

# Forfeiture Data Collection

Mobile App with Collector for ArcGIS

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Allegan County GIS  
[www.allegancounty.org/gis](http://www.allegancounty.org/gis)

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## 0.1 Forfeiture Data Collection

### 0.1.1 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**Statement of Problem** Current Tax Forfeiture workflow is built on MapInfo software which has been replaced by ESRI software.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 will facilitate:

- Mobile data collection on handheld device via Collector for ArcGIS configured with Allegan County GIS Portal (**device app**)
  - Device app 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.

### 0.1.2 Design

**Overview** This Application utilizes Treasurer Department data to document the forfeiture process. An enterprise GIS deployment enables offline data collection by up to two users.

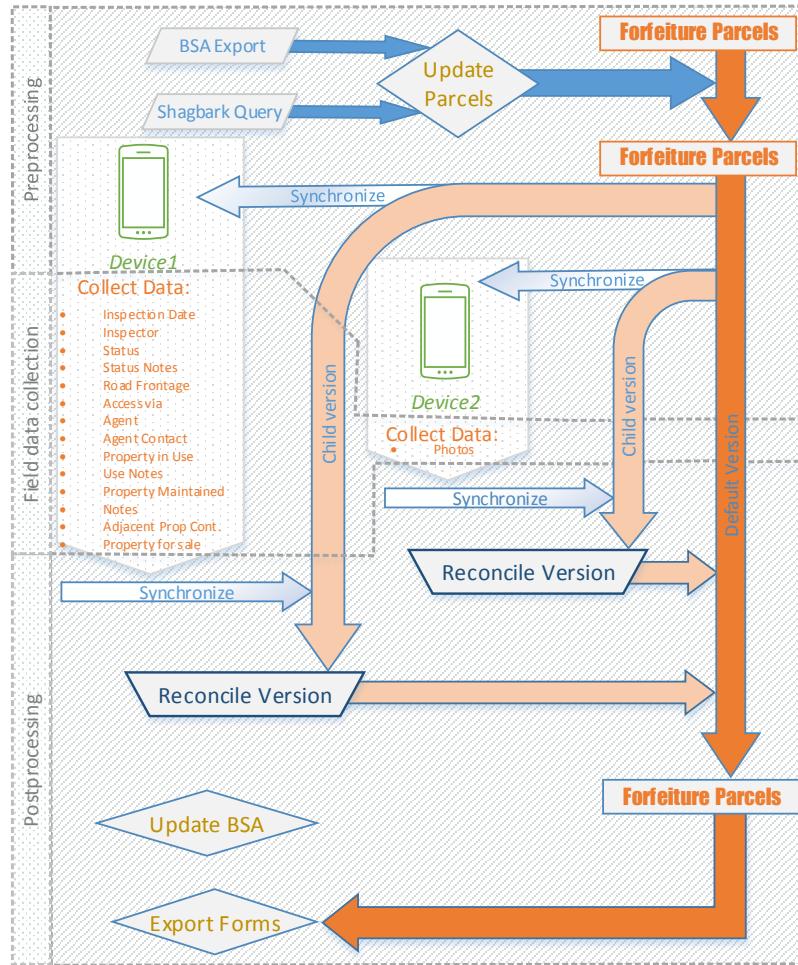


Figure 1: Project Design

There are three stages to daily workflow: Preprocessing, Field Collection, and Postprocessing. **Forfeiture Parcels**, is a map feature class that is processed in the office via the network and remotely via the internet.

## **Workflow Summary**

**Preprocessing** The data is updated to match the Treasures data in BSAforfeiture.net and check for intersections with known contamination sites. Data is then synchronized to two android mobile devices.

**Field data collection** The two mobile devices are used to collect info required, one for all the attributes, the other for photos.

**Postprocessing** The mobile devices are syncronized back to the network data and a form is exported for each site visited that day.

## **Technologies Used**

**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.

**ArcGIS Portal Webmaps and Apps** Live data from a publishing enterprise geodatabase(ACPub), running on SQL Server database server (acintsql01) is provided through a feature service (REST service) named TaxReversionParcels. A webmap called the Forfeiture Field Map consumes the TaxReversionParcels feature service, exposing the data to editing. The Forfeiture Field Map is configured to work in the ArcGIS Collector App. The app downloads the webmap, allowing the user to collect the necessary information on each forfeiture parcel in the field disconnected, and then to upload the changes when reconnected.

