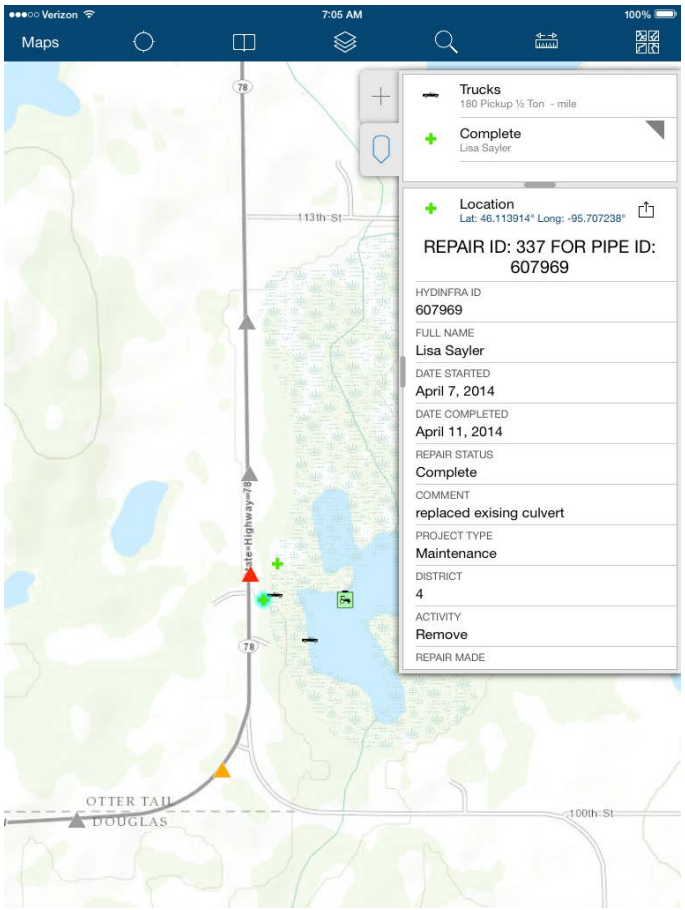
P1715 LCCA iPAD
Collector App User Guide

April XX 2014

Version 1.0.0

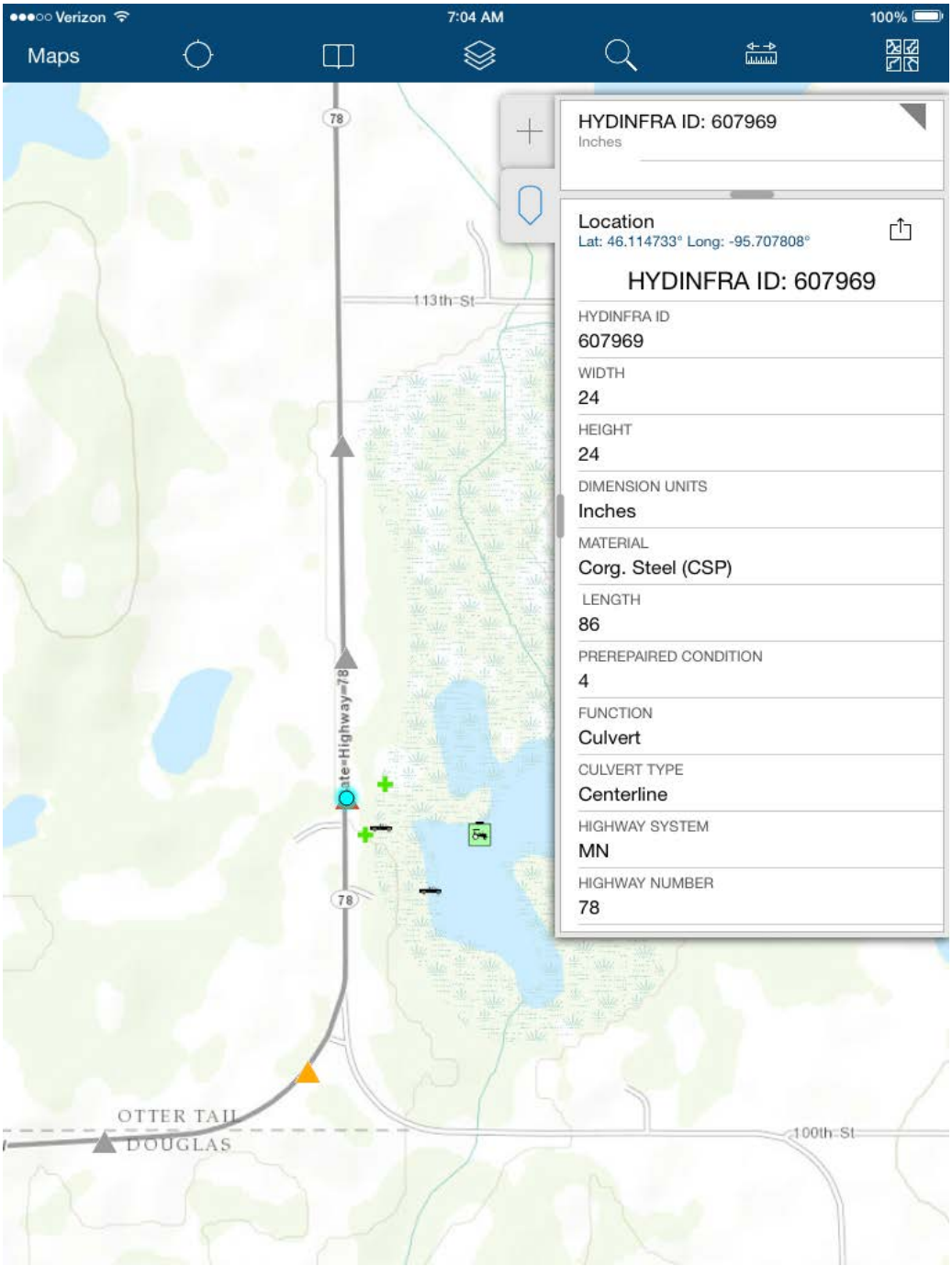
P1715 (LCCA)

Life Cycle Costs for Assets System



Objective:

Our project objective is to quickly provide the ability to track labor, equipment and material costs associated to maintenance of individual drainage pipe assets by mid-April of 2014 on an iPad until a formal asset cost collection solution is implemented.



Hardware and Software Requirements:

Hardware:

The targeted field collection device is an Apple iPad with WiFi and Cellular access to the internet 3G minimum and 4G better, and an internal GPS running iOS7 minimum.

We recommend equipping the iPAD with as much memory as possible, a protective case, and the ability to charge the device in the field. A style that works with an iPad is also very useful and not expensive.

Software download and installation:

MnDOT mobile device security policy, and related Mobile device management software for mobile devices will have to be followed along with the use of the device (iPad) and downloading and installing the free ArcGIS Collector software from iTunes.

The Apple operating system version iOS 7 (required minimum), along with ESRI's ArcGIS Collector a free application for iOS and Android (currently version 10.2.2 as of March 18th 2014) are needed to meet these requirements for this project.

ESRI's ArcGIS Collector Application for iOS can be downloaded via this link to this Apple iTunes link and is a simple install of a native iOS application: We are focusing on iOS deployment in this document.

Available on the App Store

https://itunes.apple.com/us/app/collector-for-arcgis/id589674237?mt=8

Click on the "Free" button and then click the "INSTALL" button, followed by your credentials for the registered iOS user.

ArcGIS Collector application is a native iOS or Android application installed application on your iOS or Android device, it can be then be used as a

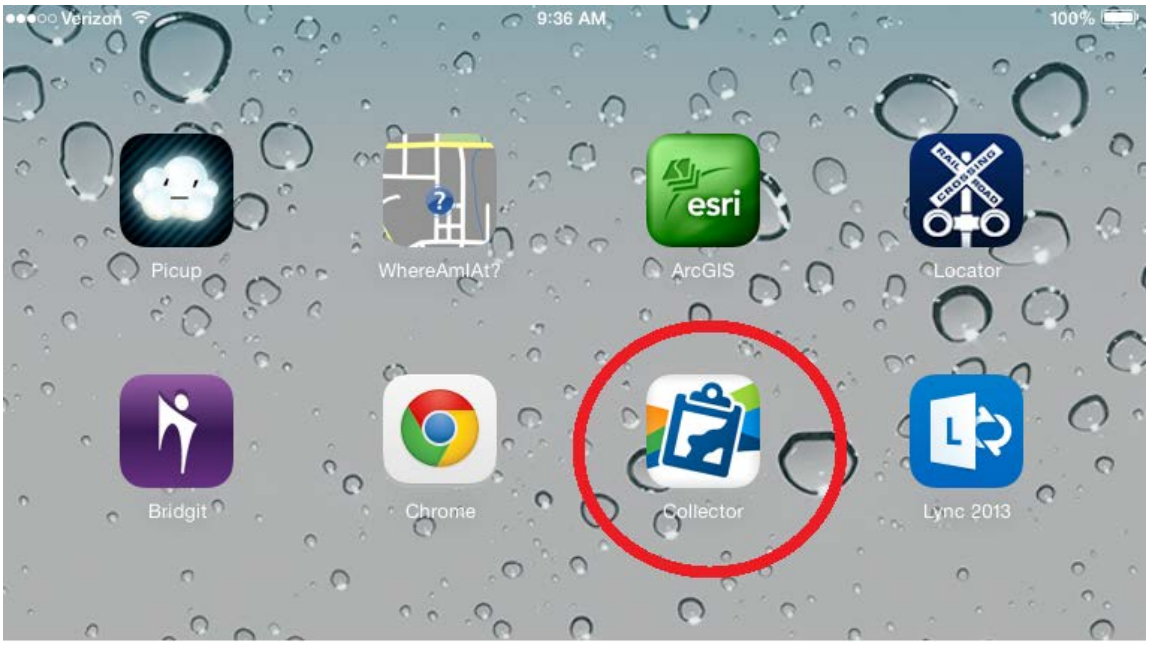
container and launch point for one or many collector type applications that you load into it via the internet. Our current focus is on iOS / iPad.

