

What We Do

Allegan County GIS
www.allegancounty.org/gis

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Part I

Service

Chapter 1

Applications

1.1 Applications for Treasurer Dept.

Forfeiture Data Collection

Problem and Analysis

Background

Treasurer department has an annual responsibility to properly document the tax forfeiture process. The LIS Department built an application in MS Access and MapInfo that consumed a daily export from BSA and was deployed to the field on a laptop. A digital camera was used for site photos and later imported into the laptop.

Statement of Problem

Current Tax Forfeiture workflow is built on MapInfo software which has been replaced by ESRI software. The Forfeiture data collection application must be recreated in the ESRI framework.

Analysis

Tax Forfeiture Application, referred to here as: **Forfeiture App** will facilitate:

- Mobile data collection on handheld device, referred to here as: **Mobile Interface**
 - Mobile Interface will:
 - * Synchronize with data in the office (online)
 - * Navigate to forfeiture sites (offline)
 - * Collect data and photos of forfeiture sites (offline)
 - * Synchronize the collected data with data in the office (online)
 - Daily form production and printing for each site visited with required data and images

Design

Overview

The Forfeiture App documents the Tax Forfeiture process

The key data set, is referred to here as: **Forfeiture Parcels**

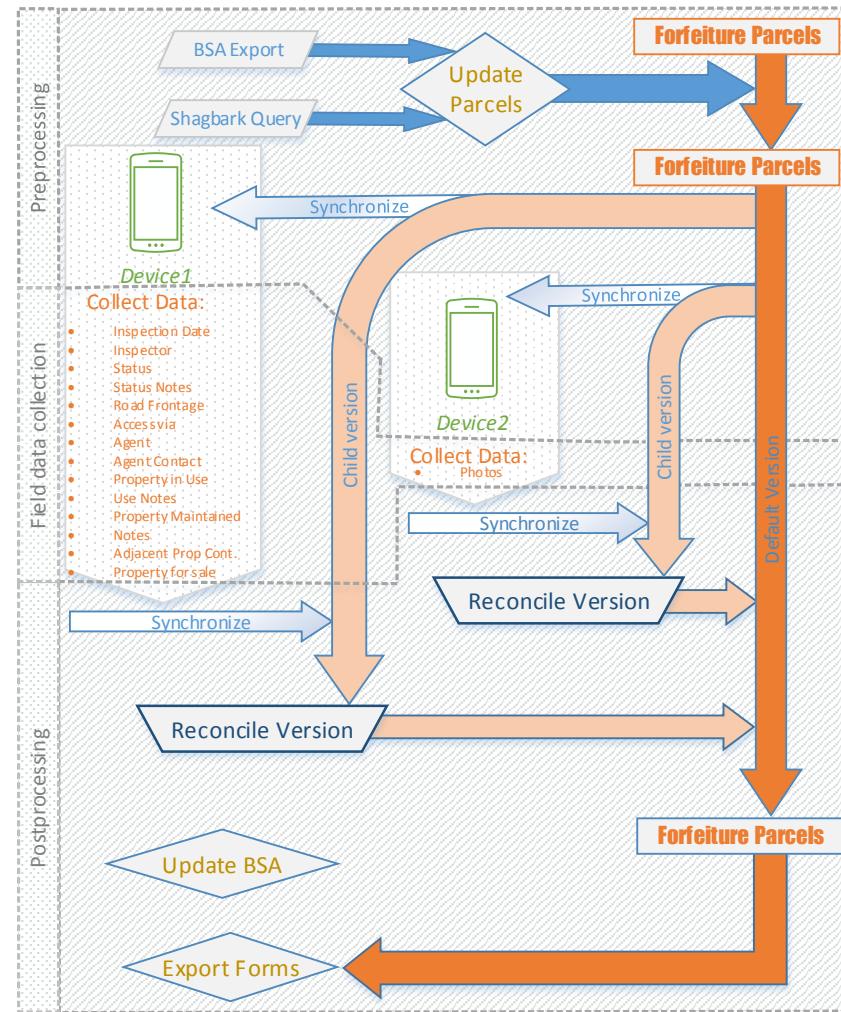


Figure 1.1: Project Design

Forfeiture App Summary

Three parts of the daily routine:

1. Preprocessing (in the office):

- Export current forfeiture list from BSA
- Update Forfeiture Parcels with BSA export
- Update Forfeiture Parcels with contaminated sites information
- Synchronize Forfeiture Parcels to Mobile Interface

2. Field data collection with Mobile Interface:

- Aids in navigation
- Provides a Checklist of data points for each site
- Attaches photos for each site
- Save results for synchronization in post-processing

3. Post-processing (in the office)

- Synchronize data and images collected in Mobile Interface to Forfeiture Parcels
 - Export form for each site
 - Print form for each site
 - Update BSA data
-

Technologies Used in The Forfeiture App

BSA Data

Details of parcels in the forfeiture process are managed in BSA Delinquent Tax.net. The Treasurer office does a BSA export of the parcels in need of a site visit in the preprocessing.

ArcGIS Desktop

Tools are designed to preprocess and postprocess forfeiture parcel data for fieldwork. The user will execute a preprocess script tool that prepares the data for field deployment. After fieldwork, a post process script tool syncronizes data from the fieldwork with the live data on the Allegan County network.

ArcGIS Collector

A free mobile application developed and tested on Android is deployed to the field for data collection. The application is configured to work offline(without an internet or cellular connection) by syncronizing before and after fieldwork. The user collects the necessary information on each forfeiture parcel in the field disconnected, and then uploads the changes when reconnected.

ArcGIS Enterprise Geodatabase

Live data from a publishing geodatabase (ACPub), running on SQL Server database server (acintsql01) provides access to Forfeiture Parcels

ArcGIS Portal Webmaps and Apps

Forfeiture Parcels is served as a feature service (REST service) named TaxReversionParcels. A webmap on Portal, called the Forfeiture Field Map consumes the TaxReversionParcels exposing the data to editing. The Forfeiture Field Map is configured to work in the ArcGIS Collector App.

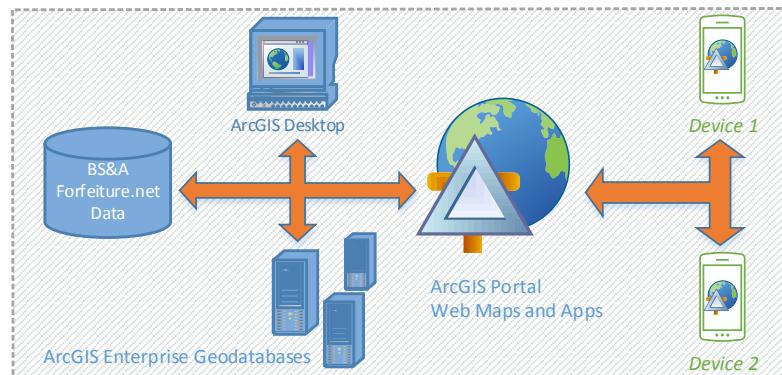


Figure 1.2: Technology Design

Data Details

Data Location

The data is located in ACPUB. ACPUB is a geo-database on ACINTSQL01.

Forfeiture Parcels Data



Figure 1.3: Live Data Location

Contamination Data

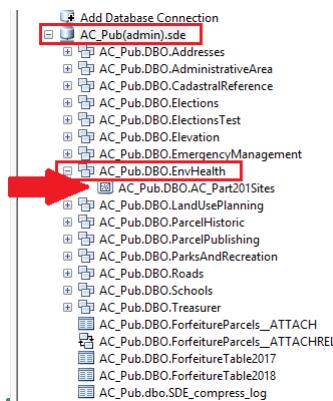


Figure 1.4: Contamination Feature Class

ForfeitureParcels Feature Class

Data Details:

Attribute Details				
Field Name	Field Alias	Entry Type	Note	
PropertyNumber	Property Number	Prefilled	NA	
Need2Print	Print Today	Dropdown	Yes or No	
InspectionDate	Inspection Date	Autofill or Dropdown	NA	
Inspector	Inspector	Dropdown	NA	
Address	Address	Prefilled	NA	
Status	Status	Dropdown	NA	
StatusNotes	Status Notes	Open Entry	120Char	
Roadfrontage	Road Frontage	Dropdown	Yes or No	
AccessVia	Access Via	Open Entry	30Char	
Agent	Agent	Open Entry	30Char	
AgentContact	Agent Contact	Open Entry	30Char	
PictureComments	Picture Comments	Open Entry	50Char	
PropertyInUse	Property In Use	Dropdown	Yes or No	
UseNotes	Use Notes	Open Entry	120Char	
PropertyMaintained	Property Maintained	Dropdown	Yes or No	
PropMaintNotes	Property Maintained Notes	Open Entry	120Char	
PropertyContaminated	Property Contaminated	Prefilled	Preprocessing	
PropertyContaminatedNotes	PropertyContaminatedNotes	Prefilled	Preprocessing	
AdjacentPropertyContaminated	Adjacent Property Contaminated	Prefilled	Preprocessing	
AdjPropertyContaminatedNotes	Adj Property Contaminated Notes	Prefilled	Preprocessing	
PropertyForSale	Property For Sale	Dropdown	Yes or No	
GlobalID	GlobalID	NA	NA	
PostedDate	Posted Date	Dropdown	Date	
Posted	Posted	Prefilled	NA	
InList	In List	Prefilled	Preprocessing	
PostedInList	Posted In List	Prefilled	Preprocessing	
Acres	Acres	Prefilled	NA	
Class	Class	Prefilled	NA	

Table 1.1: Dataset Details

Webmap Details

The Forfeiture Field Map is made up of a basemap and a feature layer.