**Forfeiture Mobile Data Collection App in Action** Three parts of the daily routine:

1. Preprocessing (in the office):

- Export current forfeiture list from BSA

- Update webmap layers with results from BSA export
- Update webmap layers with results of an intersect routine with contaminated sites
- Synchronize from webmap layers to field collection devices (**device app**)

2. Field data collection with device app:

- Navigation to forfeiture sites is aided by users location shown in map
- A Checklist of data points about the site
- Attach photos to the site
- Save results for synchronization in post-processing

3. Post-processing (in the office)

- Synchronize data and images collected in device app to webmap layers

## Data Details

**Location** The data is located in AC PUB. AC PUB is a geodatabase on ACINTSQL01.

### Forfeiture Parcels Data

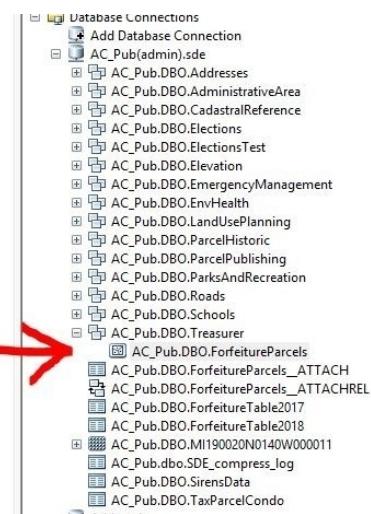


Figure 2: Live Data Location

### Contamination Data

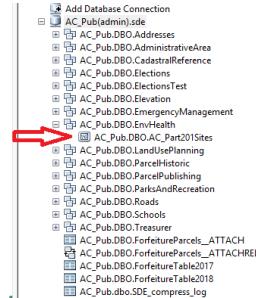


Figure 3: Contamination Feature Class

### ForfeitureParcels Feature Class

Attribute List			
Field Name	Field Alias	Entry Type	Note
PropertyNumber	Property Number	Prefilled	NA
Need2Print	Print Today	Dropdown	Yes or No
InspectionDate	InspectionDate	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
UseNotes	Use Notes	Open Entry	120Char
PropMaintNotes	Property Maintained Notes	Open Entry	120Char
PropertyForSale	Property for sale	Dropdown	Yes or No
Posted	Posted	Prefilled	NA
InList	In List	Prefilled	in Preproc
PostedInList	PostedInList	Prefilled	in Preproc
Acres	Acres	Prefilled	NA
Class	Class	Prefilled	NA
PropertyInUse	Property In Use	Dropdown	Yes or No
PropertyMaintained	Property Maintained	Dropdown	Yes or No
PropertyContaminated	Property Contaminated	Prefilled	in Preproc
Notes	Notes	Open Entry	120Char
AdjacentPropertyContaminated	Adjacent Property Contaminated	Prefilled	in Preproc
PropertyContaminatedNotes	PropertyContaminatedNotes	Prefilled	in Preproc
AdjPropertyContaminatedNotes	AdjPropertyContaminatedNotes	Prefilled	in Preproc
PictureComments	Picture1Comments	Open Entry	50Char
PostedDate	PostedDate	Dropdown	Date

Table 1: Dataset Details

**Webmap Details** The Forfeiture Field Map can be accessed on PC through the Allegan County GIS Portal. The map is made up of a basemap and a feature layer.

The screenshot shows the 'Forfeiture Field Map' item details page. At the top, there's a blue header bar with the title 'Forfeiture Field Map' and a 'Edit' button. Below the header are two tabs: 'Overview' (which is selected) and 'Settings'. The main content area starts with a thumbnail image of the map, which is a circular logo for Allegan County, Michigan, featuring a bird in flight. To the right of the thumbnail, the text reads: 'Map for field data collection in annual tax forfeiture processing' by 'bmey531' (Last Modified: August 21, 2018). Below this is a 'Web Map' link and an 'Add to Favorites' button. The next section is titled 'Description' with a placeholder text 'Add an in-depth description of the item.' Following this is a 'Layers' section listing 'TaxReversionParcels' and 'World\_Street\_Map'. The final section is 'Access and Use Constraints' with a placeholder text 'Add any special restrictions, disclaimers, terms and conditions, or limitations on using the item's content.'

Figure 4: Web Map Details

**Feature Layer Details** The webmap consists of a basemap and a feature layer, TaxReversionParcels. TaxReversionParcels has been configured for offline use.

