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ArcGIS Aviation Charting: Transition Guide to ArcGIS Pro

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ArcGIS Aviation Charting: Transition Guide to ArcGIS Pro

Executive Summary

Esri is pleased to present this guide for transitioning your ArcGIS® Aviation Charting production system from ArcMap™ software to ArcGIS Pro. This document outlines considerations, recommendations, and best practices for an efficient transition and is intended for geographic information system (GIS) professionals who have experience configuring and using ArcGIS Aviation Charting in ArcMap. Transitioning your ArcGIS Aviation Charting system from ArcMap to ArcGIS Pro will be a significant undertaking but will provide many advantages and efficiencies that will help your organization achieve its business objectives. There are several factors and considerations within this document intended to help prepare your organization for the transition to ArcGIS Pro.

This ArcGIS Aviation Charting transition guide is intended to complement other ArcGIS Pro documentation published by Esri:

- [ArcGIS Pro Migration Guide](#)
- [ArcGIS Pro Implementation Guide](#)
- [Introduction to ArcGIS Pro](#) (Online Help Documentation)
- [Switching to ArcGIS Pro from ArcMap](#) (Esri Press Book)

Advantages of ArcGIS Pro

ArcGIS Pro is Esri's latest professional desktop GIS application. It isn't an update to ArcMap but a new application designed to provide the same capabilities while incorporating and taking advantage of the most modern technology. ArcGIS Pro will seem both familiar and new to users of ArcMap since it integrates the functions of ArcMap, ArcCatalog™, ArcToolbox™, and ArcGlobe™ software within a modern user interface using a ribbon with tabs and context-sensitive menus. Much of the architecture and terminology will persist in this new paradigm; however, the implementation and details of how these functions are accessed and manipulated will take a different approach in some cases. Although it is different in many ways, ArcGIS Pro has the equivalent capabilities of ArcMap and features more powerful computing; an intuitive, accessible design; advanced sharing capabilities; and much more. Some advantages of moving to ArcGIS Pro are the following:

Improved User Experience

The latest version of ArcGIS Pro delivers a more modern and intuitive user interface, including new features and capabilities that users have been asking for. Toolbars have been replaced with a customizable ribbon that updates contextually depending on what you're doing within the application, and views and panes can be docked to allow you to navigate easily between tools, maps, tables, and layouts. ArcGIS Pro embraces a project-based design that can maintain multiple maps, 3D scenes, and

layouts in a single interface eliminating the need to open separate programs for individual tasks.

Enhanced Performance and Productivity

ArcGIS Pro is a modern 64-bit, multithreaded desktop application optimized to deliver high-performance experience on modern hardware. Its powerful processing and upgraded display engine allow the seamless integration of 2D and 3D information including faster response, visualization, analysis, and editing. These efficiencies allow you to execute standard GIS workflows in fewer steps and in less time.

Increased Collaboration

ArcGIS Pro is tightly connected with ArcGIS Online and ArcGIS Enterprise, which simplifies the sharing of GIS data, workflows, and other resources between users and organizations. Content is shared with users within the application through Portal for ArcGIS including ArcGIS Living Atlas of the World, an Esri-curated resource of data, basemaps, and millions of third-party datasets made available at no cost on ArcGIS Online.

ArcMap Compatibility

ArcMap and ArcGIS Pro can be installed and run on the same computer providing organizations with more time to make the transition. They use the same data architecture, so you can continue to work with the same datasets using either program. Maps, layouts, symbology, and models created in any ArcMap version can be ported into ArcGIS Pro with minimal changes. Once your projects are in ArcGIS Pro, you'll find all the same functionality available (with very few exceptions) plus new updates not available in ArcMap. ArcMap will continue to be available, and organizations can continue to use it, but it will no longer be updated. For more information regarding the product life cycle of ArcMap, please refer to the [Esri Support Product Life Cycles website](#).