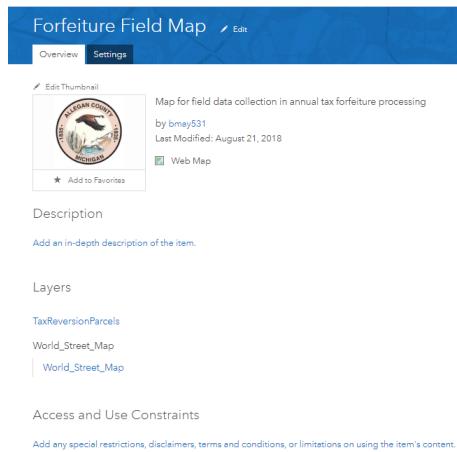


Figure 1.5: Web Map Details

Feature Layer Details

TaxReversionParcels has been configured for offline use.

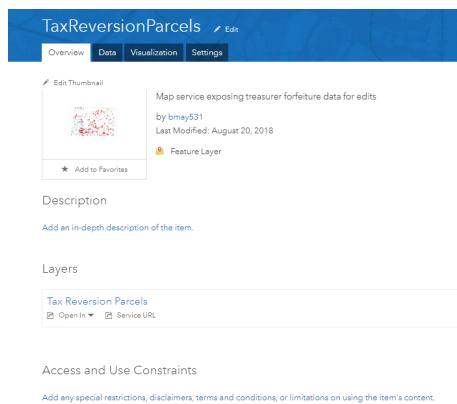


Figure 1.6: Feature Layer Details

Basemap Details

- A tiled basemap service is used

- The infoserv user credentials are used for sharing

- The url for the shared service is:

[https://tiledbasemaps.arcgis.com/arcgis/rest/
services/World_Street_Map/MapServer](https://tiledbasemaps.arcgis.com/arcgis/rest/services/World_Street_Map/MapServer)

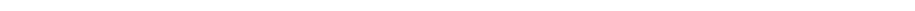
The screenshot displays the ArcGIS Online interface for the 'World Street Map (for Export)' service. At the top, there's a navigation bar with links for ArcGIS, Pricing, Map, Scene, and Help, along with a Sign In button and a search bar. Below the header, the title 'World Street Map (for Export)' is prominently displayed, with a 'Overview' tab selected. The main content area features a map preview showing a portion of the world map with red outlines around specific regions. To the right of the map, a detailed description states: 'This layer presents highway-level data for the world and street-level data for many areas around the world. This layer is designed to support export of basemap tiles for offline use. ArcGIS Online Subscription required.' It also notes that it's a 'Tile Layer by Esri' created on Oct 15, 2013, updated on Aug 15, 2018, with a view count of 39,772. Below the description, there are two buttons: 'Authoritative' and 'Subscriber'. On the right side of the page, there are several interactive buttons: 'Open in Map Viewer', 'Open in Scene Viewer', and 'Open in ArcGIS Desktop'. Further down, there's a 'Details' section with information about the source being a 'Map Service', its size (1 kb), and a five-star rating. It also includes social sharing icons for Facebook, Twitter, and LinkedIn. The 'Owner' section lists 'Esri' as the managed organization. Finally, the 'Tags' section lists numerous keywords related to the map, such as 'World', 'Global', 'Europe', 'North America', 'United States', 'Southern Africa', 'Asia', 'South America', 'Australia', 'streets', 'street map', 'tile package', 'basemap', 'highways', 'roads', 'transportation', 'landmarks', 'parks', 'community', 'community basemap', 'map', 'AFA250_base', 'current', 'esri_basemap', and 'general availability', 'export'.

Figure 1.7: Basemap Source Description

Hard Copy Record

screenshots: arcmap map arcmap tools portal screenshots sql server mgt
screen shots phone screenshots

ArcGIS Server



Administrative Manual

Annual Setup

A new dataset for forfeiture parcels must be created each year. The forfeiture information comes from BSA Forfeitures.net and the parcel geometry and other attributes comes from ACParcelsCombined.

To get the BSA Forfeiture data, create a table query for a certain year.

First, clear the features from the existing ForfeitureParcels dataset

- Use the Delete Feature Tools
- In the tool:
 - Select ACPub.DBO.ForfeitureParcels

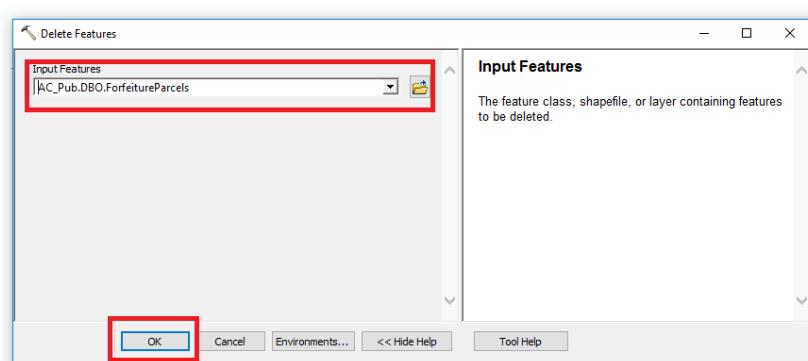


Figure 1.8: Delete Features

Press OK

Add Query Layer

- In ArcMap ⇒ Open the New Query Layer Dialog
- File ⇒ Add Data ⇒ Add Query Layer
- Select your connection

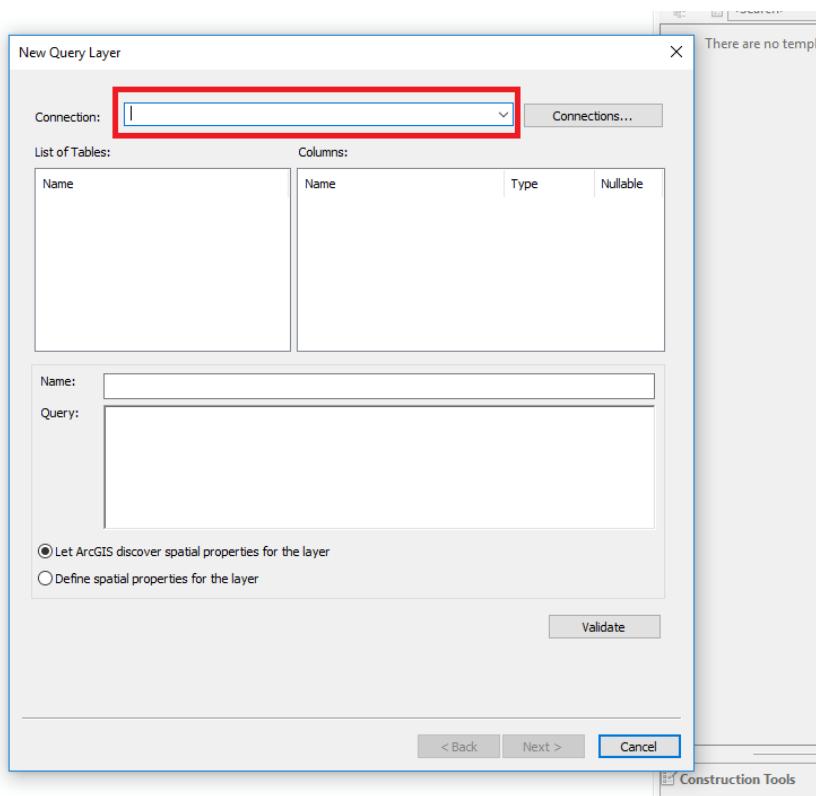


Figure 1.9: New Query Layer Dialog

Query Text:

```
SELECT [parcelnumber] FROM [D005ALLEGAN].[dbo].[Forfeitures]
WHERE forf_year = 2019
```

