



Enhancing ArcGIS Survey123 with Generative AI

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2025 Synergis UC

Agenda

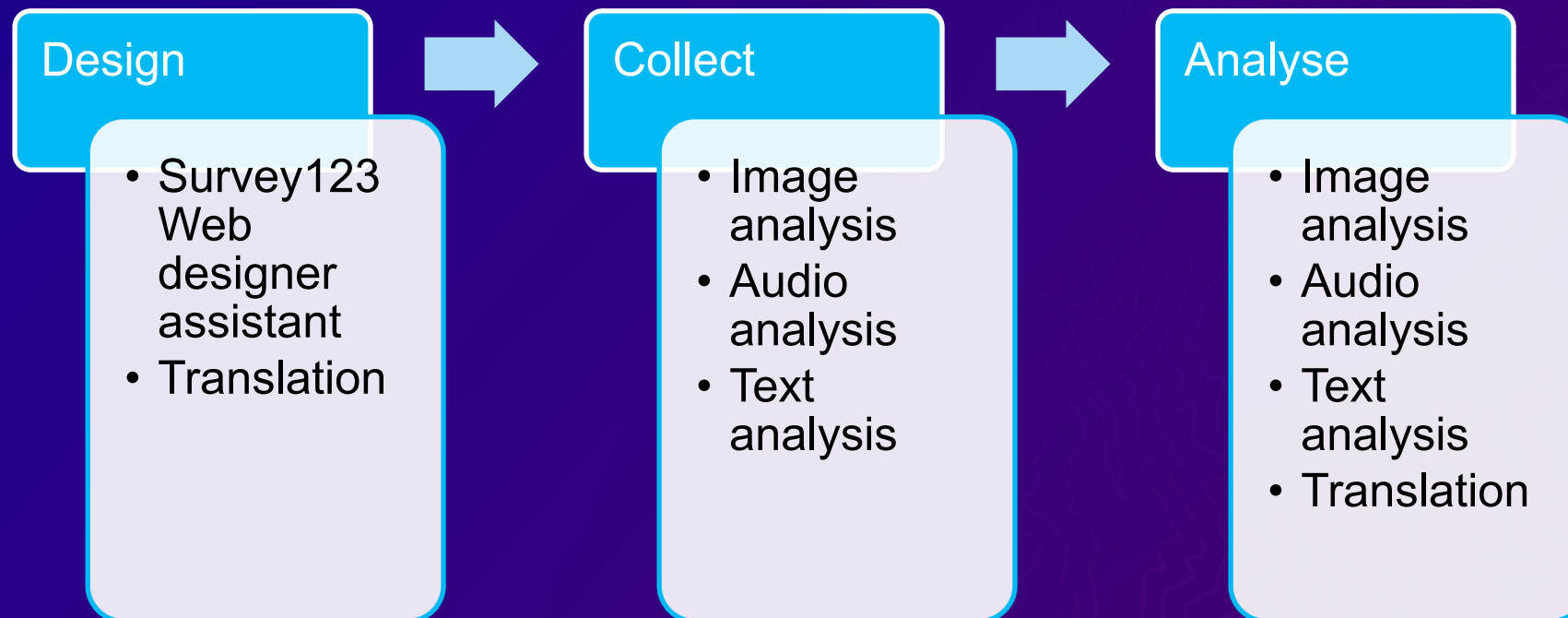
- Intro to AI features in ArcGIS Survey123
- Automatically translate survey designs
- Survey123 Web designer assistant
- Image extraction
- Text and audio extraction
- Smart assistants
- Research areas
- Questions

Intro to AI features in ArcGIS Survey123



AI features in ArcGIS Survey123

- ArcGIS Survey123: transform everyday workflows with smart forms
- With AI, the workflows can become even simpler. For example,



AI features release stages



- **Beta**

- Sign a beta license agreement
- For testing use only
- Limited documentation / No technical support

- **Preview**

- Fully documented / Technical support provided
- Functionally complete
- No guarantee that software in preview will transition to general availability

Survey123 Web designer assistant	Preview
Translation assistant	Preview
Image analysis	Beta
Audio analysis	Beta (only on survey123beta.arcgis.com)
Text analysis	Beta (only on survey123beta.arcgis.com)

