**Point to Referent widget (PointToReferent)**

**design/usage notes**

(last revised: 6/24/2024)

**DISCLAIMER:**

This widget is R&D work done by the EsriPS Transportation Department.

The widget is meant to illustrate simple examples of approaches we have used to understand development next steps as well as utilization of Esri and non-Esri technologies.

The samples are published to give back, stimulate thinking/innovation, show approaches in order to aid in the understanding of our technologies in the transportation space.

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A copy of the license is available in the repository's [license.txt](https://raw.github.com/Esri/quickstart-map-js/master/license.txt) file.

**Widget Overview:**

This PointToReferent widget uses the Location Referencing REST API: geometryToMeasure and geometeryToReferent rest end points to gather referent details as shown below:

A screenshot of a map

Description automatically generated

**Data requirements**

A referent offset location method is a technique used in linear referencing systems to specify locations along a transportation network, such as roads or railways. This method defines a location based on a known reference point (or referent) and a measured distance (offset) from that point. The reference point could be a milepost, intersection, or any other identifiable intersecting feature along the route. The offset distance indicates how far from the reference point the desired location is, typically measured in linear units such as kilometers, feet, meters or miles.

For example, if a reference point is a milepost and the posted mileage on the sign states "26" and the offset distance is 0.2 miles, the referent offset location would be at mile 26+0.2 miles. This method allows for precise location descriptions without relying solely on geographic coordinates, making it particularly useful for field workers managing and referencing assets, events, and other data along linear infrastructure.

Taking the reference offset linear referencing method concept further, this Experience Builder developer sample tool builds on Esri's ArcGIS Location Referencing solution geometryToReferent REST API operation. The tool allows a user to provide one or more coordinates (and coming soon... route and measure locations) along a route and have those locations converted into a referent and offset value. Users can configure the search criteria for the referents relative to the route calibration direction, the offset distance units of measure, the distance separator to the referent, distance precision, and other spatial coordinate settings.

**Dev environment used to create the widget:**

* Experience Builder Dev Edition 1.13

**Example widget settings:**

|  |  |
| --- | --- |
| **Setting** | **Example input** |
| Select Map Widget | Map |
| g2m Url | https://esri-rhpro-lrs.esri.com/server/rest/services/TDOT/Edit\_LRS\_Network/MapServer/exts/LRServer/networkLayers/111/geometryToMeasure |
| g2rUrl | https://esri-rhpro-lrs.esri.com/server/rest/services/TDOT/Edit\_LRS\_Network/MapServer/exts/LRServer/networkLayers/111/geometryToReferent |
| g2rLayoutId | 113 |
| featureId Field Name | MILEPOST\_MI |
| Offset Unit Rounding | 3 |
| Tolerance | The maximum distance in map units to snap a point to the closest location on a nearby route. If a point is farther than the tolerance from a route, a message is returned stating that the point can't be located. |
| Out SR | 4326 (or another example would be: 102100) |
| outOffsetUint | esriInches | esriFeet | esriYards | **esriMiles (default)** | esriNauticalMiles | esriMillimeters | esriCentimeters | esriMeters | esriKilometers | esriDecimalDegrees | esriDecimeters | esriIntInches | esriIntFeet | esriIntYards | esriIntMiles | esriIntNauticalMiles |
| userGuidance | Awaiting map selection |
| padFeatureId | True or False (026 vs 26) |
| defaultOffset | nearestUpstream or closest |
| posReferentSeperator | + |
| negReferentSeperator | - |

**Typical Test Harness:**

A map with red dots and green lines

Description automatically generated

**IMPORTANT:**

The test harness shown above was created by using the 1.13 dev edition experience builder UI.

In practice you can register this widget with your enterprise, and then use it within Portal based experiences you create.

To register the widget with your portal see this link: <https://www.esri.com/arcgis-blog/products/arcgis-enterprise/developers/add-experience-builder-custom-widgets-in-arcgis-enterprise/>

**Typical web map content:**

A screenshot of a computer

Description automatically generated

**Appendix A: Change the widget icon**

The default widget icon is located here: your-extensions\widgets\PointToReferent\icon.svg

To change:

1. Create the new icon (svg preferred, adobe illustrator can be used)
2. Rename the default icon to icon\_original.svg
3. Rename the new icon to be icon.svg

To test, first clear your browser cache.