MAXAR

New Horizons in the Geospatial Industry

October 2019

One Maxar

- We have officially integrated our business units into Maxar, a U.S. company.*
- Our organization has more than 60 years of experience in **geospatial information and analytics**, **satellite technology,** and **space systems**.
- Aligning our rich expertise, innovative technologies, and legacy of serving customer missions allows us to better serve the complex needs of our customers and partners—all with a leaner, more agile business structure.

MAXAR

SSL · DigitalGlobe · radiant SOLUTIONS · MDA

**MDA remains an independent business unit with unique requirements, including security and compliance obligations, for its work in the Canadian government and as a Merchant Supplier to the international satellite and space community.*

Maxar is a trusted mission partner with the world's largest consumers of Earth intelligence and space infrastructure.

As a global leader of advanced geospatial and space-based technology solutions, we unlock the promise of space for government and commercial markets, with decades of experience developing and sustaining infrastructure.

By collecting and moving data from space through data processing and analytics platforms, we reveal insights about our changing planet where and when it matters for our customers.

- $2.14B in FY18 revenues
- 5,900 employees
- More than 30 locations
- Customers in more than 70 countries

MAXAR

Innovation and agility across government & commercial markets

MAXAR

Integrated solutions for complex challenges

Maxar simplifies access to critical information about our changing planet, empowering customers to answer complex questions that impact environments, economies, and lives.

Space platforms

Ground systems

Information layers

Analytics

Robotics

Satellite imagery

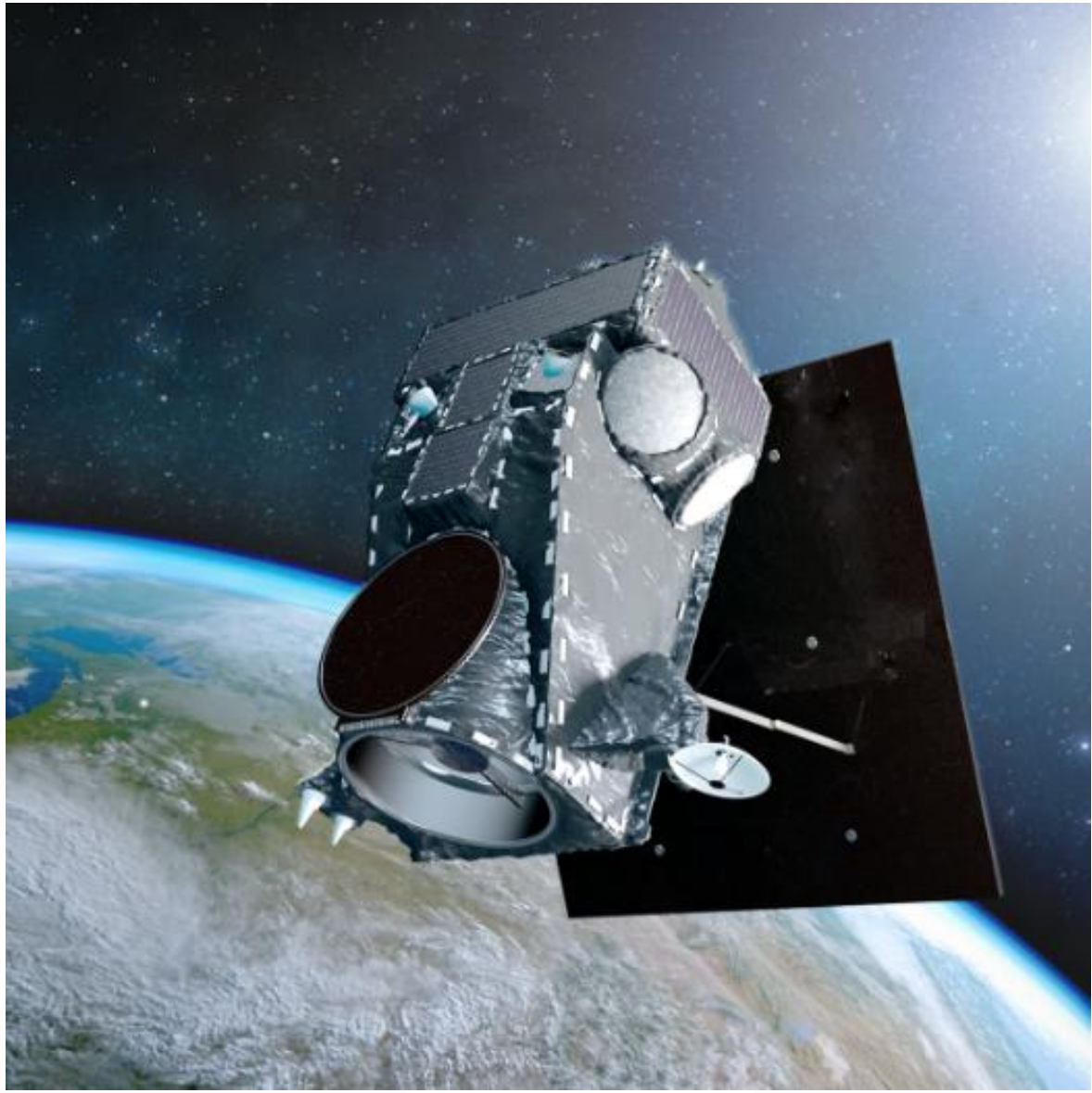
Expertise

Direct & online access

Space platforms

Advanced spacecraft manufacturing for Earth observation, exploration and communications satellites.

- High-volume production model
- Innovative, agile approach
- Standardized product line
- Commercial mindset
- Resilient constellations
- Mission assurance programs



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More GEO satellites currently on orbit than any other manufacturer

90	GEO satellites on orbit
99.99	Percent on-orbit availability
280	Satellites built & launched
2,200	Years of on-orbit experience

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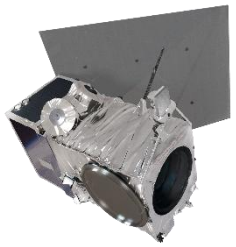
Satellite product lines

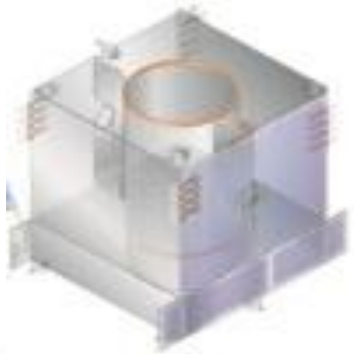
500-Class

Dual Launch
or Single Launch

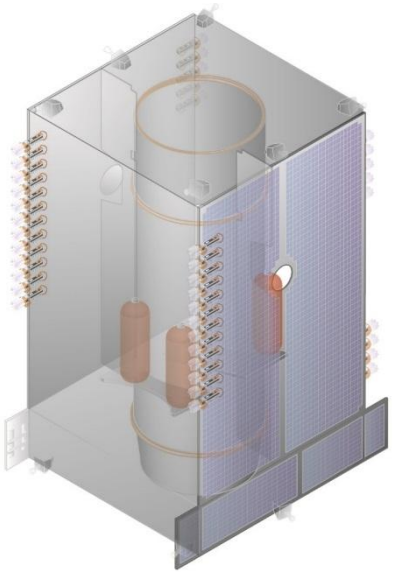


1300-Class

102”
Cylinder
Dual Launch
or Single Launch



175” Cylinder
+ Extensions



Power:	1 kW	5–9 kW	15–30 kW
Dry Mass:	700 kg	1300–2400 kg	3200–4200 kg

Modular bus enables full range of scalability

1300- and Legion-class buses are ideally suited for a range of missions for both government and commercial missions.

- Modular and scalable to higher power and more payload capacity
- Small to large products (20 W to 20+ kW payload power)
- All leverage qualified processes & supply chain management building blocks

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Ground systems

- Antennas and ground stations for multi-sensor satellite communication and control at customer sites
- Tactical ground support and defense systems

MDA, part of Maxar, has the largest installed base of Earth observation systems.

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Robotics

Nimble space robotics and mechanisms for exploration, space infrastructure, satellite servicing and autonomous operations

Maxar built every robotic arm used on the surface of Mars.

