ArcGIS Pro: Creating High Quality Map Labels

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SEE WHAT OTHERS CAN'T

Presentation Overview

- Introduction
- Point labeling
- Polygon labeling
- Line labeling
- Demo – Placement styles
- Street labeling
- Demo – Managing label density and conflict resolution
- Fitting strategies
- Demo – Fitting strategies
- Summary and Questions

The Maplex Label Engine

The high quality labeling engine in ArcGIS Pro

- **How does this relate to ArcMap?**
  - **It’s the same version of Maplex**
  - **Same labeling capability**
  - **Only the user interface is different**

Maplex is the default label engine in ArcGIS Pro

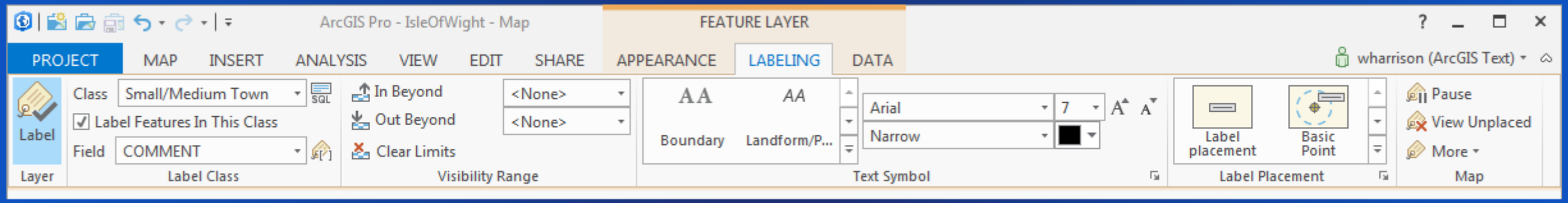
Types of Text

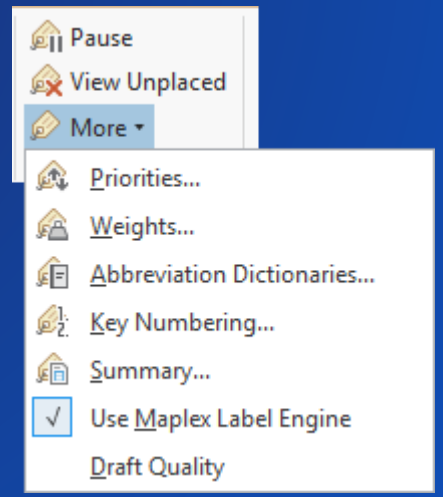
- **What are Labels?**
  - Dynamically placed text by a label engine
  - Change of content or map refresh generates new locations

- **What is Annotation?**
  - Stored text – two types – standard and feature-linked
  - Editable

Labeling Ribbon

Access to the frequently used label class properties

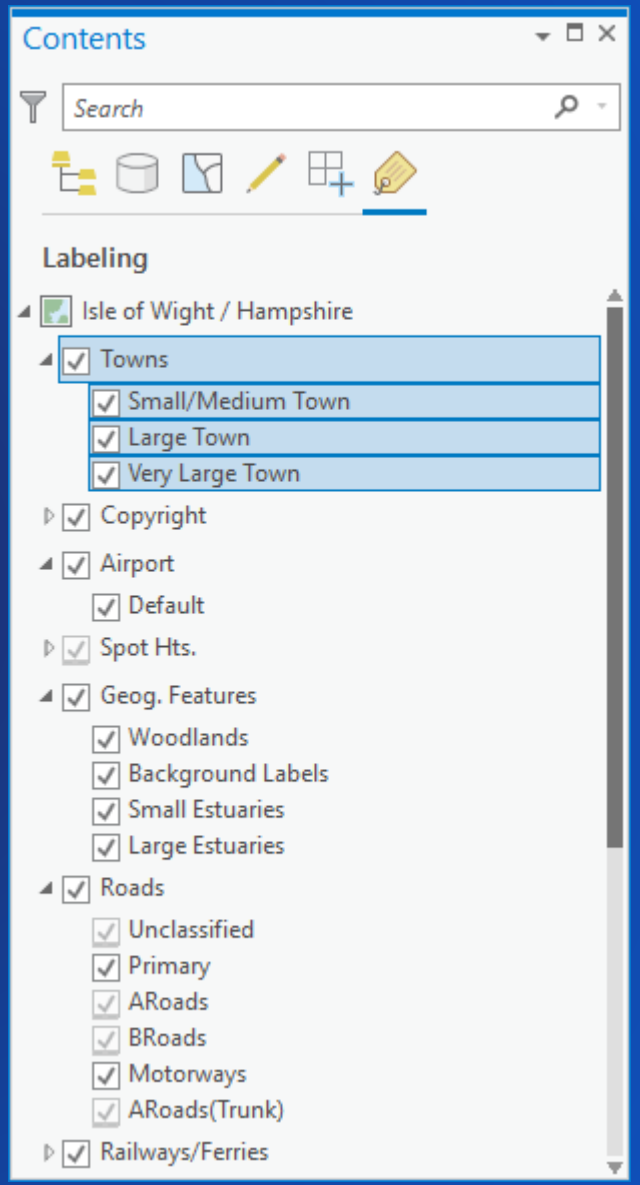




Labeling View of the Contents pane

Best place to select and manage your labels classes

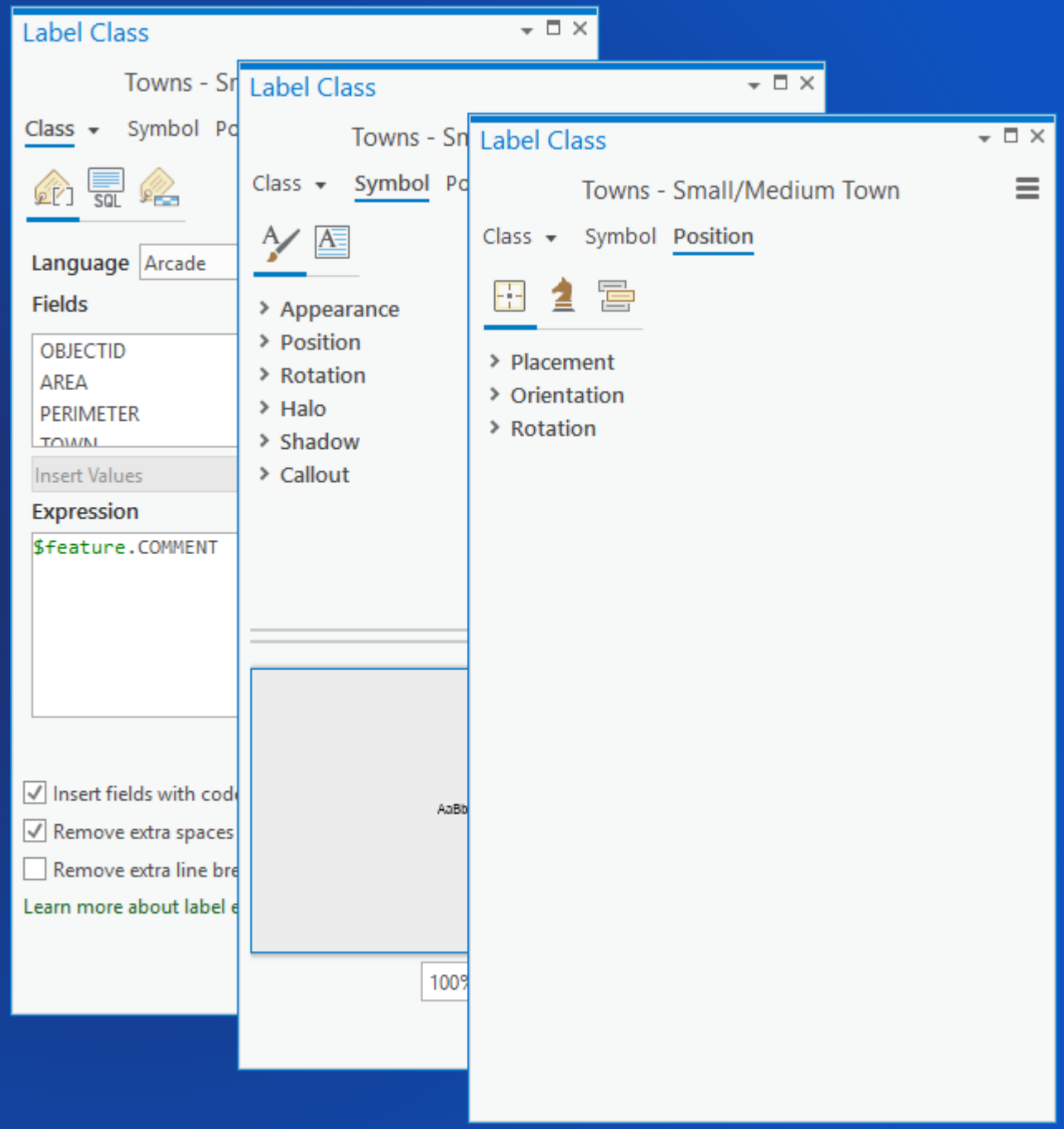
- View label classes
- Add, remove or rename a label class
- Copy and paste
- Reorder
- Multi-select workflow



Label Class Pane

Detailed properties

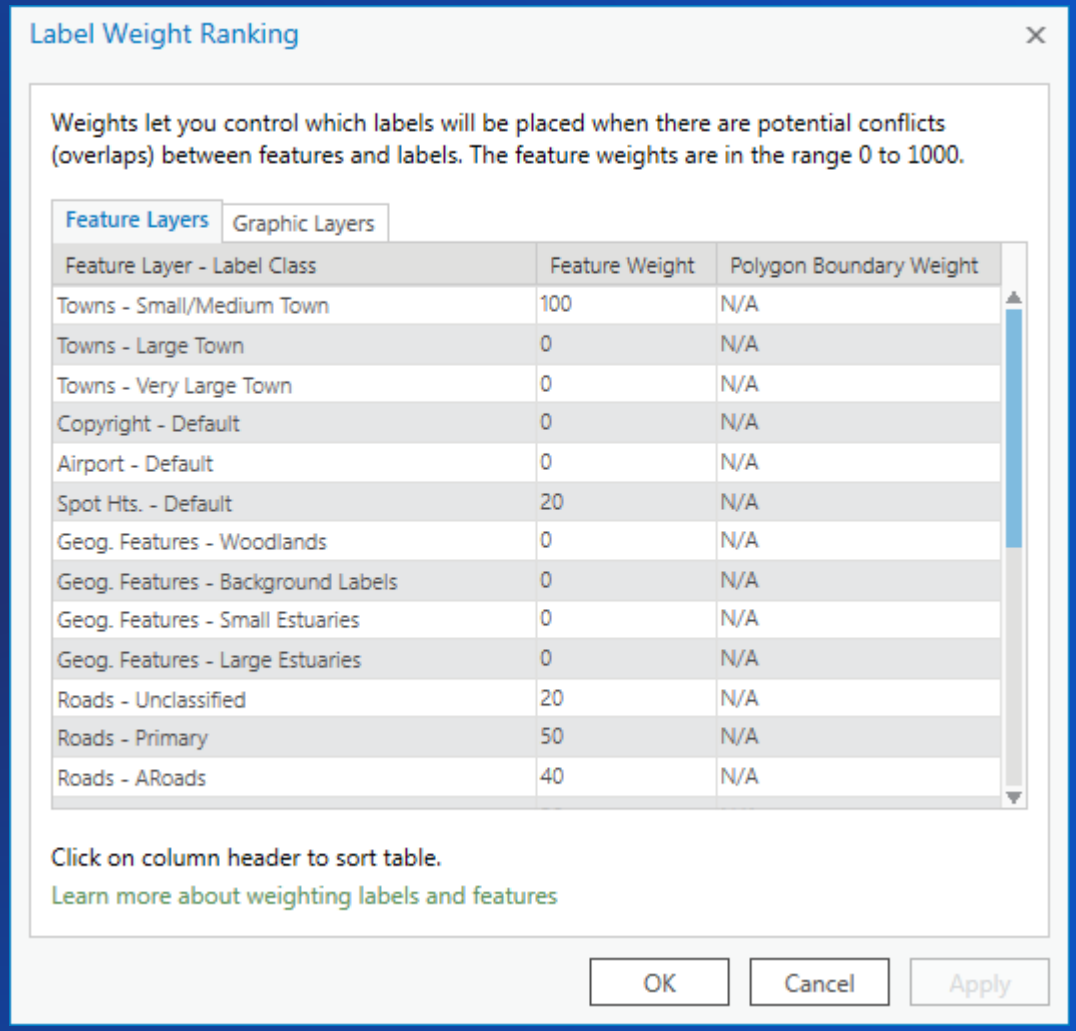
- **Label expression**
  - -specifies how to extract the label text from the feature attribution
- **SQL query**
  - -defines the set of features to label
- **Scale range**
  - -Visibility range of labels
- **Text symbol**
  - -properties that control how the text is displayed
- **Placement properties**
  - -Properties for positioning the label relative to the feature



Feature Weights

Control the label-to-feature overlap on the map

- Maplex weighting is based on values from 0 – 1000
  - zero weight allows full overlap
  - Range 1 to 999 is the main ranking
    - *Tip: use the whole range to get the best results*
  - 1000 is a special value – it represents a set of barrier features
- Polygons also have a boundary weight



Feature Weights *(continued)*

A couple of best practice guidelines…

- **Take note when weighting the interior of a large polygon**
  - Labels will try to avoid the weighted interior
  - Large background polygons may not need an interior weight
  - Maybe only the boundary needed a weight?

