

Forfeiture Data Collection

Mobile App with Collector for ArcGIS

Allegan County GIS
www.allegancounty.org/gis

November 29, 2018

Contents

0.0.1 Forfeiture Data Collection	1
Problem and Analysis	1
Background	1
Statement of Problem	1
Analysis	1
Design	2
Overview	2
Forfeiture App Summary	3
Technologies Used in The Forfeiture App	4
BSA Data	4
ArcGIS Desktop	4
ArcGIS Collector	4
ArcGIS Enterprise Geodatabase	4
ArcGIS Portal Webmaps and Apps	4
Data Details	5
ForfeitureParcels Feature Class	6
Webmap Details	7
Feature Layer Details	7
Basemap Details	8
Hard Copy Record	9
ArcGIS Server	9
Administrative Manual	10
Annual Setup	10
Load data to forfeitureParcels	18
push next	19
Match these fields	20
push next	21
Data Setup	22
Create Attachments	23
Setup Users in ArcGIS	24
Add New User to Feature Dataset	25
Extend Privileges for New User	26
Setup Users in Portal for ArcGIS	27
Add Members to Portal	28
Enter required info	29
Manage Treasurer Group	30
Share Portal Content	31

Schema Change Procedure	32
Form Edits Procedure	33
User Manual	34
Collection Device Setup	34
Collector Application Setup Details	34
Install Collector for ArcGIS	34
Configure Collector	35
Download the Forfeiture Field Map	36
Choose Map Detail	37
Open Camera Application Setup Details	38
Install Open Camera	38
Configure Open Camera	39
Daily Preprocessing Routine	41
Execute Preprocessing Script	41
Synchronize the Forfeiture Field Map	42
Forfeiture Data Collection	43
Forfeiture Parcels Data Details	43
Device 1 Field Operation	44
Device 2 Field Operation	52
Daily Postprocessing Routine	54
Synchronize Webmap	54
Execute Postprocessing Script	54
Software	57
ESRI Licensed Products	57
ArcDesktop	57
Enterprise ArcGIS Deployment	57
Collector for ArcGIS	57
Other Software	57
Open Camera for Android	57

0.0.1 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Statement of Problem Current Tax Forfeiture workflow is built on Map-Info software which has been replaced by ESRI software.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**

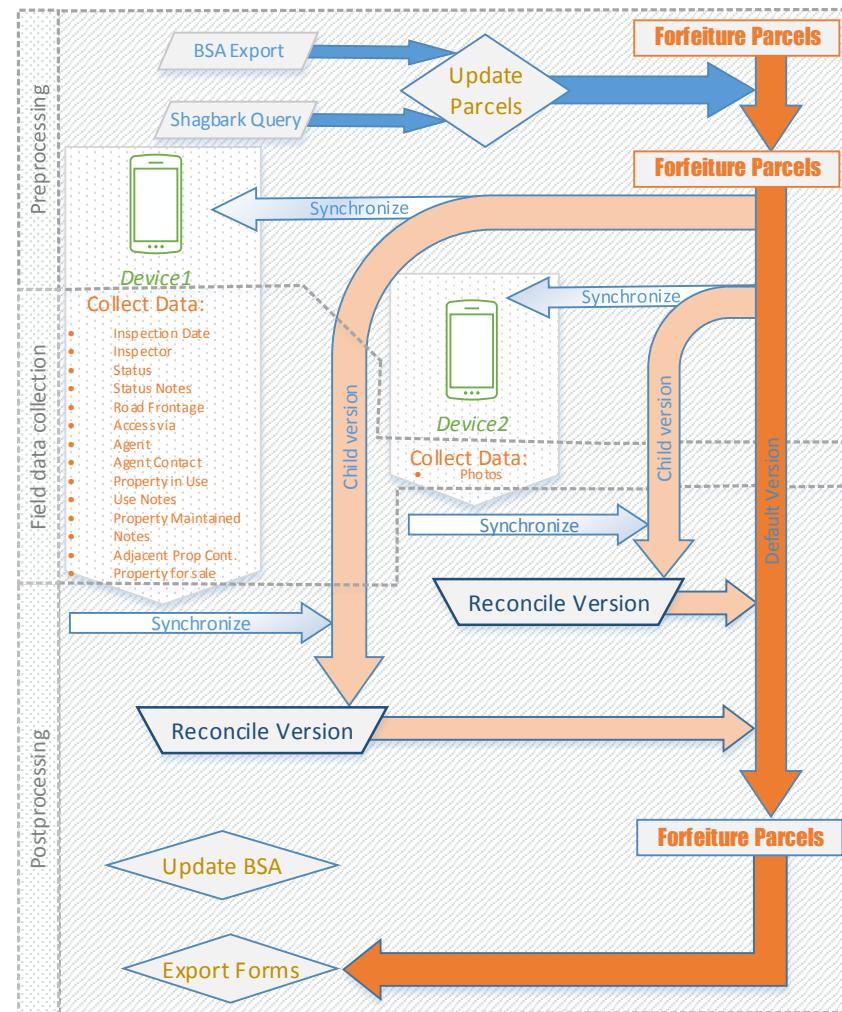


Figure 1: Project Design

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.

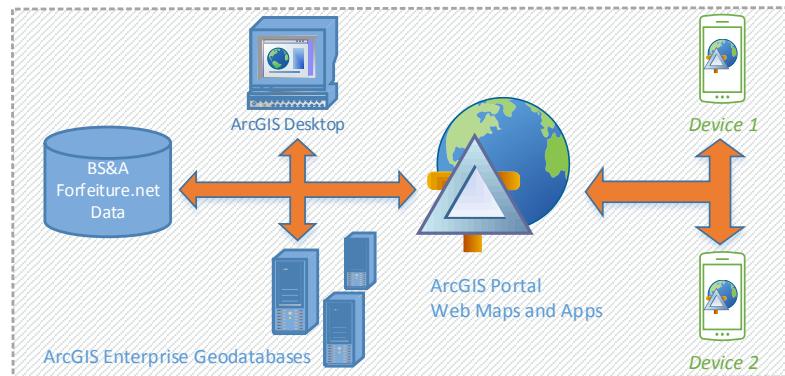


Figure 2: Technology Design

Data Details

Data Location The data is located in ACPUB. ACPUB is a geodatabase on ACINTSQL01.

Forfeiture Parcels Data

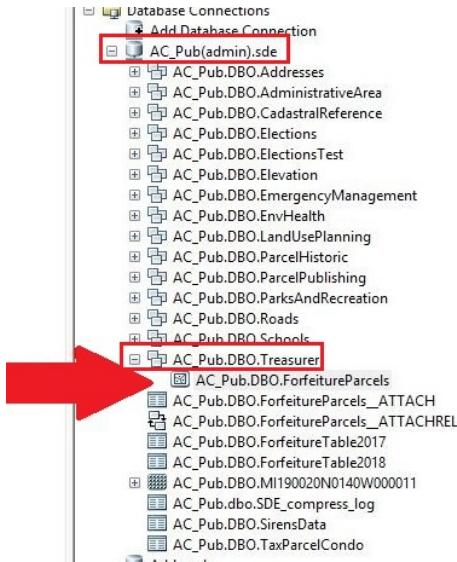


Figure 3: Live Data Location

Contamination Data

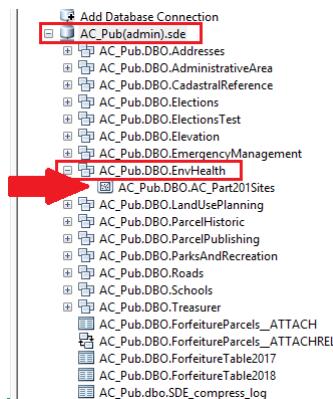


Figure 4: Contamination Feature Class

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: Dataset Details

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

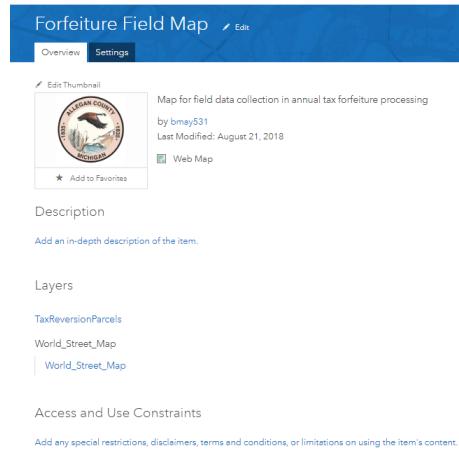


Figure 5: Web Map Details

Feature Layer Details TaxReversionParcels has been configured for offline use.

