



A Deep Dive Into ArcGIS Pro

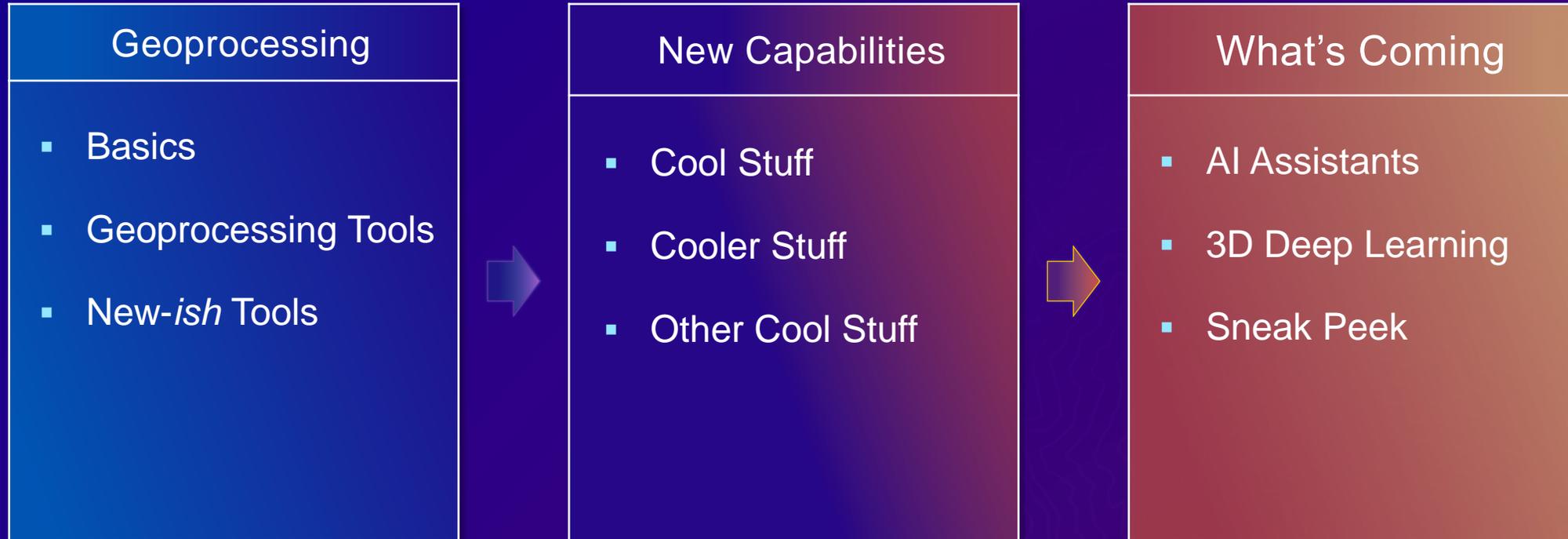
April Micro-Region Event

Ana Rodriguez | Solution Engineer

Esri San Antonio State and Local Government

Agenda

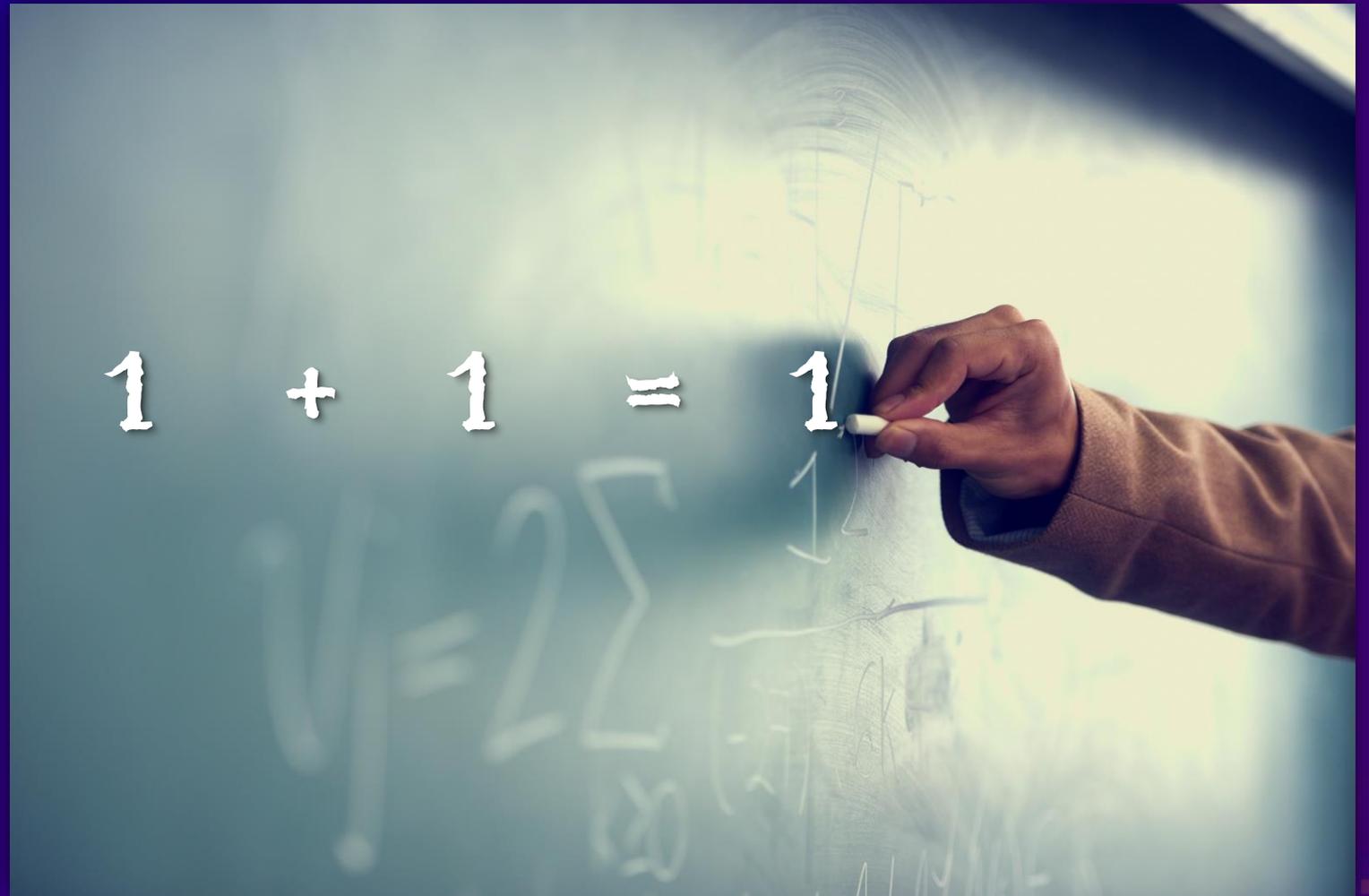
ArcGIS Pro Tools & Capabilities



- Keep an eye out for esriurl.com/ links for more information
- For tips & tricks, look for the star 

THE BASICS

$$1 + 1 = 1$$



GEOPROCESSING BASICS

esriurl.com/what-is-geoprocessing

• What is Geoprocessing?