Details of the Query Layer

Enter into the tool

- Choose connection
- Name the query
- Enter SQL query

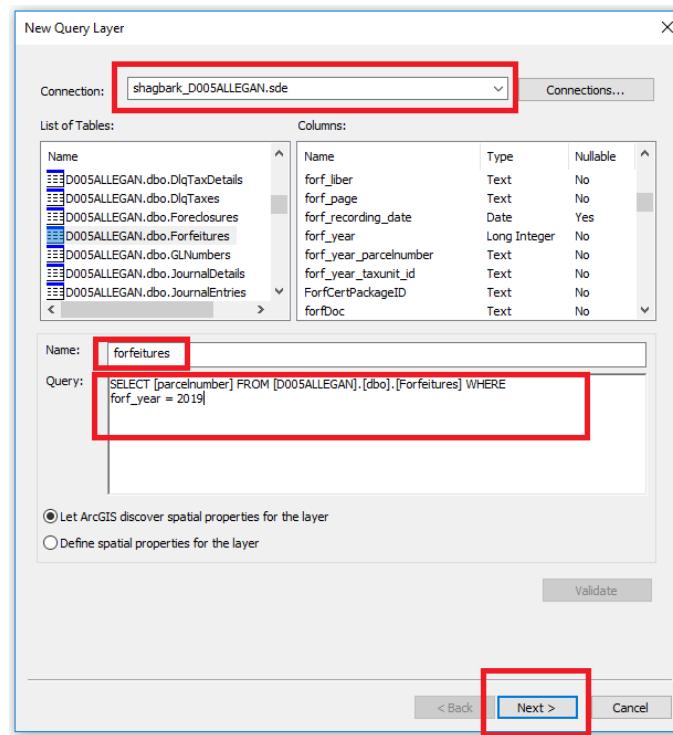


Figure 1.10: Forfeiture Query Layer Details

- Press Next

Select a Unique Identifier

- Press Finish

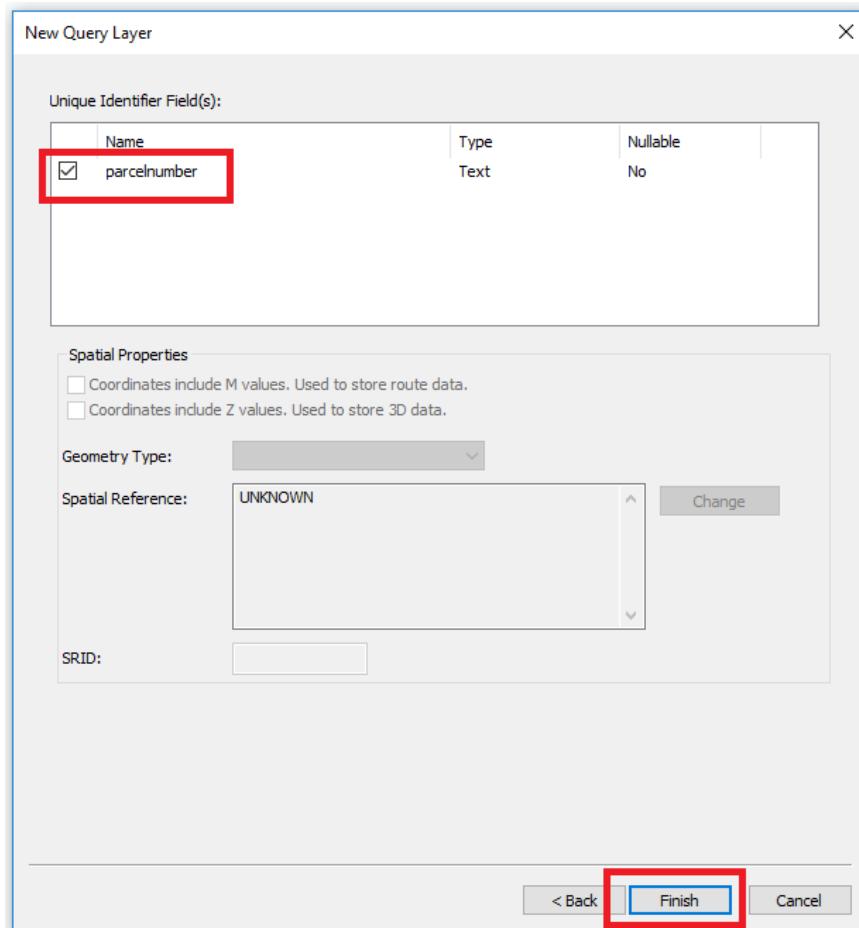


Figure 1.11: Query Layer Unique ID

Table is added to the map

The screenshot shows the ArcGIS Pro interface with two main windows: 'Table Of Contents' on the left and 'Table' on the right.

Table Of Contents: This window lists layers. A red box highlights the 'D005ALLEGAN' folder, which contains a single layer named 'D005ALLEGAN.DBO.forfeitures'.

Table: This window displays the contents of the 'D005ALLEGAN.DBO.forfeitures' table. The table has two columns: 'parcelnumber' and 'ESRI_OID'. The data is as follows:

parcelnumber	ESRI_OID
01-007-012-00	1
01-008-005-00	2
01-016-031-10	3
01-019-001-13	4
01-019-005-97	5
01-025-017-00	6
01-026-020-00	7
01-030-014-10	8
01-030-019-00	9
01-031-031-00	10
01-034-009-00	11
01-034-014-10	12
01-034-055-00	13
01-034-067-00	14
01-034-087-00	15
01-034-108-00	16
01-035-015-00	17
01-035-020-20	18
01-035-030-00	19
01-035-044-00	20
01-035-044-10	21
01-120-004-00	22
01-120-010-00	23
01-120-031-00	24
01-120-032-00	25
01-220-010-00	26
01-250-001-00	27
01-300-004-00	28
01-320-020-00	29
01-320-021-00	30
01-370-016-00	31
01-740-009-00	32
02-001-012-31	33
02-003-018-00	34
02-005-004-20	35
02-007-005-00	36

At the bottom of the 'Table' window, it says '(0 out of 836 Selected)'.

