

**2013 Esri International User Conference**

July 8–12, 2013 | San Diego, California

# **Taking Advantage of ArcGIS Online to Push a Mobile Agenda**

Michael Olkin  
Town of Amherst, MA



# Some of our goals for mobile

- Use simple interfaces
- Avoid programming whenever possible
- Aim for platform independence

# Harnessing ArcGIS Online

- Amherst's Approach
  - Web Maps on ArcGIS Online
    - Mostly using Amherst's ArcGIS for Server Services
    - Some Hosted Feature Services
  - ArcGIS App for iOS/Android/Windows Phone
    - Helps us to avoid developing custom apps for any of these platforms.

# Amherst's ArcArsenal

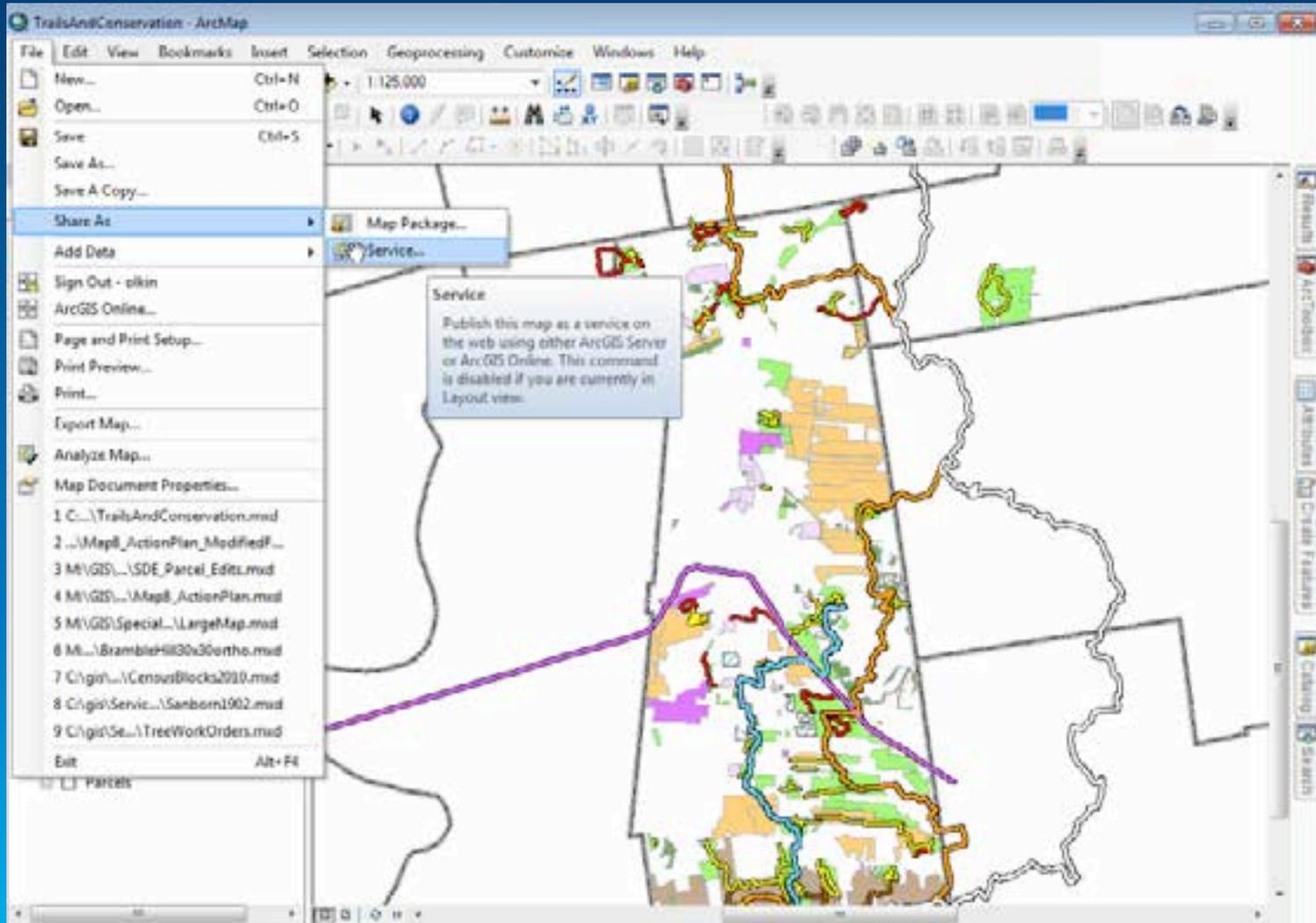
- ArcGIS for Desktop
- ArcGIS for Server / ArcSDE
- ArcGIS (for?) Online Organizational Subscription
  - Web Maps
  - Feature Services
- ArcGIS & Collector Apps for iOS/Android/WinPhone

# Editable Mobile Map Setup Steps

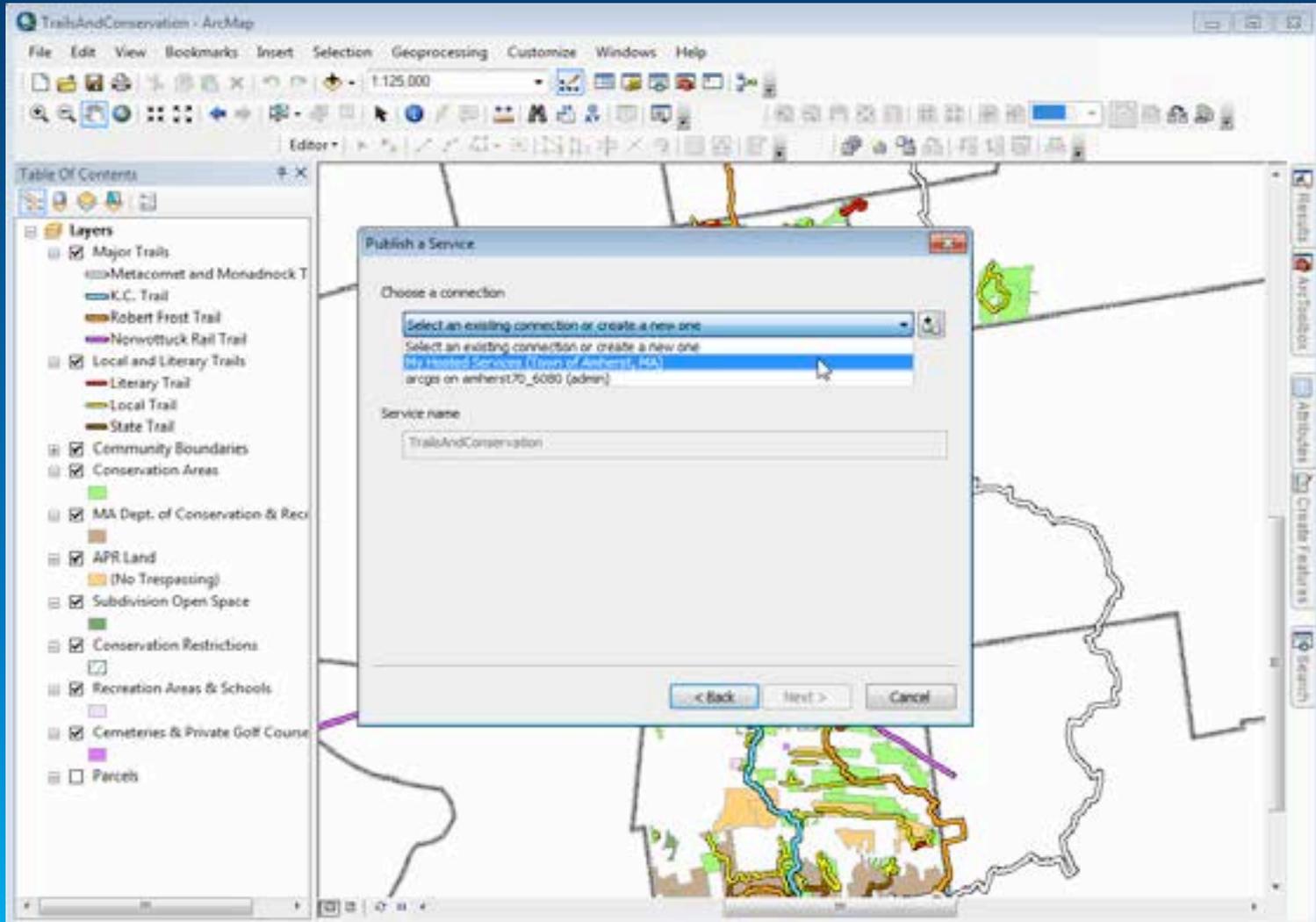
- Design the feature class(es)
  - Domains / Subtypes? Attachments? Edit Tracking?
- Compose a map in ArcMap & share as a service
  - On local AGS or as a hosted feature service
- Create ArcGIS Online Webmap
  - Set up popups & editing preferences
  - Share with appropriate groups