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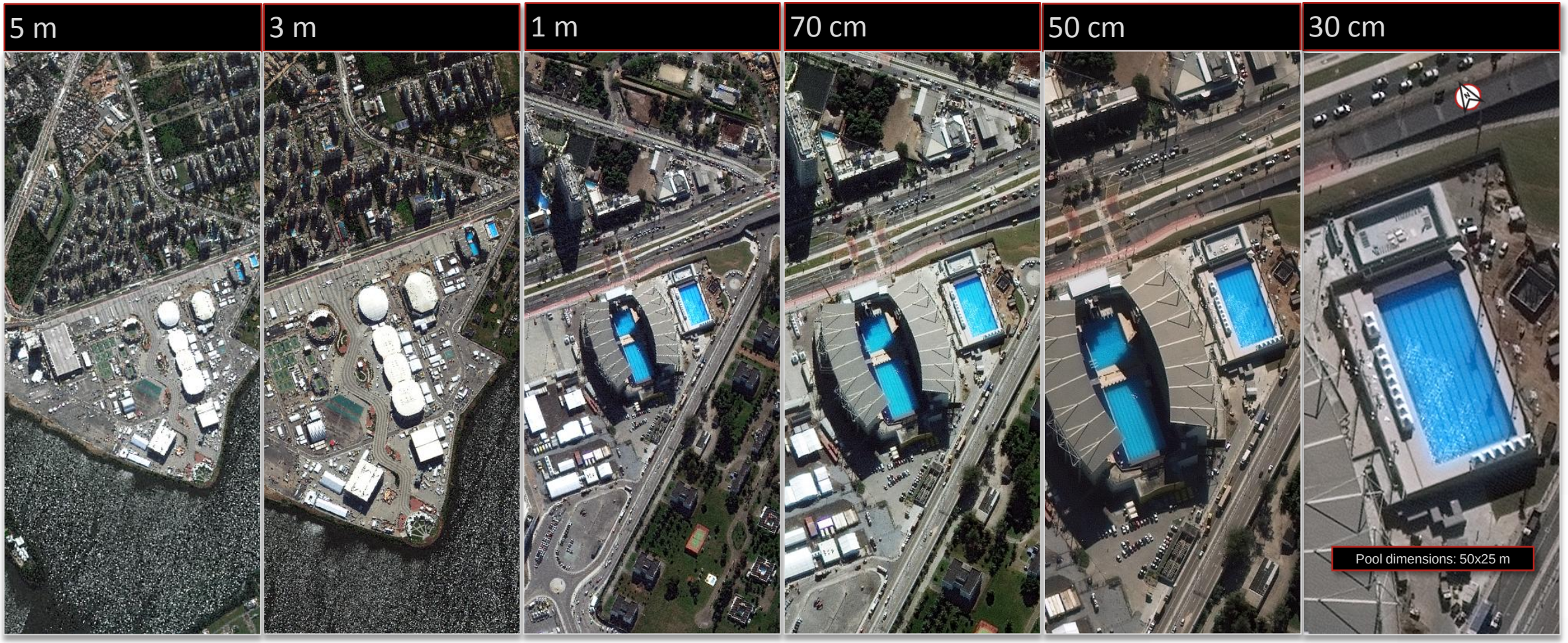
Satellite imagery

Optical and radar satellite imagery with diversity in temporal, spectral, and spatial resolution, plus unparalleled accuracy.

- Native 30 cm resolution for industry leading clarity and information density
- Advanced multispectral capabilities see beyond what's visible to the human eye
- Time-lapse data library dates back to 1999, creating a living digital inventory of change on the Earth's surface

Superior Resolution

Higher resolution = More Information

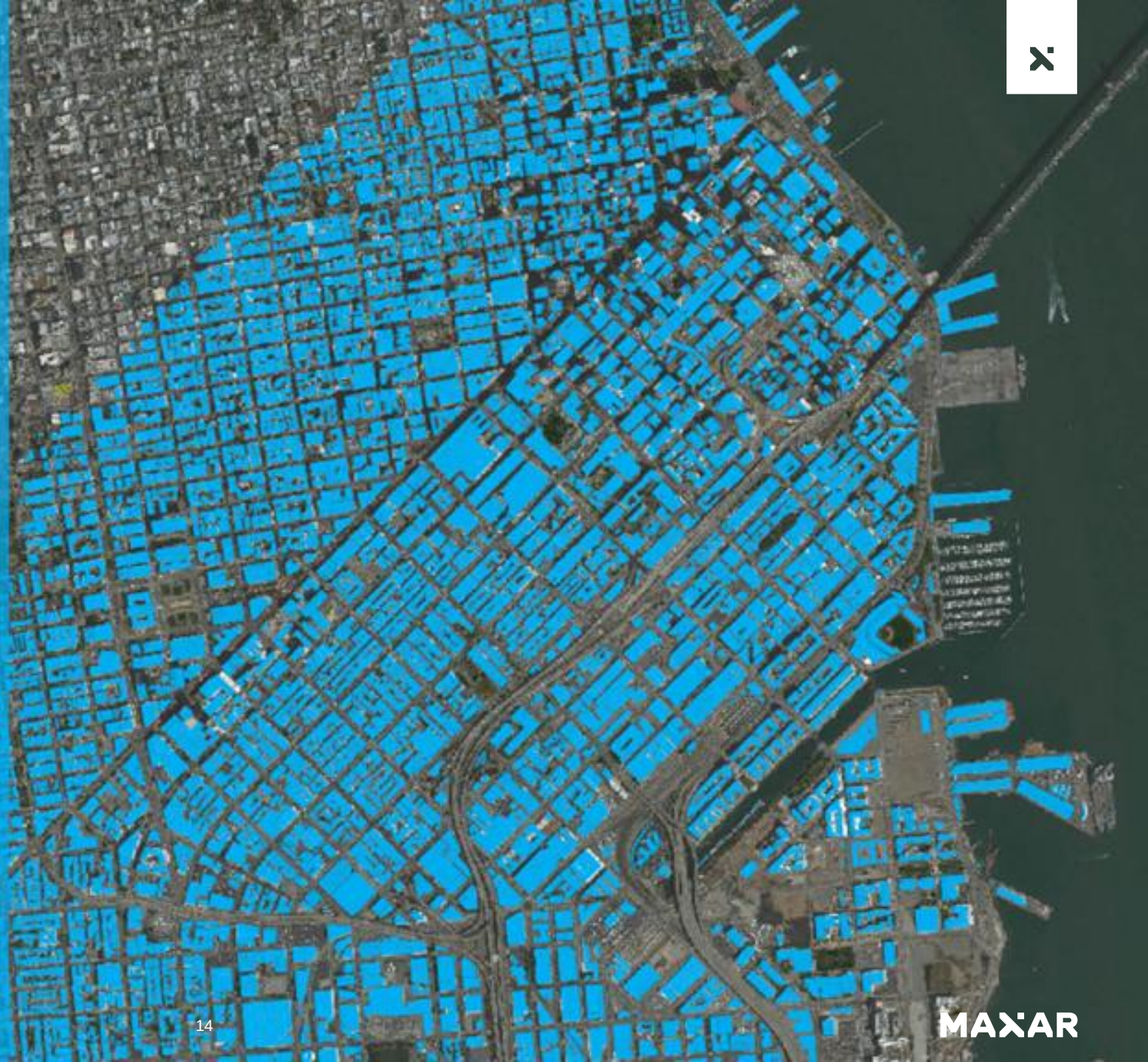


Maria Lenk Aquatics Center | Rio De Janeiro | July 5, 2016 | WorldView-3 | Image and Metadata

Information layers

Information derived from satellite imagery, including 3D models and digitized polygons.

Map provider PSMA digitized the building footprint and roof material of every structure across Australia to inform policy decisions for insurance providers at a fraction of the cost of traditional methods.



