

January 2023

Louisiana Department of Transportation and Development (DOTD)— District Ratings for GAM Walls (Mobile) Editing using FieldMaps



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1.0 Overview

1.1 Background and Description of App

FieldMaps is the mobile device app distributed by ESRI. The District Ratings for GAM Walls (Mobile) webmap will be opened in FieldMaps. This webmap displays retaining wall data collected under Louisiana Transportation Research Center (LTRC) project 18-4GT. Designated DOTD district representatives will assign pre-defined NCHRP criteria to DOTD retaining wall features using FieldMaps. The pre-defined NCHRP criteria are Operation and Maintenance, Safety Consequence, Mobility, and Economic Consequence. The webmap contains search, edit, and information summary capabilities.

Within the FieldMaps app interface, each district has an offline area that can be downloaded to the mobile device so that editing can be done whether the mobile device has a data connection or not. A user can search by district to retrieve a list of walls that need to be rated.

On the map, if a retaining wall is displayed using the district color, ratings need to be assigned for that retaining wall feature.

2.0 Accessing the Application

2.1 Access the Application

The District Ratings for GAM walls (Mobile) map is accessible only to members of the GAM Editors group.

2.1.1 iPhone or iPad App Settings

Step 1: Download the ArcGIS FieldMaps mobile app from iOS app store.

Step 2: Open the app.



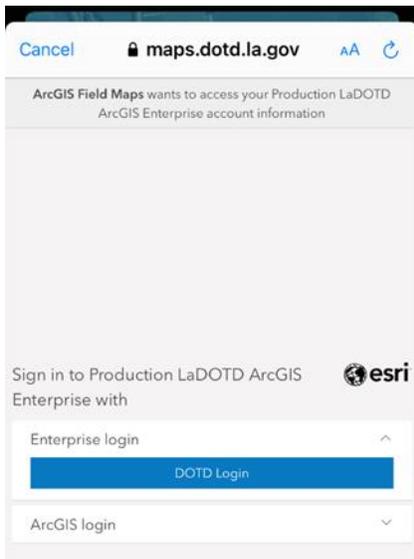
Step 3: Sign into the portal by choosing Sign in with ArcGIS Enterprise.

Choose the portal url if already listed

-or-

Choose specify url, enter the portal url (<https://maps.dotd.la.gov/portal>) and then OK button.





At the next screen, choose the blue DOTD login button and enter valid DOTD login credentials. The domain may be required in front of the login username (e.g., ladotdom\username).

Step 5: Choose settings for the app using the person icon  on the top left of the app page. None of these are required to be changed, but are preferences for the user.

The Auto Sync option is highly recommended. This is the most relevant setting to this use of ArcGIS FieldMaps app since users WILL NOT be collecting new line features.

2.1.2 Android App Settings

Step 1: Download the ArcGIS FieldMaps mobile app from an app store.



ArcGIS Field Maps

The all-in-one app for fieldwork





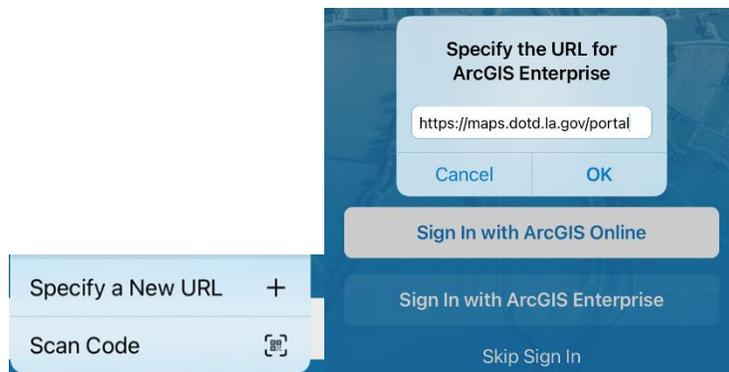
Step 2: Open the app.

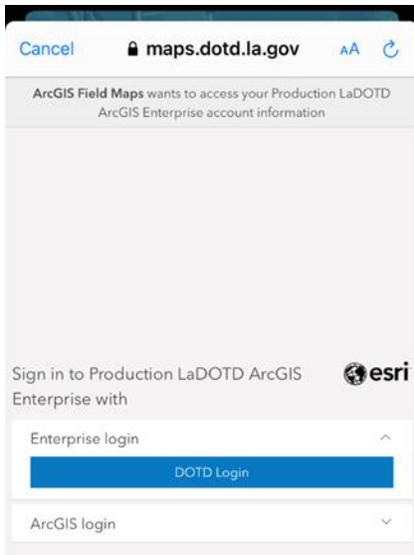
Step 3: Sign into the portal by choosing Sign in with ArcGIS Enterprise.