- Set of tools and operations used to **process** (analyze, manipulate, manage) **geographic** and related data.

- System tools and custom tools

- Workflows & ability to automate tasks using **Model Builder**  or **Python** 

• Where can you find Geoprocessing in ArcGIS Pro?

- **Geoprocessing Pane**

★ **Semantic Search** – AI-enhanced search engine

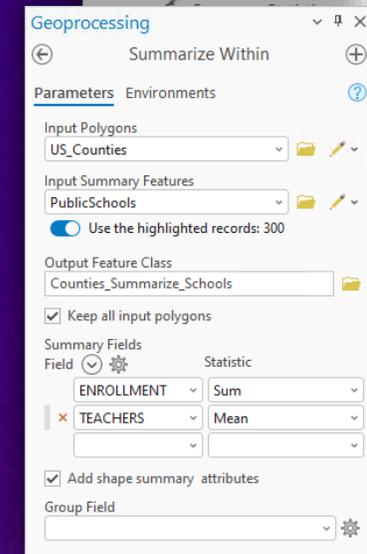
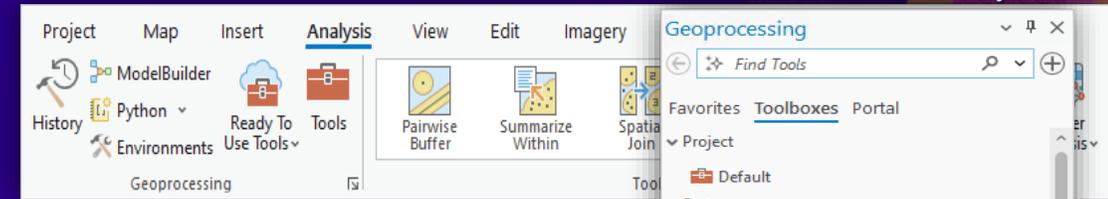
• Geoprocessing **Analysis** tab on the top ribbon.

• Geoprocessing is used behind the scenes.

- Ex. Copy/Paste in the **Catalog**  pane uses the **Copy** tool in the background

Analysis Tab

Toolboxes Library



Tool



Geoprocessing Basics

TOOLS



Use Geoprocessing Tools Efficiently

- Many tools are similarly named or appear to do the same thing, but have different approaches to processing data
 - Tools that utilize **Parallel Processing**
 - Analysis tools: **Overlay** vs **Pairwise Overlay** tools
 - Copying data: **Copy** vs **Copy Features** vs **Export Features**
 - Join tools: **spatial** vs **attribute** joins, **permanent** vs **temporary** joins
 - Tools that operate on single vs multiple fields at a time: **Calculate Field** vs **Calculate Fields (multiple)**, **Add Field** vs **Add Fields (multiple)**
- Use the **appropriate tool** for more efficient workflows

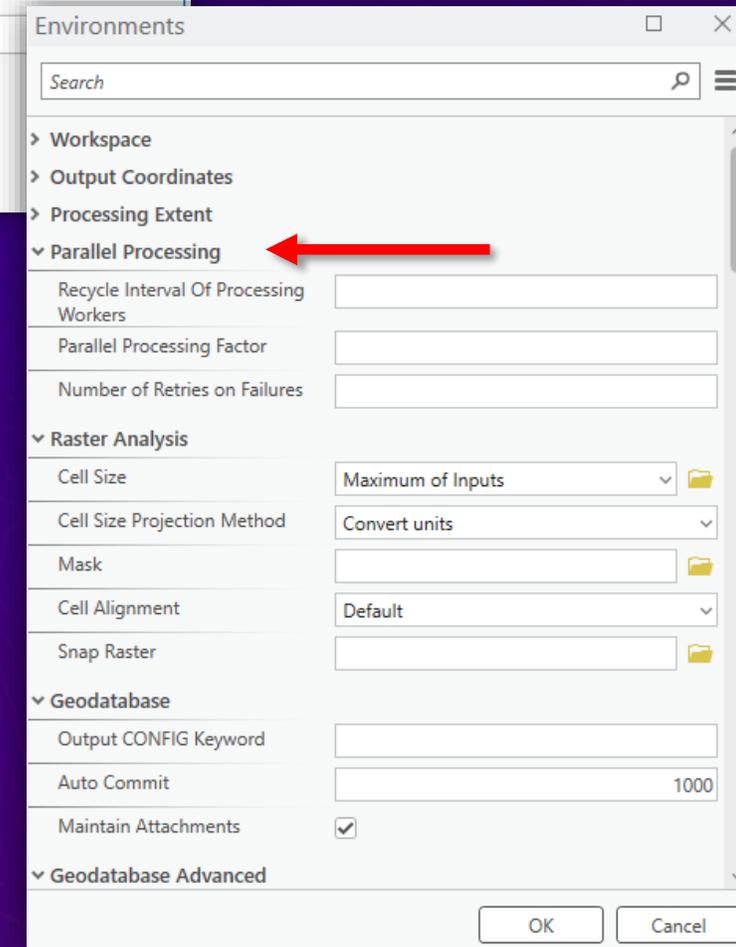
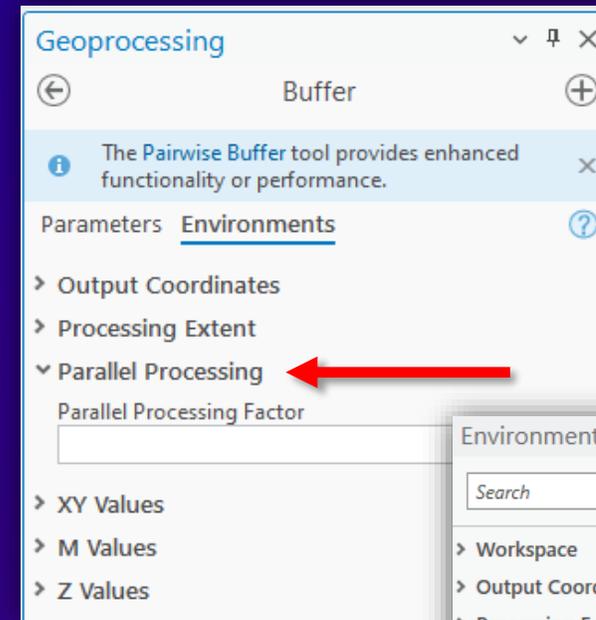