Considerations for Transitioning to ArcGIS Aviation Charting for ArcGIS Pro

Many of the core principles of Esri's data-driven cartographic production system remain the same in ArcGIS Pro. ArcGIS Aviation Charting has also leveraged the powerful new capabilities in ArcGIS Pro to make data management and cartographic production processes more performant and efficient. The strategy for transitioning your organization's current chart production configuration into ArcGIS Pro begins with understanding the differences between the two environments. Below is a list of capabilities and functions in ArcGIS Aviation Charting that should be considered when planning your organization's transition strategy.

AIS Data Model

The AIS model is regularly updated to accommodate various international standards and technology-specific requirements. Your production database should be updated to the latest version of the AIS data model to support the most recent data management and exchange improvements.

Chart Management

The Product Library from ArcMap has been deprecated in ArcGIS Pro. The Product Library was used to store all the cartographic production information for your catalog of chart products, including business rules, chart extents, and even map documents. Now, most of this information is stored in tables within the AIS geodatabase. An AOI feature class stores chart extents as features, with chart-specific attributes on each feature to support the cartographic workflow. Other tables store cartographic exceptions and extraction query information if needed. This approach allows for more automation throughout the workflow and lets you organize your project files and related documents according to your organization's best practices. In addition, existing AOIs and extraction queries can be transitioned to the new AIS data model in ArcGIS Pro and used to generate chart products with minimal effort.

Cartographic Configuration

The Visual Specifications tool (VST) from ArcMap has been deprecated in ArcGIS Pro. VST rules were composed of two distinct parts: a SQL expression to gather attribute information from related features and a VBScript expression to apply charting logic using the gathered information. This functionality has been separated in ArcGIS Aviation Charting for ArcGIS Pro. A new tool called [Prepare Aviation Data](#) performs the data mining and the business rules for symbology, and annotation is applied using ArcGIS Pro software's new native scripting language, [ArcGIS Arcade](#). Because of this change, all existing VST rules will need to be rewritten using Arcade. While this may prove to be a significant effort, it provides an opportunity to improve the existing logic and identify areas for enhanced efficiency. It also transitions you to a language that is widely used throughout the ArcGIS environment, both in desktop and online/enterprise settings.

Cartographic representations for symbology have also been deprecated in ArcGIS Pro. ArcGIS Aviation Charting now uses standard symbology capabilities. Arcade expressions applied to the layer specify the appropriate symbol for each feature based on the information gathered using the Prepare Aviation Data tool.

Labeling in ArcGIS Pro is still handled using the feature-linked annotation, but the label expressions used by each annotation class are now written with Arcade, so any existing VBScript-based label expressions will need to be rewritten. However, with the new Attribute Rule capabilities in ArcGIS Pro, feature-linked annotation classes can now be configured so annotation creation is much faster than previously possible in ArcMap. In addition, whether using dynamic labels or annotation features, the Arcade label expression is interpreted and rendered in the same way. This means that you can use dynamic labels to quickly inspect expression output during development, a capability that was not possible in ArcMap.

Note: Example configurations and styles are provided in the [ArcGIS Aviation Charting Product Files](#) package.

Masking

The Aeronautical Masking tools from ArcMap have been replaced with geoprocessing tools available in ArcGIS Production Mapping in ArcGIS Pro. The [Make Masks from Rules](#) tool generates mask polygons based on defined rules, and

the [Apply Masks from Rules](#) tool configures your map to use those polygons for masking. Since both tools are now geoprocessing tools, they are better suited to support workflow automation. [Masking rules](#) in ArcGIS Pro are defined in an XML configuration file, so existing masking rules will need to be translated into the new format. In addition, current best practices require that masking feature classes be stored within a feature dataset.

Note: Example masking configurations are provided in the [ArcGIS Aviation Charting Product Files](#) package.