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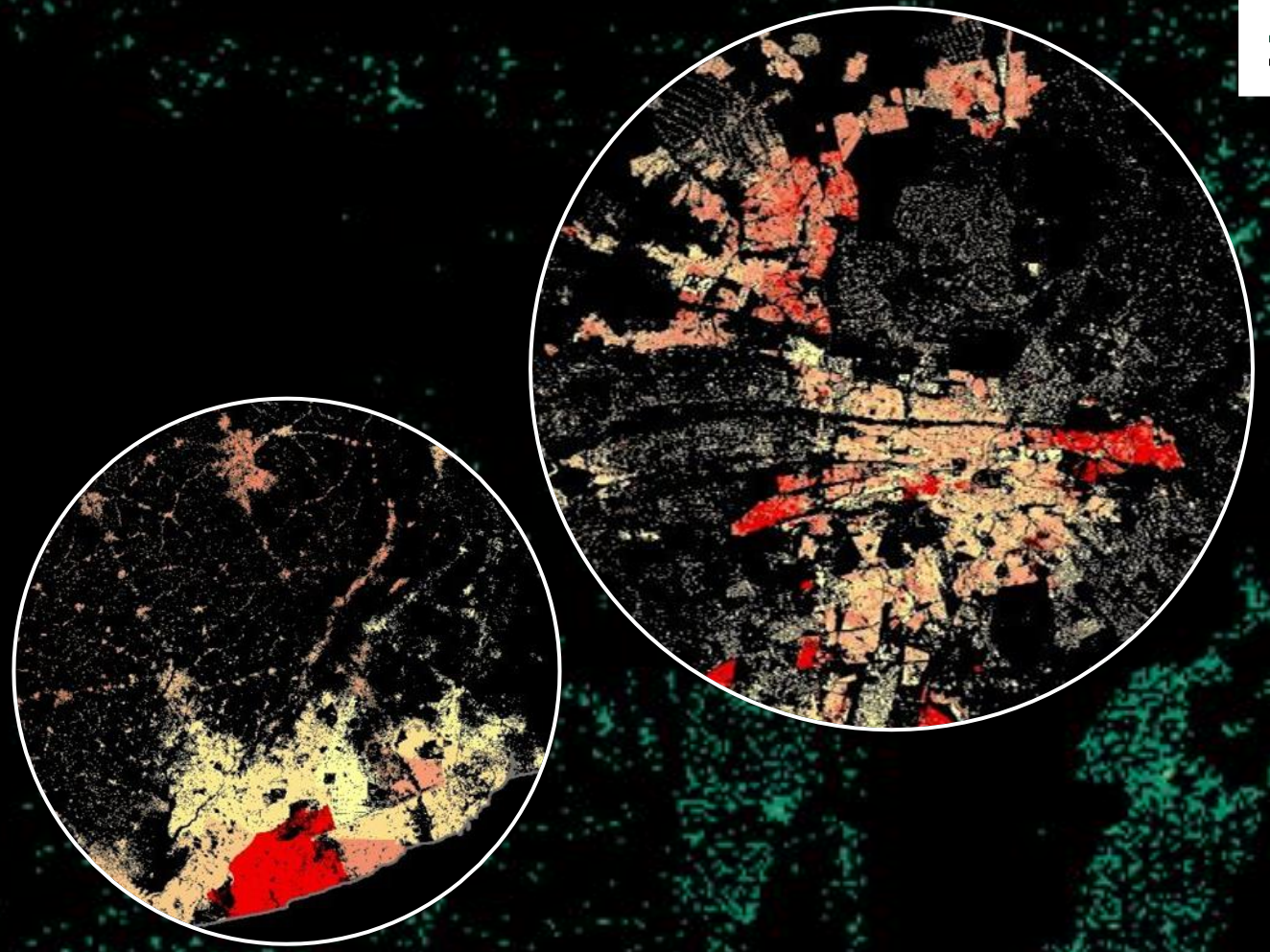
Analytics

Cloud-based platforms to run machine learning algorithms & unlock patterns in geospatial data—on a global scale.

Facebook used advanced algorithms on Maxar data to precisely map populations, fuel infrastructure development and economic growth, and expand internet access in remote regions.

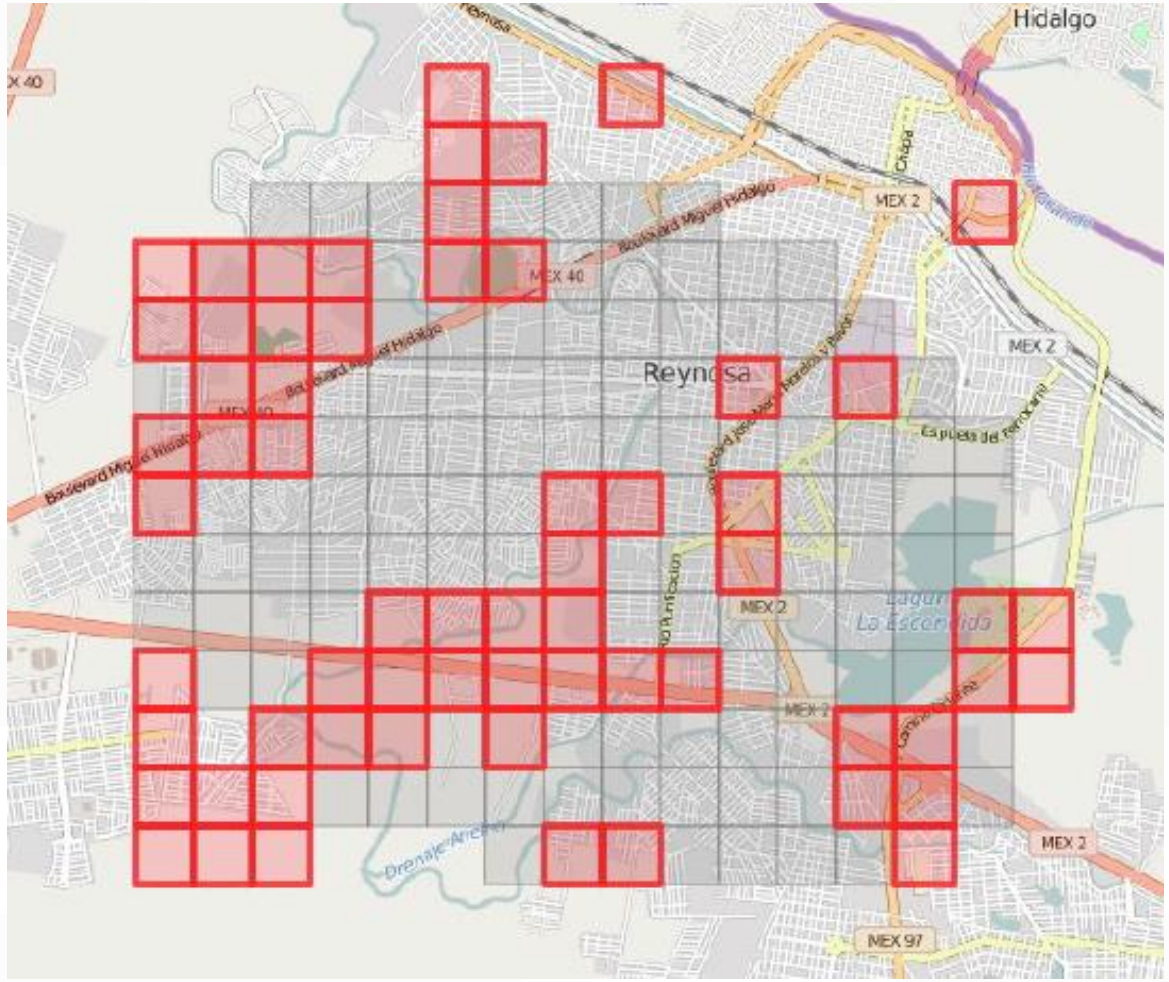


MAXAR

Expertise

With advanced geospatial expertise, our teams create foundational data and living maps for mission planners.

Our team of experts used change algorithms and object detection machine learning algorithms to quickly identify areas along the Mexico border with high levels of change. This informed where maps needed to be updated and enriched, providing the foundation to run analysis and give allow decision-makers to detect areas vulnerable to conflict or violence and help teams respond.