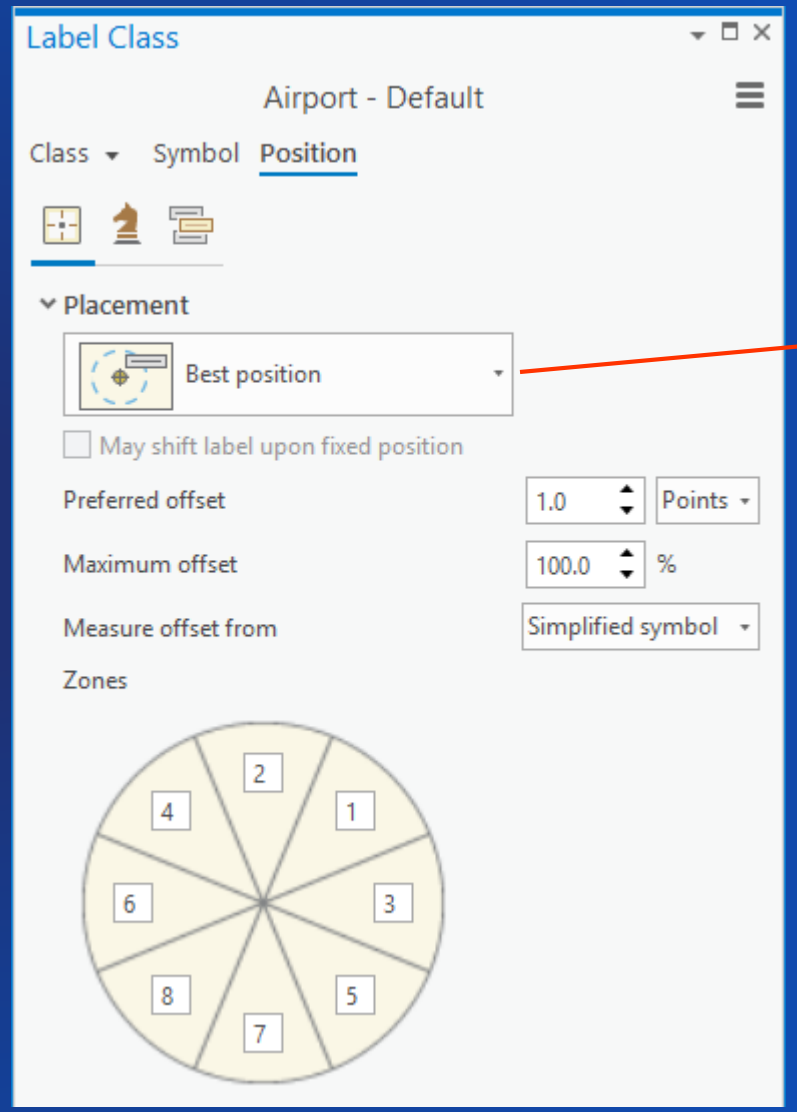
- **If a label class is ‘checked off’ and it has a feature weight, it is still active**
  - No labels produced, but the features are still added to the label engine
  - It represents a set of barrier features
  - Labels will try to avoid the barrier features

- **Label Summary dialog is useful**

Point Labeling

Point Labeling

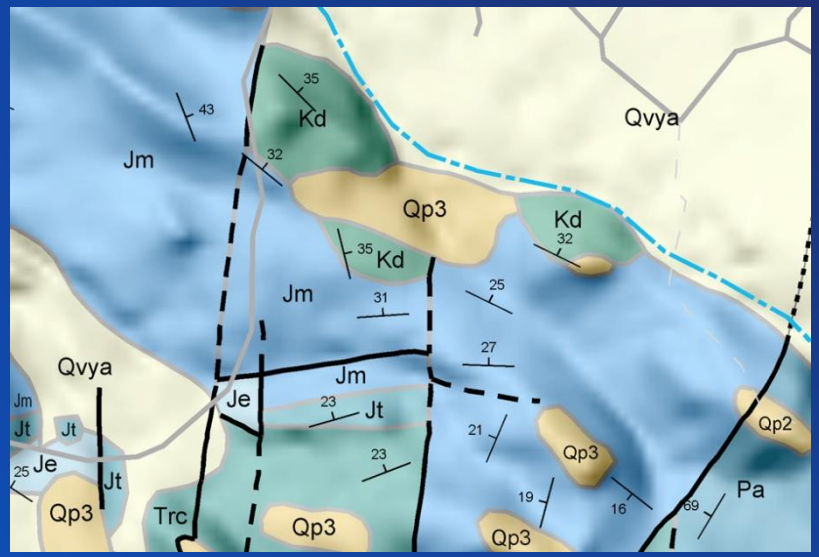
- **Default positioning is best position**
  - Control over which zone is preferred
  - Cartographic preference often top right
  - Zone grid (1- 8 preference, 0 to block)
- **Fixed positions**
  - Centered on the point
  - Cardinal positions around the point

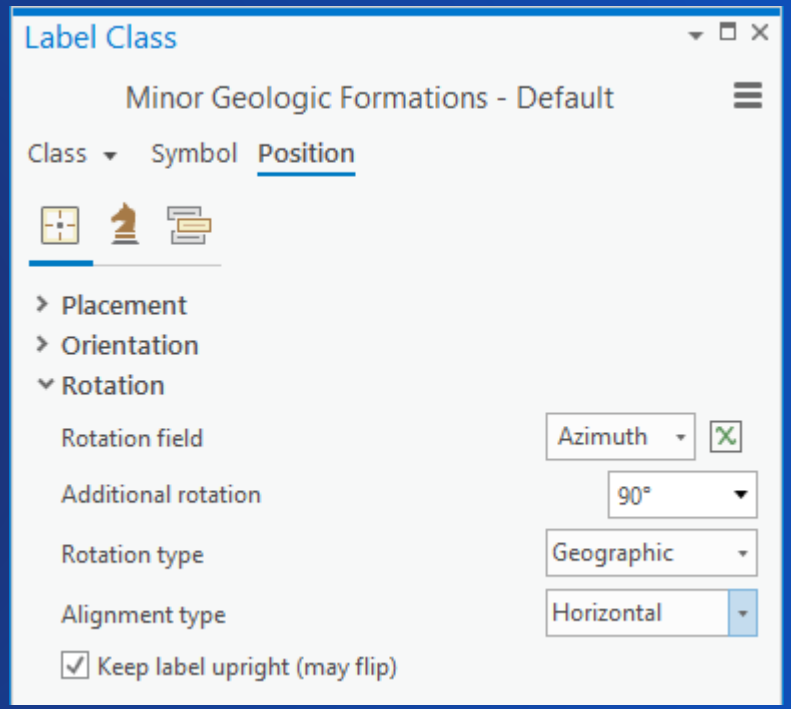


Point Label Rotation

Angle the label using an attribute in the data

- **Select the field or use an expression to set the angle**
- **Select the alignment**
  - **Horizontal, Straight or Perpendicular**

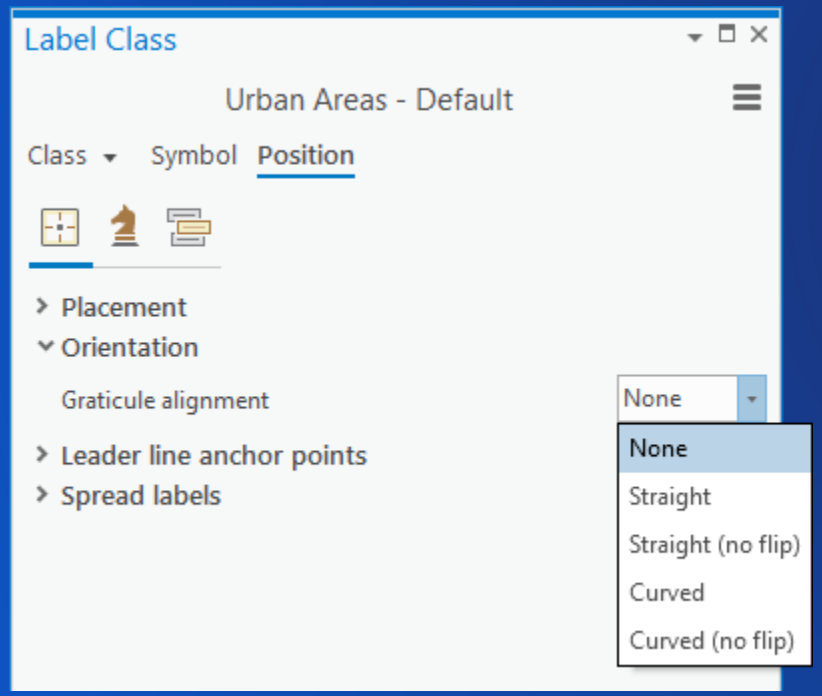


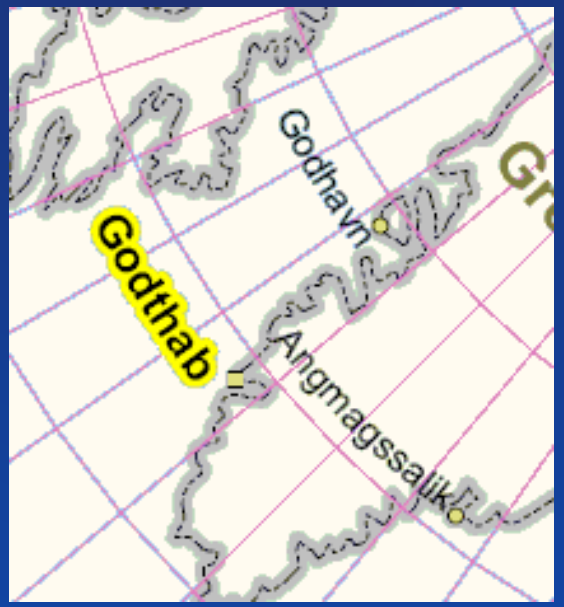


Label Orientation

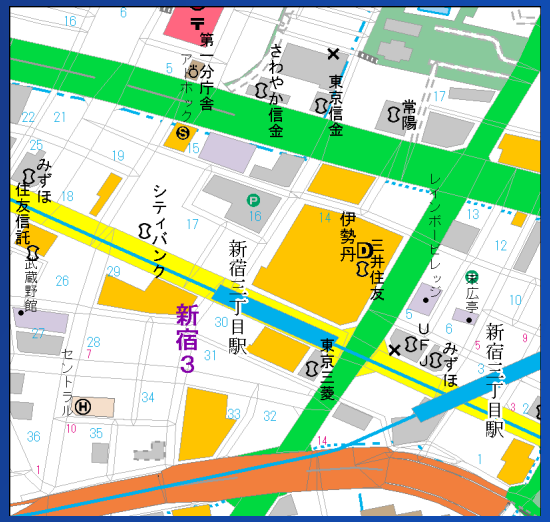
Applies to any label with a horizontal style