Parallel processing

esriurl.com/parallel-tools

esriurl.com/whats-new

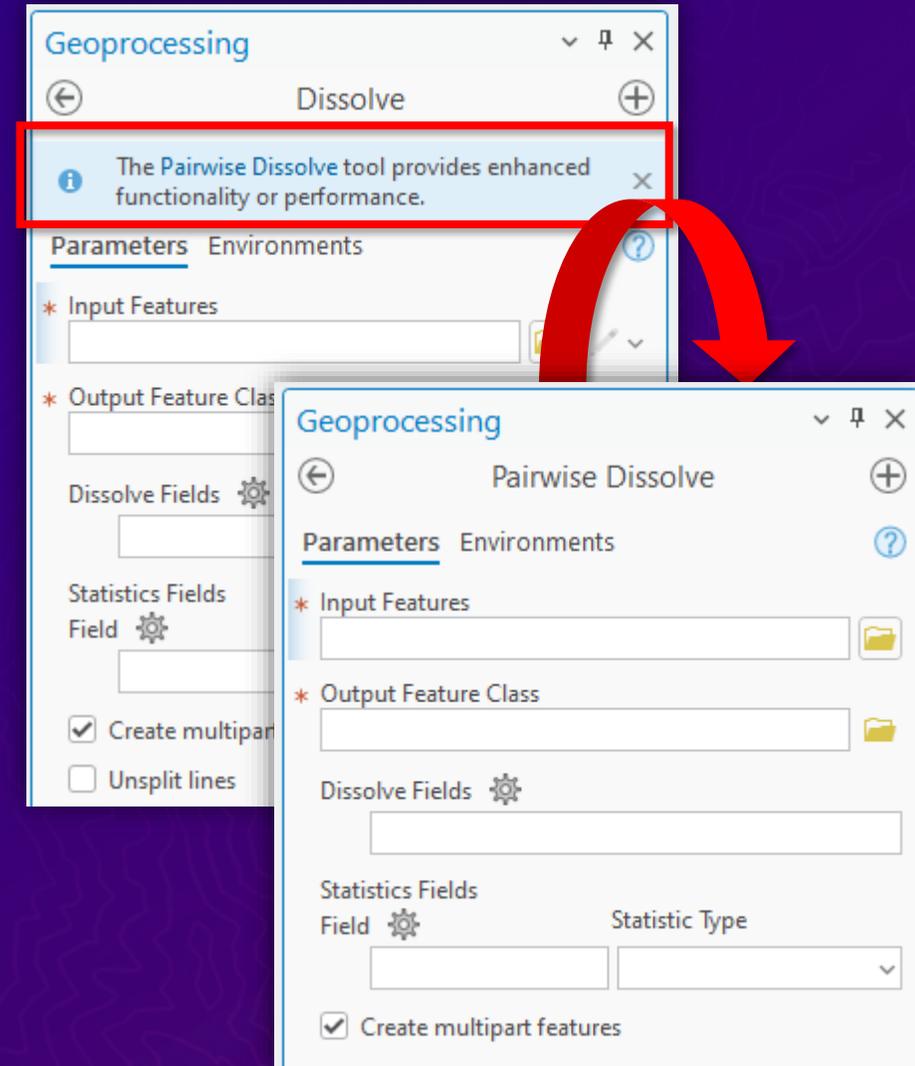
- Some tools support parallel processing
 - Split up large jobs into smaller tasks
- 200+ tools as of ArcGIS Pro 3.3
- ★ The **Parallel Processing Factor** is used to enable and control parallelism
 - An integer or % value
 - Accessed in the Environments window or tab
- Note: experiment but use your best judgement, parallel processing is not *a/ways* on by default, and it **can be slower**



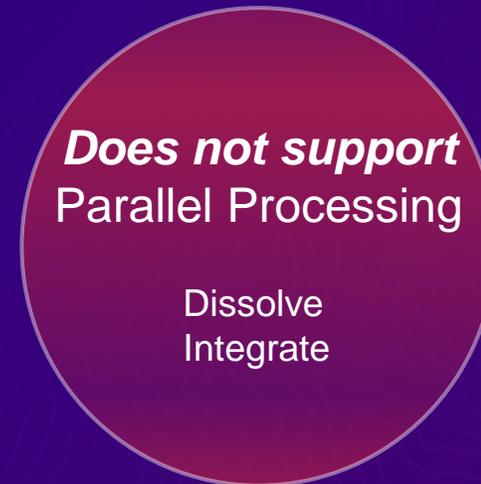
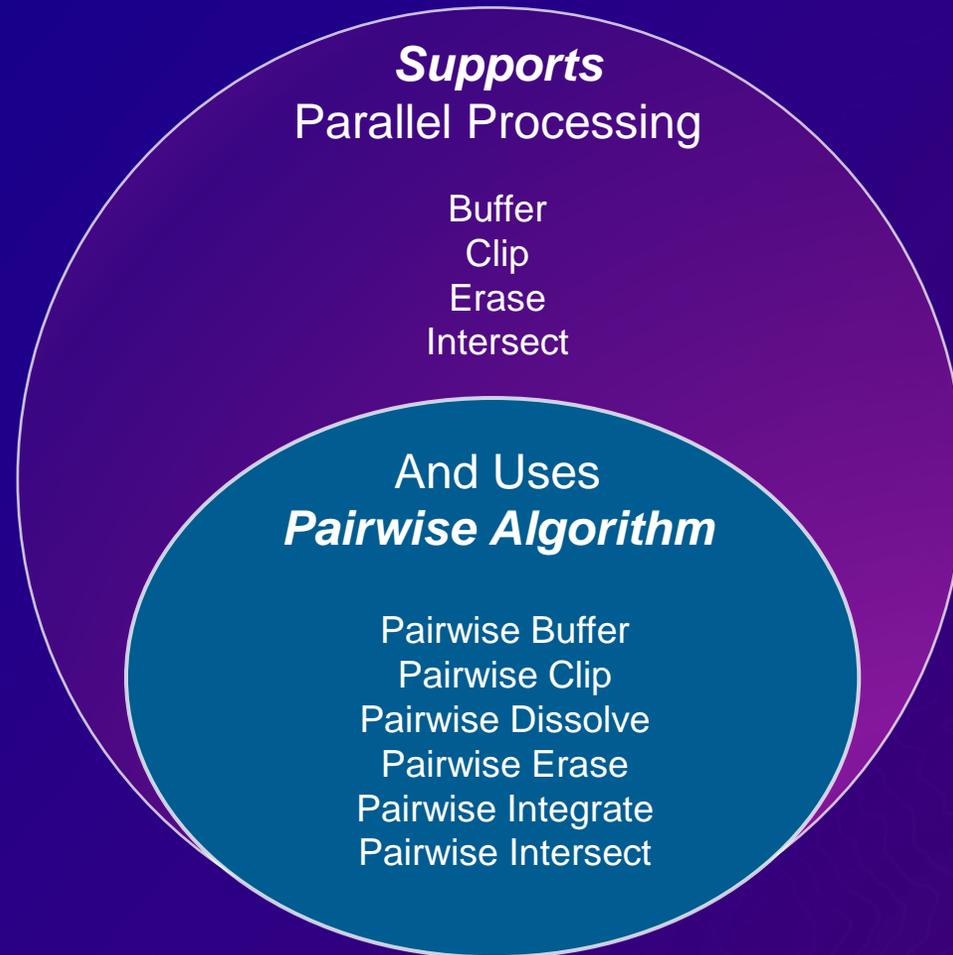
Pairwise Overlay vs Classic Overlay Tools