The screenshot shows the 'TaxReversionParcels' item details page. The layout is similar to Figure 4, with a blue header bar, 'Overview' tab selected, and a 'Data' tab available. The main content area includes a thumbnail image showing a map with red parcels, the map title 'Map service exposing treasurer forfeiture data for edits', author 'bmey531' (Last Modified: August 20, 2018), and a 'Feature Layer' icon. It also includes an 'Add to Favorites' button. Below these are sections for 'Description' (placeholder: 'Add an in-depth description of the item.'), 'Layers' (listing 'Tax Reversion Parcels'), and 'Access and Use Constraints' (placeholder: 'Add any special restrictions, disclaimers, terms and conditions, or limitations on using the item's content.').

Figure 5: 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)

ArcGIS Pricing Map Scene Help

Sign In

World Street Map (for Export)

Overview

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.

■ Tile Layer by Esri

Created: Oct 15, 2013 Updated: Aug 15, 2018 View Count: 39,772

Open in Map Viewer

Open in Scene Viewer

Open in ArcGIS Desktop

Description

This layer is designed to support exporting small volumes of basemap tiles for offline use. The content of this layer is equivalent to World Street Map with exceptions only in China and at some levels of detail. This comprehensive street-level includes highways, major roads, minor roads, one-way road indicators, railways, water features, cities, parks, landmarks, building footprints, and administrative boundaries, overlaid on shaded relief for added context. See [World Street Map](#) for more details.

The map service supporting this layer will enable you to export up to 150,000 tiles in a single request. For estimation purposes, this is large enough to support the export of:

- Large city (e.g. San Francisco) down to full level of detail or 1:11,000 scale (Level 19)
- Medium size state or province (e.g. Colorado) down to scale of 1:136,000 (Level 14)
- Medium to large country (e.g. Continental United States) down to scale of 1:128,000 (Level 11)

This layer is not intended to be used to display live map tiles for use in a web map or web mapping application. To display map tiles, please use [World Street Map](#).

Service Information for Developers

To export tiles for World Street Map (for Export), you must use the instance of the `World_Street_Map` service hosted on the [tilebasemaps.arcgis.com](#) server referred by this layer (see URL in Content box), which has the `ExportTiles` operation enabled. This layer is intended to support export of basemap tiles for offline use in ArcGIS applications and other applications using `arcgis.dataservice.exportTiles` general availability, export

Figure 6: Basemap Source Description

## unplaced images



Figure 7: Portal Contents

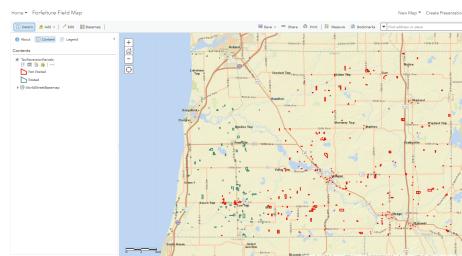


Figure 8: Field Map on PC

### **0.1.3 Hard Copy Record**

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

#### **ArcGIS Server**

**xx**

## **0.1.4 User Manual**

### **Administrative Tasks**

#### **Annual Setup**

**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.

**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.

#### **Schema Change Procedure**

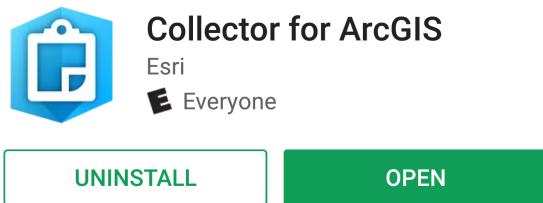
#### **Form Edits Procedure**

## Collection Device Setup

### Collector Application Setup Details

#### Install Collector for ArcGIS

- Available from the Google Play Store



Accurate Data Collection Made Easy

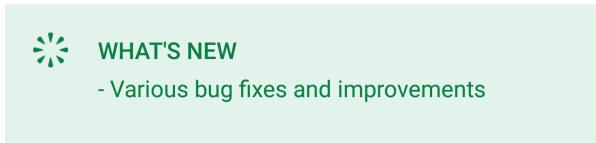


Figure 9: Download the App

## Configure Collector

for Organization Website, Type:

[https://gis.allegancounty.org/  
portal\\_webadaptor](https://gis.allegancounty.org/portal_webadaptor)

then:

Press Continue Enter Cre-

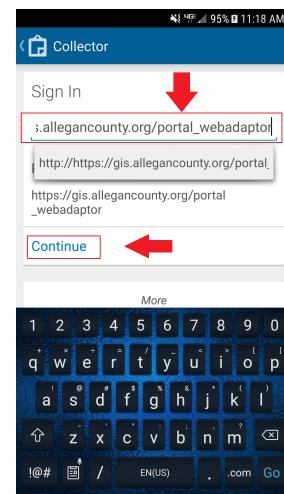


Figure 10: Collector Connection

dentials

then:

Press SIGN IN

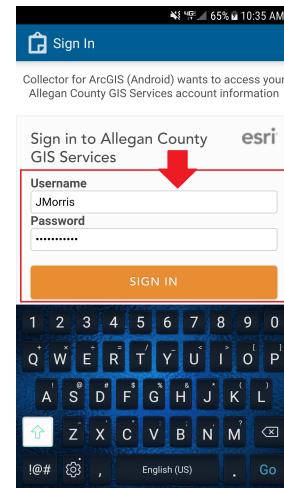


Figure 11: Enter Credentials

**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

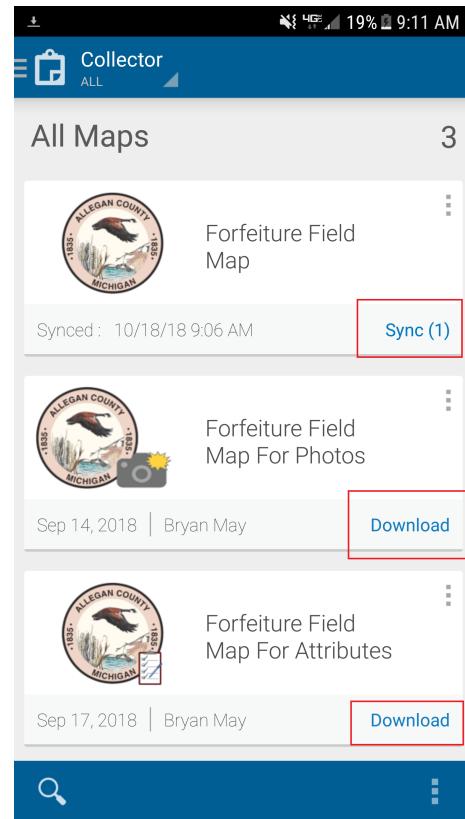


Figure 12: Collector Maps Menu

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

Press Download

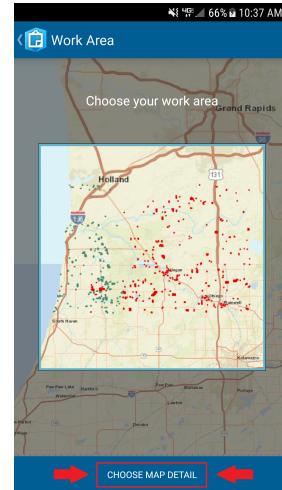


Figure 13: Choose Work Area (large)

Specify work area to download and press map detail

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

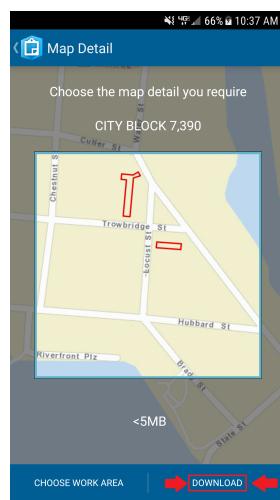


Figure 14: Choose Map Detail

This area is ready for field data collection.

