

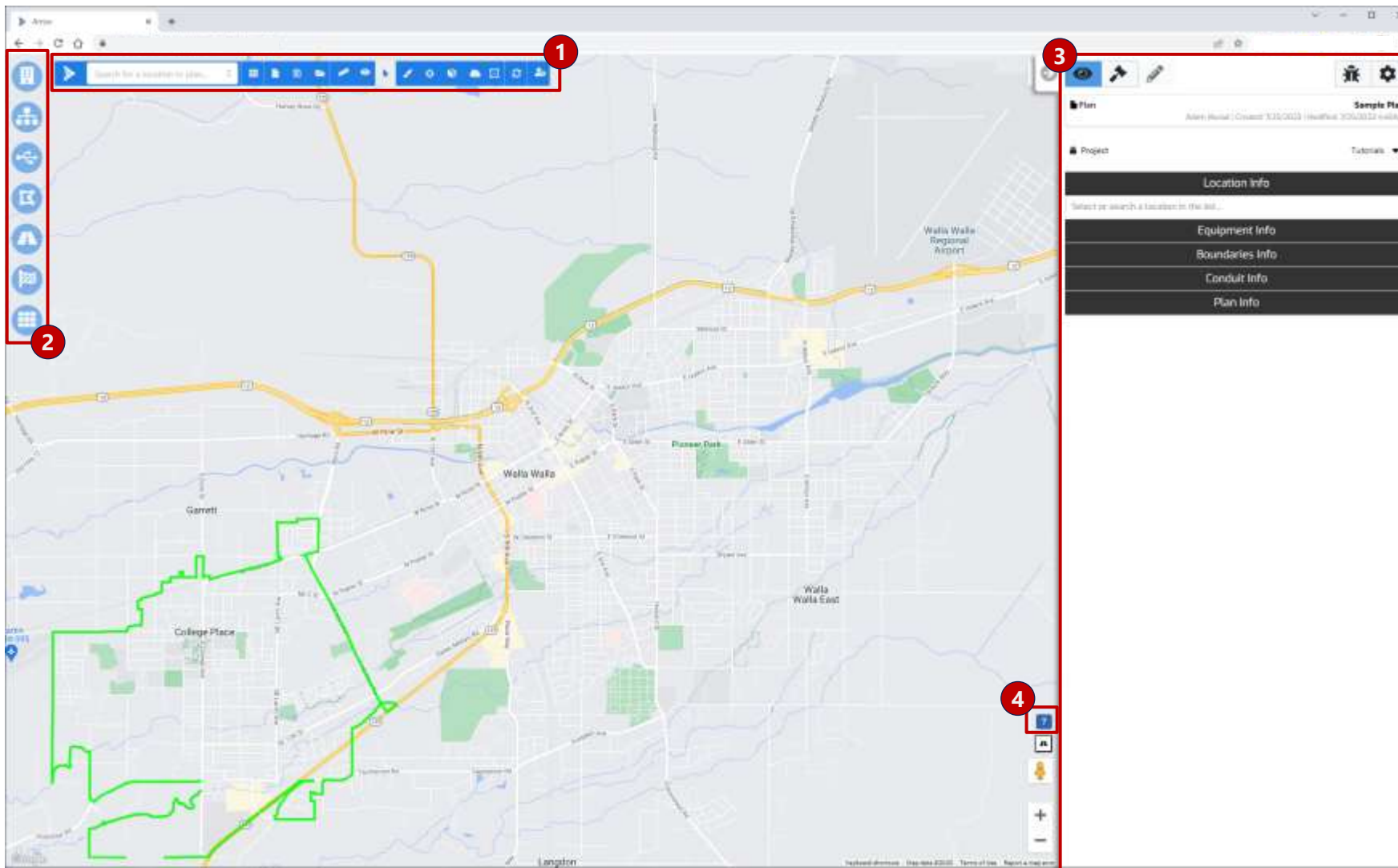
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# Arrow Platform

## UI Elements and Data Visualization



# Users interact with Arrow through controls located in three key areas of the screen: Header Bar, Visualizations Modal and the Analysis Panel



**1. Header Bar** –Displays shortcuts to useful UI tools (e.g., search), plans, and key settings

**2. Visualization Modal** – Controls which data layers and features are displayed on the map

**3. Analysis Panel** – Used for:

- Inspecting details of individual data layers (View Mode)
- Setting up new optimizations (Analysis Mode)
- Adjusting data and resource selection for individual plans (Settings)

**4. Help Center** – Opens up a panel with links to additional training, troubleshooting and support resources



**Header Bar**

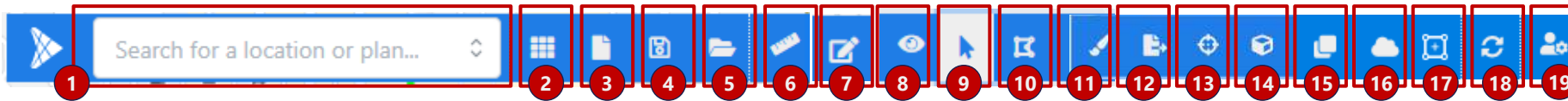
Visualization Modal

View Mode

Analysis Mode

Settings

# Header Bar displays shortcuts to useful UI tools, plans, and key settings



**1. Search** – Global search box where users can search for saved plans, addresses and geographical coordinates. Users can toggle which categories are searched.

**2. Global Settings** – Allows users and platform administrators manage key platform settings and permissions (*details on the following pages*)

**3. Create New Plan** – Shortcut to New plan creation panel

**4. Save Plan** – Saves the plan to make the analysis permanent

**5. Open Existing Plan** – Opens existing plan

**6. Ruler** – Measures distance between points on a map (straight line or along road segments)

**7. Edit Datasets** – Edit location, equipment, conduit or fiber data on the map canvas (only datasets that have been marked to allow modification are editable)

**8. View Settings** – Control how certain data features appear on the map (*details on the following pages*)

**9. Selection Tool** – (*visible only inside Analysis Panel*) Locations selection tool

**10. Multi-Selection Tool** – (*visible only in Analysis Mode*) Selects multiple locations or service areas for analysis by drawing a polygon on a map

**11. Annotations** – Draws temporary lines or polygons on the map to track progress or illustrate an analysis

**12. Import / Export Plans** – Allows administrators to export plans and import them into another project or separate instance

**13. Coverage Boundary Calculator** – (*visible only in View Mode*) Calculates number of locations within specified distance from a point selected on a map. Distance is calculated along the road segments, not straight line.