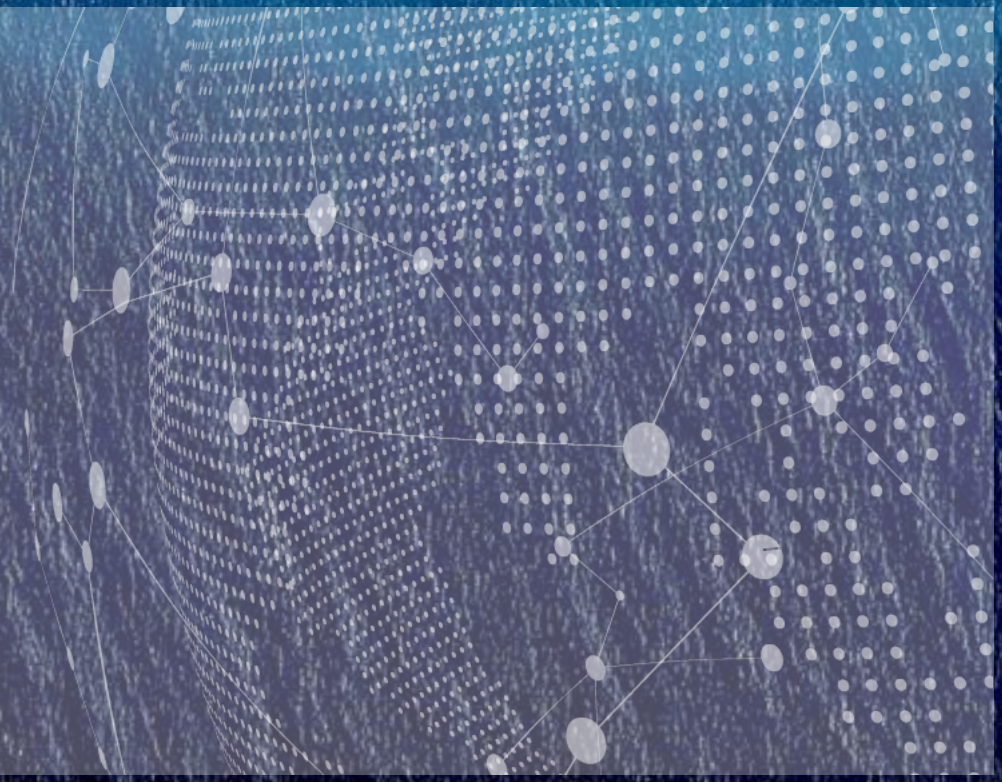
Direct & online access

Our platforms streamline customer workflows by providing simplified access to geospatial data in a single interface, or direct satellite access to collect imagery of specific areas with our constellation.

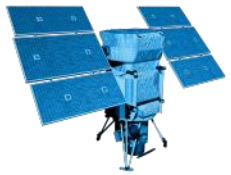
For its more than 250,000 users in the U.S. Government, the Global Enhanced GEOINT Delivery program delivers imagery directly into the hands of decision-makers, in their workflow, in near real-time.

A MAXAR COMPANY

WorldView Legion



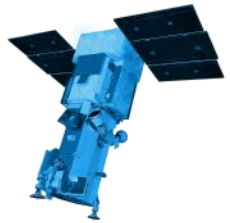
MAXAR's Current and Future Constellation



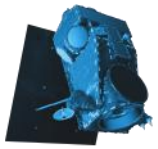
WorldView-1

GeoEye-1

WorldView-2



WorldView-3



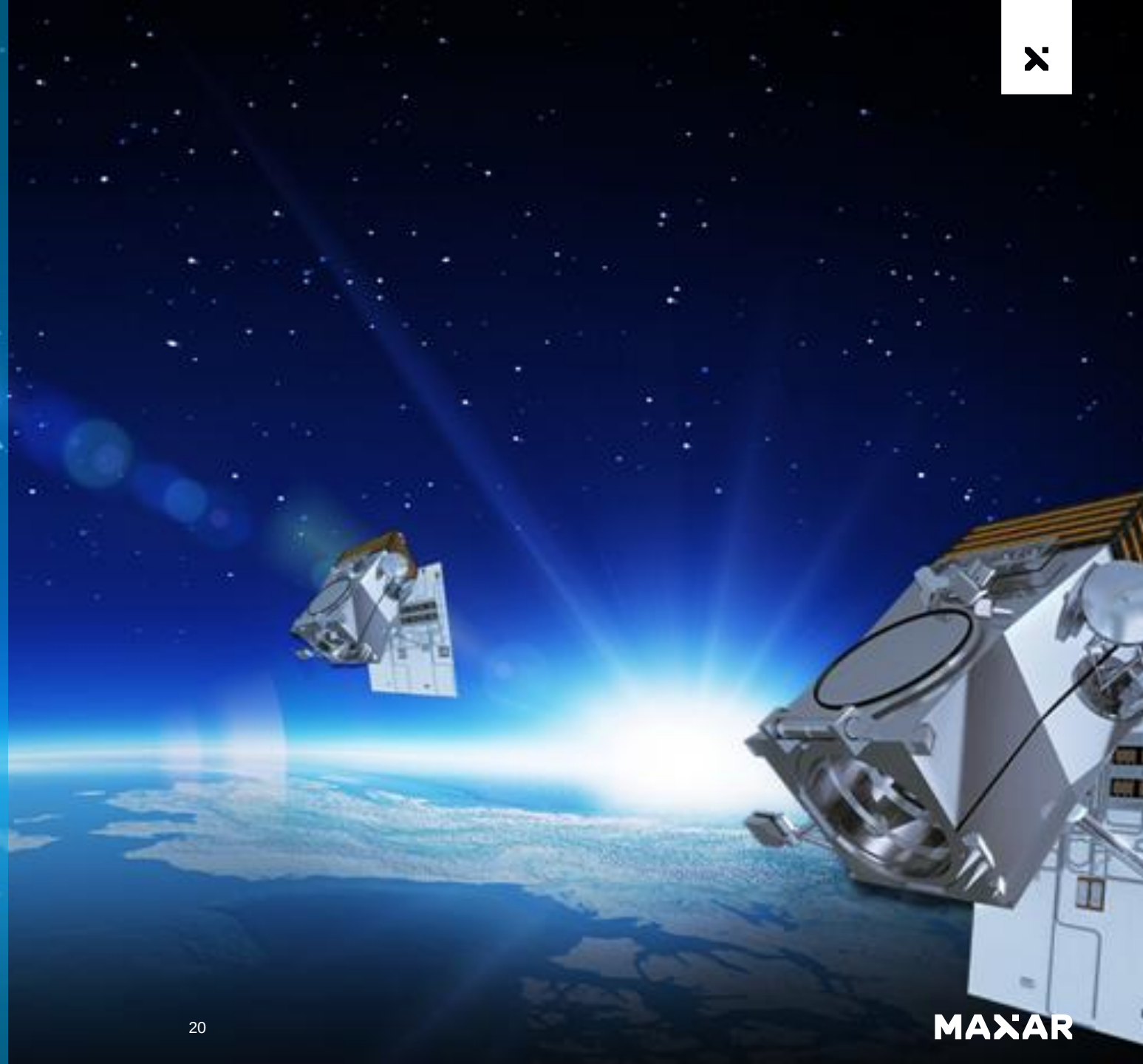
WorldView Legion

WorldView Legion

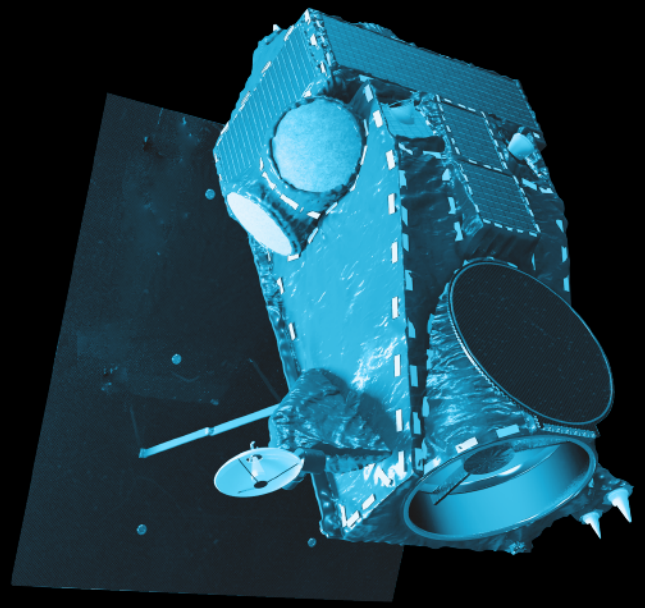
A next-generation low Earth orbit constellation, using the most innovative and flexible imaging satellites for exceptional on-orbit performance, value, and reliability.

- Launch in early 2021
- Triples Maxar's 30 cm resolution collection capacity
- 500 class spacecraft bus

Providing even greater insights into global events of significance, for critical decision-making when time is of the essence.