Choose the portal url if already listed

-or-

Choose specify url, enter the portal url (<https://maps.dotd.la.gov/portal>) and then OK button.





Step 4: At the next screen, choose the blue DOTD login button and enter valid DOTD login credentials. The domain may be required in front of the login username (e.g., ladotdom\username).

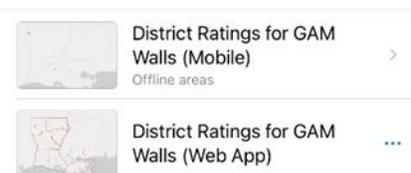
Step 5: Choose settings for the app using the icon  at the top right of the app page. None of these are required to be changed but are preferences for the user. The Auto Sync option is highly recommended. This is the most relevant setting to this use of ArcGIS FieldMaps app since users WILL NOT be collecting new line features.

3.0 Using the App

This application's purpose is to edit attributes of each retaining wall feature. The iOS version of the FieldMaps app will be used to demonstrate the mobile device screens. The Android app screens are very similar.

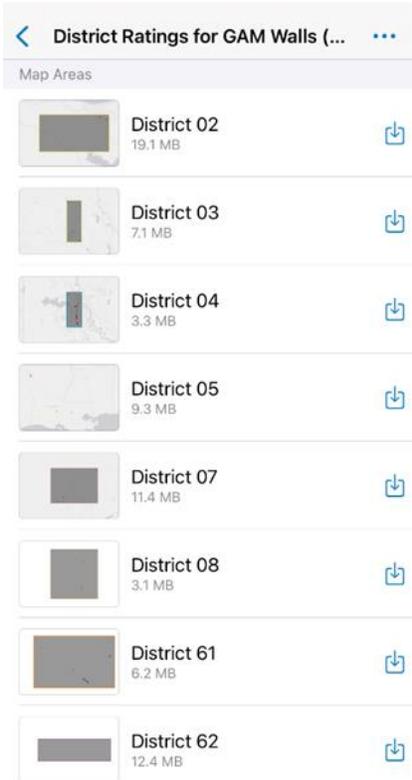
3.1 Access Group Webmap

Under Groups, select GAM Editors, and then select the District Ratings for GAM walls (Mobile) map.



The other map in this group is the map setup for the Rate GAM Walls application and should NOT be used in FieldMaps. The offline map areas for each district may take a few moments to appear.

3.2 Download District Offline Area



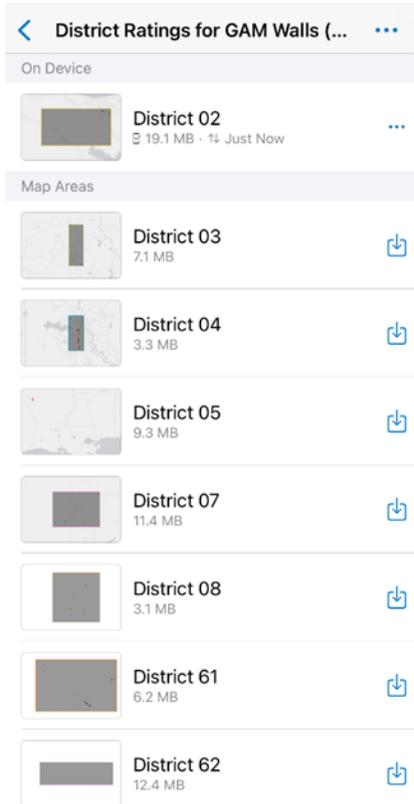
Select the  download icon for the pre-set district offline area that is applicable.

This will download the map area to the mobile device locally. The file size is listed so a user can determine if there is enough space on the device to locally store the map.

This map is setup so that an offline area is used to edit attributes in both data connection and disconnected situations.

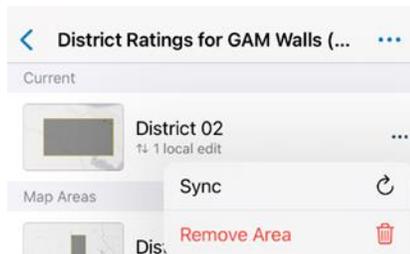
It is best to download a district offline area while connected to wi-fi once at the start of the project.

District 58 is not listed because it has no inventory of retaining walls at this time.

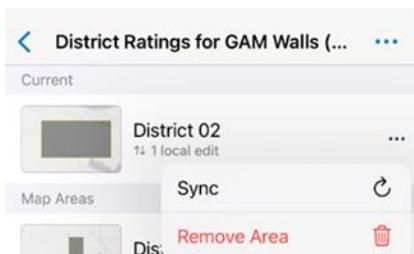


After download is complete, the ellipses button () to the right indicates the offline map area is downloaded to the device.

