

Forfeiture Data Collection

Mobile App with Collector for ArcGIS

Allegan County GIS
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Statement of Problem Current Tax Forfeiture workflow is built on MapInfo software which has been replaced by ESRI software.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.

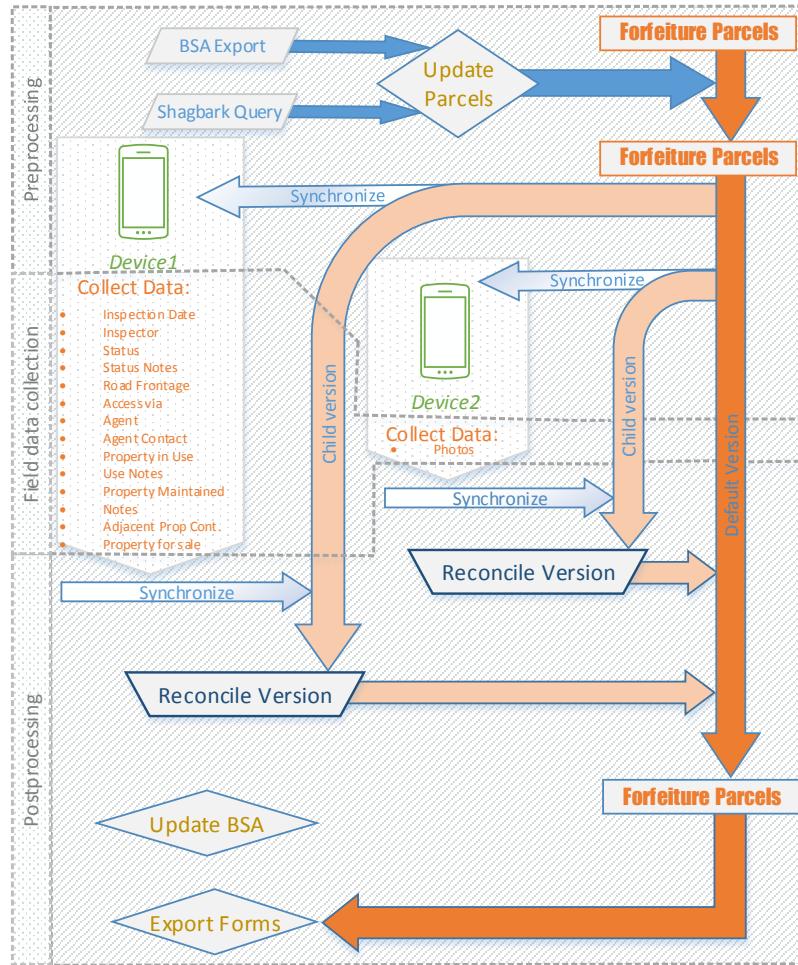


Figure 1: Project Design

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 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.

Field Data Collection Three parts of the daily routine:

1. Pre-processing (in the office):
 - Export current forfeiture list from BSA
 - Update webmap layers with results from BSA export

- 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 ACPUB. ACPUB is a geodatabase on ACINTSQL01.



Figure 2: Live Data Location Screen-shot

ForfeitureParcels Feature Class

Collector for ArcGIS

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' details page. At the top, there's a blue header bar with the map title and navigation buttons for 'Overview' and 'Settings'. Below the header is a thumbnail image of the map, which features a circular logo for 'ALLEGAN COUNTY MICHIGAN' and a landscape scene. To the right of the thumbnail, the map's description is provided: 'Map for field data collection in annual tax forfeiture processing' by 'bmey531' last modified on 'August 21, 2018'. A 'Web Map' button is also present. Below this section is a 'Description' field with a placeholder 'Add an in-depth description of the item.' Under the 'Layers' heading, there are two listed: 'TaxReversionParcels' and 'World_Street_Map'. The 'Access and Use Constraints' section contains a placeholder 'Add any special restrictions, disclaimers, terms and conditions, or limitations on using the item's content.'

Figure 3: 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' details page. It has a similar structure to Figure 3, with a blue header bar, a thumbnail image showing a map of parcels, and a description: 'Map service exposing treasurer forfeiture data for edits' by 'bmey531' last modified on 'August 20, 2018'. A 'Feature Layer' button is shown. Below the thumbnail is a 'Description' field with a placeholder. The 'Layers' section shows 'Tax Reversion Parcels' with options to 'Open In' or 'Service URL'. The 'Access and Use Constraints' section has a placeholder.