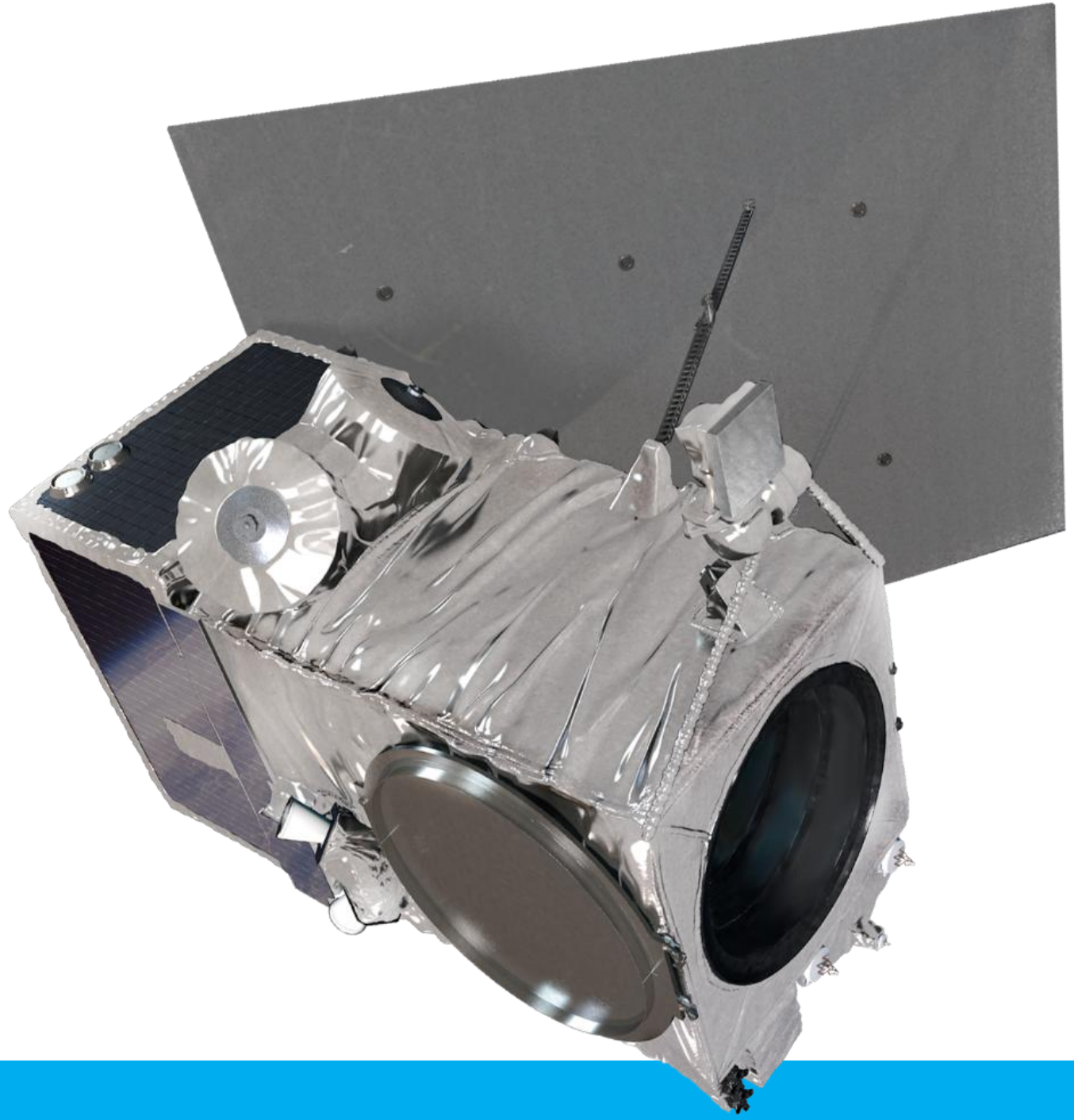


MAXAR



WorldView Legion

- HIGHER REVISIT
- MORE INSIGHTS AT SCALE
- REGIONAL CAPACITY FOR ID&I & COMMERCIAL




100
PETABYTES

>100 Petabyte!