Sync can be used to send local edits back to the portal and at the same time any data updates can be populated to the mobile device.



There is also a Remove Area choice that should not be used until the end of the project.



NOTE: Please do not use the Remove Area for the duration of the project. There is a known ESRI issue. If a user removes an offline area and redownloads, the data will not be filtered and not indicate wall status correctly. If a user removes a downloaded area on a mobile device, contact LTRC to have the particular district's offline area recreated at the portal.

3.3 Access District Offline Area Map

Once the district offline area downloads, click on the district name to open the map.

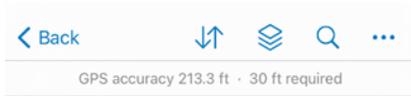


The initial view of the map automatically centers over the district area. There may not be any retaining walls in this area at this zoom level.

Continue onto section 3.4 for the editing workflow steps and/or to retrieve a list of walls by district.

3.3.1 Map Interface Navigation

The map uses a gray canvas basemap. The icons at the top open tools or a menu of tools.



Use a finger to move around the map area.

Use finger-separating motion to zoom in to the map for more detail. As you zoom in, more placename labels and road labels will appear. The map has a maximum zoom level configured, so increased zooming in will result in a distorted view of basemap and labels.

Use finger-coming together motion to zoom out on the map providing a less detailed view. The default extent is set so the map will not zoom out any further.

3.3.2 Sync Edits Icon

The arrow icon  is for syncing edits made locally on this device. It will have a dot  if local edits need to be synced (see Section 3.4.4).

3.3.3 Layers Icon

The stacked papers icon  opens a menu of map layers.

Each layer has a slider that allows the layer display to be toggled on/off.

It is highly recommended that the user keep the ToBeRated and the RetainingWall layers toggled on at all times.

The ToBeRatedLayer has a filter applied so that it will only show those retaining wall features that need to have the attributes selected. Each district is assigned a unique color theme for this layer. As a wall is edited and submitted, that wall should no longer appear as a colored line if all three attributes have values.

The RetainingWall layer contains the entire inventory of wall segments. This layer provides the ability to visualize all walls in the same black color regardless of the attributes completed or not.

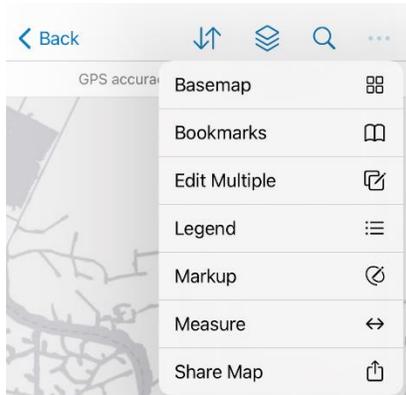
The markup layer is a layer that is user drawn (Section 3.3.10).

3.3.4 Search Icon

The search icon  on the top right is a filtered search by district for the walls that need to be rated (Section 3.4.1).

3.3.5 Collapsed Menu Icon

The collapsed menu  provides access to several tools.

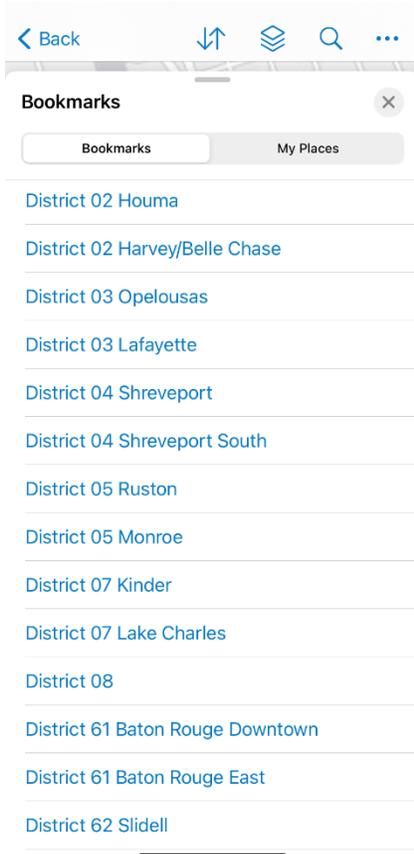


3.3.6 Basemap (under Collapsed Menu)

Basemap selection choice is not available when using an offline area, so only one choice appears.



3.3.7 Bookmarks (under Collapsed Menu)



Preconfigured map views are included for each district based on retaining wall clusters.