Figure 4: 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)' service. At the top, there are navigation links: ArcGIS, Pricing, Map, Scene, Help, and a sign-in button. Below the title, there's a 'Overview' tab and a map preview showing a small area of the world map. To the right of the map, there's a brief description: '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.' Below this, it says 'B Tile Layer by Esri' and provides creation and update dates. There are also 'Authoritative' and 'Subscriber' status indicators. On the right side, there are buttons for 'Open in Map Viewer', 'Open in Scene Viewer', and 'Open in ArcGIS Desktop'. Below these buttons, there's a 'Details' section with a 'Source: Map Service' link, a size indicator of 'Size: 1 xs', and a five-star rating. There are social media sharing icons for Facebook, Twitter, and LinkedIn. Under the 'Owner' section, it lists 'Esri' and 'Merged by: Esri'. Finally, the 'Tags' section contains a long list of geographical and thematic terms.

Figure 5: Basemap Source Description

unplaced images

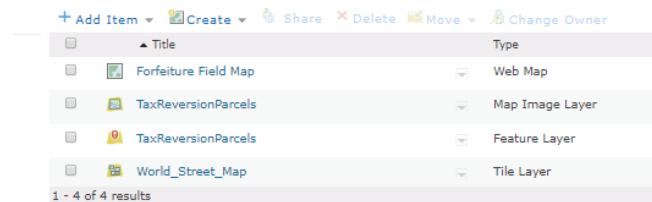


Figure 6: Portal Contents

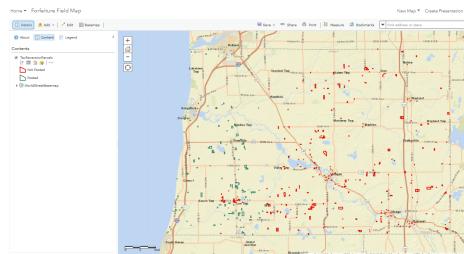


Figure 7: Field Map on PC

0.1.3 Hard Copy Record

0.1.4 User Manual

Admin Tasks

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

Camera Settings

Internet Settings

Collector Setup Details

Install Collector for ArcGIS

- Available from the Google Play Store



Figure 8: Download the App

Configure Collector

for Organization Website, Type:

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

then:

Press Continue

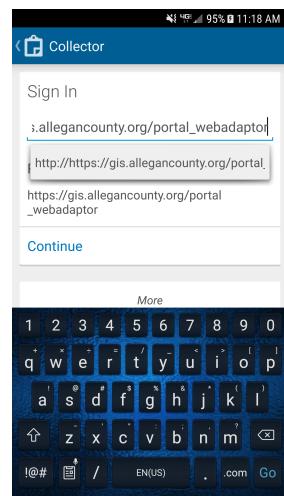


Figure 9: Collector Connection

Enter Credentials

then:

Press SIGN IN

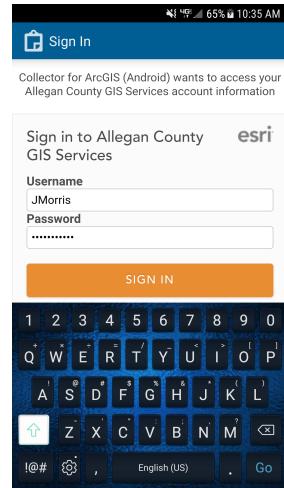


Figure 10: Enter Credentials

Download the Forfeiture Field Map

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

Press Download

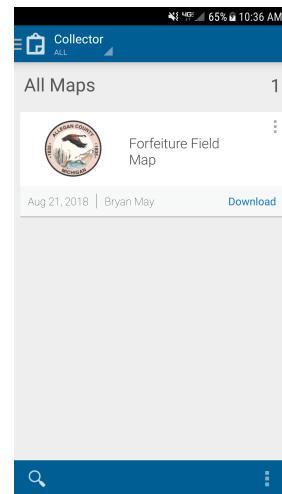


Figure 11: Collector Maps Menu

Specify work area to download

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

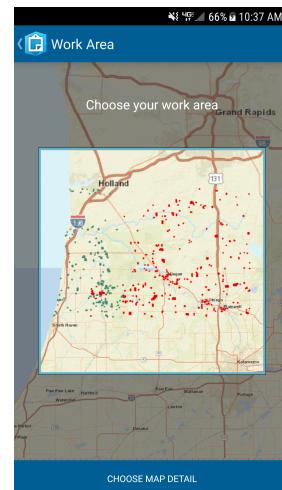


Figure 12: Choose Work Area (large)

Choose Map Detail

Zoom into the level of detail desired.

Press Download

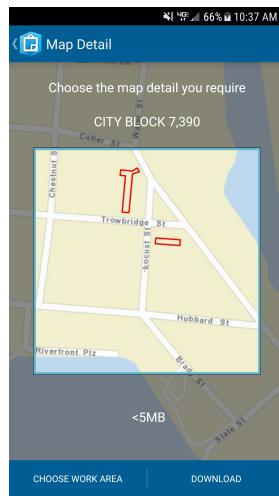


Figure 13: Choose Map Detail

Here is how the map should look on the device:

This area is ready for field data collection.