Figure 1.12: Forfeiture Table Added

Add Parcels Layer to the map

Add ACParcelsCombined to the map to provide parcel geometry and attributes

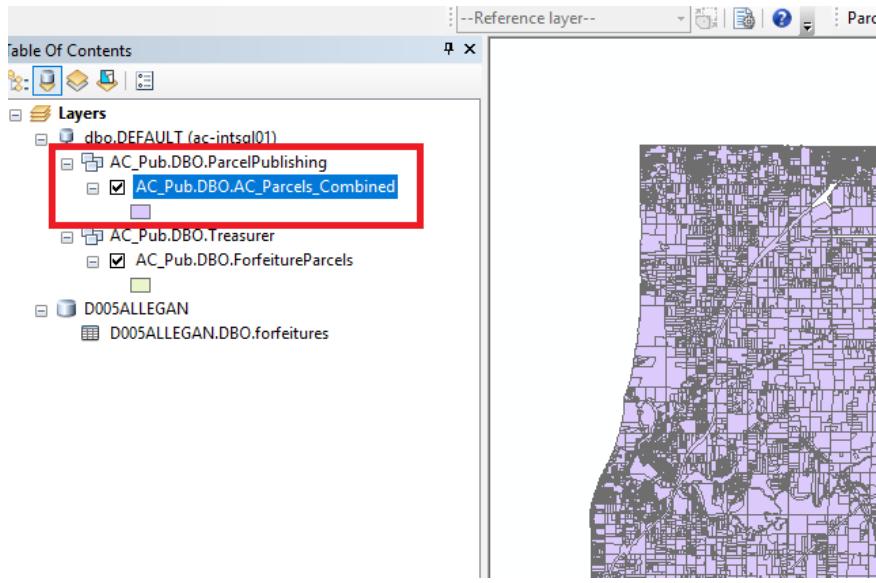


Figure 1.13: Parcels Layer Added

Create Join

Create new join to ACParcelsCombined of forfeitures based on parcel numbers

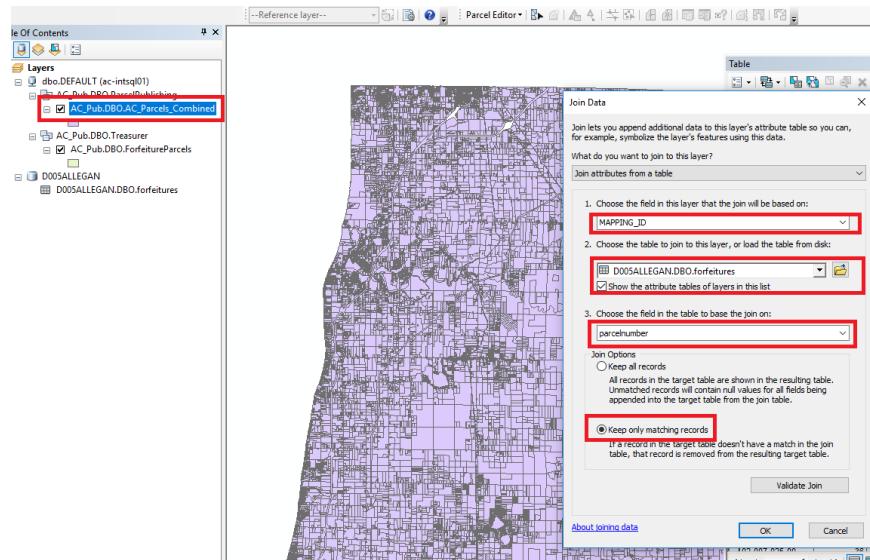


Figure 1.14: Join Parcels

Export Joined Features to a temp location

- Right click → on joined feature class in TOC and choose export

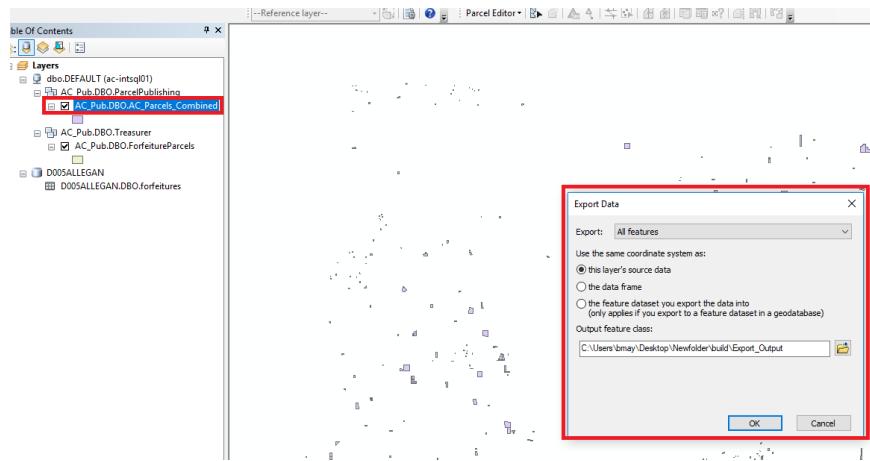


Figure 1.15: Export Joined Features

- choose location and press OK

Load data from temp location to forfeitureParcels

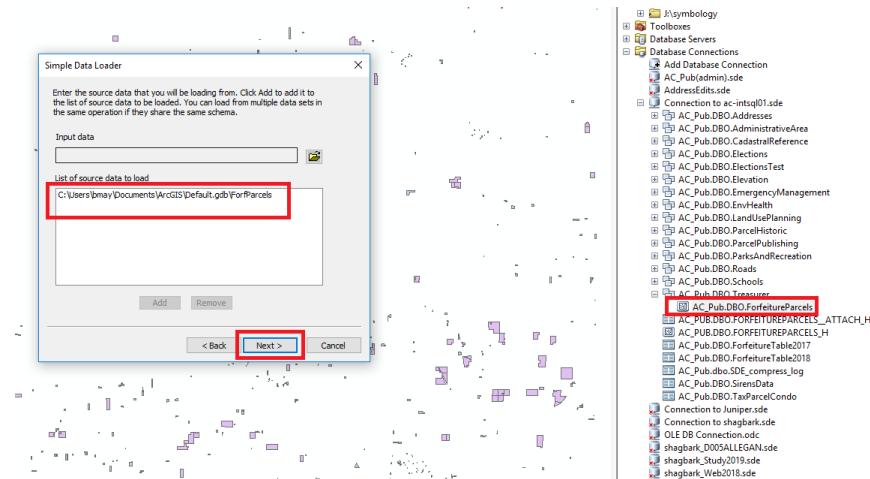


Figure 1.16: Load Data 1

push next

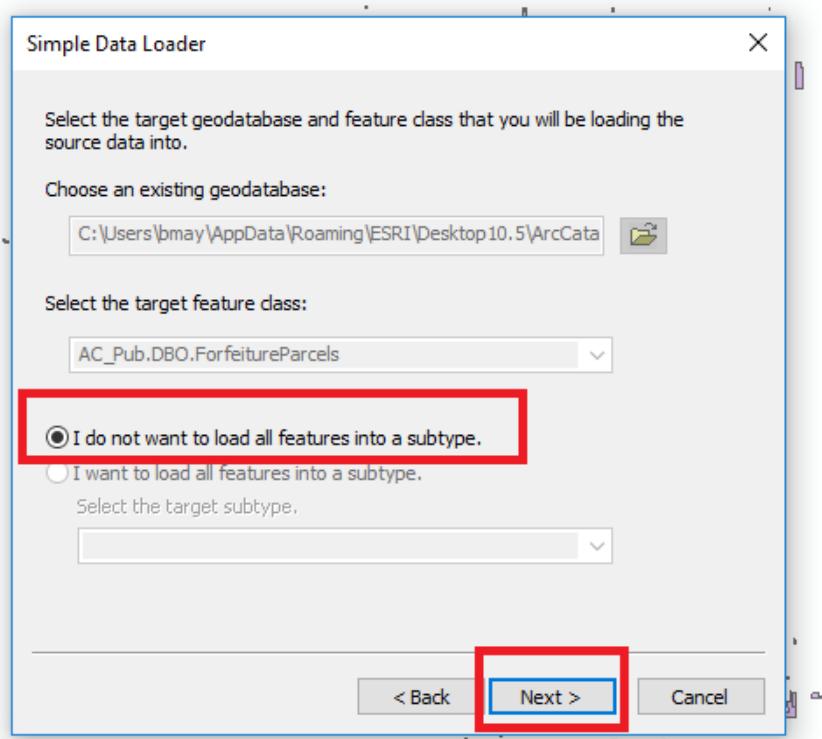


Figure 1.17: Load Data 2

Match these fields

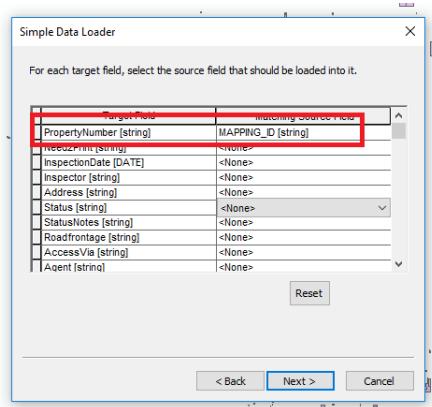


Figure 1.18: Match Fields

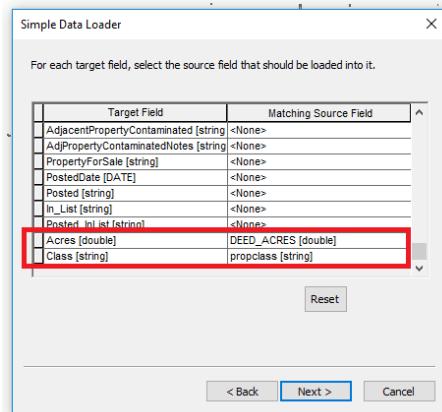


Figure 1.19: Match Fields

push next

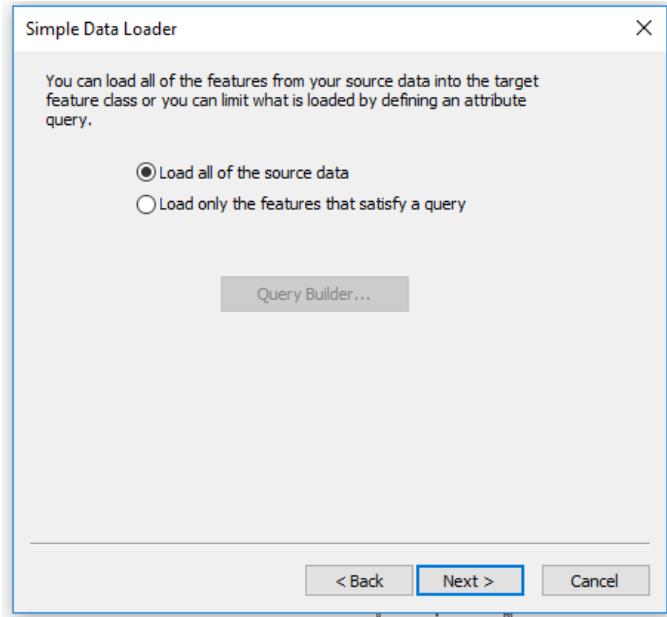


Figure 1.20: Load Data 3

push Finish

Data Setup

Register as versioned and Add Global IDs

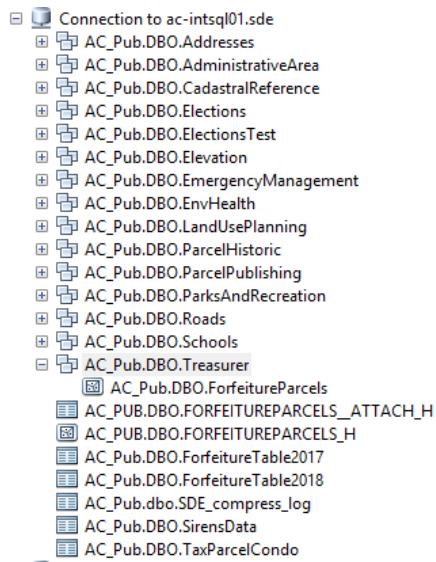


Figure 1.21: Setup Data

push Finish

Create Attachments

Right Click ⇒ Manage ⇒ Add Attachments

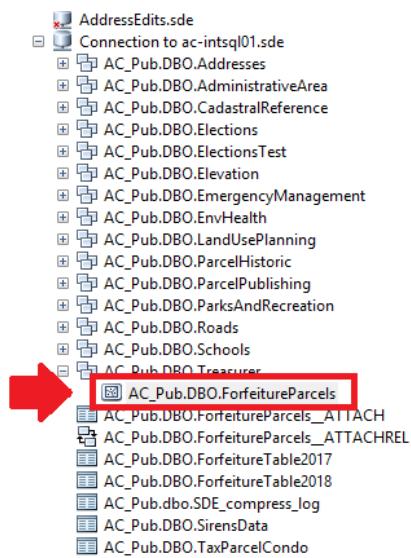


Figure 1.22: Create Attachments

Setup Users in ArcGIS

Users that will run Pre and Post processing scripts must be created and given privileges on ACPub Treasurer Feature Data Set.

