Statistical Analysis on Urban Land Use

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2 Land Use Summary

3 Road Density

4 Land Use Distribution

Statistical Analysis in GIS

Extract hidden information in spatial and non-spatial data by applying traditional and spatial statistical analysis methods.

Abundant Information in GIS

Statistical Analysis Methods in GIS

Attribute Statistics

Ring

Histogram

Area

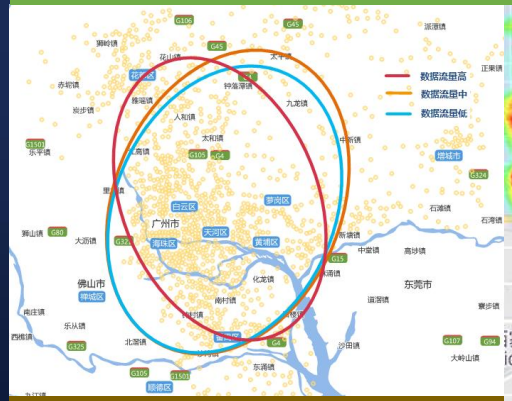
Line

Scatter

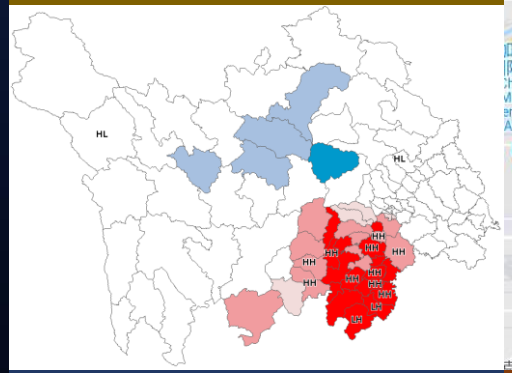
Bubble

....