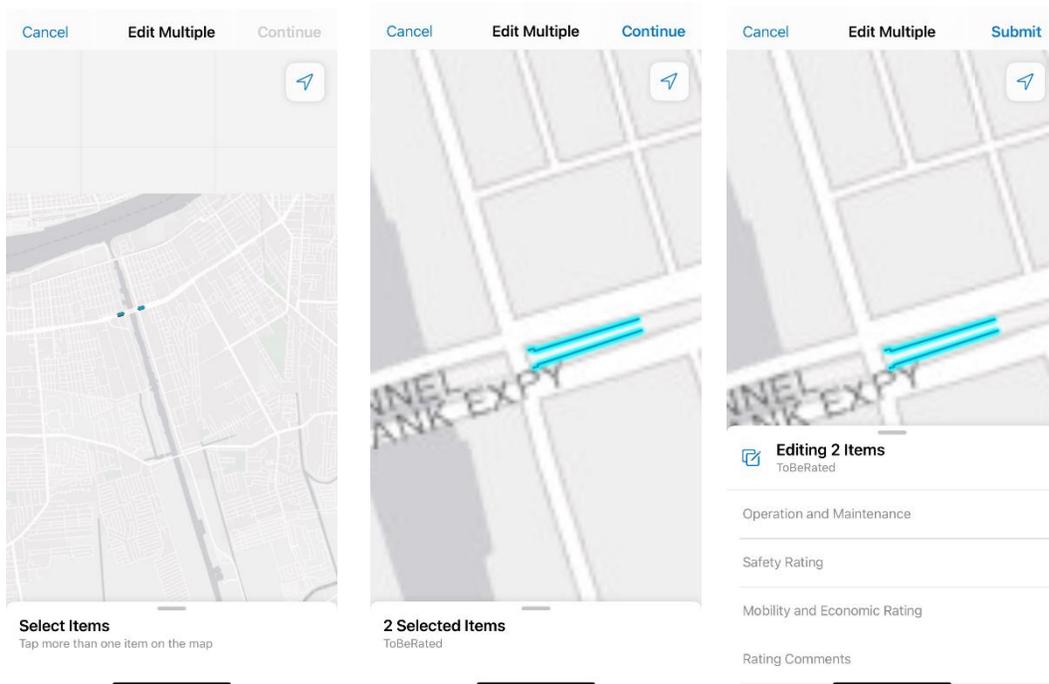
The map will zoom to the bookmark area chosen; but if a bookmark is selected that is not within the district offline area, there will be no map data only a blank gray screen.

3.3.8 Edit Multiple (under Collapsed Menu)

This is NOT recommended for use because each retaining wall segment has differing material, height, or other characteristics that warrant individual consideration for condition assessment.

Please read section 3.4 for the editing workflow and sync options before using this multiple edit tool.

If a user decides to use multiple selection, it is recommended the user zoom in very close so that walls are individually displayed.



The tool allows multiple selection of retaining wall segments to be edited.

If a user edits attributes while multiple segments are selected, the same value will be populated to all selected features.

Users should take great care to always know which wall features are selected at any time during app usage.

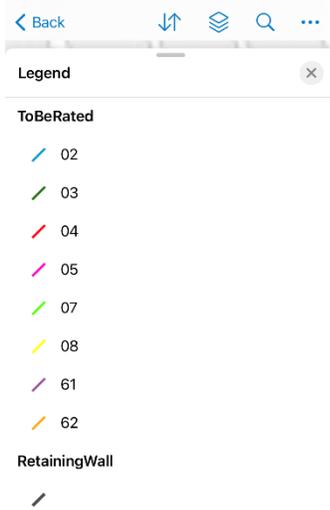
The user must click on the map to select all feature near the chosen position.

Selected items will be displayed with a light blue color and a count will appear at the bottom of the screen. A swipe up will reveal a list of the selected items.

Click Continue to choose the attribute selections.

Click Submit after edits.

3.3.9 Legend (under Collapsed Menu)



This tool indicates the display coloring for each layer.

For the ToBeRated layer, each district is assigned a unique color.

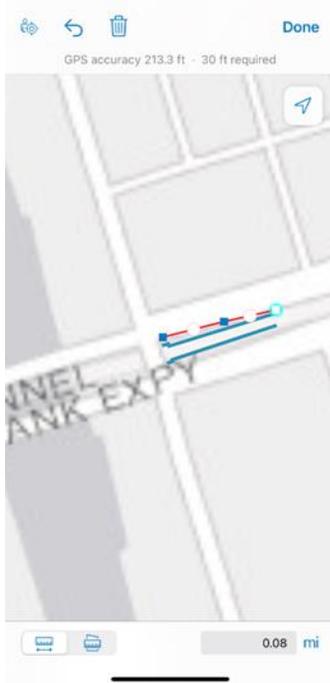
RetainingWall is a constant color so that all walls can be displayed regardless of the attribute rating status.