175 km

Vivid 2.0

Coverage when and where you need it

Annual Updates

New Imagery Collections

#1 Aesthetics

Most Beautiful Visuals

Ready to go

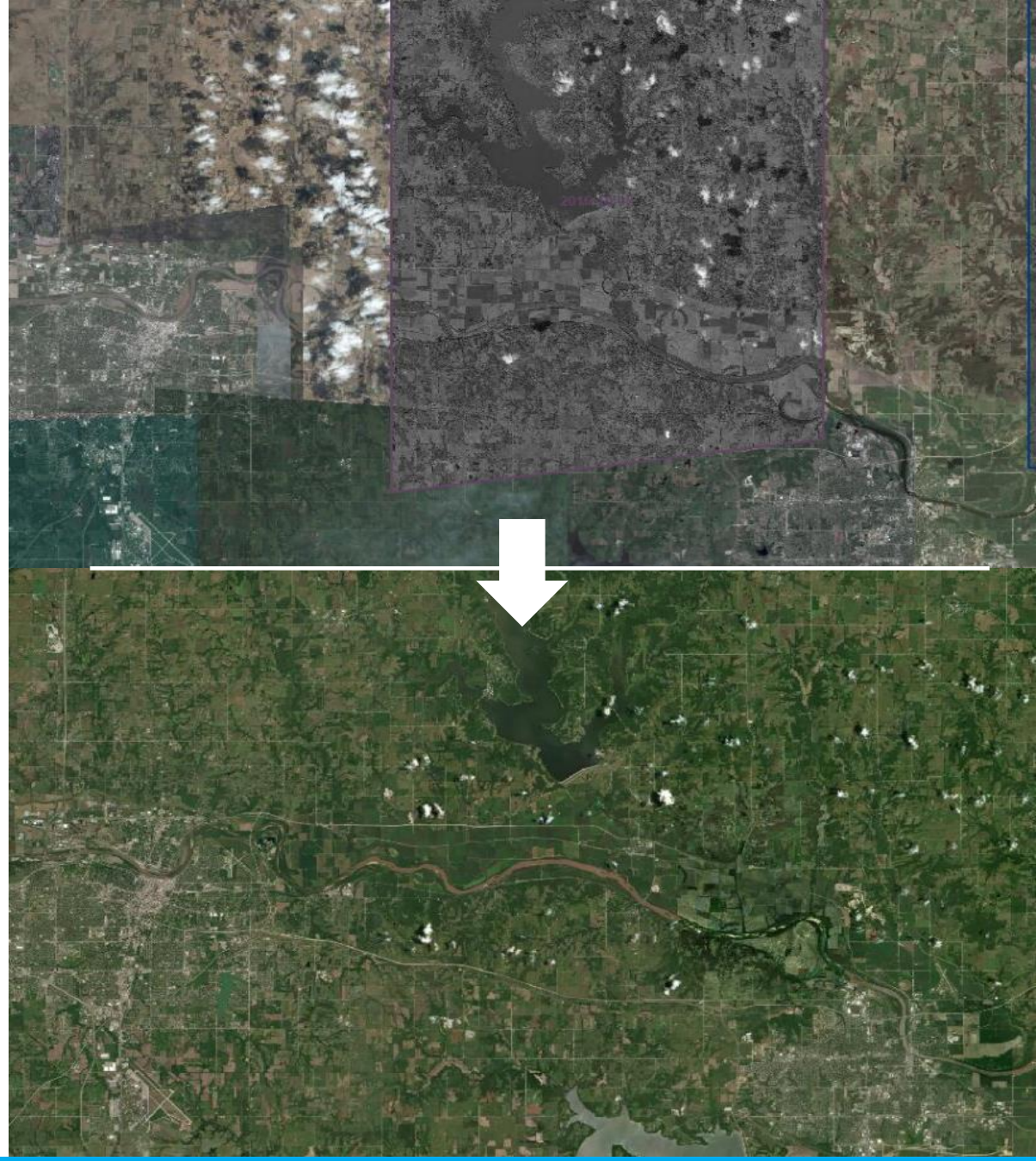
Available Off-the-Shelf

Complete

Global Coverage

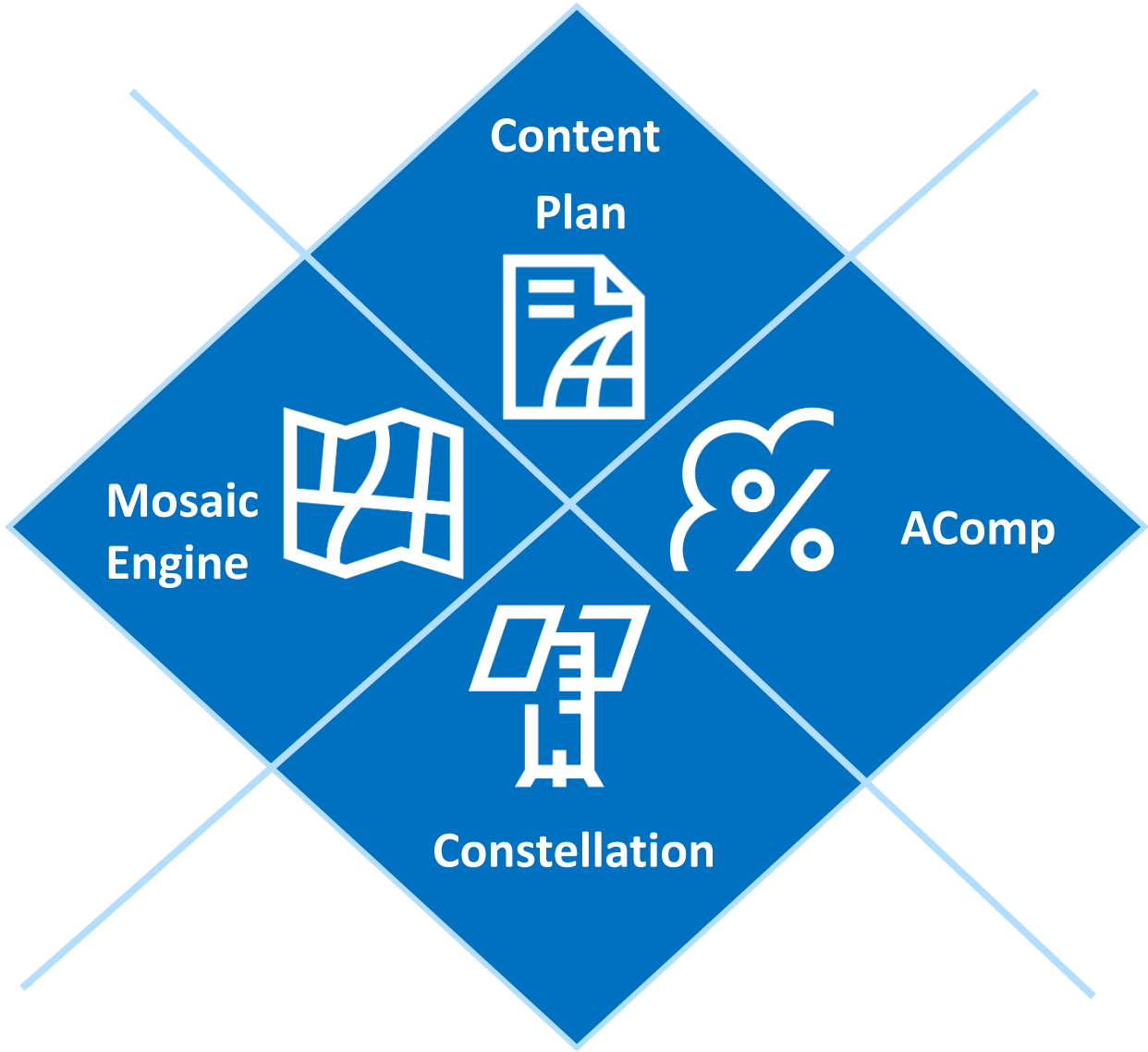
Advanced global mosaic

- High resolution coverage globally for precision mapping at scale
- High accuracy for reliable location intelligence
- Curated and color-balanced for optimal aesthetics across geographies
- Advanced mosaicking processes for a near seamless image layer
- Updated annually to maintain currency
- Global coverage ready off-the-shelf for immediate availability
- Access options for simplified integration



Powering Vivid

- Unmatched quality and clarity due to patented algorithms
- 25 years of climatology data analyzed to optimize constellation for “best time to collect” schedule
- Improved completeness and near seamless contextual layer
- Largest and most advanced constellation in market
- Leading technology unrivaled in accuracy and resolution combined



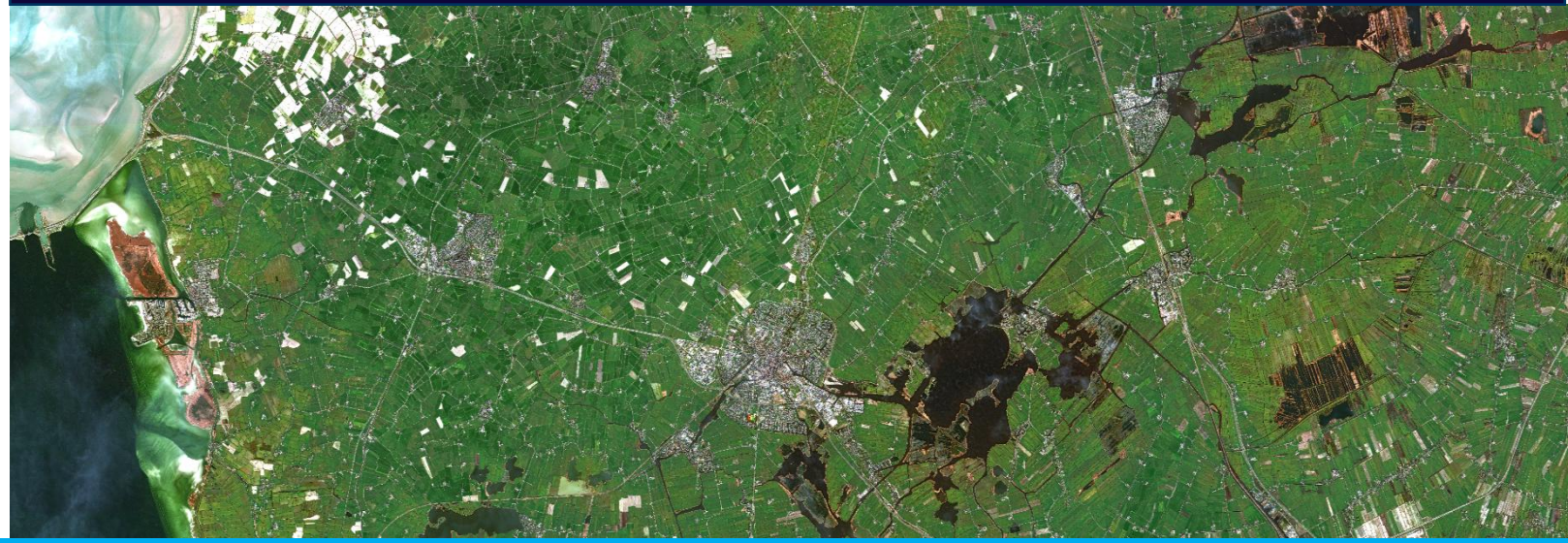
AComp

Maxar's Atmospheric Compensation (AComp) tool **improves image clarity and significantly increases the collection viability.**

AComp is a rigorously tested proprietary algorithm that removes the effects of haze and atmospheric scattering on satellite imagery.