**14. Boundary Reports** – (*visible only in View Mode*) Opens Boundary Reports modal where user can download custom reports for their coverage boundaries

**15. Duplicate Plans** – Enables you to create copies of existing plans in the same project.

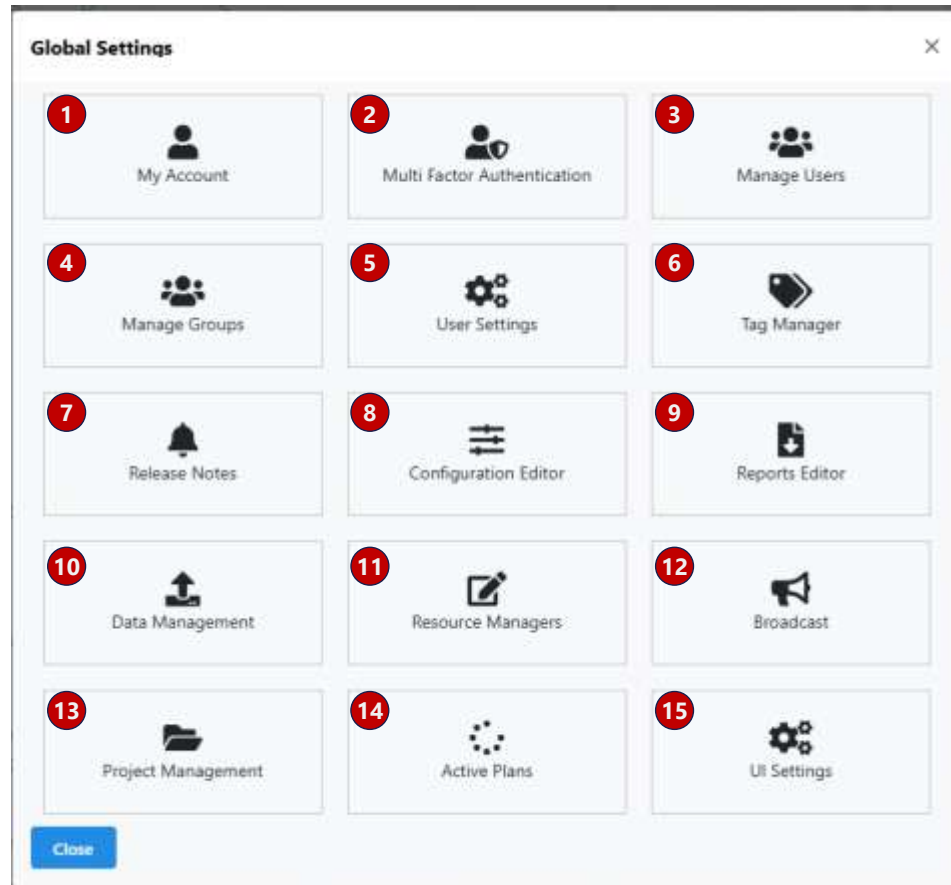
**16. RFP Plans** – Accesses the panel for submitting and retrieving RFP plans and reports (submitted through the panel or Arrow APIs)

**17. Edit Plan Service Area** – (*visible only inside a saved plan*) Temporarily adjust the service area boundary (in the context of a saved plan), for example, to capture additional locations that are originally outside of the serving area

**18. Refresh Tiles** – Refreshes map vector tiles

**19. Account Settings** – Shortcut to user account settings and app logout

# Global Settings allow users and platform administrators to manage key platform settings and permissions



**1. My Account** – Change password

**2. Multi-Factor Authentication** – Manage MFA settings

**3. Manage Users** – [Administrators only] Manage users and their permissions

**4. Manage Groups** – [Administrators only] Manage groups and their permissions

**5. User Settings** – Set default Project template, map start location, and imperial or metric unit for resource manager settings

**6. Tag Manager** – Manage plan tags

**7. Release Notes** – List recent app upgrades and enhancements

**8. Configuration Editor** – [Administrators only] Manage various aspects of UI display

**9. Reports Editor** – [Administrators only] Manage reports available for download after the plan is run

**10. Data Management** – View and manage existing data sets and upload new ones

**11. Resource Editor** – View and update resource managers

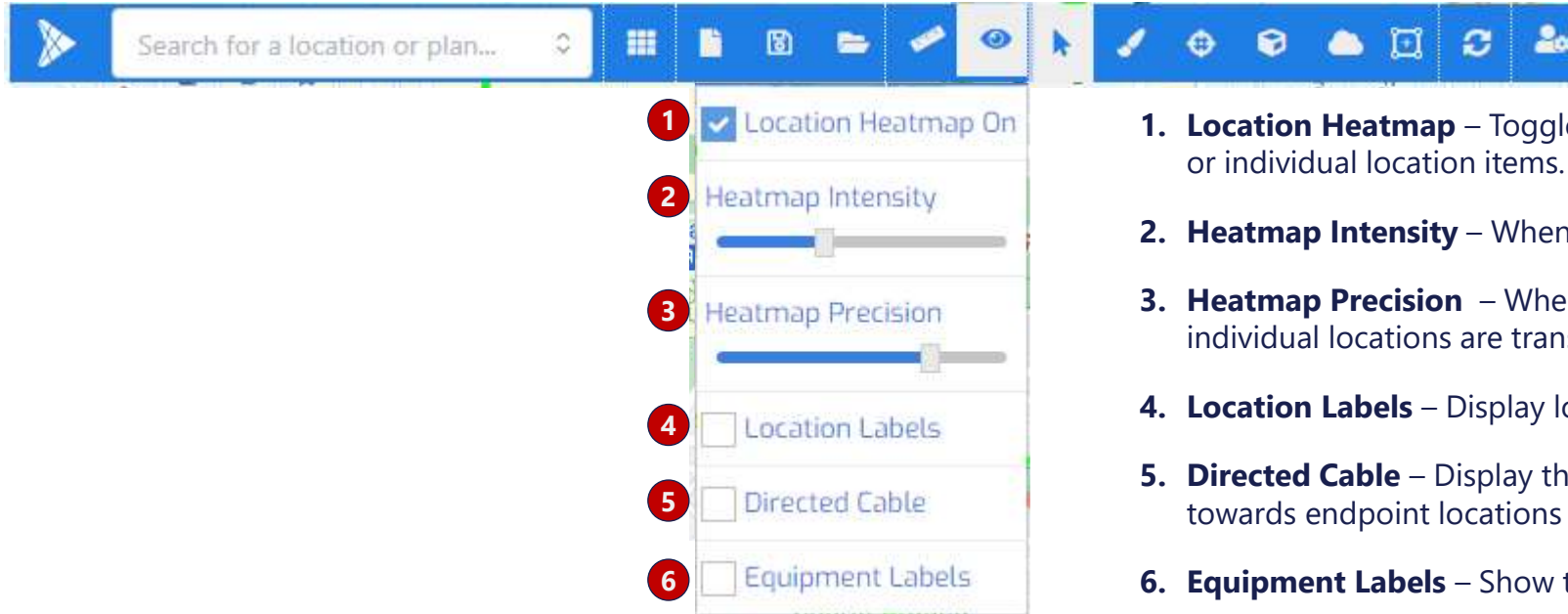
**12. Broadcast** – [Administrators only] message other Arrow users logged into the system (e.g., to announce upcoming downtime)