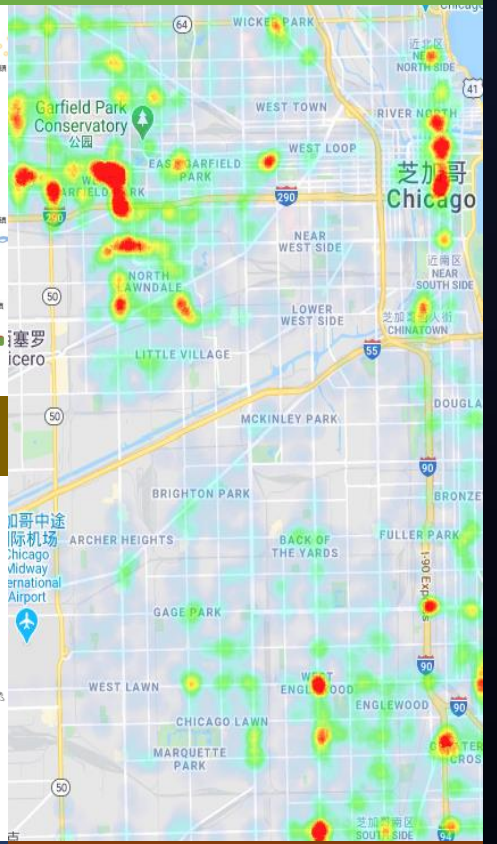
Spatial Statistics



Directional Distribution

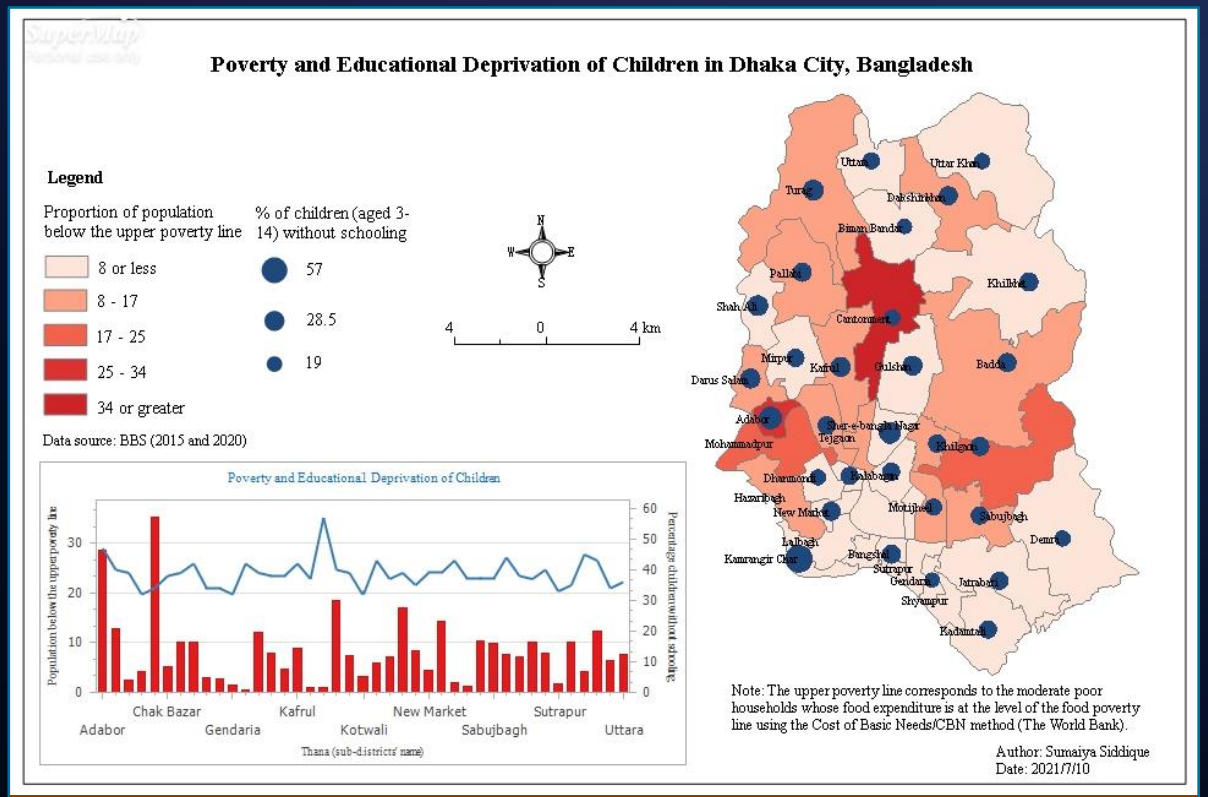


Cluster

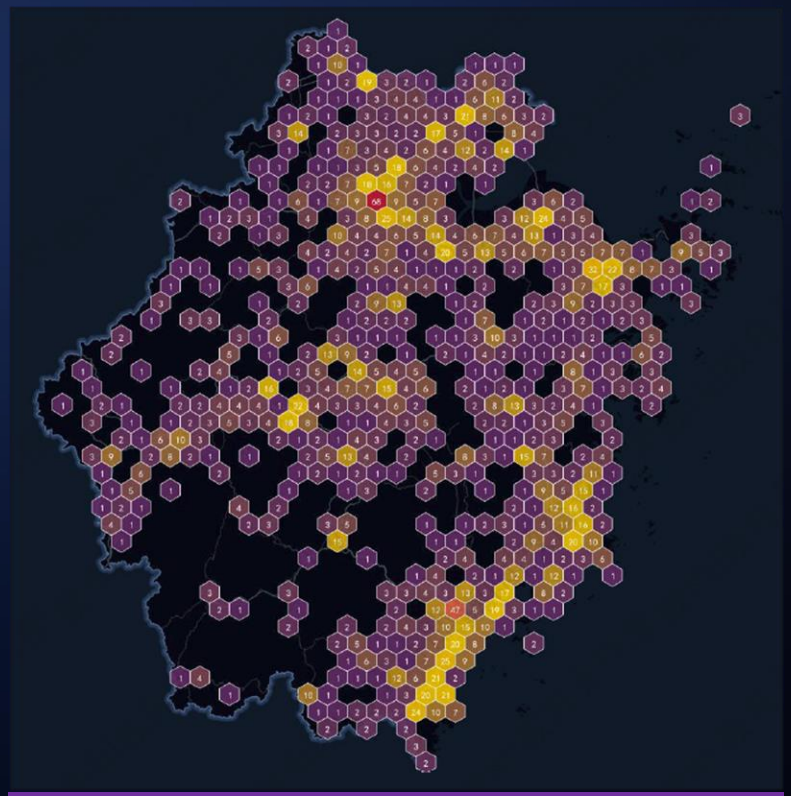


Heat Map

Application of GIS Statistics

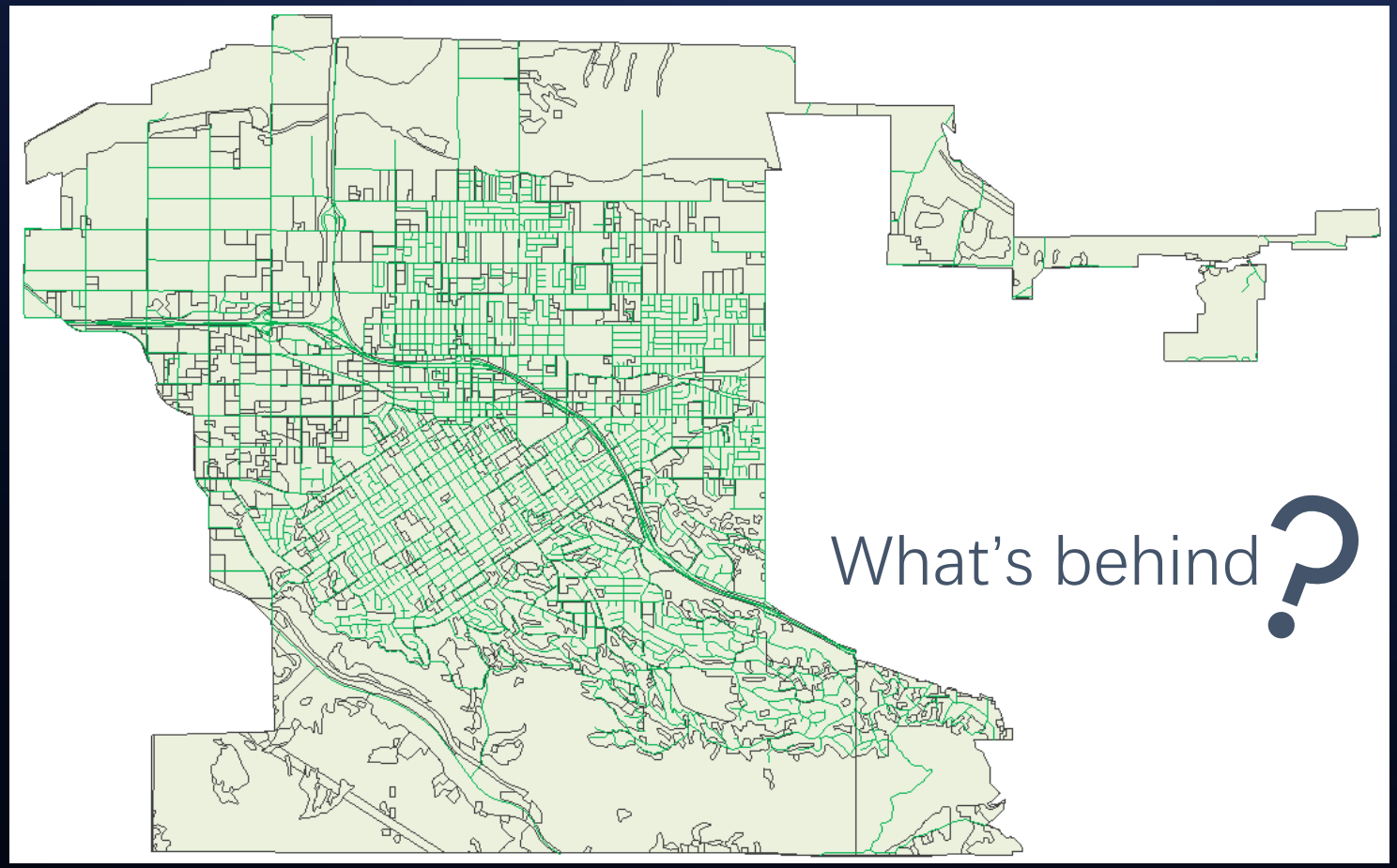


Relationship between Poverty and Education



Spatial Distribution of Clinics

Urban Planning Statistics in GIS

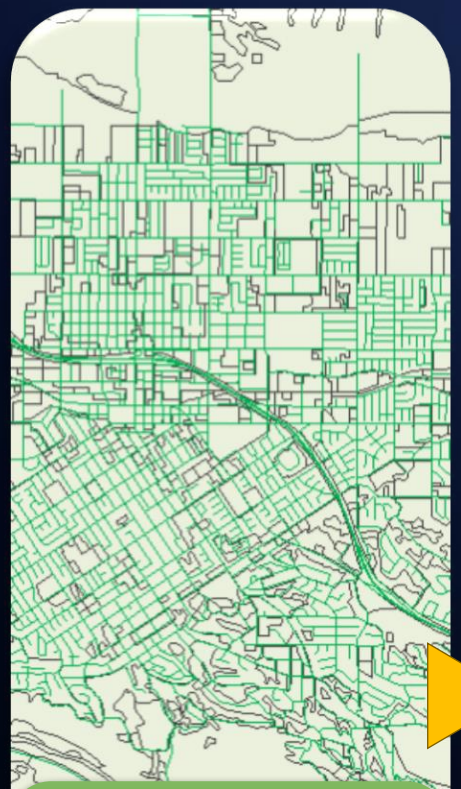


- Basic statistics
- Road density
- Directional distribution of land categories
- Relations between demographics and land use
- ……

Land Use Summary

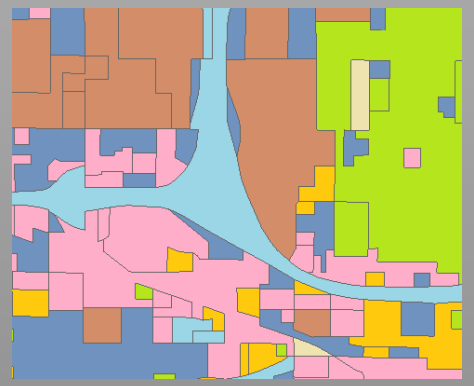
What’ s the land use type for each piece of land? Which is the category that takes the most area? Which is the category made by numerous small pieces of land?

Get to Know Your Data



Original

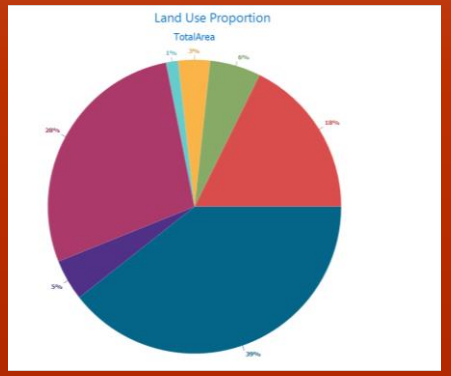
1 Visualize land use type



2 Summarize basic statistics

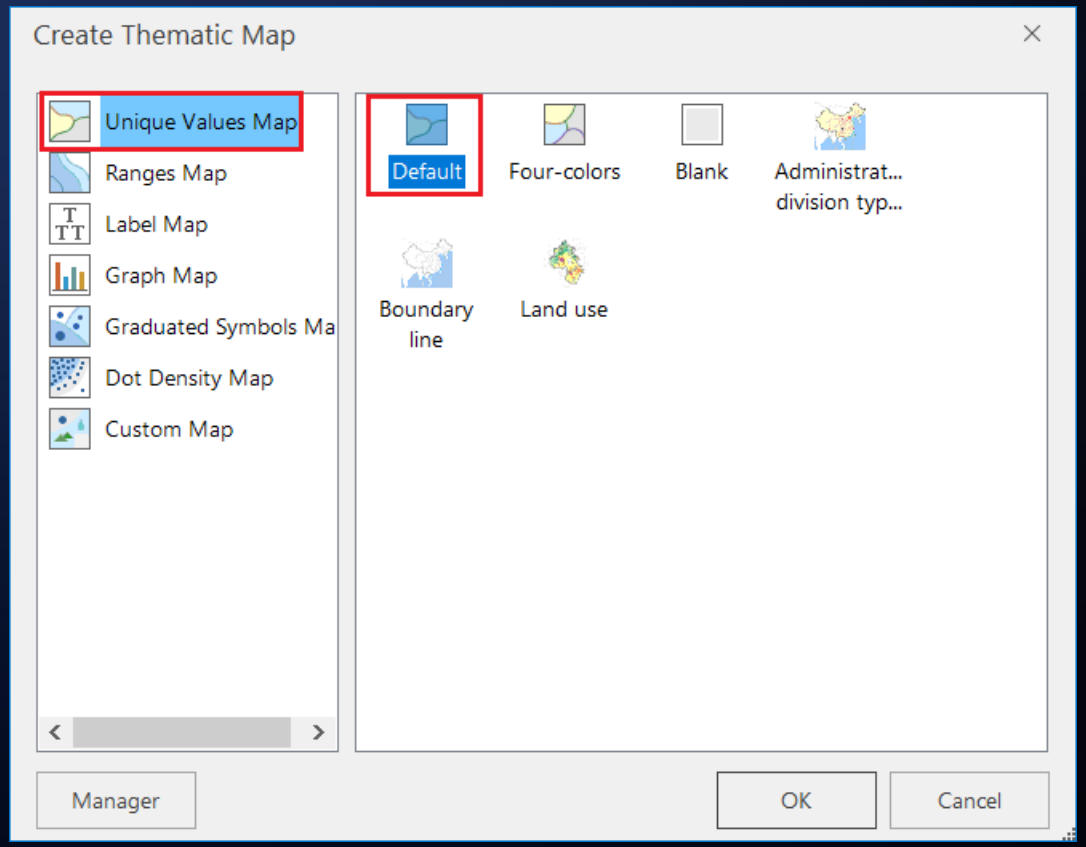
N_Land	TotalArea
117	17,366,060
163	5,516,028
46	3,437,436
21	1,313,744
273	27,457,810
64	4,447,780
197	38,685,100

3 Visualize statistic results

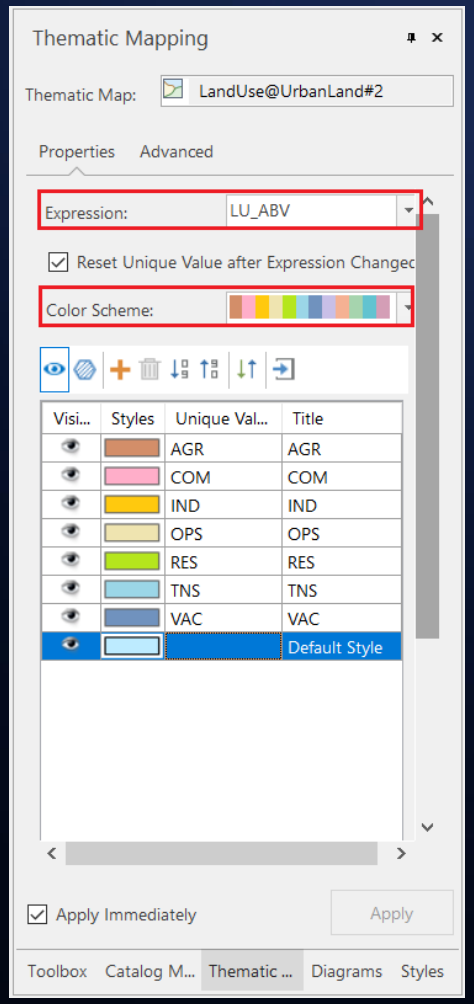


Create Thematic Map

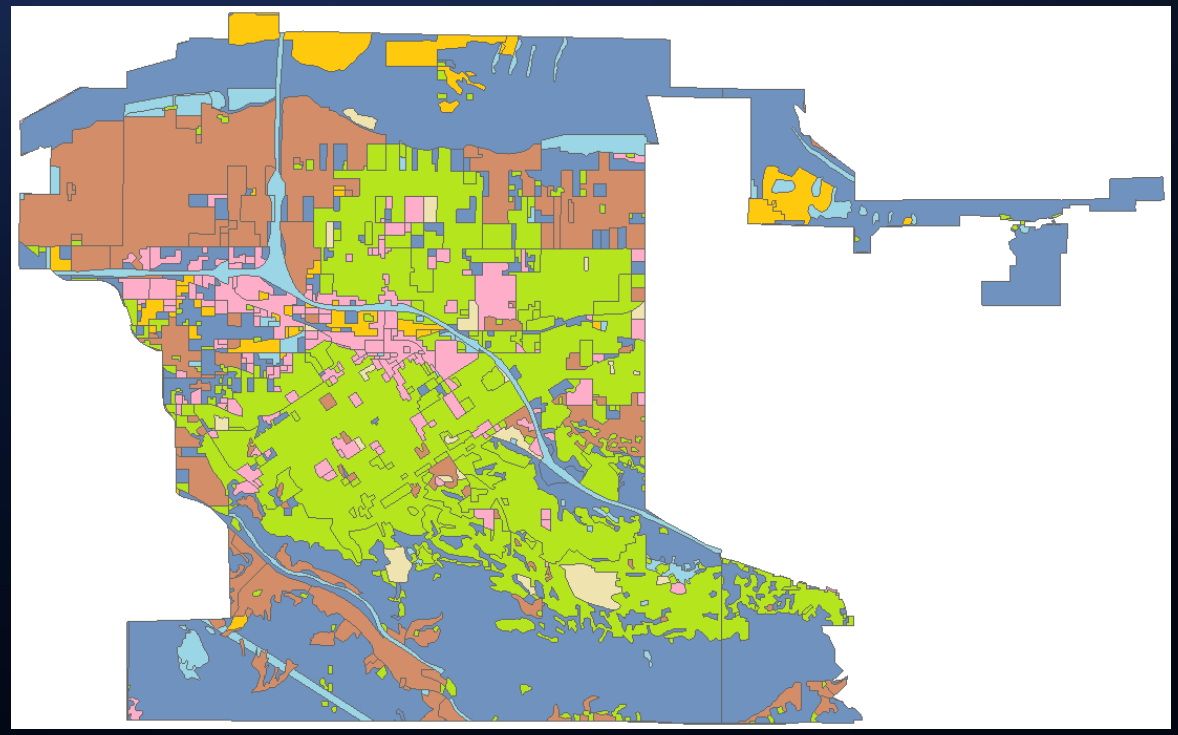
- Connect to data source UrbanLand.udbx
- Add dataset LandUse into map window
- Select LandUse layer in Layer Mananger → right click → Create Thematic Map
- Unique Value Map → Default



