

ArcGIS Full-Motion Video Capabilities

John Fry, Solution Engineer

Alex Muleh, Product Development

What is Full Motion Video ?



Assumed to
have geo-
spatial
metadata

Generated
from sensed
data

Related to
each other in
both space
and time



Motion Video - Out4 - VIC_140826Z_006	
Recording	
Directory:	
c:\GIS\Video\Out4\VIC_140826Z_006.csv	
Checksum	52602
Classifying Country	//CA
Releasing Instructions	ISO-3166 Two Letter
Event Start Time - UTC	1/1/1970 12:00:00 AM
Frame Center Elevation	1555.95788574219
Frame Center Latitude	40.6548337781126
Frame Center Longitude	-104.996322265359
Flag Data	0
Signator ID	0000000000000000
ESRI_Metadata_Collect	
Latitude Point 1	40.6558042667139

From: Motion Imagery Standards Board, "FAQ"

Useful for Many Industries



Collected from Many Platforms

Esri Full Motion Video

Easily view and analyze full motion video data from drones, unmanned aerial platforms, and video cameras within your ArcGIS environment

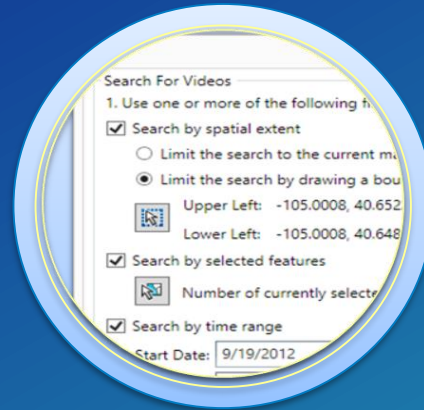


Seamless Interaction Between Video and Map

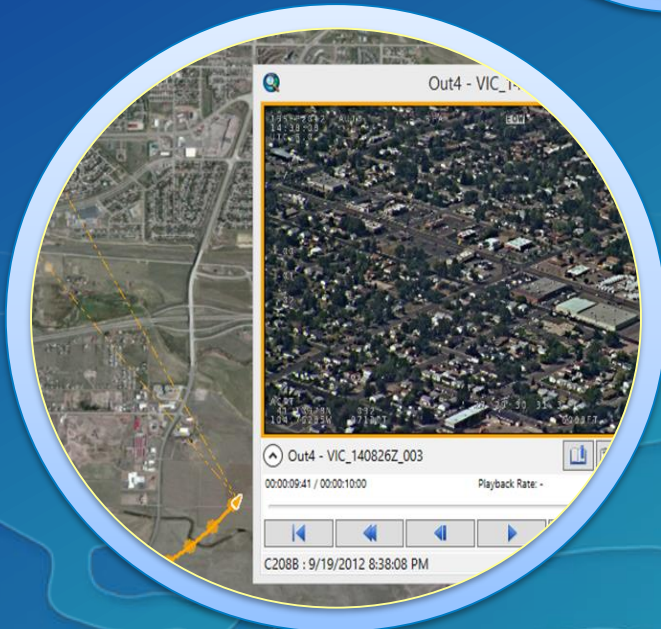
Enable Smarter Decisions with
Actionable Intelligence