For any new users of the geoprocessing tools, use the create Database User tool
or

Go to ⇒ Right click on ACpub ⇒ Administration ⇒ Add User

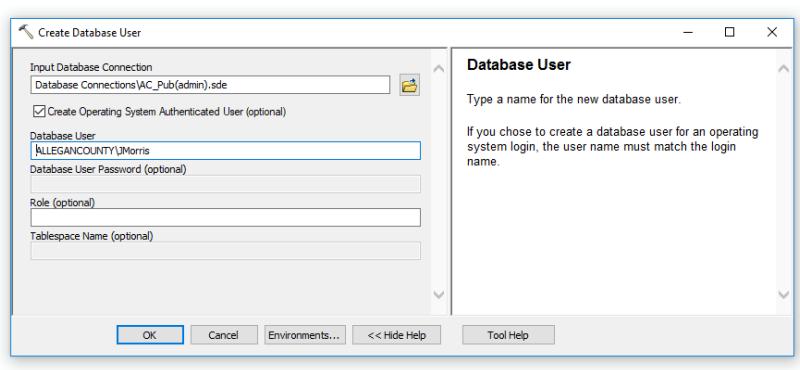


Figure 1.23: Add Db User

Add New User to Feature Dataset

In Catalog, ⇒ right click on Treasurer Feature Data Set ⇒ Manage ⇒ Privileges ⇒ Add ⇒ Type new user ⇒ ok

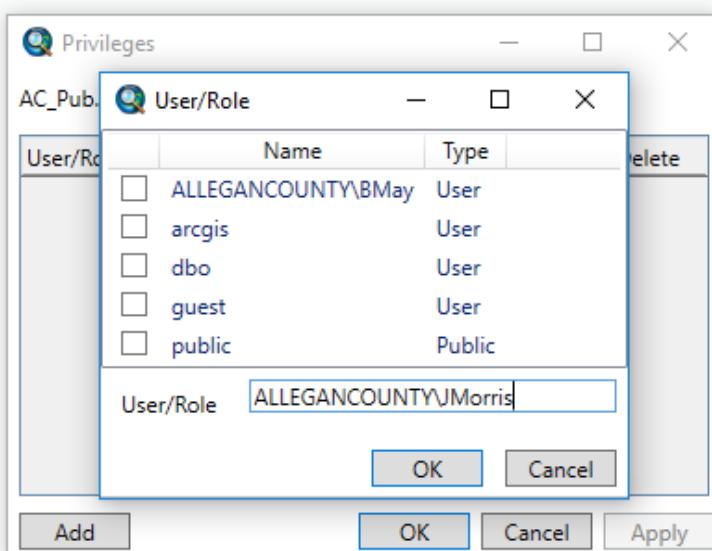


Figure 1.24: Add Feature Dataset User

Extend Privileges for New User

In Catalog⇒right click on Treasurer FDS ⇒ Manage⇒ Privileges⇒ check boxes

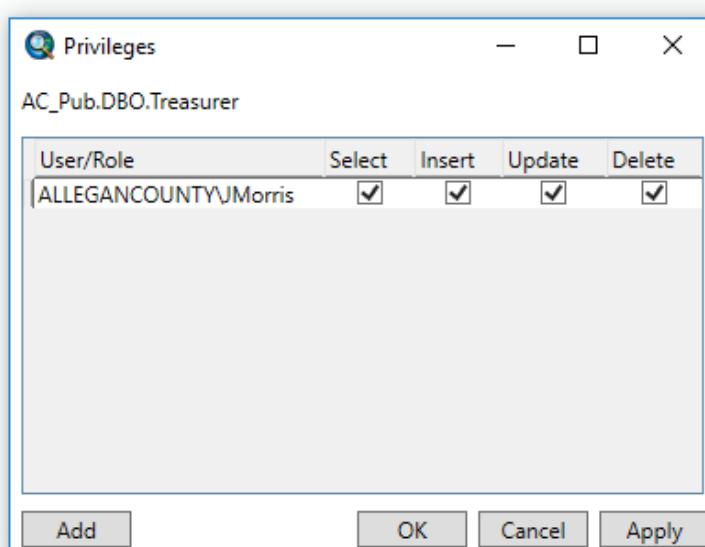


Figure 1.25: Extend Feature Dataset Privileges

Setup Users in Portal for ArcGIS

Users that will use the Collector for ArcGIS must have profiles added to and managed in the Allegan County GIS Portal site.

In Portal go to My Organization

The screenshot shows the 'My Organization' page of the Allegan County GIS Services portal. At the top, there are navigation links for 'Edit Settings', 'Add Members', and 'View Status'. Below this, a table lists 'Current Members' with the following data:

Name	Username	Last Login	Level	Role	Action
Bryan May	bmay531	Nov 2, 2018	1	Administrator	[Edit]
Christina Andress	CAndress	Sep 19, 2018	2	Administrator	[Edit]
Jennifer Morris	JMorris	Oct 18, 2018	2	Administrator	[Edit]
Neil Besteman	nbesteman	Oct 29, 2018	2	Administrator	[Edit]
Paula Reed	preed6	Feb 7, 2017	1	Viewer	[Edit]

On the right side, there is a 'Membership' section with the following information:

- Members per level:
 - 1 of 30
 - 4 of 5
- Total Members: 5 of 35
- Find...
- The most viewed items
- The last items added
- Groups
- The organization's registered apps

Figure 1.26: Portal Add User 1

Add Members to Portal

Push add members ⇒ built in member

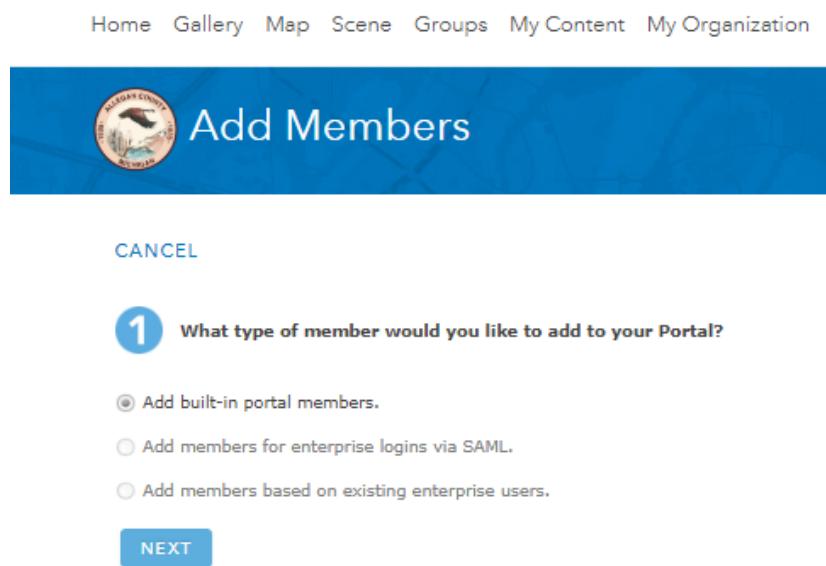


Figure 1.27: Portal Add User 2

Enter required info

The screenshot shows a web-based application titled "Add Members". At the top left is the Allegan County GIS Services logo. The main title "Add Members" is centered above a form area. A blue banner at the top contains the text: "Create new Allegan County GIS Services logins one at a time or in batch from a file. Select any role for the member to be a part of. You must inform the member of their user name and password. If you do not have an email address for a particular user, use the administrator's email address." Below this, a red note says "Password may not be less than 8 characters." The form itself has two tabs: "One at a time" (selected) and "From a file". It includes fields for Email, First Name, Last Name, Username, Password, Level (with radio buttons for 1 and 2), and Role (a dropdown menu showing "Publisher"). At the bottom are three buttons: "BACK", "ADD ANOTHER" (highlighted in green), and "REVIEW ADDITIONS".