ArcGIS Collector application is intended to be used with strong cell connection to the internet and assumes by design that collections are being performed as close to the asset in question as possible as opposed to a back-office web interface which does not.

The 'native' behavior of the collector application with the GPS turned on and the 'Zoom to my location' button turned on  means that repair you collect are automatically located where you are physically with the device with in the tolerance of its GPS abilities. With the 'Zoom to my location' button active or on; it will then by design fight you if you try and place the repair at a different location with your finger tap. If you wish to position the repair with your finger in a different location make sure the 'Zoom to my location' button is OFF  but your GPS is still ON … these are two different things, one controlled at the application level and one controlled at the iPad level. Note that if you are inside having this OFF  and setting the sensitivity of your location from the application settings to a maximum radius will help in reducing complaints from the device about accuracy.

Open the project in the installed ESRI's ArcGIS Collector Application:

Click on the ArcGIS Collector Application button now installed on your iPad:

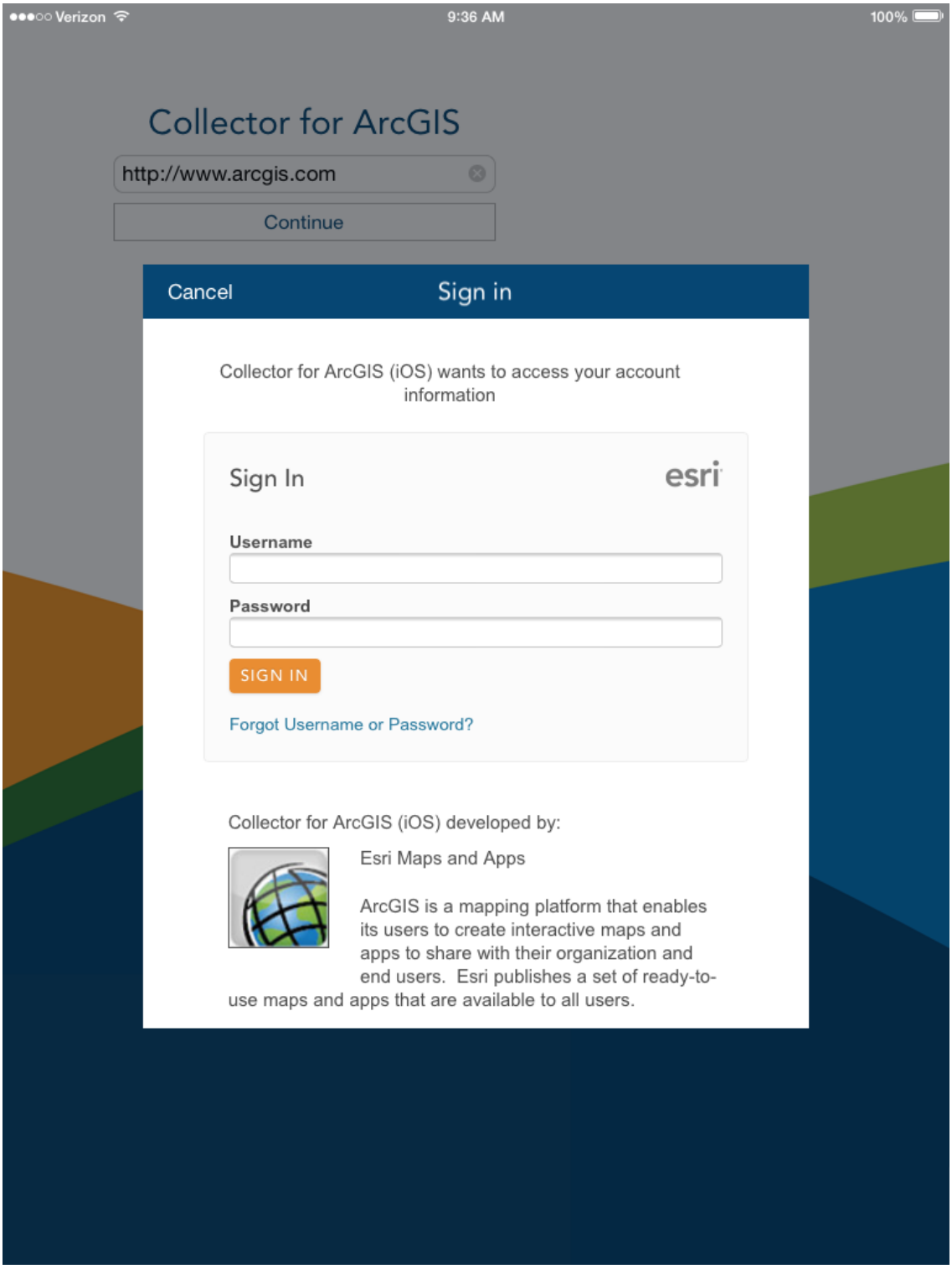


Clicking on the Collector application icon brings up an input field to indicate what service over the internet the LCCA collection application can be obtained from:

Enter in the URL: http://www.arcgis.com and then login.


Collector for ArcGIS
http://www.arcgis.com
Continue
Try it
Learn More
About

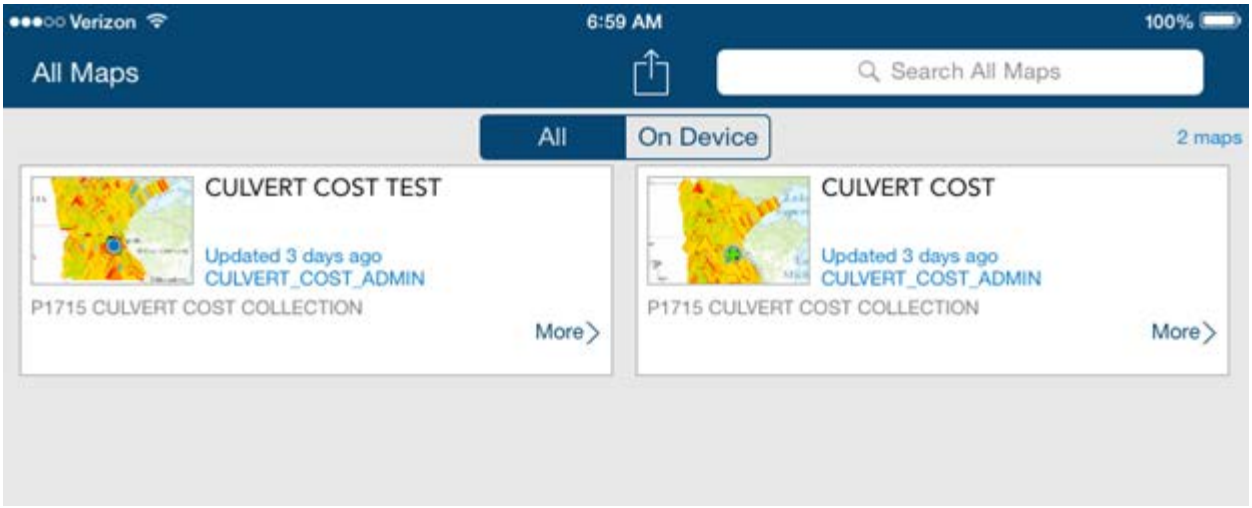
Once connected to the site indicated by the URL you just typed in, you will be presented with a login screen. Enter your credentials that were provided to you.



Once successfully logged in you will choose from a gallery of one or more applications some may be for testing and some for production. Choose the appropriate application for the work you are performing.

Click or tap with your finger or stylus on the map image to load in this case the Culvert Cost application into the Collector iPad application container for running.

Remember to check to have your GPS enabled, battery charge, Cell and / or WiFi connection working and start collecting.