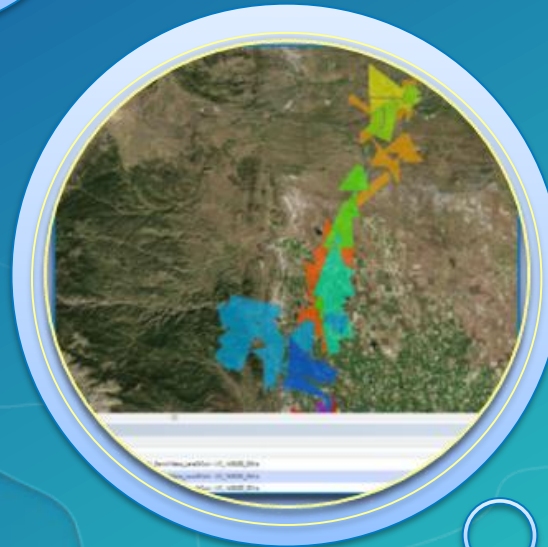
Quickly Find, View, and Analyze Videos



Videos Integrated with ArcGIS



Share Videos and Analysis Results



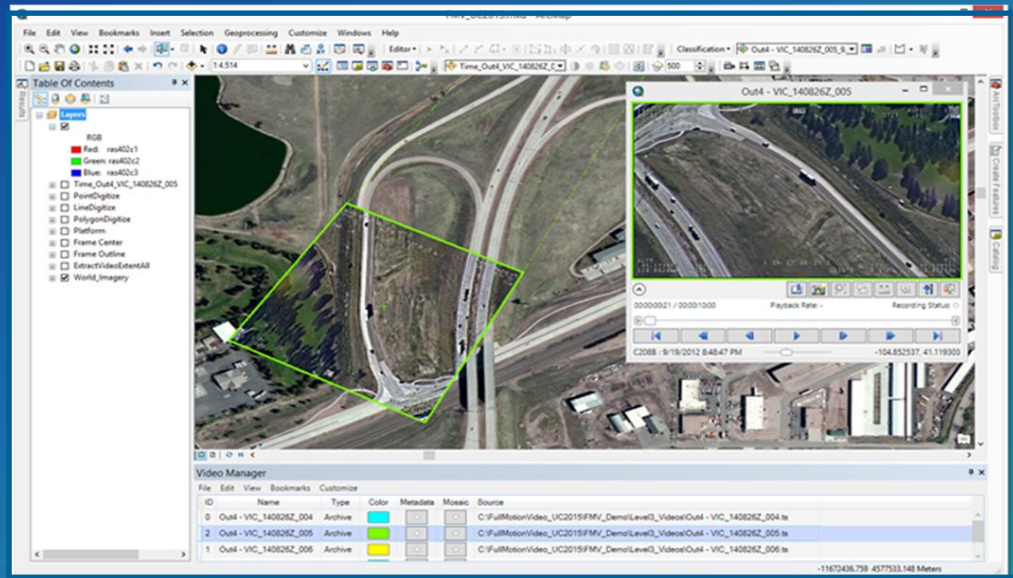
Display Full Motion Video to Make Timely Decisions

Overlay video frames on maps for situational awareness



Pan and zoom in the video for accurate visualization

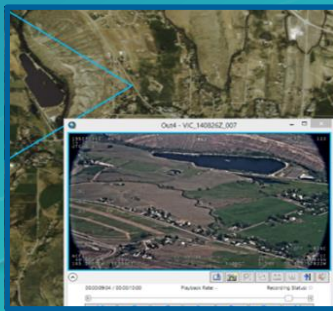
Live Stream Viewing and Recording for real time information



Full Motion Video - Out4 - VIC_140826Z_006	
Recording Status: ON	
Output Directory: C:\ArcGIS\Video\Out4VIC_140826Z_006.csv	
Checksum	52602
Classifying Country	USA
Releasing Instructions	ISO-3166 Two Letter
Event Start Time - UTC	1/1/1970 12:00:00 AM
Frame Center Elevation	1555.95788574219
Frame Center Latitude	40.6548337781126
Frame Center Longitude	-104.996322265359
Generic Flag Data	0
Item Designator ID	0000000000000000
Mission ID	ESRI_Metadata_Collect
Offset Corner Latitude Point 1	40.6558042667139

View video metadata for complete scope of mission

Playback in slow motion for review



Analyze and Exploit Full Motion Video for Actionable Intelligence

Overlay features from your map on the video and annotate videos for complete geospatial analysis



Measure and track locations on your video in the map, and from the map to your video