Building a Transition Strategy for Your Organization

A successful ArcMap to ArcGIS Pro transition consists of many moving parts and requires a well-defined plan and strategy to ensure success. The success criteria for a software transition will look different for every organization but will be measured largely by the improved efficiency of being able to access the system and perform required tasks. The following best practices and recommendations are aimed at enabling your organization to effectively plan and execute your ArcMap to ArcGIS Pro transition.

Embrace Change

Software transition is often a necessary process if an organization wants to adopt new technologies and embrace new ways of working. It is important to keep an open mind about how the new Esri® platform may be able to help your organization prepare for the future and meet your long-term goals.

Identify and Prepare the Team

A successful software transition requires involvement from many people within your organization. Identify and build a team of representatives from each stakeholder business unit who can help guide and champion the transition. These representatives will promote communication throughout the organization and support the delivery of the necessary tasks required for a successful transition. In some cases, you may also need to look outside your organization to provide the necessary organizational, technical, and educational resources to enable your staff to perform the transition.

Please refer to Esri's Learning Plan for ArcGIS Aviation Charting for a list of recommended educational resources including a combination of self-paced training, web courses, online help documentation, videos, and instructor-led workshops.

Create a Transition Road Map

Adequate planning can make all the difference between a smooth transition and one riddled with issues. First, identify what success will look like and then establish performance baselines and key performance indicators to determine acceptable levels of performance throughout the transition process. Your organization may also want to identify and mitigate potential areas of difficulty and risk. This information will help your organization determine the appropriate technical, temporal, and financial requirements for the transition. Communicating, understanding, and clarifying the plan with all relevant stakeholders and team members will be critical to the success of the transition.

Perform the Transition in Phases

Consider the success criteria for your organization to develop the appropriate methods, schedules, requirements, and documentation required for every step of the software transition. An iterative approach will help focus the team on reasonable milestones and schedules while maintaining communication and expectations with stakeholders. Regular testing and prototyping during each phase will allow your team to catch unanticipated issues, find performance gaps, and regroup or change direction before any more effort is wasted. Your organization should consider maintaining the current ArcMap software-based production system active in parallel to provide a point of reference for the new ArcGIS Pro system as well as a useful contingency option.

Don't Be Afraid to Ask for Help

Your local Esri distributor and industry-specific Esri representatives can provide valuable insight and assistance during any phase of your software transition from ArcMap to ArcGIS Pro.

Sample ArcGIS Aviation Charting Transition Strategy

The following is a sample, three-phase transition strategy for moving your production ArcGIS Aviation Charting system from ArcMap to ArcGIS Pro. It incorporates many of the recommendations and considerations outlined above.

1 Prepare for Transition

Phase 1 focuses on identifying all existing assets from the ArcMap chart production system and preparing to transition them into the ArcGIS Pro environment.

Inventory Current Assets

Create an inventory of all data, configurations, and materials used by the ArcGIS Aviation Charting system for chart production. This will include the following:

Data

- Current AIS database
- Source data (AIXM, etc.)
- Ancillary data

Configurations

- Product Library
 - Areas of interest
 - Extraction queries
 - Visual specifications

Note: This may be an opportunity to review your cartographic logic approach and identify possibilities to improve performance and efficiency

- Aviation Properties
 - Masking rules
 - Create airspace areas/Lines
 - Line bypass

- Route processing
- Change reporter
- Element options

- Export Configurations
 - Production PDF
- Color separation

Materials

- Symbols, representations, colors, style files, etc.
- Map documents (MXDs)
- Additional supporting documentation

Set Up the ArcGIS Pro Environment

Install, license, and configure the ArcGIS Pro environment.

Set up AIS data environment

- Create/Update AIS database
- Load/Update AIS schema

Set up ArcGIS Pro materials

- Import/Review applicable style files
 - Ensure all symbols and colors are available

- Import/Review applicable fonts

- Import/Update map documents as projects
 - Ensure layers are available
 - Verify applicable drawing order
 - Update project resources

Load/Migrate Data

Load, migrate, and verify all required data within the ArcGIS Pro environment.