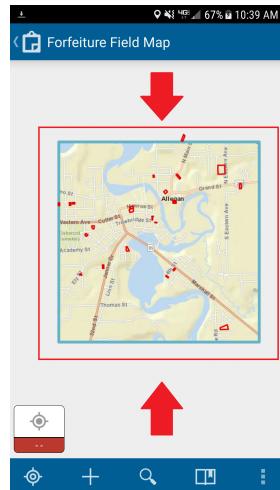


Figure 15: Map on Device

## Open Camera Application Setup Details

### Install Open Camera

- Available from the Google Play Store

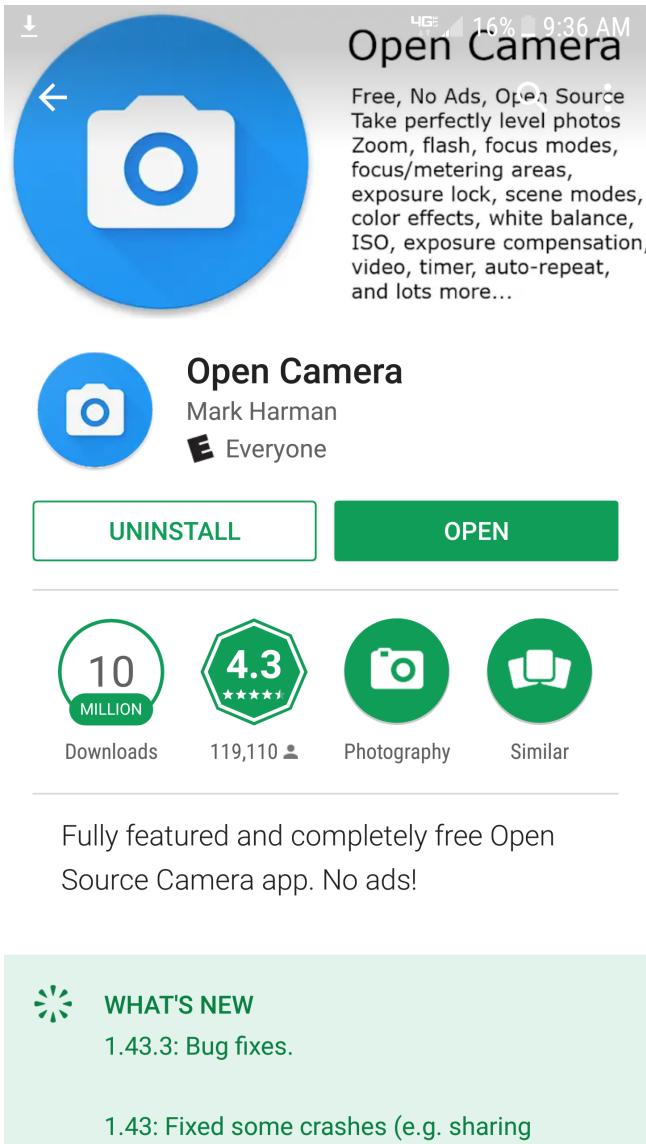


Figure 16: Open Camera from Google Play Store

## Configure Open Camera

In the Open Camera Application:  
Press the gear shaped Settings

button to go into the settings menu  
Press the Photo Settings but-

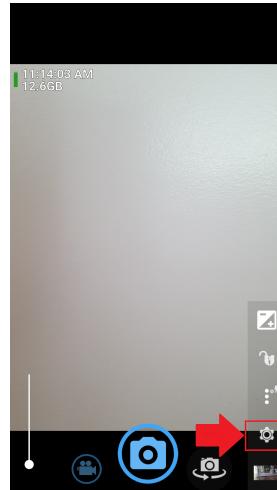


Figure 17: Find Settings Menu

ton

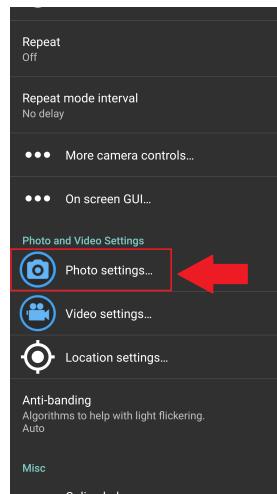


Figure 18: Setting Screen

## Set Photo Resolution

In photo settings:  
Press the Camera resolu-

tion button  
Select **640 x 480**

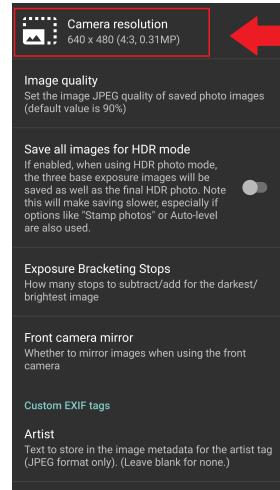


Figure 19: Photo Settings Menu

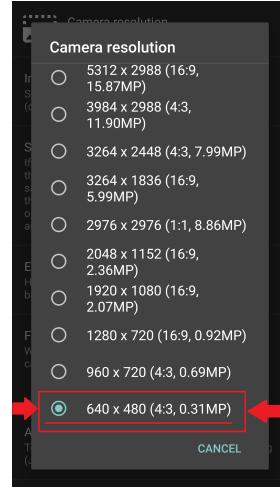