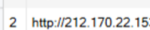
Search video archives for full analysis options

Videos

- ☐ Out4 - VIC140826Z_007.ts
- ☒ Out4 - VIC140826Z_006.ts
- ☐ Out4 - VIC140826Z_005.ts

Video Search Results

UNIX Time Stamp	File Name
Sep 19, 2012, 21:06:11.324	Out4 - VIC_140826Z_006.ts
Sep 19, 2012, 21:06:11.543	Out4 - VIC_140826Z_006.ts
Sep 19, 2012, 21:06:11.743	Out4 - VIC_140826Z_006.ts
Sep 19, 2012, 21:06:11.943	Out4 - VIC_140826Z_006.ts
Sep 19, 2012, 21:06:12.151	Out4 - VIC_140826Z_006.ts
Sep 19, 2012, 21:06:12.371	Out4 - VIC_140826Z_006.ts
Sep 19, 2012, 21:06:12.571	Out4 - VIC_140826Z_006.ts
Sep 19, 2012, 21:06:12.774	Out4 - VIC_140826Z_006.ts
Sep 19, 2012, 21:06:12.994	Out4 - VIC_140826Z_006.ts
Sep 19, 2012, 21:06:13.194	Out4 - VIC_140826Z_006.ts
Sep 19, 2012, 21:06:13.399	Out4 - VIC_140826Z_006.ts
Sep 19, 2012, 21:06:13.596	Out4 - VIC_140826Z_006.ts
Sep 19, 2012, 21:06:13.814	Out4 - VIC_140826Z_006.ts
Sep 19, 2012, 21:06:14.034	Out4 - VIC_140826Z_006.ts
Sep 19, 2012, 21:06:14.234	Out4 - VIC_140826Z_006.ts
Sep 19, 2012, 21:06:14.454	Out4 - VIC_140826Z_006.ts
Sep 19, 2012, 21:06:14.654	Out4 - VIC_140826Z_006.ts
Sep 19, 2012, 21:06:14.854	Out4 - VIC_140826Z_006.ts

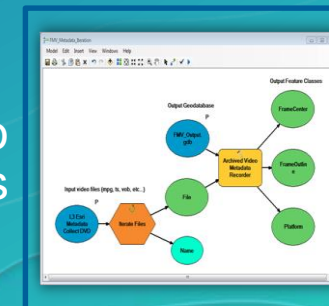


The screenshot shows the 'Video Manager' window with a menu bar (File, Edit, View, Bookmarks, Search, Customize) and a table of video files. The table has three columns: ID, Name, and Type. It contains three entries:

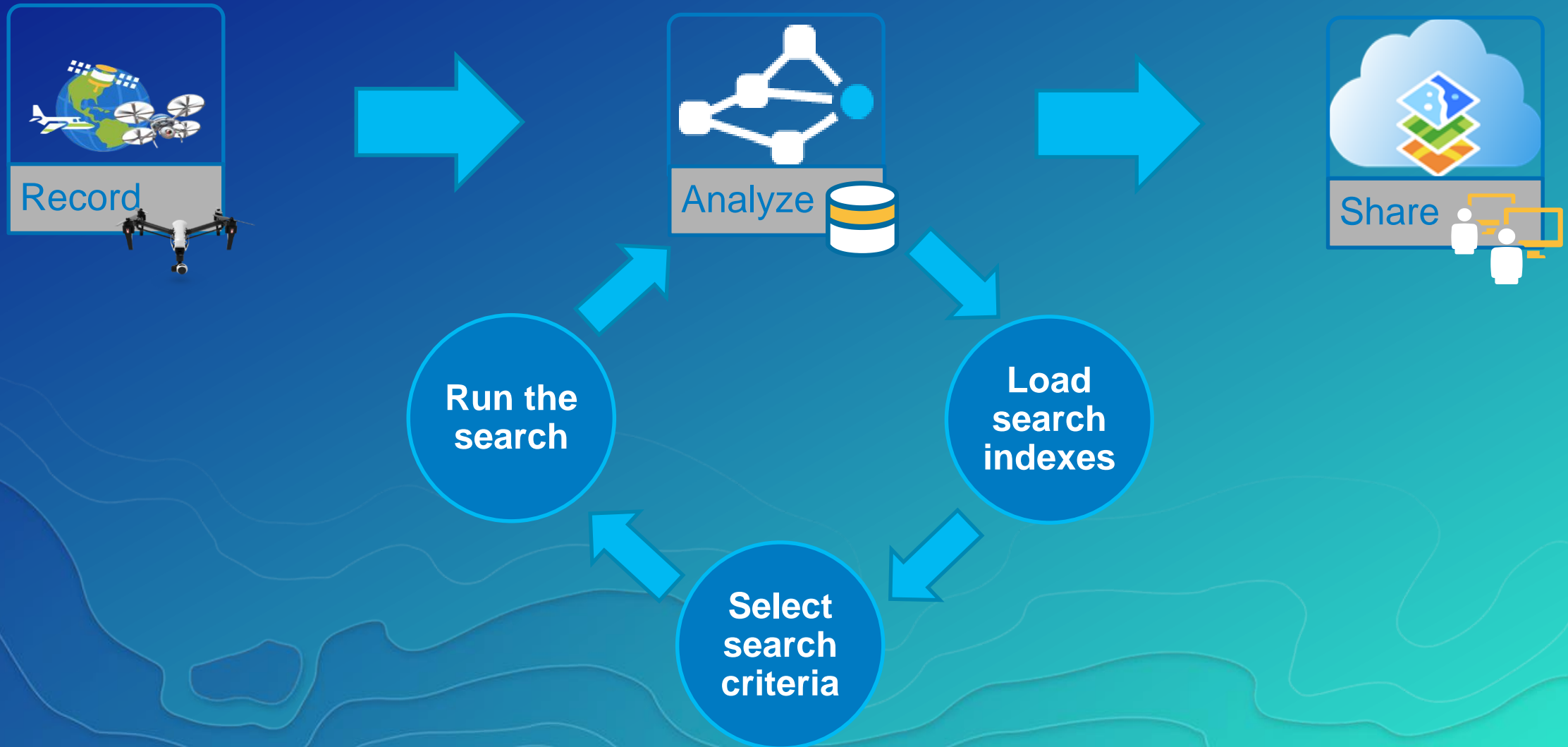
ID	Name	Type
0	Out4 - VIC_140826Z_005	Archive
1	http://206.196.158.57/mjpg/video.mjpg	Stream
2	http://212.170.22.153:8080/mjpg/video.mjpg	Stream