# Primer: Sharing Feature Services

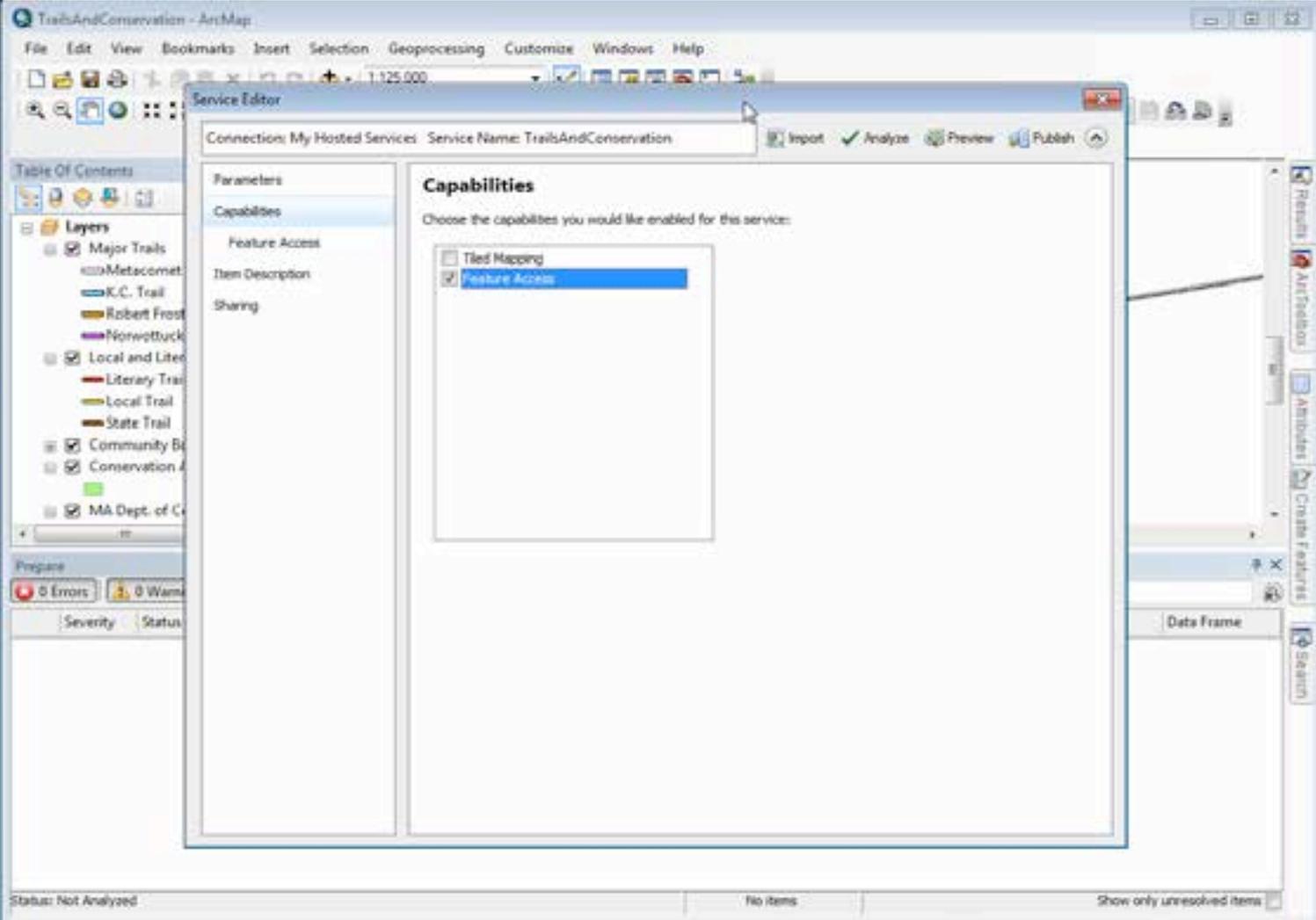
# Sharing as a Service from ArcMap



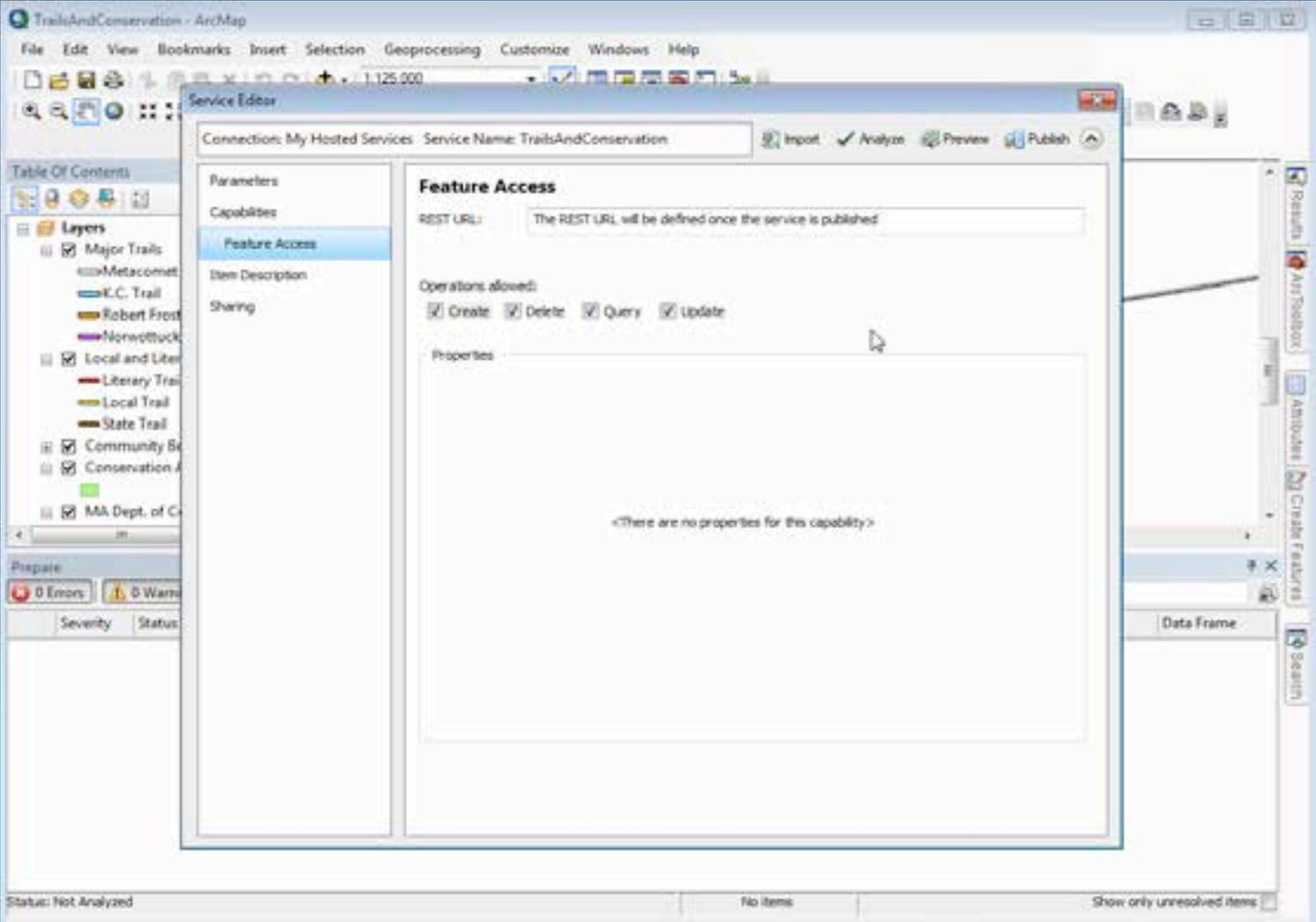
# Hosted Service Setup



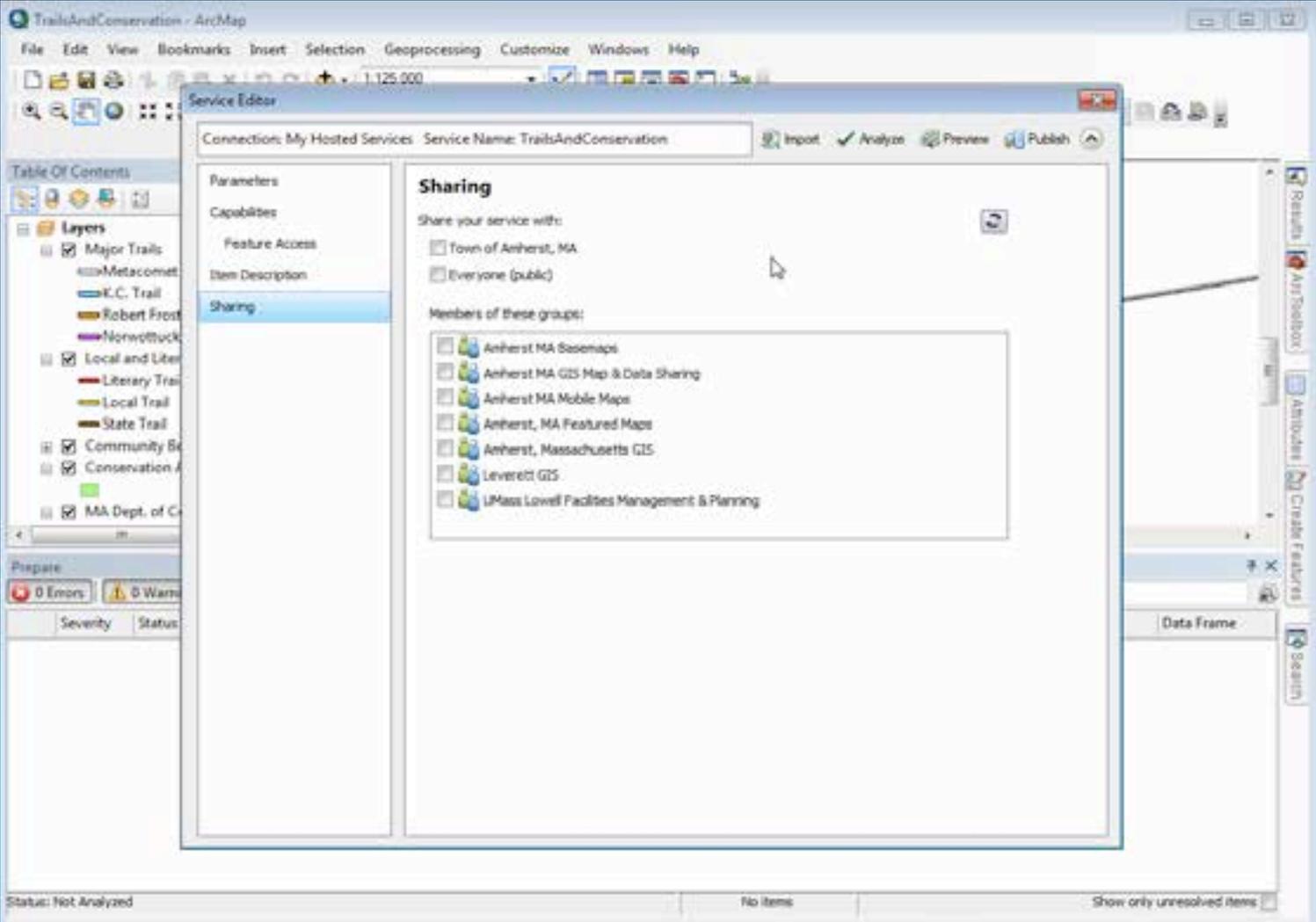
# Hosted Service Setup



# Hosted Service Setup



# Hosted Service Setup



# Hosted Feature Service

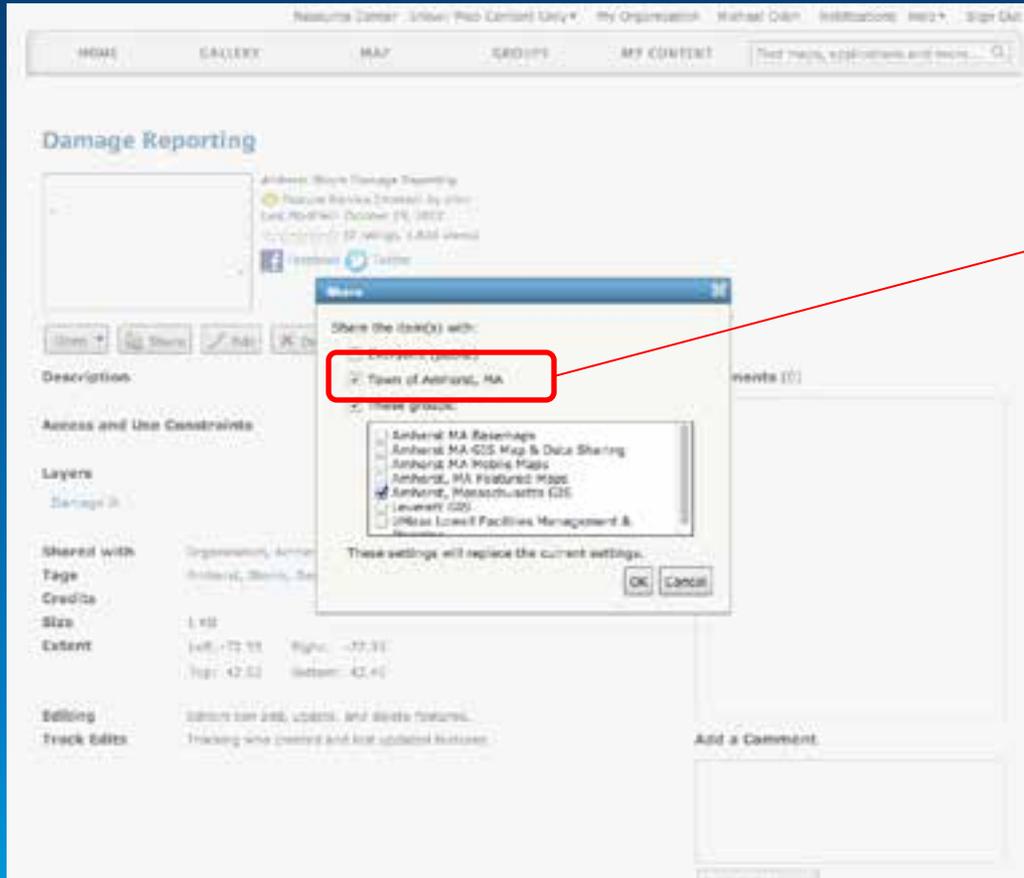
The screenshot shows the ArcGIS Online 'My Content' interface. At the top, there are navigation tabs: HOME, GALLERY, MAP, GROUPS, and MY CONTENT (which is active). A search bar is located to the right of the MY CONTENT tab. Below the navigation is the 'My Content' header with a logo. A toolbar contains buttons for New, Delete, Add Item, Create Map, Share, Delete, Move To, Publish, and Change Owner. On the left, a tree view shows the folder structure under 'olkin', including Amherst, Archive, Basemaps, BID, Conservation Dept, Layer Packages, Other Stuff, Parking, and UTILITIES. The main area displays a table of content items:

<input type="checkbox"/>	Title	Type	Modified	Shared	Size
<input type="checkbox"/>	Amherst MA Drainage System Map	Web Map	Nov 7, 2012	Organization	30 KB
<input type="checkbox"/>	Amherst MA Open Work Orders	Web Map	Nov 7, 2012	Organization	4 KB
<input type="checkbox"/>	Amherst MA Sewer Map	Web Map	Nov 7, 2012	Organization	31 KB
<input type="checkbox"/>	Amherst MA Street Tree Maintenance	Web Map	Nov 7, 2012	Organization	10 KB
<input type="checkbox"/>	Amherst MA Tree Work Orders	Web Map	Nov 7, 2012	Organization	12 KB
<input type="checkbox"/>	Amherst MA Water Distribution System	Web Map	Nov 7, 2012	Organization	20 KB
<input type="checkbox"/>	Amherst Survey Control Points	Web Map	Nov 8, 2012	Everyone	5 KB
<input type="checkbox"/>	Damage Reporting	Feature Service	Oct 29, 2012	Organization	1 KB
<input type="checkbox"/>	DamageReporting	Service Definition	Oct 29, 2012	Organization	51 KB

# Hosted Feature Service

The screenshot displays the ArcGIS Online user interface for a feature service item. At the top, there is a navigation bar with links for HOME, GALLERY, MAP, GROUPS, and MY CONTENT, along with a search box. The main content area is titled "Damage Reporting" and features a map viewer on the left. To the right of the map, the item's metadata is shown, including the title "Amherst Storm Damage Reporting", the creator "Feature Service (Hosted) by s10m", the last modified date "October 28, 2012", and the number of views "148 Views, 1,624 Views". Social media sharing options for Facebook and Twitter are also present. Below the metadata, there is a row of action buttons: Open, Share, Edit, Delete, Make To, Change Owner, and Usage. The page is divided into two main sections: "Description" and "Comments (0)". The "Description" section contains several sub-sections: "Access and Use Constraints", "Layers" (listing "Damage (0)"), "Shared with" (Organization, Amherst, Massachusetts 020), "Tags" (Amherst, Storm, Damage), "Credits", "Size" (1 KB), "Extent" (Left: -72.55, Right: -72.33, Top: 42.12, Bottom: 42.43), "Editing" (Editors can add, update, and delete features), and "Track Edits" (Tracking who created and last updated features). The "Comments (0)" section is currently empty and includes an "Add a Comment" button and a "Publish Comment" button.

# Hosted Feature Service Security



# Hosted Feature Service

**Description**

Font: verdana Size: 12

**Access and Use Constraints**

Font: verdana Size: 12

**Tags** Amherst,Storm,Damage  
Choose from your tags

**Credits**

**Extent** Left: 172.53 Right: 172.53 Top: 42.53 Bottom: 42.45

**Editing**  Enable editing and allow editors to:  
 Add, update, and delete features  
 Update feature attributes only  
 Add features only

**Track Edits**  Keep track of who created and last updated features.  
 Editors can only update and delete the features they add.

