

# Designing Effective GIS Dashboards:

TAILORING COMPLEXITY TO THE DISTRICT'S NEEDS

---



**Emily McBroom**

GIS Manager

Phone: 940-488-1086

7985 FM 2931

Aubrey, TX 76227

[emcbroom@mustangwater.com](mailto:emcbroom@mustangwater.com)


*Second To None Providing Life's Most Precious Resource*

# What is a dashboard (ESRI)

---

<https://doc.arcgis.com/en/dashboards/10.8/get-started/what-is-a-dashboard.htm>

ArcGIS Enterprise (10.8.x) | [Other versions](#) ▼

A dashboard is a view of geographic information that helps you monitor events or activities. Dashboards are designed to display multiple visualizations that work together on a single screen. They offer a comprehensive and engaging view of your data to provide key insight for at-a-glance decision making. Like [web maps](#) and [web layers](#), dashboards are part of the [ArcGIS geoinformation model](#). They are [items](#) within your organization that can be identified by their icon  when [browsing and searching](#) for content.

# Key Terms

**The type of dashboard you create should be based on who you're sharing it with and the information you want to convey.**



Monitor



Make decisions



See trends



Multiple visualizations quickly



Configurable elements



Informative vs. Interactive

# EXAMPLE 1: SIMPLE AND STRAIGHT FORWARD

---

## THE REQUEST

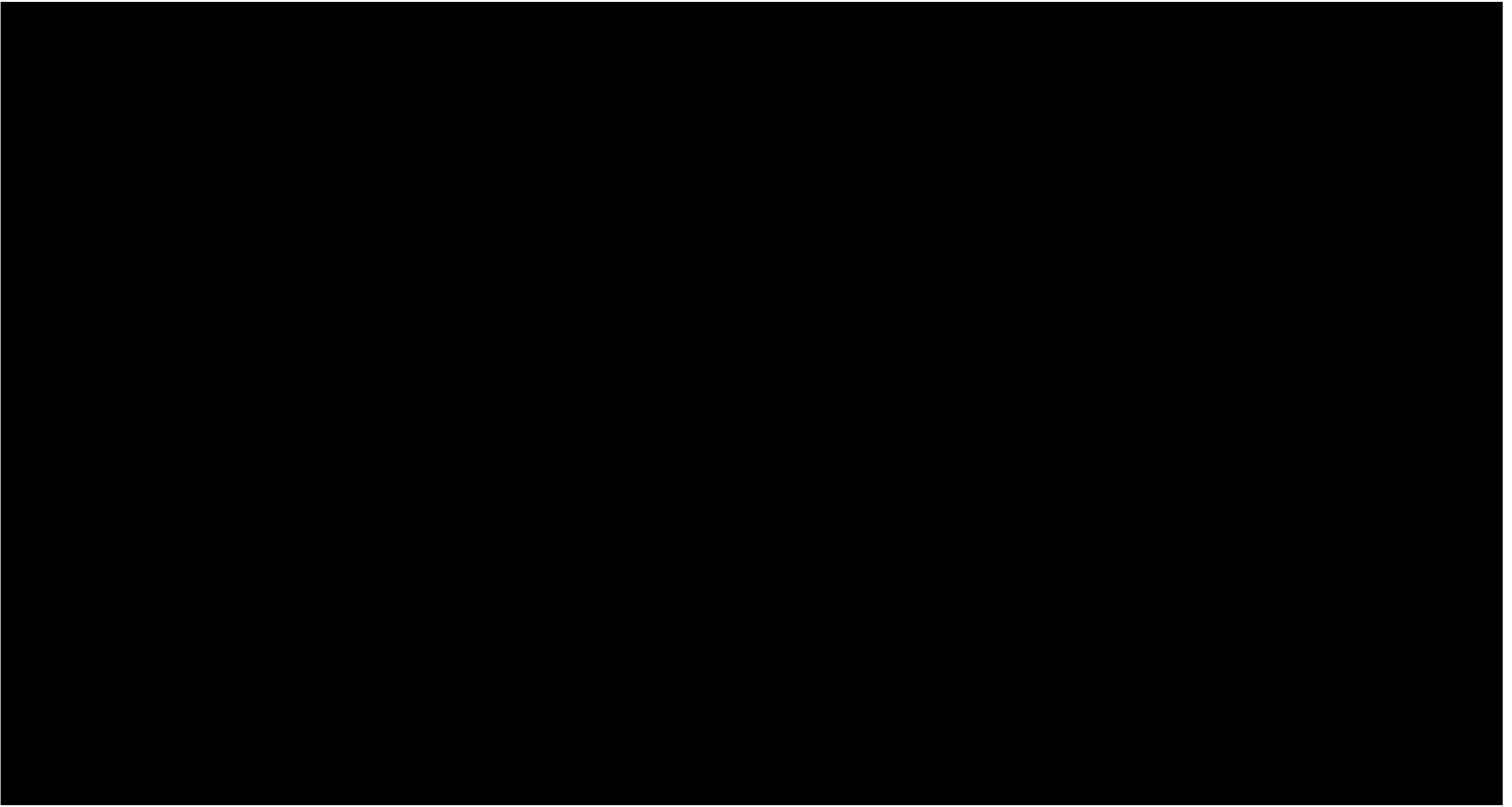
*“Do you think you can make a map where we can tell if any person who calls or comes in here is located inside our district?”*