esriurl.com/pairwise

- The **Pairwise Overlay** tools maximize performance for very large and complex datasets
 - Use an algorithm that deals with the data in discrete, well-defined batches
 - Use parallel processing by default
- Some **classic overlay tools** support parallel processing, but not by default
 - Enable in the **Environments** tab
- ★ Some **Pairwise Overlay** and **Classical Overlay tools** can be used interchangeably but some cannot



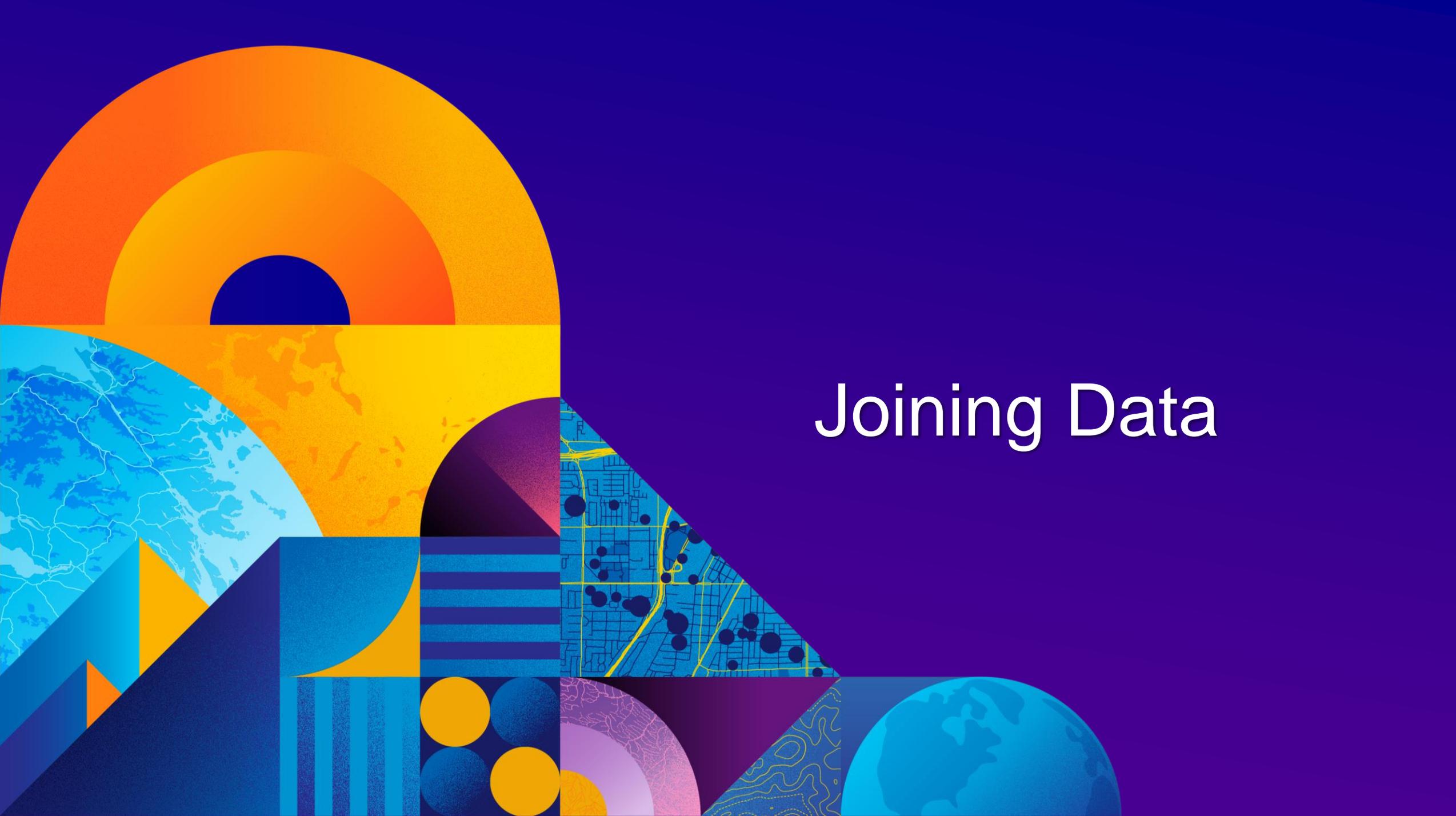
Pairwise Overlay vs Classic Overlay Tools



Copy Tools

esriurl.com/export-copy-data

Tool Name	Add/Edit fields via Field Map	Copies subtypes and domains	Copies relationship classes	Copies attachments	Supports Global IDs	Can Query/Sort	Copying method	★ Speed
Copy Tool / Catalog Pane Copy		✓	✓	Optionally	Optionally		On-disk data	Fastest
Copy Features				Optionally	Optionally		Row by row	Faster
Export Features	✓	✓		Optionally	Optionally	✓	Row by Row	Fast



