display: A list of field attributes

These field attributes will display:

- Date\_Time (Date\_Time)
- Address (Address)
- Type (Type)
- Violation (Violation)

Configure Attributes

Show feature attachments as links

Pop-up Media

Display images and charts in the pop-up!

ADD

No images or charts. Click 'Add' to add one. Use the arrows to order.

### Configure Attributes

Check the fields you want to display and edit. Select a field to change its alias, order it, and format it.

<input type="checkbox"/> Display	<input type="checkbox"/> Edit	Field Name	Field Alias
<input checked="" type="checkbox"/>	<input type="checkbox"/>	(OBJECTID)	OBJECTID
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	(Date_Time)	Date_Time
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	(Address)	Address
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	(Type)	Type
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	(Violation)	Violation
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	(Location)	Location
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	(Notes)	Notes

Format  
12/21/1997 6:00 PM

Hint

OK CANCEL

HOME ▾ ViolationPoint

Details Add ▾ Edit Basemap

Pop-up Properties

Pop-ups display information about features in the layer. Define the pop-up below.

**Pop-up Title**  
ViolationPoint: {OBJECTID}

**Pop-up Contents**  
Display: A list of field attributes ▾

- These field attributes will display:
- Date\_Time (Date\_Time)
  - Address (Address)
  - Type (Type)
  - Violation (Violation)

Configure Attributes  
 Show feature attachments as links

**Pop-up Media**  
Display images and charts in the pop-up:

ADD ▾

No images or charts.  
Click 'Add' to add one.  
Use the arrows to order.

SAVE POP-UP CANCEL



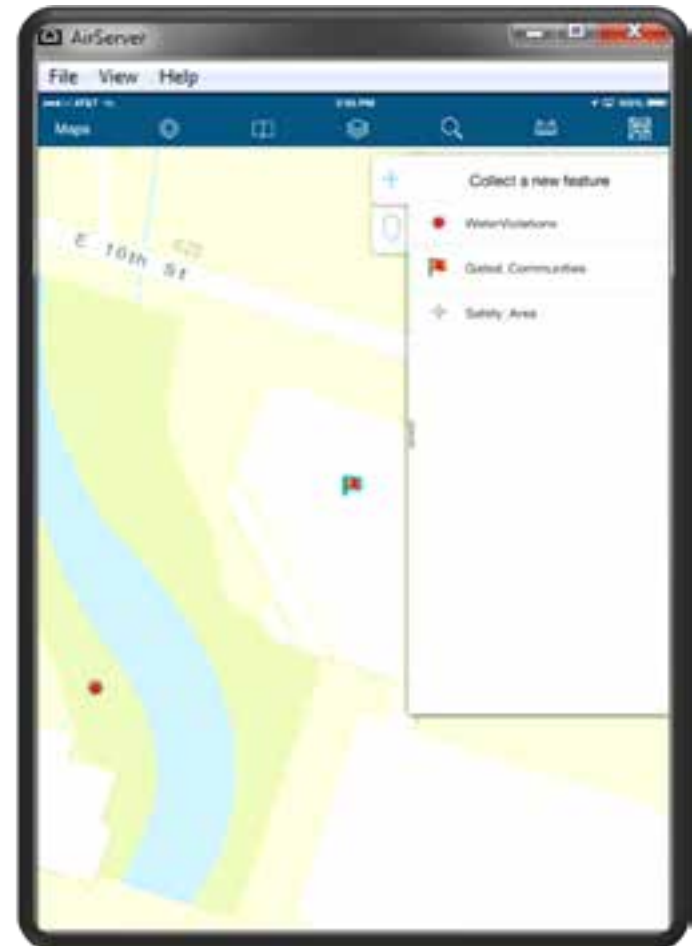
# Collector Application

- Install ESRI Collector App from iTunes for iPhone or Ipad or from Google Play for Android devices.
- Tap app on device
  - Sign in using your ArcGIS Online account
  - The ALL Maps screen will appear
  - Select the specific web map you have created or is shared to your group
  - Tap the Location Button