Bookmark videos to reference locations of interest

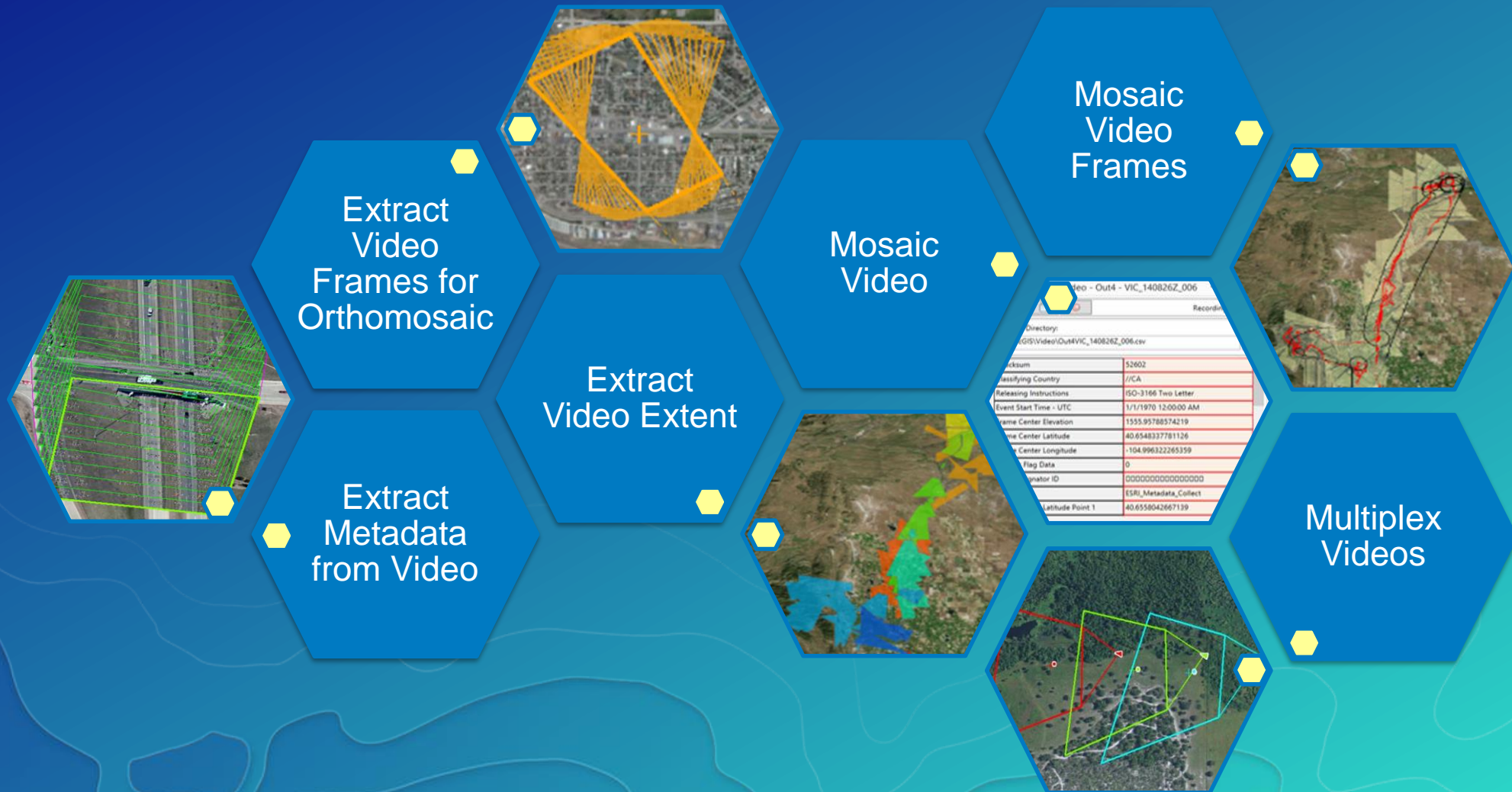
Add video information to models for multi-int analysis



Search Your Videos for Rapid Discovery and Information



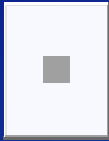
Automate Your Workflow with FMV Geoprocessing





Using FMV in ArcGIS

John Fry, Alex Muleh



Log in from the ArcGIS Maps ribbon to Unlock Map.



Support for FMV Collected From Commercial Drones

Only videos that support MISB are supported by the ArcGIS FMV add-in

**Sensor System with Airborne GPS,
Inertial Measurement Unit (IMU)
and built-in Multiplexer**



**Video is already multiplexed and
can be analyzed by ArcGIS**

**Commercial Drone with camera,
GPS and IMU**



**Need to use ArcGIS Video
Multiplexer tool to combine the
video and metadata into a MISB
video**

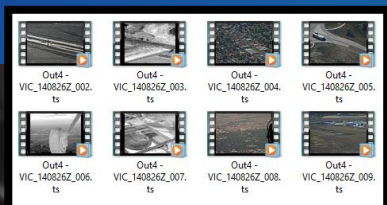
Video Multiplexer

Best Practices in FMV User Manual pdf

- **Non-MISB Metadata Support**

- Works with non-MISB metadata to make your videos MISB-compliant (Ready for the FMV Add-in)
- Calculates frame center and corner data automatically
- Adjusts time