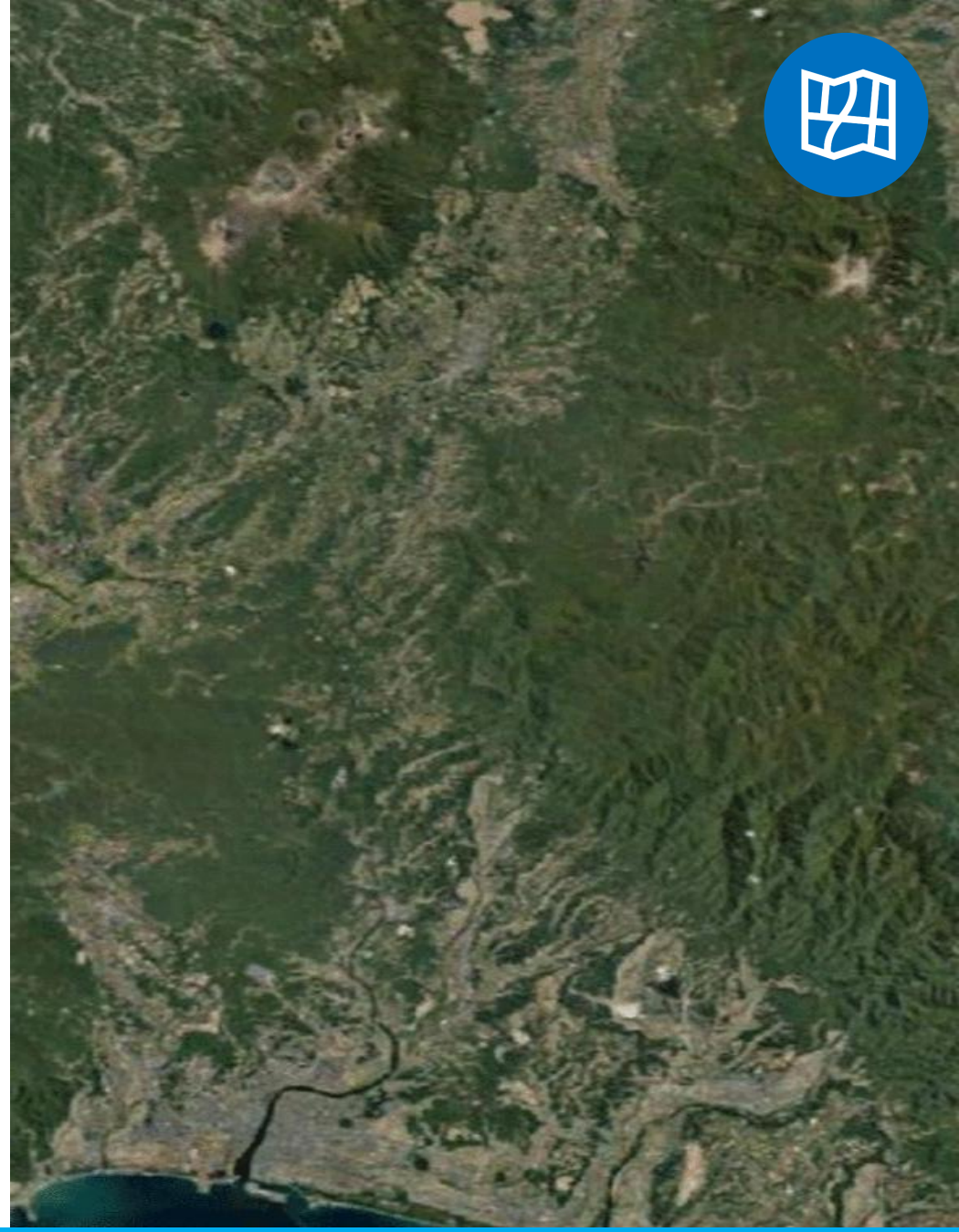
Before AComp

After AComp



Mosaic Engine

- Automated material selection prioritizes aesthetics and currency
- Processing in AWS for **speed and scalability**
- Access to the entire DG Image Library
- Ability to reference existing image layers
- **Advanced radiometry and patented seamline placement algorithms**
- Flexibility to tailor the image selection throughout the mosaic



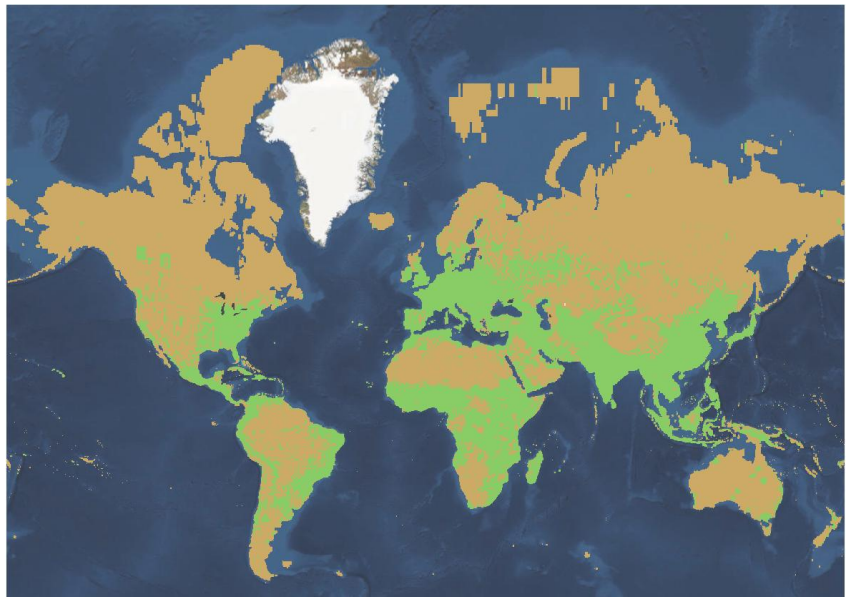
Content Plan

- **Predictability**: Plan for future projects
- **Timing:** Prepare data according to when your collection will be available
- **Repeat Collections:** Implement change detection
- **Quality**: **Highest resolution, best accuracy, most spectral bands**
- **Budgeting:** Secure resources to optimize operations
- **Service Level Agreement: Commitment to collect at specified times**

Predictable Coverage

Resolution	50cm
Coverage Area	Global (excludes Greenland and Antarctica)
Accuracy	<8.5m CE90*
Cloud Cover %	<5% globally
Completeness %	>99% globally
Image Age	Target <24 months average per country; <20 months average globally
Update Frequency	Every year
Annual Refresh	>50% globally
Aesthetics	Balance aesthetics and currency

Areas refreshed in each annual update based on content plan (**annual**, **multiple years**)



*Mosaic measured to 6.7m CE90

Metro 2.1

Metro offers premium quality imagery for metros across the globe

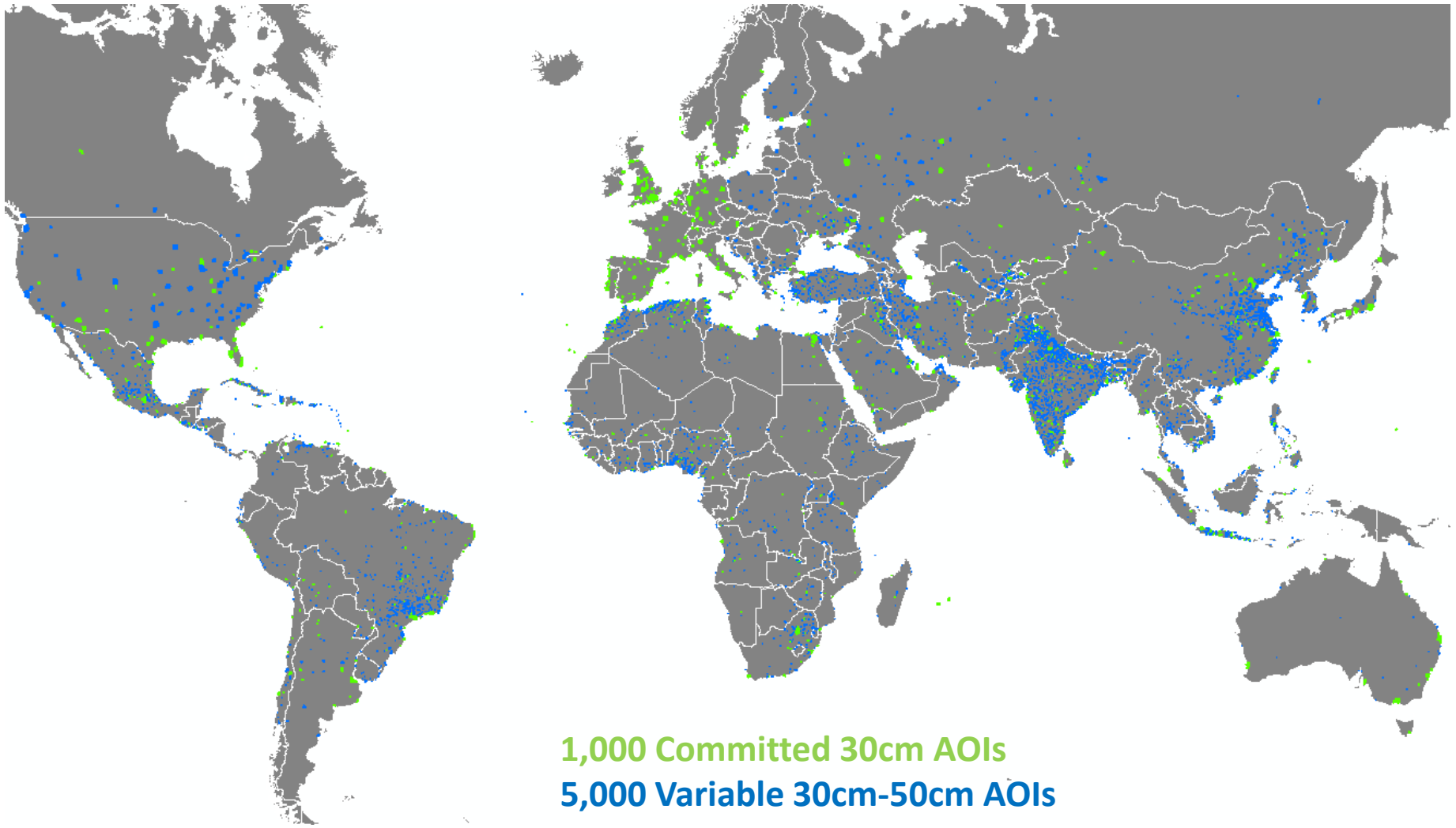
Current Imagery	• Annual refresh maintains currency • Image layer updates within months of collection
Predictable Updates	• Committed annual update schedule • 1,000 metros maintained year-to-year with 30cm coverage
Visual Clarity	• >3,000 metros with 30cm coverage • Refresh at “best time to collect” ensures quality
Ideal Coverage	• 6,000 high-population, high-interest metro areas globally • >20% of the world’s population