Enabling AI features in ArcGIS Online and Survey123

The image shows a composite screenshot of the ArcGIS Online settings interface. On the left, a navigation menu includes 'General', 'Home page', 'Gallery', 'AI assistants', 'Map and scene', 'Items', 'Groups', 'Collaborations', 'Credits', 'Security', 'Open Data', 'Hub', and 'Organization extensions'. The 'AI assistants' section is highlighted with a blue border. The 'Security' section is also highlighted with a blue border. The main content area is divided into two panels. The top panel, titled 'AI assistants', contains a sub-section 'AI assistants' with a description: 'AI assistants leverage the power of generative AI to help you create content, introspect, and even write code. [Learn more.](#)' Below this is a toggle switch for 'Allow use of AI assistants by members'. The bottom panel, titled 'Blocked Esri apps and capabilities', contains a sub-section 'Blocked Esri apps and capabilities' with a description: 'Control which apps and capabilities are blocked based on regulations, standards, and best practices.' Below this is a toggle switch for 'Block Esri apps and capabilities' and a button 'Manage blocked Esri apps and capabilities'. On the right, the 'Extensions' section is highlighted with a green border. It contains a description: 'Survey123 extensions offer additional functionality to meet specific workflow needs. These settings will change the behavior of Survey123 for all users in your organization. [Learn more about organization settings](#)' Below this is a note: 'Organizational settings will only apply to public surveys if [Allow anonymous access to your organization](#) is enabled for your ArcGIS organization.' The 'Extensions' section includes three sub-sections: 'Enhanced camera features' with a description 'Enable enhanced camera features to improve accuracy and performance when scanning barcodes and detecting faces.' and a note 'These features may use Google technology. [Learn more about enhanced camera features](#)'. It has three radio button options: 'Let users decide in field app settings' (selected), 'Enable enhanced camera features', and 'Disable enhanced camera features'. 'Survey123 assistant' with a 'PREVIEW' badge and a description 'Enable the Survey123 assistant in the web designer. The assistant helps you design surveys through a conversation and translate survey designs into multiple languages.' It has a button 'Learn more about the Survey123 assistant' and two radio button options: 'Enable the Survey123 assistant' (selected) and 'Disable the Survey123 assistant'. 'Analysis tools' with a 'BETA' badge and a description 'Enable analysis tools to improve efficiency and streamline your workflows. Analysis tools include:'. It has a list of tools: 'Analyze image—Extract information from images using natural language prompts.' and a button 'Learn more about analysis tools'. It has two radio button options: 'Enable analysis tools' and 'Disable analysis tools' (selected).

Transparency Cards: Building Trust in AI

In-depth details about our AI features

- What Are Transparency Cards and Why Do They Matter?
 - Short, structured summaries of our AI features
 - Empower you to make informed, decisions about using AI in ArcGIS
- What They Include:
 - Purpose of AI in the product
 - Certification, deployment method, how you can manage access
 - Data storage, processing location
 - Scoped usage and intended users
 - Models, training data and level of human interaction
 - Security, guardrails and best practices
 - + a lot more
- Who Should Use Them:
 - Analysts, developers, and decision-makers working with AI tools
- Key Benefit:
 - Supports transparency for your informed use of AI