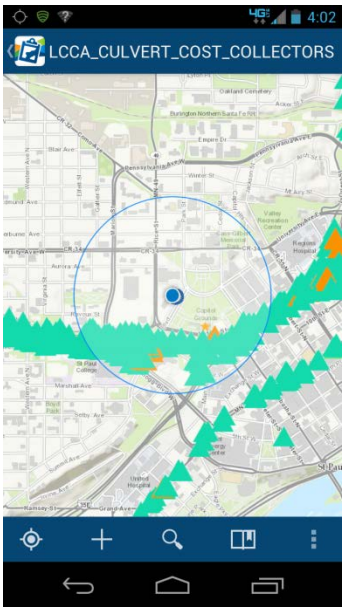
The application will open with a basemap and Hydinfra data displayed near the GPS coordinates of your currently detected location. Tip – Make sure that location services on your iPad are turned on!

The blue dot with the blue circle around it represents your location as the iPad can determine, and the blue circle represents the perceived accuracy of that location. On a good day with a clear signal you can expect near 5 meter accuracy. While this may not be enough to locate two culverts very close to each other as previously captured with high precision GPS devices, it is close enough

along with the HydInfra description and attributes to determine which culvert or pipe is which based on a relative comparison of attributes and relative location.

If needed, different background basemaps and imagery can be displayed to improve the situational awareness for a particular repair location via the basemap selector menu tool  .

The Collector application with the GPS enabled and map showing your current location will move and follow you on your mobile device (iPad or Android) as you drive along.

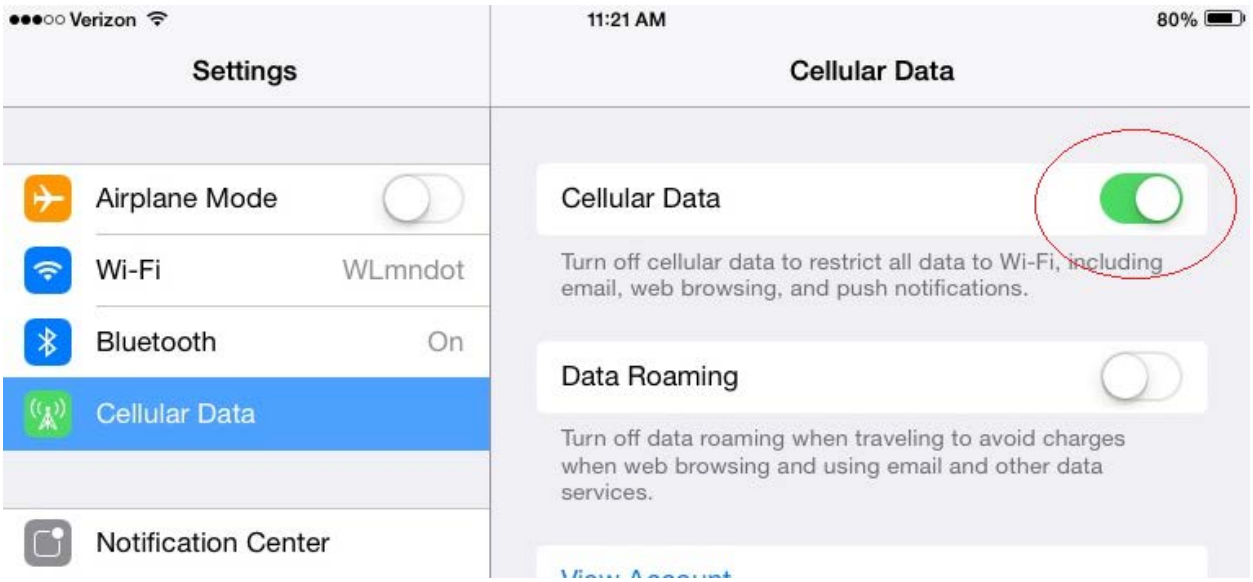


iPad Settings:

Access the iPad settings from the Settings button ‘gear’ icon. 

Cellular Data:

Make sure you have your Cellular Data selection turned on. This provides your network and data access and improves the accuracy of your location due to cell tower location information.



WiFi Data :

If you are in an area where you can use WiFi such as a provided from a hotspot device or work WiFi have it turned on as well. This is also used to improve your location accuracy.

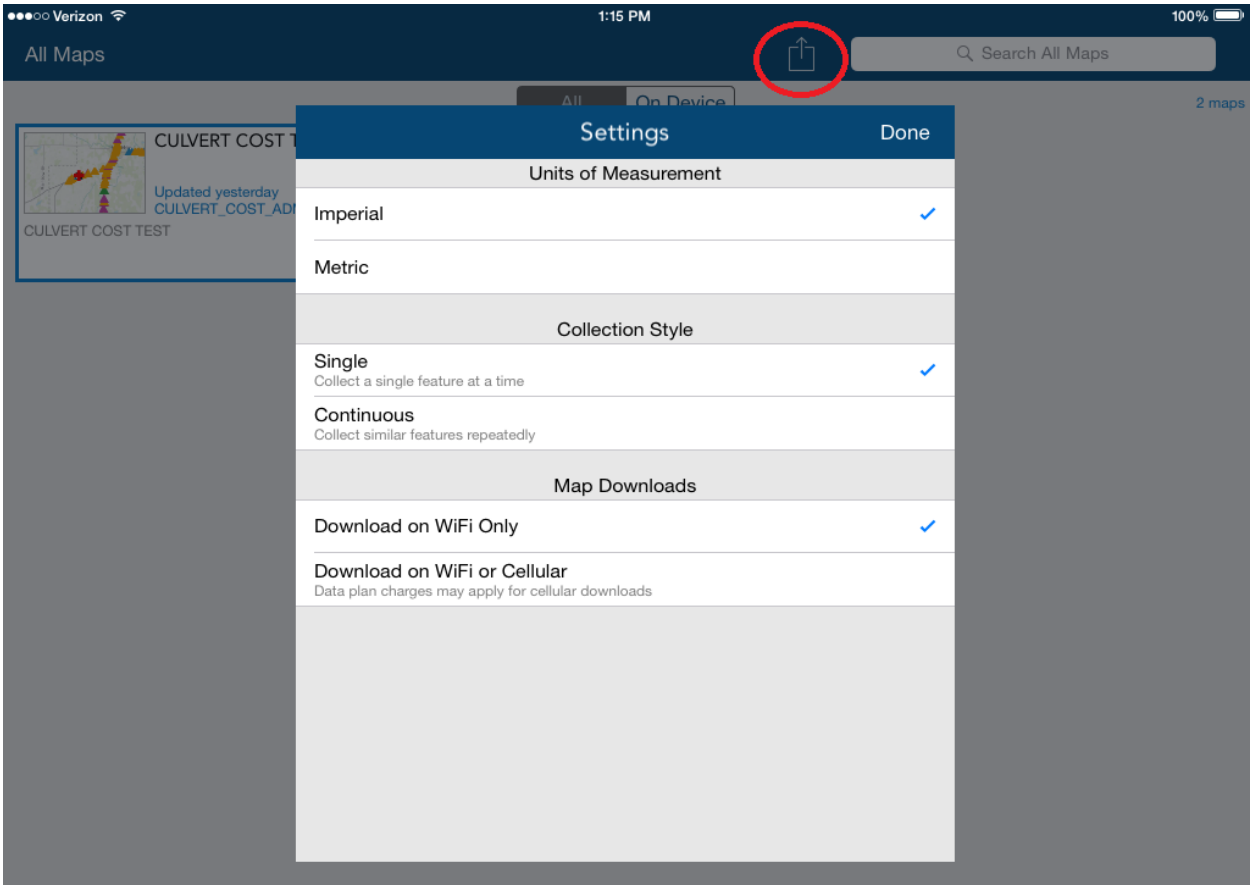
Bluetooth :

Optional currently uses mostly to connect your iPad to your Bluetooth keyboard. In future versions may Bluetooth to GPS or laser range finders.

Location Services:

Location Services uses GPS and WiFi hotspot and cell tower locations to determine your approximate location along with the GPS provided to the device. You can find it under the privacy settings.

You can adjust the collection Settings Units of Measure and other important settings by clicking this special menu button  .