- **Graticule alignment**





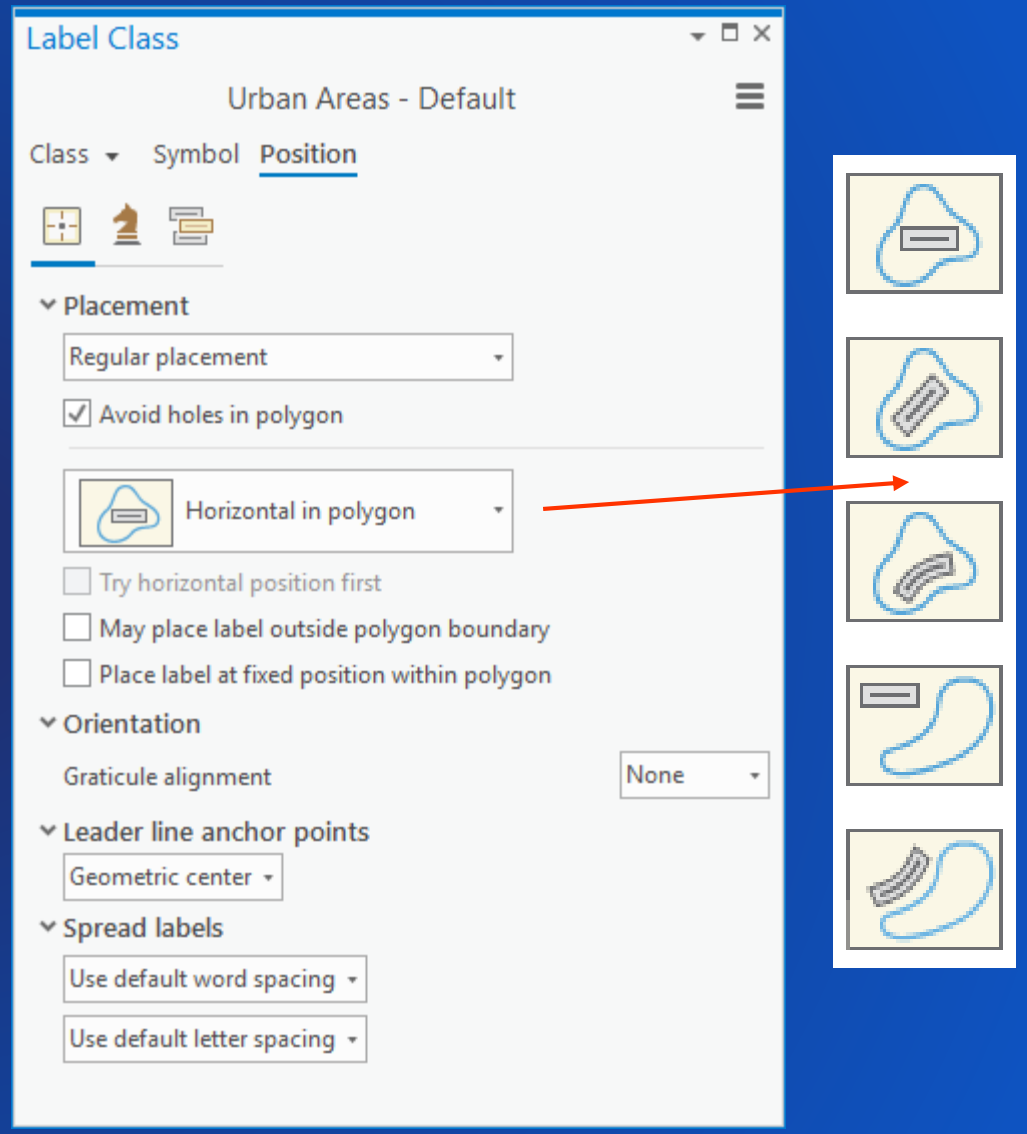
- **Vertical text placement**
  - **East Asian langauages**
  - **Font must have vertical text metrics**



Polygon Labeling

Polygon Labeling

- Placement methods
  - Centered or offset
  - Various orientations (horz, straight, curved)
  - Straight and curved good for spatial extent
- Feature Types
  - Regular placement
  - Land parcel placement
    - *only useful if you have building footprints
  - River placement
  - Boundary placement



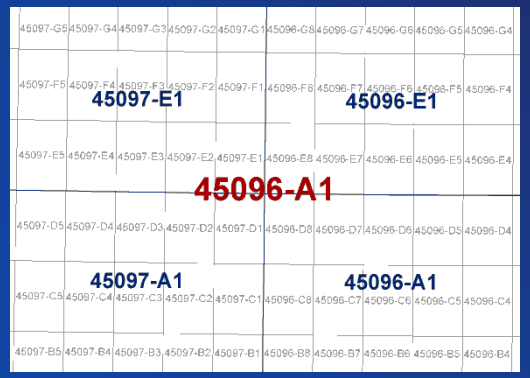
Polygon Boundary Labeling

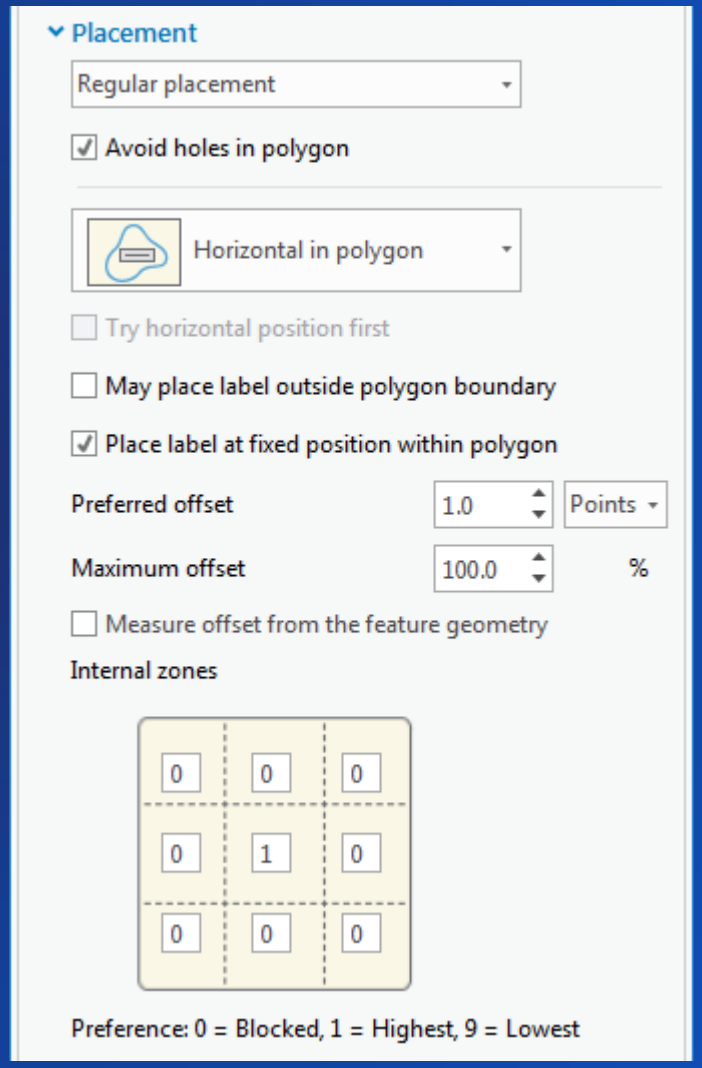
Adjacent polygons are labeled at their boundary

- Internally generates boundary line
- Option to repeat labels at a interval
- Single sided boundaries and holes are optionally labeled

Fixed Position Within a Polygon

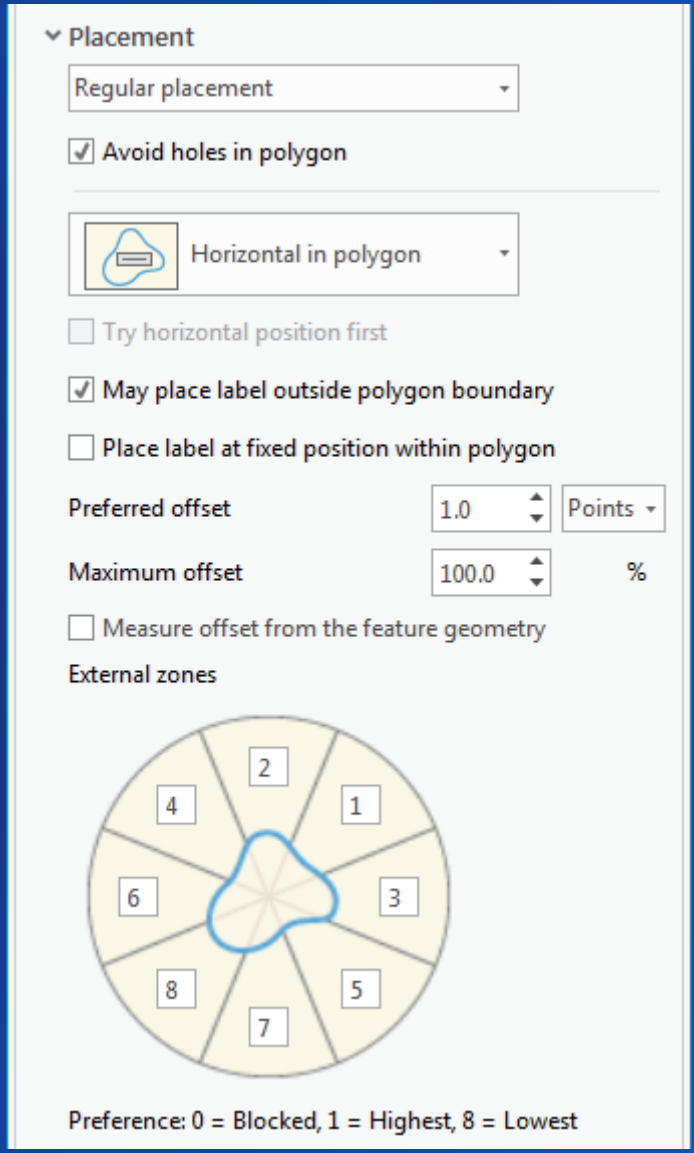
- Place label at fixed position within polygon
  - Specify internal zones
  - Refers to the unclipped polygon
- Best with rectangular features





Fixed Position Outside of the Polygon

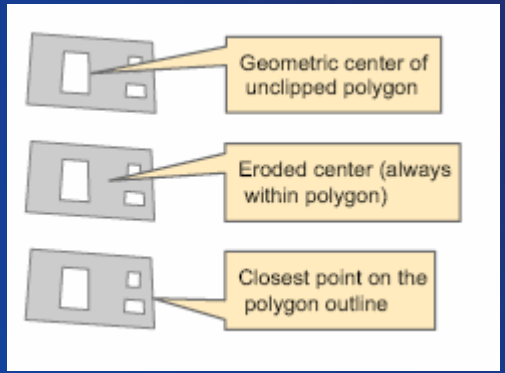
- Similar to placing a label around a point
  - Specify external zones
- May place label outside of the polygon
  - Mixed size features such as lakes
- Often used with a leader line style

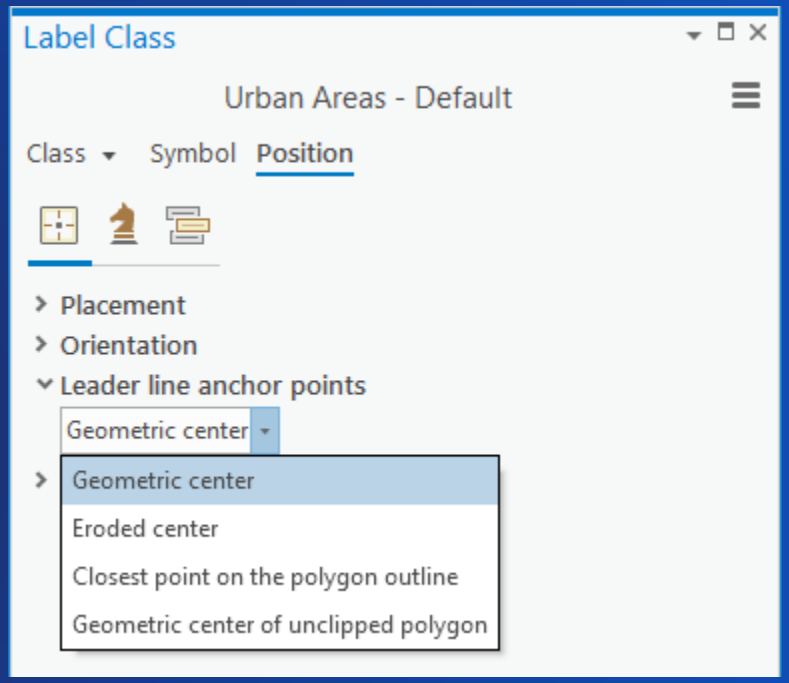


Polygon Leader Anchor Points

Controls the position of the anchor point on the feature

- Closest point to polygon outline
- Anchor point within the polygon
  - Depends on complexity of polygon (holes)
  - Clipped or unclipped polygon



