Drone2Map:

Workflows for Processing a Dataset

Steven Lambert, ESRI, Portland, ME

Drone2Map: An Introduction

- Topics:
  - Who should be attending?
  - Overview of Drone2Map
  - Basic D2M Workflow
  - 2D Data Processing
  - 3D Data Processing
  - Inspection Workflow
  - Summary & Close
- Demonstrations:
  - Rapid & 2D Processing
  - 3D Processing
  - Inspection Processing

Why are there Different Workflows & Templates?

- All templates can create similar product collections
- Advantage is that templates provide default settings for common mapping applications and make the processing simpler, repeatable and easier.
- Three Basic Workflows & Templates
  - 2D: Orthophoto base maps, surface models (DEM, DSM), tile caches
    - Use Case: Image Reference Layer, Surface Model for Terrain Model, Supporting Web Services
  - 3D: All of the 2D + textured meshes + 3D web scenes
    - Use Case: All 2D plus 3D visualization, analysis and design
  - Inspection: Focused on visualization and annotation workflows, tagging
    - Use Case: Visualization, Safety, Inspection, Work Order Generation

Drone Mapping Workflow…

Drone2Map

T	C	P	E	D
Tasking (Flight Planning)	Collection	Processing (Photogrammetry)	Exploitation	Dissemination

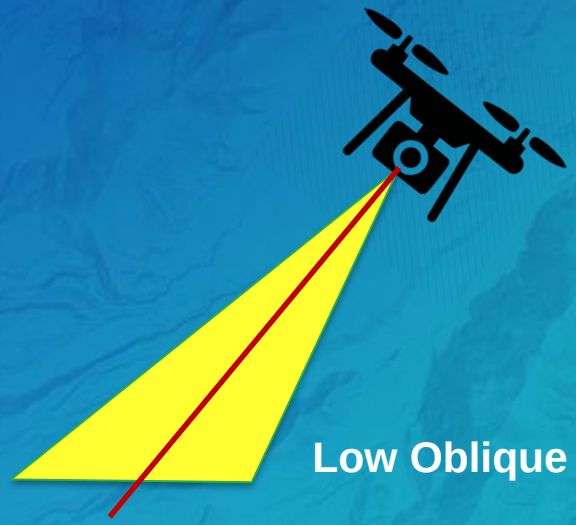
Drone Manufacturers

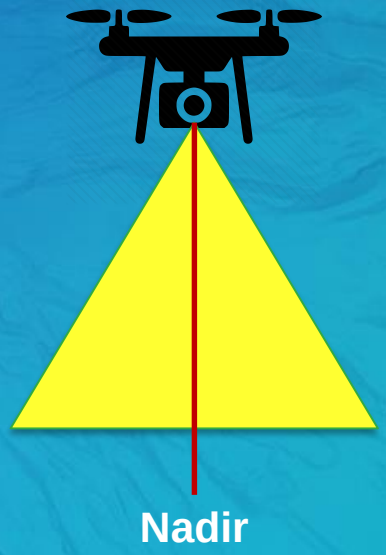
Drone2Map Dataset Requirements

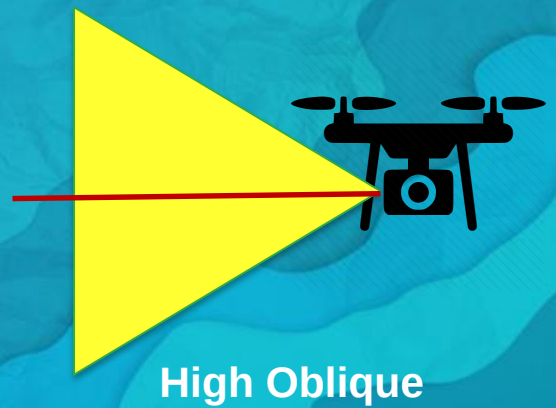
- Imagery
  - Collected appropriately to support use case
  - EXIF Tagged (Position, Orientation, Camera Information, Camera Calibration, Image Information)
  - Possible to use non-tagged imagery, use 3rd party tool to create EXIF tag information or import georeferencing information
  - Not recommended for historical aerial imagery (9x9) images due to file sizes (Use ArcGIS Pro Ortho Mapping tools)
- Ground control
  - Optional but Recommended to improve overall accuracy if limited coverage, poor collection geometry, high accuracy required.
  - Correct coordinate system information
  - Be careful when using map extracted control or image service extracted control. Accuracy may be less than GPS accuracy