**13. Project Management** – Manage project templates

**14. Active Plans** – [Administrators only] track progress on long-running plans and cancel plan execution if desired

**15. UI Settings** – [Administrators only] update UI visualization settings and default selections

# View Settings control how certain data features appear on the map



1. **Location Heatmap** – Toggle between displaying location data as a heatmap or individual location items.
2. **Heatmap Intensity** – When heatmap is enabled, it controls its intensity
3. **Heatmap Precision** – When heatmap is enabled, it controls how precisely individual locations are transformed into the heatmap source
4. **Location Labels** – Display location labels on the map
5. **Directed Cable** – Display the direction of the cable, from Central Office towards endpoint locations
6. **Equipment Labels** – Show the site CLLI of each equipment on the map



Header Bar

**Visualization Modal**

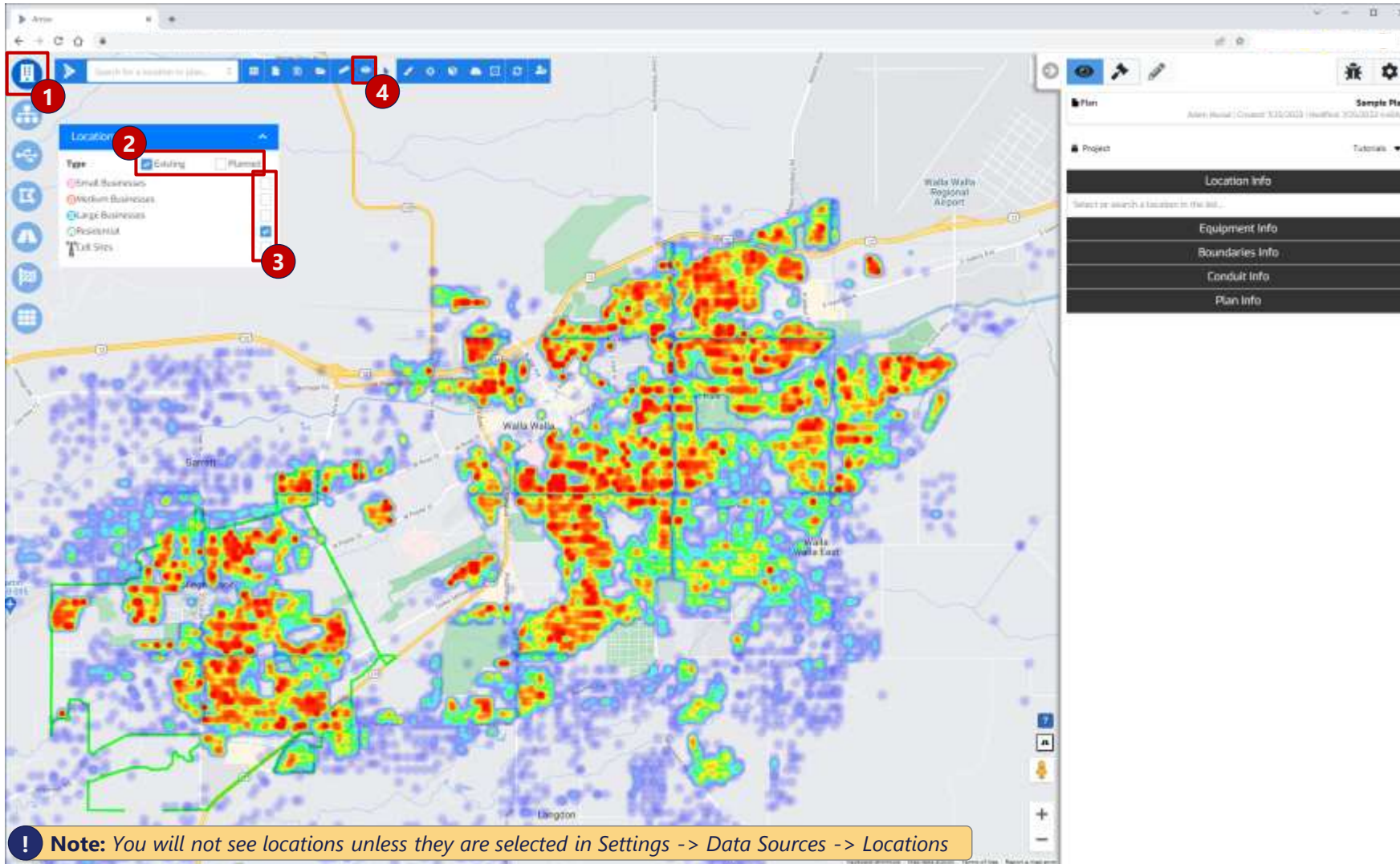
View Mode

Analysis Mode

Settings

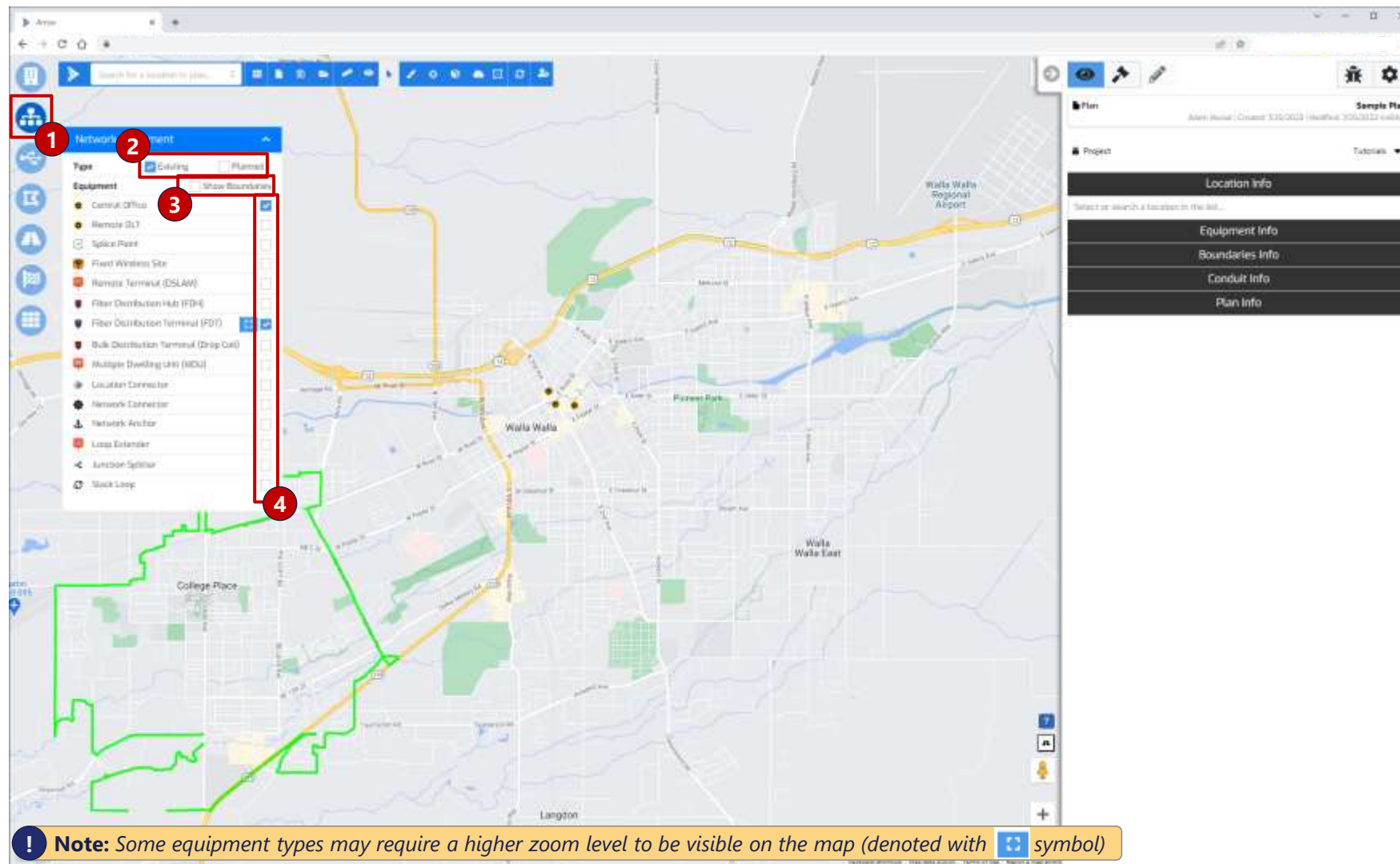


Locations modal is where a user can turn location categories on and off to visualize on the map



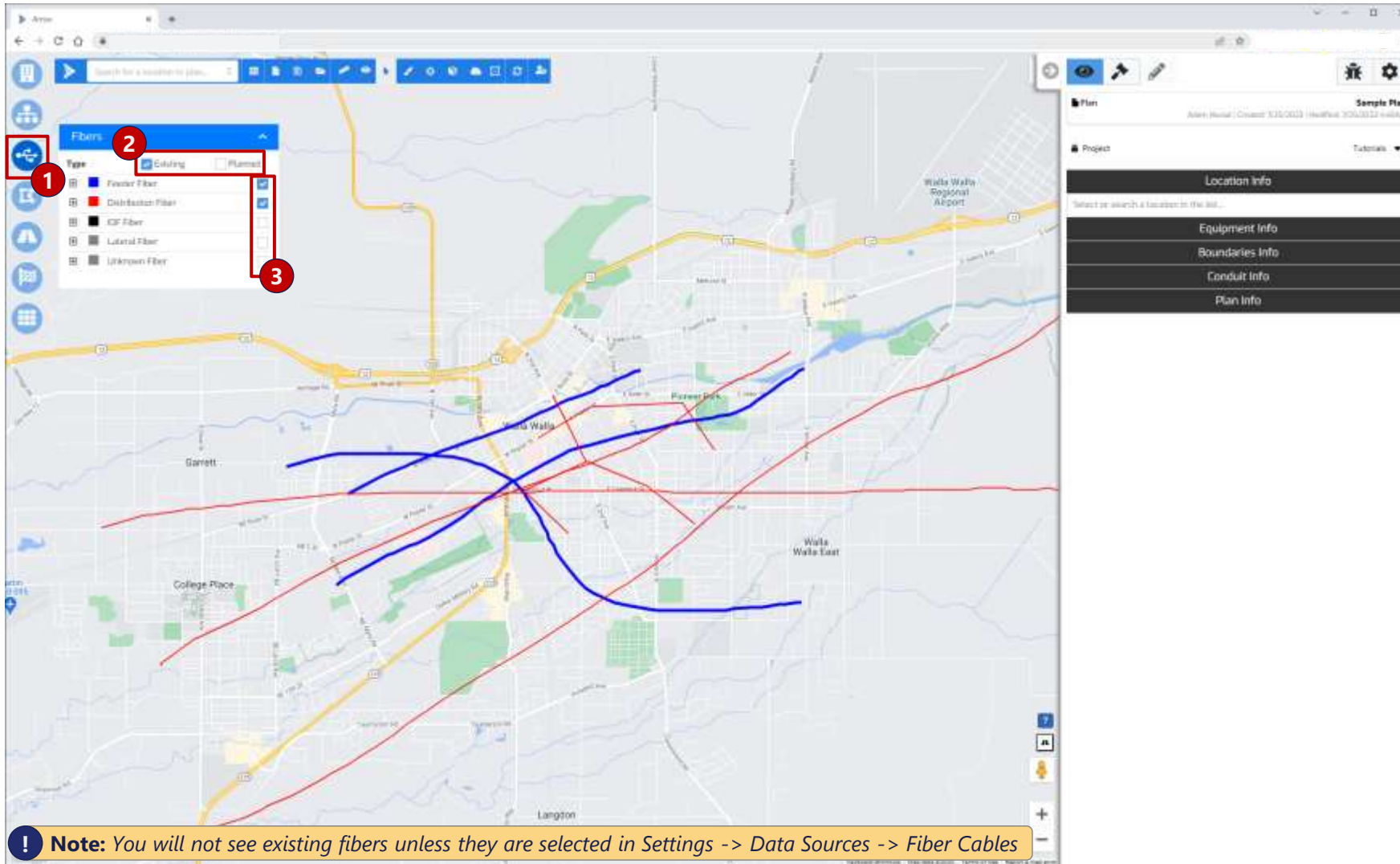


Network Equipment modal is where a user can turn on equipment layers to view on the map