Figure 20: Camera Resolution Setting

## 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 tool-

box

Open tool 1

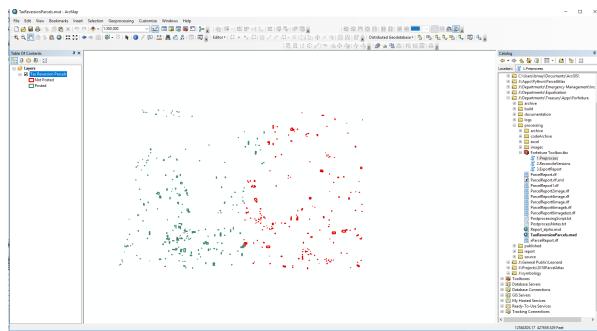


Figure 21: Processing Tools

## Synchronize the Forfeiture Field Map

Note the date and time:  
Press Sync Note the date

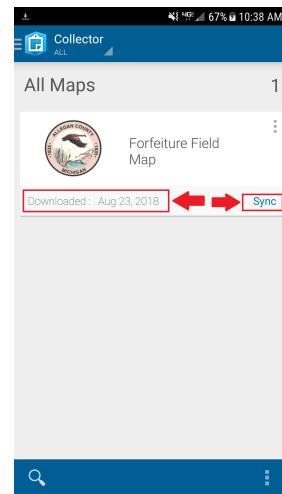


Figure 22: Map Downloaded

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and time Map is now syn-

chronized

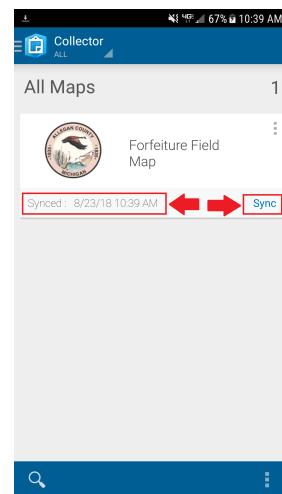


Figure 23: Map Synchronized

## **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. If the boxes are aut-fill, select from dropdown or typed.

**Device 1 Field Operation** Device one data collection interface, used to add data to all of the boxes

In the Forfeiture Field Map, for each site visited:  
**Select the desired parcel**