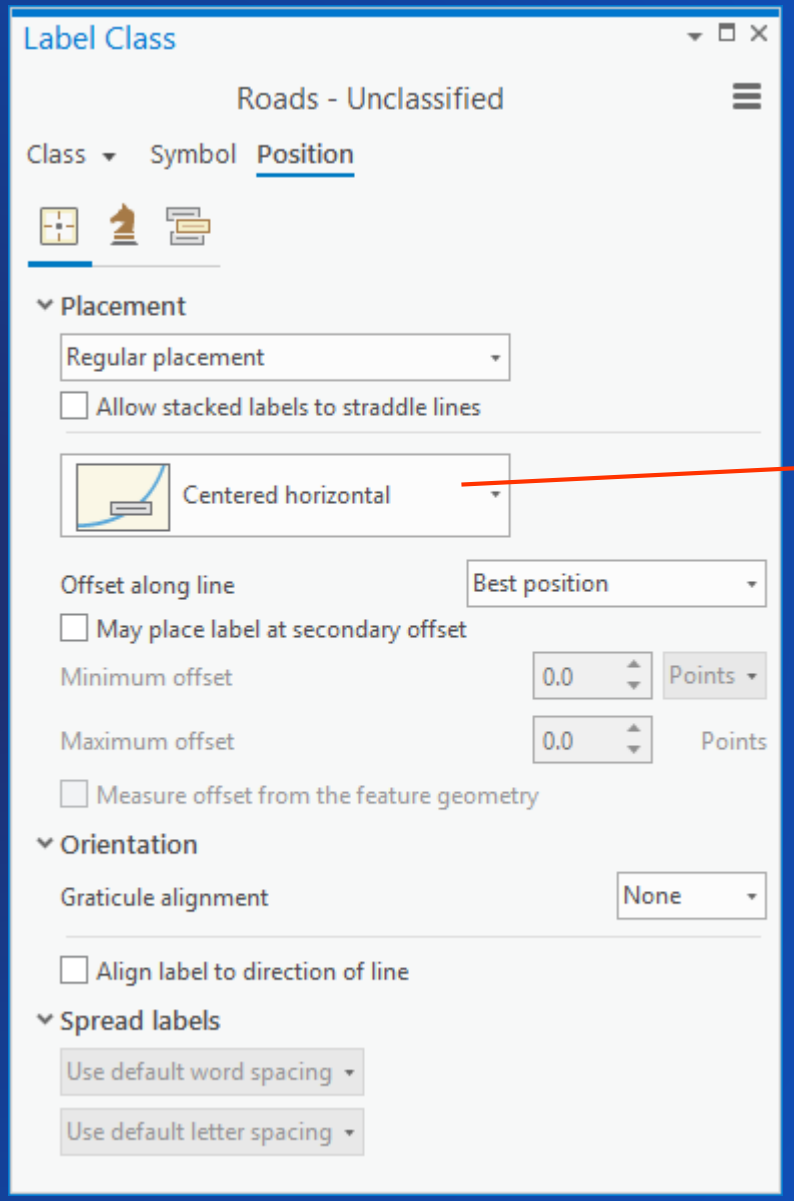


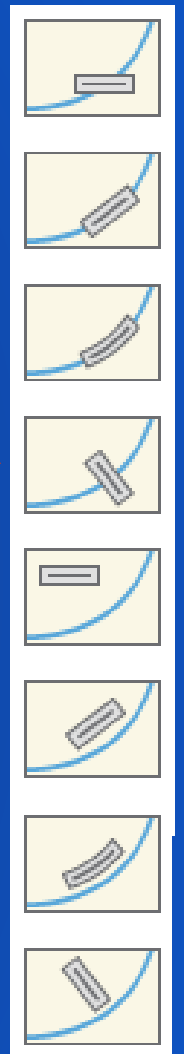
Line Labeling

Line Label Position

Options for placing a label on a line feature.

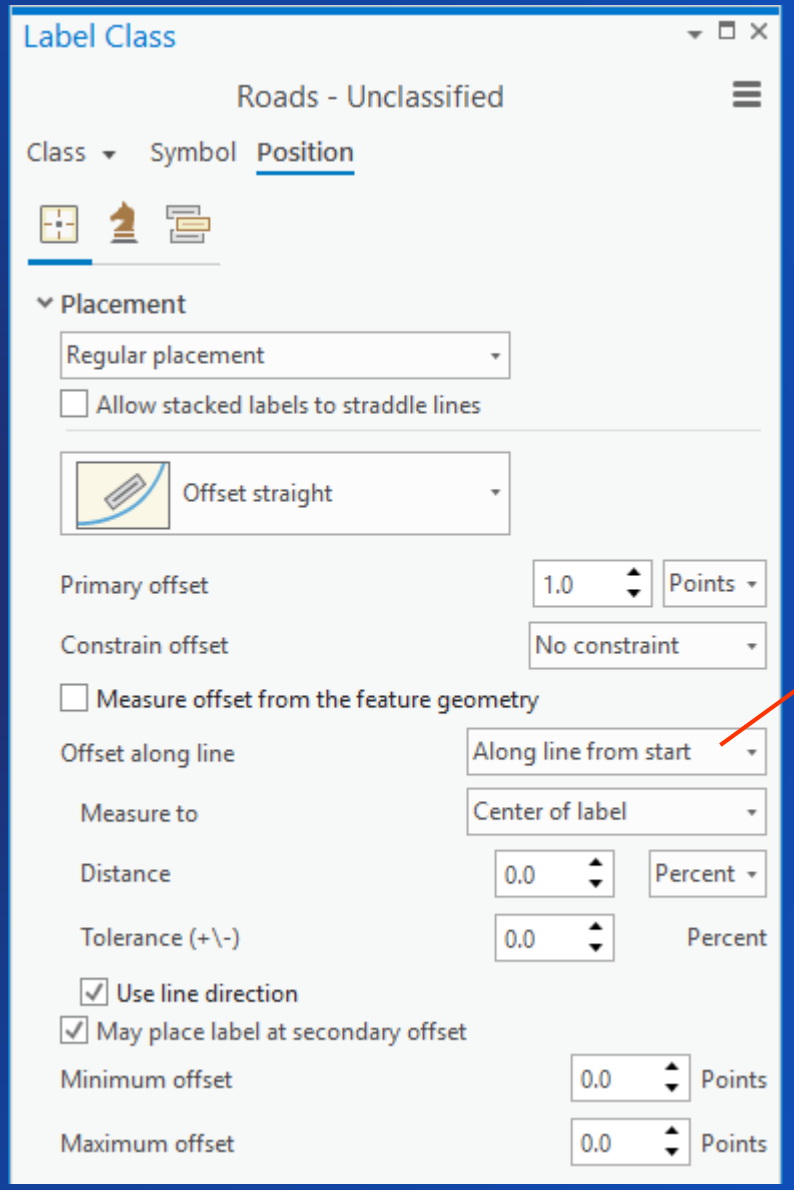
- **Placement methods**
  - Centered or offset
  - Various orientations
    - Horizontal, straight, curved, perpendicular
- **Placement styles**
  - Regular placement
  - Street placement
  - Street address placement
  - Contour placement
  - River placement

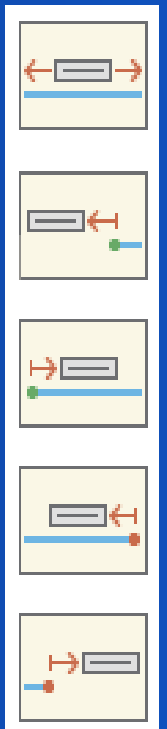




Line Label Offset

- **Offset label from the line**
  - Preferred offset
  - Constrain the label to one side of the feature
  - Measure offset from geometry or symbol
- **Offset label along the line**
  - Default is best position along the line
    - Prefers central, smooth section
  - Fixed position
    - Offset distance
    - Measure to left, centre or right of label
    - Tolerance to give some freedom of movement

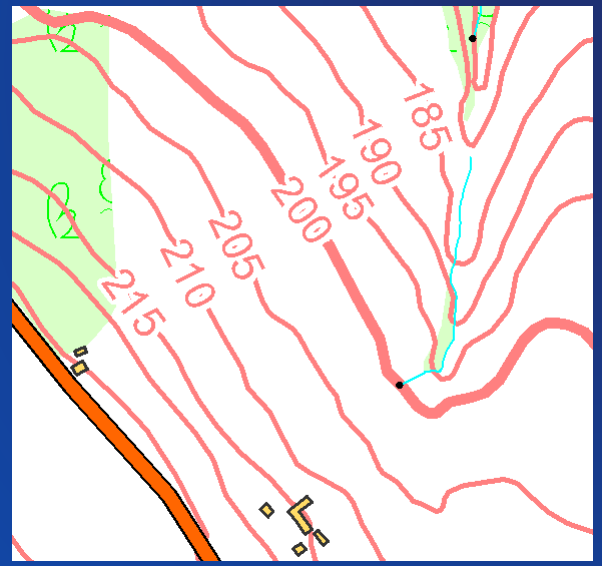


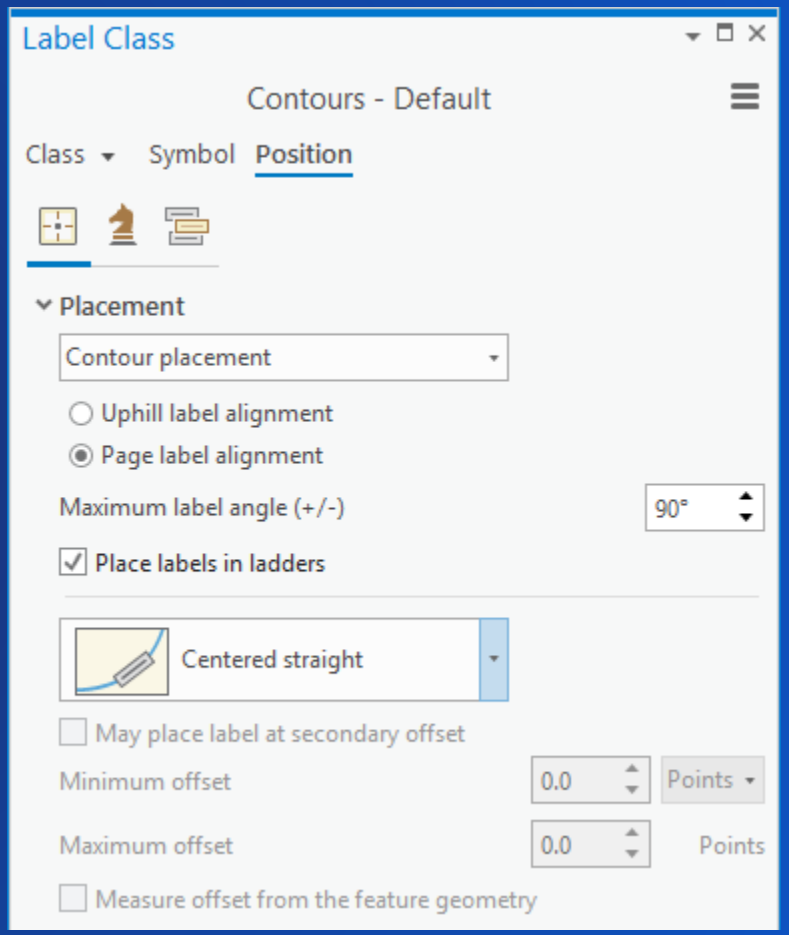


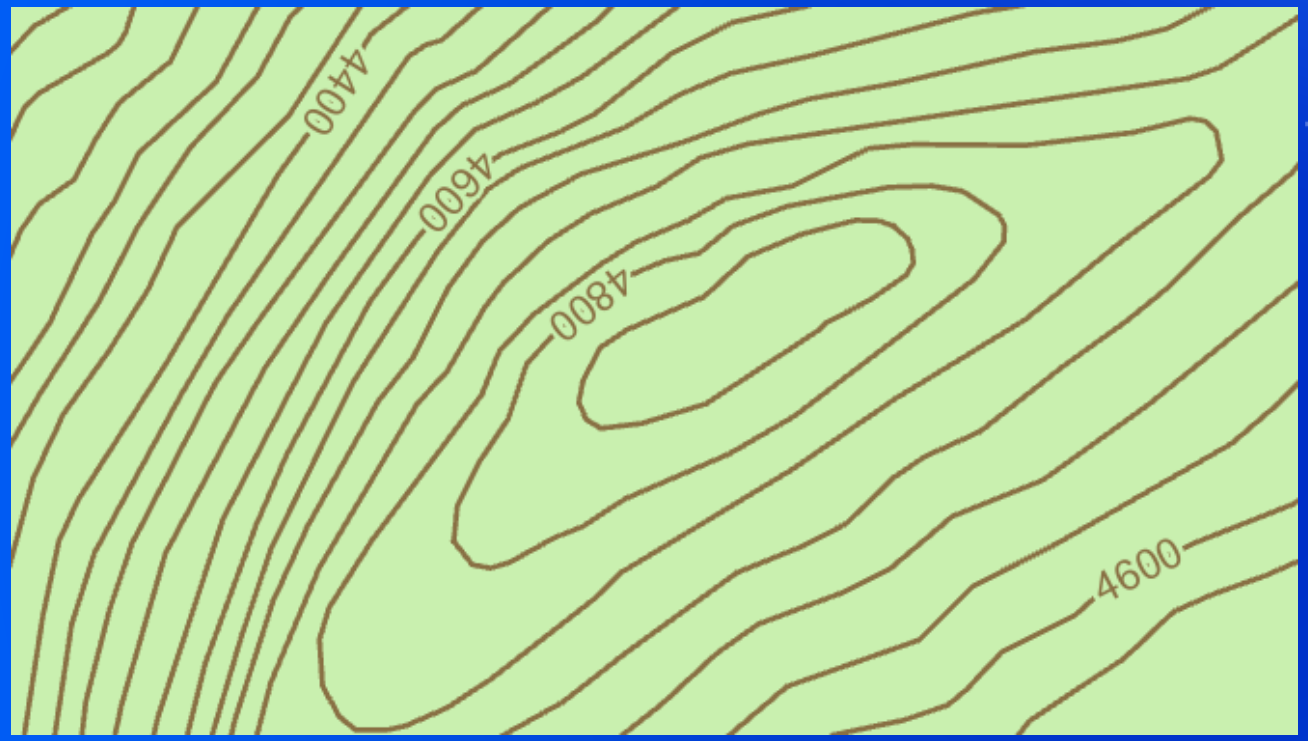
Contour Placement

Features with a height attribute that represent terrain on the map

- **Contour placement style**
  - **Page or Uphill alignment**
  - **Label laddering**