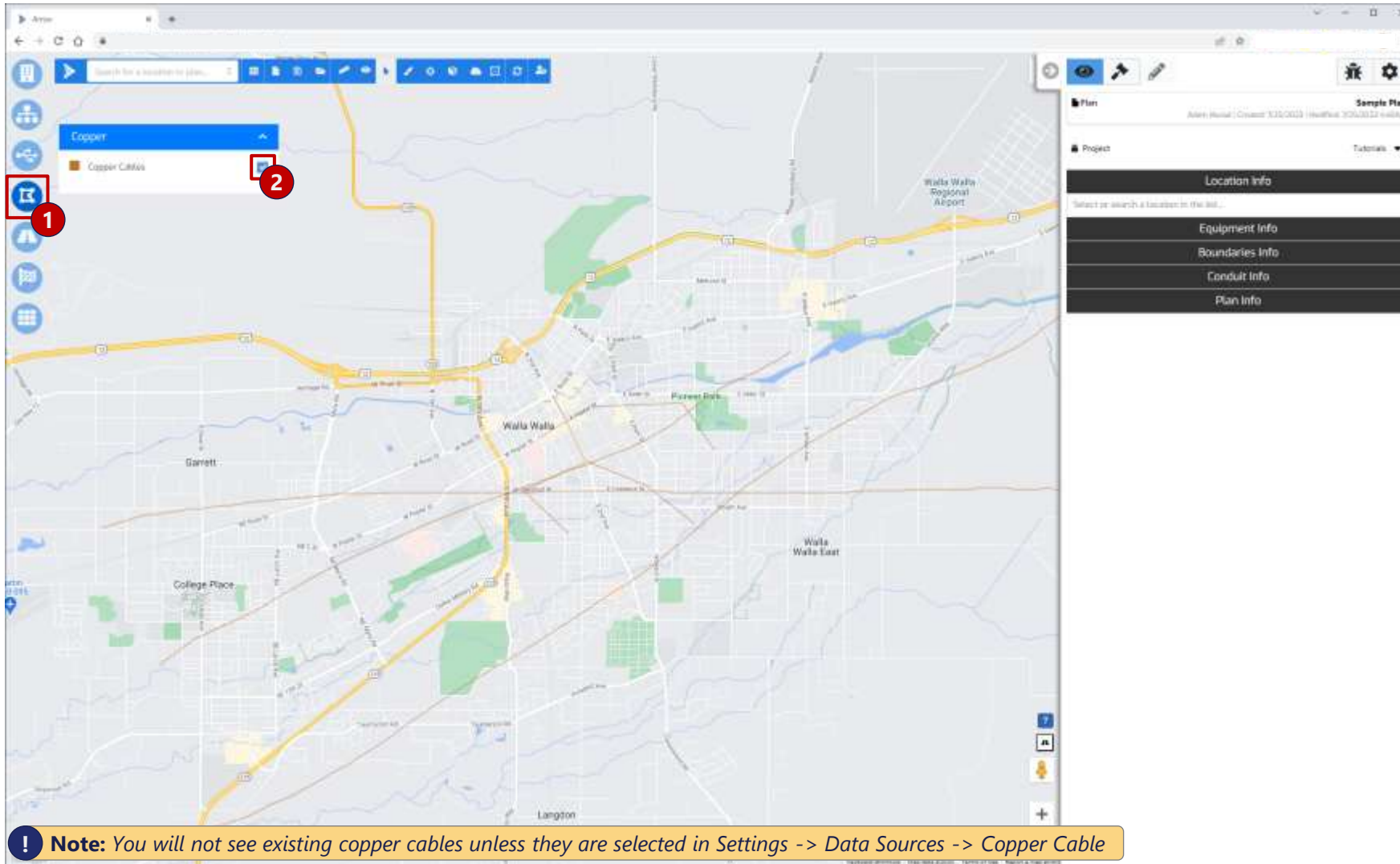


1. **Open Modal** – Select “Network Equipment” button to open the modal
2. **Existing vs. Planned** – Toggle viewing existing and/or planned network equipment
3. **Show Boundaries** – Display site boundaries on the map
4. **Equipment Selection** – Toggle specific equipment types to bring into the view

Fibers modal is where a user can turn on cable layers to view on the map



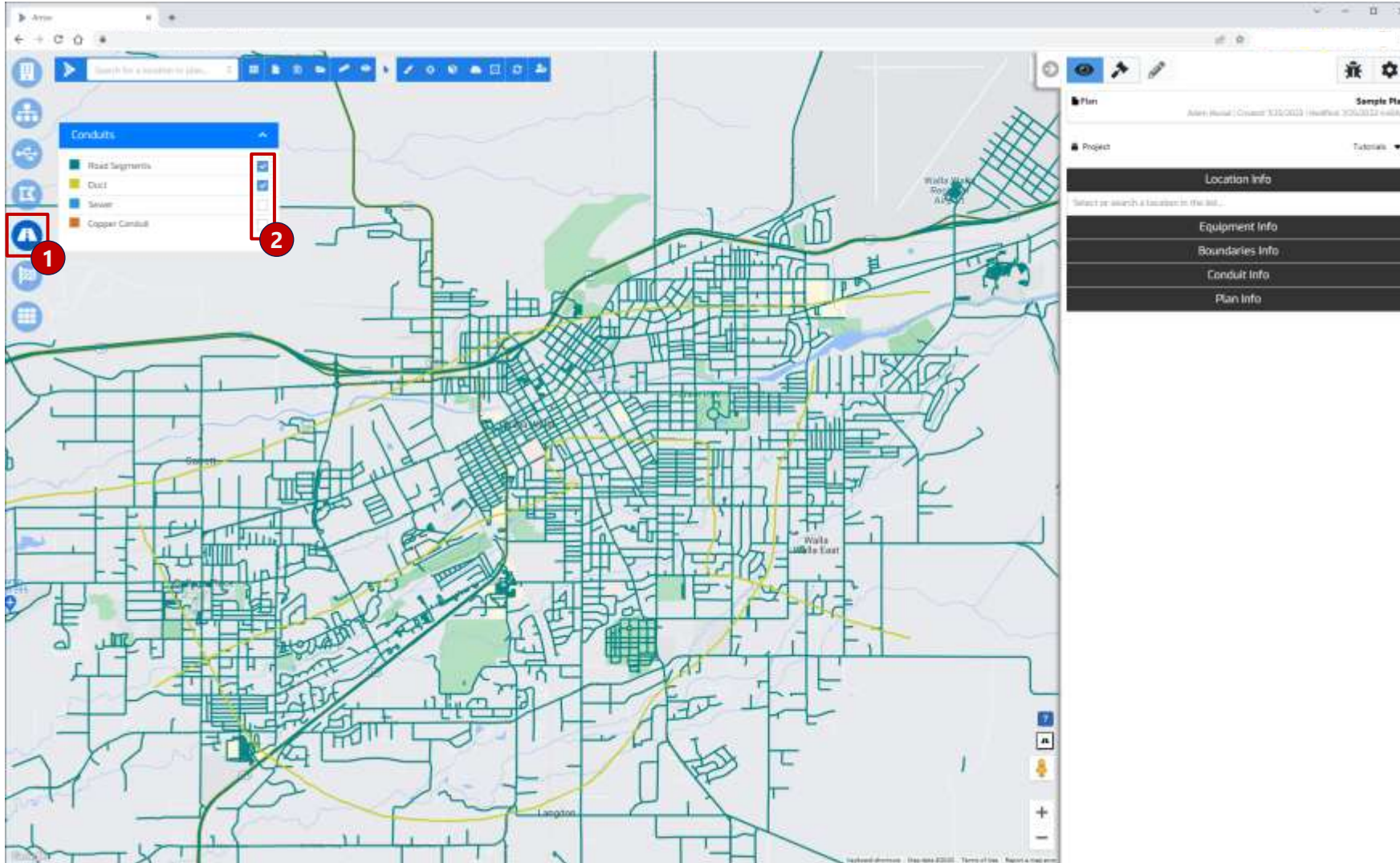
Copper modal is where a user can turn on existing copper layers to view on the map for reference