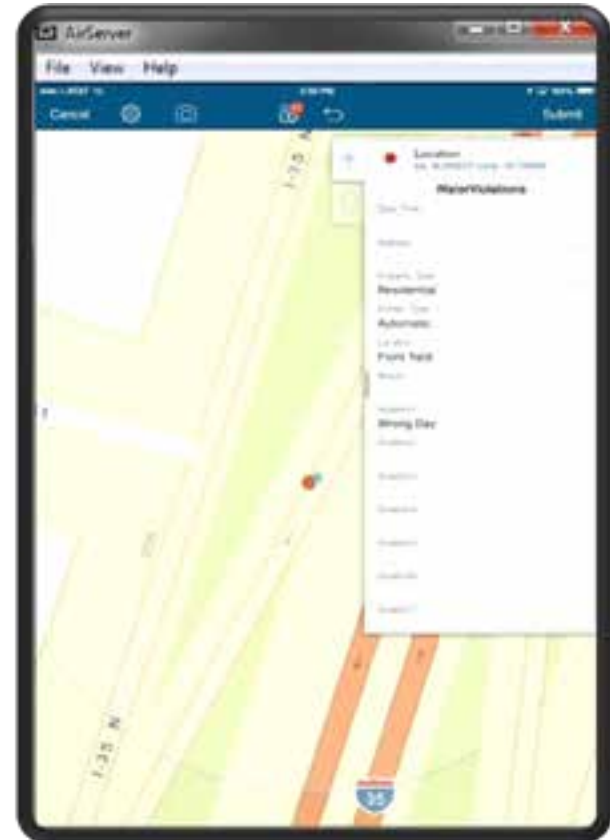
# Collector App Continued

- Select the Collect New features tool to plot a feature
- Choose the feature you want to create.



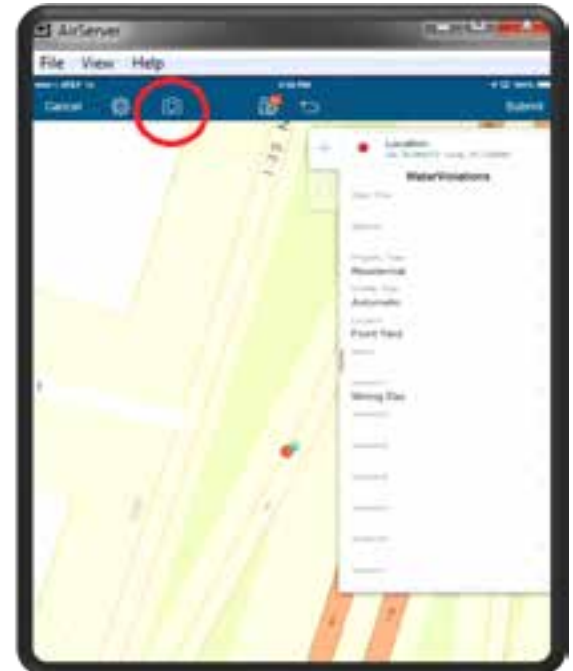
# Collector App Continued...

- The edit form will now show on the screen. Fill out the required fields.



# Collect App Continued...

- Tap on the camera icon to add an attachment



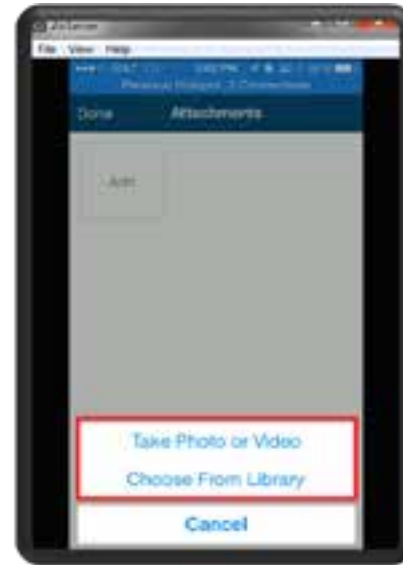
- Tap the add button.





# Collector App Continued...

- Select either Photo, Video or Choose an existing picture from your Library.