# Hosted Feature Service

ArcGIS REST Services Directory

[Home](#) > [services](#) > [DamageReporting \(FeatureServer\)](#) > [Damage](#)

---

[JSON](#)

**Layer: Damage (ID:0)**

**View In:** [ArcGIS.com Map](#) [ArcGIS Explorer Online](#)

**Name:** Damage

**Display Field:** Type

**Type:** Feature Layer

**Geometry Type:** esriGeometryPoint

**Description:**

**Copyright Text:**

**Min. Scale:** 0

**Max. Scale:** 0

**Default Visibility:** true

**Max Record Count:** 1000

**Supported query Formats:** JSON

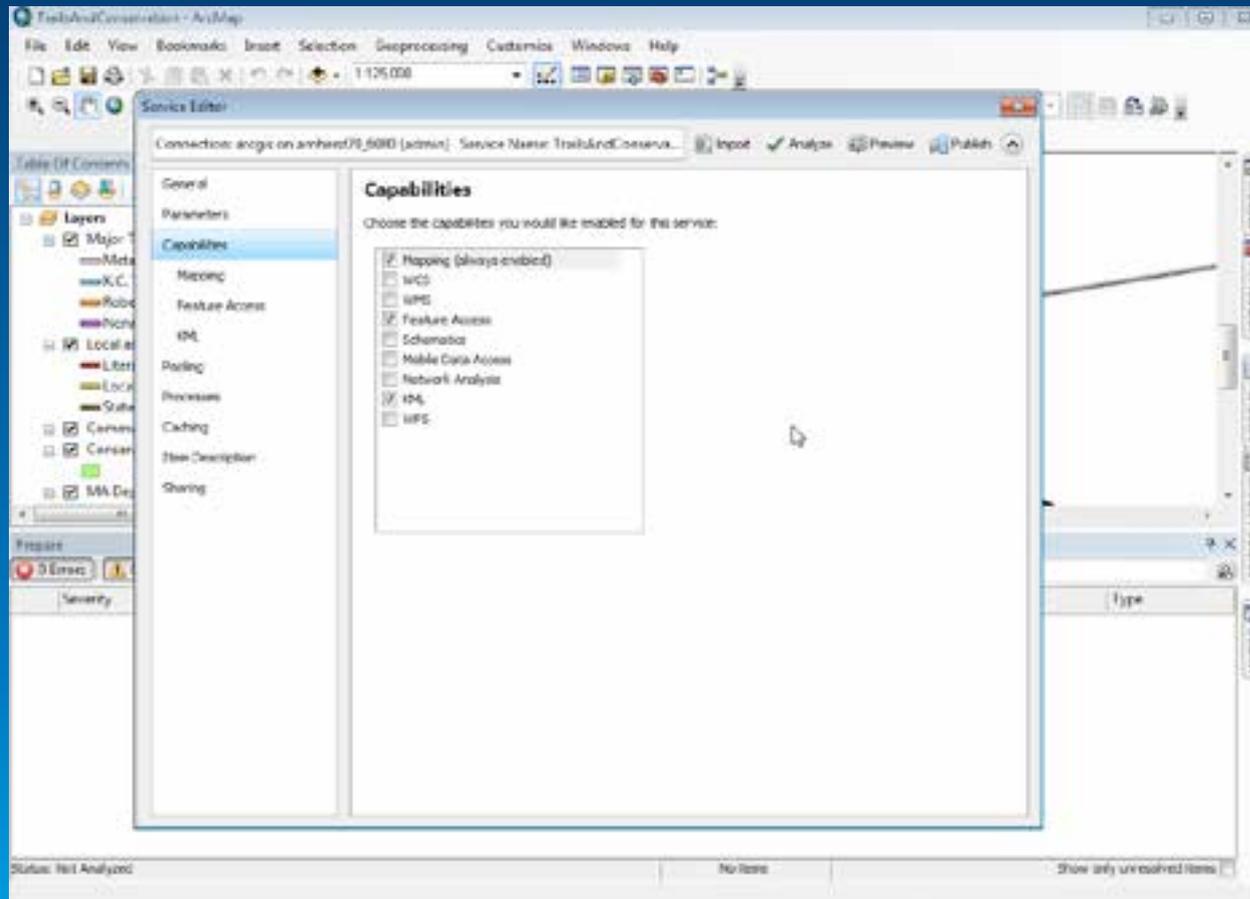
**Extent:**

XMin: -8054656.8569  
YMin: 5238602.1148  
XMax: -8051481.8505  
YMax: 5239550.4502  
Spatial Reference: 102100

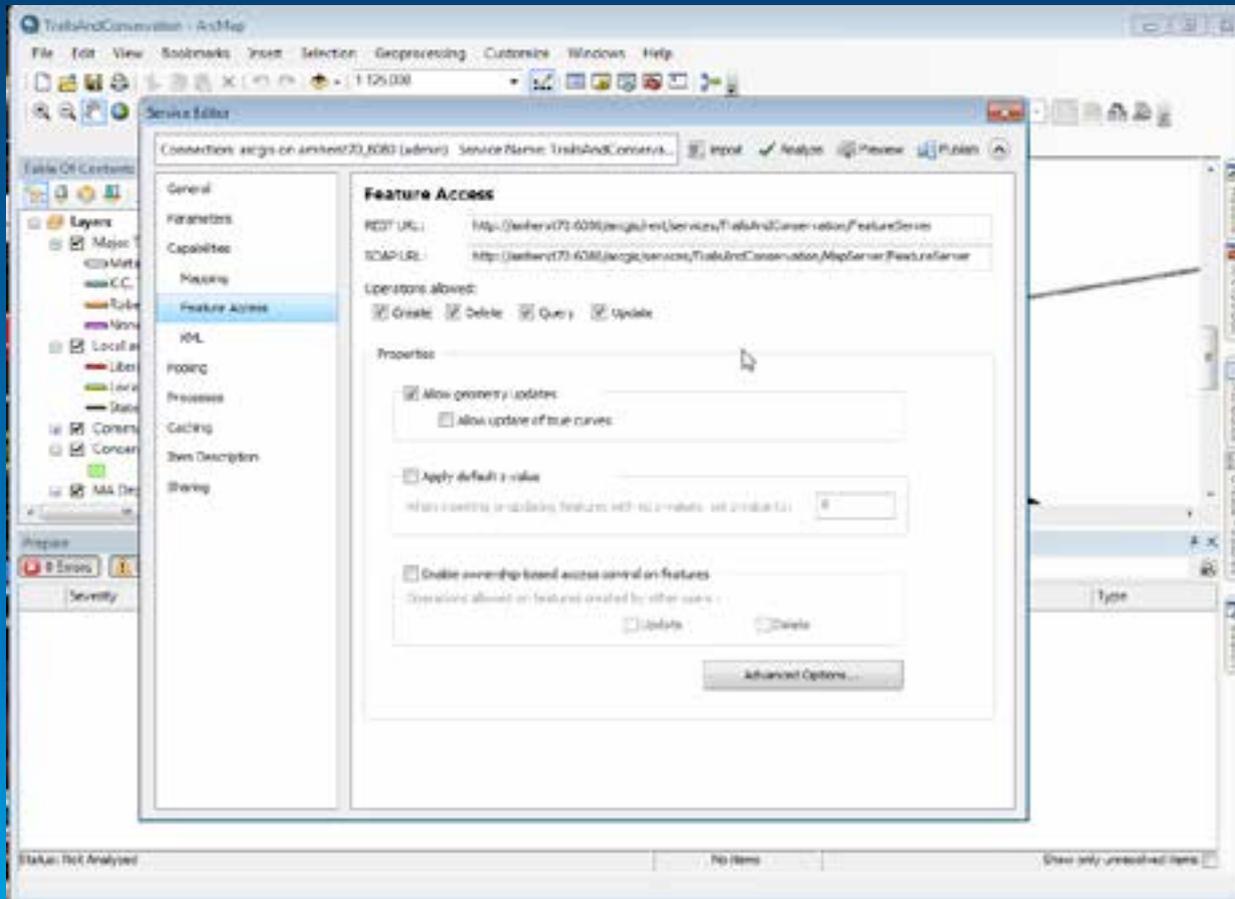
**Drawing Info:**

Renderer:  
Unique Value Renderer:  
Field 1: Status

# AGS Feature Service



# AGS Feature Service



# AGS Service Security

The screenshot displays a list of six Map Services in ArcGIS Online. Each service entry includes a thumbnail, a title, a status, and instance counts. The 'TrailRequest' service is highlighted with a red circle around its control icons.

Service Name	Status	Instances Running	Instances in Use	Maximum Instances
Predicts (Map Service)	Started	1	0	2
PropertyMap (Map Service)	Started	2	0	2
SanitarCoverMap (Map Service)	Started	1	0	2
StreetTrees (Map Service)	Started	1	0	2
TrailRequest (Map Service)	Started	1	0	2
TrailsAndConservation (Map Service)	Started	1	0	2

# AGS Service Security

Additional login necessary for end users: This is your own local domain or AGS security, which is separate from ArcGIS Online.

There are other security options (token based, etc) that are not reviewed here.



# Enabling Feature Access on an AGS Svc

The screenshot shows the ArcGIS Server Manager interface for editing a service named 'TraiRequest'. The 'Capabilities' tab is selected in the left-hand navigation pane. In the 'Select and configure capabilities' section, the 'Feature Access' checkbox is checked and highlighted with a red circle. Other capabilities shown include Mapping (always enabled), WFS, Schematics, Network Analysis, WFS, WCS, Mobile Data Access, and KML. Below this, the 'Mapping Configuration' section shows the REST and SOAP URLs. The 'Operations Allowed' section has 'Map', 'Query', and 'Data' checked. The 'Dynamic Workspaces' section has 'Allow per request modification of layer order and symbology' unchecked. At the bottom, there is a table for 'Workspace ID', 'Type', and 'Connection String'.

**ArcGIS Server Manager** | Services | Site | Security | Logs

Manage Services | OGC Services | KML Network Links

Editing: TraiRequest [Help](#) [Save and Restart](#) [Cancel](#)

General  
Parameters  
**Capabilities**  
Pooling  
Processes  
Caching  
Item Description

Select and configure capabilities:

- Mapping (always enabled)
- WFS
- Schematics
- Network Analysis
- WFS
- WCS
- Feature Access**
- Mobile Data Access
- KML

Mapping Configuration

URLs

REST URL: <http://amherst20.6680/arcgis/rest/services/05/TraiRequest/MapServer>

SOAP URL: <http://amherst20.6680/arcgis/services/05/TraiRequest/MapServer>

Operations Allowed

- Map
- Query
- Data

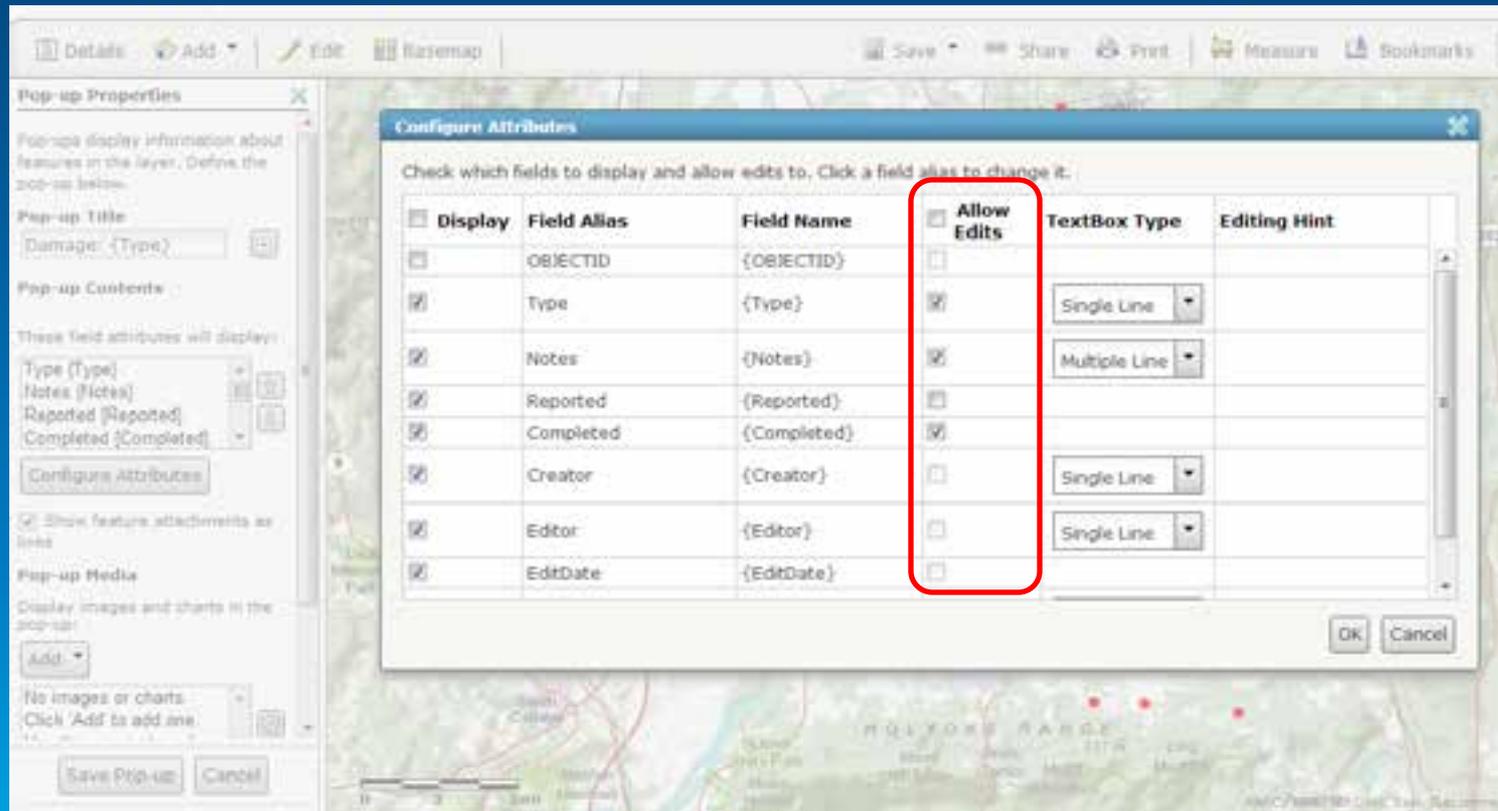
Dynamic Workspaces

Allow per request modification of layer order and symbology

To register a database, file geodatabase, shapefile or raster workspace, click Add [Add](#)

Workspace ID	Type	Connection String
--------------	------	-------------------

# Enabling Editing in your Web Map



The screenshot shows the ArcGIS Online interface with the 'Configure Attributes' dialog box open. The dialog box is titled 'Configure Attributes' and contains a table with columns: Display, Field Alias, Field Name, Allow Edits, TextBox Type, and Editing Hint. The 'Allow Edits' column is highlighted with a red box. The table lists several fields, including OBJECTID, Type, Notes, Reported, Completed, Creator, Editor, and EditDate. The 'Allow Edits' checkbox is checked for Type, Notes, Reported, and Completed, and unchecked for OBJECTID, Creator, Editor, and EditDate. The 'TextBox Type' column shows dropdown menus for each field, with 'Single Line' selected for most and 'Multiple Line' for Notes. The 'Editing Hint' column is empty for all fields. The dialog box also includes 'OK' and 'Cancel' buttons at the bottom right.