Create Thematic Map

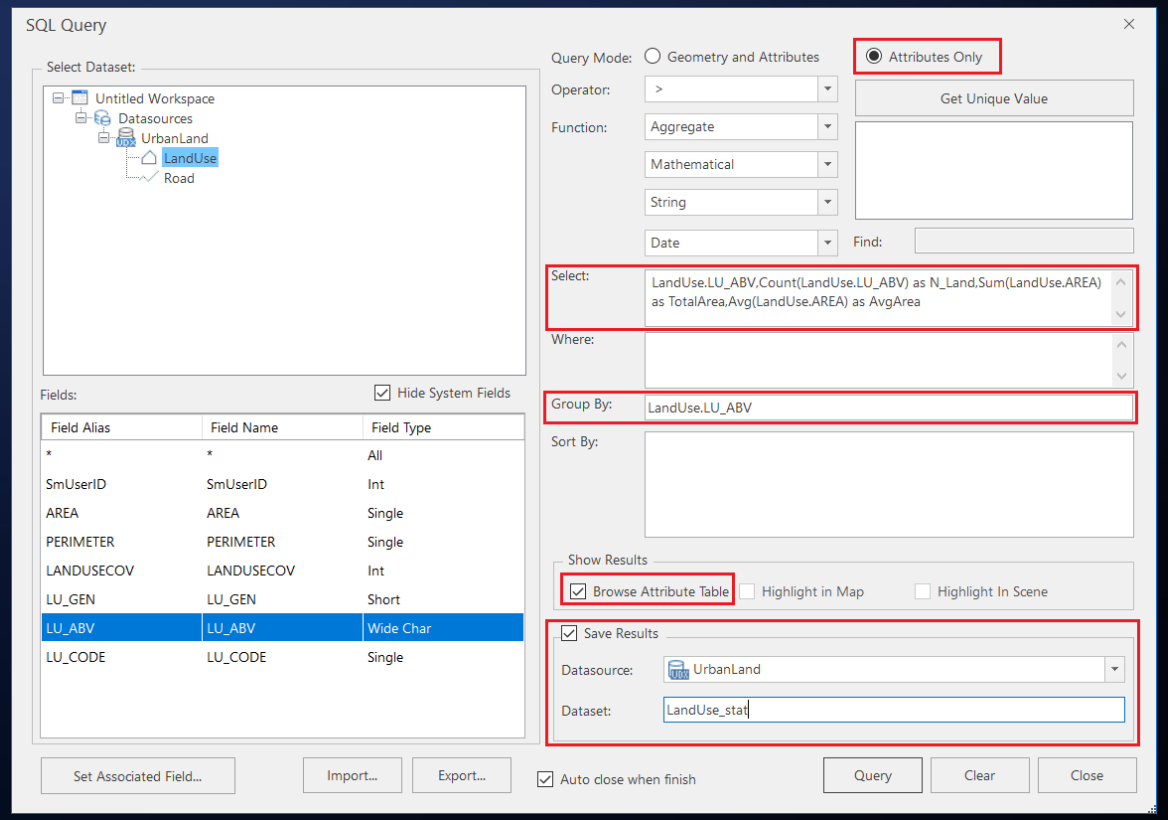


- Expression: LU_ABV
- Select a proper color scheme



Statistical Summary: SQL Query

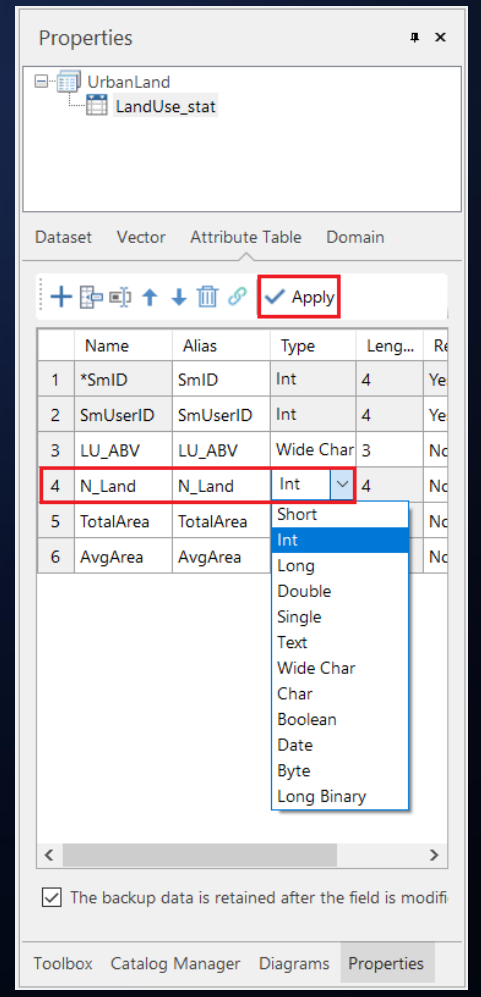
- Spatial Analysis → SQL Query
- Select: LandUse.LU_ABV,Count(LandUse.LU_ABV) as N_Land,Sum(LandUse.AREA) as TotalArea,Avg(LandUse.AREA) as AvgArea
- Group By: LandUse.LU_ABV



Statistical Summary: Change Attribute Type

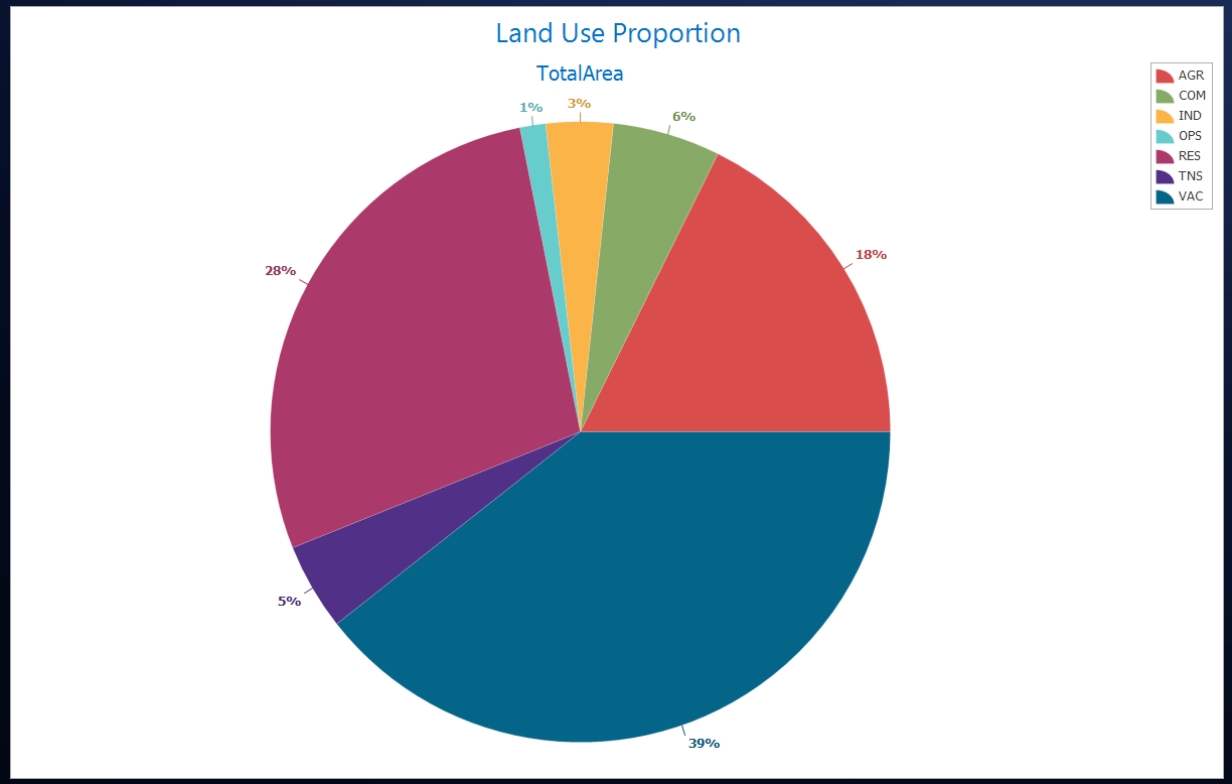
- The type of statistic result field is the same as the original field
- Select LandUse_stat in Workspace Manager → right click → Properties
- N_Land Type: Wide Char → Int, click Apply

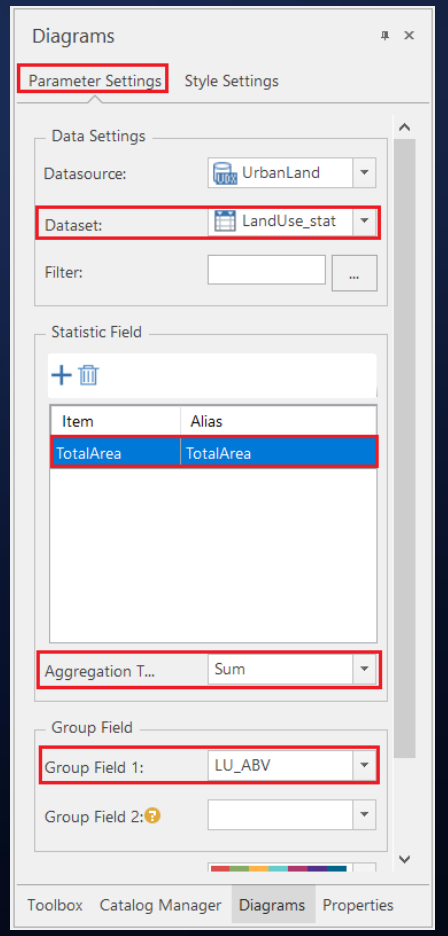
No	LU_ABV	N_Land	TotalArea	AvgArea
1	AGR	117	17,366,060	148,427.9
2	COM	163	5,516,028	33,840.66
3	IND	46	3,437,436	74,726.88
4	OPS	21	1,313,744	62,559.22
5	RES	273	27,457,810	100,578.1
6	TNS	64	4,447,780	69,496.55
7	VAC	197	38,685,100	196,371.1