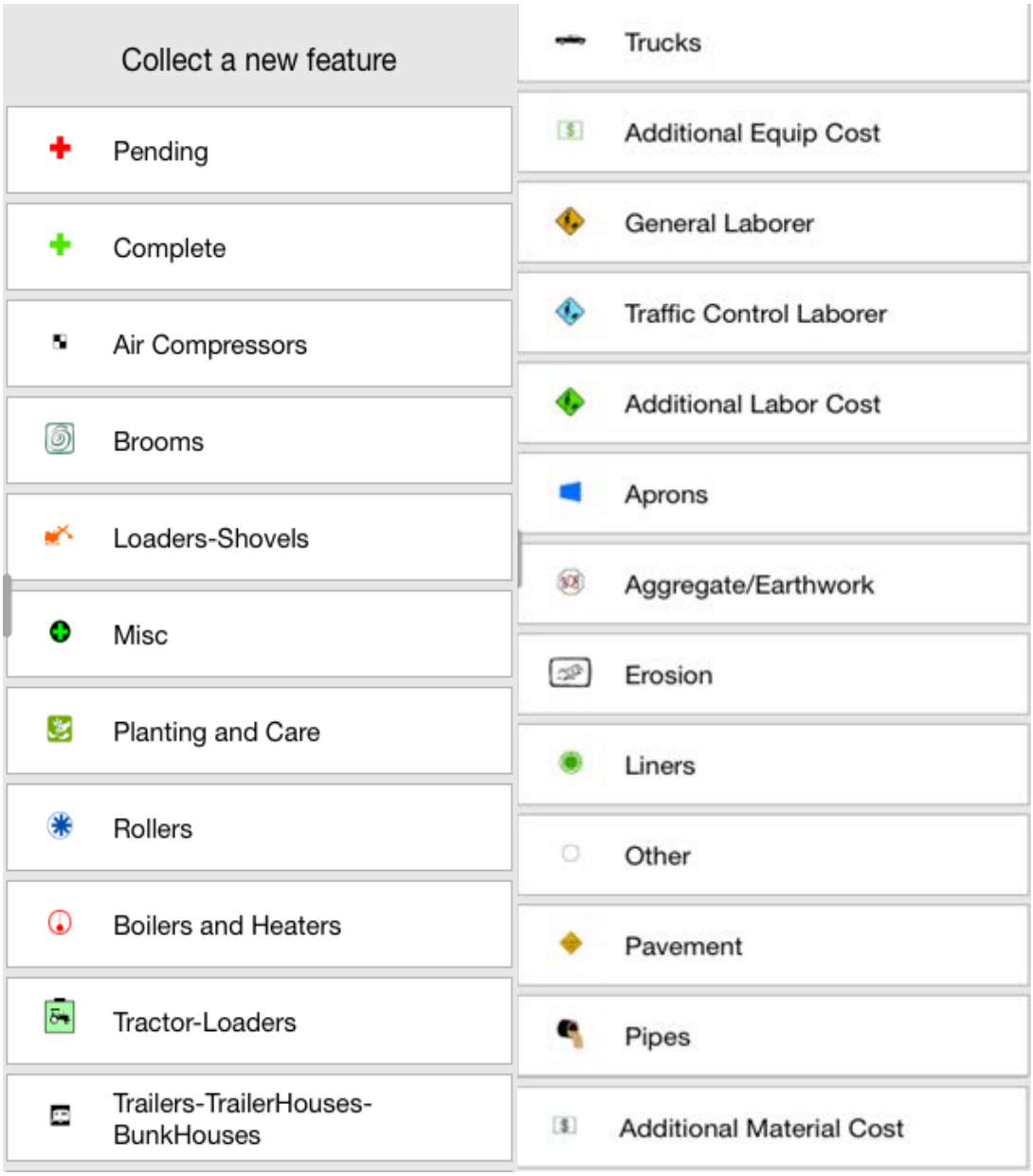
Culvert Repair Collections:

ArcGIS iOS panel and menu bar

- Verizon
  Cell signal and WiFi signal indicate if you are can be connected to the internet via a Cell provider such as Verizon in this case or by WiFi or both. A good strong fast connection is needed to work with this application.
- Maps Returns to previous application selection screen.
- Zoom to my location (On and Off).
- Book marks.
- Hydinfra and repair layers to show.
- Search places or addresses (Not Hydinfra ID).
- Measure distance on map.
- Choose from basemap gallery.
- 10:46 AM Current time.
- 84% Battery state.
- Special menu (Settings, Copy options etc)

TOC – From Collector application on the iPad application

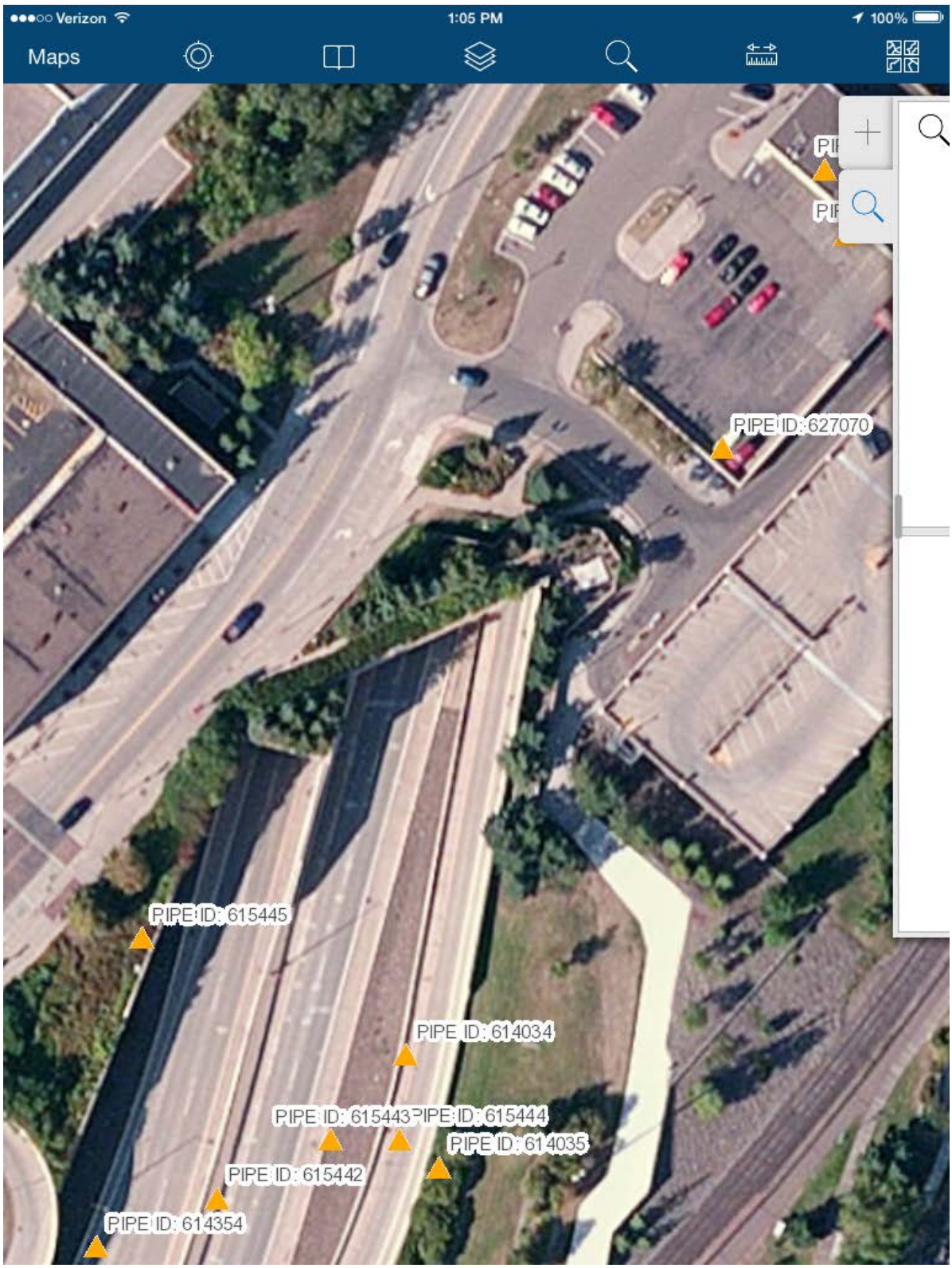
These are your repair items of Repair (Pending or Complete), and the related Labor, Material, and Equipment to choose from that are associated with a Hydinfra ID a.k.a culvert.