Display	Field Alias	Field Name	Allow Edits	TextBox Type	Editing Hint
<input type="checkbox"/>	OBJECTID	{OBJECTID}	<input type="checkbox"/>		
<input checked="" type="checkbox"/>	Type	{Type}	<input checked="" type="checkbox"/>	Single Line	
<input checked="" type="checkbox"/>	Notes	{Notes}	<input checked="" type="checkbox"/>	Multiple Line	
<input checked="" type="checkbox"/>	Reported	{Reported}	<input type="checkbox"/>		
<input checked="" type="checkbox"/>	Completed	{Completed}	<input checked="" type="checkbox"/>		
<input checked="" type="checkbox"/>	Creator	{Creator}	<input type="checkbox"/>	Single Line	
<input checked="" type="checkbox"/>	Editor	{Editor}	<input type="checkbox"/>	Single Line	
<input checked="" type="checkbox"/>	EditDate	{EditDate}	<input type="checkbox"/>		

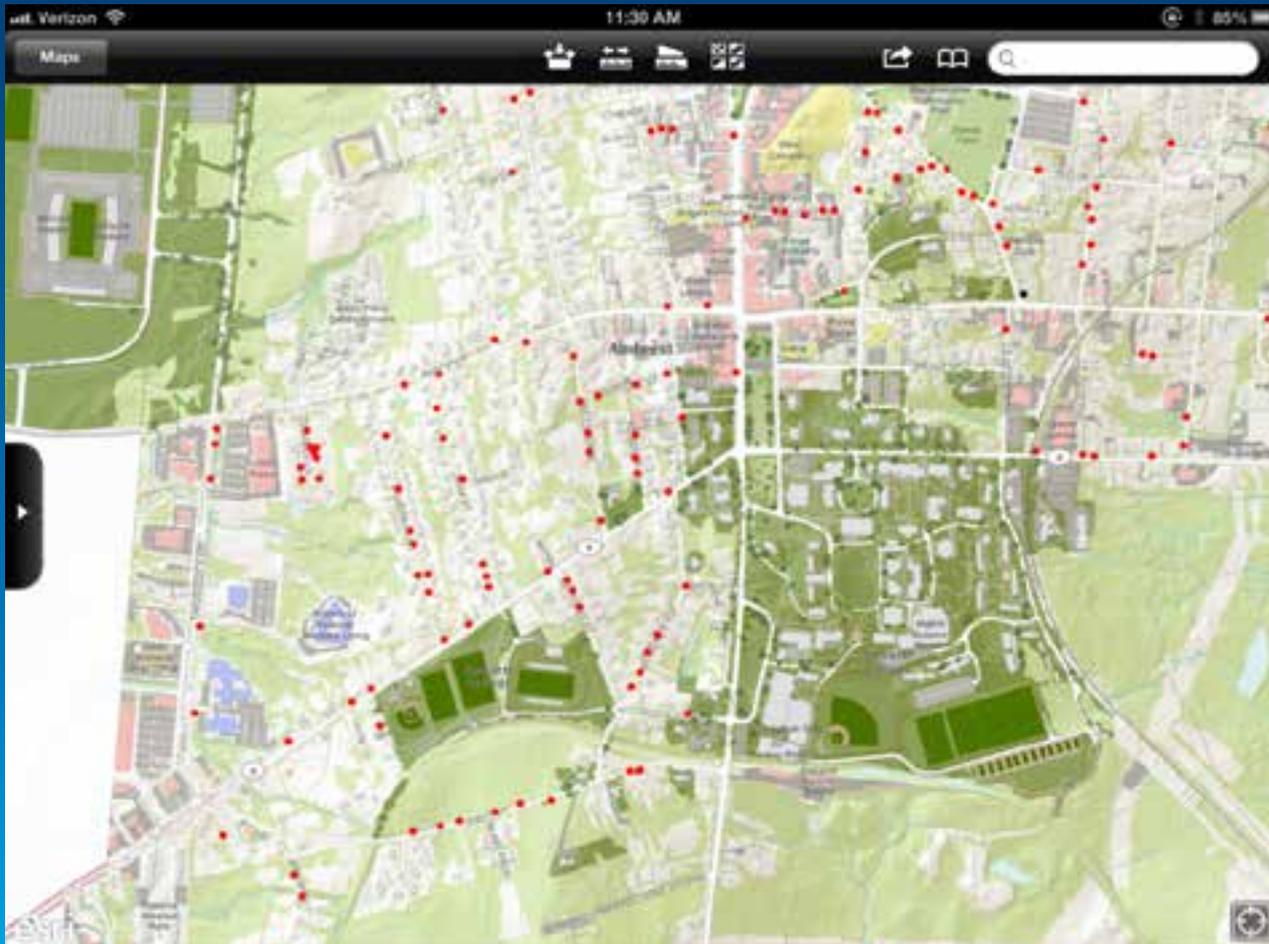
# Amherst Example Mobile Maps

- Secured Staff Maps with Editable Features
  - Storm Damage Tracking
  - Street Tree Management & Maintenance
  - Invasive Species Inventory
  - Work Order Management
  - Water / Sewer / Drain Maps
  - Street Sign Inventory
- Publicly Accessible Maps
  - Trails & Conservation Land Maps
  - Parking
  - Property Maps
  - Trail Obstruction Reporting

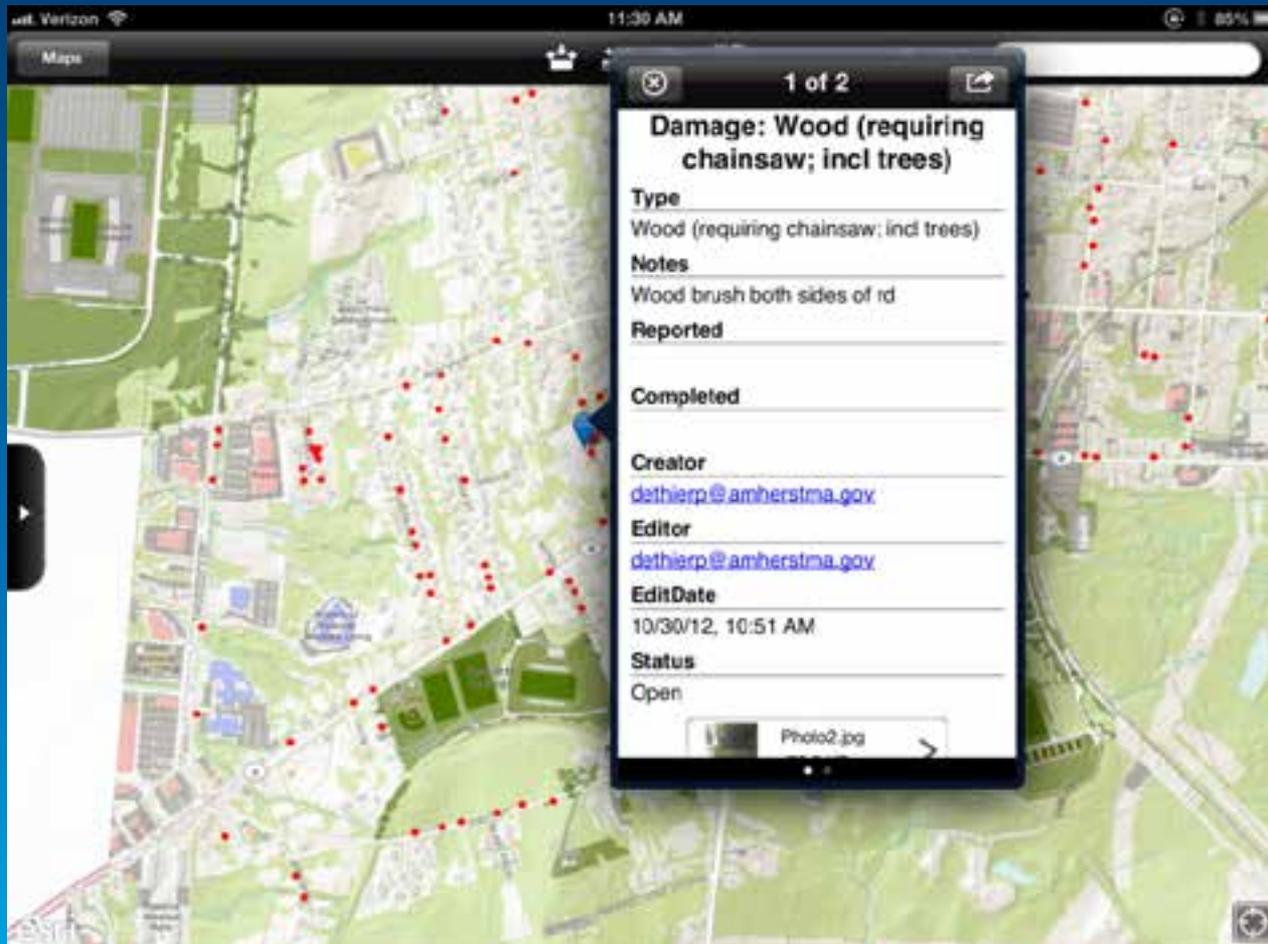
# Storm Damage Tracking

- Initiated on October 29<sup>th</sup> 2012 for Hurricane Sandy
  - Hosted Feature Service
  - Setup in <1 hour
  - Field observations with iPads by Engineering Staff
  - Available at the EOC as a “live” web map
  - Used during cleanup in days after the storm
  - Used for federal roadway cleanup reimbursements