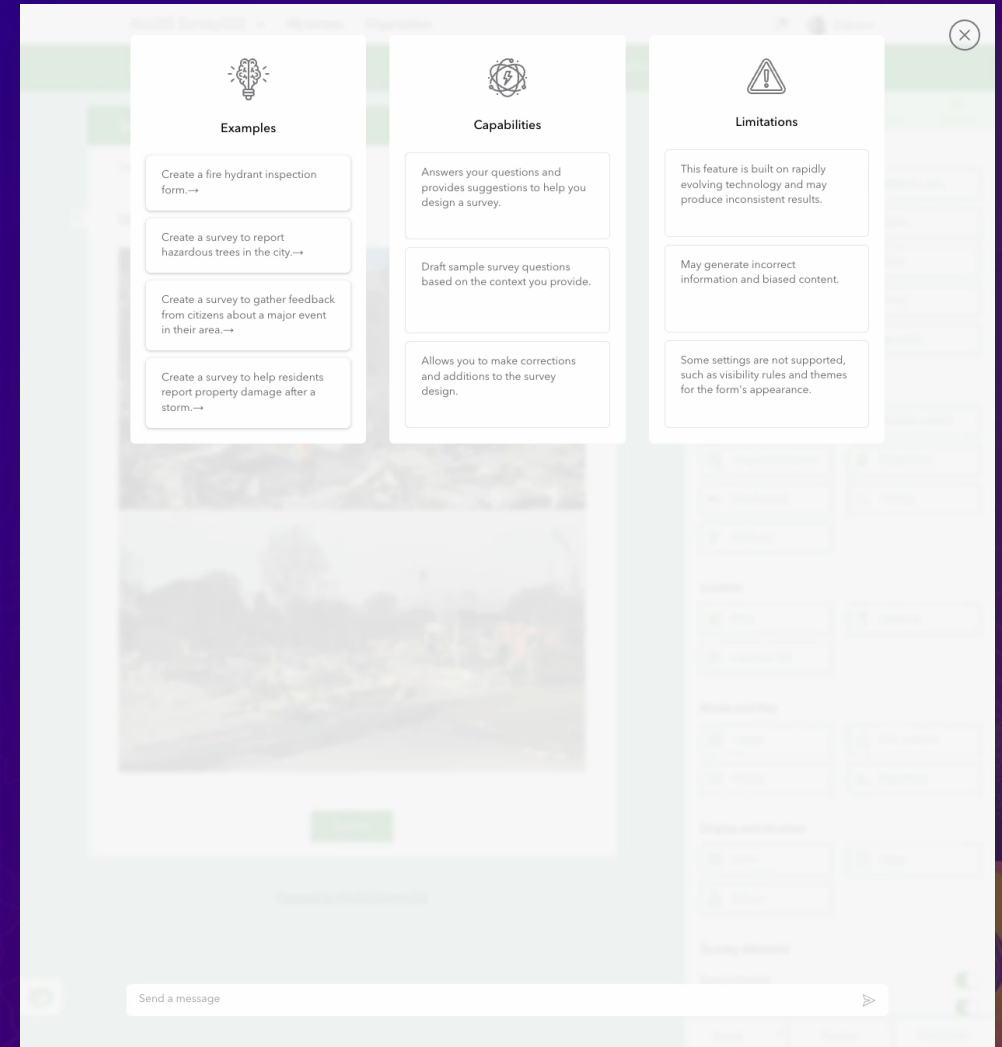


Survey123 Web designer assistant (preview)



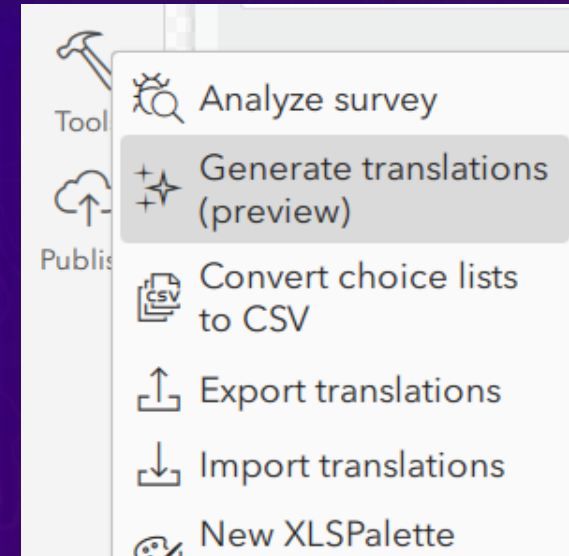
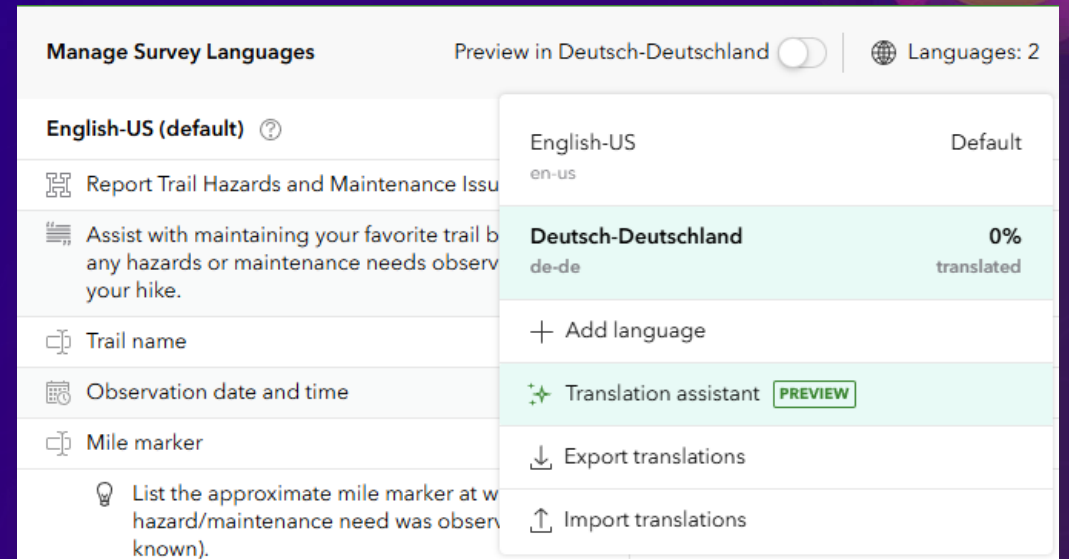
Survey123 Web designer assistant