**Push the edit button**



Figure 24: Select Parcel

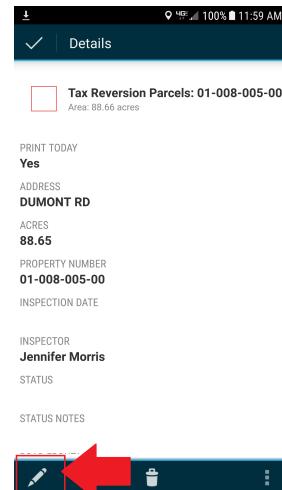


Figure 25: Parcel Details

Class prefilled Acres prefilled

## Device 1 Field Operation Cont.

Select Yes for Print Today

Select Use Current or en-

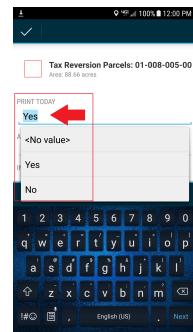


Figure 26: Print Today Yes or No

ter any date  
Select Inspector From

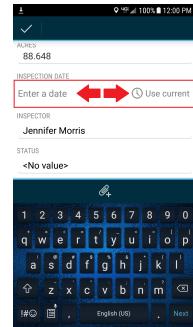


Figure 27: Enter Date

Dropdown

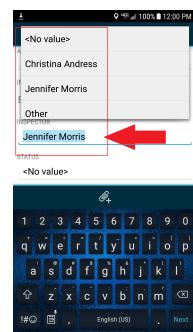


Figure 28: Select Inspector

## Device 1 Field Operation Cont.

Select Occupied or Not Occupied

Enter status notes up to

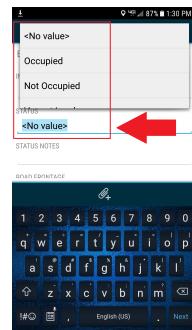


Figure 29: Status

120 characters  
Select Yes or No for Road

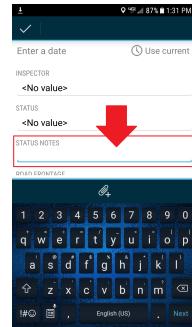


Figure 30: Status Notes

Frontage

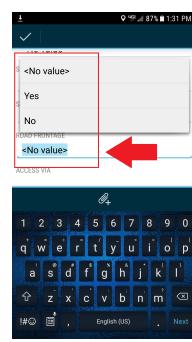


Figure 31: Road Frontage

**Device 1 Field Operation**  
Cont. Enter road used for  
access

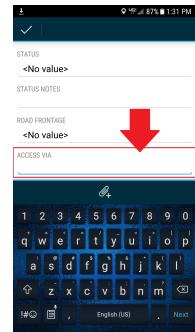


Figure 32: Access Via

Enter Agent Name

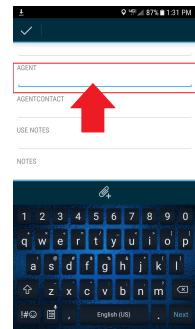


Figure 33: Agent

Enter Agent Contact Info



Figure 34: Agent Contact

## Device 1 Field Operation Cont.

Enter Use Notes up to 120 characters

Enter Notes up to 120

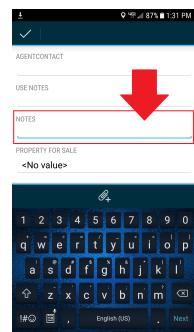


Figure 35: Use Notes

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characters

Enter property for sale yes

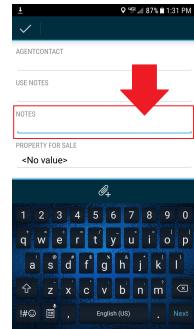


Figure 36: Notes

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or no



Figure 37: Property for Sale

### Device 1 Field Operation Cont.

Property in Use Yes or  
No  
Adjacent Property Con-



Figure 38: Property in Use

---

taminated Notes up to 120  
characters  
Property Contaminated

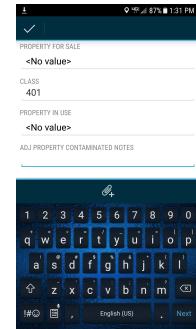


Figure 39: Adjacent Property Contam-  
inated Notes

---

yes or no prefilled

32

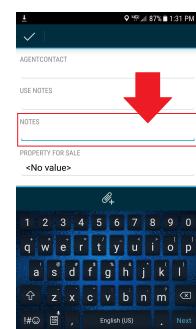


Figure 40: Property Contaminated

## Device 1 Field Operation Cont.

Enter notes up to 120 characters

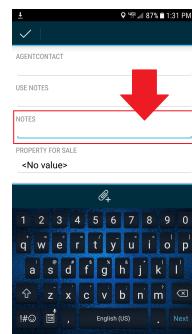


Figure 41: Notes up to 120 characters

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Adjacent Property Contaminated yes or no pre-filled

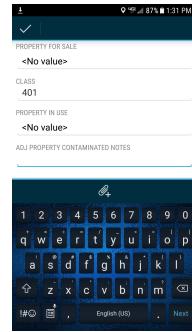


Figure 42: Adjacent Property Contaminated

---

Enter Property Contaminated notes up to 120 characters

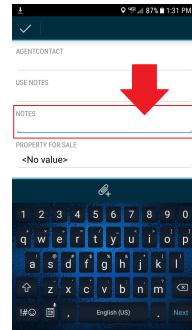


Figure 43: Property Contaminated

## Device 1 Field Operation Cont.

Property Maintained Yes or No

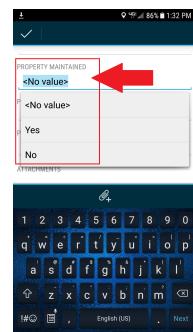


Figure 44: Property Maintained

Picture Comments up to 120 characters

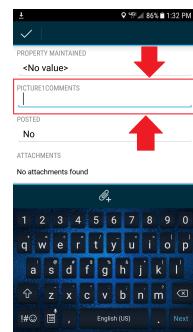


Figure 45: Picture Comments

Placeholder

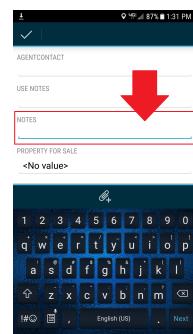


Figure 46: Placeholder

**Device 2 Field Operation** In the Forfeiture Field Map, for each site visited, a photo or photos can be added from the Open Camera Application.