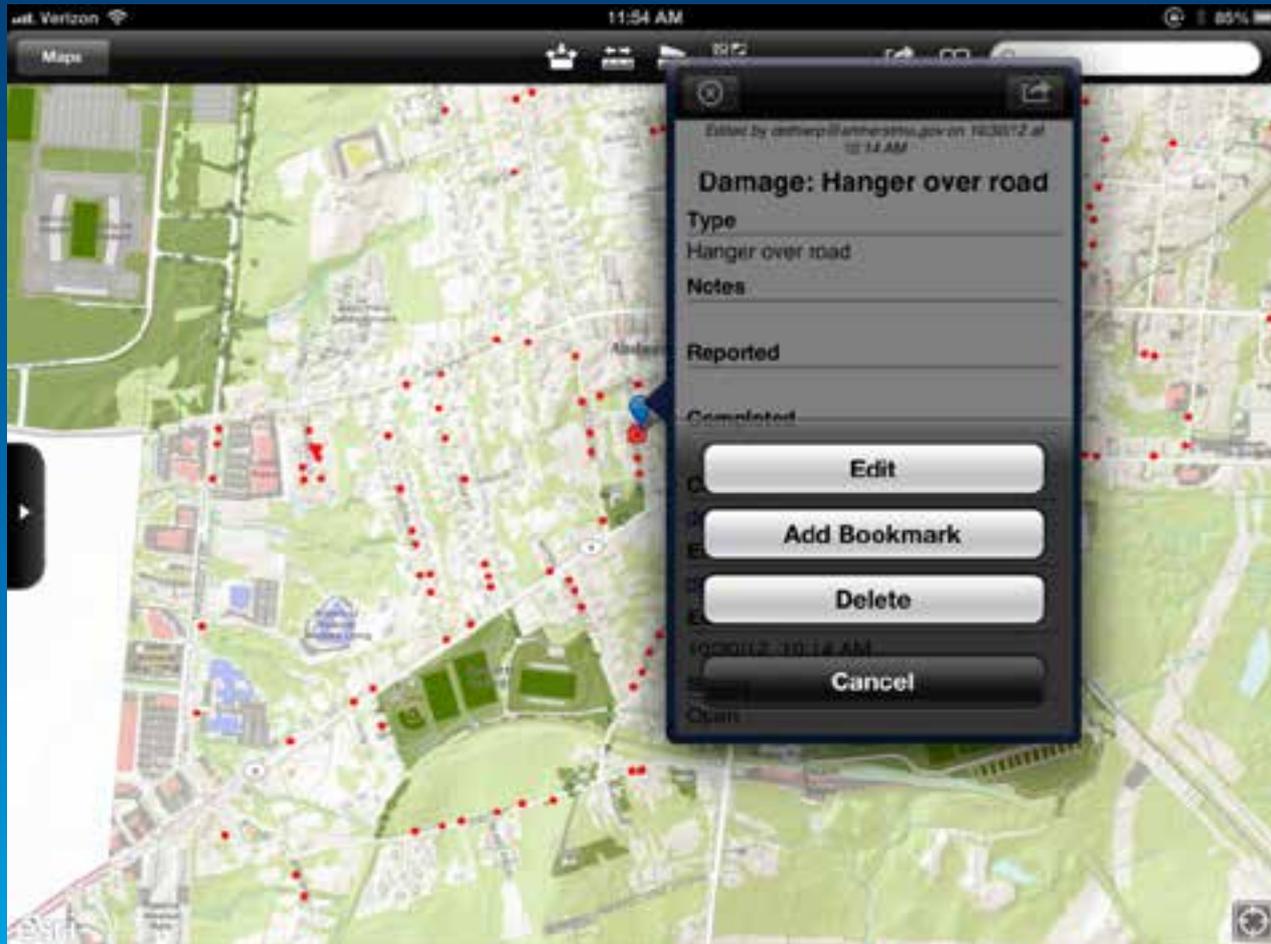
# Storm Damage Tracking



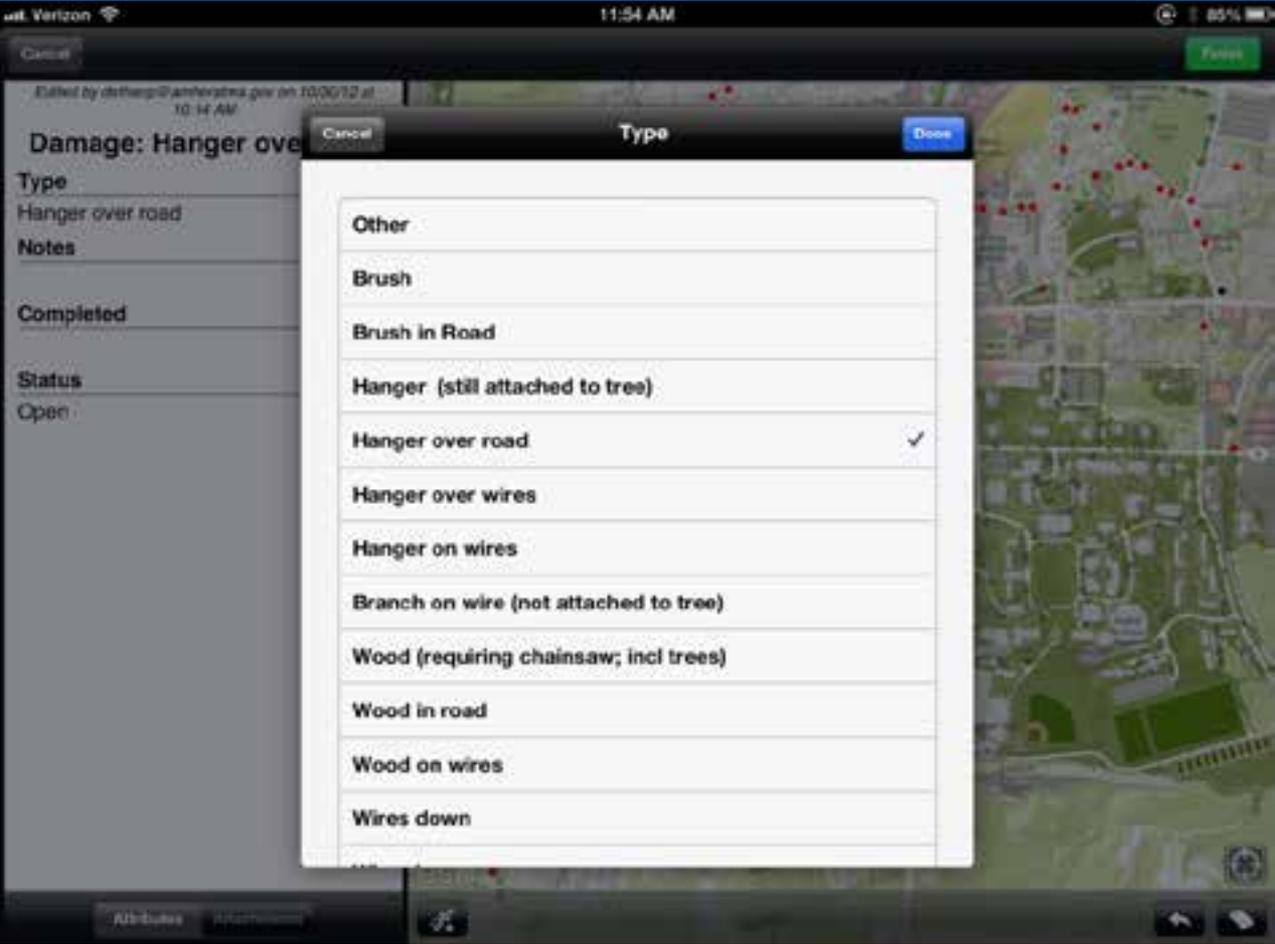
# Storm Damage Tracking



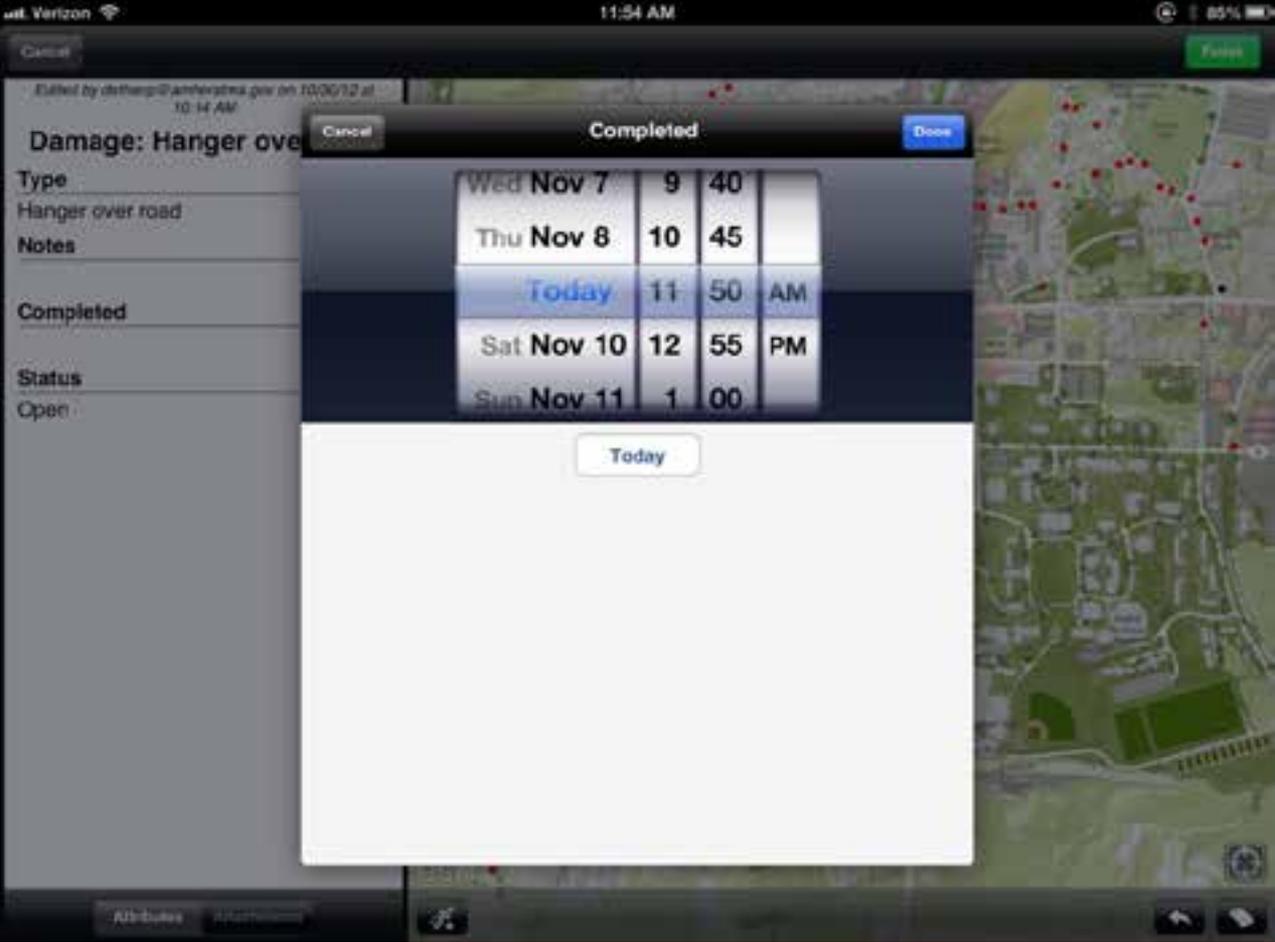
# Storm Damage Tracking



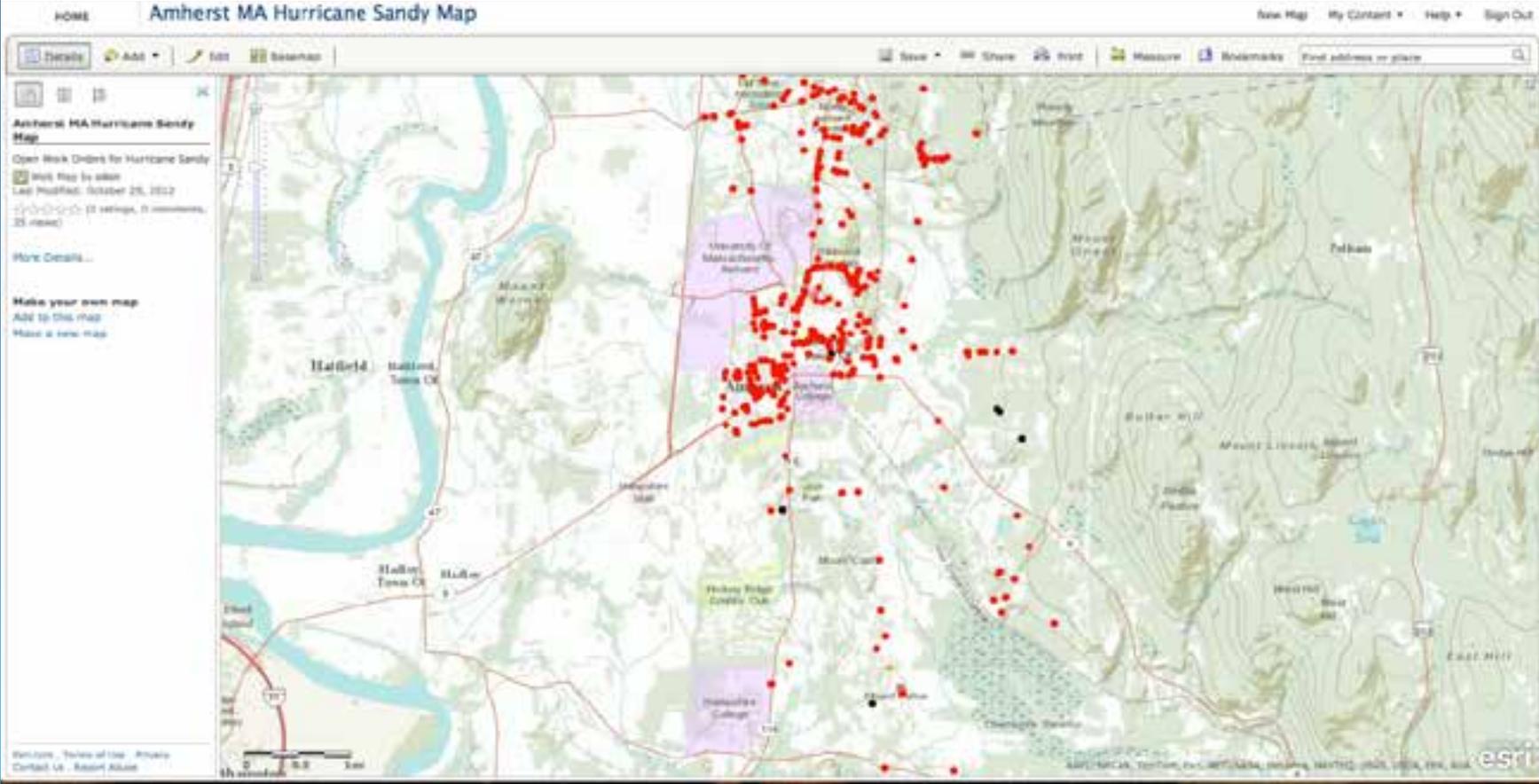
# Storm Damage Tracking



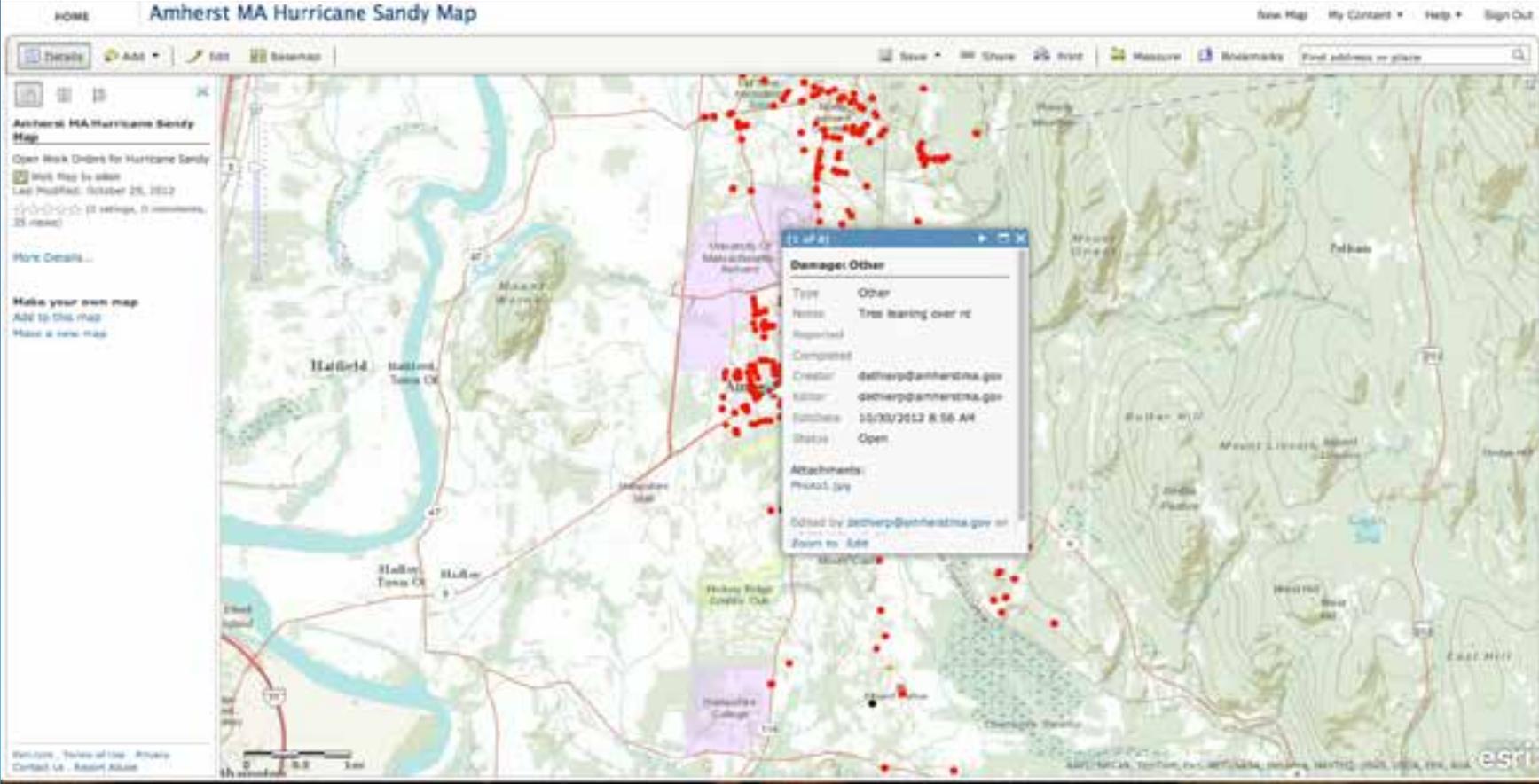
# Storm Damage Tracking



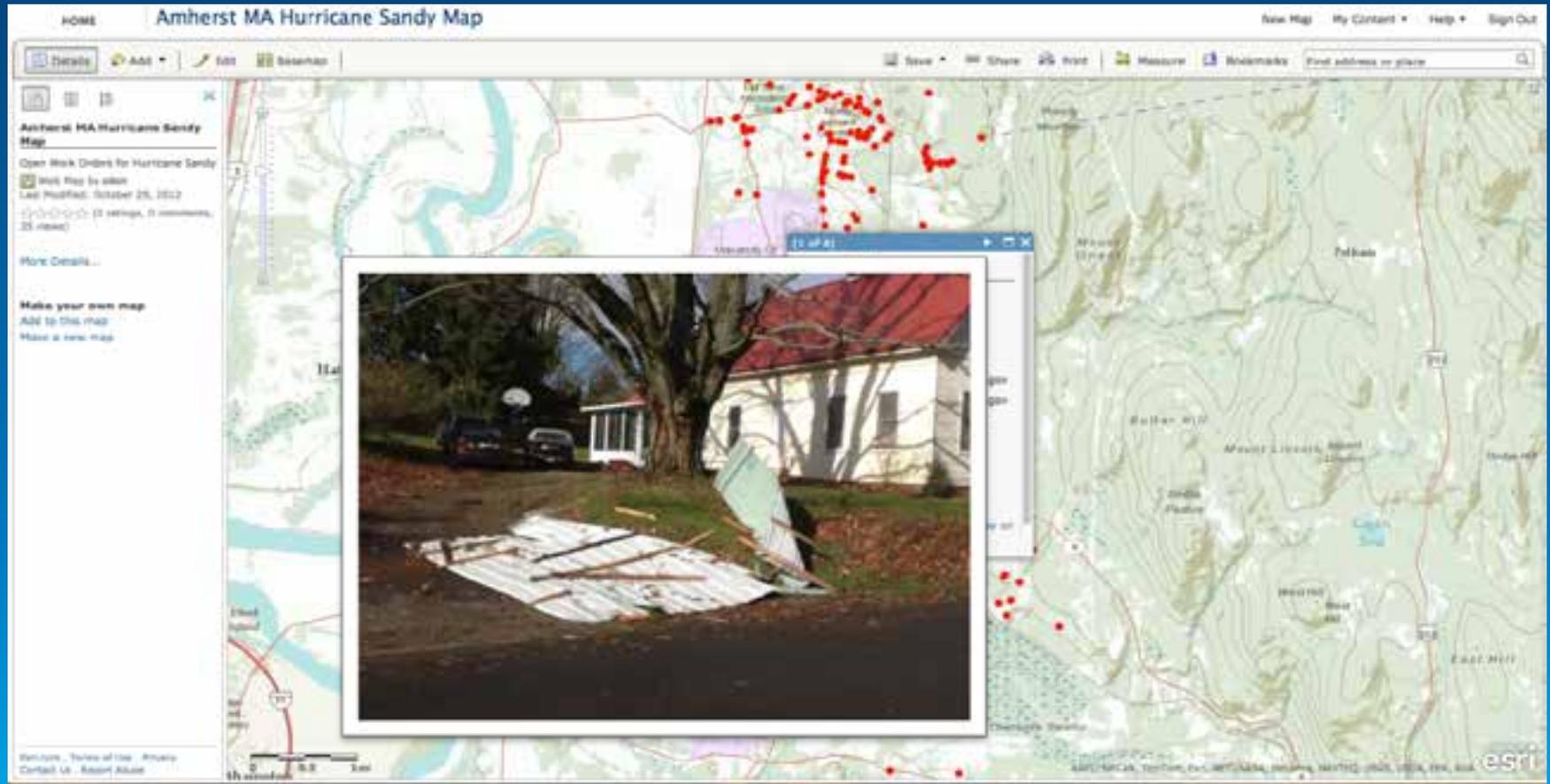
# Storm Damage Tracking EOC “Live” event tracking map



# Storm Damage Tracking EOC “Live” event tracking map

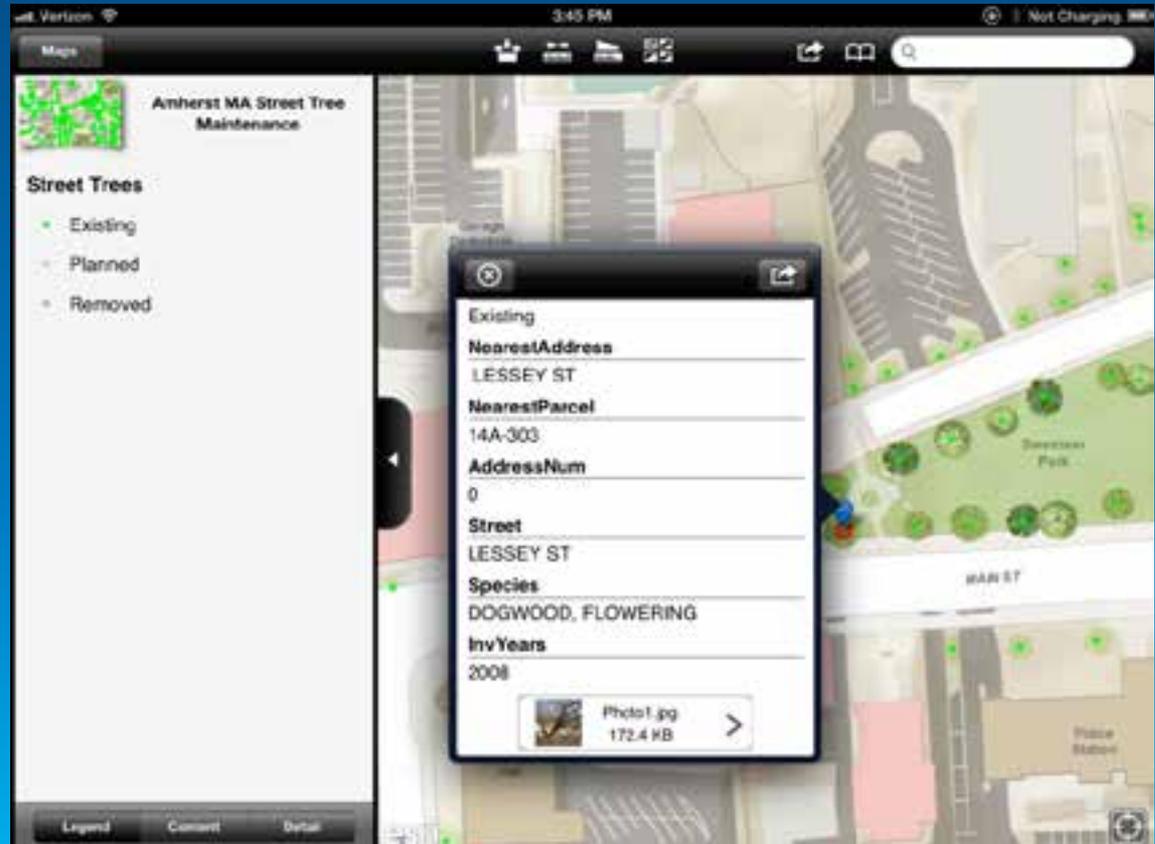


# Storm Damage Tracking EOC “Live” event tracking map



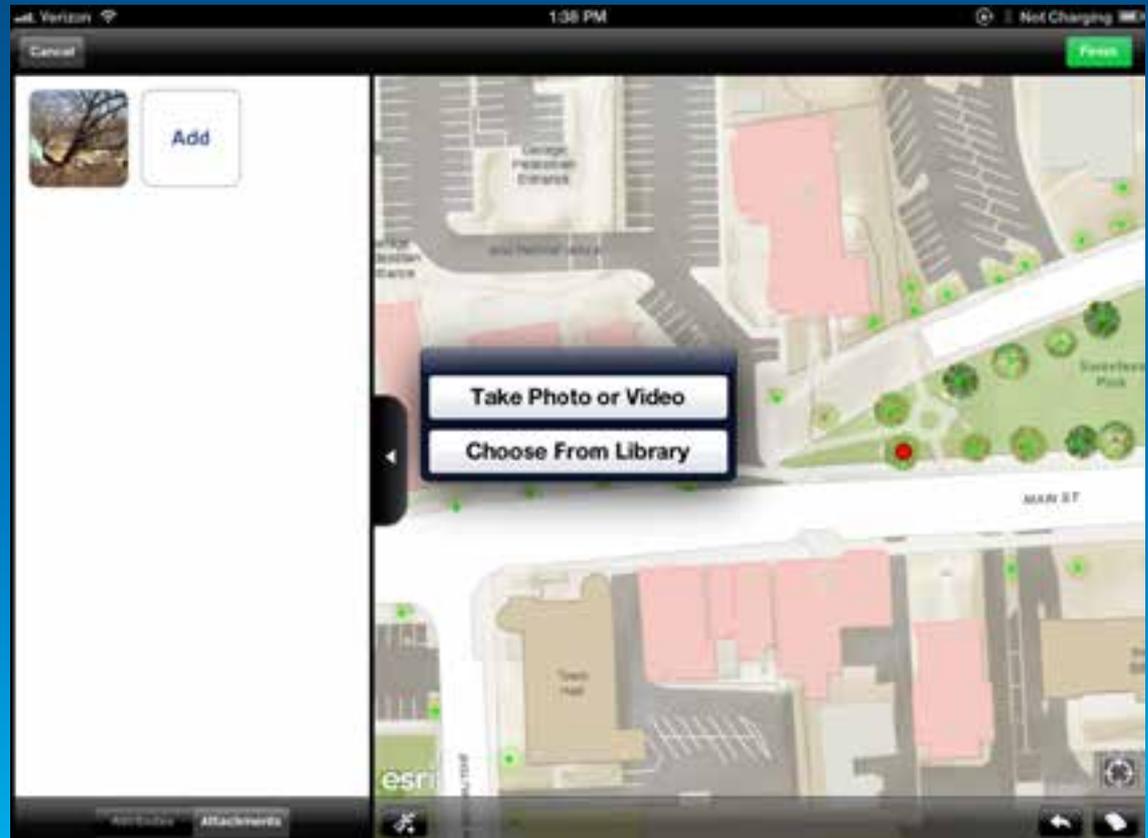