- Use AI to design surveys by a conversation
- Examples:
 - Design a survey for hydrant inspection
 - Insert an image question after question #1
 - Update the title of question #2
 - Bring the designed survey into Survey123
- Preview release
- Support Group / Page questions now



Translation assistant

- Use AI to translate survey designs
- Verify by human translators for accuracy
- Requires at least one additional language
- Web designer
 - Defaults to replacing empty values
 - Optionally replace existing translations
- Connect
 - Requires Python configured with Survey123 Connect
 - Overwrites existing translations



Supported languages

- Supports all ArcGIS organization languages
- Additionally supports languages from Azure AI translator

Supported languages

The following languages are supported by the Survey123 field app, Survey123 Connect, the Survey123 web app, and the Survey123 website. When the language is changed, app text is translated, and dates, times, and numbers display in the expected format for the language. (For the field app on iOS, the device region must also be set to match the language.)

Note:

You can include translations for survey questions in any language, not only the ones listed below. For more information, see [Manage multiple languages](#).

Language	Language code
Arabic	ar
Bosnian	bs
Bulgarian	bg
Catalan	ca
Chinese - Simplified	zh-cn
Chinese - Traditional (Hong Kong)	zh-hk
Chinese - Traditional (Taiwan)	zh-tw
Croatian	hr

< Choose other language

When the survey is viewed in the following language, the translated text will be displayed. Some number and date formats are not supported. [Learn more](#)

Language

- АԥԿԿԿ / Abkhaz
- Afar / Afar
- Afrikaans / Afrikaans
- Akan / Akan
- Shqip / Albanian
- አማርኛ / Amharic
- Aragonés / Aragonese
- Հայերեն / Armenian

Image analysis

- Extract information from Image questions
- Examples:
 - Read the water meter
 - Get the full name from a driving license
 - Get the license plate from an image
 - Any swimming pools in a satellite image
 - Describe an image
 - Count electric poles in an image
 - Show the colors of cars in an image