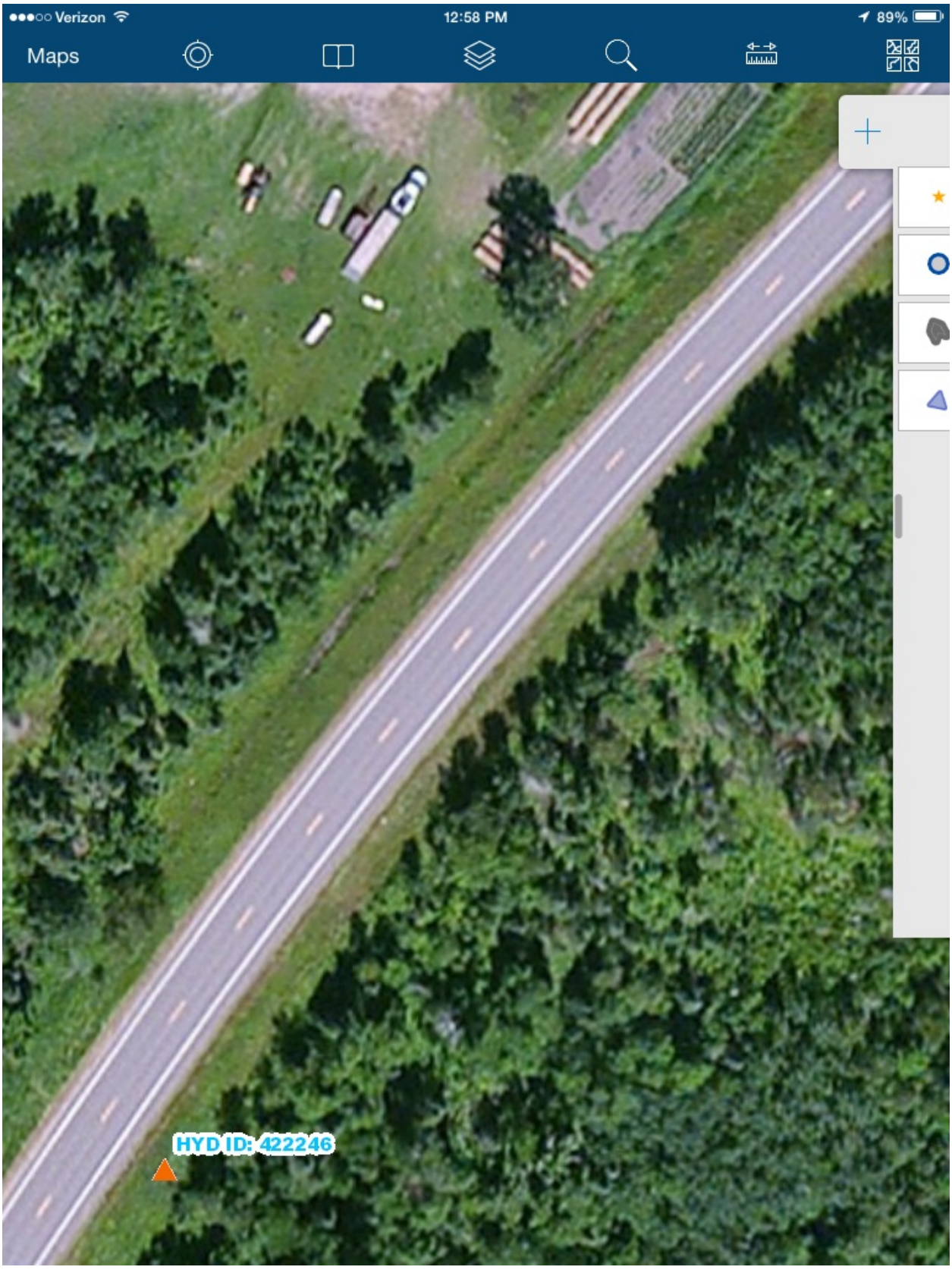


Basemaps:

Clicking on the basemap icon shows a collection of basemaps including imagery that can be used to augment your situational awareness. This requires a good connection to the internet to work well.

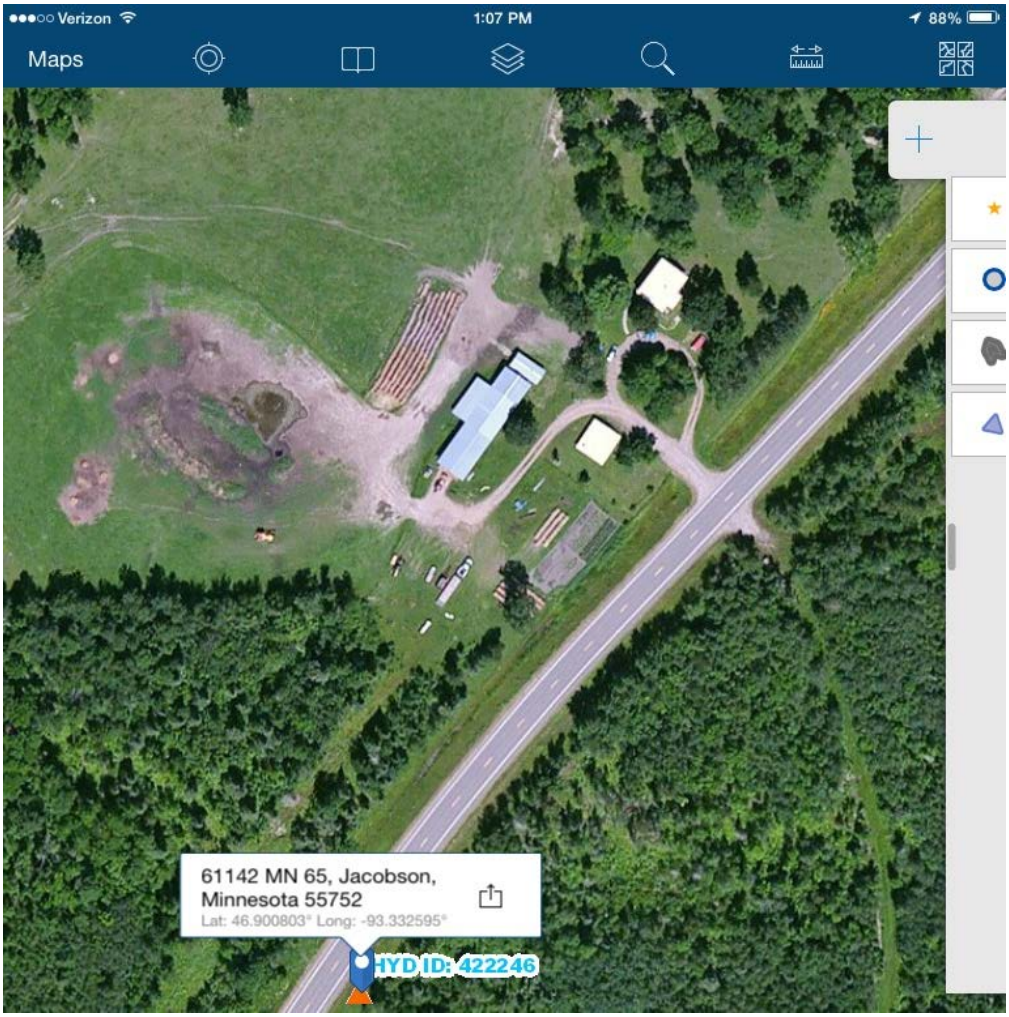
Choosing imagery can be helpful in the Metro as well as greater Minnesota when locating Culverts and other related structures or land marks.



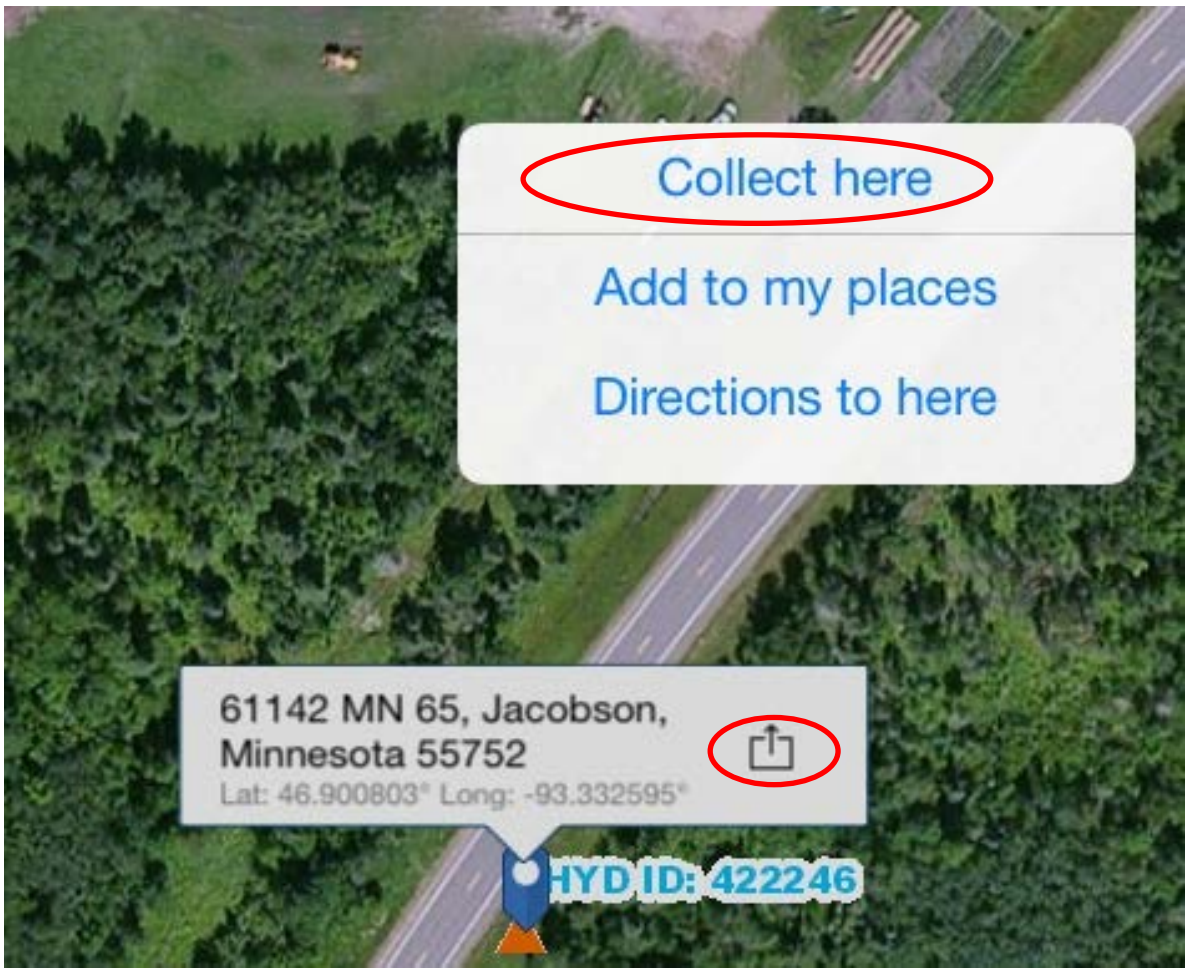

Verizon
12:58 PM
89%
Maps
HYD ID: 422246

Create or Edit Existing Culvert Repair Event:

Zoom or navigate to approximate culvert location and touch screen for a few seconds with your finger to display approximate address and up-arrow for options.