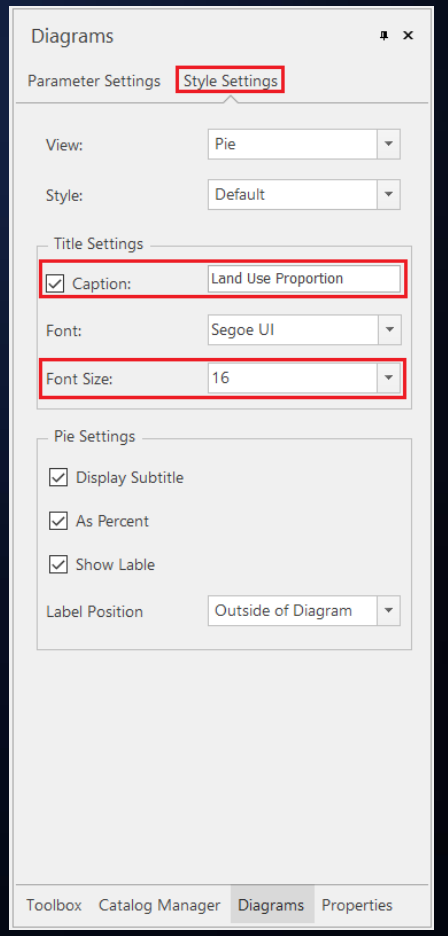


Statistics Visualization: Diagrams

- Start ⟶ Diagrams ⟶ Pie

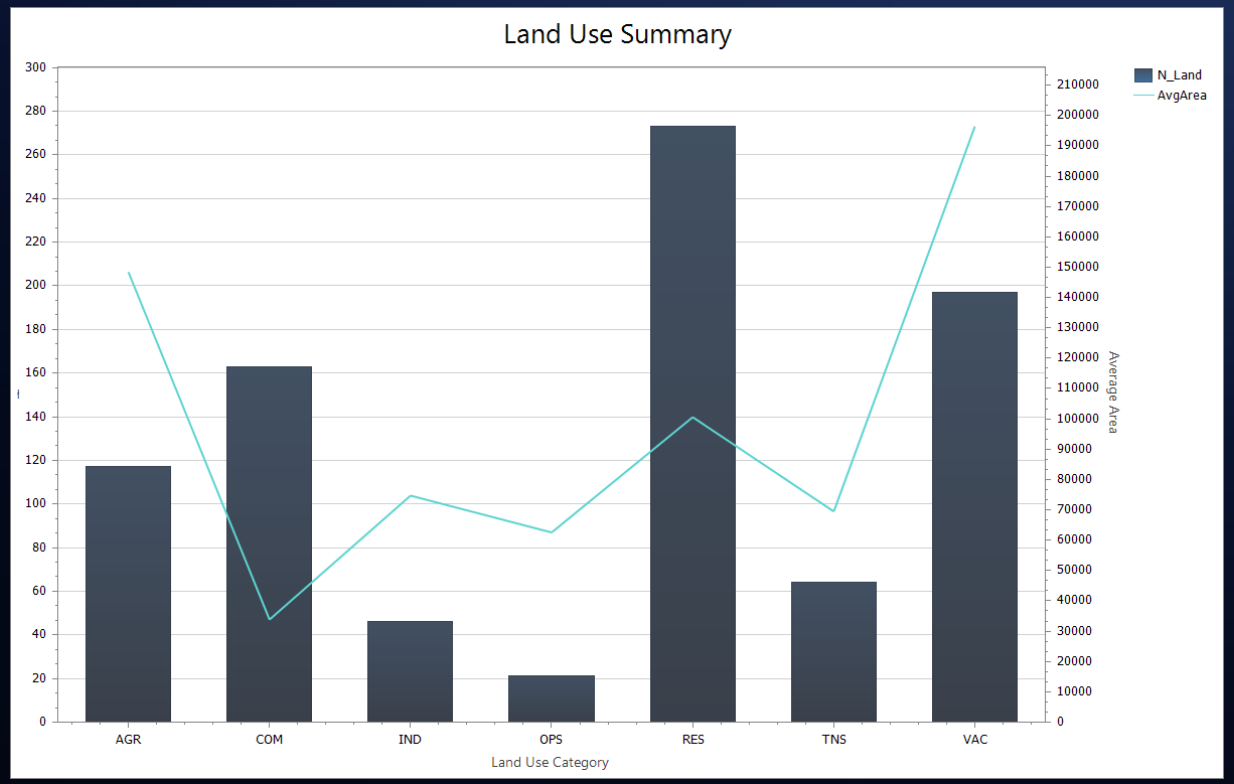


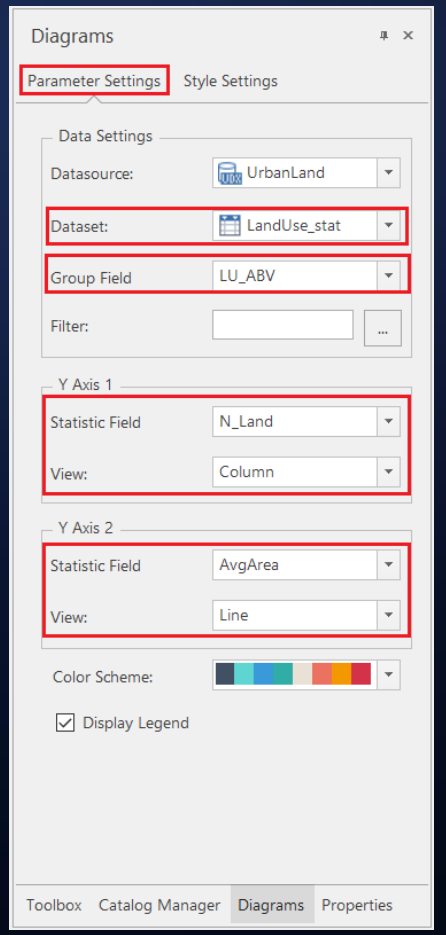


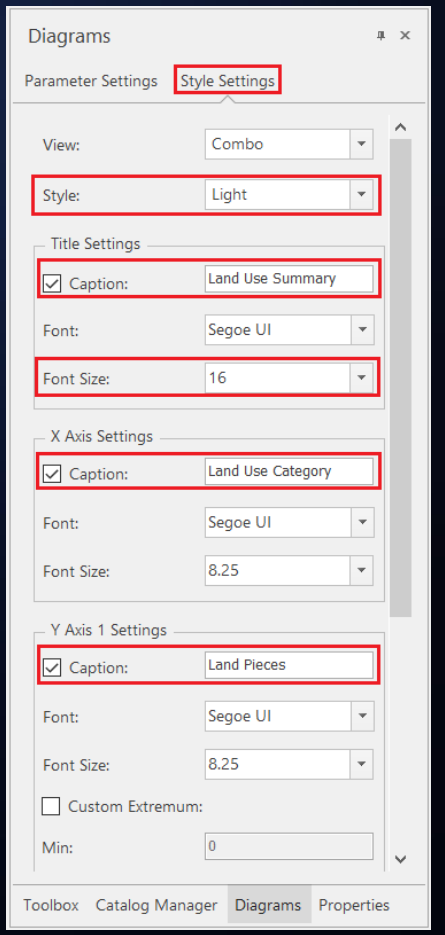


Statistics Visualization: Diagrams

- Start → Diagrams → Combo







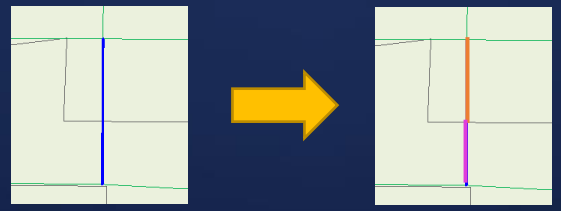
Road Density

Traditional statistics based on spatial relationship.

Spatial Relationship between Roads and Land Piece

Roads in each land piece

- Overlay

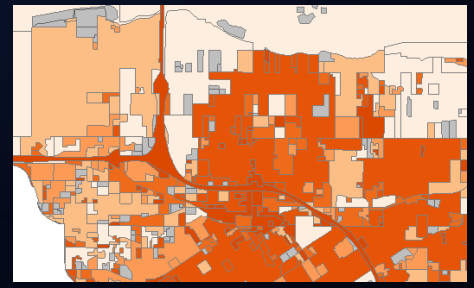


Total length of roads by land pieces

- Calculate road length
- Sum of length by land pieces

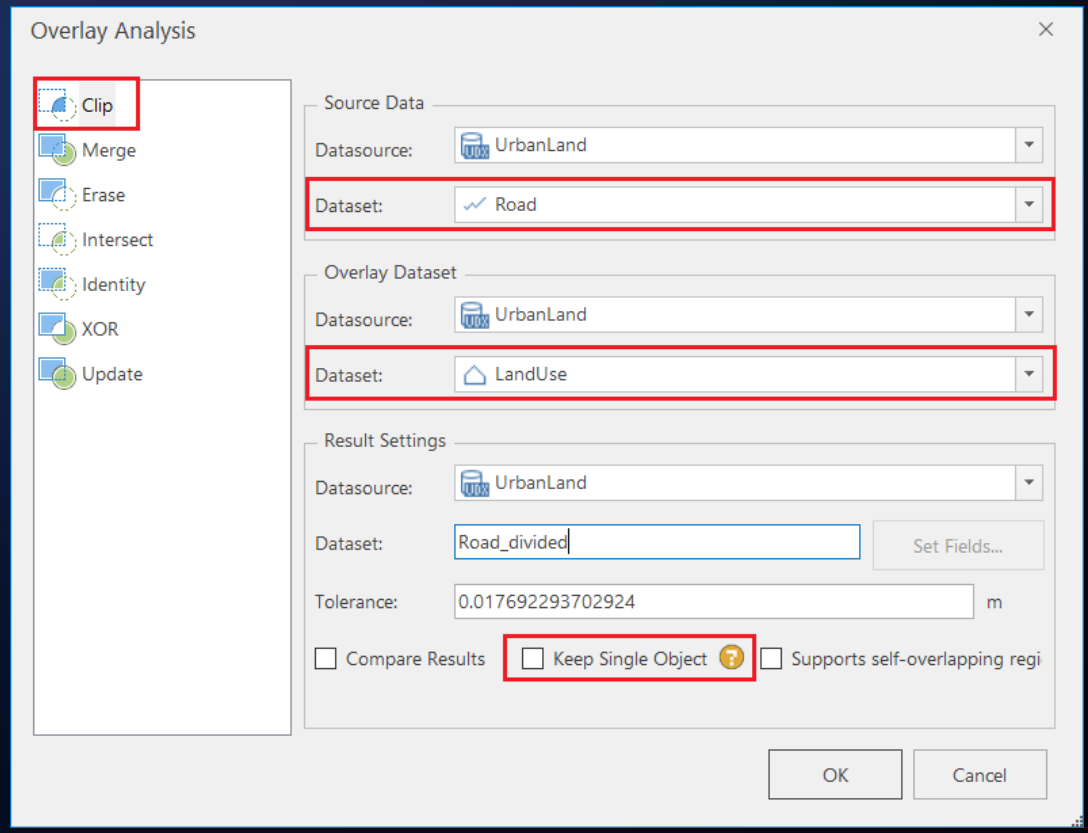
Road density by land pieces

- Field calculation
- Thematic map



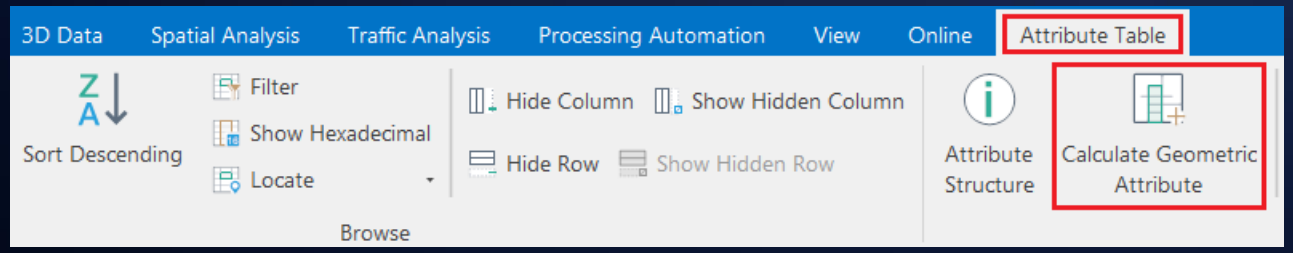
Divide Roads by Land Boundaries: Overlay