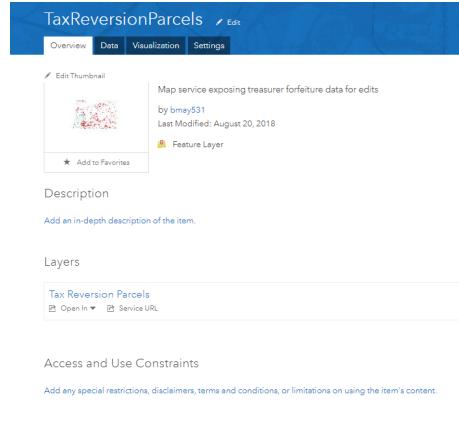


Figure 6: Feature Layer Details

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

The screenshot shows the ArcGIS Online interface for the 'World Street Map (for Export)' layer. At the top, there's a navigation bar with 'ArcGIS', 'Pricing', 'Map', 'Scene', and 'Help' buttons, along with a 'Sign In' button and a search bar. Below the navigation is a blue header bar with the title 'World Street Map (for Export)'. Underneath the header, there's a 'Overview' section containing a thumbnail map of the world with a red bounding box around the Americas, and some descriptive text about the layer's purpose and requirements. To the right of the overview are three 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 (Map Service), size (1 kb), and a five-star rating. It also includes social sharing icons for Facebook, Twitter, and LinkedIn. Below that is an 'Owner' section showing 'Eri' as the owner and 'Managed by esri'. Finally, there's a 'Tags' section listing various geographical and thematic terms.