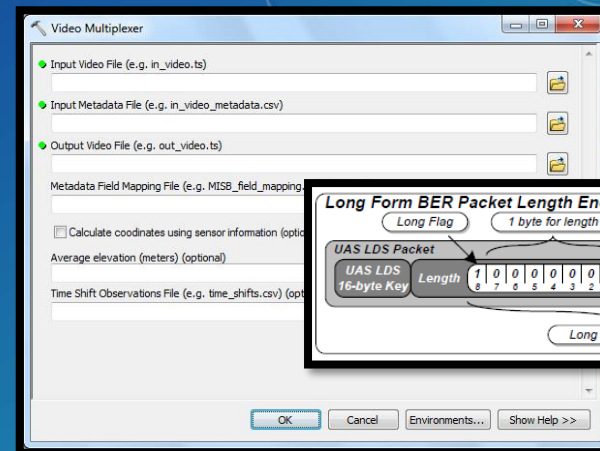
Supply Positional Metadata
w/ Multiplexer Template



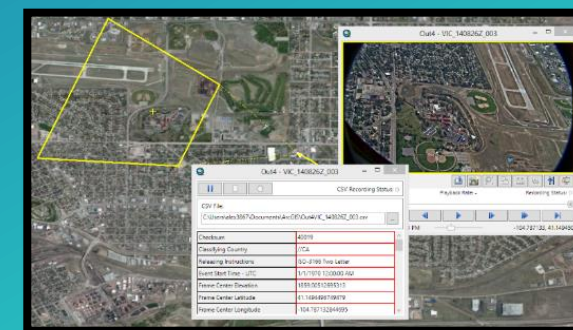
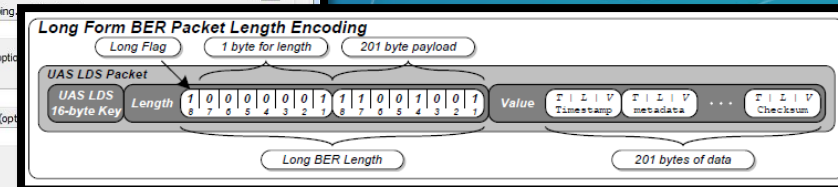
Collect Video

TimeStamp	PlatformHeading	PlatformPitch	PlatformRoll	SensorLatitude	SensorLongitude	SensorAltitude	HorizontalFOV
14334297777800780	276.809403	0.043947	6.382946	27.405409	-82.126628	174.209001	52.301213
14334297777860930	276.22797	0.043947	6.613361	27.405412	-82.126687	173.635462	52.301213
1433429778121090	275.854429	0.076907	6.503494	27.405414	-82.12674	173.348592	52.301213
1433429778281250	275.579767	0.175787	6.283761	27.405421	-82.126794	173.061723	52.301213
1433429778480460	275.371023	0.29664	5.932798	27.405422	-82.126864	172.487984	52.301213
1433429778640620	275.239185	0.42848	5.558947	27.405425	-82.126917	172.201114	52.301213
1433429778800780	275.286226	0.786106	5.114413	27.405428	-82.126976	171.627375	52.301213
1433429778960930	275.281131	0.999786	4.933137	27.405431	-82.12703	171.627375	52.301213
1433429779121090	275.392996	1.109653	4.910428	27.405433	-82.127084	171.340505	52.301213
1433429779281250	275.502861	1.08768	4.92636	27.405433	-82.127153	170.766766	52.301213
1433429779480460	275.623713	1.032746	4.878184	27.405438	-82.127212	170.478986	52.301213
1433429779640620	275.78851	0.900906	5.108798	27.405438	-82.127266	169.906157	52.301213
1433429779800780	275.953307	0.824	5.372784	27.405438	-82.12732	169.619287	52.301213
1433429779960930	276.952186	0.813013	5.679495	27.405438	-82.127373	169.332418	52.301213
1433429780121090	276.096132	0.75808	5.81225	27.405438	-82.127443	168.758679	52.301213
1433429780320310	276.129091	0.867946	5.789361	27.405444	-82.127502	168.471809	52.301213
1433429780480460	276.173037	1.1558	5.723746	27.405444	-82.127556	168.184939	52.301213
1433429780640620	276.172037	1.38451	5.745109	27.405444	-82.127609	168.184939	52.301213