Choose to Collect information here, add this location to your bookmark or get directions from current location to this location:



Collect cost data for Culvert Repair:

Important repair cost collection work-flow tip:

Due to several factors such as the short time to develop a collection solution that will meet our mid-April deadline, the current state of cost and materials lists still being developed, and the current version of the ESRI product there is no way to provide automatically populate the keys linking the repair event to the Hydinfra Pipe and the repair event materials, labor, and equipment cost records.

What does this mean to you?

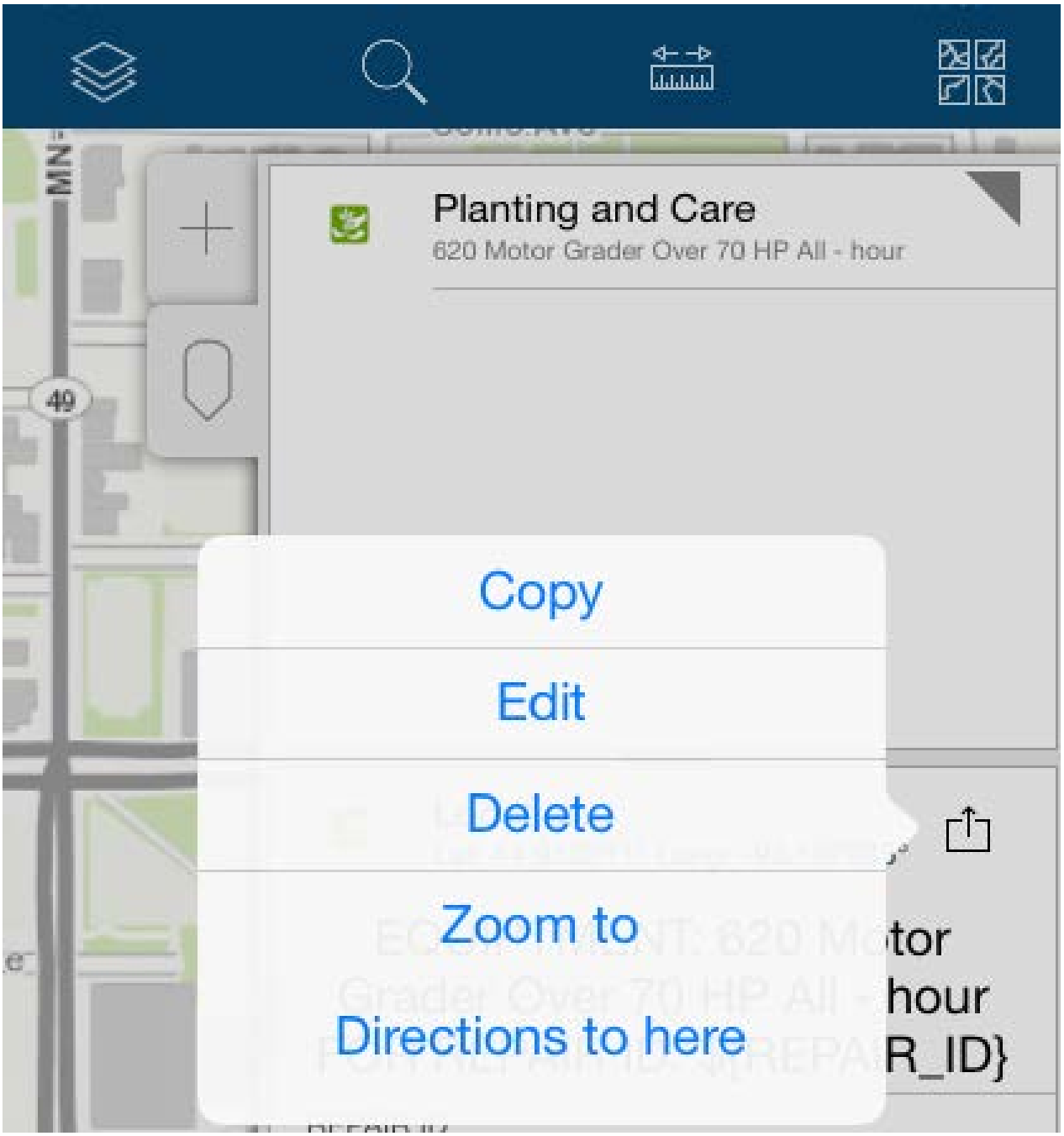
When you create a new repair event for a given culvert or pipe, you must record in the repair event the culvert or pipe id in the field by typing it in or copy and paste. This then provides a connection by that culvert or pipe id between the repair record and the culvert being repaired.

In a similar fashion as you add individual repair cost items (materials, labor, equipment) to the new repair event, the repair event number must be copied to each of these cost items as you complete their input form. This will then tie the many cost items to the one repair event which is then related back to the culvert or pipe id that is derived from Hydinfra.

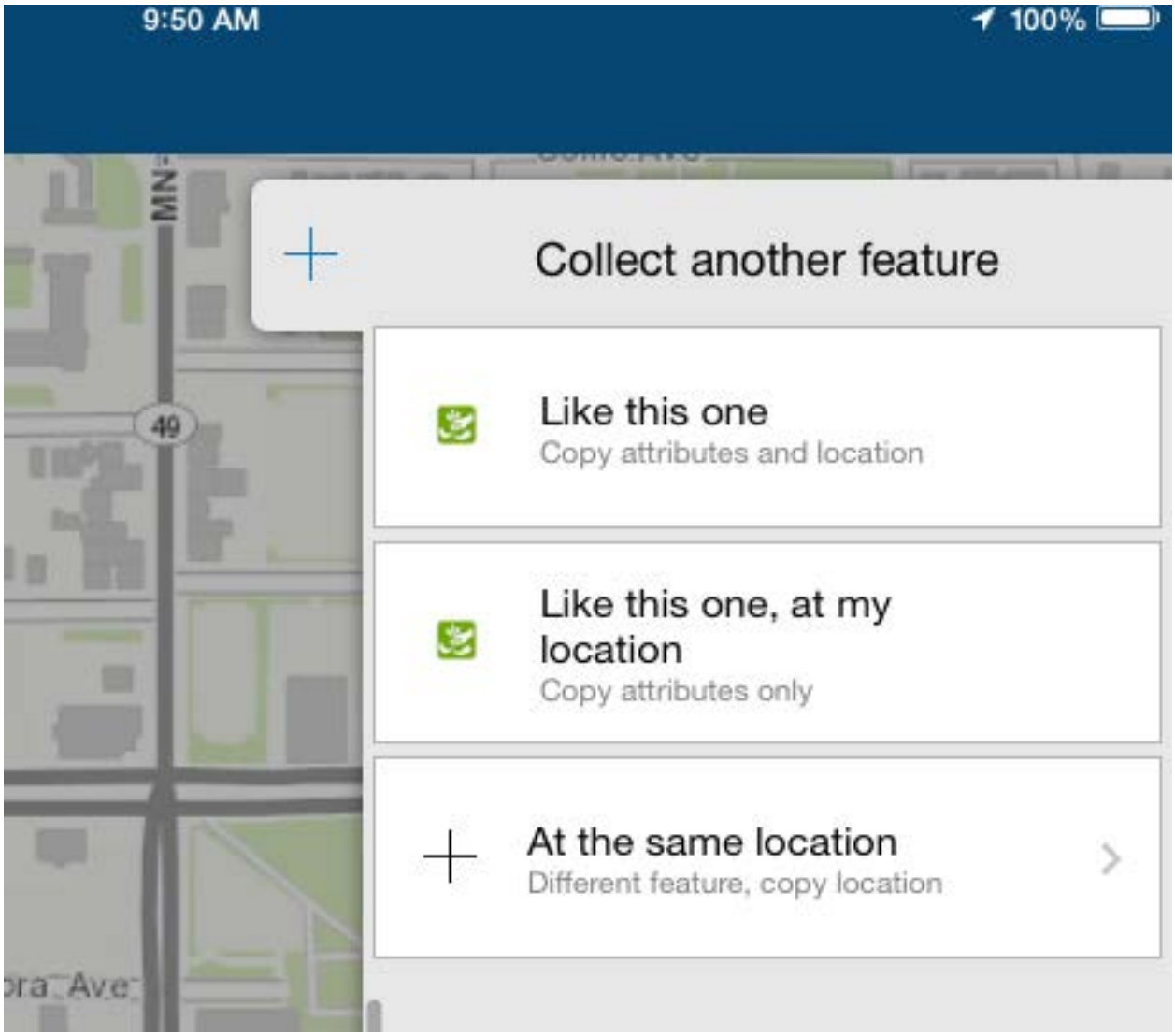
Future versions of the software may perform this operation automatically and you won't have to do it yourself, but until then it remains a simple yet critical operation to make the task fully successful. As always if you forget just edit the repair entry and add it or even delete it and re-add the repair if you need to change it completely.