Placement Styles Demo

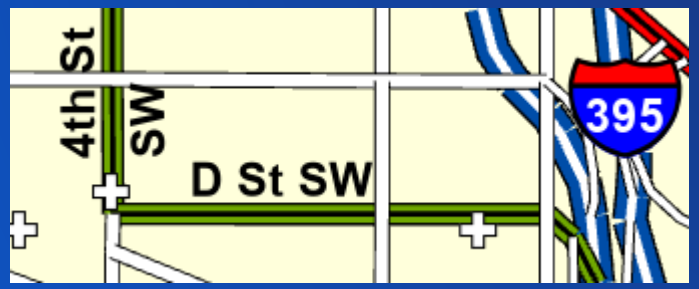
Street Labeling

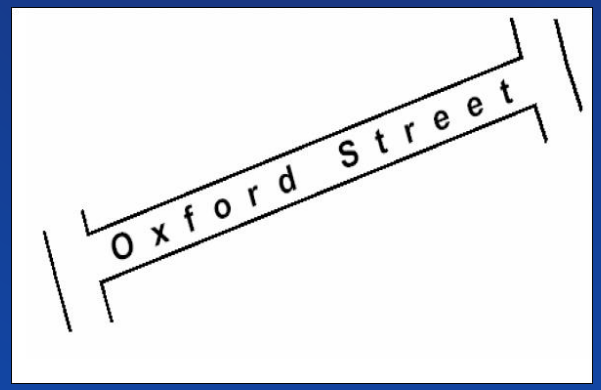
Best practices for handling dense street maps

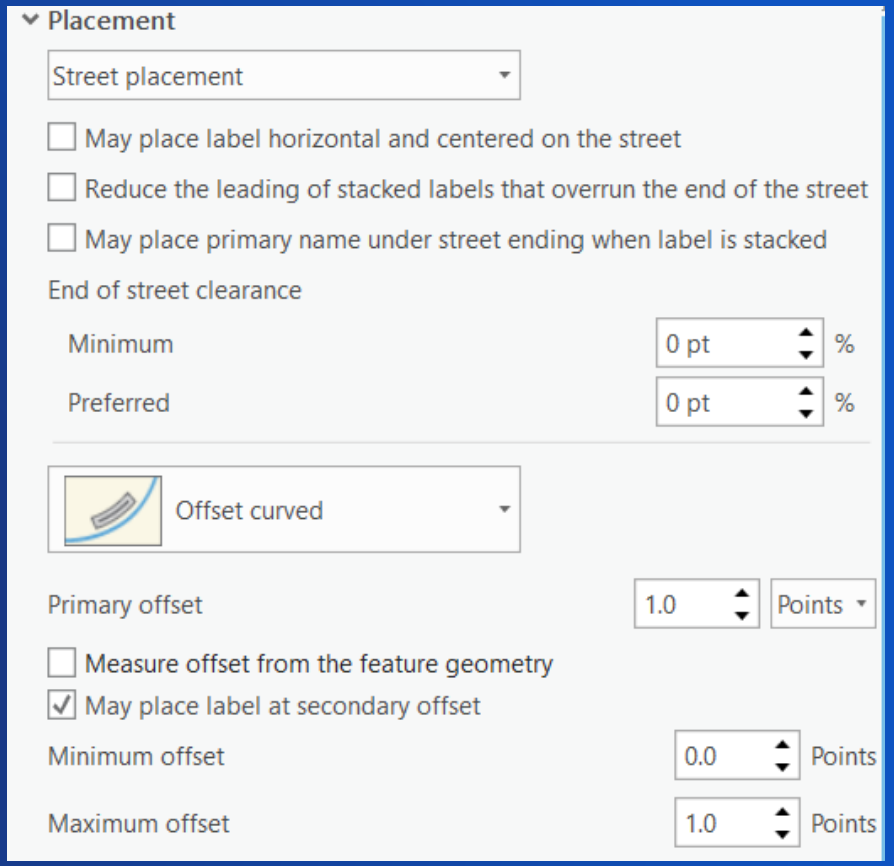
Street Placement

Where you categorize a line as a street feature

- **Street placement style**
  - **Different placement methods**
    - **label is placed inside a cased symbol (European style)**
    - **label is offset from the line symbol (North American style)**
  - **Automatically spread words and\or characters**
  - **End of street clearance**
  - **Special rules for line connection**







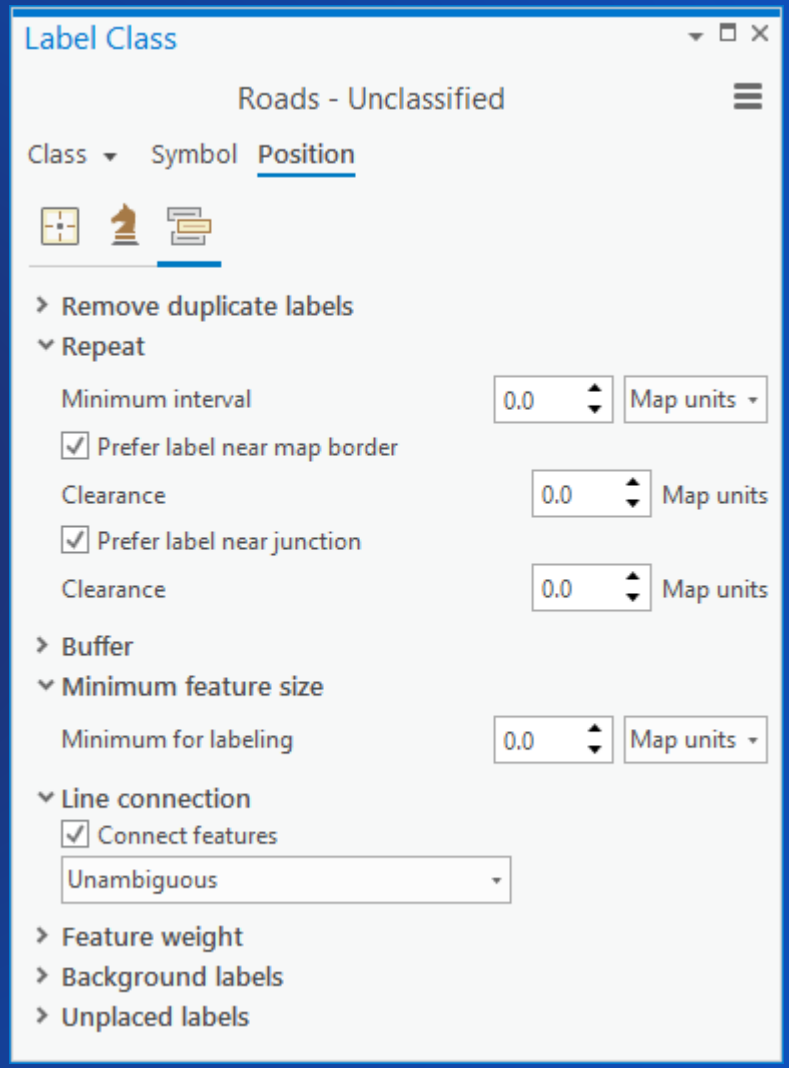
Conflict Resolution: Label Density

Label Density – Line Layers

Conflict resolution tab

- Line connection

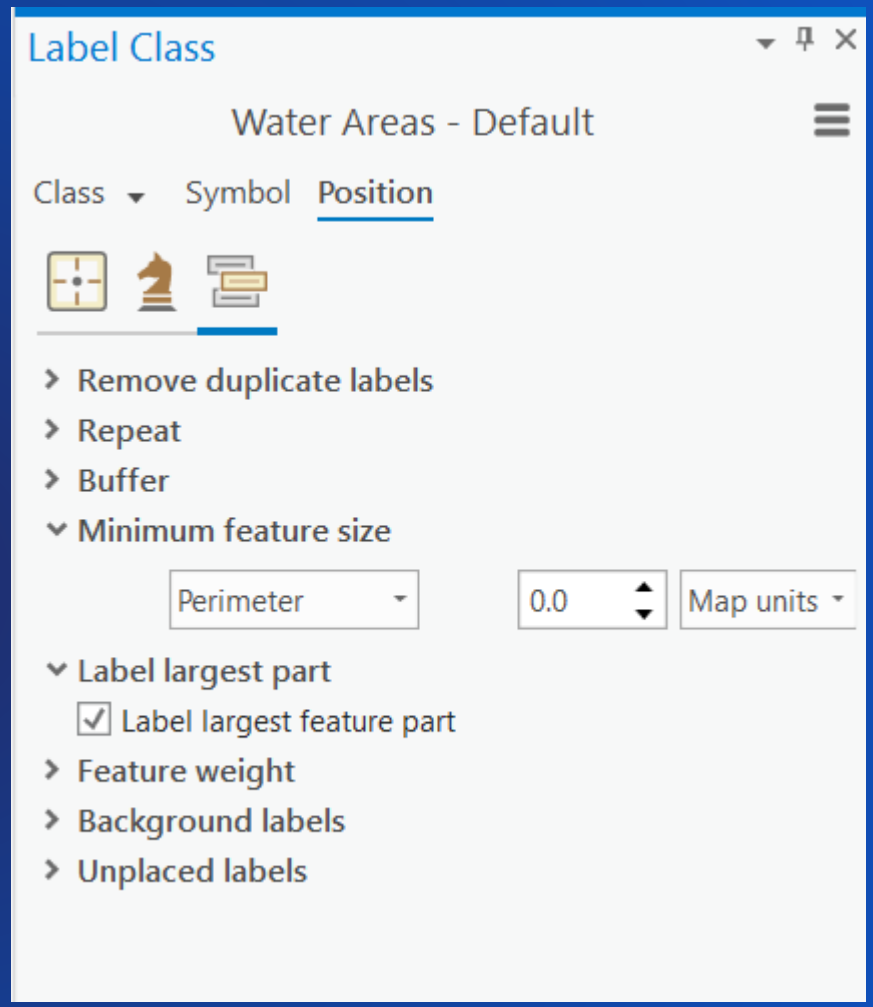
  - Connected features
  - Per feature, per part, per segment
- Remove duplicate labels
- Repeat
  - Road maps
  - Interval
  - preferences
- Buffer
- Minimum feature size