# Street Tree Management

- Add Planned New Plantings
- Update Inventory Info
- Attach Photos



# Street Tree Management

- Add Planned New Plantings
- Update Inventory Info
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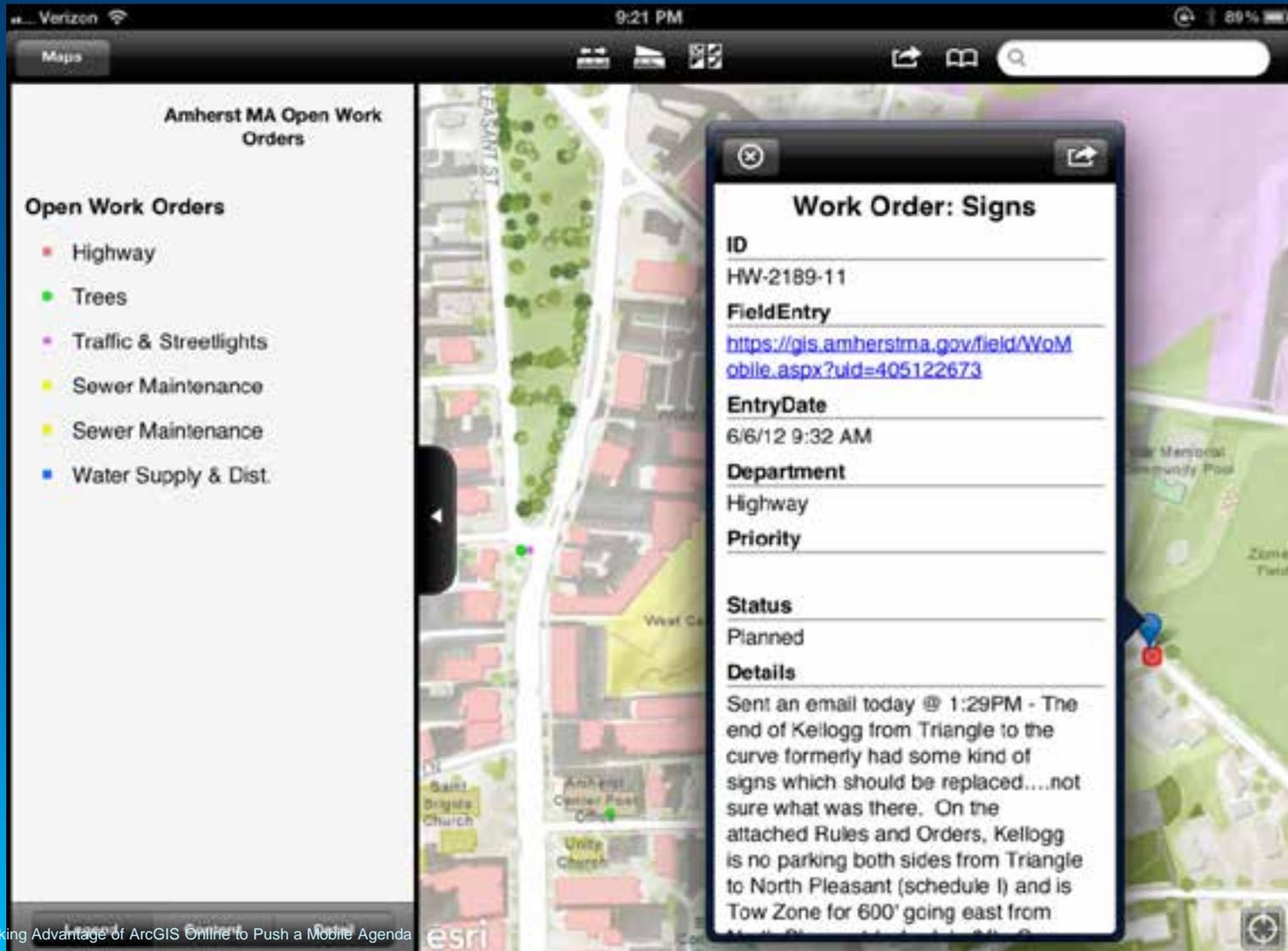
# Invasive Species Inventory

A volunteer effort on Amherst Conservation Areas conducted by a college student, Summer 2012



# Work Order Management

## Work Order access from the field



# Work Order Management

## Close Out Work Orders from the field

Amherst MA Open Work Orders

Open Work Orders

- Highway
- Trees
- Traffic & Streetlights
- Sewer Maintenance
- Sewer Maintenance
- Water Supply & Dist.