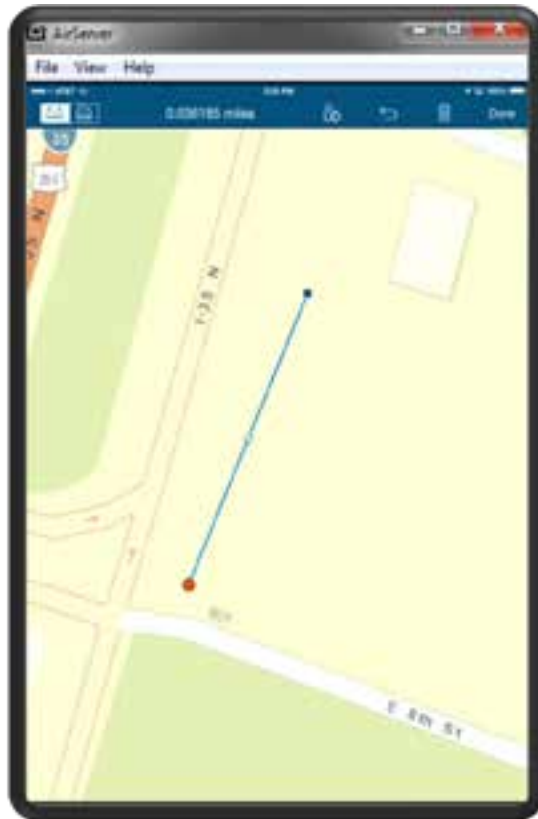


- Take Photo – Preview it  
Choose Use Photo  
Select Done or add additional attachments.  
Select Done to finish editing new feature.



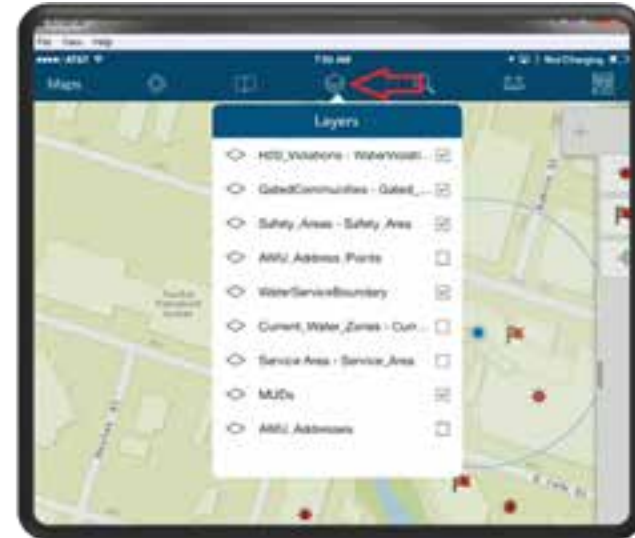
# Other Collector Functionality

- Measure Tools
- Line and Polygon measuring.

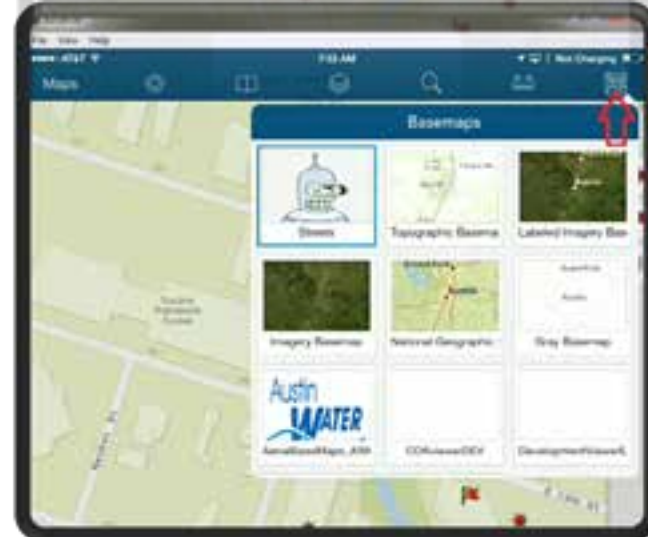


# Other Collector Functionality

- Toggle Map layers On and Off



- Switch Base Maps



# Limitations

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- Position Accuracy– Limited to the accuracy of the onboard GPS of the mobile device.
- Zoom scale – Limited to 1: 1128 for largest scale.\*\* Can be addressed by building base maps with tiles at a larger scale
- Data plan cost. --Unknown what data usage is for devices.



# Once Future Enhancements

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- Direct interface into Tracking software from AGOL -- Pending
- Offline Editing Capability – Now Available --
- Connecting to SDE database – Available thru Arcserver services
- Connecting to Survey Grade GPS for better Positional Accuracy – Can be done with Lightning to DB9 Cable.



# John's Wish List

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- **Ability to use Related Tables in Collector App**
- **Query data in Collector App**
- **Attribute Transfer from different Features**