Label Density – Polygon Layers

Conflict resolution tab

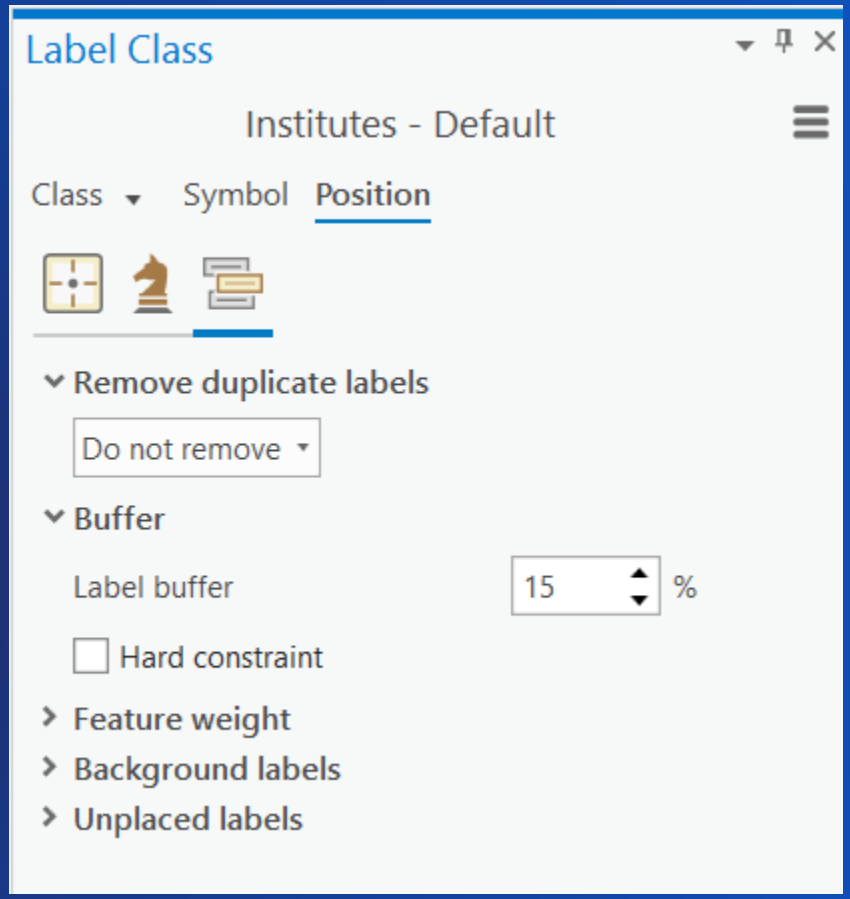
- Remove duplicate labels
- Repeat
- Buffer
- Minimum feature size
  - Perimeter or area
- Label largest part



Label Density – Point Layers

Conflict resolution tab

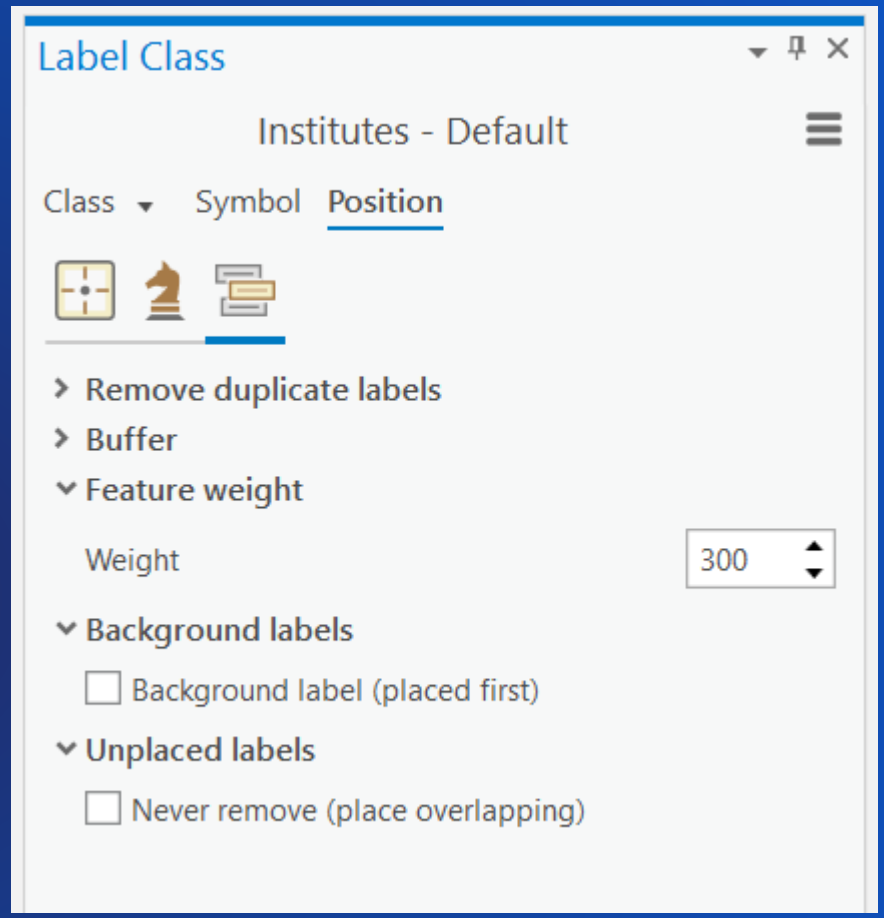
- **Remove duplicate labels**
- **Buffer**



Conflict Resolution: Unplaced Labels

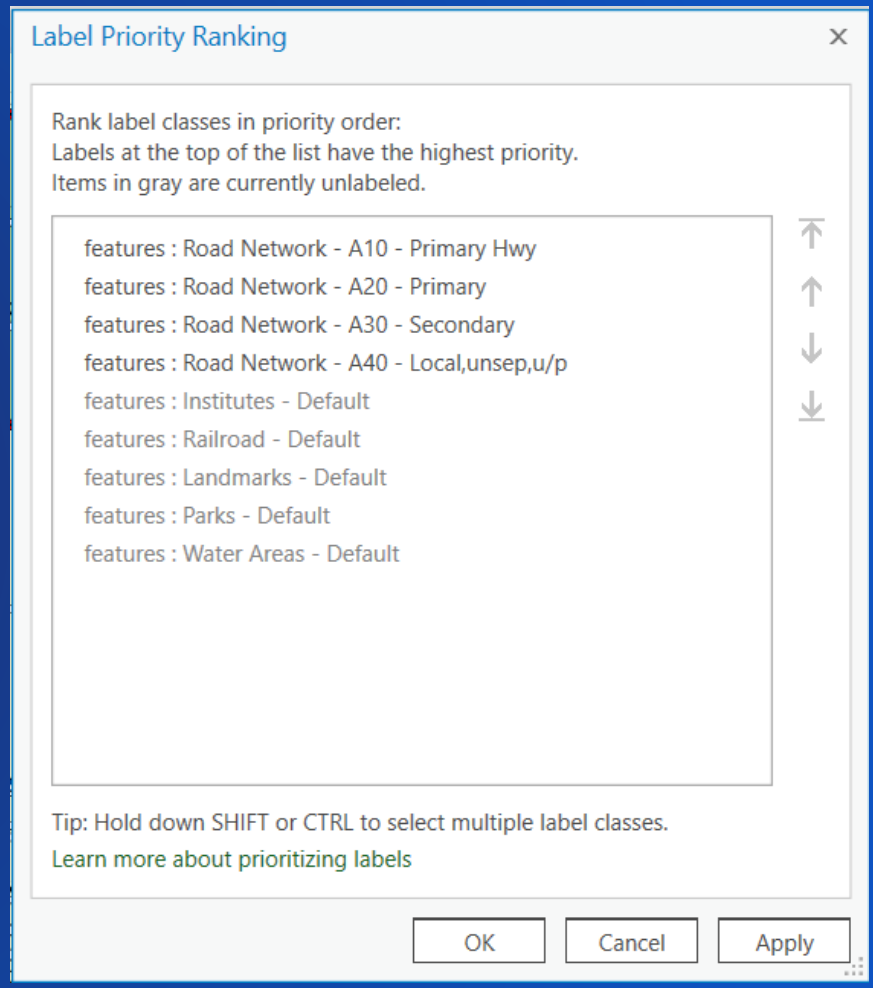
Conflict Resolution

- Background labels
  - transparent text symbols!
- Additional access to the feature weights
- Unplaced labels - Never remove
  - Forces the placement of the label…
  - …you will get overlap ☹
  - Last resort.



Label Priority

- Rank your label classes in order of their relative importance on the map
- UI shows all label classes in the map
- Controls the label placement order
- Also serves as the deletion priority for conflict resolution
  - If two labels are in conflict it's the one that has the higher priority that will win



Label Density Demo

Quality control on your maps

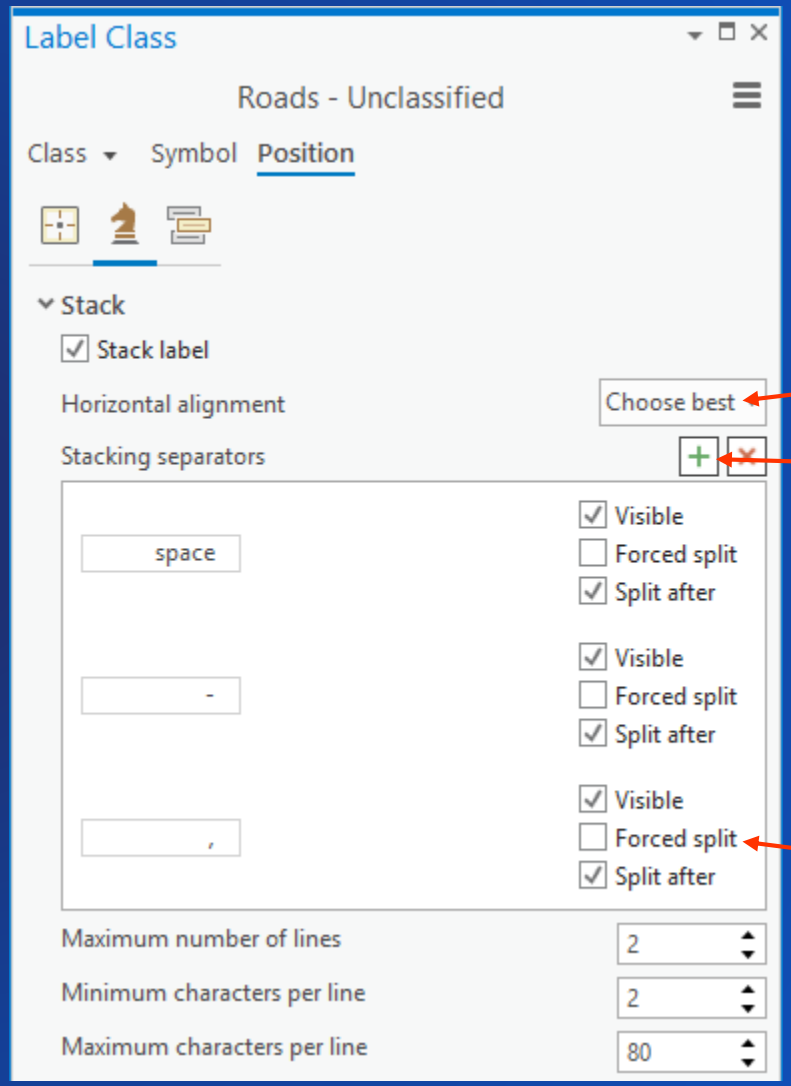
Placement Strategies

Getting the tricky labels onto your map

Label Stacking

Automatic stacking of text onto multiple lines

- **Stacking Separators**
  - User defined separators
    - Defaults are space and comma
  - Visible or not
  - Forced split
  - Split before or after
- **Horizontal alignment**
  - Choose best
  - Fixed (left, right or centered)
- **Limits**
  - Number of lines
  - Number of characters per line



Control the horizontal alignment

Add new character

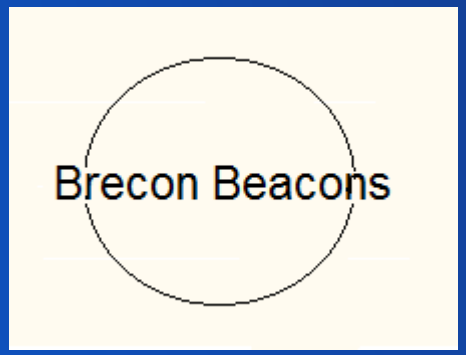
Control the line break

Label Overrun

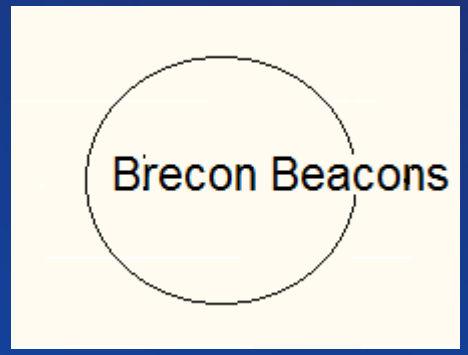
Label is allowed to overrun the feature extent