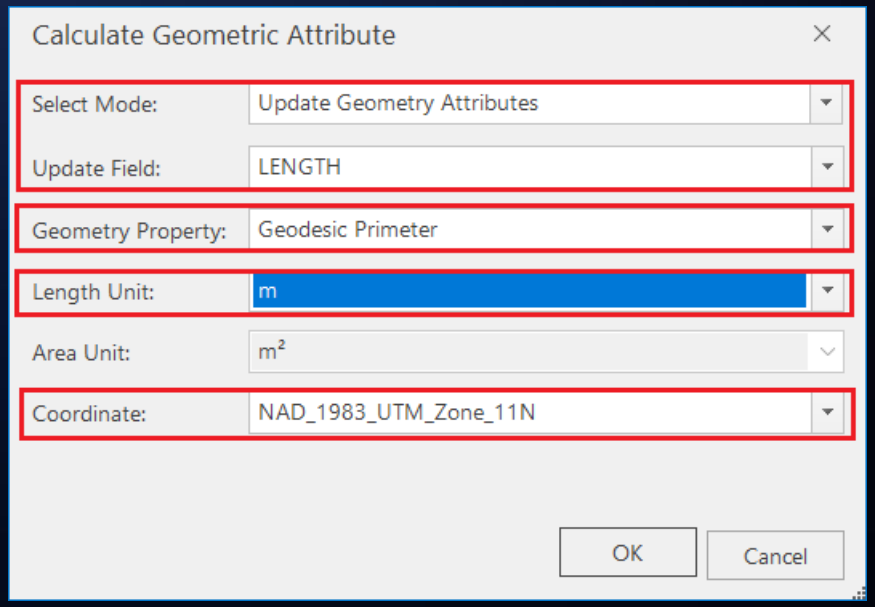
- Spatial Analysis → Overlay Analysis
- Uncheck “Keep Single Object”



Feature Length: Attribute Calculation

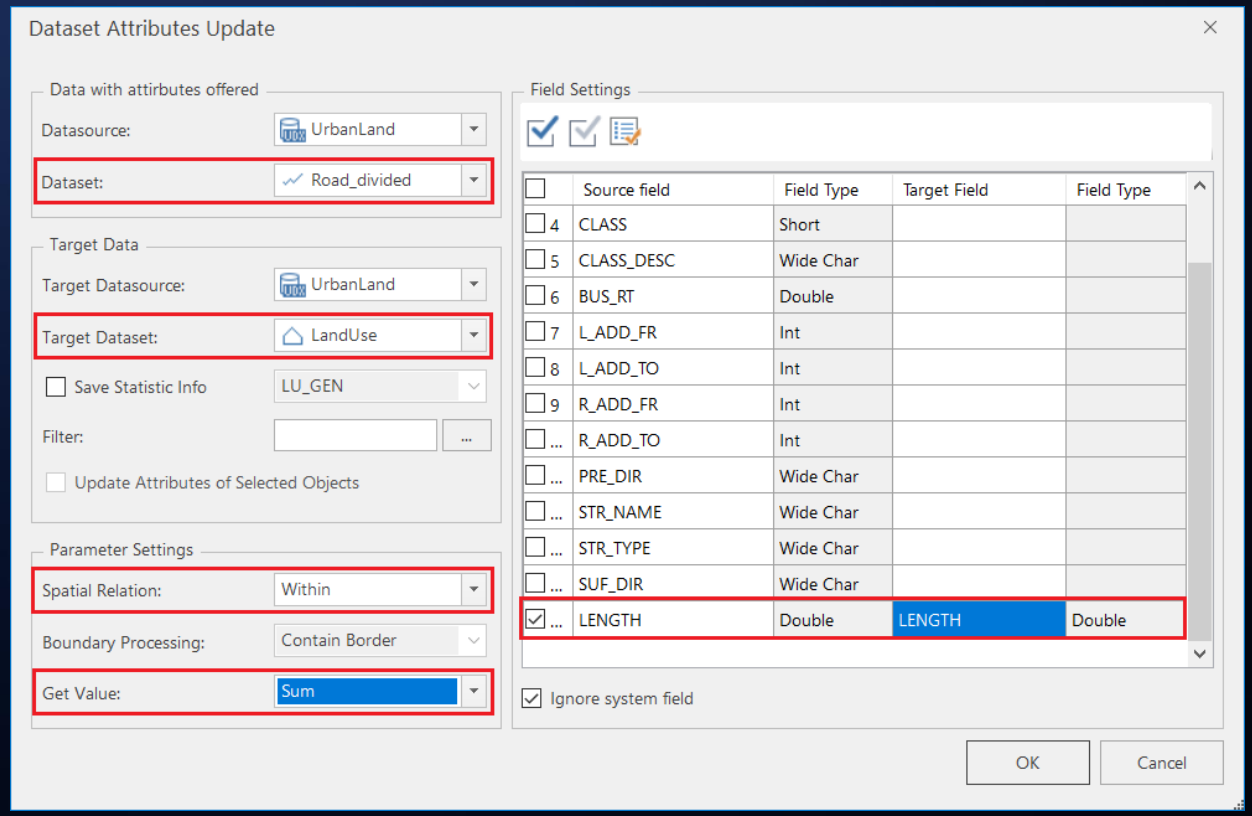
- Browse attribute table of Road_divided
- Attribute Table → Calculate Geometric Attribute





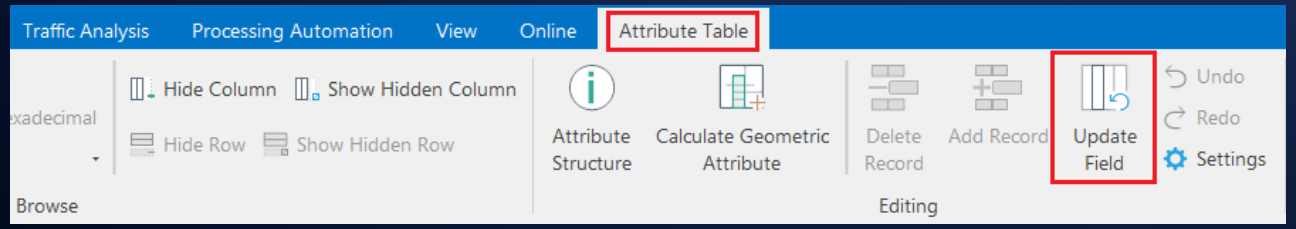
Total Length of Roads by Land Piece: Dataset Attribute Update