Joining Data

Join Tools

Summary

Tool Name	Joins are based on attributes between tables	Joins are based on the spatial relationship between features	Supports single or multiple results per match	★ Creates a temporary join in memory	Permanently modifies input dataset	Can use the Field Map control	Join on matching attributes	Index join fields	Creates a new output feature class
Add Join	✓		✓ ¹	✓				✓ ³	
Join Field	✓		✓		✓	✓		✓ ³	
Add Spatial Join		✓	✓ ²	✓	✓ ³	✓	✓ ³		
Spatial Join		✓	✓			✓	✓ ³		✓

1 Multiple results per join are supported if the Input Table has an Object ID field, and the Join Table is in the same database

★ 2 Multiple results from a joined table can be aggregated using the **field map** parameter

3 New in ArcGIS Pro 3.2+ as an optional parameter

New tool highlights (1/2)

esriurl.com/whats-new

• Surface Parameters

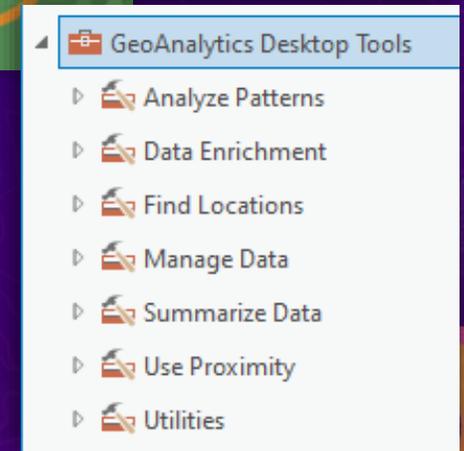
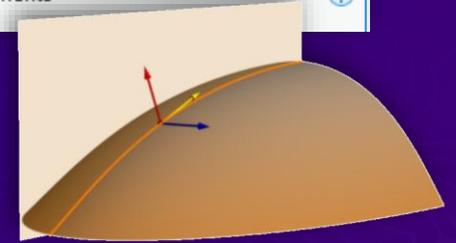
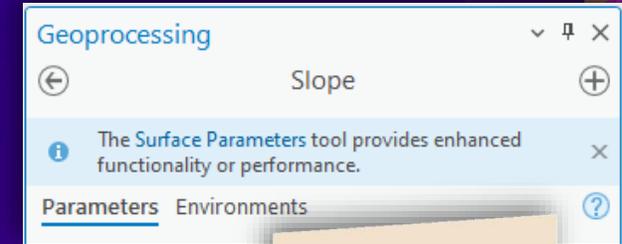
- Can benefit users of the existing **Slope**, **Aspect**, and other surface processing tools
- Can compute more accurate geodesic results, with faster processing time

• Distance (Spatial Analyst Tools)

- Improved geodesic accuracy and performance, new ability to consider units of vertical coordinate systems
- Available with **Spatial Analyst** license

• GeoAnalytics Desktop Tools

- Similar tools to the **Analysis** toolbox
- Utilize **distributed processing** using Spark
- Advanced license, but does not require a special extension license or hardware



New tool highlights (2/2)

esriurl.com/whats-new

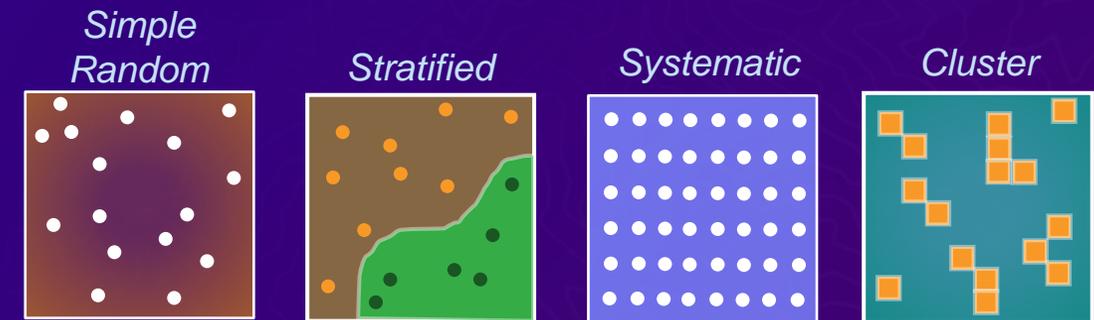
• Apportion Polygon

- Proportionally distributes the count-based attributes of input polygons to a target polygon based on the percentage of the target that overlays the input



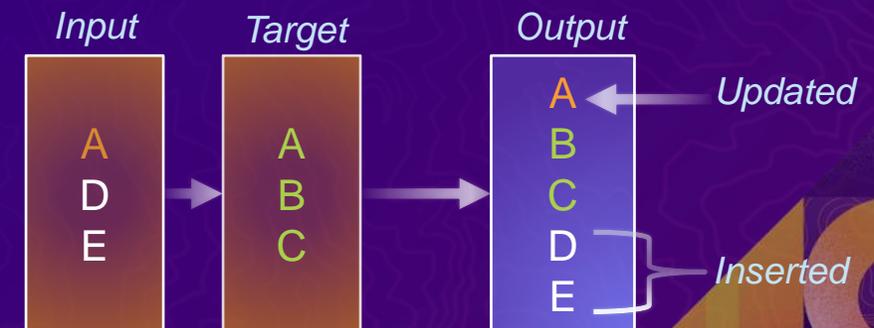
• Create Spatial Sampling Locations

- Scientifically appropriate method of generating random points



• Append

- Upsert (Update + Insert) enhancement
- New update options based on specified matching fields
- Derived output parameters let you see the total number of rows inserted and updated



THE COOL STUFF



WHAT'S
COMING





esri[®]

**THE
SCIENCE
OF
WHERE**[®]

[Add section title]



[Add topic]