3.3.10 Markup (under Collapsed Menu)

Markup tool provides the ability to capture sketches and notes on a map. Markup is saved as a layer on your device and is NOT specific to this map. Use markup for your own information, similar to drawing on a paper map.

Search [arcgis.com](https://www.arcgis.com) using the terms “arcgis fieldmaps markup” to learn more about this capability.

3.3.11 Measure (under Collapsed Menu)



The tool will measure a user drawn line.

Place your finger somewhere on the map and keep clicking to make new segments.

After 2 points are chosen, the tool will populate a distance in miles or square miles.

Click the person icon to automatically zoom where you are.

As you are selecting points, the curved left arrow will undo the last point location.

The trash can will delete the entire line drawn.

Click Done to exit the tool.

This webmap was not intended to support precise measurements. The FieldMaps settings as well as the mobile device settings determine the accuracy of this measurement.

3.3.12 Share Map (under Collapsed Menu)

Depending on the mobile device, there are options to share the webmap. Please do not share this map and data outside of DOTD or LTRC personnel. This data is sensitive since it concerns the operational condition of DOTD geotechnical assets.

3.4 Edit Retaining Wall Feature Workflow

This application's purpose is to edit attributes of each retaining wall feature.

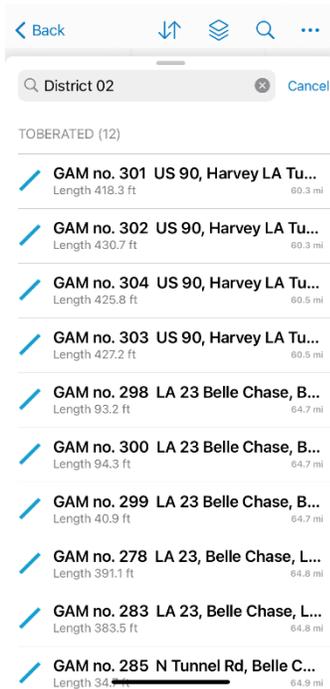
The offline map area on the mobile device should sync back automatically for data updates each time the FieldMaps app is opened or more frequently if the Auto-Sync setting is enabled.

However, it is advisable to sync the district offline area before leaving a wi-fi signal and beginning any edit workflows. This ensures the latest data on the mobile device. Occasionally LTRC personnel may add a previously not inventoried retaining wall that needs to be rated.



Use the Sync tool  to get the most recent data even if there are currently no local edits.

3.4.1 Step 1. Search by District



Click the search icon  at the top of the map interface.

Enter a specific DOTD district that matches the offline area map you downloaded. Example is “District 02.”

Enter everything between the quotes, but not the quotes. The word District must be used as well as the zero must be used for districts 02, 03, 04, 05, 07, and 08.

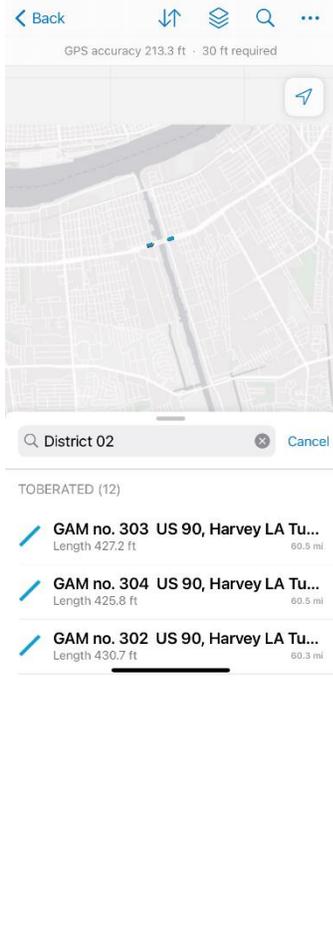
A list of retaining wall features in the district will appear. The list will contain the 12 retaining walls that need to be rated that are spatially closest to the current map extent.

Only 12 items are returned at one time, so any search list cannot be interpreted as a full count of walls that remain to be rated. The list will keep returning the next 12 features until the count of features that need to be rated for this district falls below 12.

Each district is assigned a unique color theme for the ToBeRated layer, which is shown by the symbol displayed to the left of each list item.