Flight Planning/Data Collection

- Use Case Driven
- Overlap Configuration
  - Sidelap, Endlap, Altitude
- Collection Angle
  - Nadir, Low Oblique, High Oblique
- Metadata (Exif)
  - Camera Calibration
  - Position & Orientation
  - Exposure Information
- Coordinate Systems (H, V)

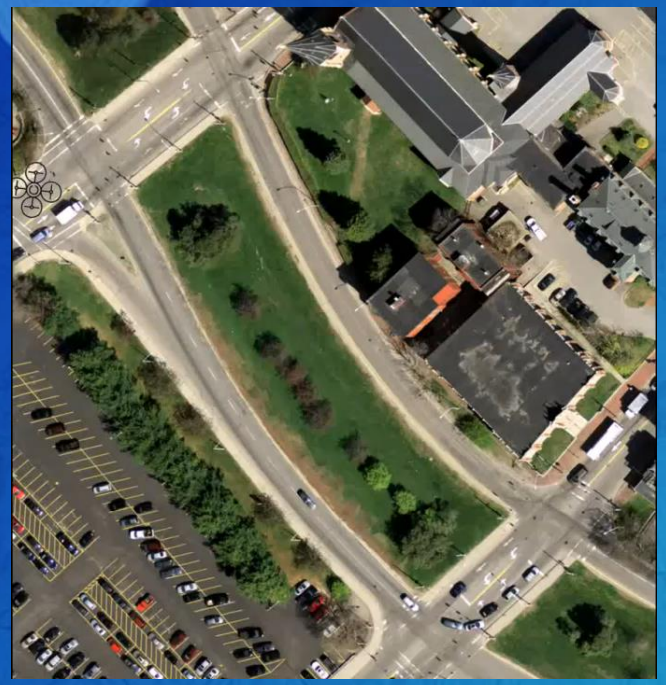






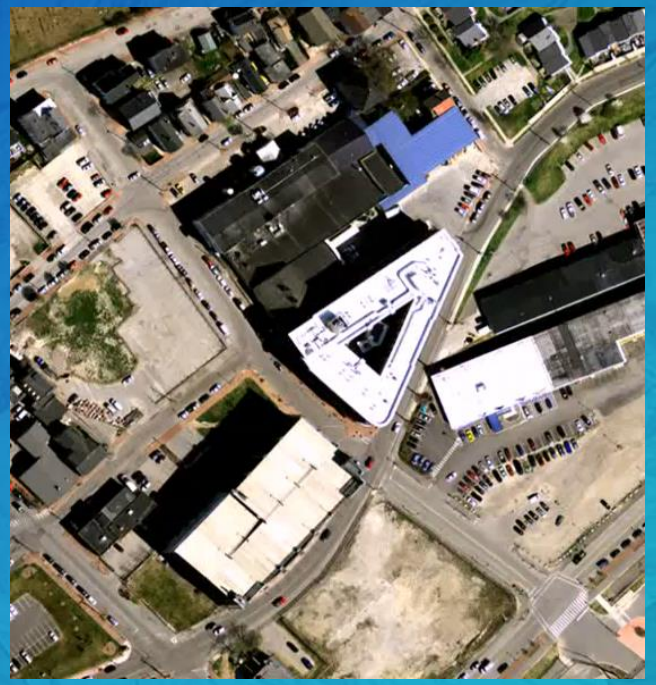
Drone2Map Project Modes

2D Mapping
Overlapping, nadir images
Orthomosaics, DEM, DSM



Nadir (Vertical) Images

3D Mapping
Overlapping, nadir, low oblique images
2D + 3D point clouds, meshes, scenes