- [Add subtopic]
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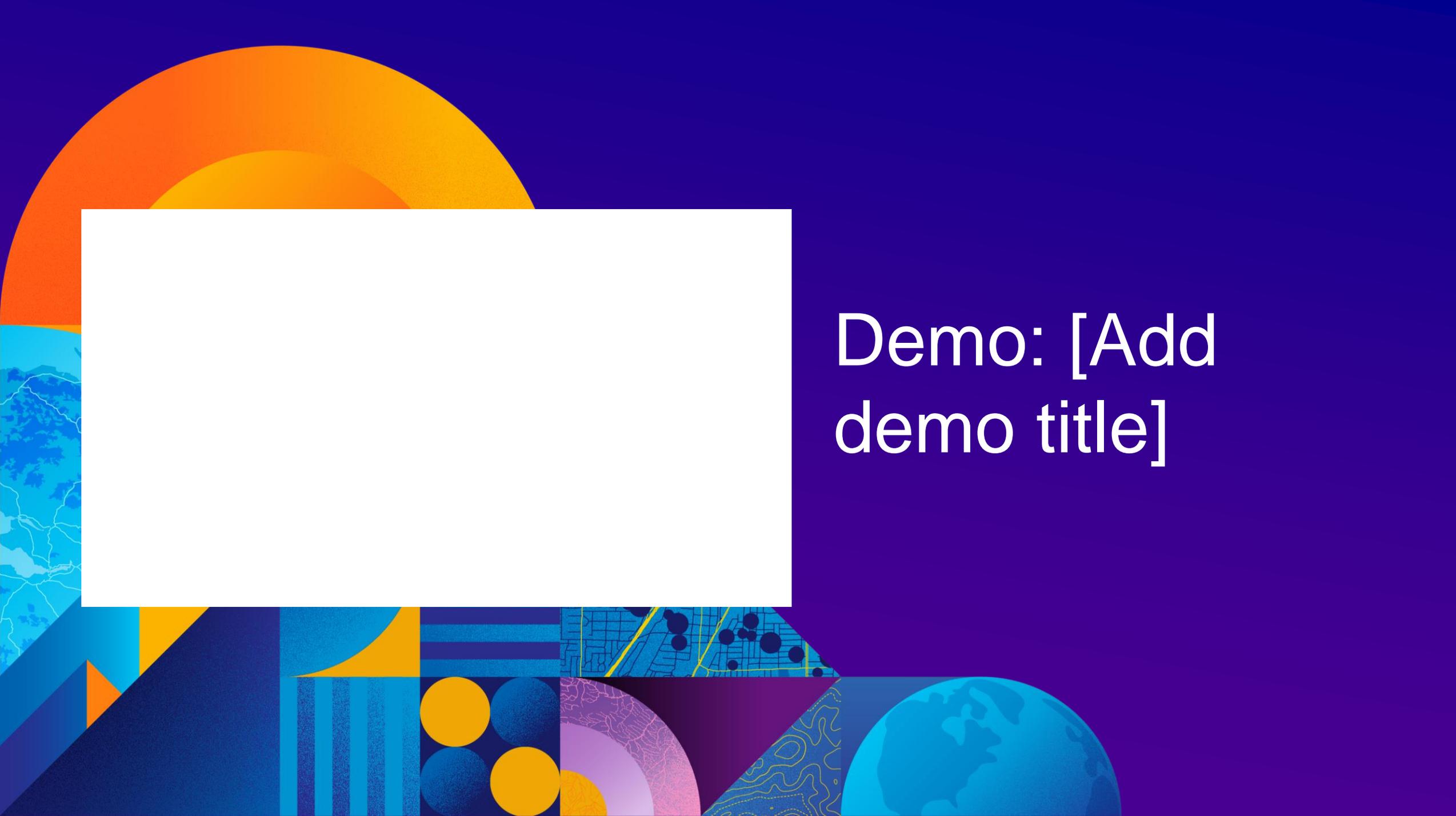
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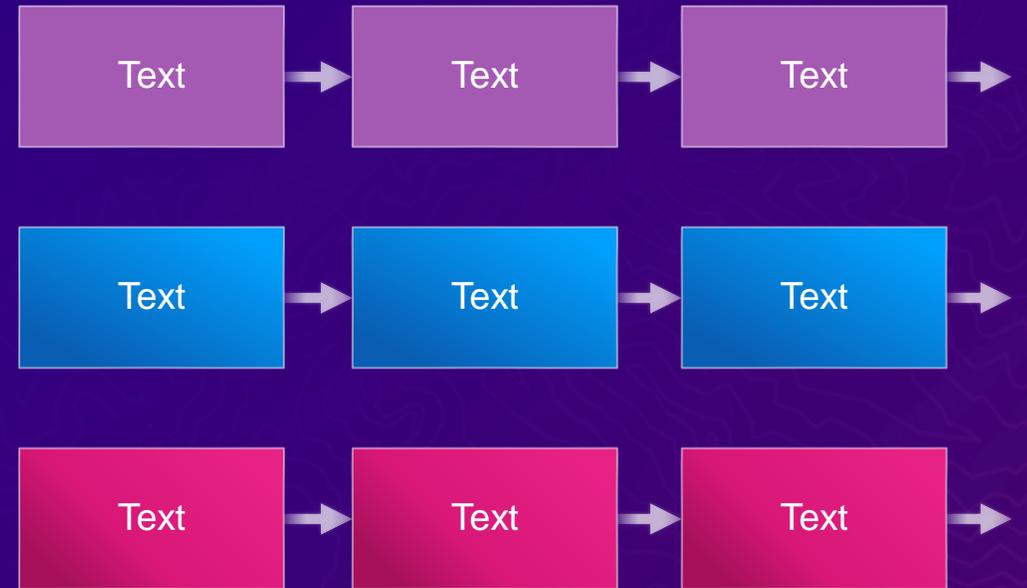
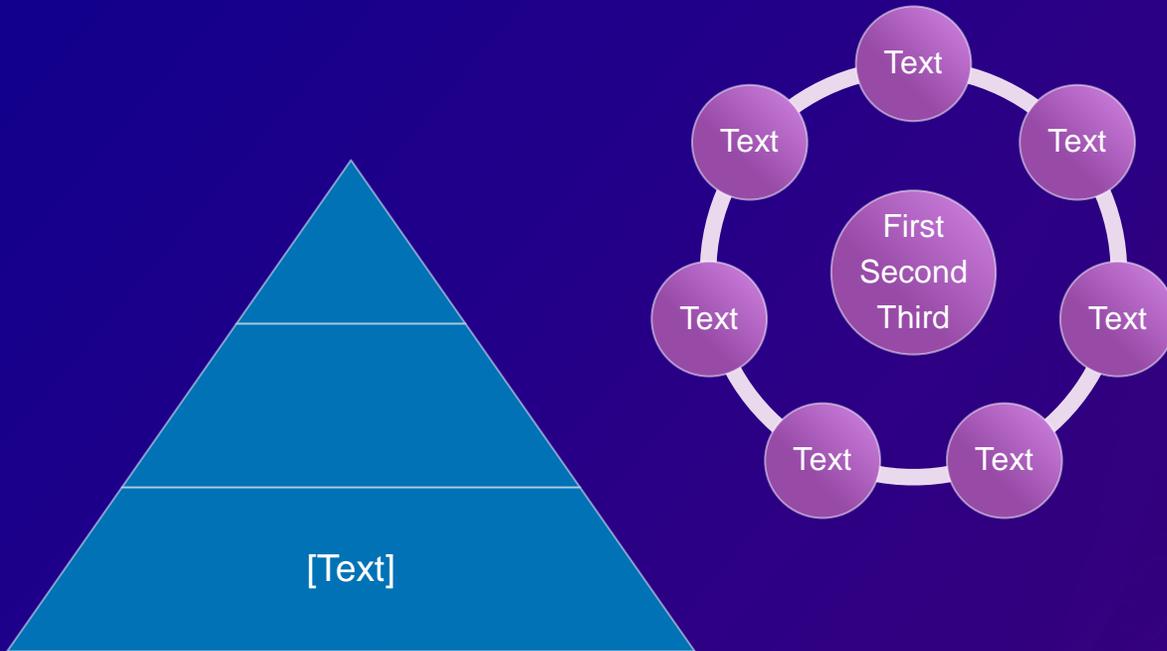