- **Lines**

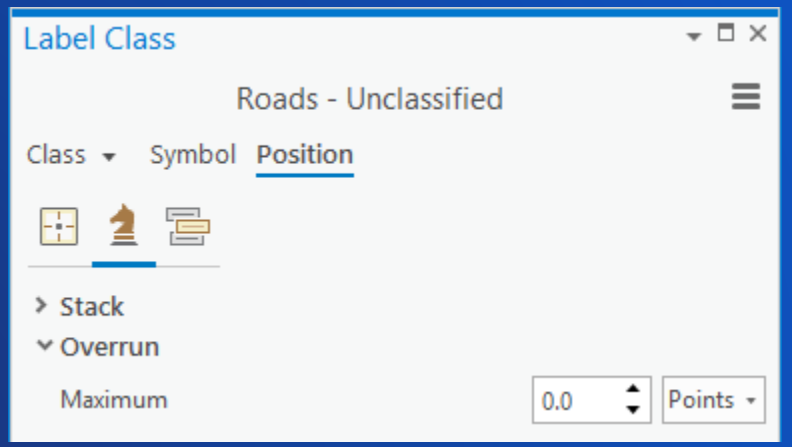
- **Polygons**

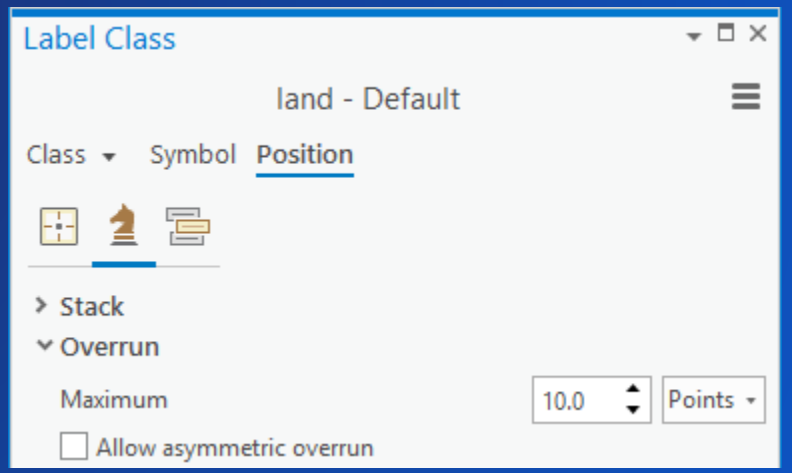


Symmetric overrun



Asymmetric overrun

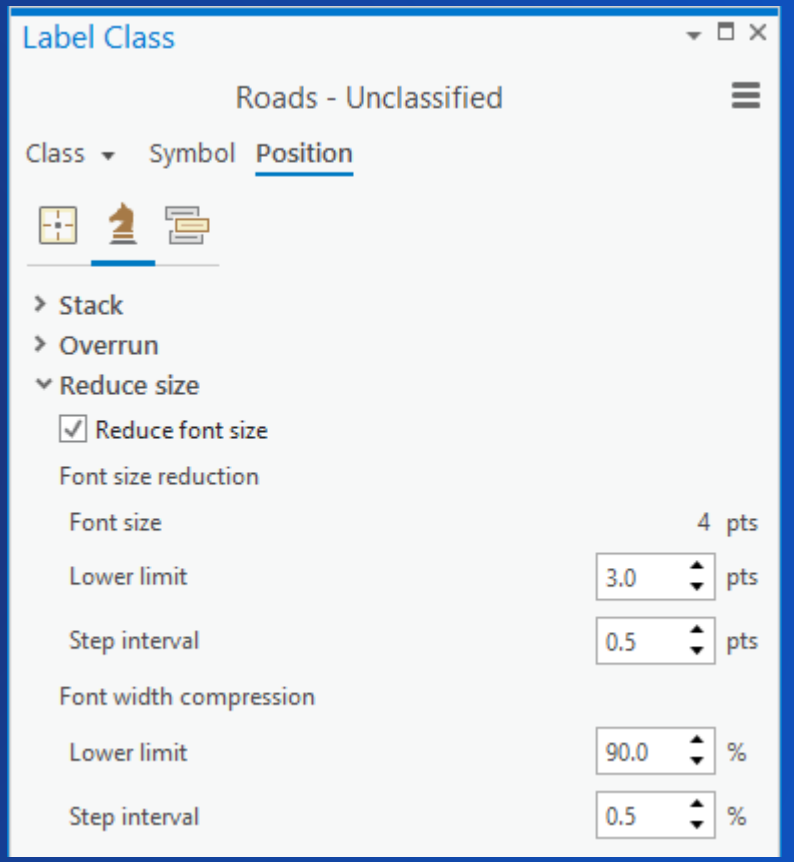




Label Reduction

Label is reduced in size or width to fit on the map

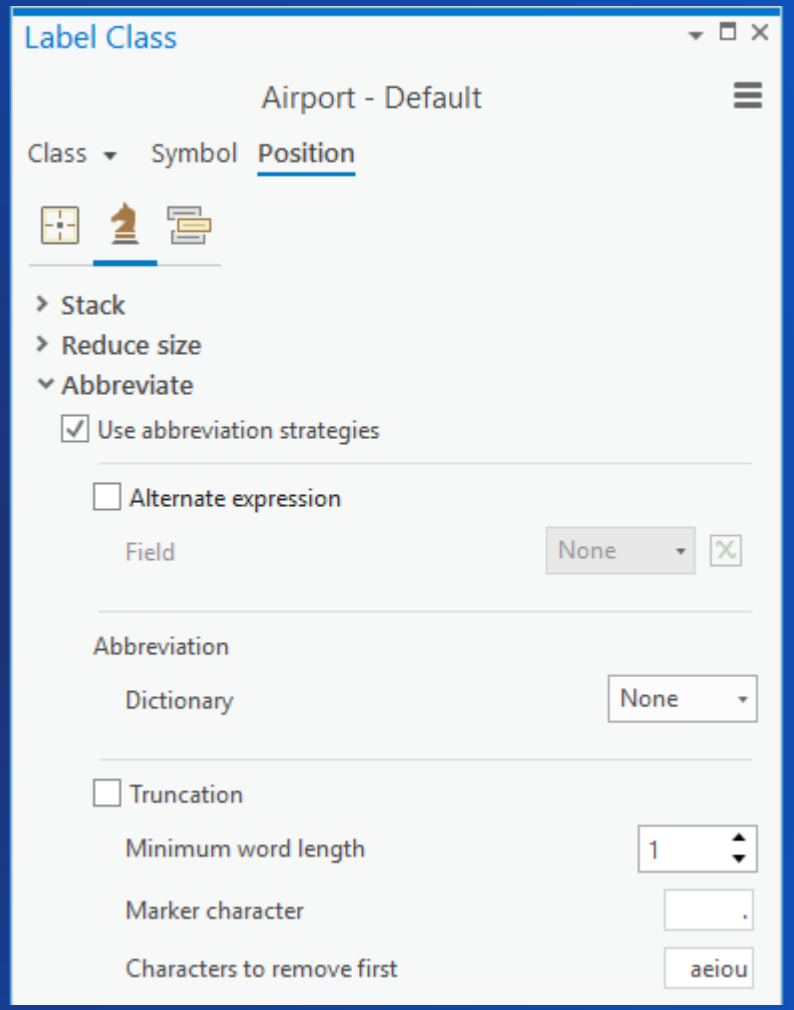
- **Font size reduction**
  - Reduce label in size in stepped intervals
    - e.g 10pt to 6pt in 0.5 pt intervals
- **Font width compression**
  - Reduce label in width in stepped intervals
    - e.g 100% to 90% in 0.5% intervals



Abbreviation Strategies

Using shortened versions of your label to allow it to place

- **Alternate text**
  - **Field of expression**
- **Abbreviation Dictionary**
  - **Ending, keyword, translation**
- **Truncation**



Alternate Text

- **Field**
- **Arcade script**
  - E.g. if label contains ‘College’, ‘School’, ‘Nursery’ or ‘University’ then label with ‘Sch.’

Knowsley Park Centre for Learning, Serving Prescot, Whiston and the Wider Community

↓

Knowsley Park

```
var eduSearchTerms = ["SCHOOL", "ACADEMY", "COLLEGIATE", "COLLEGE", "UNIVERSITY"]
var relSearchTerms = ["CHURCH", "MOSQUE", "SYNAGOGUE", "MONASTRY", "TEMPLE","TABERNACLE", "WORSHIP"]

for (var i in eduSearchTerms)
{
  if(find(eduSearchTerms[i], upper($feature.Name2)) > -1)
    return "Edu."
}
for (var i in relSearchTerms)
{
  if(find(relSearchTerms[i], upper($feature.Name2)) > -1)
    return "Rel."
}

return $feature.Name2
```

Label Abbreviations

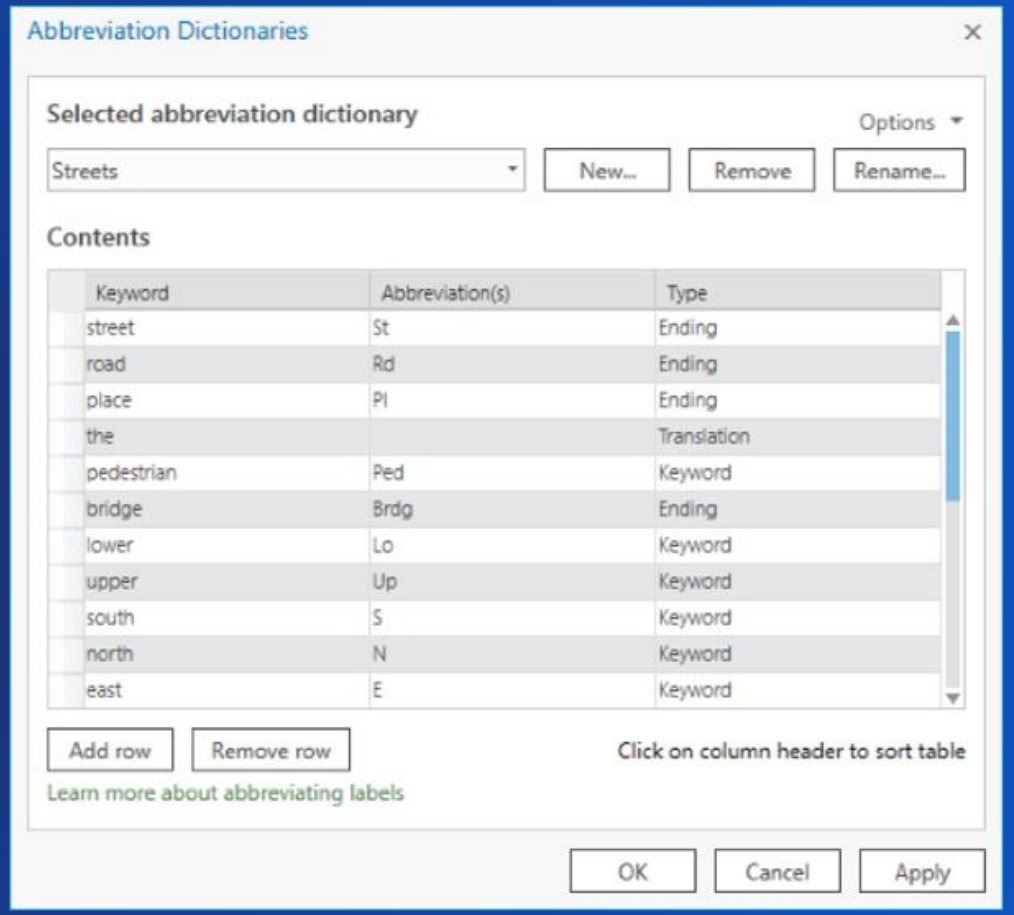
Abbreviate label text using an label abbreviation dictionary

- Ending
  - Applies to the last word in the label
  - Street to St, Road to Rd, Avenue to Ave
- Keyword
  - Applies to any word in the label except the last word
  - South to S., Mountain to Mt.
- Translation
  - Simple substitution that applies to the entire label text
  - ‘Postal Office’ to P.O.
  - ‘Unknown Road’ to an empty string

Label Abbreviations (continued)