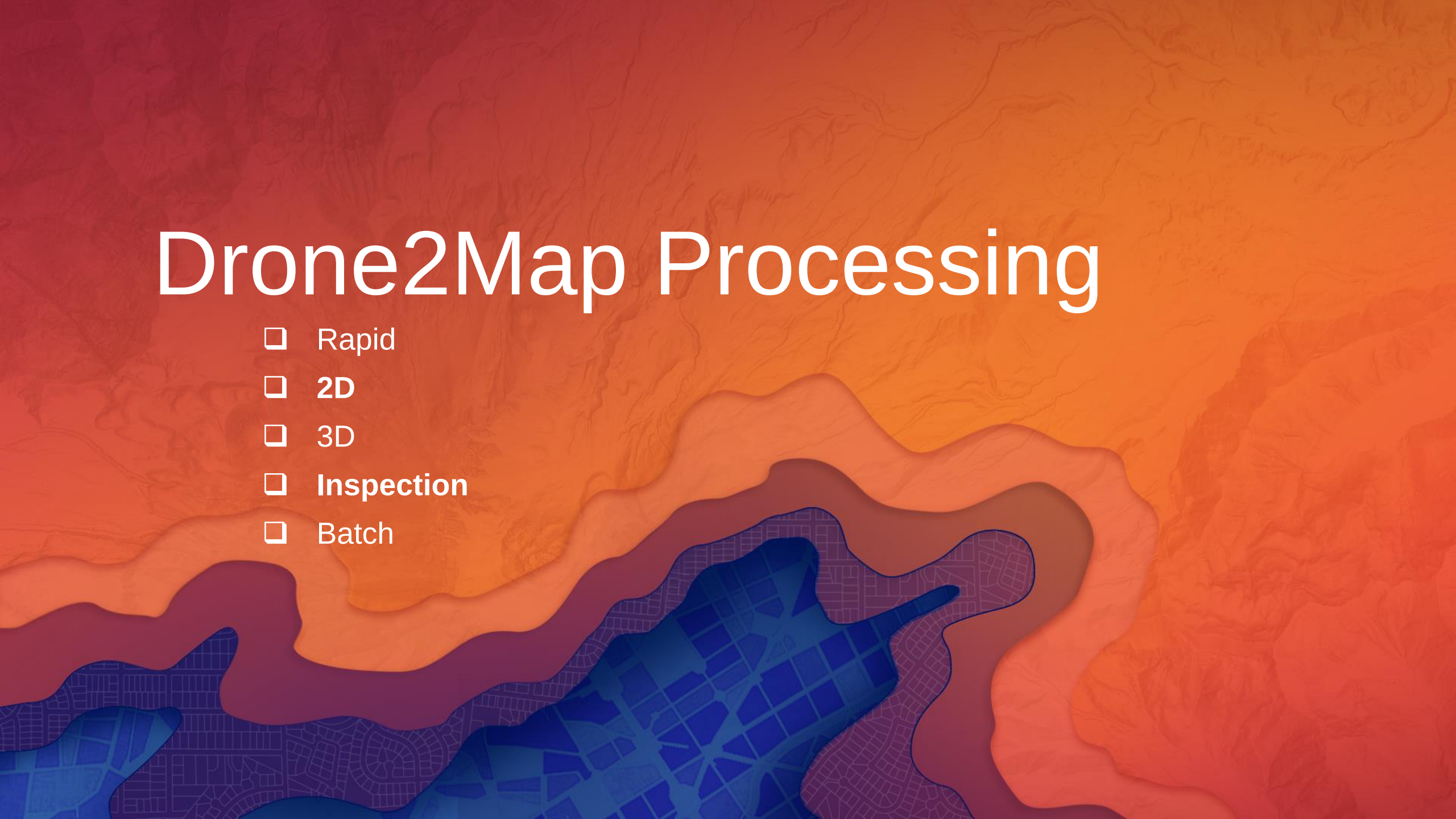
Nadir (Vertical) and Low Oblique (in direction of arrow) Images

Inspection Mapping
Overlapping, high oblique images
Annotation, attribution, visualization

Concentric High Oblique Images (different altitudes)

Drone2Map Processing

- Rapid
- **2D**
- 3D
- **Inspection**
- Batch



Rapid Processing Template – Shoreline Sample

- Designed as a Field Collection QC Tools
- Validate collection coverage adequacy, overlaps, gaps, preliminary accuracy
- Easier to add content while still onsite that to find out inn office that coverage is insufficient
- Processing Report Review
- Export to ArcGIS Pro

2D Processing Template – Shoreline Sample

- Used to create 2D mapping products and surface models that support orthorectification
- Creation of 2D Orthomosaics
- Creation of DSM & DTM surfaces
- Creation of Tile Packages
- Integration with ArcGIS Online

3D Processing Template – Coal Pile & Small Building Projects

- Two separate Use Cases
  - Computation of 3D information: Volumes, cross-sections from image derived surface models
  - Development of 3D spatial models (meshs) for imaged objects
- Creation of 2D Orthomosaics
- Creation of Point Clouds from overlapping imagery
- Creation of DSM & DTM to support volumetric computations
- Creation of 3D Meshes from Overlapping Images