Demo: [Add
demo title]

Acknowledgments

- [Add acknowledgment]
- [Add acknowledgment]
- [Add acknowledgment]

Color suggestions



Use Copy/Paste Formatting

to apply these color options



Solids



Gradients

For additional diagram options, see the [Diagrams, Tables, and Timelines template](#)

What is [add product name, capability, or technology]?

- [Add simple description of product, capability, or technology]
 - [Add capability]
 - [Add capability]
 - [Add capability]

What is [add product name, capability, or technology]?

- [Add simple description of product, capability, or technology]
 - [Add capability]
 - [Add capability]
 - [Add capability]

Highlights

- [Add highlight]
- [Add highlight]
- [Add highlight]
- [Add highlight]

What's new with [add product or solution name]?

- [Add enhanced functionality]
- [Add enhanced functionality]

- [Add new functionality]
- [Add new functionality]

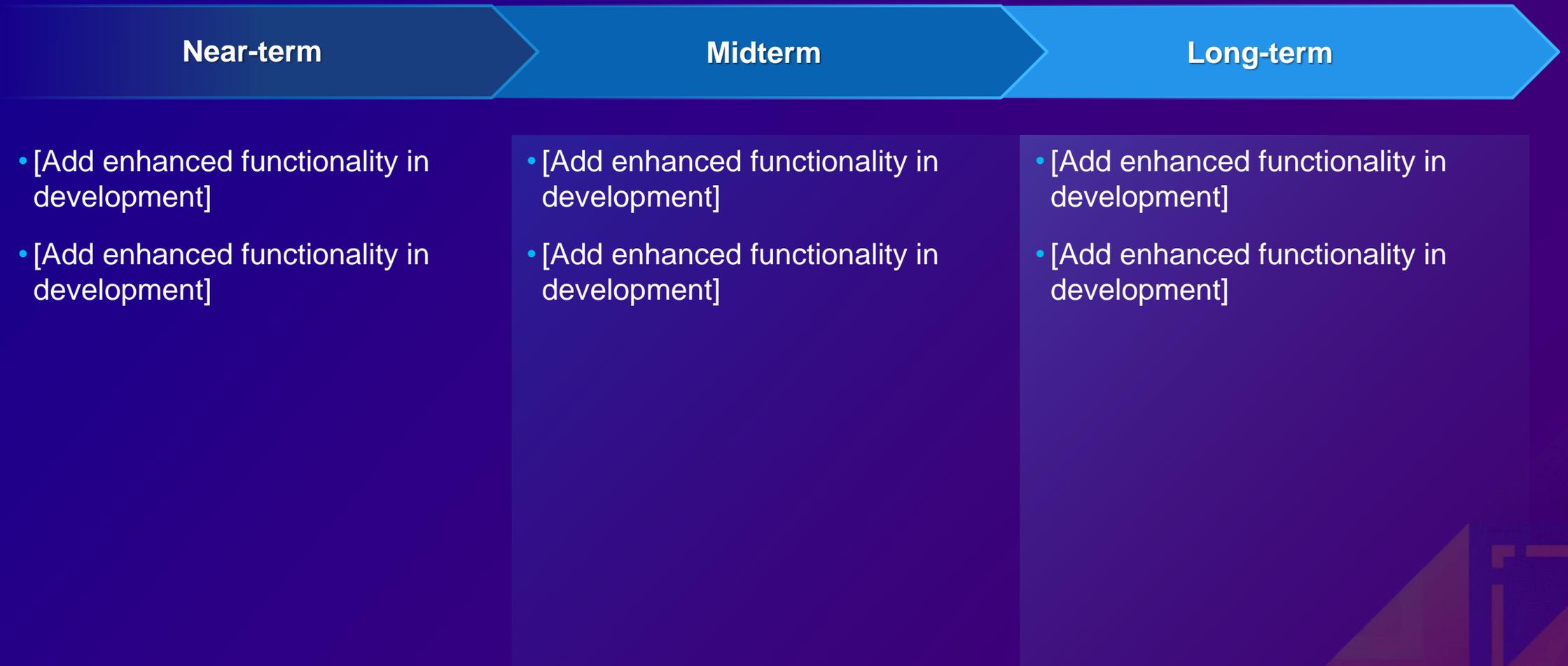
[Add topic]

- [Add enhanced functionality]
- [Add enhanced functionality]

- [Add new functionality]
- [Add new functionality]



[Add product or solution name] road map





What is [add product name, capability, or technology]?

- [Add description]
 - [Add description]
 - [Add description]
- 

[Add product name] vision and strategy

- [Add subtopic]
- [Add subtopic]
- [Add subtopic]

What is [add feature]?