There is also a nice feature to 'clone' or 'copy' a repair item such as adding a pickup truck and you have several, just make a copy of the first one and choose the correct type if they are different! Please refer to the following images.

To copy or other special menu choices click on the  button and choose **Copy**.



The Copy tool asks then which of 3 copy types you wish to perform depending on your needs at the time (read the description for each here and choose).



Additionally due to the process still being worked out with RCA and other 'cost' sources, it may be the case that 'costs' are not entered in the field but are updated later from the office or a process once costs that are not currently

available during a repair become known. Refer to your lead or supervisor for instructions.

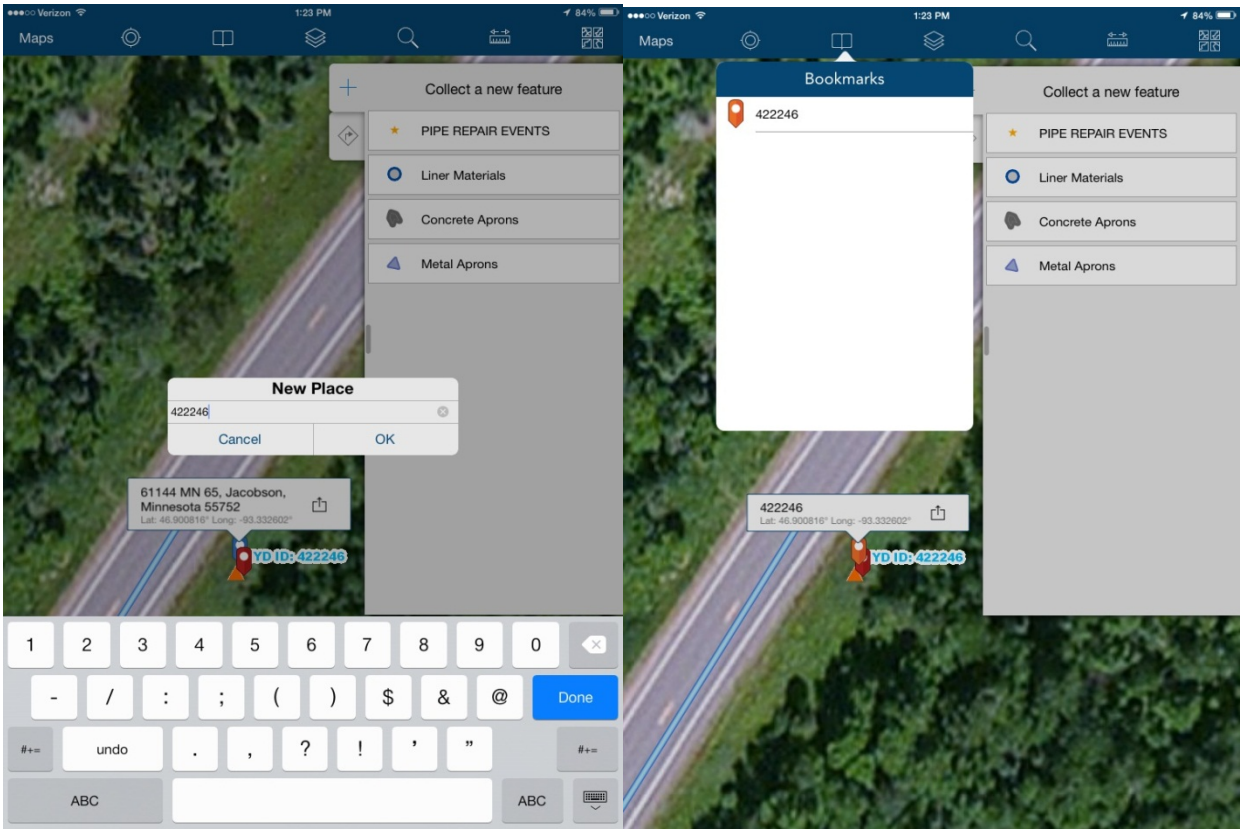
Choosing “Collect here” displays the tab menu showing choices for adding repair cost information for Labor, Materials and Equipment. It is IMPORTANT to note that one should be as close to the repair location as possible because by design the adding of a new repair event will cause the application to zoom to your current location.

While we are NOT technically collecting repair location data (because the Culvert location has already been located with great precision using higher accuracy GPS devices than available in a tablet or smart phone.), the approximate location of the repair will be recorded and displayed on the map relative to where one is physically when adding the records or where you position it with your finger or stylus on the map

The primary work-flow for this has been described as ArcGIS Collector is a field collection application used in a connected environment collecting repair cost information at the Culvert site or in the cab of a nearby truck at the site. Any back-office edits or entries should be done by other means such as ArcMap or the web interface (below) which does not want to enforce your current location like the Collector application does by default (over-ride of course with)

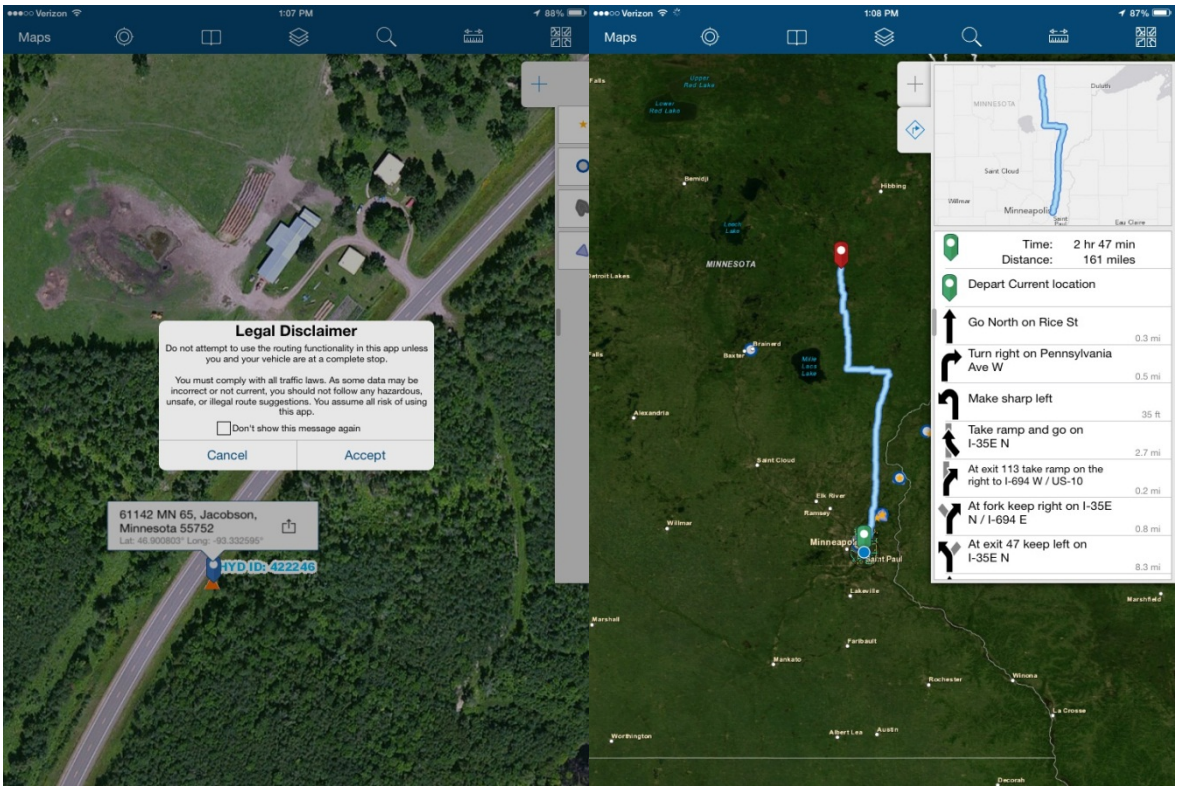
Bookmark “my places”

It is handy to be able to save a bookmark of a hydinfra pipe ID so that one can return to it later within the application.