## WHAT TO CONSIDER:

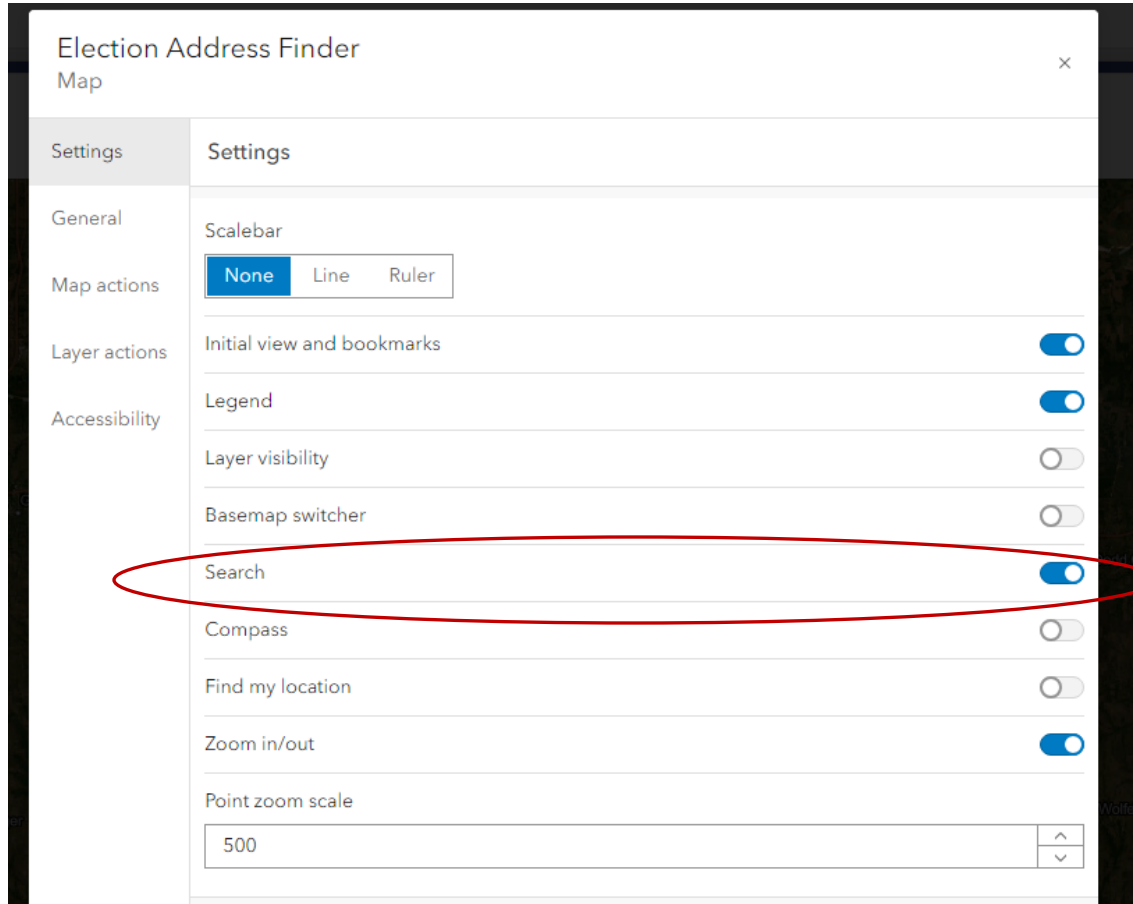
AS EASY TO USE AS POSSIBLE

DON'T OVER DO IT

HAS ONE PURPOSE



# How it was configured



**Election Address Finder**  
Map

Settings

General

Map actions

Layer actions

Accessibility

Scalebar

None Line Ruler

Initial view and bookmarks

Legend

Layer visibility

Basemap switcher

**Search**

Compass

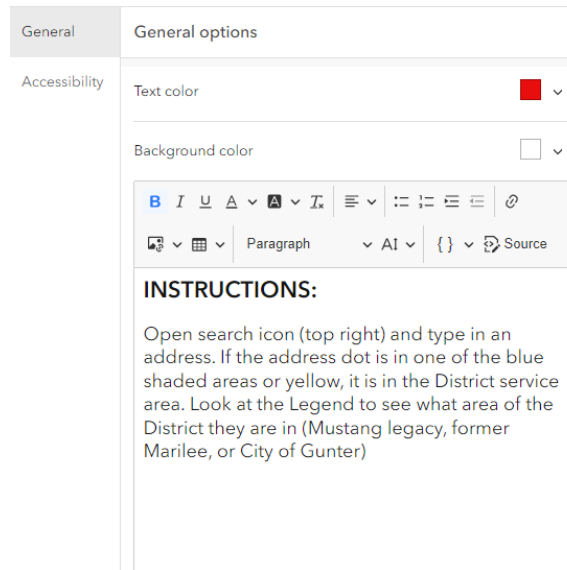
Find my location

Zoom in/out

Point zoom scale

500

## Rich text



General

General options

Accessibility

Text color

Background color

**B I U A**

Paragraph  AI    Source

**INSTRUCTIONS:**

Open search icon (top right) and type in an address. If the address dot is in one of the blue shaded areas or yellow, it is in the District service area. Look at the Legend to see what area of the District they are in (Mustang legacy, former Marilee, or City of Gunter)

## INSTRUCTIONS:

Open search icon (top right) and type in an address. If the address dot is in one of the blue shaded areas or yellow, it is in the District service area. Look at the Legend to see what area of the District they are in (Mustang legacy, former Marilee, or City of Gunter)

# EXAMPLE 2: INTERACTIVE AND DATA EXPORT

---

## THE REQUEST

*“Is there a way to highlight the line between valves we are going to shut off and show which customers need to be contacted?”*

## WHAT TO CONSIDER:

We do not have asset management or utility network

Easily accessible

Easy to use





Water Distribution

Map

Settings

General

Map actions

Layer actions

Accessibility

Active targets: 0

GraysonCAD\_Parcels  
Active targets: 0

DentonCAD\_Parcels  
Active targets: 0

DentonCAD\_Parcels Addresses  
Active targets: 3

CollinCAD\_Parcels Addresses  
Active targets: 2

GraysonCAD\_Parcels Addresses  
Active targets: 2

Mustang SUD CCN Boundary  
Active targets: 0

When map is clicked

Show pop-up

Select feature ⓘ

Additional selection tools  
Requires one or more layer actions to be configured.

Rectangle

Lasso

Circle

Line

Cancel Done

# How it was configured

---

# EXAMPLE 3: TRACK QUALITATIVE DATA

---

## THE REQUEST (FROM MYSELF)

*“How am I going to show the process of developments that is constantly updated in a group of shared Teams punchlist/notes tables?”*