Figure 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

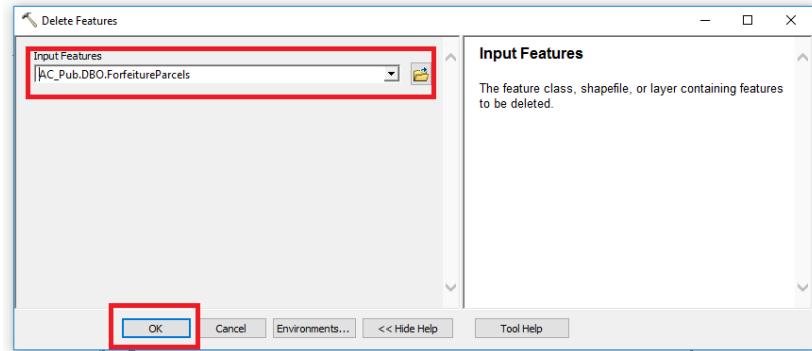


Figure 8: Delete Features

Press OK

Add Query Layer

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

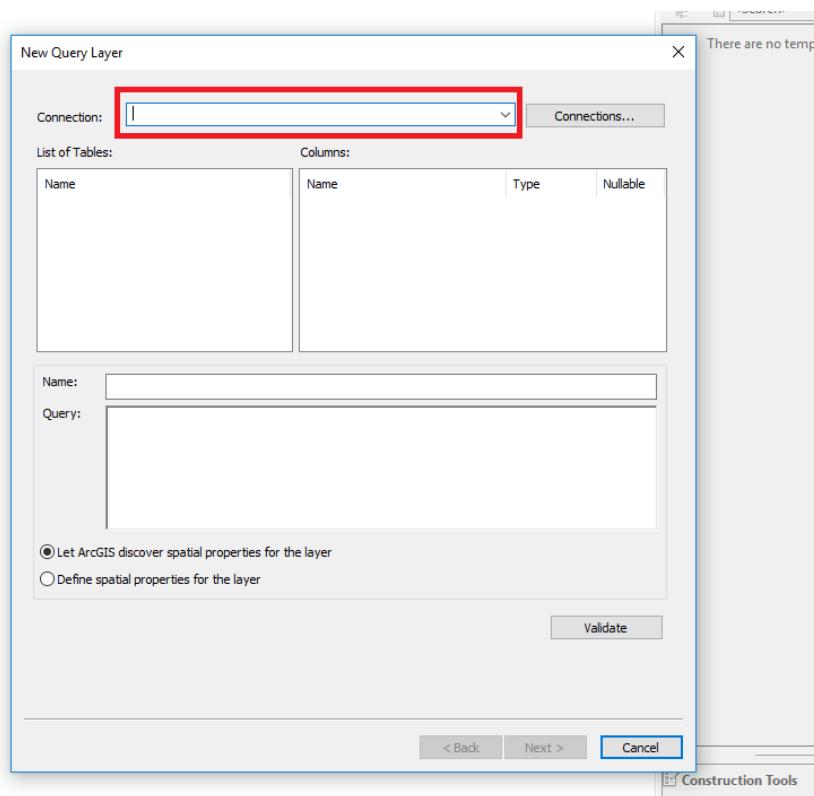


Figure 9: New Query Layer Dialog

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

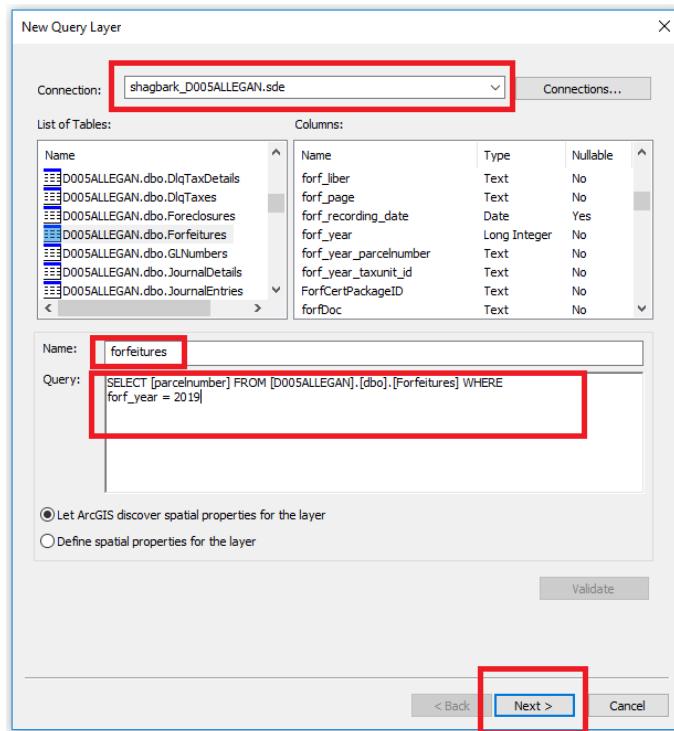


Figure 10: Forfeiture Query Layer Details

- Press Next

Select a Unique Identifier

- Press Finish

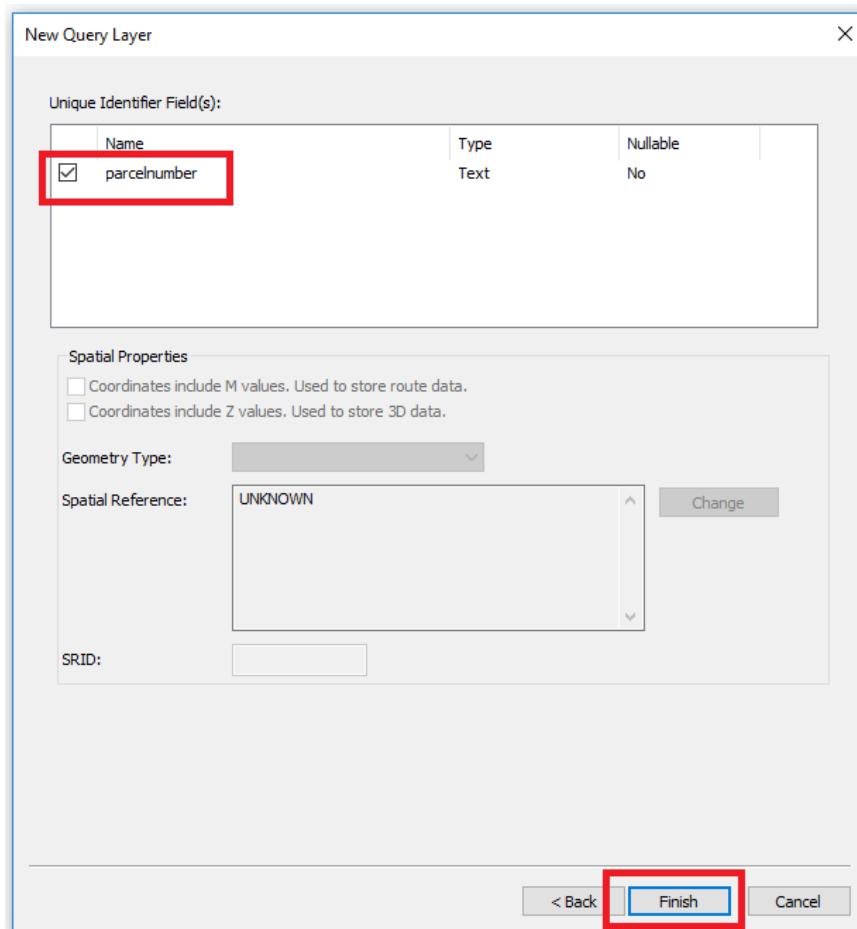


Figure 11: Query Layer Unique ID

Table is added to the map

The screenshot shows the ArcGIS Pro interface with two main windows. On the left is the 'Table Of Contents' window, which displays a hierarchical list of layers. A red box highlights the 'D005ALLEGAN' folder, which contains a layer named 'D005ALLEGAN.DBO.forfeitures'. This layer is checked, indicating it is currently selected. On the right is a 'Table' viewer window titled 'D005ALLEGAN.DBO.forfeitures'. It displays a table with two columns: 'parcelNumber' and 'ESRI_OID'. The table lists 836 rows of data, starting with '01-007-012-00' and ending with '00-007-025-00'. The last row shows '(0 out of 836 Selected)'.