Directions to Here:

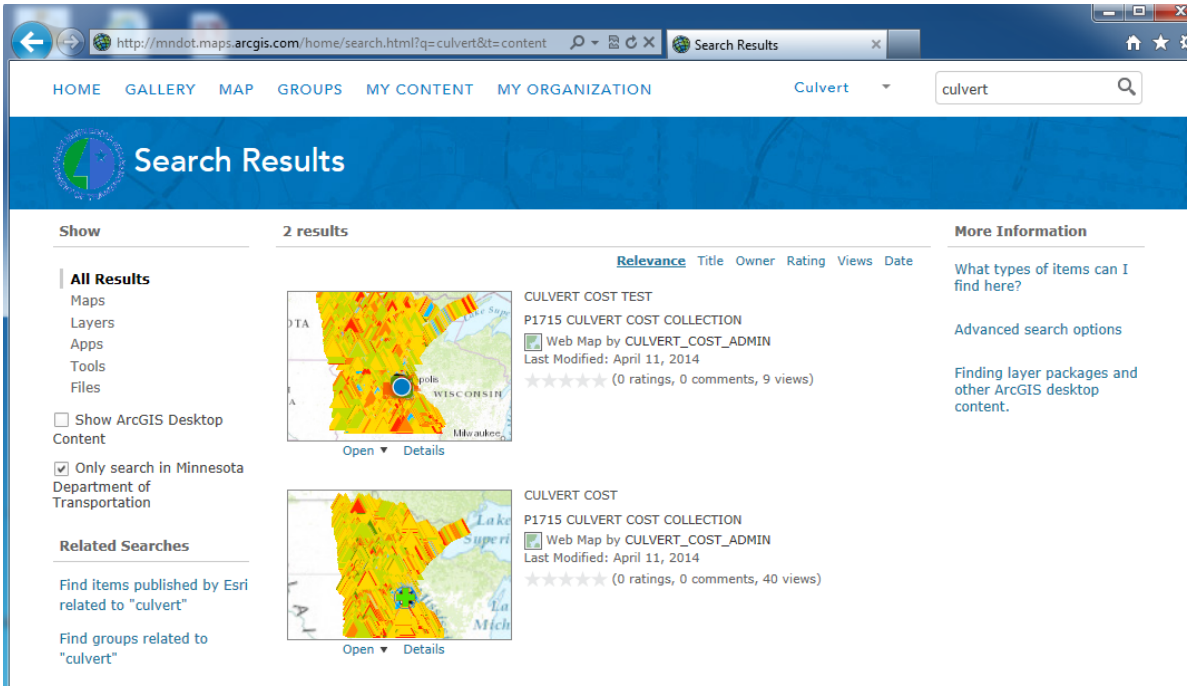
Directions are provided as part of the application and the iPad navigation functionality and can be used to help route you to the target. This is not supported by any custom code and works as is dependent on the ESRI application and iPad services provided. Note that there is a legal disclaimer advising one to not be driving while operating this function.



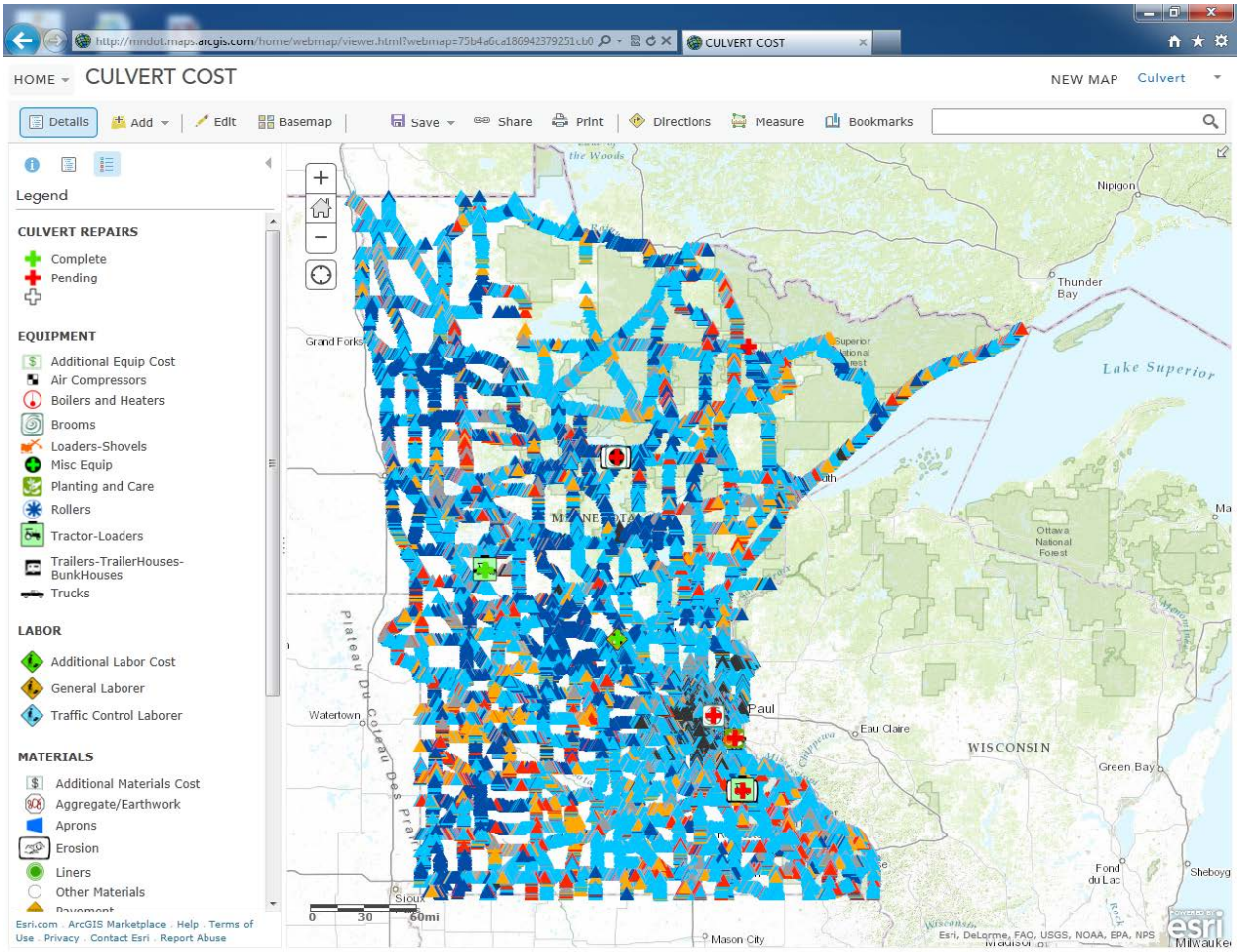
Web Interface:

TOC Details from the Web interface from a browser:
http://mndot.maps.arcgis.com/home/

If you are working without an iPad and using a modern web browser such as Safari, Chrome, Firefox, or IE 10+ then this is the interface you will be using. It is very similar to the iPad application but does not enforce your location by default and has repair groupings in the TOC with more defined categories.



Web interface with TOC and map showing the conditions of culverts by color:



Hydinfra data and Repair data

TOC Symbols	Description
CULVERT REPAIRS Complete Pending	Culvert repair status as a cross in three colors: Pending (Red){default value}, Complete (Green), and null (no color outline only)
Equipment	Equipment Categories for recording repair costs
Additional Equip Cost	Additional cost beyond what has a category defined entered as a lump sum value in dollars
Air Compressors	Air Compressors needed for the culvert repair
Boilers and Heaters	Boilers and Heaters needed for the culvert repair
Brooms	Brooms and sweepers needed for the culvert repair
Loaders-Shovels	Loaders and Shovels needed for the culvert repair
Misc Equip	Miscellaneous Equipment needed for the culvert repair
Planting and Care	Planting and the care of planting related to the repair
Rollers	Roller Equipment needed for the culvert repair
Tractor-Loaders	Tractor-Loaders needed for the culvert repair
Trailers-TrailerHouses-BunkHouses	Trailers, TrailerHouses, and BunkHouses needed.
Trucks	Pickup trucks and other needed trucks for repair
LABOR	Labor Categories for recording repair costs
Additional Labor Cost	Additional Labor Costs above what was planned defined entered as a lump sum value in dollars

 General Laborer	General Laborer costs for culvert repair
 Traffic Control Laborer	Labor needed to help with Traffic Control
Materials	Materials needed for Culvert Repair
 Additional Materials Cost	Additional material cost for culvert repair defined entered as a lump sum value in dollars
 Aggregate/Earthwork	Culvert repair costs related to earthwork and fill
 Aprons	Culvert repair cost related to Aprons
 Erosion	Culvert repair cost related to erosion control
 Liners	Cost of liners used in culvert repair jobs
 Other Materials	Cost of 'Other' materials used in culvert repair
 Pavement	Cost of pavement material used in culvert repair
 Pipes	Cost of Pipe used in culvert repair
CULVERTS	Read-only Hydinfra Data by Condition Code
 UNKNOWN	Unknown condition
 Can't Tell	0 – Can't Tell the condition
 Like New	1 – Like New condition
 Fair	2 – Fair Condition
 Poor	3 – Poor Condition
 Very Poor	4 – Very Poor Condition

Example: Here is a Culvert with a Hydinfra Id of 607969 with a condition of Very Poor (4) – and its related repair id (33) which is a green cross indicating completed status.