Figure 1.28: Portal Add User 3

Manage Treasurer Group

In Portal ⇒ Go to groups ⇒ Invite new user to the group

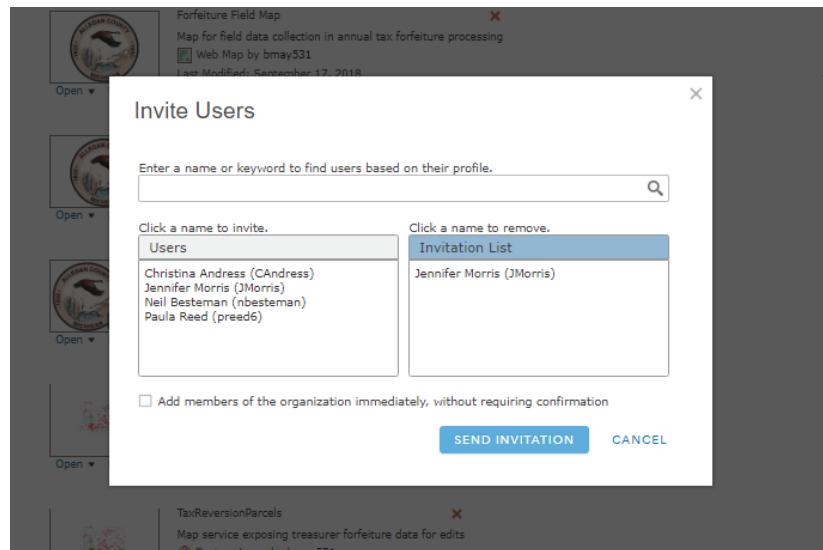


Figure 1.29: Portal Add User 4

Share Content To The Group

Any content used by the group needs to be shared to the group

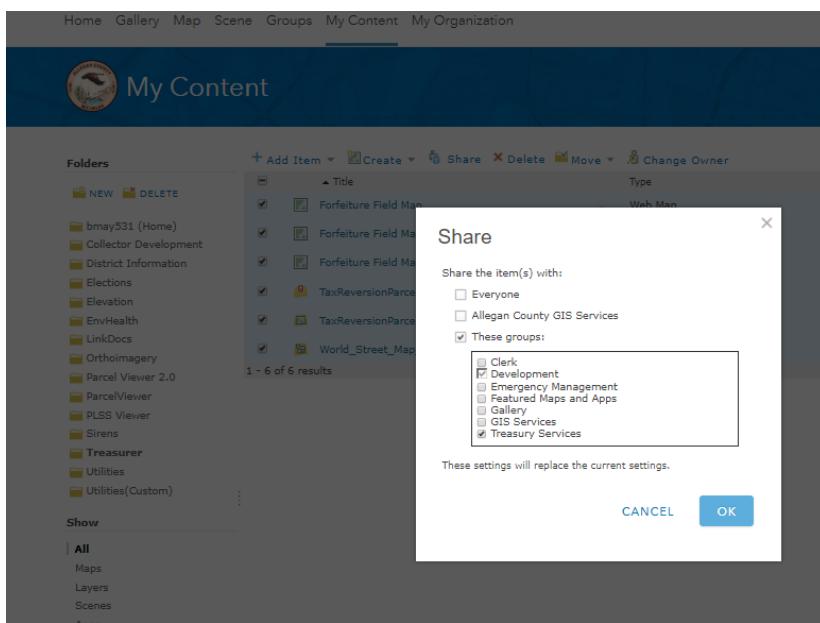


Figure 1.30: Portal AddUser 5

Schema Change Procedure

Form Edits Procedure

User Manual

Collection Device Setup

Collector Application Setup Details

Install Collector for ArcGIS

- Available from the Google Play Store

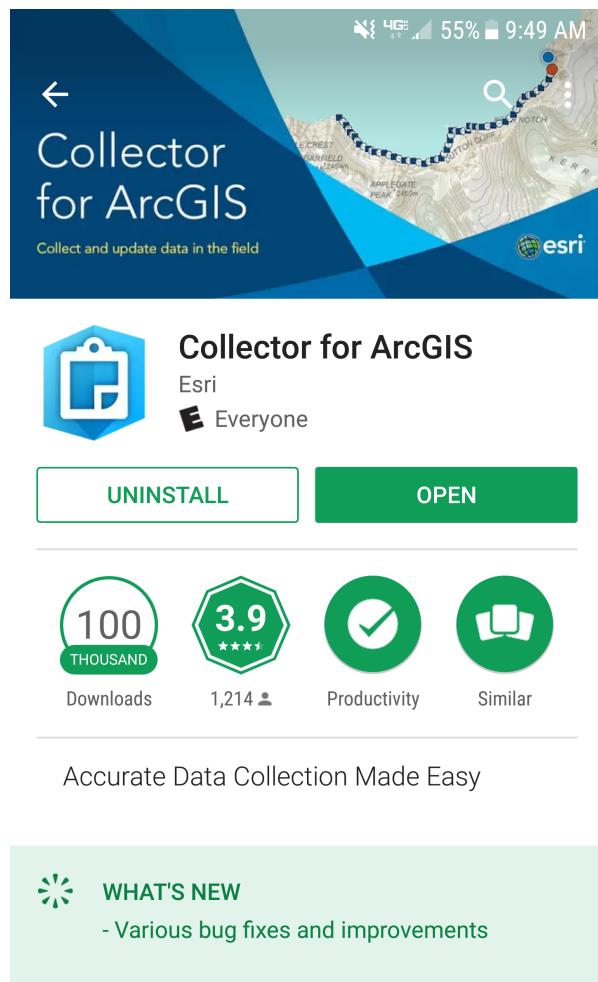


Figure 1.31: Download the App

Configure Collector

for Organization Website, Type:

`https://gis.allegancounty.org/
portal_webadaptor`

then:

Press Continue

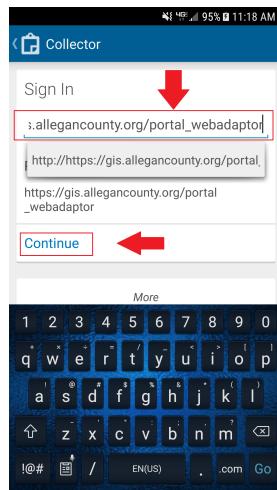


Figure 1.32: Collector Connection

Enter Credentials

then:

Press SIGN IN

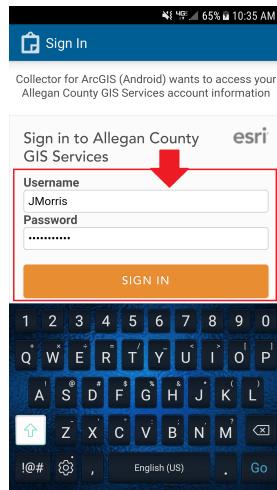


Figure 1.33: Enter Credentials

Download the Forfeiture Field Map

There are 3 different versions of the map

- Forfeiture Field Map
- Forfeiture Field Map For Photos
- Forfeiture Field Map For Attributes

The Download option indicates it is not on the device but is available for offline use

Choose a Map

Press Download

Specify work area

and press

map detail

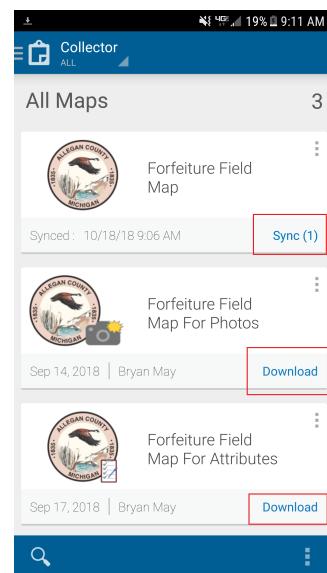
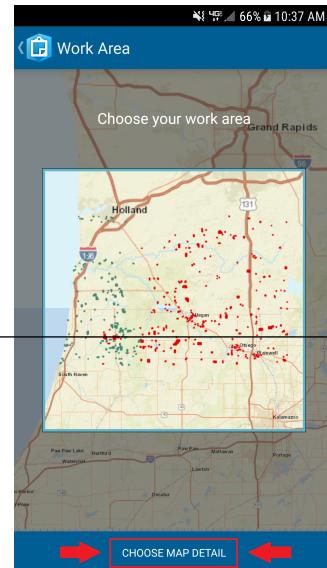


Figure 1.34: Collector Maps Menu

Note that a larger area takes longer to download but the basemap only needs to be downloaded once



Choose Map Detail

Zoom into the level of detail desired.

Press Download

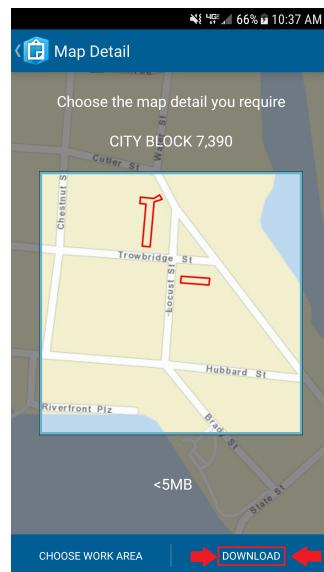


Figure 1.36: Choose Map Detail

This area is ready for field data collection.