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
00-007-025-00	36

Figure 12: Forfeiture Table Added

Add Parcels Layer to the map

Add ACParcelsCombined to the map to provide parcel geometry and attributes

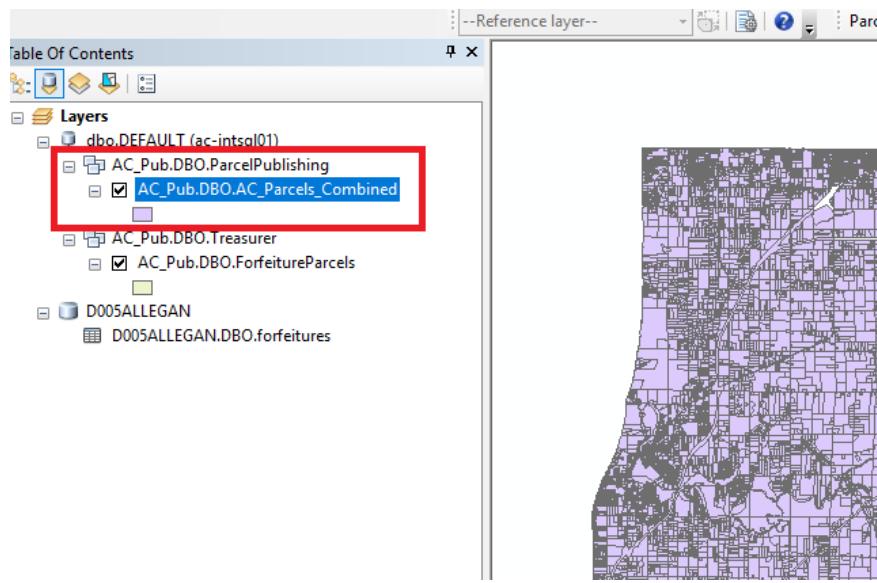


Figure 13: Parcels Layer Added

Create Join

Create new join to ACParcelsCombined of forfeitures based on parcel numbers

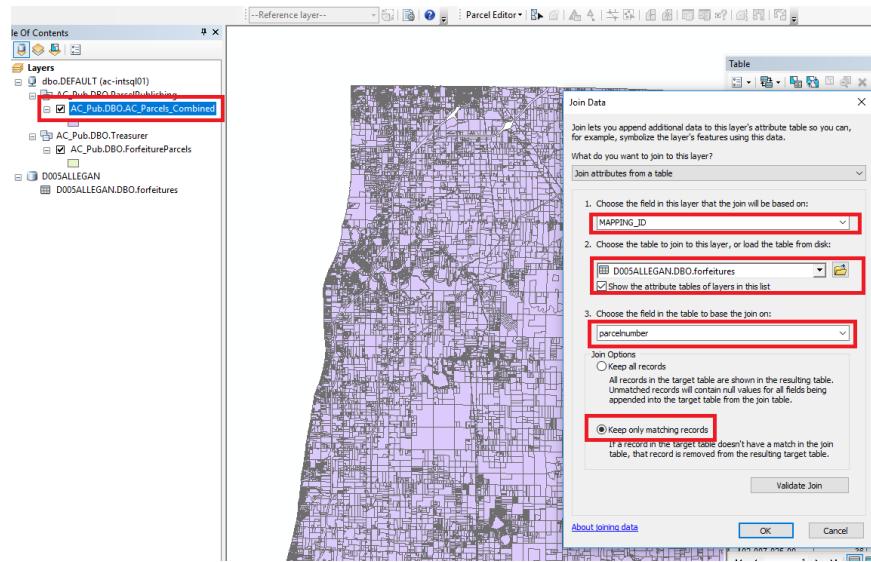


Figure 14: Join Parcels

Export Joined Features to a temp location

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

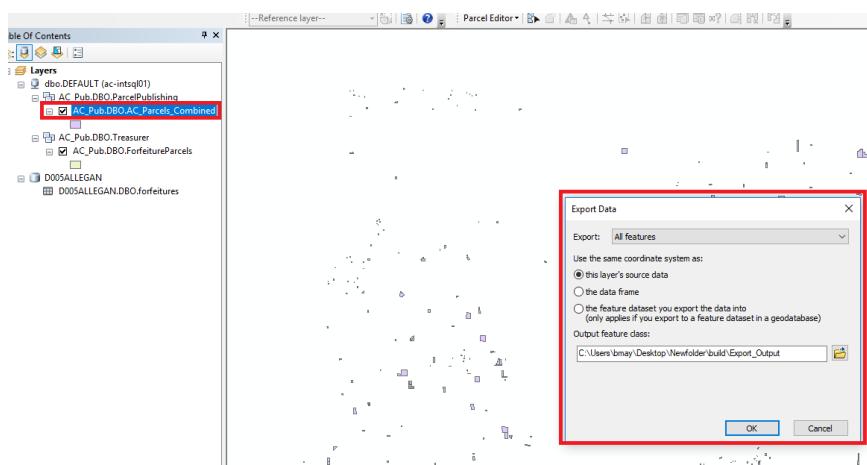


Figure 15: Export Joined Features

- choose location and press OK

Load data from temp location to forfeitureParcels

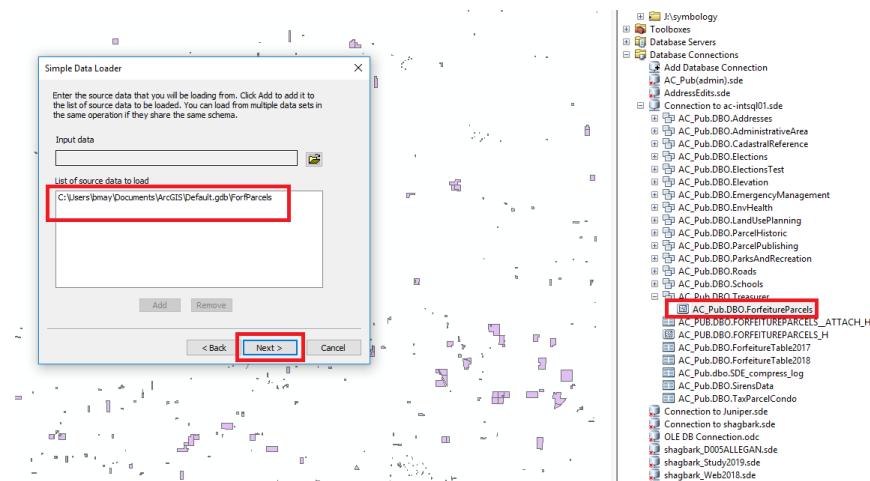


Figure 16: Load Data 1

push next

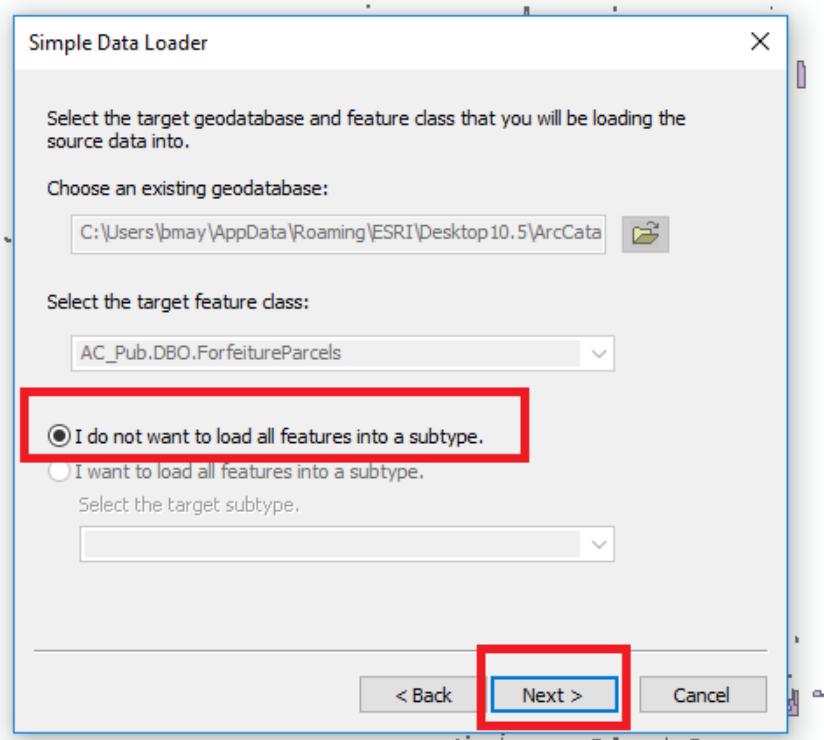


Figure 17: Load Data 2

Match these fields

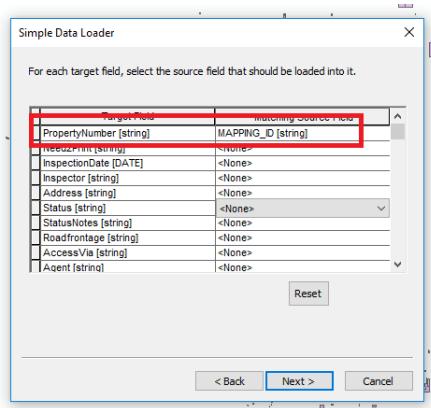


Figure 18: Match Fields

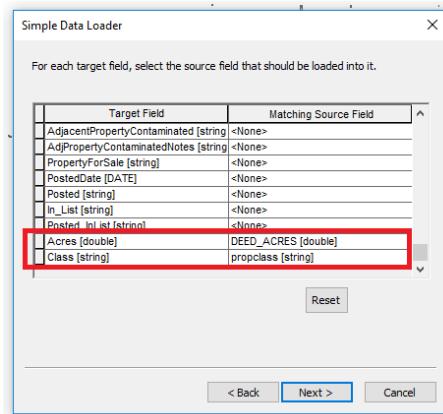


Figure 19: Match Fields

push next

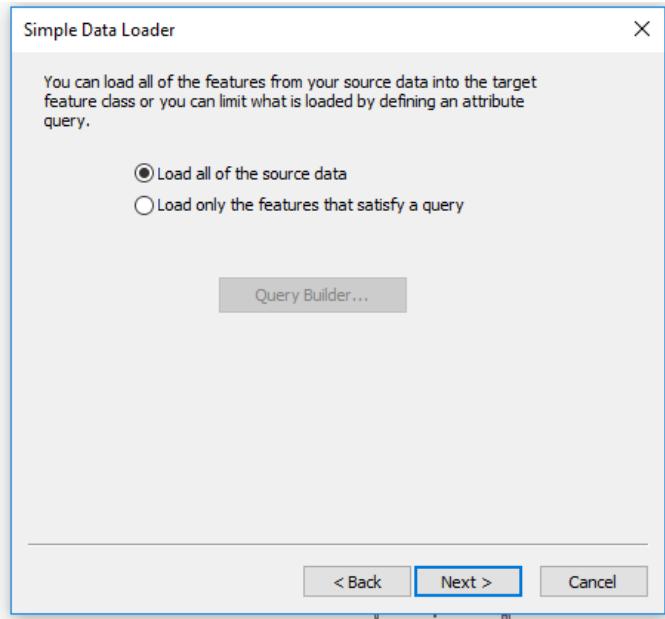


Figure 20: Load Data 3

push Finish

Data Setup Register as versioned and Add Global IDs

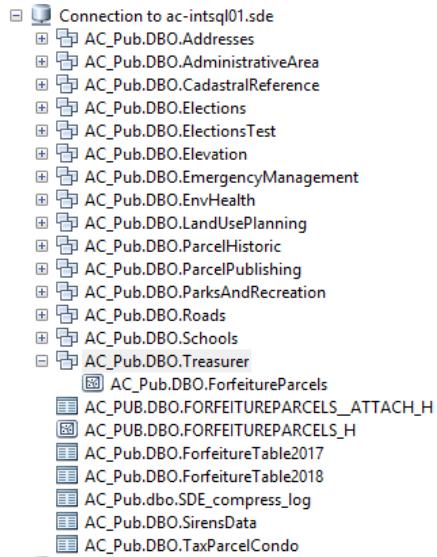


Figure 21: Setup Data

push Finish

Create Attachments

Right Click ⇒ Manage ⇒ Add Attachments

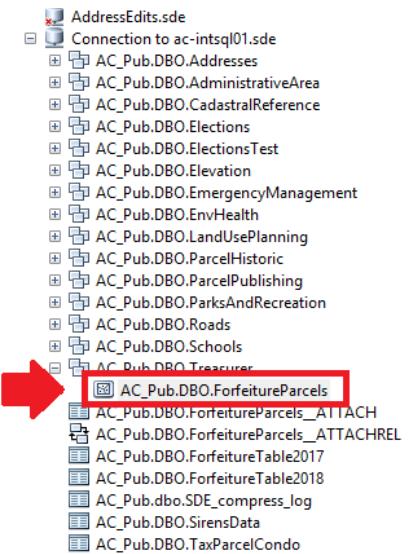


Figure 22: Create Attachments

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

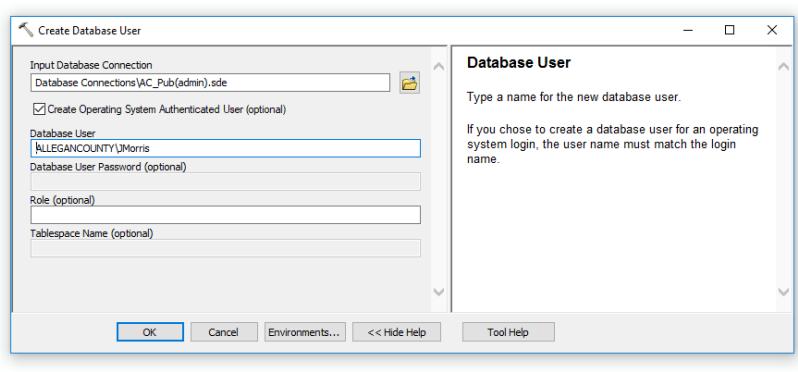


Figure 23: Add Db User

Add New User to Feature Dataset

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

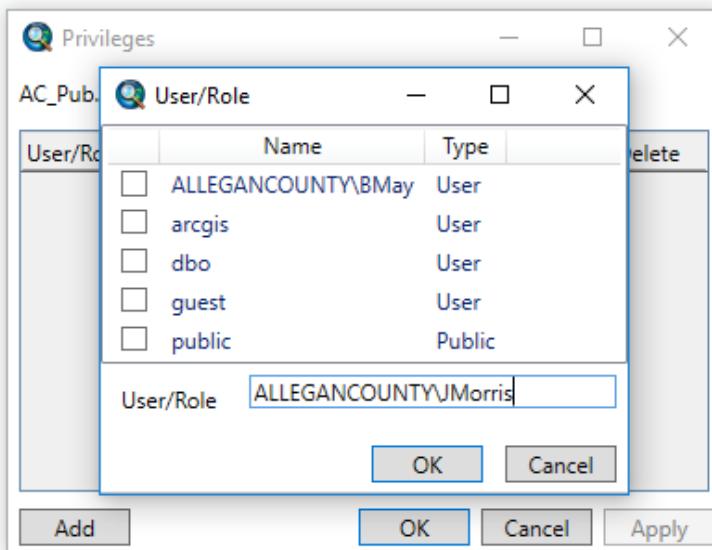


Figure 24: Add Feature Dataset User