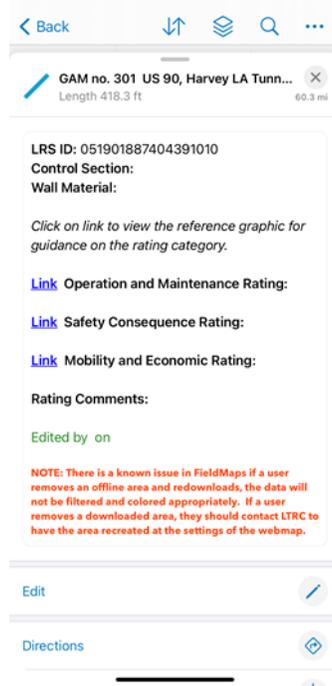
The list will return no results if a district number is used that differs from the offline map area downloaded.

3.4.2 Step 2. Choose a Retaining Wall from the Search List



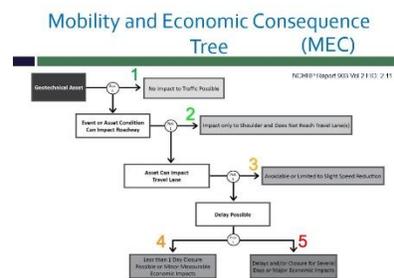
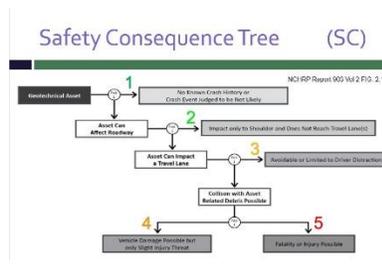
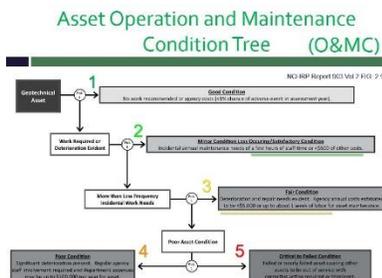
Click on one of the listed retaining walls that need to be rated. The map will automatically move and center on that retaining wall location while highlighting it in light blue.

A pop-up window of information will appear. Swipe up to see all the information.



Each retaining wall segment has a unique GAM number that aids in identifying which segment of a continuous wall is selected. A place name title is also included; however, the entire name maybe cut off due to screen size.

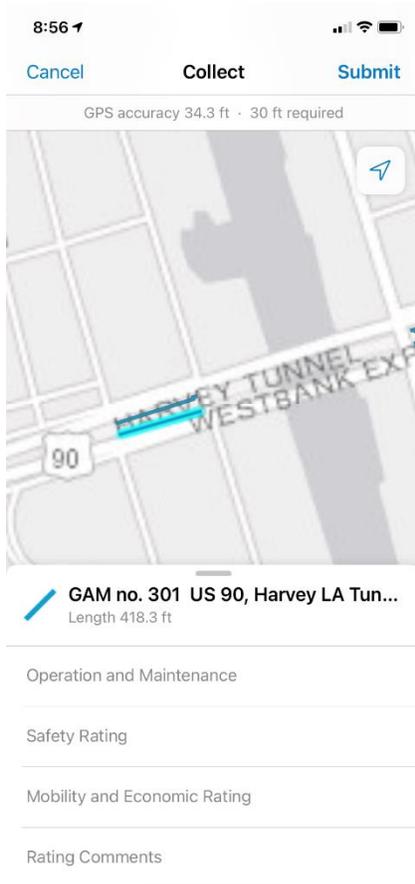
The [link](#) to the left of each of the 3 rating categories are the reference graphics for the pre-defined NCHRP rating criteria of Operation and Maintenance, Safety Consequence, and Mobility and Economic Consequence. If clicked, each will open in the mobile device’s browser. When editing, all the pre-defined NCHRP wording will be visible when assigning the rating.



3.4.3 Step 3. Edit a Retaining Wall

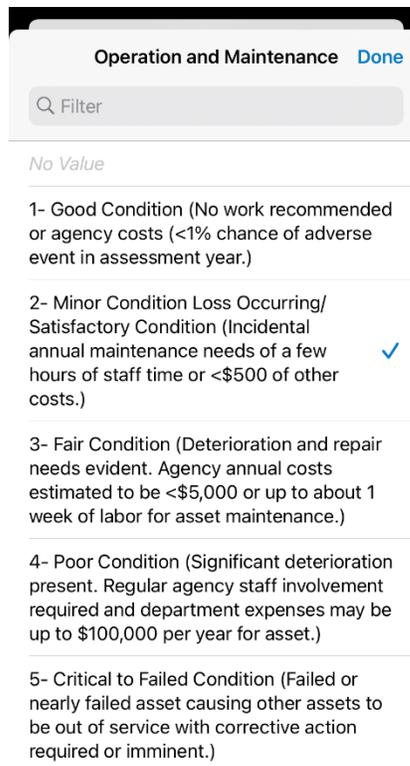


On the pop-up window of information, choose the pencil icon or the word Edit.