Abbreviate label text using an label abbreviation dictionary

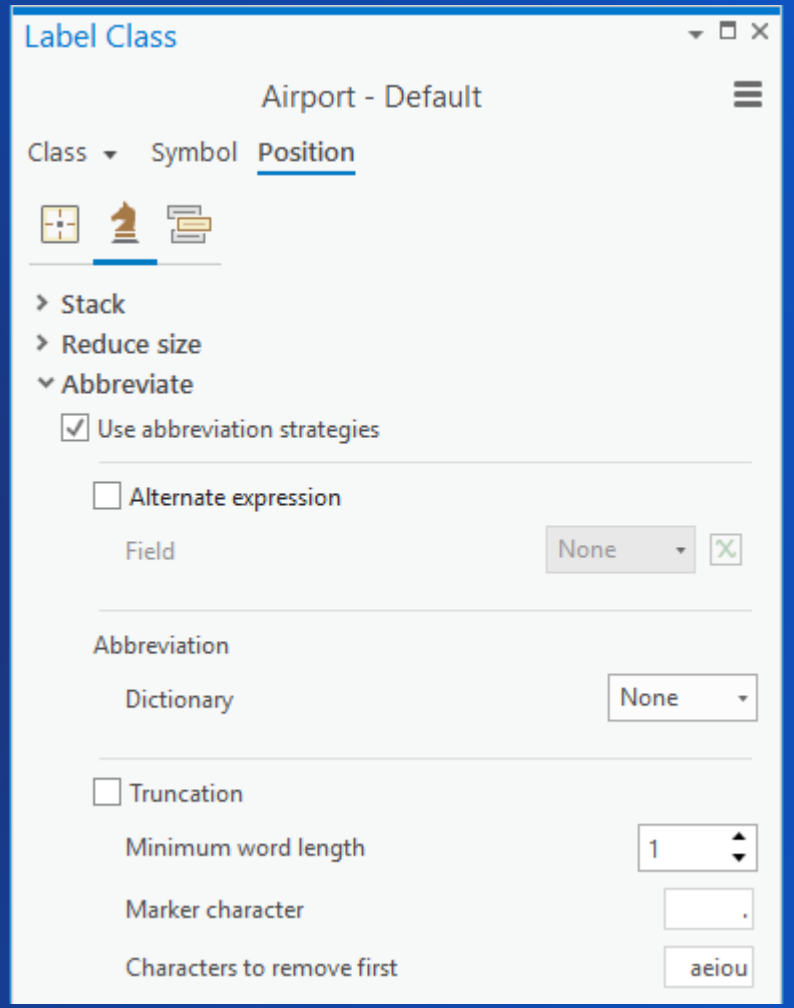
- Create a named dictionary
  - Create new
  - Import existing - See KB 30494 for US streets example
- Share dictionaries
  - Available to any label class in your map
  - Can be shared as a .dic file



Label Truncation

Characters are automatically removed from the label text

- Another type of abbreviation
- Algorithm that removes characters
- Default is ‘aeiou’
- Degrades readability
- Similar to ‘tweet shortening’



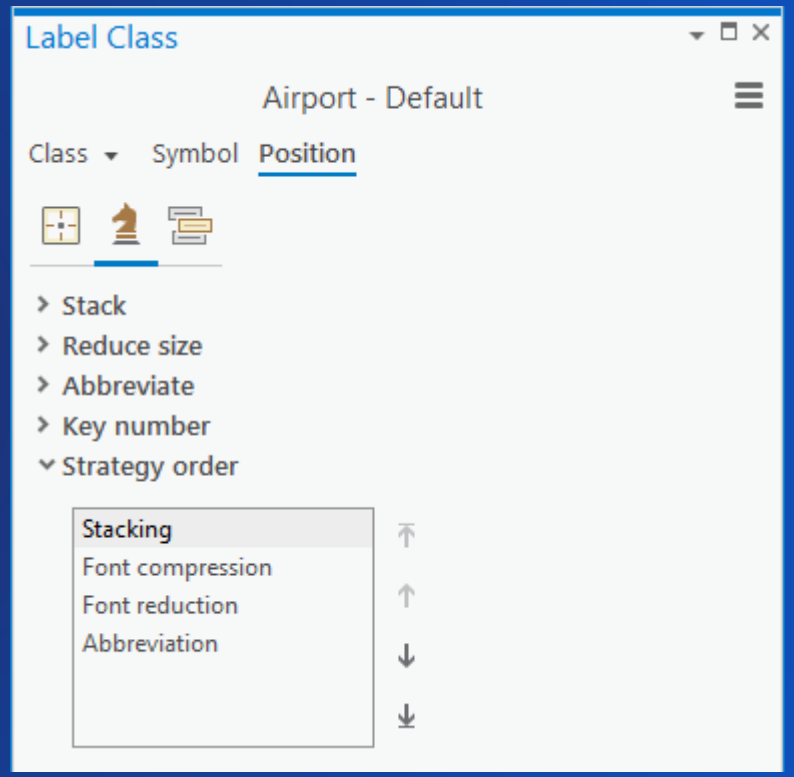
Key Numbering

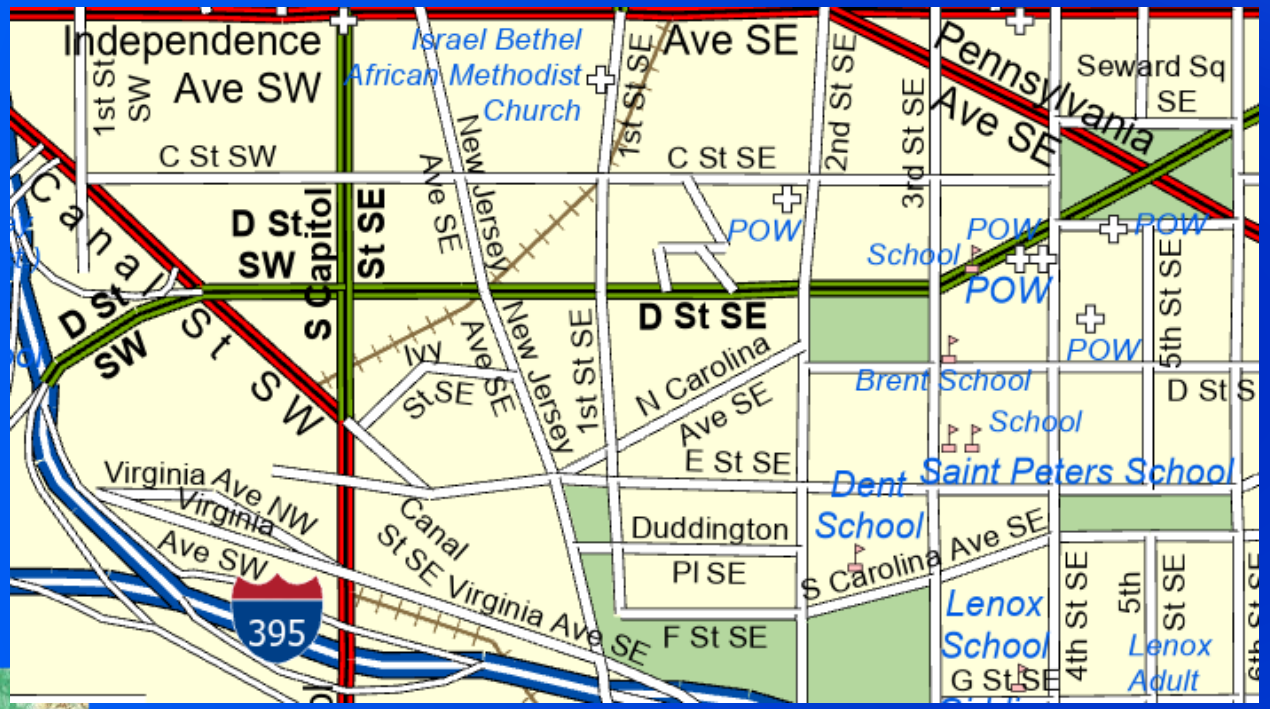
Creates a numbered list for the unplaced labels

- Labels that don’t fit are replaced with a number
- Label text then placed in a list
- Various options
  - Key numbering scheme
  - Size of the list etc

Strategy Order

- Select the order in which fitting strategies are tried
- **Preference** as opposed to exact order





Fitting Strategies Demo

Stacking, overrun, abbreviation strategies, font reduction, key numbering

Maplex Help and Resources

- Help System
- Detailed explanations of placement options
- Step-by-step guidelines for common labeling tasks
- Labeling tutorial

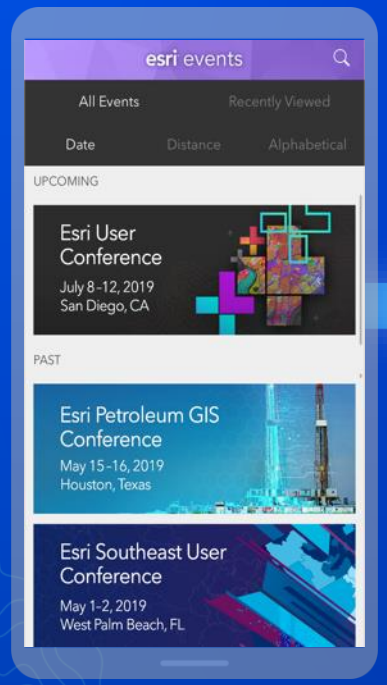
- See Esri styles for examples of Maplex in use

Summary

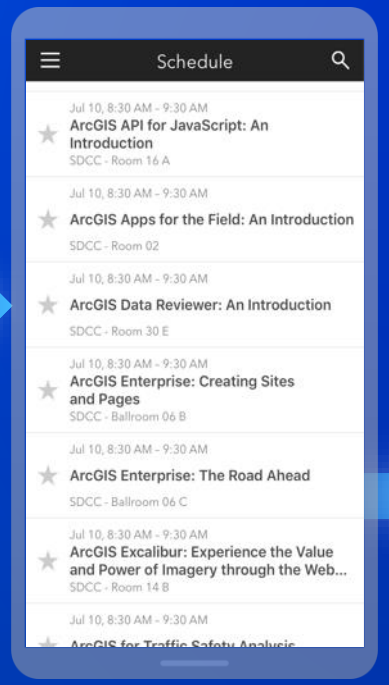
- Maplex is an advanced, high-quality, cartographic text placement engine
- Provides numerous placement properties and strategies to define the location of labels
- Generates clear, well placed labels, to make a better looking map!

Please Share Your Feedback in the App

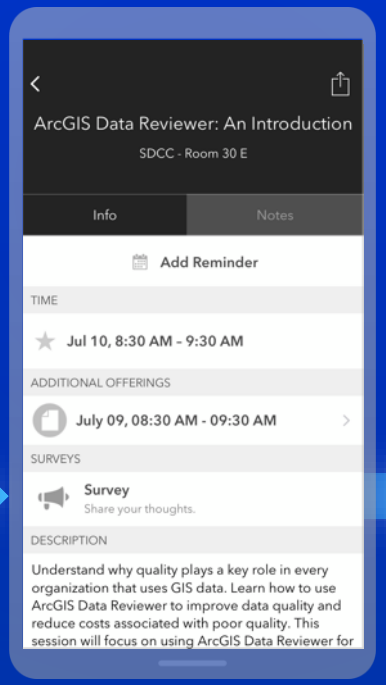
Download the Esri Events app and find your event



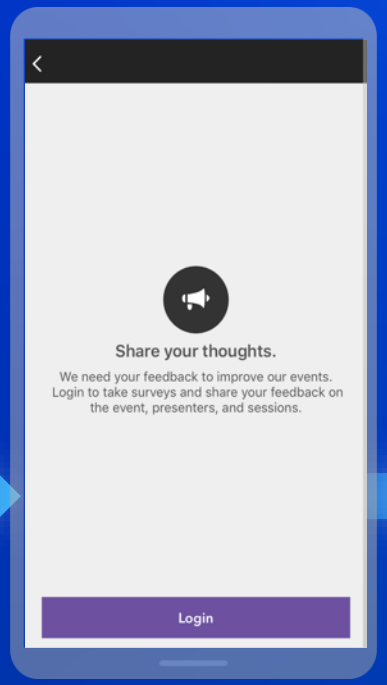
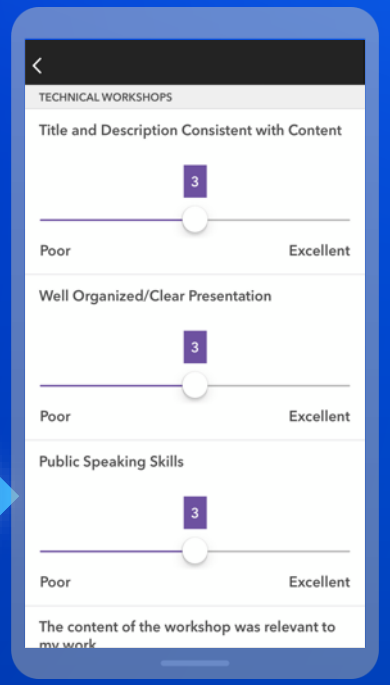
Select the session you attended



Scroll down to "Survey"



Log in to access the survey



Complete the survey and select "Submit"