Read Value from Water Meter

Water Meter

image001.png

Reading Value

👍
👎

Submit

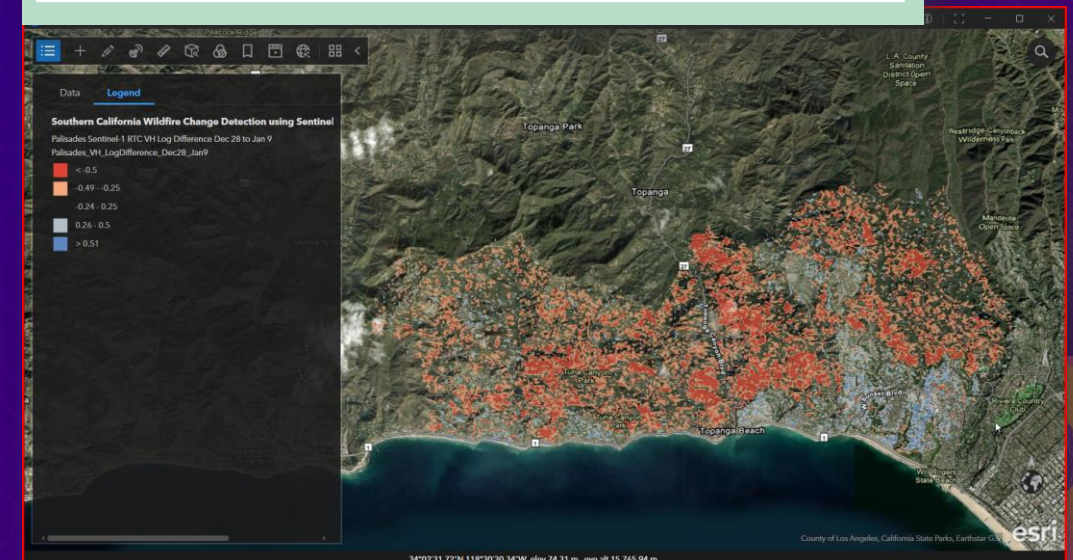


Image analysis

- Beta release
- Survey123 Web Designer
 - Calculation
 - Analyze image
 - Your prompt
- Survey123 Connect
 - `pulldata("@ai","image2text",
${<imageQuestionName>},"<yourPrompt>")`
- Not supported
 - Survey123 Field app
 - Public with anonymous users

The screenshot displays the Survey123 Web Designer interface for configuring an image analysis calculation. The main form area is divided into two sections:

- Image**: A dashed box containing the text "Drop image here or select image" and a camera icon for uploading an image.
- Summary of the image**: A large text input field for entering a prompt, with a close icon in the bottom right corner.

Below the form is a green "Submit" button. At the bottom of the page, it says "Powered by ArcGIS Survey123".

On the right side, the "Edit calculation: Summary of the image" configuration panel is visible. It includes:

- Navigation tabs: "Extract data" (selected), "Number", and "String".
- Source selection: Radio buttons for "Question" (selected), "Survey", and "Layer".
- Extract property from question: A dropdown menu set to "Image" and a "Clear" link.
- Function selection: A dropdown menu set to "Analyze image".
- Prompt text: "What would you like to extract from the image?" with a text input field containing "Describe what you see in the image and summarize it in 100 words".

Text analysis

- Extract insights from Text questions
- Useful for:
 - Analyzing sentiment
 - Determining input language
 - Translating input language
 - Summarizing multiline input
 - Identifying key information
- Authored in Connect as
 - `pulldata("@ai","text2text",${<textQuestionName>},"<yourPrompt>")`
- Not supported
 - Survey123 field app
 - Public with anonymous users

Audio transcription

- Transcribe Audio questions
- Useful for:
 - Transcribing an entire audio response
 - Capturing tone of voice
 - Translate audio responses
 - Identify key information
- Authored in Connect as
 - `pulldata("@ai","audio2text",{<audioQuestionName>},"<yourPrompt>")`
- Not supported
 - Survey123 field app
 - Public with anonymous users

Image analysis vs Smart assistant's

Image analysis	Smart assistants
<ul style="list-style-type: none">• Web app and new in Connect• Large language model• Esri service• Online only	<ul style="list-style-type: none">• Field app only• Local machine learning model• Self trained model• Online & offline