## WHAT TO CONSIDER:

Track developments that change status regularly

Keep track of almost daily changes to spreadsheets

Avoid disrupting updates for users in Teams



# How it was configured with more complexity

- More manual steps by GIS
- Connection to table
- Applying IDs
- Use of ArcPro map environment
- Python Notebook to update a hosted feature layer (ChatGPT assistance)
- Update regularly

```
import arcpy
from arcpy import env
from arcpy.mp import ArcGISProject

# Set up the ArcGIS project and map
project = ArcGISProject("CURRENT")
map_name = "DevelopmentTracker"
map = project.listMaps(map_name)[0]

# Names of feature classes
exported_layer_name = "DevelopmentTracker_ExportFeatures"
hosted_layer_name = "Development Tracker"

# Get Layers
exported_layer = map.listLayers(exported_layer_name)[0]
hosted_layer = map.listLayers(hosted_layer_name)[0]

# Path to Local geodatabase and Excel table
geodatabase_path = r"Y:\06 GIS\ArcPro Map Projects\DevelopmentTracker\DevelopmentTracker.gdb"
table_path = r"Y:\06 GIS\ArcPro Map Projects\DevelopmentTracker\DevelopmentTracker.xlsx\DevelopmentTracker$"

# Fields list for explicit use in cursors
fields_list = ["Inspector", "PROJECT", "PLANS_APPROVED", "REQUIRED_EASEMENTS", "FINAL_PLAT",
               "COVERSHEET", "SUBMITTALS_APPROVED", "PRECON_MEETING", "PASS_HYDROSTATIC_TESTING",
               "FLUSHED_PASSED_BACT", "HYDRANTS_TESTED", "TELEWISE_WW", "PASS_AIR_TEST",
               "MANDREL_DEFLECTION_TEST", "INFIL_EXFIL_TEST", "FINAL_AIR_TEST", "RPZ_INSTALLED",
               "FINAL_WALK", "CORRECT_PUNCH_LIST", "LIFT_STATION", "Notes", "GIS_ID"]

# Create a dictionary to store GIS_ID and corresponding row data from the Excel table
data_dict = {}
with arcpy.da.SearchCursor(table_path, fields_list) as search_cursor:
    for row in search_cursor:
        project_name = row[fields_list.index("PROJECT")]
        data_dict[project_name] = row

# Start an edit session to update the exported_layer
workspace = geodatabase_path # Edit session requires workspace path
edit = arcpy.da.Editor(workspace)
edit.startEditing(False, True)
edit.startOperation()

# Update the exported_Layer with matched GIS_ID data from Excel
try:
    with arcpy.da.UpdateCursor(exported_layer, fields_list) as update_cursor:
        for row in update_cursor:
            project_name = row[fields_list.index("PROJECT")]
            if project_name in data_dict:
                # Directly update the existing row with new data from Excel
                for i, field in enumerate(fields_list):
                    row[i] = data_dict[project_name][i]
                update_cursor.updateRow(row)
            print("Exported Layer updated successfully.")
finally:
    # Ensure that the edit operation and session are closed properly
    edit.stopOperation()
    edit.stopEditing(True)

arcpy.management.DeleteFeatures(hosted_layer)
print("Hosted Data Deleted")

arcpy.management.Append(exported_layer, hosted_layer, "NO_TEST")
print("Hosted layer updated successfully.")
```

# Symbolize using Arcade in AGOL Map

Feasibility Studies

Styles

①

Choose attributes


Feasibility Study by Returned Date

+ Field    + Expression

②

Pick a style

These styles are good for your current field selection.



Types (unique symbols) ⓘ

Style options

Feasibility Study by Returned Date

Run

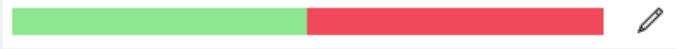
```
1 var dateReturned = $feature["DateReturned"];
2
3 if (dateReturned == null) {
4   return 1;
5 }
6 if (dateReturned != null) {
7   return 2;
8 }
```

Feasibility Studies

< Style options

Types (Unique symbols) ^

Symbol style



Display features by value order

Feasibility Study by Returned Date

Title	Count
Feasibility Studies Returned	20
Studies to Engineer	36
Other	

# Back to the Dashboard

Use the out-of-the-box formatting options to match your symbology.

For information on using Arcade to dynamically symbolize tables or lists inside the dashboard with color check out this website.

<https://gisguidebooks.com/>

List options

Advanced formatting ⓘ Enable

Line item template

**B** *I* U A A *ix* | ☰ ☷ ☰ ☷ | 🔗 🔄 ☑

☰ ☷ Paragraph ☰ AI ☷ { } 🔗 Source

{field/In\_Feasibility}: {field/DateReturned}

Line item icon

None Symbol

Show search ☑

Highlight text color  ☑

Text color  ☑

Background color  ☑

Separator color  ☑

Selection color  ☑

Selection text color  ☑

## Feasibility Studies Returned

Search...
998 Bledsoe Rd: 10/04/2023
Aubrey Middle School #2: 8/10/2023
Buck Creek: 8/17/2023
Calk/Airport: 12/11/2023
Celina RV Park-wait for pymt: 12/5/2023
Celina West outer: 12/5/2023
CR 134: 12/11/2023
Deer Crossing 2, 3, 4: 10/4/2023
DHI Crossroads: 9/20/2023
FM 121 Gunter TX: 10/4/2023
FM 121/9th St: 10/04/2023
Gunter Farm Estates: 12/5/2023
Kimberlin Buck Creek: 8/22/2023
Lackland Massey Rd Development: 8/15/2023
Marilee Ridge Estates: 9/25/2023
Northwest Old Tioga: 10/04/2023
O'Reilly Auto parts Gunter: MSUD REVIEW
Preston Industrial Park: 9/25/2023
Sunset Ranch MUD: 10/11/2023
Warehouse Hwy 289: 1/18/2024

# LAST EXAMPLE: MONITORING LEAD AND COPPER INVENTORY

---

## THE REQUEST

*“The EPA requires an inventory of all service line materials by October 2024. How can we keep track of it?”*