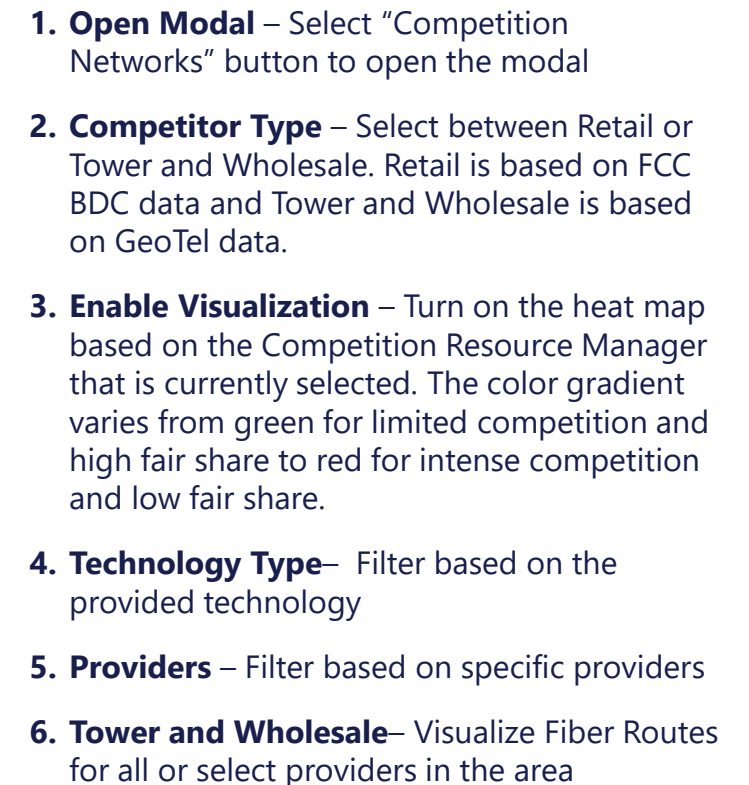
1. **Open Modal** – Select “Copper” button to open the modal
2. **Copper Selection** – Toggle cable visualization on/ off



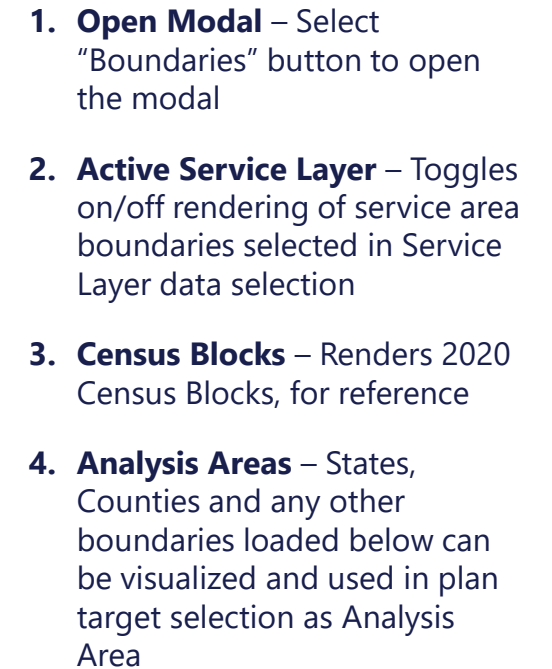
Conduits modal is where a user can visualize road segments and other conduit types, along which new network can be planned



1. **Open Modal** – Select “Conduits” button to open the modal
2. **Cable Selection** – Toggle specific conduits layers to bring into the view







**Note:** Having a boundary switched on is necessary for running plans targeting "Service" and "Analysis" Areas, but not when targeting individual locations





Header Bar

Visualization Modal

**View Mode**

Analysis Mode

Settings

# Location Info tab allows users to inspect details of individual locations

**1. Select Location** – Click on individual location on a map to bring up the Location Info tab

**2. Location Information** – Key location information displays at the top of the panel

**3. Additional Information** – Displays all additional attributes assigned to the location during the upload process (from the upload template)

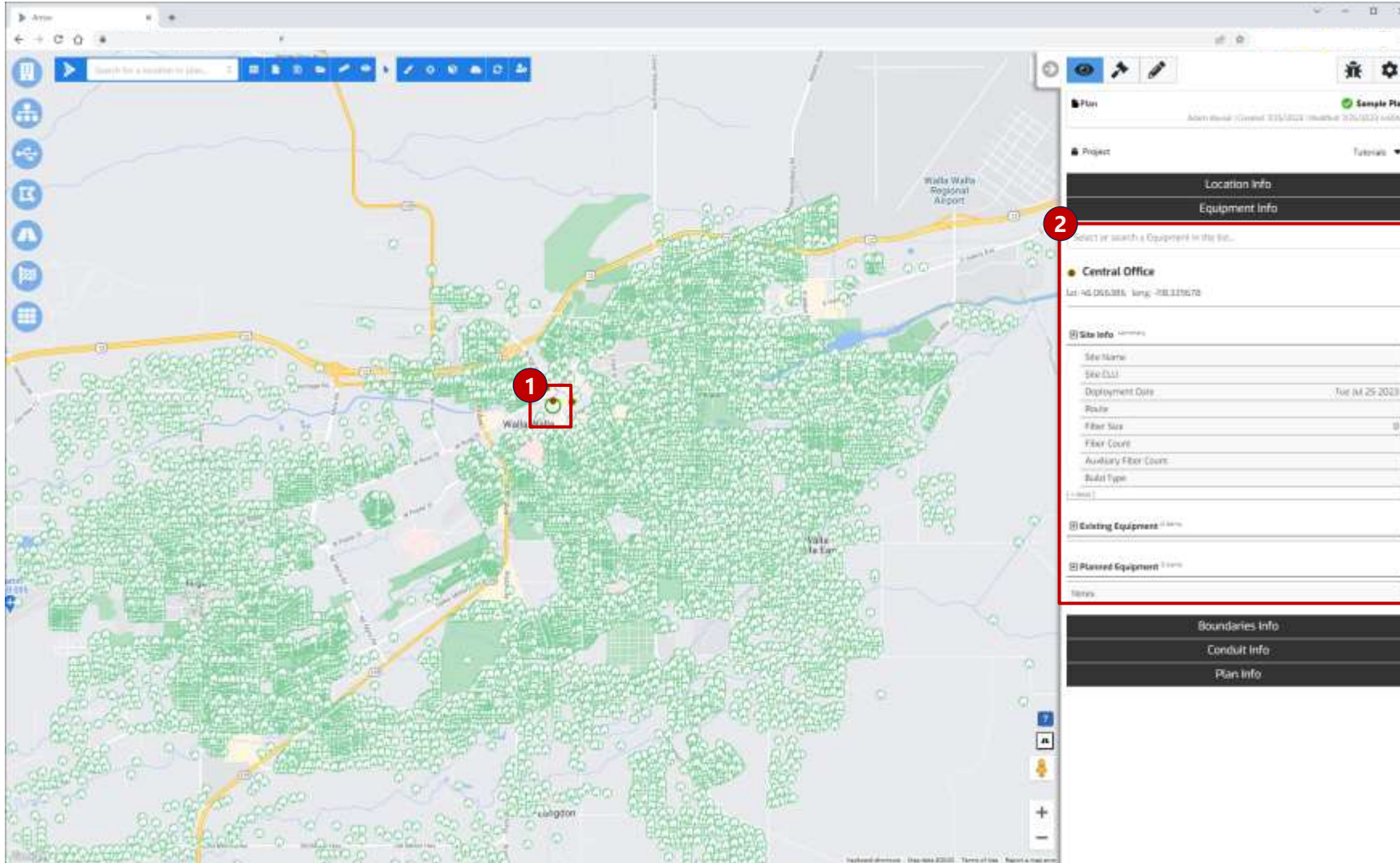
**Note:** Locations can only be selected when heatmap feature is off