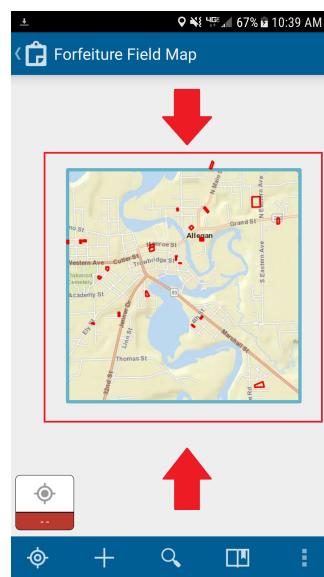


Figure 1.37: Map on Device

Open Camera Application Setup Details

Install Open Camera

- Available from the Google Play Store

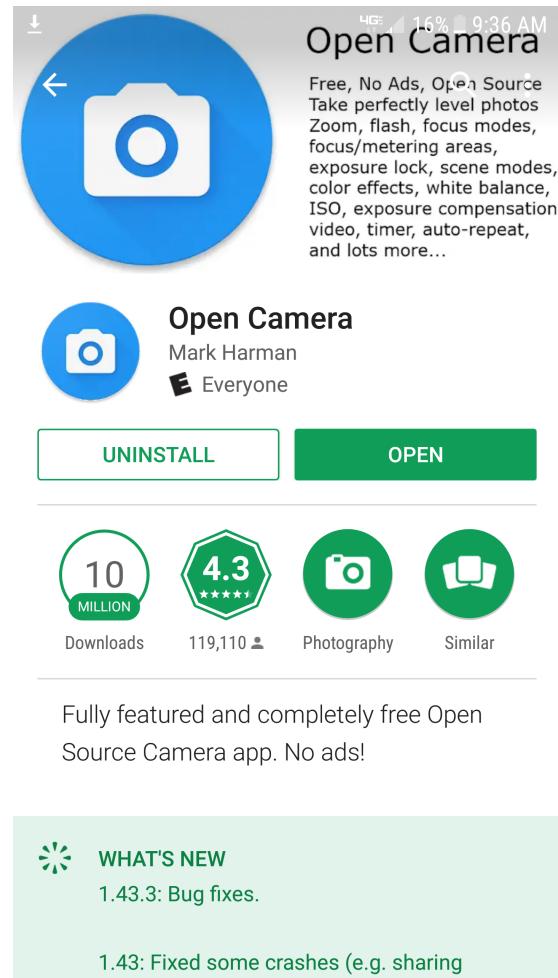


Figure 1.38: Open Camera from Google Play Store

Configure Open Camera

In the Open Camera Application:

Press the gear shaped Settings button to go into the settings menu

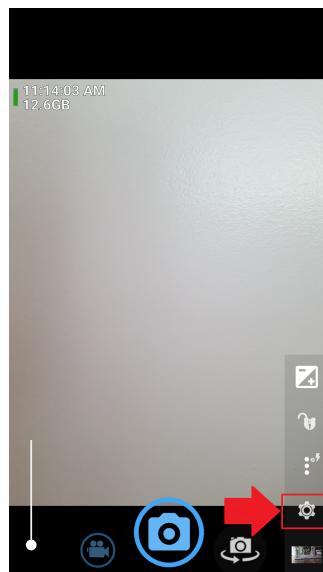


Figure 1.39: Find Settings Menu

Press the Photo Settings button

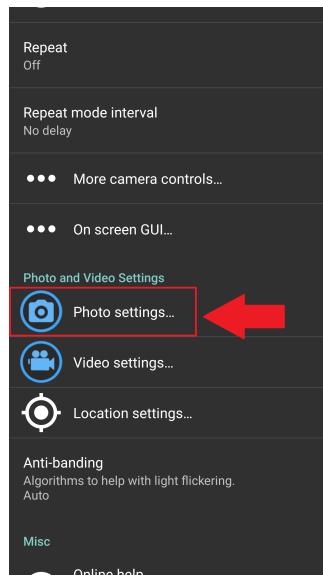


Figure 1.40: Setting Screen

Set Photo Resolution

In photo settings:

Press the Camera resolution button

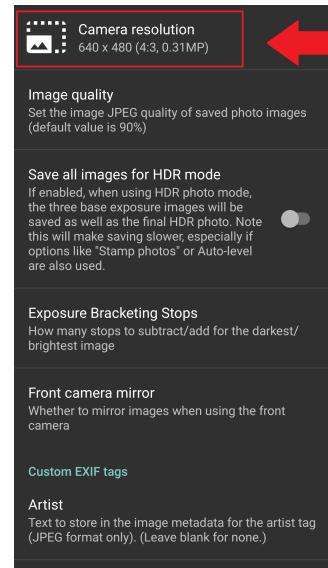


Figure 1.41: Photo Settings Menu

Select **640 x 480**

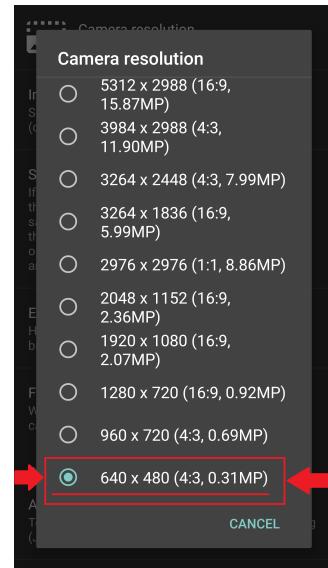


Figure 1.42: Camera Resolution Setting

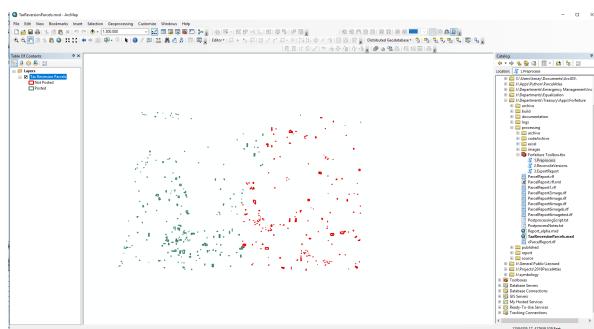
Daily Preprocessing Routine

Execute Preprocessing Script

A tool in ArcGIS that:

- Exports current forfeiture list from BSA
- Updates webmap layers with results from BSA export

In Catalog:



Open the toolbox

Figure 1.43: Processing Tools

Open tool 1

Synchronize the Forfeiture Field Map

Note the date and time:

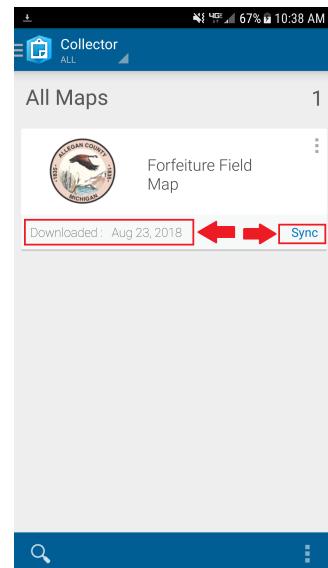
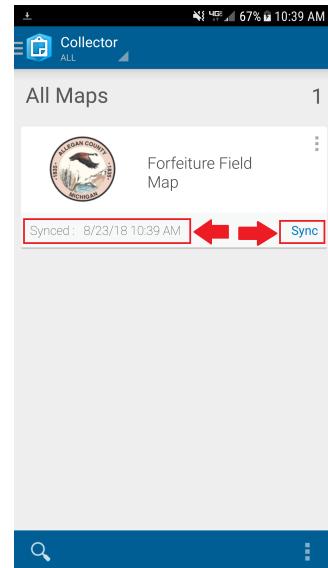


Figure 1.44: Map Downloaded

Note the date and time:



Map is synchronized

Figure 1.45: Map Synchronized

Forfeiture Data Collection

Forfeiture Parcels Data Details

Attributes are of four entry types:

- prefilled
- autofill
- dropdown
- text box

For each site visited, select the desired parcel, push the edit button and collect attributes.

Device 1 Field Operation

Select a parcel



Figure 1.46: Select Parcel

Push the edit button

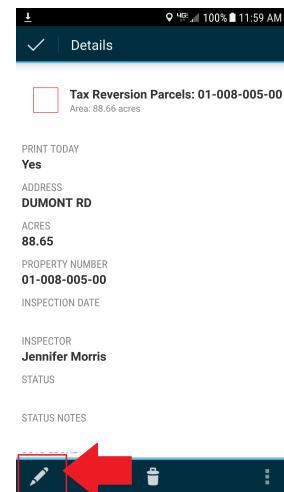


Figure 1.47: Parcel Details

Device 1 Field Operation Cont.

Select Yes for Print Today

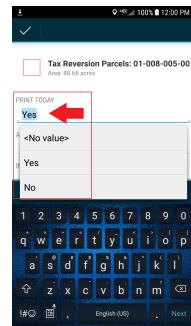
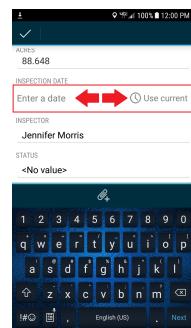


Figure 1.48: Print Today Yes or No

Select Use Current or enter any date



Select Inspector From Dropdown

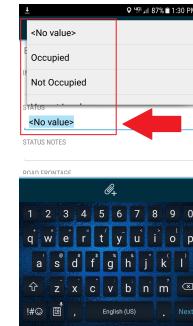
Figure 1.49: Enter Date



Figure 1.50: Select Inspector

Device 1 Field Operation Cont.