Use Multiplexer GP Tool



Gets Metadata to MISB
Compliant Data



Video Data Now MISB
Compliant and on the Map



Integrating Commercial Drone FMV

John Fry, Alex Muleh

Current FMV Release

Version 1.3.2

- Works with ArcMap 10.3.X, 10.4.X, and 10.5
- Increased performance- 2.7K, 4K, and higher resolutions of digital video
- Automatic population of metadata in editing of feature class
- Improved search algorithm for videos / improved UI
- New “*Capture Groups of Images*” tool – captures frames from streaming video
- The “*Mosaic Video GP*” tool now supports JPG, JP2, PNG, NITF, and TIFF file types
 - Georeferencing of each frame now uses the Projective transformation to increase overall accuracy
- New “*Extract Video Frames for Orthomosaic*” tool to export video frames and associated MISB metadata for input into Ortho Mapping tools for ArcGIS or Esri Drone2Map.

The Road Ahead for Full Motion Video

FMV 1.3.2

- Improved Accuracy
- EXIF metadata support
- Enhanced playback performance

Pro 2.1

FMV Enterprise

- Video processing
- FMV as part of web GIS

2016

2017 Q2

2017 Q3

2017 Q4

2018

Pro FMV Product Development

- New Workflows
- Modern user experience
- 3D
- 64-bit and GPU enhancements

Pro 2.x

Pro FMV Demo

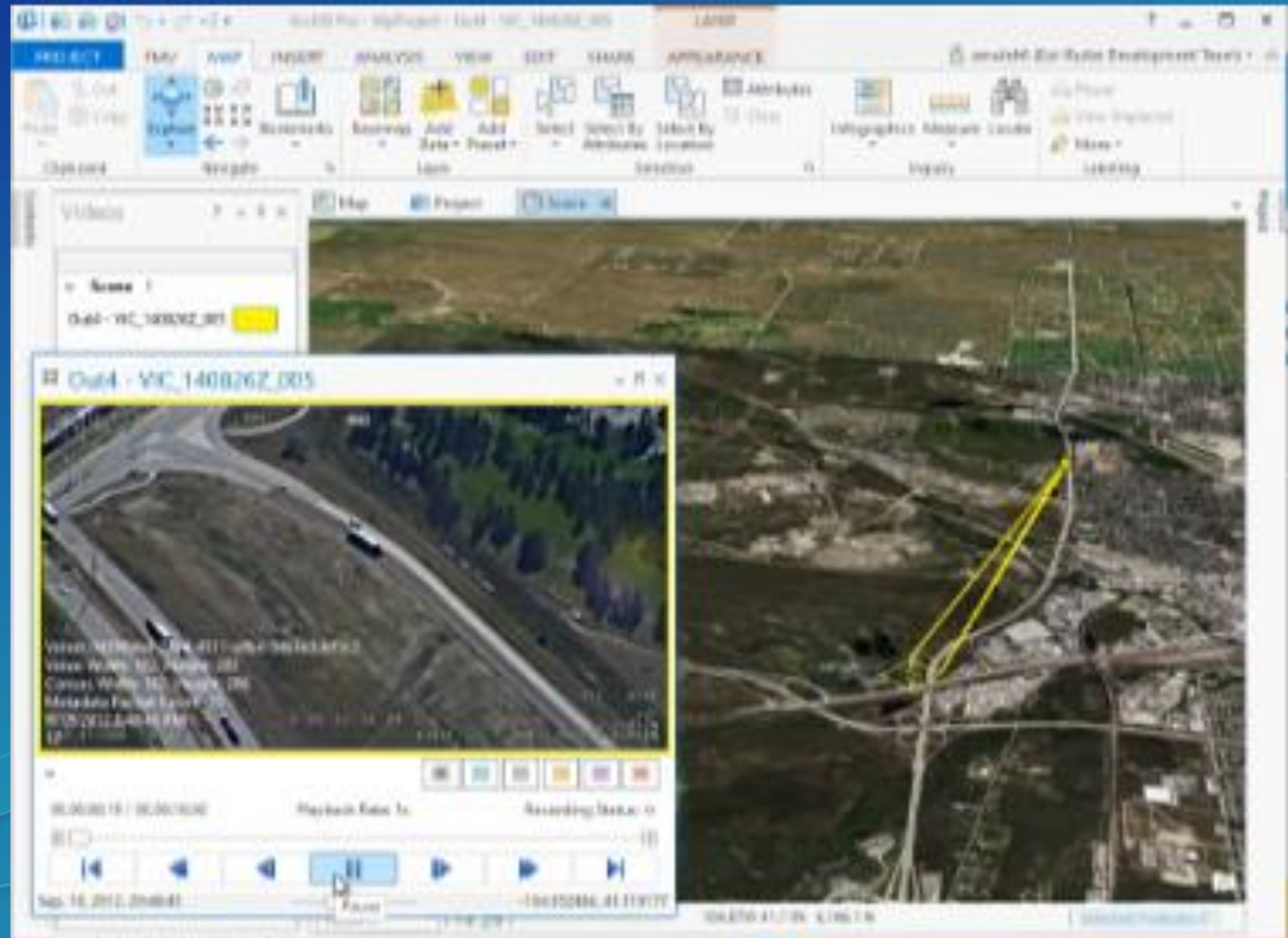
Coming 2017 with Pro 2.1

New Workflows

Modern user experience

3D and Mensuration

64-bit and GPU enhancements



Full Motion Video Landing Page

Easy access to additional information...

- Order the FMV add-in and GP tools
- Customer service information
- Get tutorials and free data