Location Info	
Select or search a location in the list.	
Name	Undefined
Address	Undefined
Latitude	46.054847
Longitude	-118.368673
Census Block	530779202002196
ID	930779202002196-575075545526

Other Attributes	
Attributes	
location_category	household
number_of_employees	
industry_id	
address	
number_of_households	10
subblock_id	930779202002196
name	
source_id	202008558
site_number	
location_type	household
BAU Settings	
Plan Settings	

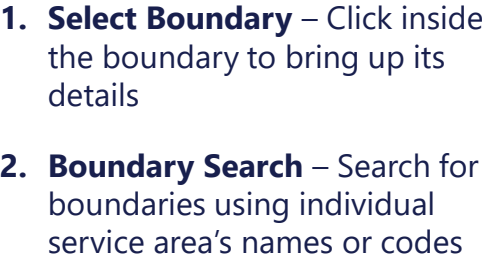
Equipment Info  
Boundaries Info  
Conduit Info  
Plan Info

# Equipment Info tab allows users to inspect the details of existing and planned network equipment



- 1. Select Equipment**– Click on individual equipment element on a map to bring up the Equipment Info tab
- 2. Location Information** – Equipment details, if set by the user (existing equipment), or placed in the plan (planned equipment), display in the panel





# Competition Info tab enables users to understand the providers present in a specific boundary

The screenshot shows the 'Competition Info' tab in a software application. On the left, a map displays a red boundary (1). A sidebar on the left contains filters for 'Technology Type' (Fiber, Cable, Copper, Fixed Wireless, Satellite) and a list of 'Providers' (Lumen Technologies, Inc., Comcast Corporation, Verizon Communications Inc., T-Mobile USA, Inc., Mitchell Inc., Radco Holdings, LP). The main panel on the right shows details for the selected boundary. It includes a 'Fair Share' calculation (2) showing 46%, a list of competitors (3) with radio buttons for selection, and a table of competitive technology performance (4) for Lumen Technologies, Inc.

Technology	Coverage Percentage	Upload Speed	Download Speed
Copper	88.4%	10 Mbps	100 Mbps

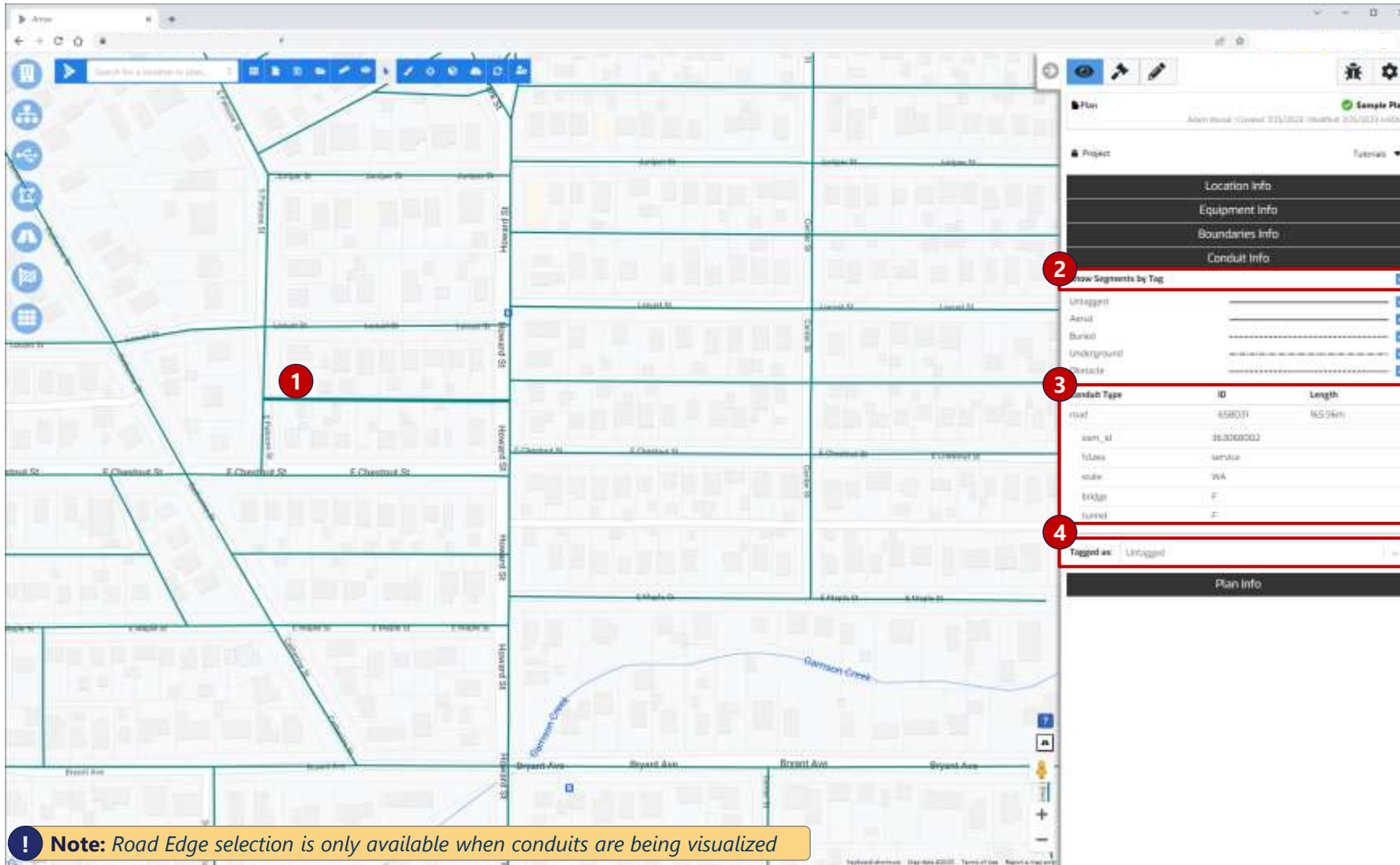
  

Technology	Maximum Download Speed (Mbps)				
	<= 25	<= 50	<= 100	<= 200	<= 10000
Cable	0.0	0.0	0.0	0.76	0.76
Fiber	0	0	0	0	0
Copper	0.05	0.05	0.05	0.05	0.05
Satellite	0	0	0	0	0
Fixed Wireless	0	0	0.34	0.35	0.35

**Note:** Boundary selection only works when in View Mode

- 1. Select Boundary** – With Retail competition enabled, click inside the boundary to bring up its details
- 2. Fair Share** – This calculation is based on the provider's present in the selected boundary and settings in the currently selected Competition Resource Manager (see Penetration Rate Calculation in the appendix for additional detail)
- 3. Competitive Technology** – You can change the order of which technologies to display
- 4. Competitor Detail** – Click on an individual provider to see additional detail