- [Add simple description of application or solution type]
 - [Add capability]
 - [Add capability]
 - [Add capability]

[Add topic]

Currently available	Changes coming
<ul style="list-style-type: none"><li data-bbox="224 651 881 696">• [Add existing functionality A]<li data-bbox="224 739 881 785">• [Add existing functionality B]	<ul style="list-style-type: none"><li data-bbox="1312 651 2048 753">• [Add enhanced functionality A in development]<li data-bbox="1312 796 2048 899">• [Add enhanced functionality B in development]

[Add topic]

Currently available

[Replace with visual of existing functionality]

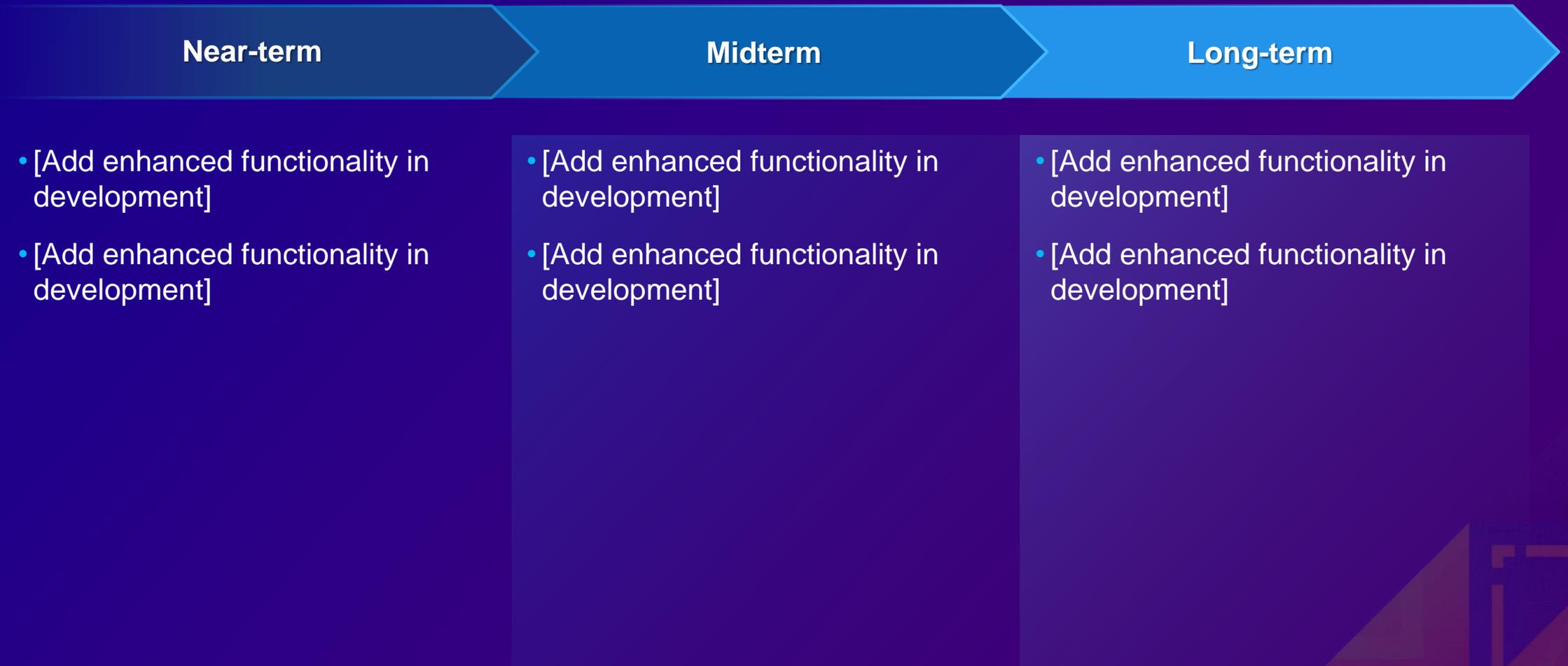
[Add optional caption]

Changes coming

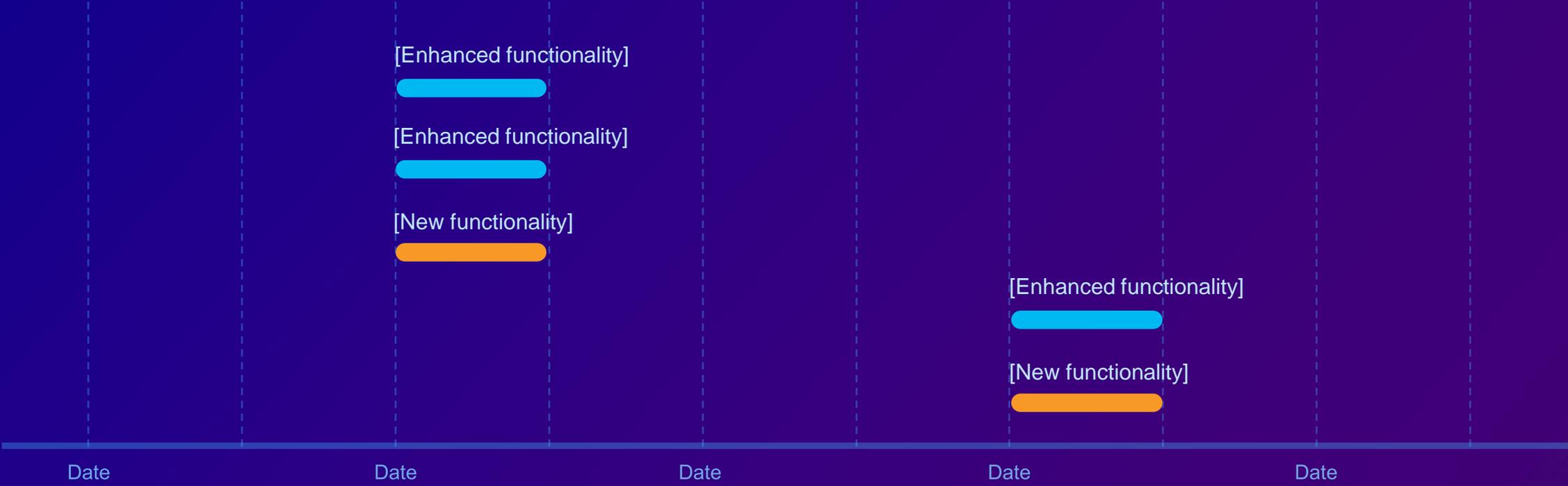
[Replace with visual of enhanced functionality]

[Add optional caption]

[Add product or solution name] road map



[Add product name] release schedule



What is [add product name]?

- [Add simple description of application or solution type]
 - [Add capability]
 - [Add capability]
 - [Add capability]

Highlights

- [Add highlight]
- [Add highlight]
- [Add highlight]
- [Add highlight]

[Add product name] release schedule