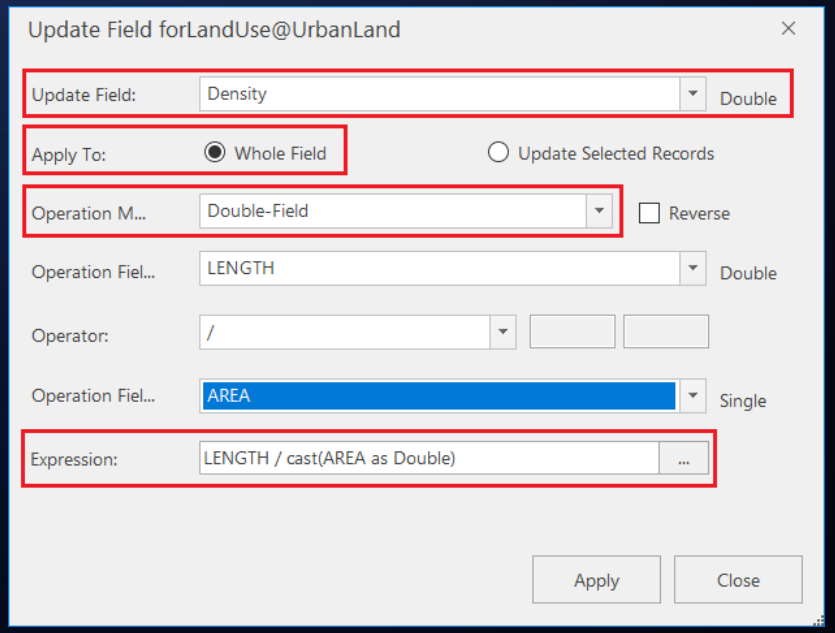
- Data → Dataset Attribute Update



Road Density: Update Field

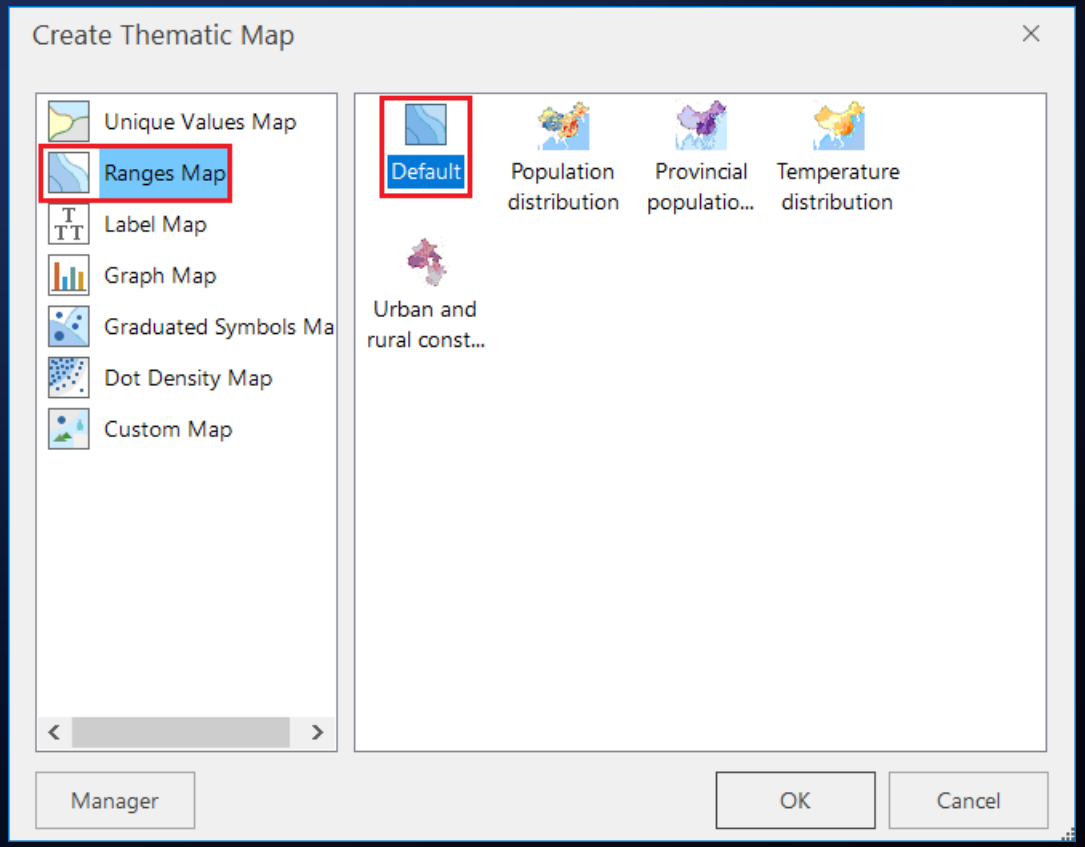
- Attribute Table → Update Field



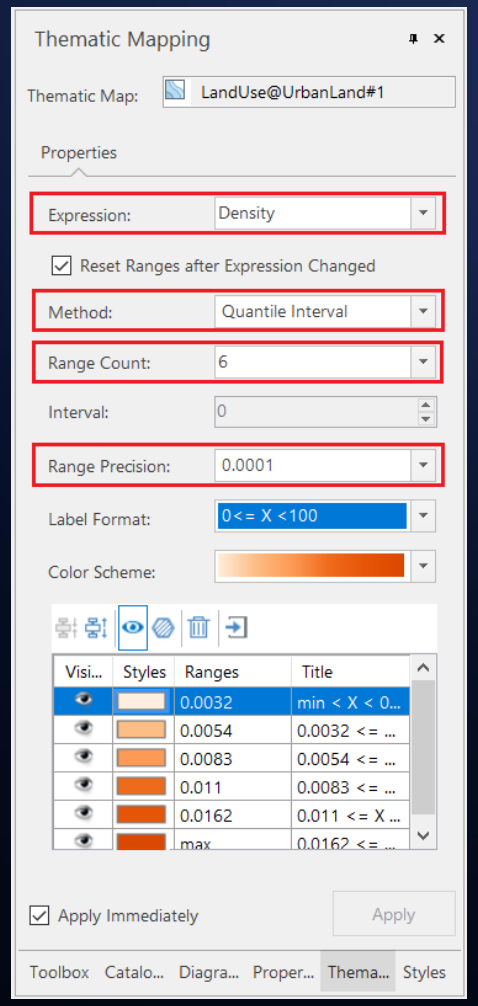


Statistics Visualization: Thematic Map

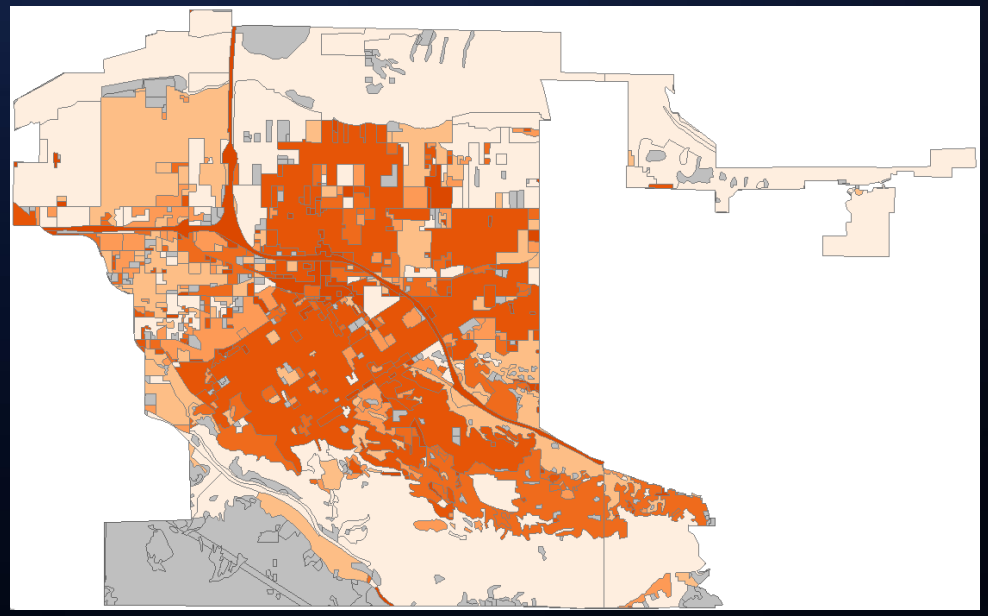
- Add dataset LandUse into map window
- Select LandUse layer in Layer Mananger → right click → Create Thematic Map
- Ranges Map → Default



Statistics Visualization: Thematic Map



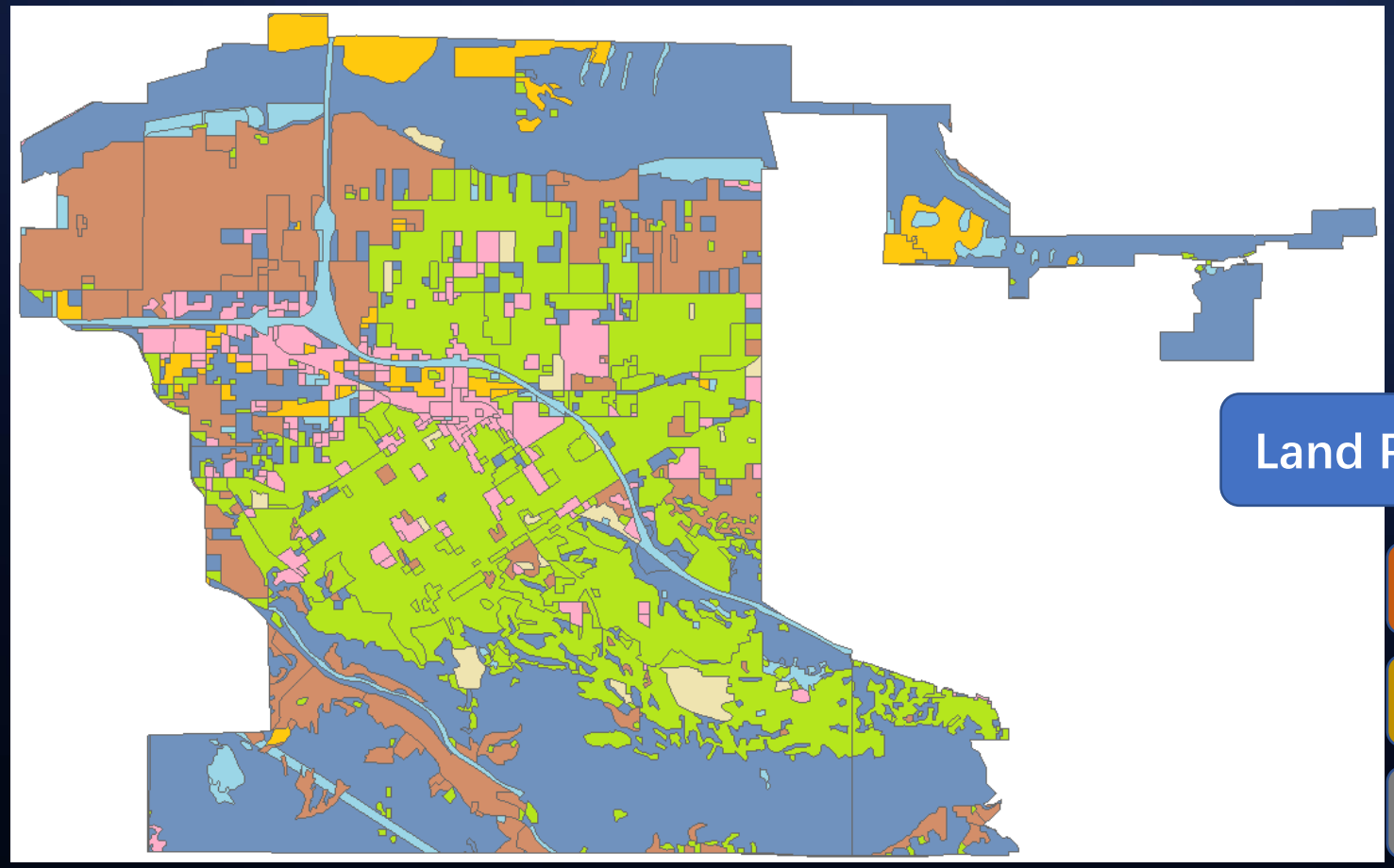
- Expression: Density
- Method: Quantile Interval
- Range Precision: 0.0001



Land Use Distribution

Where is the mean center of each land use category? What are the spatial distribution features for varied land use category?