- Presentations
- FAQ's
- Blogs
- GeoNet links <https://geonet.esri.com>
- And more!



Order FMV Today!

ArcGIS FMV add-in is available free of charge to customers current on maintenance with ArcGIS for Desktop 10.0 or higher.

You can order the ArcGIS FMV add-in two ways - by calling us or through the My Esri portal.

Get your license today to start visualizing and analyzing your videos in ArcGIS.

Call Us

Place the order over the phone. Once the order is processed, you will receive an email that includes an authorization number to activate FMV and a link in your My Esri portal with a token that gives you download permission.

800-447-9778

(8:00 a.m. - 5:00 p.m. PT Monday - Friday)

My Esri

Log in to [My Esri](#) using your credentials and click on the Downloads tab under 'My Organizations'. Select the version of ArcGIS for Desktop that you currently own and click on the Download link at the top of the page. The 'Get Started' box will contain a link to request the Full Motion Video License.

Go to my.esri.com

<http://www.esri.com/products/arcgis-capabilities/imagery/full-motion-video>

FMV Web Course

Working with Full Motion Video in ArcGIS

- DESCRIPTION:
- Full motion video (FMV) sensors on unmanned aerial vehicles or drones, or as static video cameras, provide a new type of video data. Learn how to fully utilize video from these sensor platforms and analyze FMV technology using the ArcGIS platform.
- <https://www.esri.com/training/catalog/5806637ec82bd5746b9143dd/working-with-full-motion-video-in-arccgis/>

Questions?





esri

THE
SCIENCE
OF
WHERE