**Work Order: Signs**

ID: HW-2189-11

FieldEntry: <https://gis.amherst.edu/mobile.aspx?uid=...>

EntryDate: 6/6/12 9:32 AM

Department: Highway

Priority:

Status: Planned

Details:

Sent an email to the end of Kellogg to the curve formerly had some kind of signs which should be replaced. ...not sure what was there. On the attached Rules and Orders, Kellogg is no parking both sides from Triangle to North Pleasant (schedule I) and is Tow Zone for 600' going east from North Pleasant (schedule IV). See attached

Reported: 06/06/2012

Update Cancel

Completed

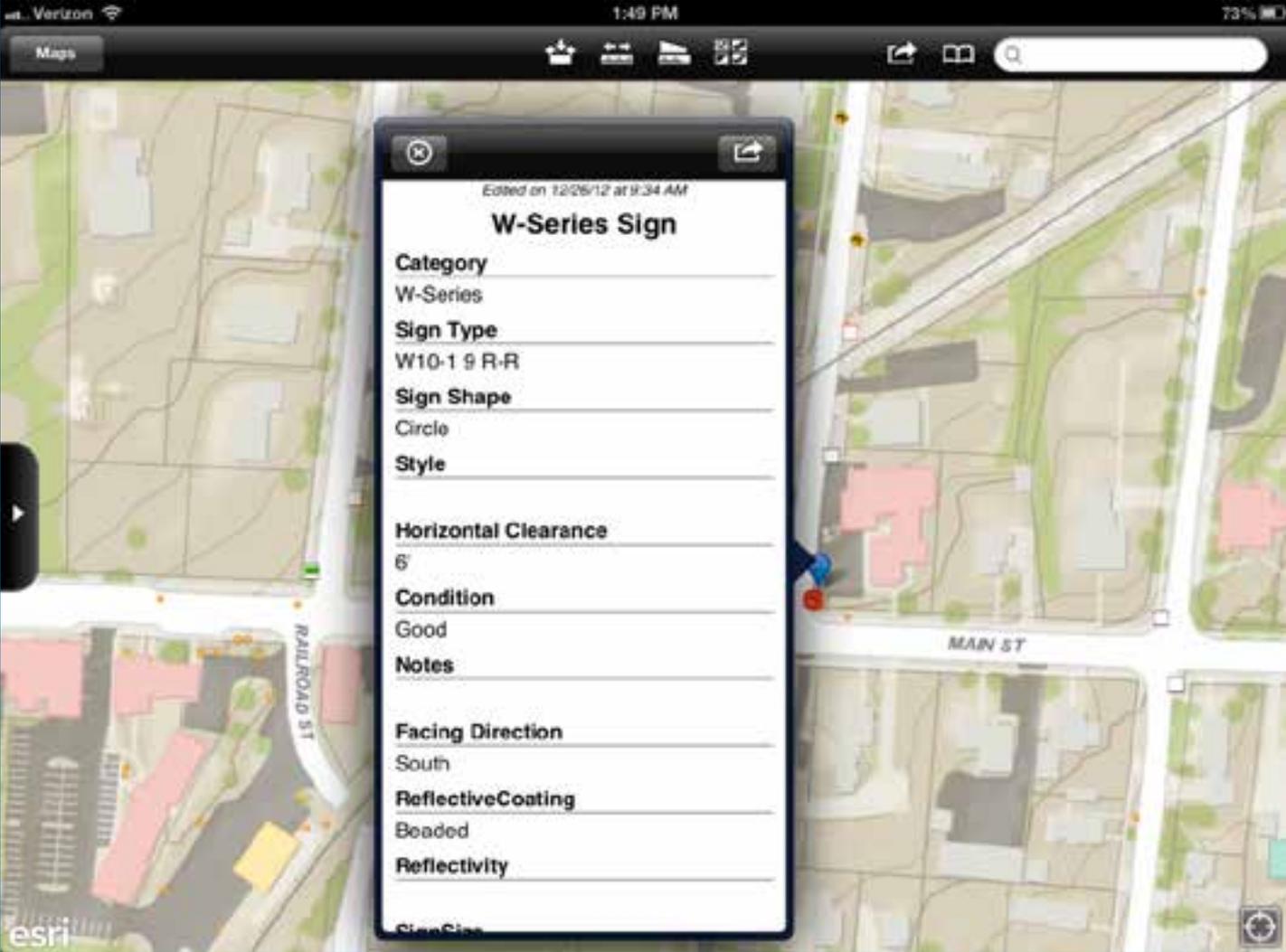
Given to tree warden

In Progress

On Hold

Planned ✓

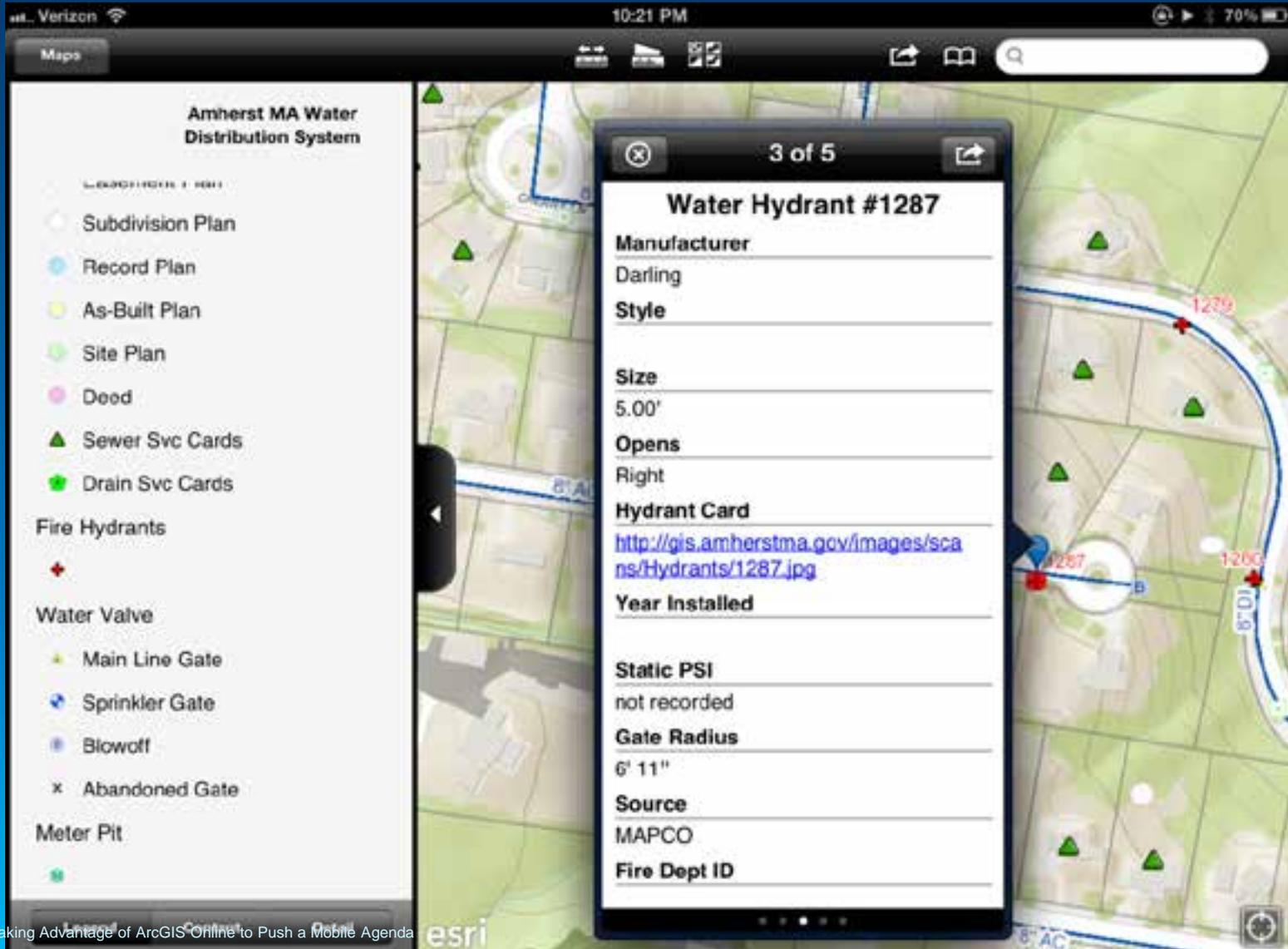
# Sign Inventory & Maintenance



# Sign Inventory & Maintenance



# Utility System Maps



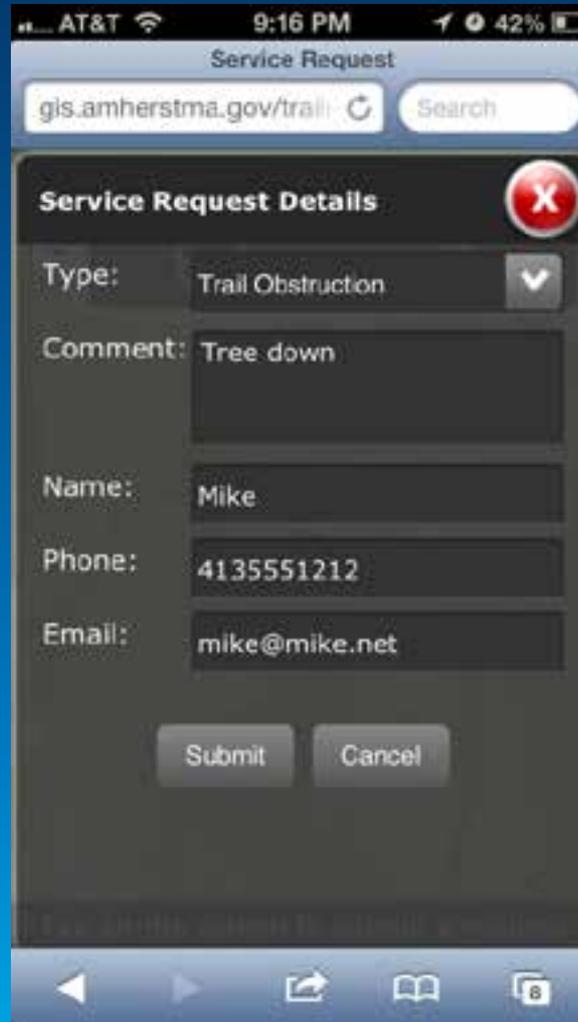
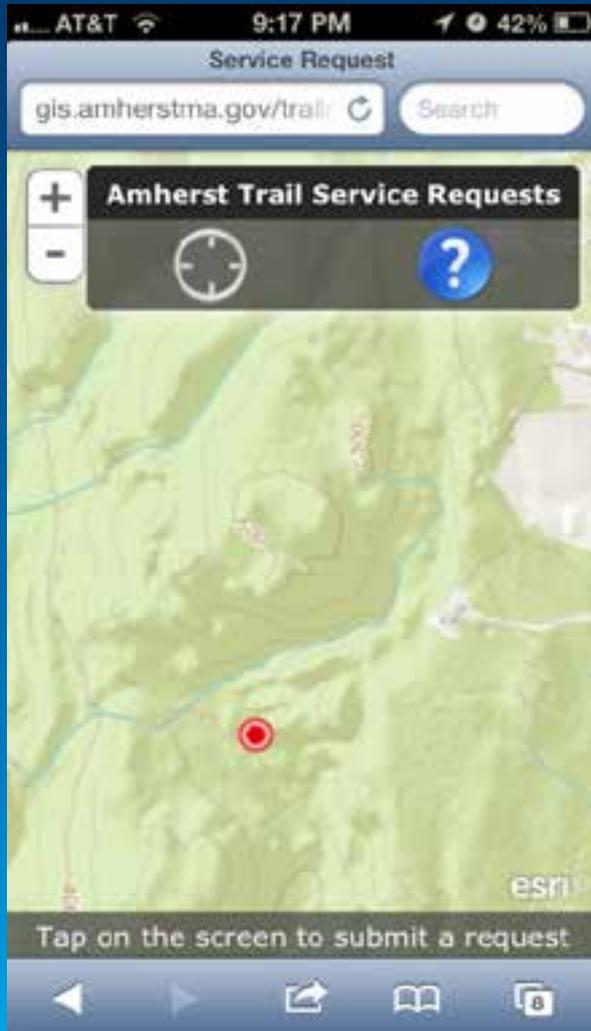
# Utility System Maps

The image displays a mobile GIS application interface for the Amherst MA Water Distribution System. The left sidebar lists various map layers, including Subdivision Plan, Record Plan, As-Built Plan, Site Plan, Deed, Sewer Svc Cards, Drain Svc Cards, Fire Hydrants, Water Valve (Main Line Gate, Sprinkler Gate, Blowoff, Abandoned Gate), and Meter Pit. The main map area shows a street view with a green triangle marker. A data popup window titled "3 of 5" provides details for "Water Hydrant #1287":

<b>Manufacturer</b>	Darling
<b>Style</b>	
<b>Size</b>	5.00'
<b>Opens</b>	Right
<b>Hydrant Card</b>	<a href="http://gis.amherstma.gov/images/scans/Hydrants/1287.jpg">http://gis.amherstma.gov/images/scans/Hydrants/1287.jpg</a>
<b>Year Installed</b>	
<b>Static PSI</b>	not recorded
<b>Gate Radius</b>	6' 11"
<b>Source</b>	MAPCO
<b>Fire Dept ID</b>	