Select a parcel from the map



Figure 47: Select Parcel

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Push Attachment Button

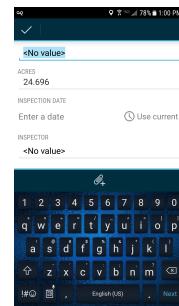


Figure 48: Push Attachment Button

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Select Gallery

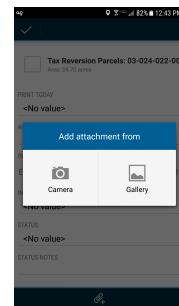


Figure 49: Add Attachment From Gallery

## Device 2 Field Operation Cont.

Navigate to the Open Camera Folder

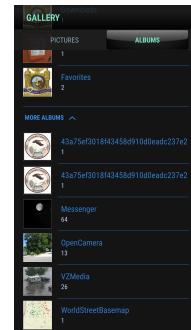


Figure 50: Open Camera Folder

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From within the Open Camera Folder, Select the appropriate image

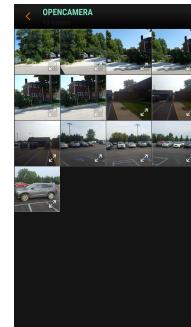


Figure 51: In the Open Camera Folder

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Press the check button to save the image to the parcel

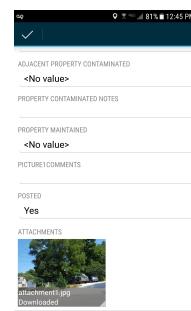


Figure 52: Image in the App

**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** A tool in ArcGIS that:

- Reconciles geodatabase versions
- Generates forms for each site visited

### **0.1.5 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**

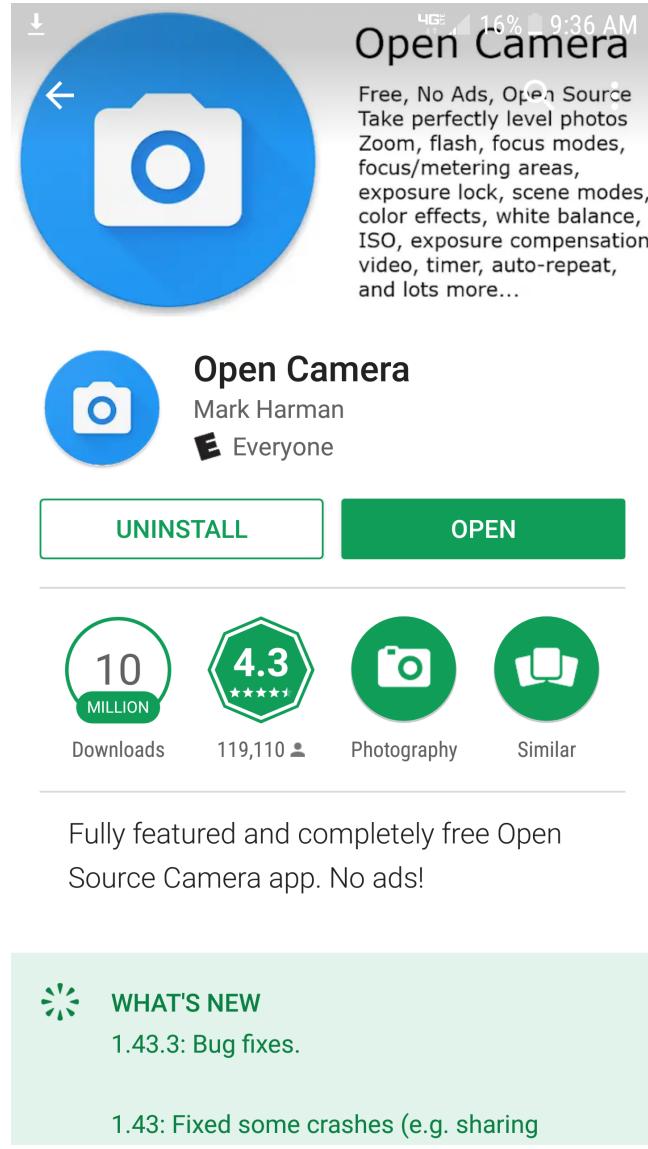


Figure 53: Open Camera from Google Play Store