Geographic Distribution of Land Pieces



Land Pieces by Categories

Distribution Center

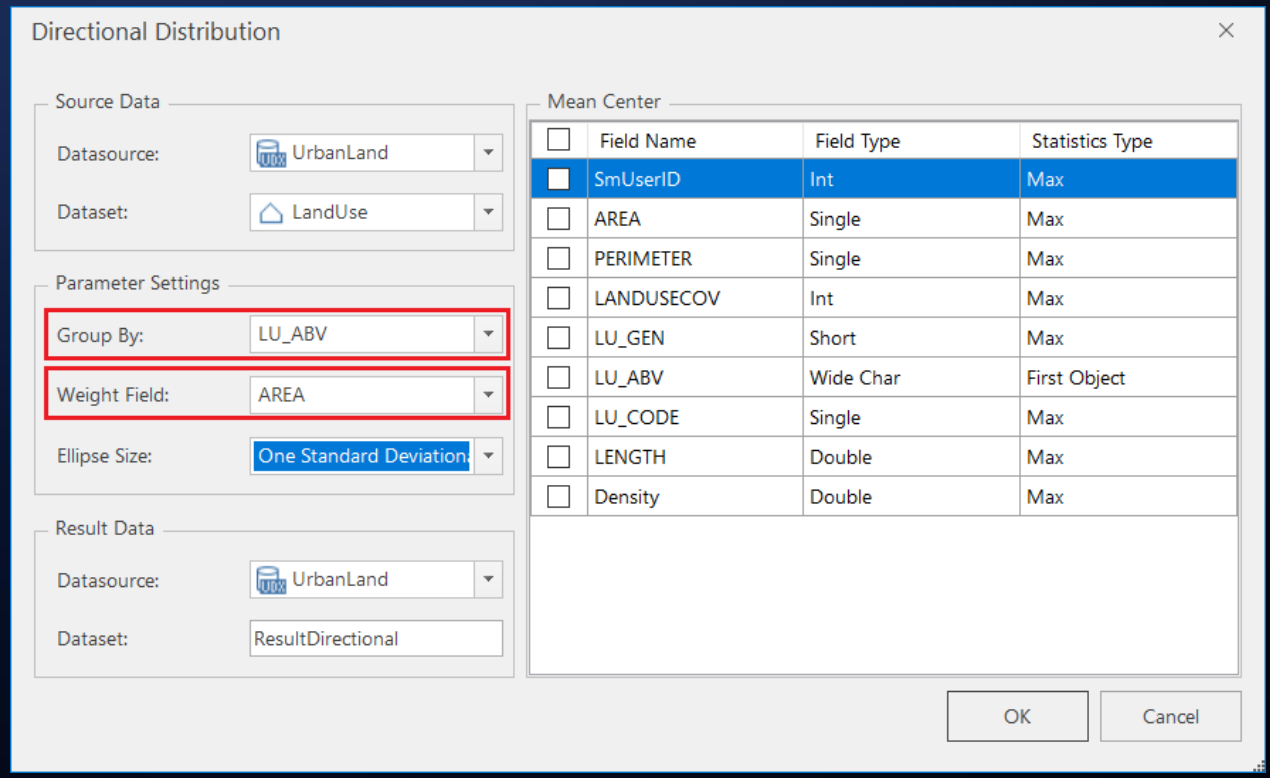
Spread Trend

Proper Visualization

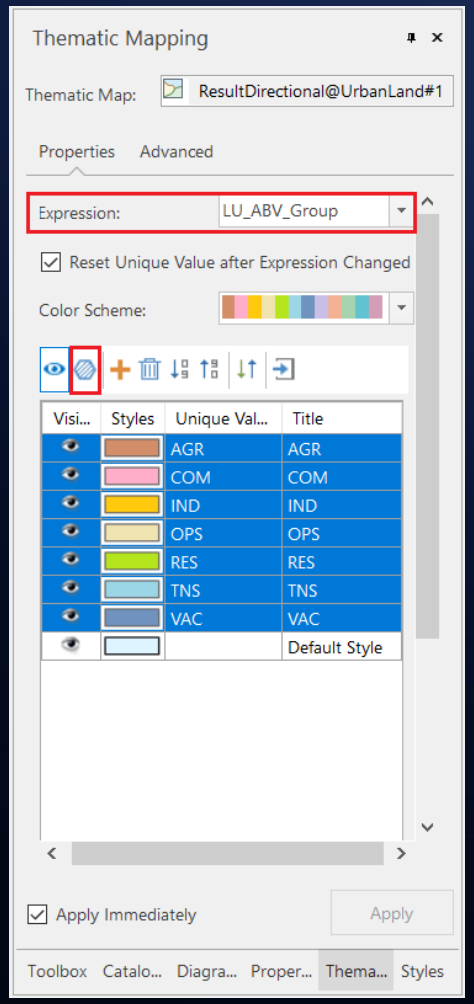
Geographic Distribution: Directional Distribution

- Spatial Analysis → Spatial Statistical Analysis → Measuring Geographic Distributions → Directional Distribution