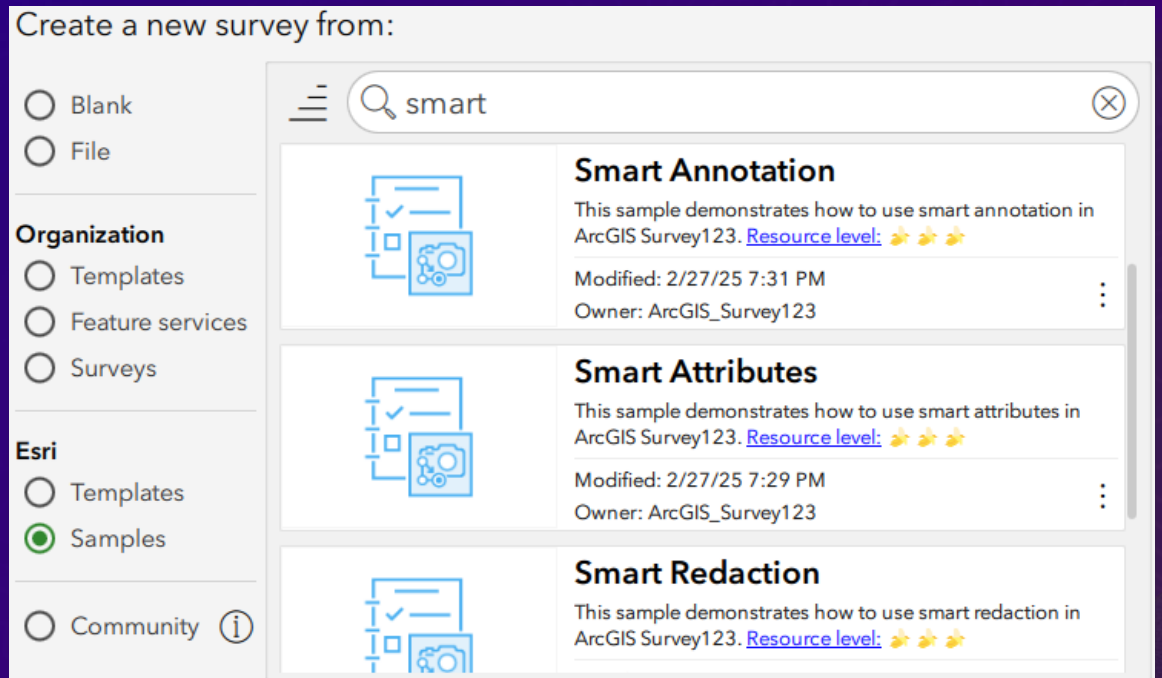
Survey123 Smart assistant



Smart assistants

Survey123 Connect

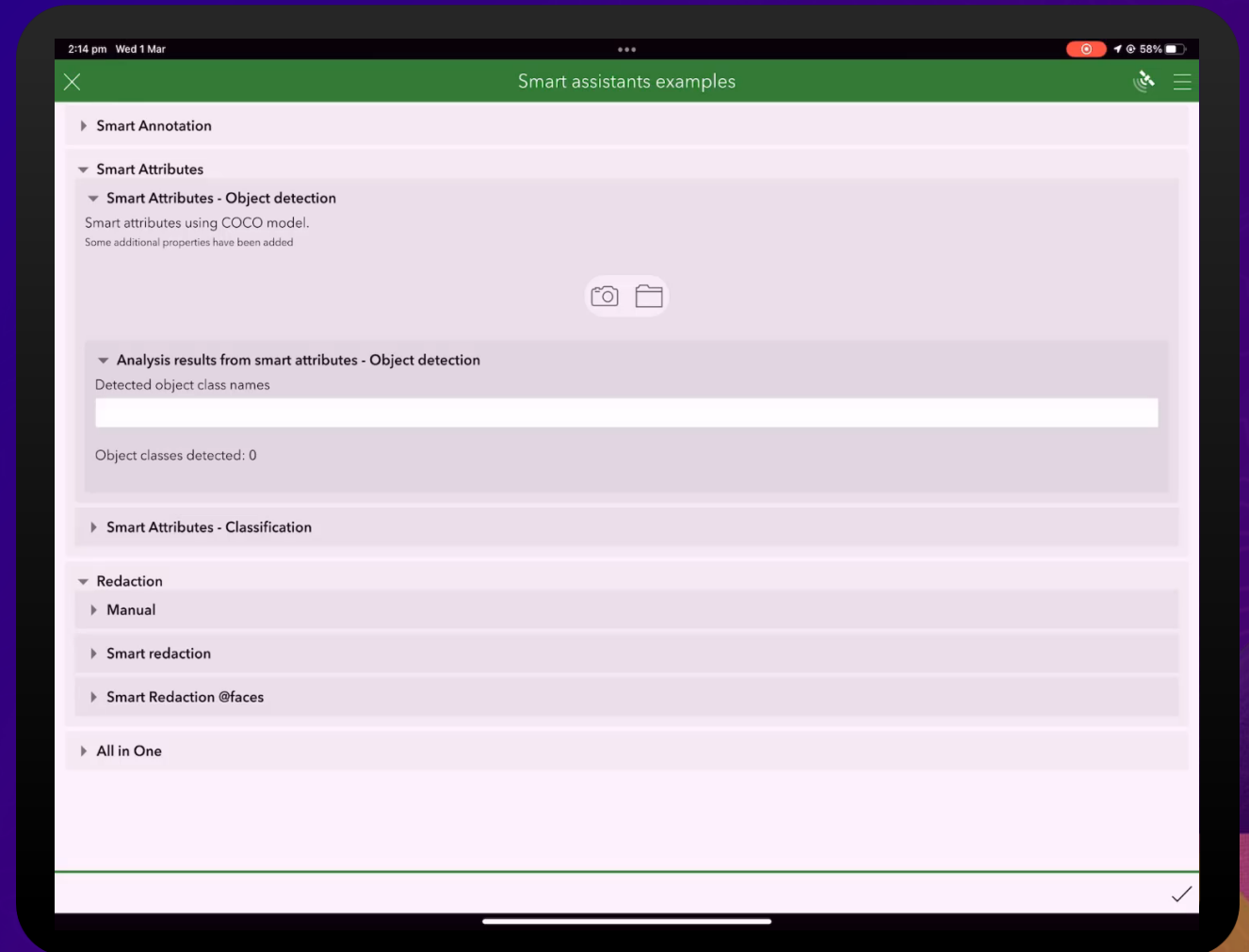
- Use machine learning models to analyze images in the Survey123 field app
- Smart assistants work offline
- Types
 - Smart attributes
 - Smart redaction
 - Smart annotation
- Create your own models with the [arcgis.learn](#) module in ArcGIS API for Python