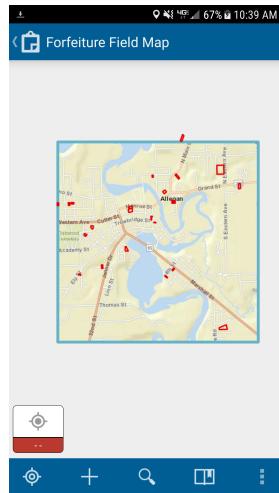


Figure 14: Map on Device

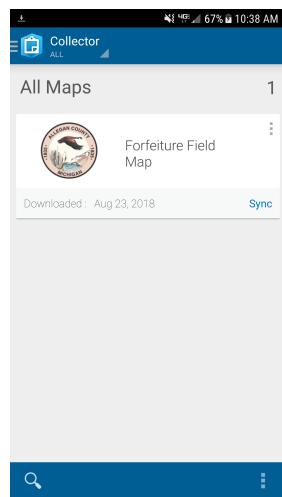
Daily Preprocessing Routine

Execute Preprocessing Script A tool in ArcGIS that:

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

Synchronize the Forfeiture Field Map

Note the date and time:



Press Sync

Figure 15: Map Downloaded

Note the date and time

Map is now synchronized



Figure 16: Map Synchronized

Forfeiture Data Collection

Forfeiture Parcels Data Details Attributes are of four entry types:

- prefilled
- autofill
- dropdown
- text box

In the Forfeiture Field Map, for each site visited, select the desired parcel, push the edit button and collect attributes. If the boxes are autofill, select from dropdown or typed.

Attribute List		
Field Name	Entry Type	Note
Property Number	Prefilled	NA
Inspection Date	Autofill or Dropdown	NA
Inspector	Dropdown	NA
Class	Prefilled	NA
Acres	Prefilled	NA
Address	Prefilled	NA
Status	Dropdown	NA
Status Notes	Open entry	254 Char limit
Road Frontage	Dropdown	Yes or No
Access via	Open entry	30 Char Limit
Agent	Open entry	30 Char Limit
Agent Contact	Open entry	30 Char Limit
Property in use	Dropdown	Yes or
Use Notes	Open entry	254 Char limit
Property Maintained	Dropdown	Yes or No
Notes	Dropdown	254 Char limit
Prop Contam	Dropdown	Yes or No
Notes	Open entry	254 Char limit
Adj Prop Contam	Dropdown	NA
Notes	Open entry	254 Char limit
Property for sale	Dropdown	Yes or No
Posted	Prefilled	in Pre and Postproc
InList	Prefilled	in Preproc
PostedInList	Prefilled	in Preproc
Print Today	Dropdown	Yes or No

Table 1: Dataset Details

Device 1 Field Operation

In the Forfeiture Field Map, for each site visited, select the desired parcel, push the edit button and then edit attributes.

This figure shows the data collection interface. Device one will be used to add data to all of the boxes. Touch the boxes to enter text or select a dropdown.

The screenshot displays the 'Collector for ArcGIS' application interface. At the top, it shows a red square icon with the text 'Tax Reversion Parcels: 01-008-005-00' and 'Area: 88.66 Acres'. Below this is a list of data fields:

- Inspection Date: August 14, 2018
- Inspector: Christina Andress
- Status: Occupied
- Status Notes: notes.....notes
- Road Frontage: Yes
- Access Via: Dumont Rd
- Agent: (empty)
- AgentContact: (empty)
- Use Notes: (empty)
- Notes: (empty)
- Property For Sale: No

At the bottom right is a 'Print Today' button.

Figure 17: Device 1 Data Entry

Device 2 Field Operation

In the Forfeiture Field Map, for each site visited, select the desired parcel, push the edit button and then the add attachment button. Select photo and take a photo.

This figure shows the data collection interface. Device two will be used to add photos to a parcel.

The screenshot displays the Collector for ArcGIS application interface. At the top, it shows the title "Collector for ArcGIS". Below the title, there is a header bar with a trash icon. The main content area contains several data entry fields:

- A red square icon followed by the text "Tax Reversion Parcels: 01-008-005-00".
- A field labeled "Area: 88.66 Acres".
- A dropdown menu labeled "Property in use".
- A text input field labeled "Adj Property Contaminated Notes".
- A dropdown menu labeled "Property Contaminated".
- A text input field labeled "Notes".
- A dropdown menu labeled "Adjacent Property Contaminated".
- A text input field labeled "Property Contaminated Notes".
- A dropdown menu labeled "Property Maintained".

Below these fields is a section titled "Attachments" with a blue camera icon. It lists four attachments:

Attachment	Size
attachment1	1.2 MB
attachment2	858 KB
attachment3	1.1 MB
attachment4	878 KB
Photo	22 KB

Figure 18: Device 2 Data Entry

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.