Select Occupied or Not Occupied



Enter status notes up to 120 characters

Figure 1.51: Status

Select Yes or No for Road Frontage

Figure 1.52: Status Notes

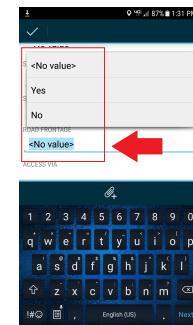


Figure 1.53: Road Frontage

Device 1 Field Operation Cont.

Enter road used for access

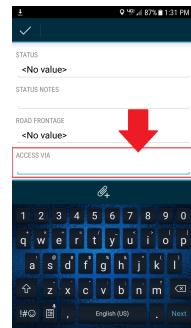


Figure 1.54: Access Via

Enter Agent Name

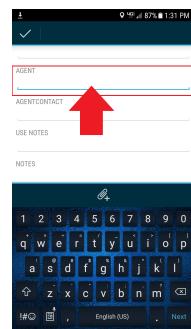


Figure 1.55: Agent

Enter Agent Contact Info

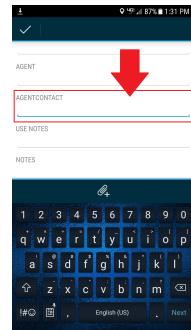


Figure 1.56: Agent Contact

Device 1 Field Operation Cont.

Enter Use Notes up to 120 characters



Figure 1.57: Use Notes

Enter Notes up to 120 characters

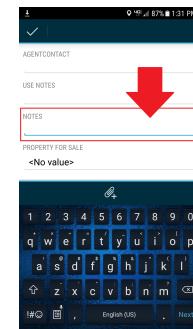


Figure 1.58: Notes

Enter property for sale yes or no

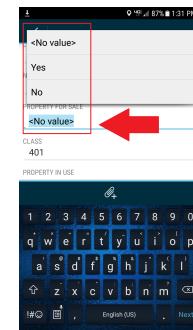


Figure 1.59: Property for Sale

Device 1 Field Operation Cont.

Property in Use Yes or No

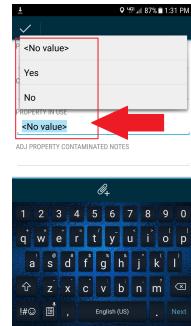


Figure 1.60: Property in Use

Placeholder

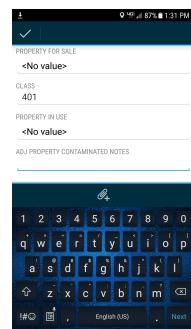


Figure 1.61: Placeholder

prefilled

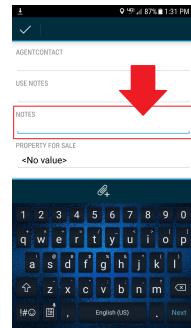
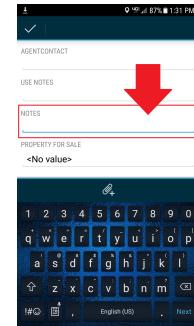


Figure 1.62: Property Contaminated

Device 1 Field Operation Cont.

Enter notes up to 120 characters



Adjacent Property Contaminated pre-filled

Figure 1.63: Notes up to 120 characters

Property Contaminated notes prefilled

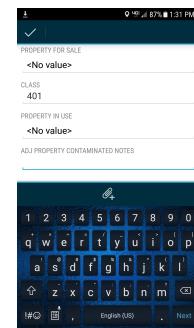


Figure 1.64: Adjacent Property Contaminated

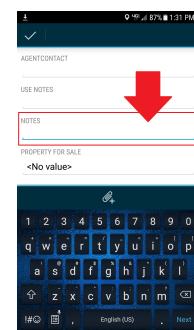


Figure 1.65: Property Contaminated

Device 1 Field Operation Cont.

Property Maintained Yes or No



Figure 1.66: Property Maintained

Picture Comments up to 120 characters

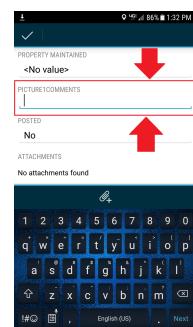


Figure 1.67: Picture Comments

Placeholder

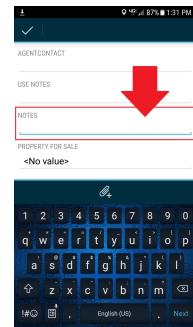


Figure 1.68: Placeholder

Device 2 Field Operation

Use photos taken with the Open Camera Application.



Select a parcel from the map

Figure 1.69: Select Parcel

Push Attachment Button

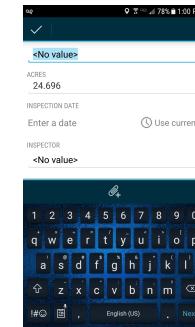


Figure 1.70: Push Attachment Button

Select Gallery

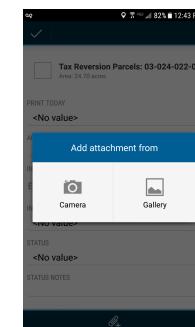


Figure 1.71: Add Attachment From Gallery

Device 2 Field Operation Cont.

Navigate to the Open Camera Folder

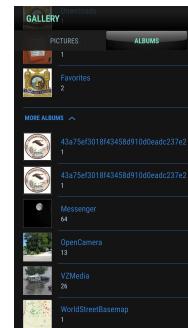
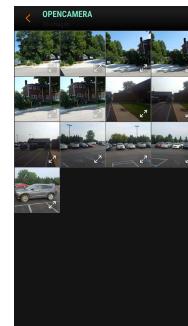


Figure 1.72: Open Camera Folder

Select the appropriate image



Press the check button to save the image to the parcel

Figure 1.73: In the Open Camera Folder

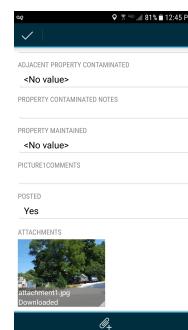


Figure 1.74: Image in the App

Daily Postprocessing Routine

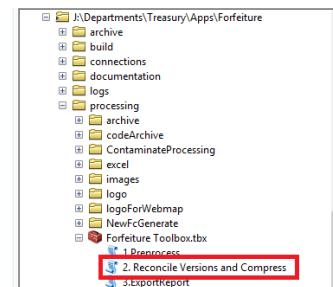
Back at the office

Synchronize Webmap

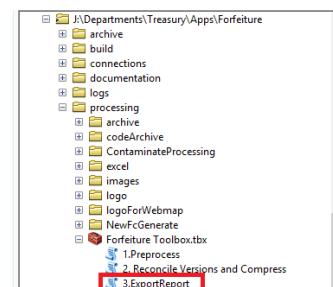
In Collector for ArcGIS, push the sync button on the Forfeiture Field Map

Execute Postprocessing Script

The Postprocessing Script is A tool in ArcGIS that: Reconciles geodatabase versions



Execute the Reconcile Versions and Compress Tool



Generates forms for each site visited

Figure 1.76: Export Report Tool

Execute the Export Report
Tool

- Reconciles geodatabase versions
 - Execute the Reconcile Versions and Compress Tool

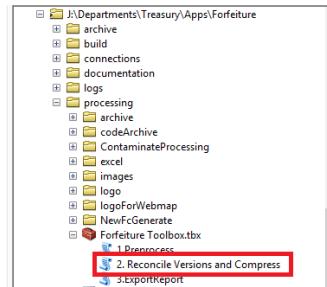


Figure 1.77: Reconcile Versions and Compress Tool

- Generates forms for each site visited
 - Execute the Export Report Tool

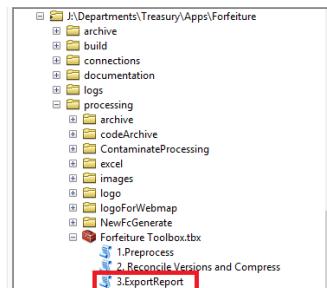


Figure 1.78: Export Report Tool

Software

ESRI Licensed Products

ArcDesktop

Users of this application need a license to ArcGIS Standard level.

Enterprise ArcGIS Deployment

This app uses ArcGIS Server and ArcGIS Portal.

Collector for ArcGIS

Developed and tested on Android(7.0). Collector is available at the Google Play Store.

Other Software

Open Camera for Android

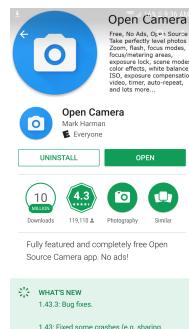


Figure 1.79: Open Camera from Google Play Store