- Import/Update AOI features in AIS
- Import AIXM to AIS
- Import/Migrate ancillary data to AIS
- Verify/Validate source data

2 Configure ArcGIS Aviation Charting in ArcGIS Pro

This phase 2 focuses on the translation and transition of the assets identified in the initial phase and implements them within the ArcGIS Pro environment. This should include configuring and prototyping an initial chart product to familiarize your team with the workflow and technologies to produce an aviation chart. This prototype product will become a template for other charts in the series.

Translate/Migrate Cartographic Logic and Configurations/Preferences into ArcGIS Pro

Identify the changes within the ArcMap and ArcGIS Pro configuration applications and technologies. Perform any translation of logic and configurations

between the relevant formats and then migrate the applicable configurations from ArcMap to ArcGIS Pro.

Extraction Queries

- Migrate from the Product Library to AIS

Visual Specifications

- Migrate VST rules to Prepare Aviation Data configuration and Arcade expressions for symbology and annotation

Annotation

- Configure annotation classes including updated settings, Arcade expressions, and attribute rule(s)

Masking Settings

- Migrate from Aviation Preferences to the ArcGIS Pro masking configuration XML format

Tool Properties/Preferences

- Migrate the Aviation Preferences for the following tools:
 - Create Airspace Lines/Areas
 - Process Air Traffic Service Routes
 - Generate Aviation Chart Leads
 - Report Aviation Chart Changes
 - Generate Summary Table Data
- Note the Applicable Parameters for the Following Tools:
 - Cartographic Exceptions
 - Add Aviation Line Bypass
 - Aviation North Arrow
 - Generate Changeover Points
 - Generate Derived Airspace Geometry

Configure the Aviation Charting Project(s)

Utilizing the MXDs from ArcMap, configure the ArcGIS Pro projects for aviation chart production.

Update All Applicable Project Resources

- Folder connection
- Geodatabase
- Toolbox
- Styles
- Map/Layout

Add/Order Data Layers/Tables

- Feature Classes
 - AOI
 - Source
 - Cartographic
 - Annotation

- Masking
- Tables
- Ancillary Information
- Configure Layout
 - Page dimensions
 - Surround elements
 - Grids

Review the Chart Output

Thoroughly review the aviation chart and document all necessary updates including logic, cartography, and layout changes. Iterate the configuration and process until the result meets your expectations.

3 Initialize Chart Products

Utilizing the configurations from phase 2, prepare other chart product(s) within the same series and begin to refine your approach to the production workflows.

Chart Production Workflow

Follow the provided high-level workflow to produce an aviation chart product.

- Set the aviation geodatabase
- Set the AOI
- Set cartographic exceptions
- Run the Generate Aviation Cartographic Features tool
- Run the Prepare Aviation Data tool
- Run the Create Feature Linked Annotation script (if necessary)
- Run the Make Masks from Rules tool
- Run other applicable cartographic finishing tools
- Run other applicable surround element tools
- Perform cartographic cleanup and quality control
- Export the chart product

About the Authors

Esri's Aviation Team is composed of dedicated sales, marketing, services, and research and development staff with commercial and military domain expertise who support airports and the aeronautical information management communities with the progression of Esri technology. Members of the aviation team are actively engaged in the aviation community and closely monitor industry trends to validate that Esri technology supports and enables our users with industry-specific requirements such as data compliance, temporality, digital products, and web service-based delivery methods. For more information, please contact us at aero@esri.com.



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Since 1969, Esri has helped customers unlock the full potential of data to improve operational and business results. Today, Esri software is deployed in more than 350,000 organizations including the world's largest cities, most national governments, 75 percent of Fortune 500 companies, and more than 7,000 colleges and universities. Esri engineers the most advanced solutions for digital transformation, the Internet of Things (IoT), and location analytics to inform the most authoritative maps in the world.

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