Extend Privileges for New User

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

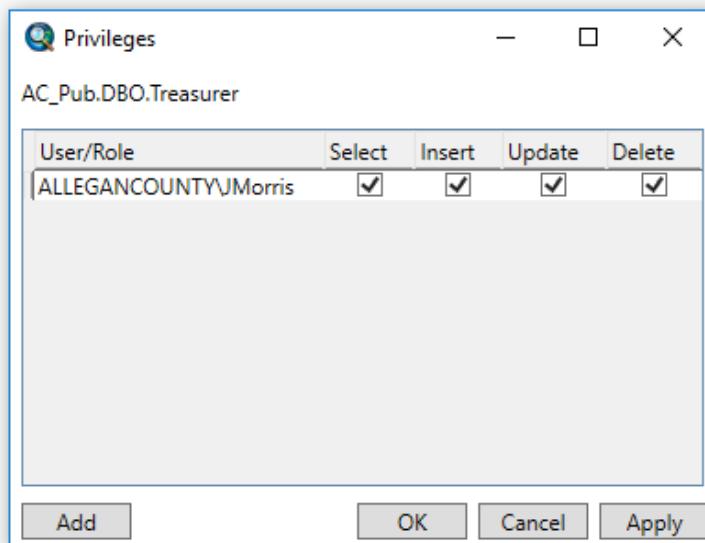


Figure 25: Extend Feature Dataset Privileges

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

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

Membership

Members per level: ① 1 of 30
② 4 of 5

Total Members 5 of 35

Find...
The most viewed items
The last items added
Groups
The organization's registered apps

Figure 26: Portal Add User 1

Add Members to Portal

Push add members ⇒ built in member

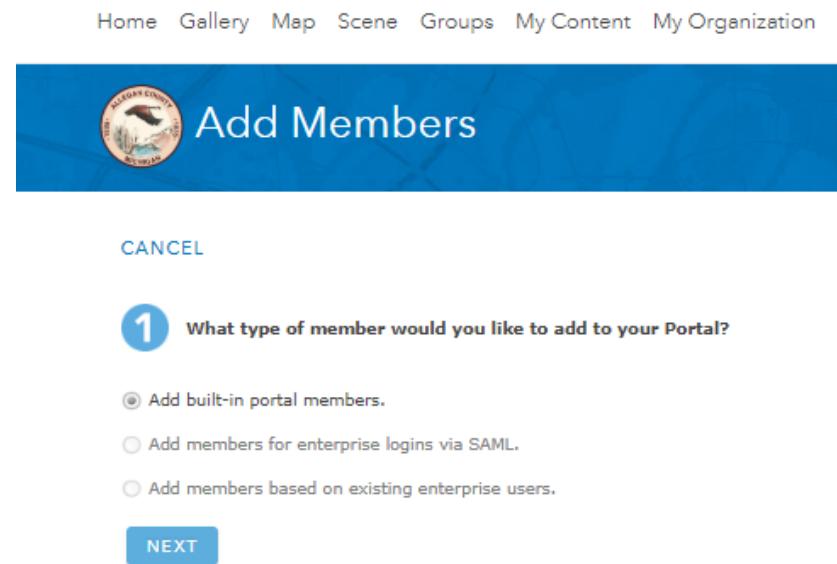
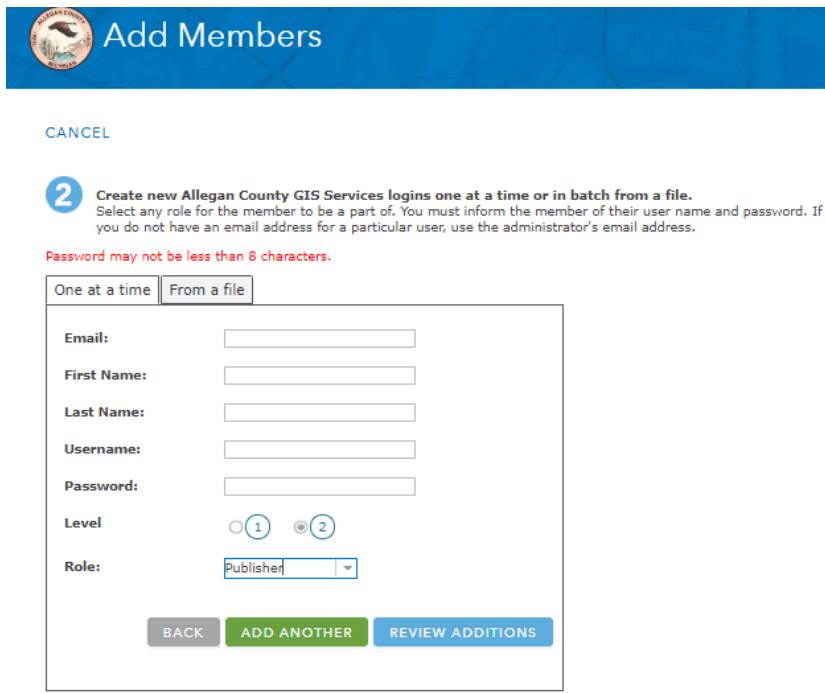


Figure 27: Portal Add User 2

Enter required info



The screenshot shows a web-based application titled "Add Members". At the top left is the Allegan County GIS Services logo. To its right is the title "Add Members". Below the title is a blue header bar with the word "CANCEL" in white text. The main form area has a light gray background. It contains several input fields and controls:

- A radio button group labeled "One at a time" and "From a file".
- Text input fields for "Email", "First Name", "Last Name", "Username", and "Password".
- A radio button group labeled "Level" with options "1" and "2".
- A dropdown menu labeled "Role" with the value "Publisher" selected.
- At the bottom are three buttons: "BACK" (gray), "ADD ANOTHER" (green), and "REVIEW ADDITIONS" (blue).

There is also a note above the input fields: "2 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." A red error message "Password may not be less than 8 characters." is displayed below the "Password" field.