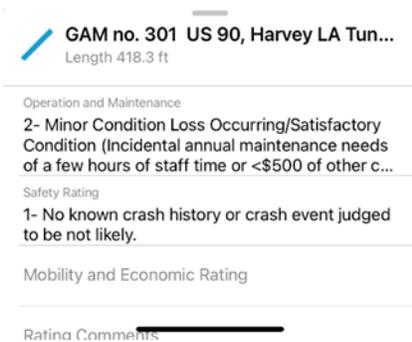


(Required) Click on one of the three categories to rank the currently selected feature.

The number and text are pre-loaded as choices for each category.



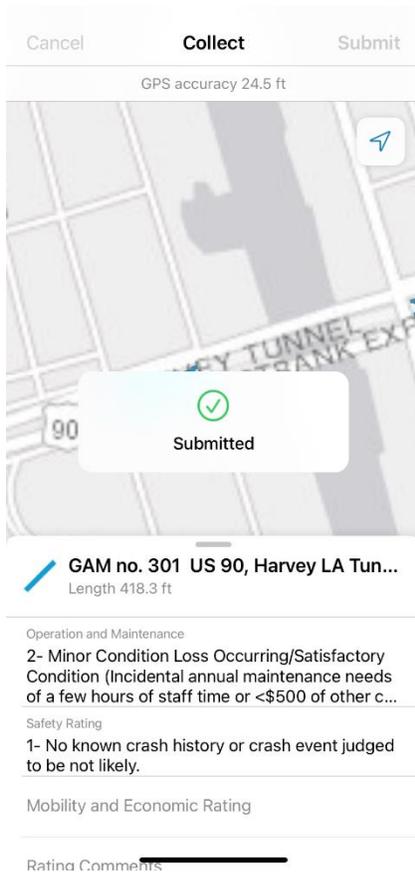
(Required) Click on rating 1, 2, 3, 4, or 5. The check mark alerts you as to which value is currently selected.



After each selection, the edit screen reappears with all the categories indicating selections already made and those with no selection.

(Required) Repeat a selection for all three categories. The app will allow you to submit edits without all three categories chosen. However, the wall segment will still appear on a district search because all three categories do not have a value.

(Optional) Enter text into the Rating Comments field. Type up to 750 characters to give additional information on this wall segment only.



Click Submit in the top right of the screen to save the edits locally to the mobile device.

Login name and a time/date stamp are saved to the data source with the ratings.

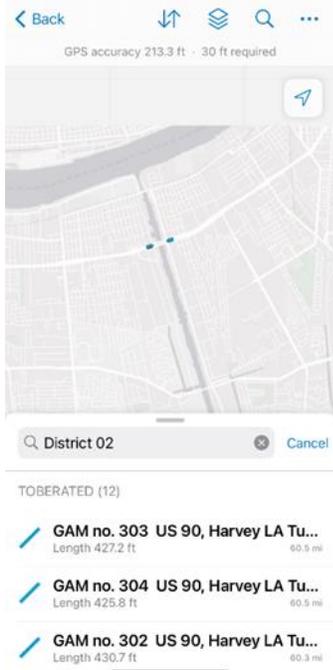


The Sync icon will have a dot if the edit is local only to the app but not yet synced to the data source.

The local app edits will sync automatically based on the time frame in the app settings if auto-sync is enabled during a data connection. If there is not a data connection, then Step 4 must be executed at a later time to sync the local edits back to the data source.

If all three categories have a value for this wall, the map will refresh so the colored line for that wall disappears. That wall is considered rated and is filtered out from being shown in ToBeRated layer. There is still a black line representing that wall.

Exit the information window for the feature just rated.



The original search list reappears. It will still have the wall just edited until the search is refreshed.

Choose another wall from the list to rate and repeat steps 2-3.

-or-

Repeat step 1 to retrieve a refreshed district list then repeat steps 2-3 to rate another wall segment.

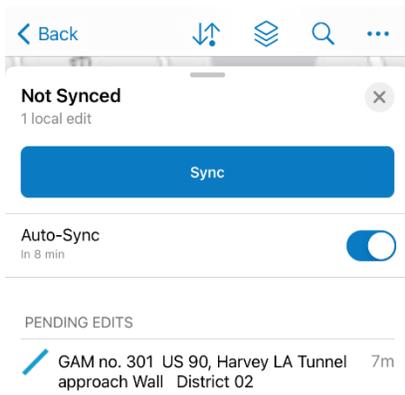
Continue searching, selecting, and editing walls from the list until a search on the district returns no results.