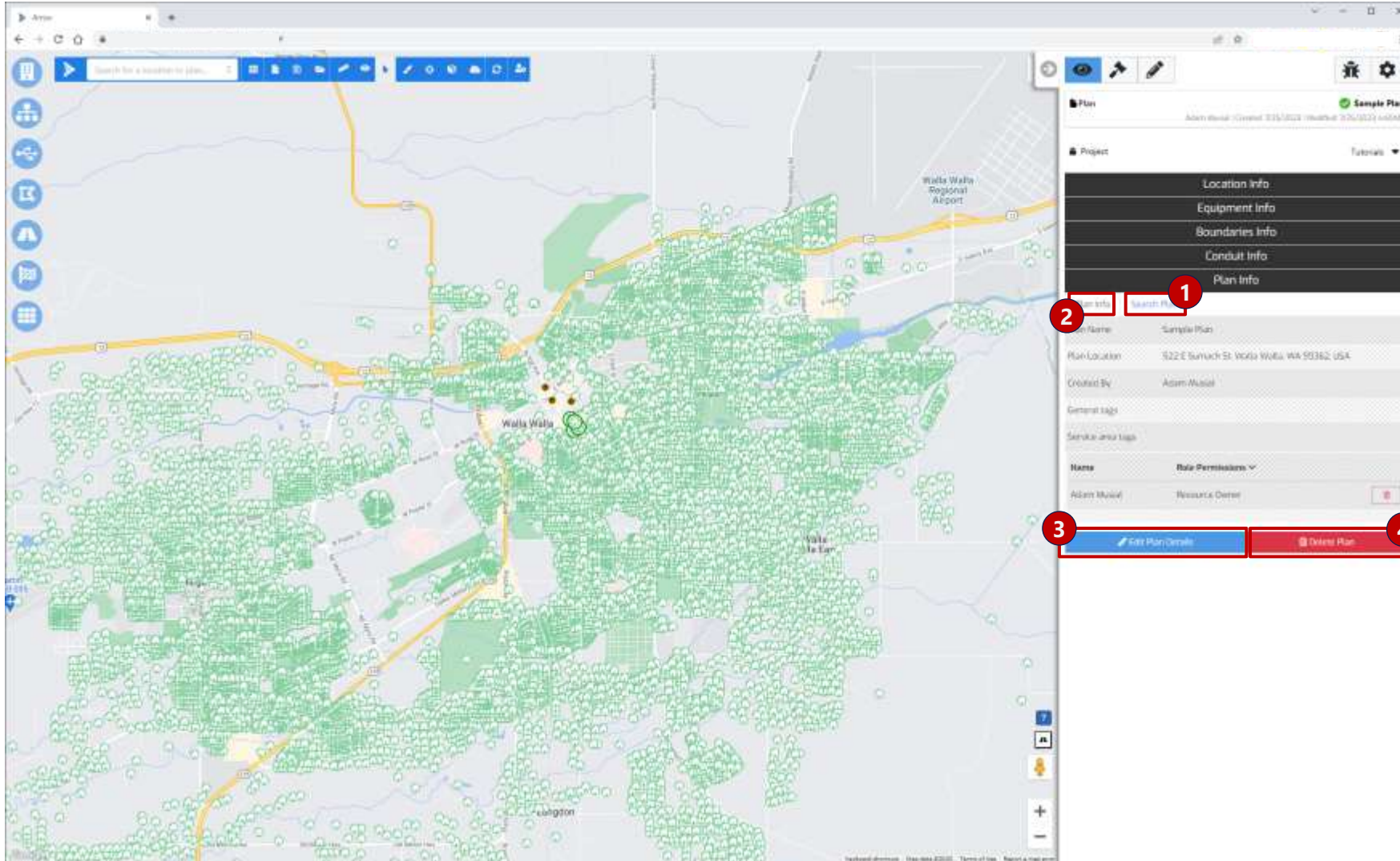
# Conduit Info panel displays information about the conduits and enables users to change placement type of individual road segments



1. **Select Conduit** – Select individual segment by clicking it on a map
2. **Show Segments by Tag** – Displays placement tags of road segments, if available
3. **Conduit Info** – Displays available segment attributes
4. **Tagged As** – Users with modify permissions and above can change placement tag of the selected segment(s). Use the Shift key to select multiple segments



# Plan Info tab allows users to search, open, delete, rename and update permissions to existing plans



1. **Search Plans** – Opens up plan search utility
2. **Plan Info** – Brings up info panel with key information about the plan
3. **Edit Plan Details** – Unlocks the greyed-out area above, and allows the user to rename the plan, update start location, tags and user permissions
4. **Delete Plan** – Deletes current plan



Header Bar

Visualization Modal

View Mode

**Analysis Mode**

Settings

*Define all the aspects of optimization plan*

### Summary results and access to detailed reports

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Header Bar
Visualization Modal
View Mode
Analysis Mode
<b>Settings</b>

# Setting menu is used to select Data and Resource Managers used in a plan

## Data Selection

*Specifies data layers to use in a plan*

The screenshot shows the 'Data Selection' menu within a software interface. At the top, there are icons for view, edit, and settings. Below these, the 'Plan' section shows 'Sample Plan' and 'Adam Murali | Created: 7/25/2023 | Modified: 7/25/2023 4:40AM'. The 'Project' section has a 'Tutorials' dropdown. Below this are 'Commit', 'Discard', and 'Undo' buttons. The 'Data Selection' section contains several rows with dropdown menus and a person icon for each: 'Locations' (Businesses (2023), Households (2023)), 'Service Layer' (Wirecenters (Bestel 2023)), 'Equipment' (Central Offices (Bestel 2023)), 'Fiber Cables' (None Selected), 'Copper Cable' (None Selected), 'Conduits' (Road Segments (20M)), 'Conic tile system' (None Selected), and 'Construction locations' (None Selected). At the bottom, there is a 'Resource Selection' section.

## Resource Selection

*Defines modeling assumptions to use*

The screenshot shows the 'Resource Selection' menu within a software interface. At the top, there are icons for view, edit, and settings. Below these, the 'Plan' section shows 'Sample Plan' and 'Adam Murali | Created: 7/25/2023 | Modified: 7/25/2023 4:40AM'. The 'Project' section has a 'Tutorials' dropdown. Below this are 'Commit', 'Discard', and 'Undo' buttons. The 'Resource Selection' section contains several rows with dropdown menus and a person icon for each: 'Price Book' (Default Price Book), 'Telecom Spend Matrix' (Default Telecom Spend Matrix), 'Competition' (Default Competition), 'ROIC Manager' (Default ROIC Manager), 'ARPU Manager' (Default ARPU Manager), 'Impedance Manager' (Default Impedance Manager), 'Rate Reach Manager' (Default Rate Reach Manager), 'Network Architecture Manager' (Default Network Architecture Manager), 'Fusion Manager' (Default Fusion Manager), and 'Planning Constraints Manager' (Default Planning Constraints Manager).

**Note:** Detailed documentation of Data Layers and Resource Managers can be found in Data Preparation guide and Resource Managers guide, respectively.