Smart assistants

Survey123 Connect

- Use machine learning models to analyze images in the Survey123 field app
- Support for TensorFlow Lite models
 - Stored in the survey's media folder in .tflite format
- Smart assistants work offline
- Create your own models with the [arcgis.learn](#) module in ArcGIS API for Python



Smart assistants

- Smart attributes

- Extract values based on the objects the model detects
- Results stored in the image's EXIF metadata
 - Use pulldata("@exif") to extract values

- Smart redaction

- Blur, pixelate, or block out these regions
- Obscure personally identifiable information (PII) and other sensitive content
- Manually add, modify, or remove redacted regions
- Redaction is permanent in the final image

- Smart annotation

- Automatically annotate objects in images
- Use alongside a custom annotation palette

Take a photo

Take a photo of a speed limit sign or stop sign. If you can't find a sign around you, you may take a photo of an online image or browse to a local image.

`smartAttributes=signs_16062022_060742&cameraPreview=true`



classification-20250702-163658.jpg



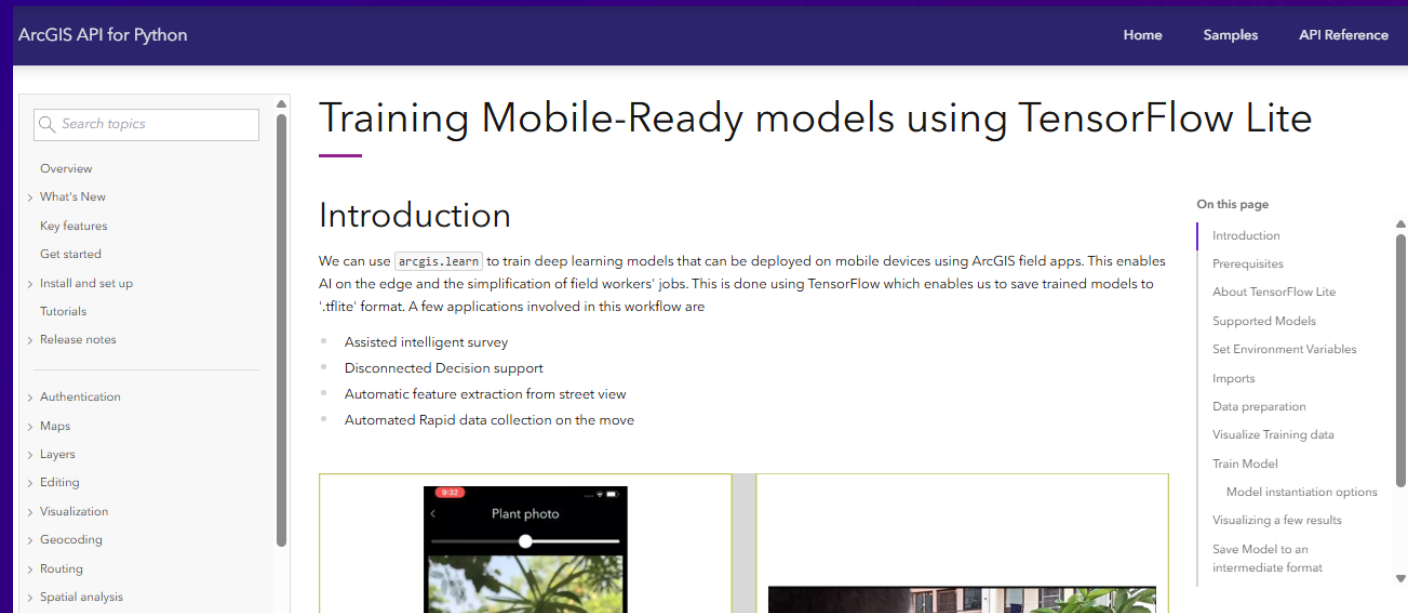
Sign type

Speed sign

Stop sign

Train models with ArcGIS

- `arcgis.learn` module to train a TFLite model
 - Image classification
 - Object detection
- ArcGIS tools for training models
 - ArcGIS API for Python
 - ArcGIS Online Notebooks
 - ArcGIS Pro



The screenshot shows the ArcGIS API for Python documentation page for "Training Mobile-Ready models using TensorFlow Lite". The page includes a navigation menu on the left with categories like Overview, What's New, Key features, Get started, Install and set up, Tutorials, Release notes, Authentication, Maps, Layers, Editing, Visualization, Geocoding, Routing, and