Only 12 items are returned at one time, so it cannot be interpreted as a full count of features that remain to be rated. The list will keep returning the next 12 features until the count of features that need to be rated for this district falls below 12.

You may leave the app without syncing local edits. Those ratings chosen will remain locally until the next sync.

3.4.4 Step 4. Sync Local Edit back to the Portal

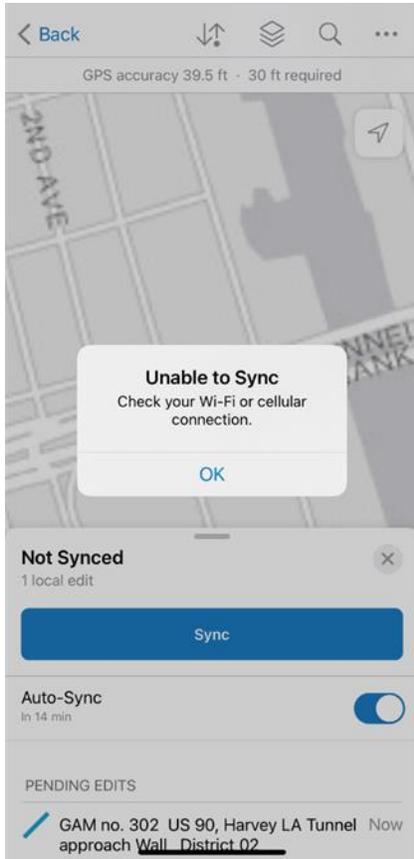
If ratings were made while not having a data connection or without auto-sync enabled, the edits will remain as local edits. The sync button at the top will have a dot if the edit is local only to the app but not yet synced to the data source.



Click the Sync button at the top of the page.

The pending edits are shown.

Click the Sync button to push these edits to the data source.



A success message or a connection issue message will appear.

If an “unable to sync” message appears, try again later when there is a data connection.

3.4.5 Known Issues

Remove offline area



Please do not use the Remove Area selection at the map listing screen. There is a known ESRI issue. If a user removes an offline area and redownloads, the data will not be filtered and not indicate wall status correctly. If a user removes a downloaded area on a mobile device, contact LTRC to have the particular district’s offline area recreated at the portal.

If the user creates the offline map area at the mobile device, this is not an issue because all data components are removed and recreated when a new offline area is created (see section 4.2).

Wall location

The walls may not overlay exactly with roads on the basemap at all zoom levels. The GAM retaining walls feature data are accurately located to the DOTD Roads and Highways official LRS roadway locations. How the walls appear on the basemap is due to slight differences in the webmap projection. The actual location on this webmap does not have to be precise because the functionality is to gather attribute information rather than positional information.

4.0 Miscellaneous

4.1 Any Extra Information about the App

This app has a specific purpose to ascertain retaining wall condition based on NCHRP developed criteria. It is not planned to be continued past this data collection effort by the districts.

DOTD district and HQ administrators can use the companion View District Ratings for GAM Walls at

<https://maps.dotd.la.gov/portal/home/item.html?id=3f9a4f91ffd44d2cbf3e395165f57bd7>.

Originally released in 2019, this application was revised in 2021 when the data and application were transitioned to the DOTD GIS Enterprise and Portal framework.

4.2 User Created Offline Areas

Offline map areas for each district have been created as part of the webmap for use in FieldMaps. It is not recommended that district personnel create their own offline areas within the FieldMaps app.

Search [arcgis.com](https://www.arcgis.com) using the terms “arcgis fieldmaps create offline area” to learn more about this capability.

4.3 How to Access the LTRC Project Information

Additional information is available about the entire body of LTRC-sponsored research for project 18-4GT that produced the DOTD Retaining Wall GIS Data. The LTRC Final Report is accessible through the View District Ratings (Web App) on the Enterprise Portal Maps and Apps Landing Page at <https://maps.dotd.la.gov/portal/apps/sites/#/home>.

4.4 LTRC-Sponsored Research

The LTRC research program emphasizes applied research and technology transfer to further knowledge in the field of transportation and to solve transportation problems encountered by DOTD and the general transportation community. Input for research programs is solicited from state and local government, universities, and private industry.

This FieldMaps webmap usage is a GIS implementation that fulfills LTRC's mission to provide applied research and technology transfer directly to DOTD and the general transportation community.

Please consult the [LTRC webpage](#) for information on current research studies, completed research, or for announcements of input periods for research initiatives.