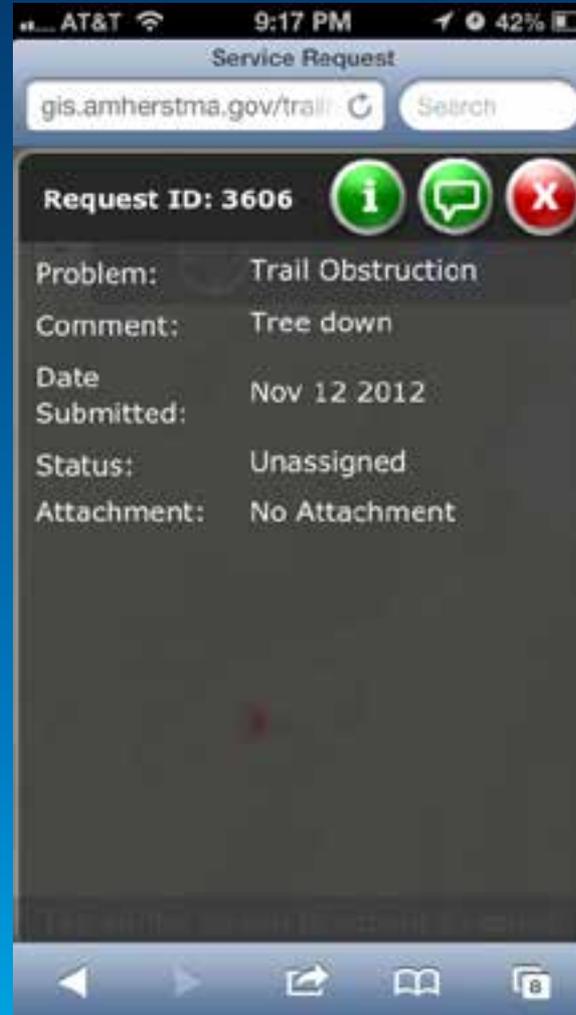
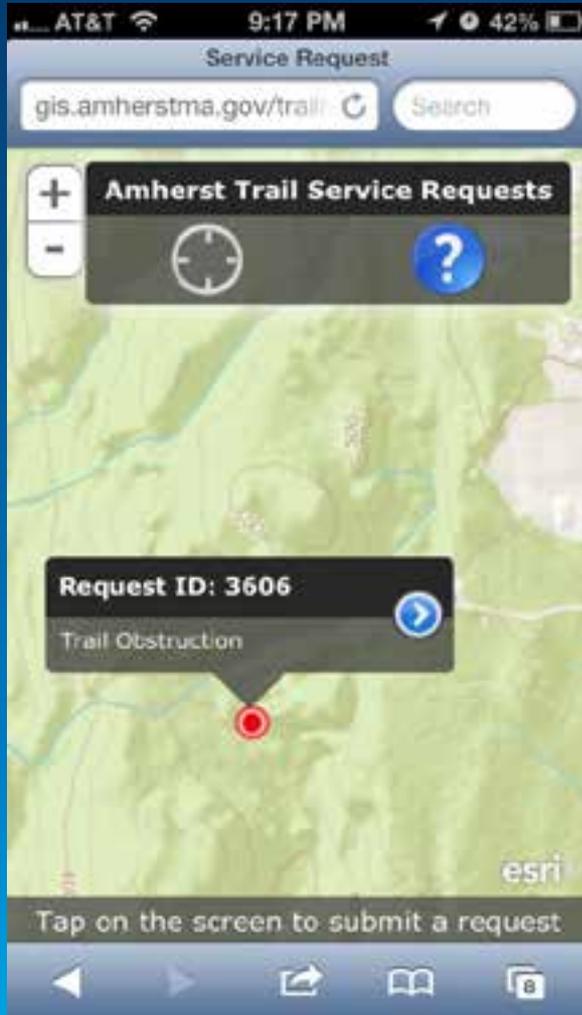
To the right, a handwritten field sketch titled "Hydrant Gate for Sherman Lane" shows a street layout with a red dot labeled "HYD. 1287" and a north arrow. The sketch is dated "11-28-67".

# Trail Obstruction Reporting



Built using the “Citizen Service Requests (ArcGIS 10.1)” HTML5 / JavaScript application template, posted on ArcGIS.com.

# Trail Obstruction Reporting



Built using the “Citizen Service Requests (ArcGIS 10.1)” HTML5 / JavaScript application template, posted on ArcGIS.com.

# Trails & Conservation Land

The image displays a web application for "Amherst MA Trails & Land Conservation". The desktop interface at the top features the "AMHERST MASSACHUSETTS" logo and a navigation menu with icons for LIVING, VISITING, BUSINESS, GOVERNMENT, BOARDS & COMMITTEES, DEPARTMENTS, and ONLINE SERVICES. A search bar is located below the logo. The main content area includes a breadcrumb trail: "You are here: Home > Departments > Conservation and Development > Conservation > Conservation Areas & Ecological Management > Map". The title "Conservation Area & Trail Map" is prominently displayed. Below the title are links for "Larger Map", "Amherst GIS Viewer Map", "Mobile Map", and "Download". A legend on the left side of the map defines various trail types and conservation areas. The mobile phone view, overlaid on the right, shows the same map with a zoom control and status bar information (AT&T, 1:57 PM, 77% battery).

**AMHERST MASSACHUSETTS**

Search amherstma.gov

LIVING VISITING BUSINESS GOVERNMENT BOARDS & COMMITTEES DEPARTMENTS ONLINE SERVICES

You are here: Home > Departments > Conservation and Development > Conservation > Conservation Areas & Ecological Management > Map

### Conservation Area & Trail Map

Larger Map | Amherst GIS Viewer Map | Mobile Map | Download

## Amherst MA Trails & Land Conservation

Amherst MA Trails and Land Conservation

#### Legend

- Trails & Land Conservation**
- Major Trails
  - Metacombet and Monadnock Trail
  - K.C. Trail
  - Robert Frost Trail
  - Nonwottuck Rail Trail
- Local and Literary Trails
  - Literary Trail
  - Local Trail
  - State Trail
- Community Boundaries
- Conservation Areas

AT&T 1:57 PM 77%

# Parking

The screenshot shows the Amherst Massachusetts website's parking page. At the top, there is a navigation bar with the Amherst logo and several menu items: LIVING, VISITING, BUSINESS, GOVERNMENT, BOARDS & COMMITTEES, DEPARTMENTS, and ONLINE SERVICES. Below the navigation bar, a breadcrumb trail reads: "You are here: Home > Departments > Finance > Treasurer/Clerk > Parking in Amherst".

The main content area is titled "Parking in Amherst" and features a large blue "P" icon. To the right of the icon, the text reads: "PARKING IN AMHERST We're making parking in Amherst Center even more convenient! [www.amherstma.gov/parking](http://www.amherstma.gov/parking)".

Below the main heading, there is a "News" section with a circular icon of a parking meter. The text says: "News! You will find the [new pay-by-space meters](#) are paperless, accept credit cards and are even linked to each other. Email us your questions and suggestions [parking@amherstma.gov](mailto:parking@amherstma.gov)".

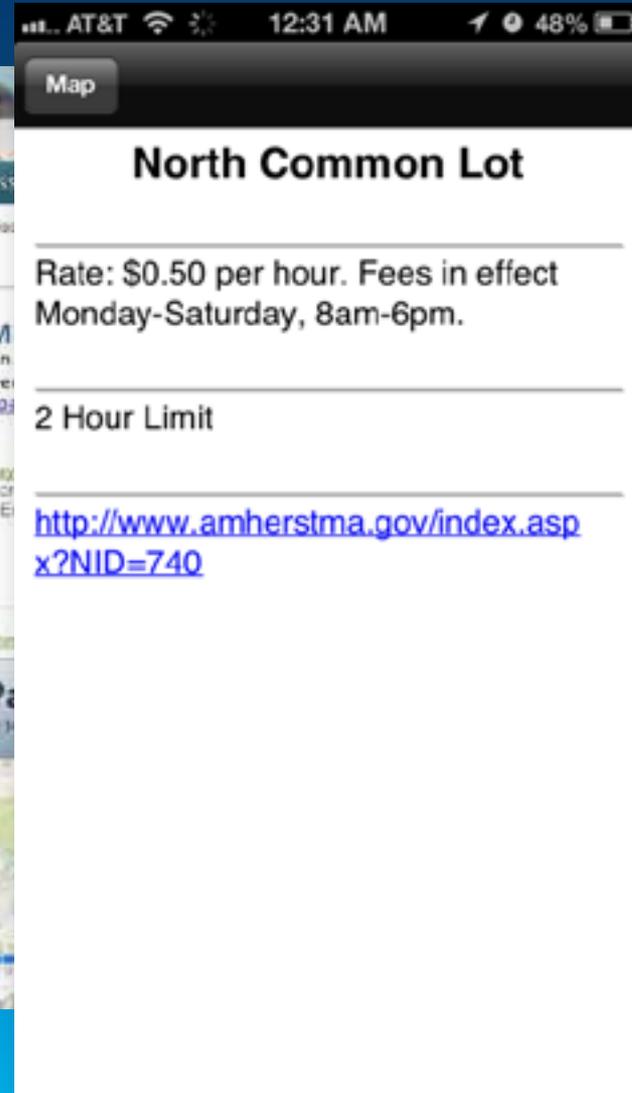
On the right side of the main content area, there is a "Contact" section with the following information: "Contact Parking Clerk 4 Boltwood Avenue Amherst, MA 01102 [parking@amherstma.gov](mailto:parking@amherstma.gov) Phone 413-255-3023". Below this, there is a "Hours" section: "Hours Mon, Tue, Wed and Fri 8:00a to 4:30p Thursday 12:00p to 4:30p".

At the bottom of the main content area, there are links for "Login Map", "Mobile Map", and "Download a Printable Map (PDF)".

The bottom section of the page is titled "Amherst Center Parking Map" and includes the text: "Lots & meters \$ .50 per hour. Fees in effect Monday-Saturday during posted times. Click on the map for more info." Below the text is a map of the Amherst Center area with a legend. The legend includes: "Parking Public Parking Lots", "Parking Lot", "Boltwood Garage", and "Parking Costs". The map shows a blue dashed line indicating a route through the center area.

On the left side of the page, there is a sidebar with several sections: "Amherst Takes Open Government To the MAX!", "Parking in Amherst" (with sub-links for Enforcement, New Pay-By-Space Meters, Payments, Permit Parking, Rates & Fees, and Meter Parking), "ONLINE PAYMENTS", "MAPS & PROPERTY INFO", "EMERGENCY ALERTS", "JOBS & APPLY ONLINE", "BLOGS & FORUMS", and "TOWN CALENDARS". At the bottom of the sidebar, there is a banner for "AMHERST BIENNIAL 2012" and a "View Tour Book" link.

# Parking



# Take Our Maps With You

[www.amherstma.gov/mmmaps](http://www.amherstma.gov/mmmaps)

**AMHERST MASSACHUSETTS**

Search amherstma.gov

Living VISITING BUSINESS GOVERNMENT BOARDS & COMMITTEES DEPARTMENTS ONLINE SERVICE

You are here: Home > Departments > Information Technology > Geographic Information Systems > GIS Resources > Amherst Maps Mobile

### Amherst Maps Mobile

The ArcGIS App for Smartphones and Tablets provides access to Amherst's extensive set of maps from anywhere. This free app can be downloaded from Google Play, the Apple App Store, Amazon Appstore, and Windows Marketplace.

Once you have the ArcGIS App, just search for "Amherst" to find all of our mobile maps, including [Jobs & Conservation Areas](#), [The Amherst Property Map](#), [Amherst Center Districts](#), [Zoning](#) and more!

[System Requirements and More Information](#)

Available on the **App Store**

GET IT ON **Google play**

Get Windows Phone 7

Available on Amazon Appstore

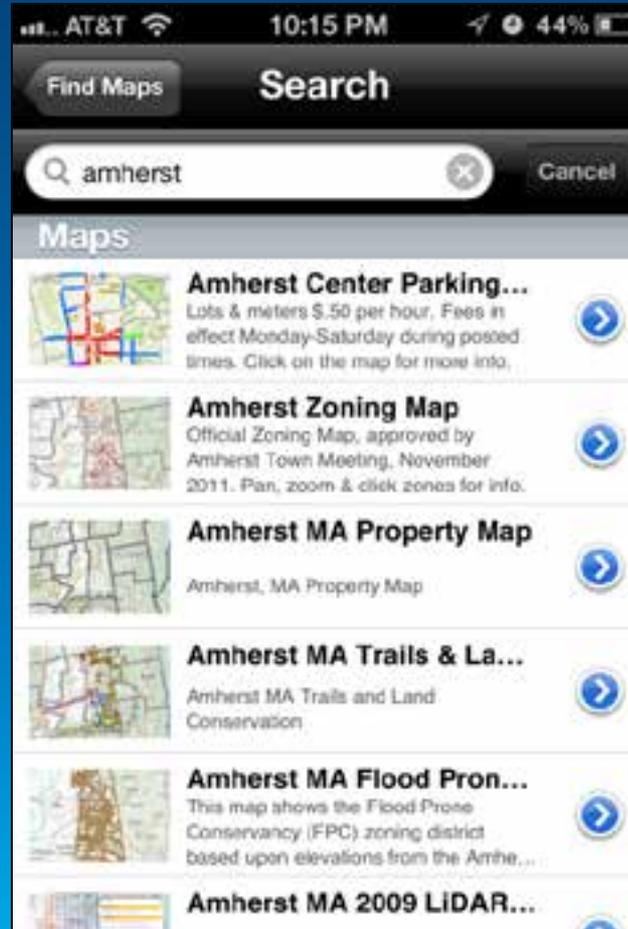
**AMHERST BIENNIAL 2012**

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425 Wood Avenue • Amherst, MA 01002 • Ph: 413-259-3333 • Email: [info@amherstma.gov](mailto:info@amherstma.gov) • Home

# Take Our Maps With You

Search for “Amherst”  
in the ArcGIS App



# Taking Advantage of ArcGIS Online to Push a Mobile Agenda



Michael Olkin  
GIS Administrator  
Town of Amherst, MA  
[www.amherstma.gov/maps](http://www.amherstma.gov/maps)  
[olkinm@amherstma.gov](mailto:olkinm@amherstma.gov)