Spatial analysis. The main content area features an "Introduction" section with a sub-header "Introduction" and a paragraph explaining that `arcgis.learn` is used to train deep learning models for deployment on mobile devices. Below the text is a list of applications: Assisted intelligent survey, Disconnected Decision support, Automatic feature extraction from street view, and Automated Rapid data collection on the move. There are also two image placeholders: one showing a mobile app interface titled "Plant photo" and another showing a street view image.

<https://developers.arcgis.com/python/latest/guide/training-mobile-ready-models-using-tensorflow-lite/>

Research areas

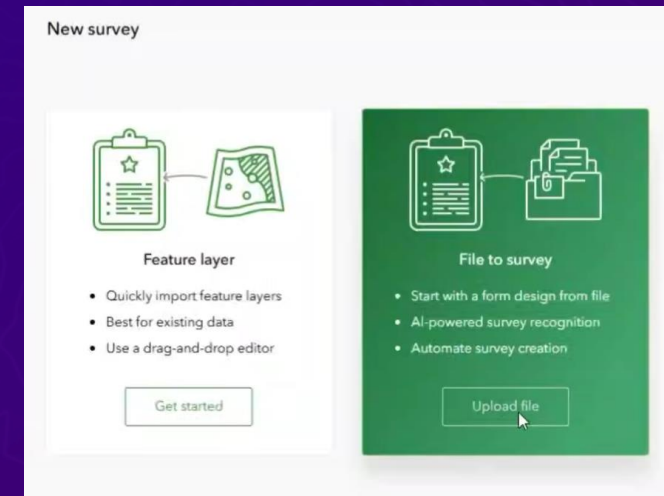
Survey123



Research areas

Mid-term

- Generate a survey theme
- Scan a paper form to generate a survey
 - Use computer vision to read image and suggest a layout
- Create new survey from a file
- Batch Analyze collected survey data
- Report template assistant
- Survey123 JS API assistant
- ...



Summary

Enhancing ArcGIS Survey123 with Generative AI

- **Benefits of AI Integration**

- Speed and efficiency of data processing.
- Greater insights from unstructured data (e.g., images, audio).
- The ability to scale data collection without sacrificing quality.

- **Use at multiple levels of the survey lifecycle**

- Design
- Collect
- Analyze

Additional resources

- [Survey123 assistant overview](#)
- [Design a survey using a conversation](#)
- [Generate translations](#)
- [Trusted AI in ArcGIS](#)
- [Training Mobile-Ready models using TensorFlow Lite](#)
- [Train a model to identify street signs](#)

Questions



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