## WHAT TO CONSIDER:

Managers need to quickly see progress to meet deadline





# How it was configured

## OUT-OF-THE-BOX TOOLS

- Modified dashboard provided in ESRI Solution
- Used gauges for tracking progress
- Used map to table actions to allow zooming to features and showing pop-ups

### List

The configuration panel for the 'List' widget is shown on the left. It includes the following sections:

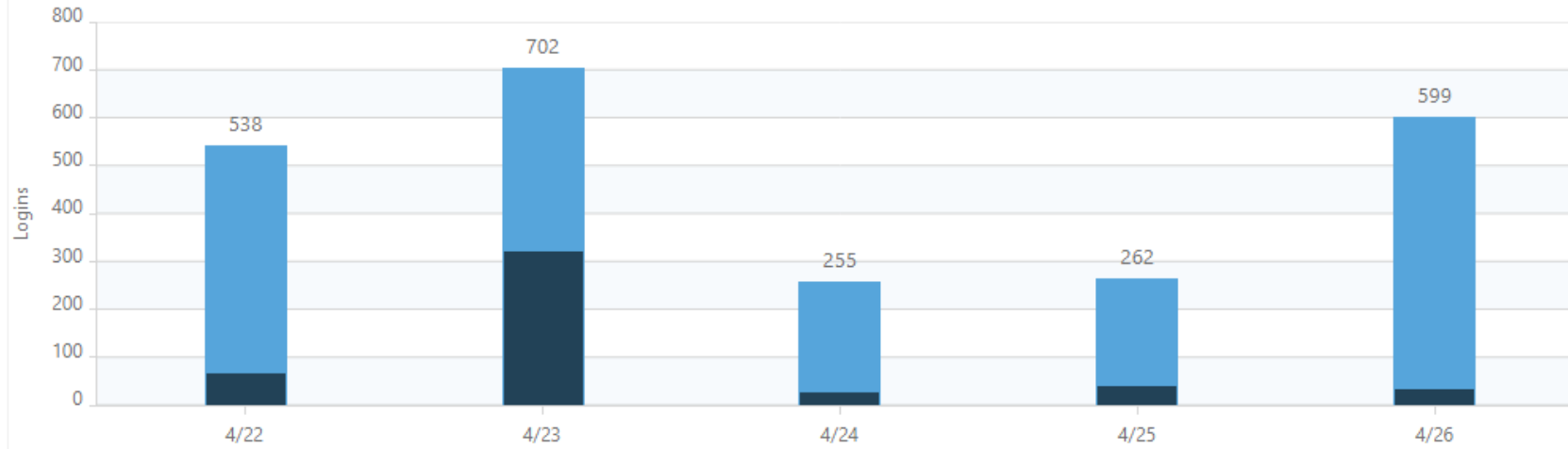
- Data:** Actions
- List:** Selection mode (Single, Multiple)
- General:** (Empty)
- Actions:** When selection changes
- Accessibility:** Filter (Active targets: 0), Flash (Active targets: 1), Show pop-up (Active targets: 1), Pan (Active targets: 0), Zoom (Active targets: 1)
- Map:** Lead Service Line Field Map (checked, toggle on)

The 'List' widget on the right is titled 'List of checked since 10/25/2023' and displays the following data:

Date/Time	Address
5/10/2024, 2:27 PM	803 N Preston Rd
5/6/2024, 3:34 PM	10511 County Road 175
5/6/2024, 3:12 PM	10937 County Road 217
5/6/2024, 12:26 PM	County Road 134
5/6/2024, 12:17 PM	County Road 134
5/6/2024, 11:58 AM	Wolf Trail
5/6/2024, 11:46 AM	County Road 128
5/6/2024, 10:42 AM	5635 County Road 177
5/6/2024, 9:28 AM	200 E Main St
5/6/2024, 8:58 AM	S Highway 289
5/6/2024, 8:49 AM	S Highway 289
5/3/2024, 11:56 AM	County Road 177

### Usage of Registered Apps by Org Members

Total App Logins this Period: **2,356**



Showing: All Registered App Usage App Name: ArcGIS Dashboards X

Select items from below tables to update chart

Usage by App Name		Usage by Member	
App Name	Logins	Member	Logins
ArcGIS Dashboards	486	esimon@mustangwater.com	204
		emcbroom_MustangSUD	192
		water_operators	40
		WaterMSUD	19
		cdickerson_MustangSUD	9
		MsudWW	7
		kskillman_MustangSUD	5

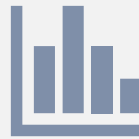
## In Summary



Know your audience for the task



Use few steps, if possible



Sometimes the simplest dashboards can make the largest impact