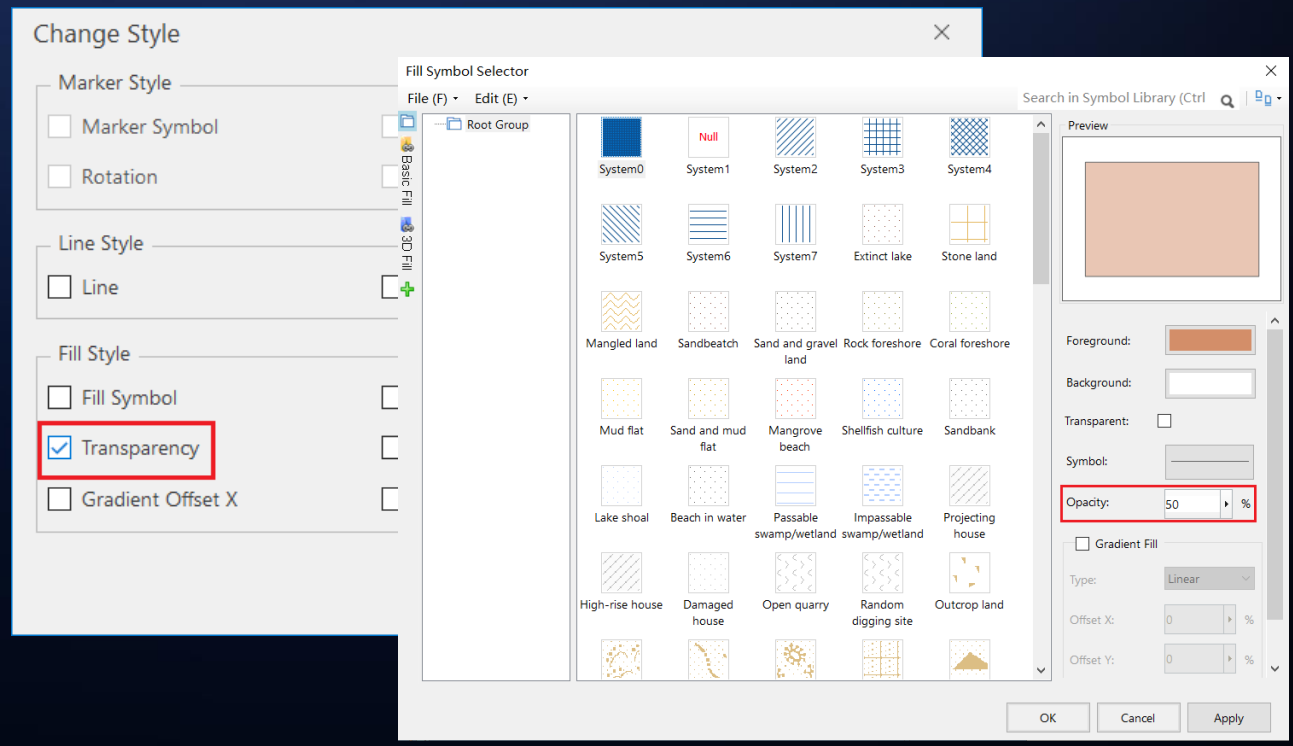
- Group By: LU_ABV
- Weight Field: AREA



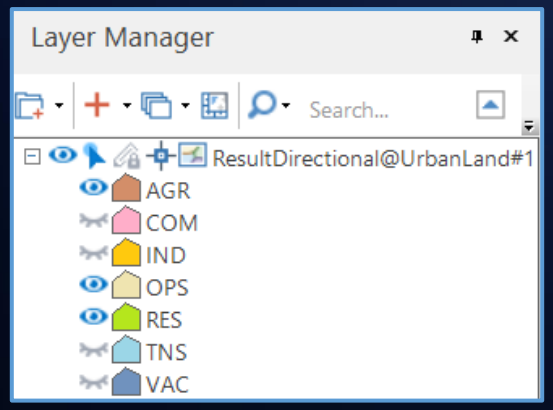
Data Visualization: Create Thematic Map

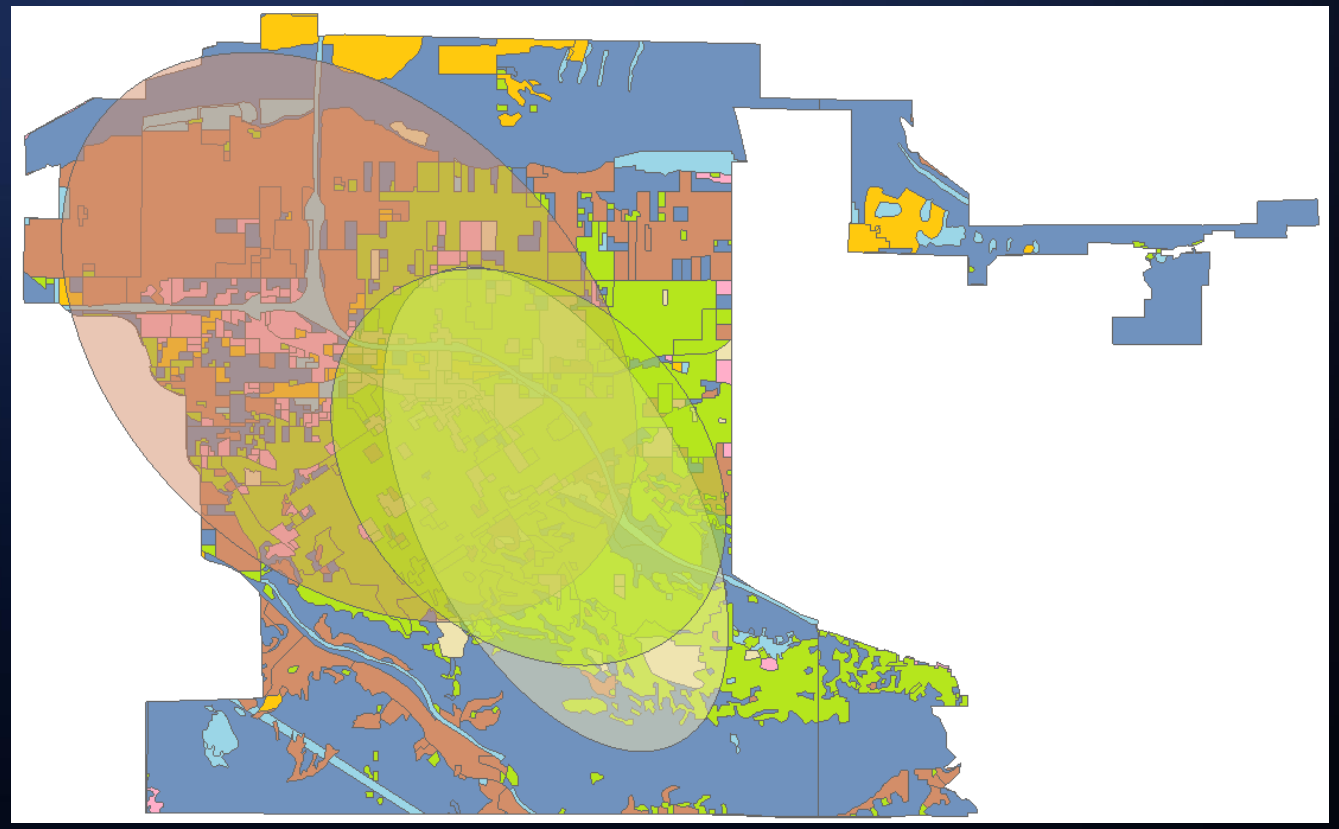


- Expression: LU_ABV_Group
- Change Style: opacity 50%



Data Visualization:
Category Visibility in Thematic Map





Retrospect:
Unique Thematic & Traditional Statistics

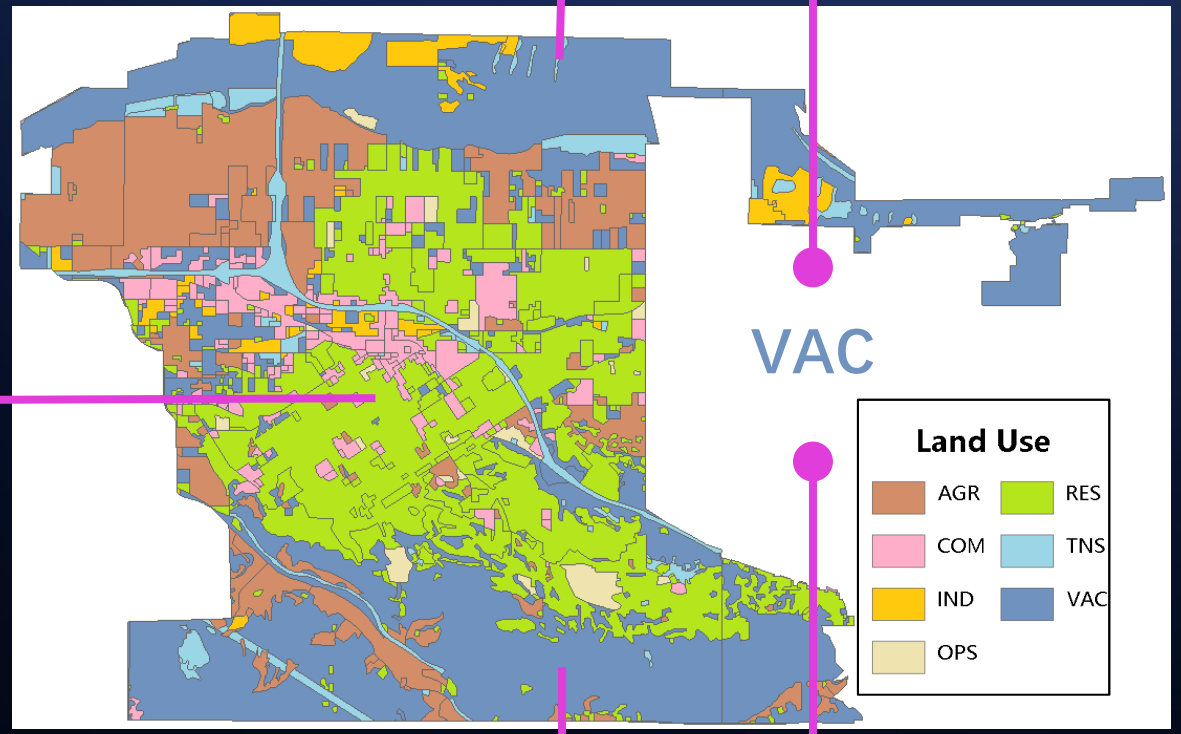
North

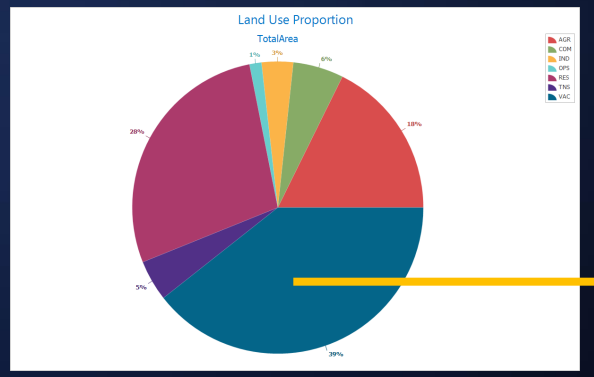
Center

RES

VAC

South



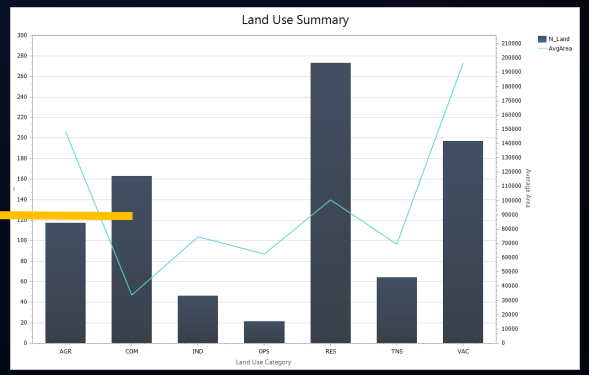


Top 1

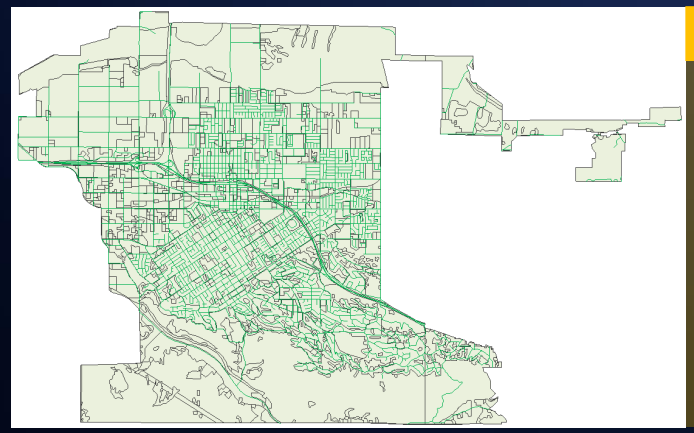
RES

Numerous Small Pieces

COM



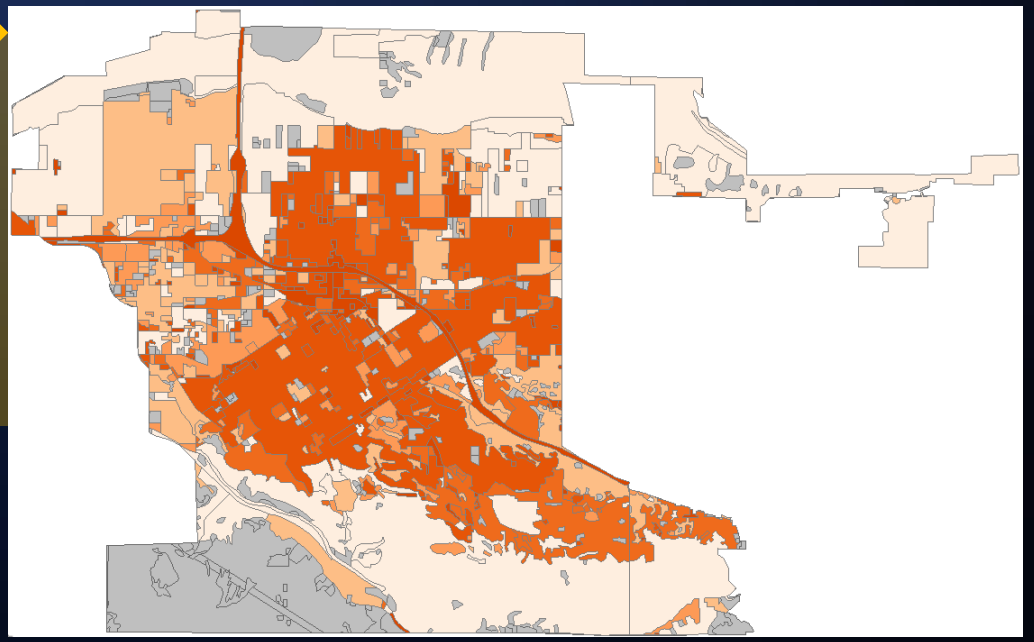
Retrospect:
Relationship between Roads and Land Pieces



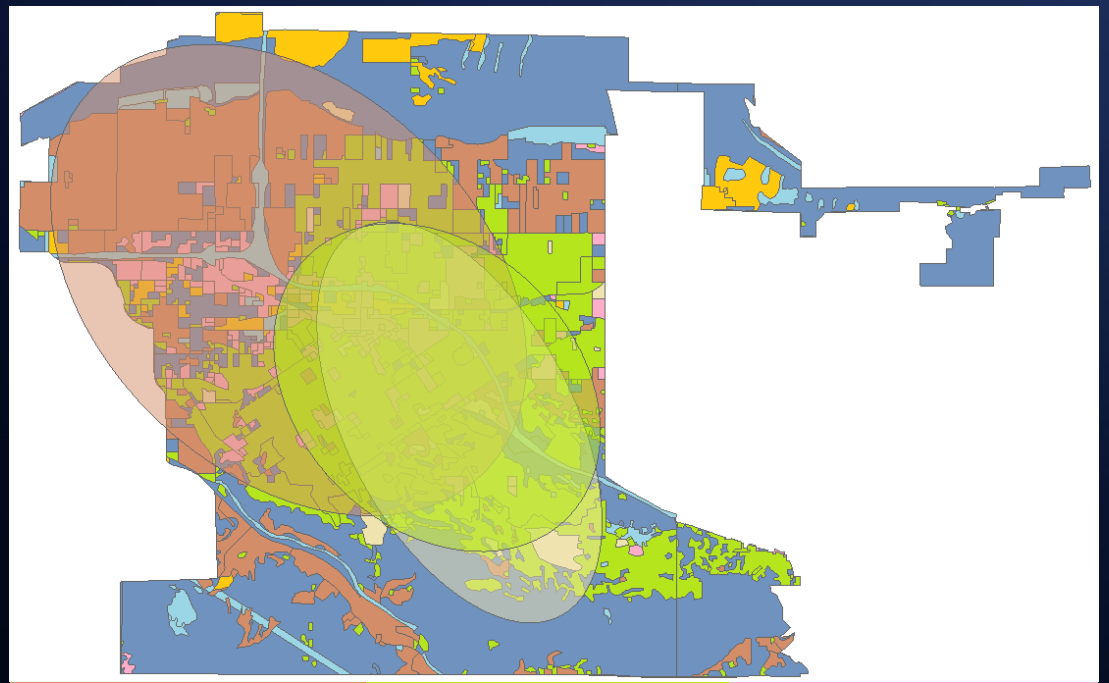
Overlay

Attribute Calculation

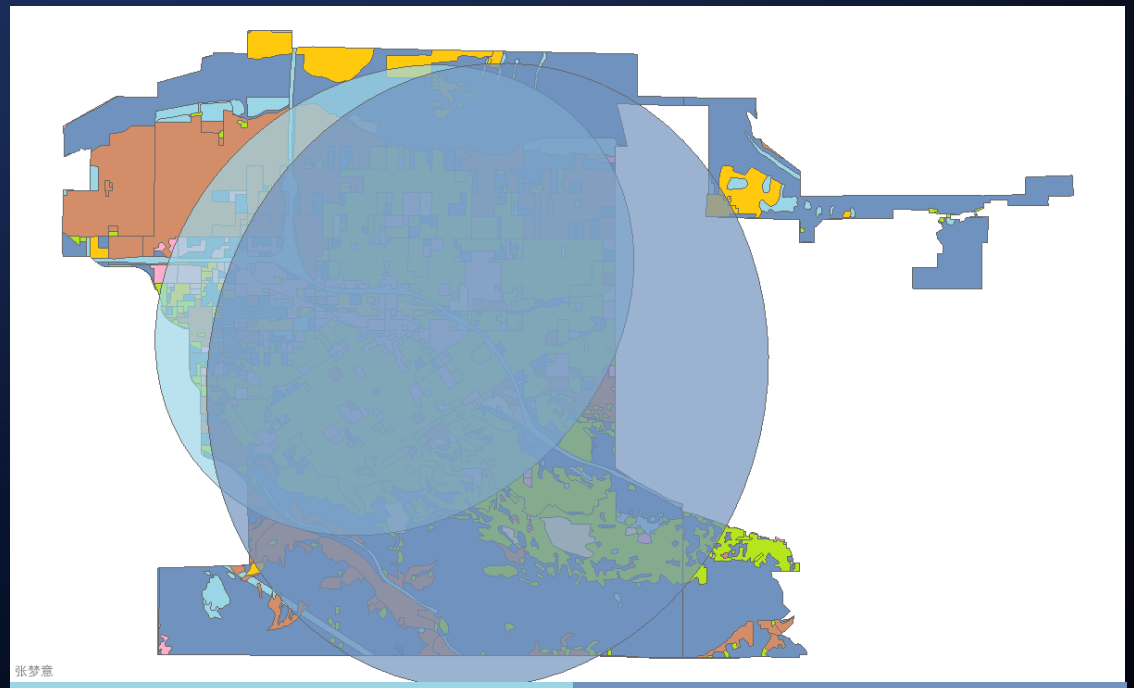
Update Field



Retrospect:
Categories with Similar Distribution Pattern



AGR | RES | COM



TNS | VAC

THANK YOU