Figure 28: Portal Add User 3

Manage Treasurer Group

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

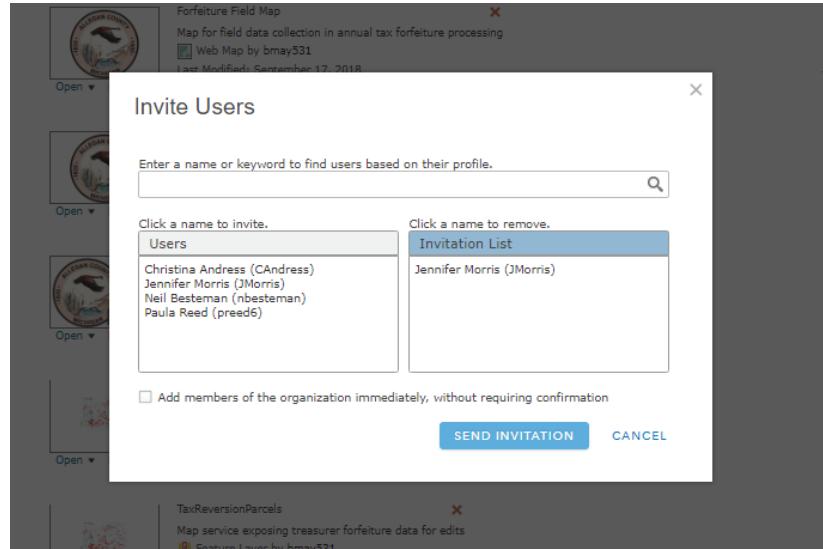


Figure 29: Portal Add User 4

Share Content To The Group

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

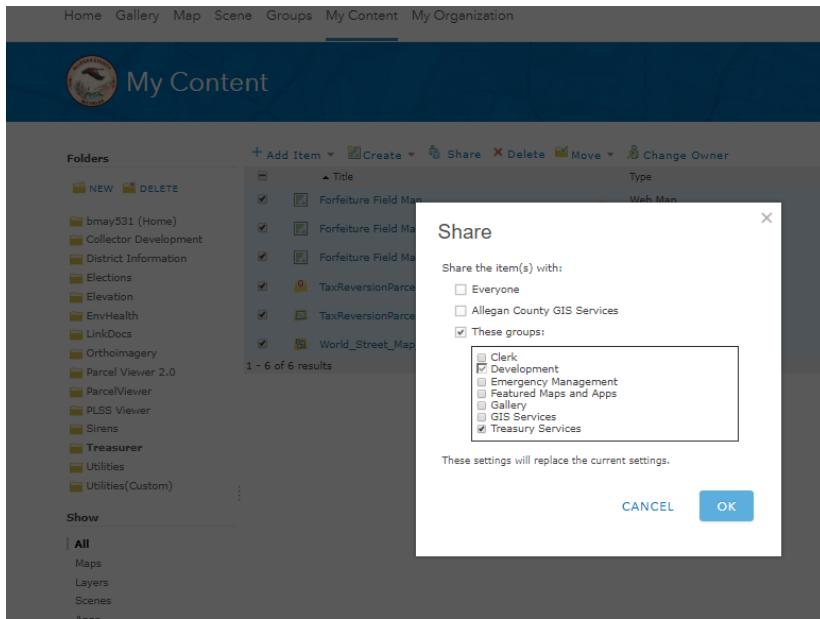


Figure 30: Portal AddUser 5

Schema Change Procedure

Form Edits Procedure

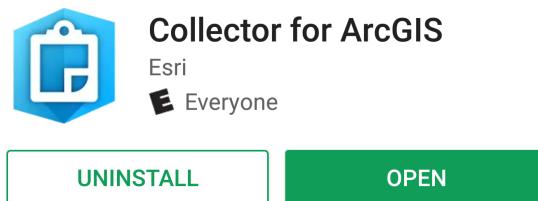
User Manual

Collection Device Setup

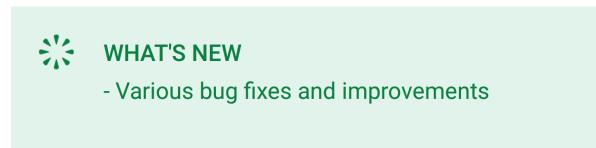
Collector Application Setup Details

Install Collector for ArcGIS

- Available from the Google Play Store



Accurate Data Collection Made Easy



[READ MORE](#)

Figure 31: Download the App

Configure Collector

for Organization Website, Type:

https://gis.allegancounty.org/portal_webadaptor

then:

Press Continue

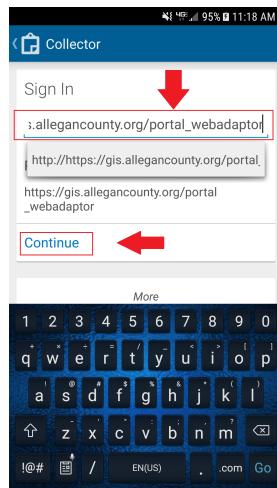


Figure 32: Collector Connection

Enter Credentials

then:

Press SIGN IN

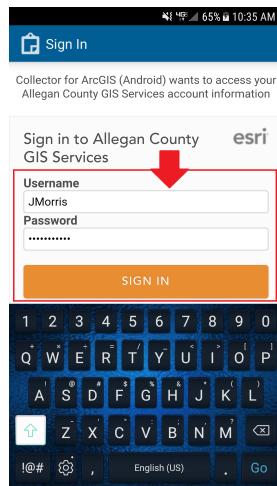


Figure 33: Enter Credentials

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

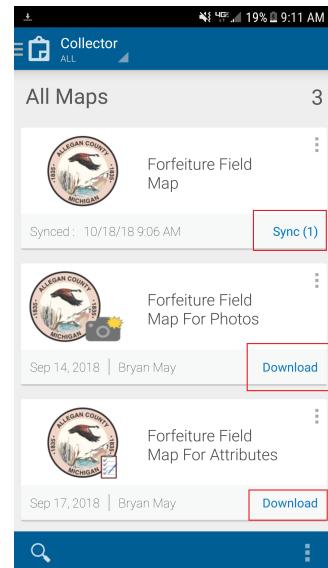


Figure 34: Collector Maps Menu

Specify work area

and press

map detail

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

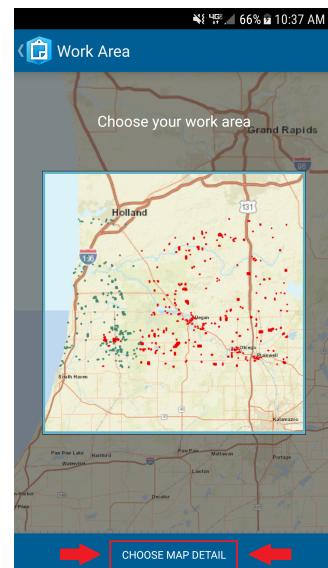


Figure 35: Choose Work Area (large)

Choose Map Detail

Zoom into the level of detail desired.

Press Download

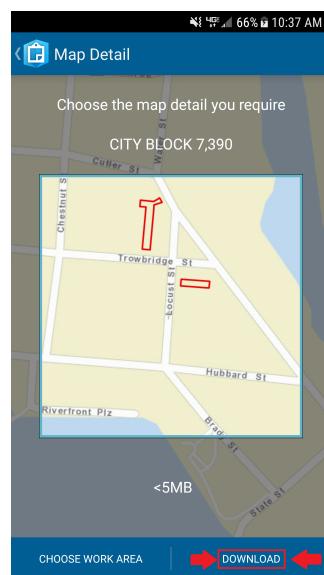


Figure 36: Choose Map Detail

This area is ready for field data collection.