Inspection Template – Cell and Transmission Tower Projects

- Integration of low and high oblique images
- Uses near nadir to provide georeferencing framework
- Uses low-oblique for visualization and inspection workflows
- Because of poor overlap using low-oblique, requires more coverage, higher overlaps to provide good block geometry
- Avoid high obliques if possible, too much sky weakens the solution strength; OK if high obliques completely fall on the object, such as a building façade

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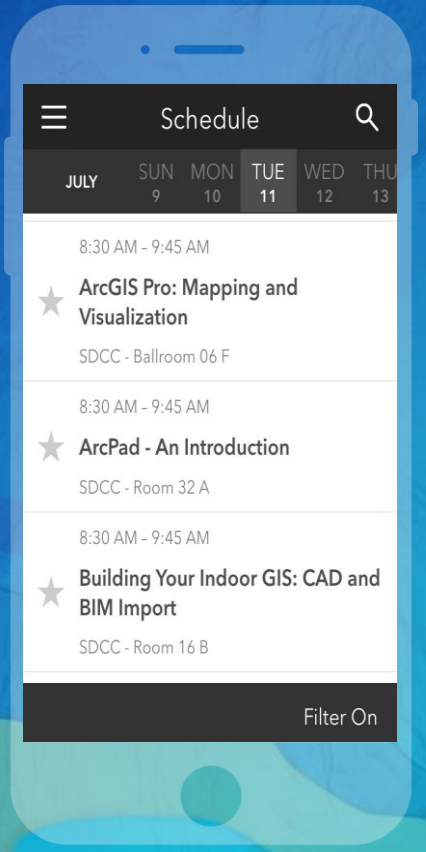

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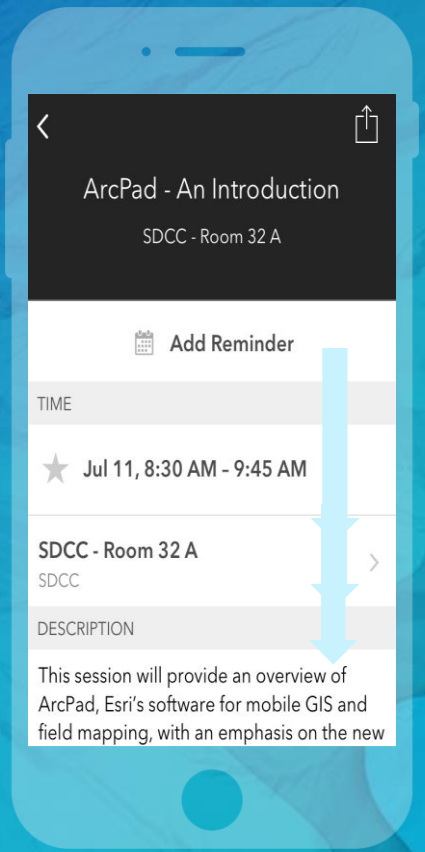

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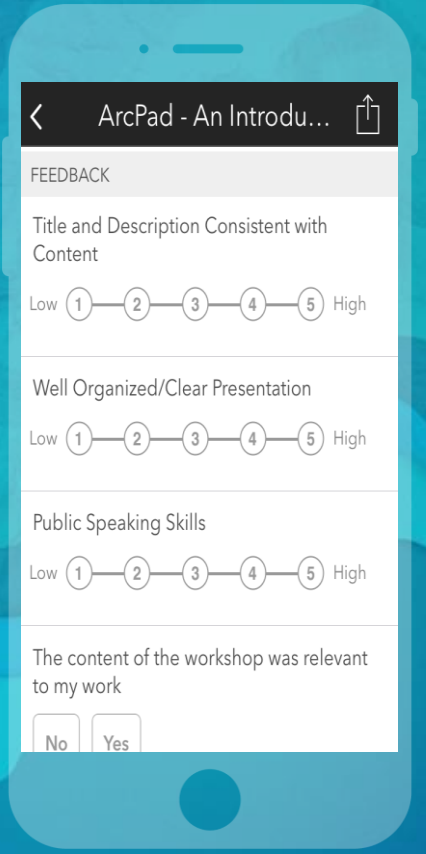

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