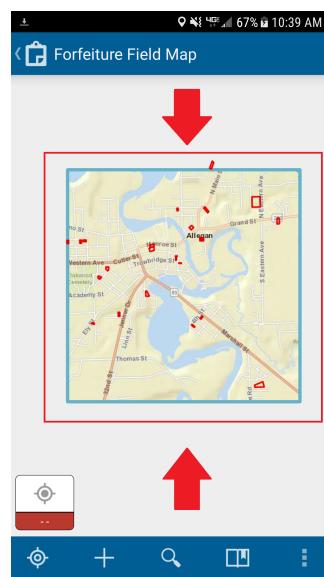


Figure 37: Map on Device

Open Camera Application Setup Details

Install Open Camera

- Available from the Google Play Store

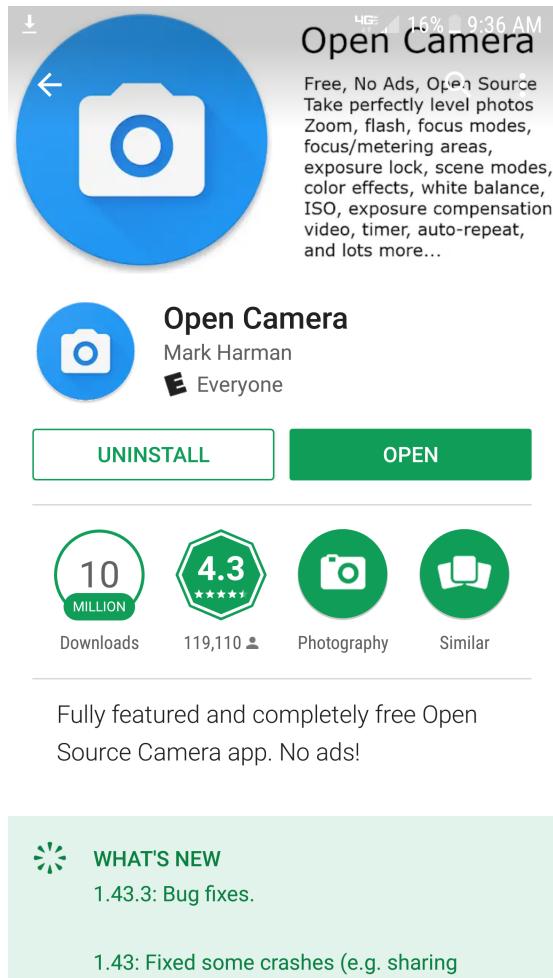


Figure 38: Open Camera from Google Play Store

Configure Open Camera

In the Open Camera Application:

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

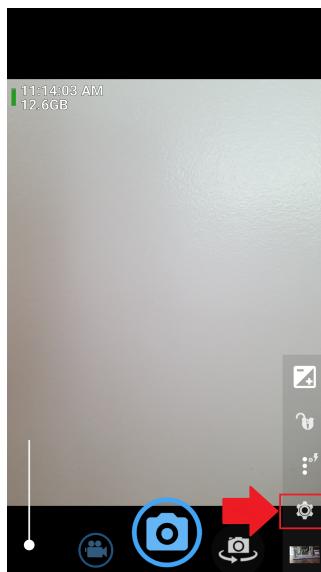


Figure 39: Find Settings Menu

Press the Photo Settings button

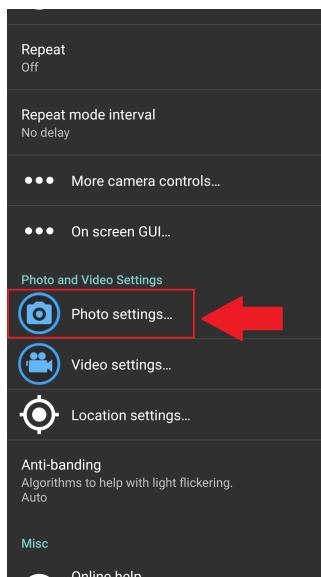
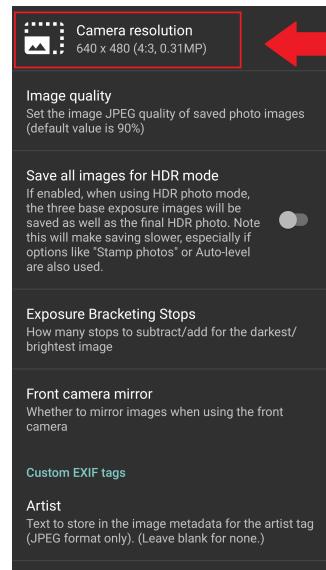


Figure 40: Setting Screen

Set Photo Resolution

In photo settings:



Press the Camera resolution button

Figure 41: Photo Settings Menu

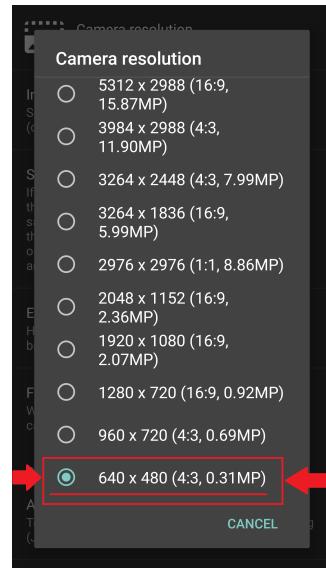
Select **640 x 480**

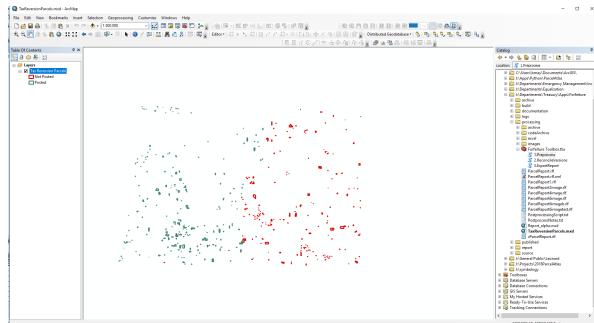
Figure 42: Camera Resolution Setting

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 43: Processing Tools

Open tool 1

Synchronize the Forfeiture Field Map

Note the date and time:

Press Sync

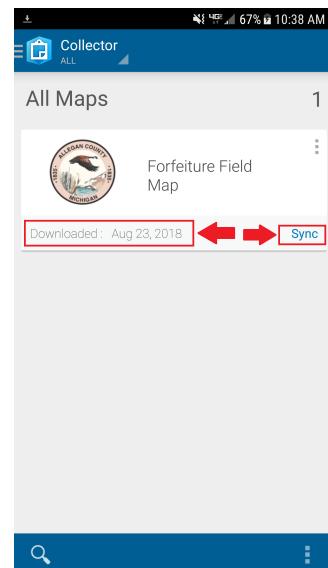


Figure 44: Map Downloaded

Note the date and time:

Map is synchronized

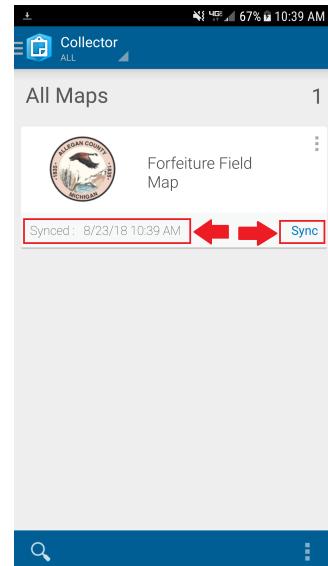


Figure 45: Map Synchronized

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 46: Select Parcel

Push the edit button

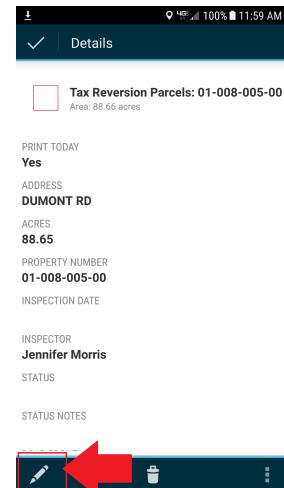


Figure 47: Parcel Details

Device 1 Field Operation Cont.
Select Yes for Print Today

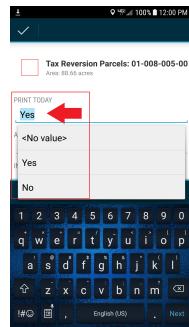


Figure 48: Print Today Yes or No

Select Use Current or enter any date

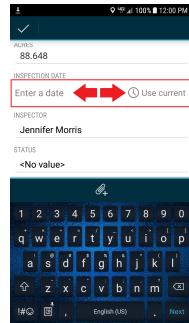


Figure 49: Enter Date

Select Inspector From Drop-down



Figure 50: Select Inspector

Device 1 Field Operation Cont.
Select Occupied or Not Occupied

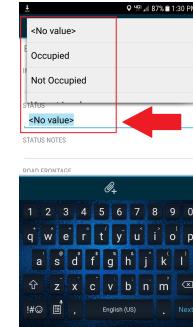


Figure 51: Status

Enter status notes up to 120 characters

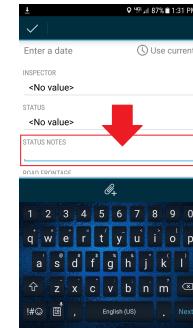


Figure 52: Status Notes

Select Yes or No for Road Frontage

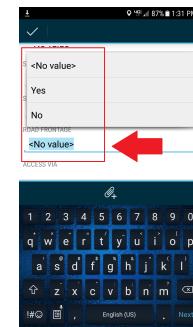


Figure 53: Road Frontage

Device 1 Field Operation Cont.
Enter road used for access

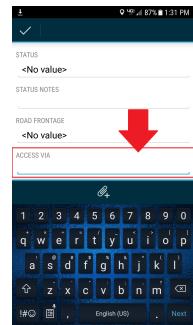


Figure 54: Access Via

Enter Agent Name

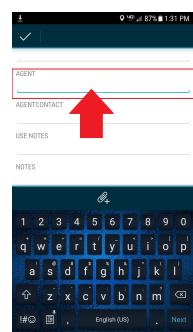


Figure 55: Agent

Enter Agent Contact Info

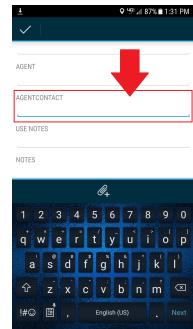


Figure 56: Agent Contact

Device 1 Field Operation Cont.
Enter Use Notes up to 120 characters

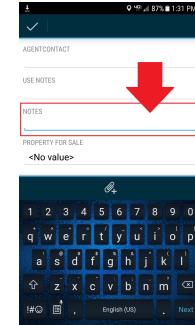


Figure 57: Use Notes

Enter Notes up to 120 characters

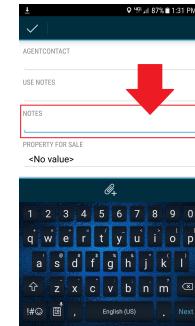


Figure 58: Notes

Enter property for sale yes or no

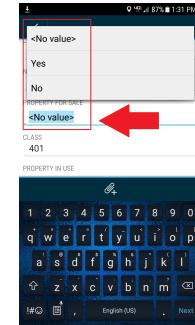


Figure 59: Property for Sale

Device 1 Field Operation Cont.
Property in Use Yes or No

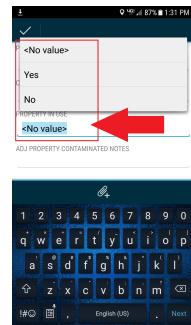


Figure 60: Property in Use

Placeholder

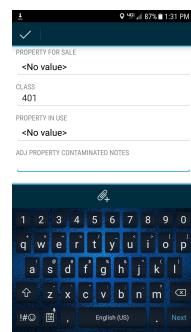


Figure 61: Placeholder

prefilled

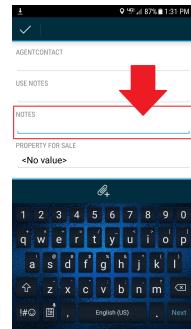


Figure 62: Property Contaminated

Device 1 Field Operation Cont.
Enter notes up to 120 characters

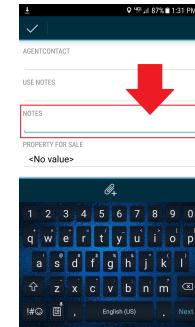


Figure 63: Notes up to 120 characters

Adjacent Property Contaminated prefilled

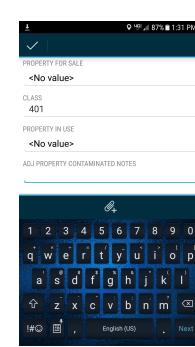


Figure 64: Adjacent Property Contaminated

Property Contaminated notes prefilled

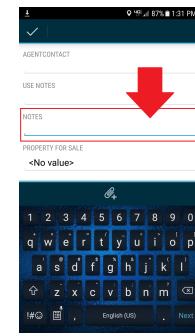


Figure 65: Property Contaminated

Device 1 Field Operation Cont.
Property Maintained Yes or No



Figure 66: Property Maintained

Picture Comments up to 120 characters

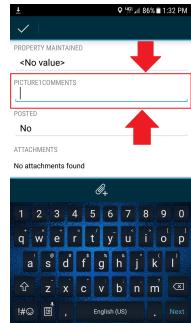


Figure 67: Picture Comments

Placeholder

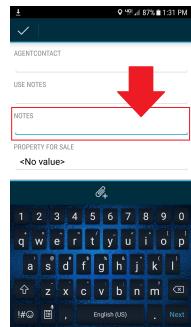


Figure 68: Placeholder

Device 2 Field Operation

Use photos taken with the Open Camera Application.



Select a parcel from the map

Figure 69: Select Parcel

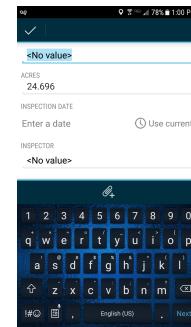
Push Attachment Button

Figure 70: Push Attachment Button

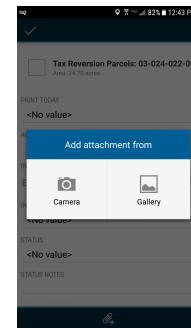
Select Gallery

Figure 71: Add Attachment From Gallery

Device 2 Field Operation Cont.
Navigate to the Open Camera Folder

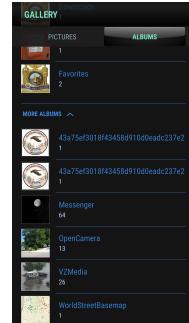


Figure 72: Open Camera Folder

Select the appropriate image

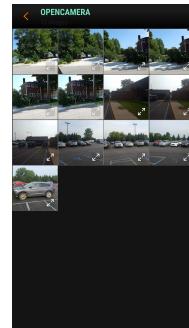


Figure 73: In the Open Camera Folder

Press the check button to save
the image to the parcel

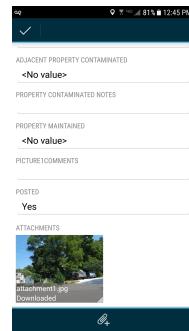


Figure 74: Image in the App

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

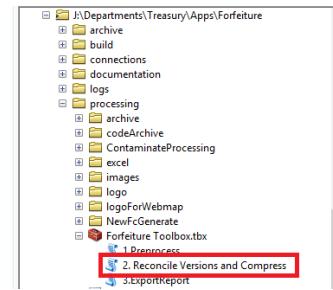


Figure 75: Reconcile Versions and Compress Tool

Execute the Reconcile
Versions and Compress
Tool

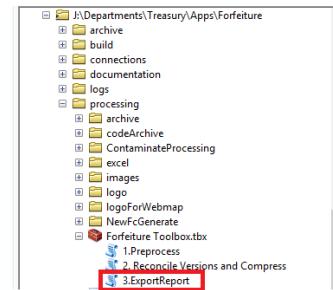


Figure 76: Export Report Tool

Generates forms for each
site visited

Execute the Export Report Tool

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

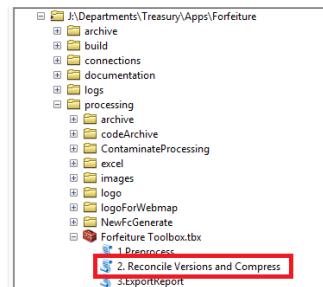


Figure 77: Reconcile Versions and Compress Tool

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

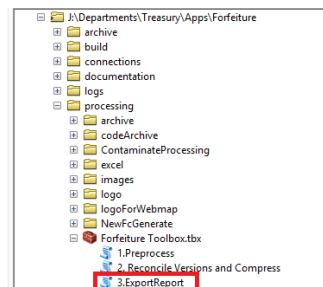


Figure 78: Export Report Tool

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

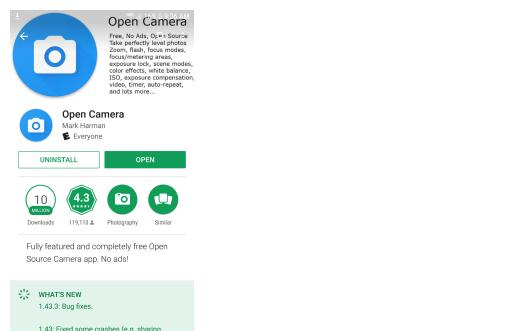


Figure 79: Open Camera from Google Play Store