Metro product specs include committed image coverage, currency and clarity

	Metro 2.0/2.1	
Description	Premium image layer over urban areas across the globe, refreshed annually to maintain a current view of the ground	
Product AOIs **AOI Coverage Area**	6,000 ~2.16 million sqkm	
Product GSD	50cm up to 3,000 AOIs	30cm (native & HD[1]) at least 3,000 AOIs
AOI Annual Refresh **Refresh Coverage**	100% (all 6,000 AOIs refreshed annually) >75% of the AOI for most AOIs; >50% allowed	
Currency	Over 2,000 AOIs <12 months Remaining AOIs <24 months	Over 2,000 AOIs <12 months Remaining AOIs <24 months

1. Metro v2.1 released in Q3 2019 introduced Metro mosaics with 30cm GSD using HD sampling, to expand 30cm coverage using our entire constellation

Metro includes 6,000 high-population, high-interest global metros



1,000 Committed 30cm AOIs
5,000 Variable 30cm-50cm AOIs

Metro 2.1 offers expanded 30cm coverage using HD sampling

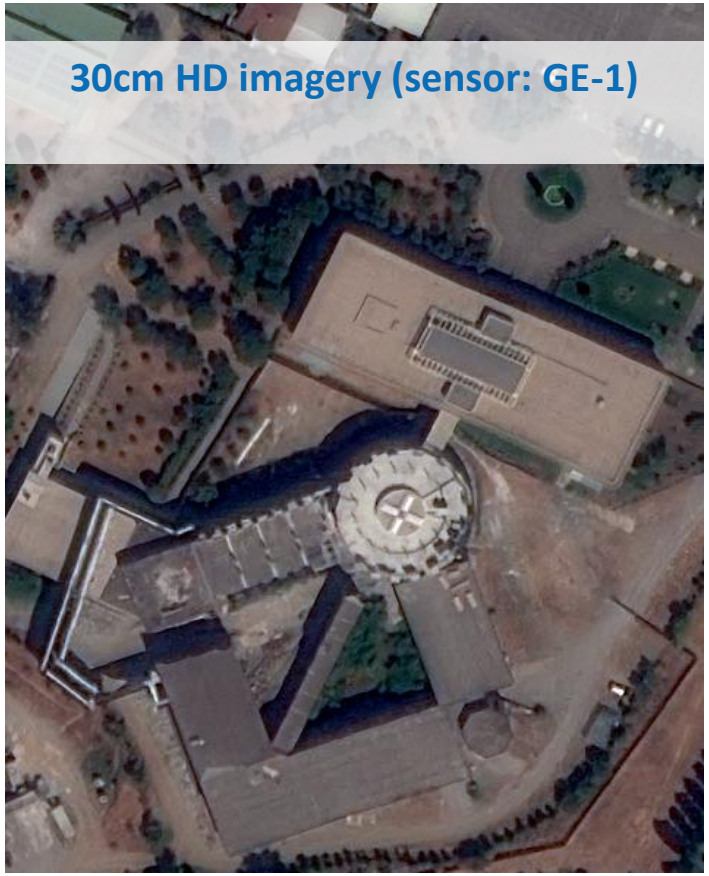
Metro offers unique and differentiated value with

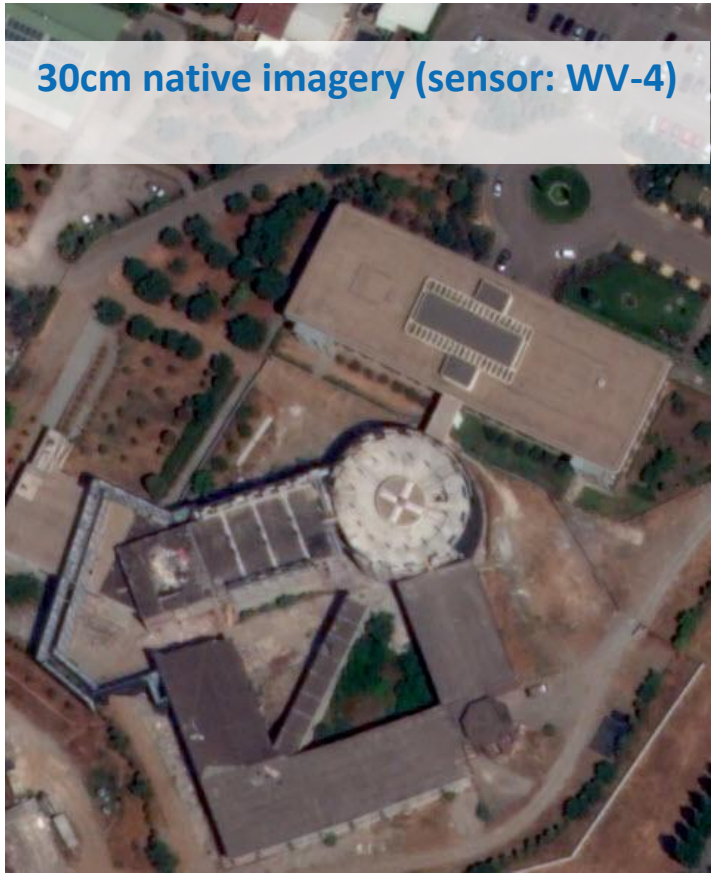
- ✓ Enhanced aesthetics through manual tonal balancing and cloud patching
- ✓ Higher relative accuracy with image bundling and seam line editing
- ✓ Committed currency with minimum annual refresh % for each area
- ✓ **Better clarity and feature definition with 30cm product GSD**

- With Metro 2.0 in 2018, we expanded from ~500 AOIs with 30cm coverage to 3,000 AOIs with 30cm coverage each year

- With Metro 2.1 in 2019, we're expanding our 30cm coverage by employing our innovative High-Definition (HD) sampling technology, which enables 30cm effective resolution from our entire constellation
  - 30cm coverage will include 30cm native and 30cm HD

HD sampling improves image clarity





- Visual and automated feature comparisons indicate 30cm HD imagery has a comparable sharpness to 30cm native imagery

Dynamic

Dynamic Mosaics

Today's mosaic for tomorrows mission assurance

- **Current:** mosaics created & updated with current imagery
- **Rapid & Scalable:** produced quickly at any scale
- **Accurate:** mosaics produced at accuracy of 8.5m CE90
- **High resolution**: country scale image at 50cm resolution
- **Indispensable:** enables wide range of use cases
- **Integrated:** seamless interoperability with GIS tools

Rapid & Scalable: broad coverage available when and where you need it

- Mosaics are rapidly producible for any region

Sections of Zimbabwe, Zambia & Botswana

Region	Area	Production Time
Shanghai	1.4M km^2	2 days
Australia – Simpson Desert	1.1M km^2	3 days
Zimbabwe, Zambia & Botswana	750,000 km^2	2 days
Syria	100,000 km^2	8 hours

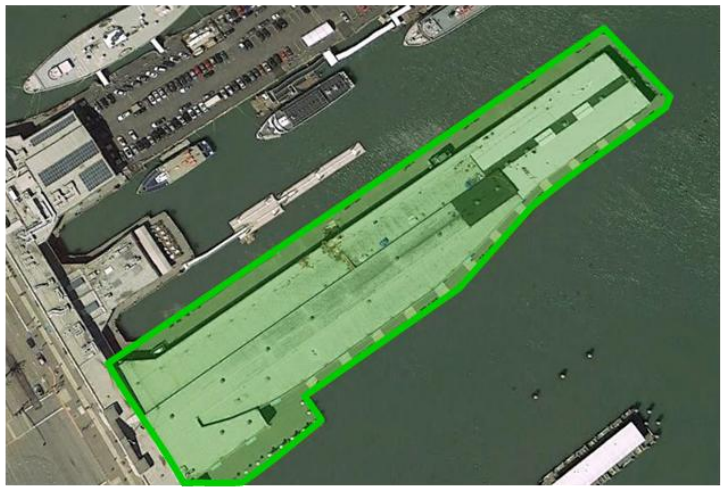
Accurate: mission critical accuracy for mission mapping and planning

- Mosaics are created to an accuracy of 8.5m CE90
- Provides a trusted baselayer for georeferencing or military mapping

Nearest Satellite Competitor

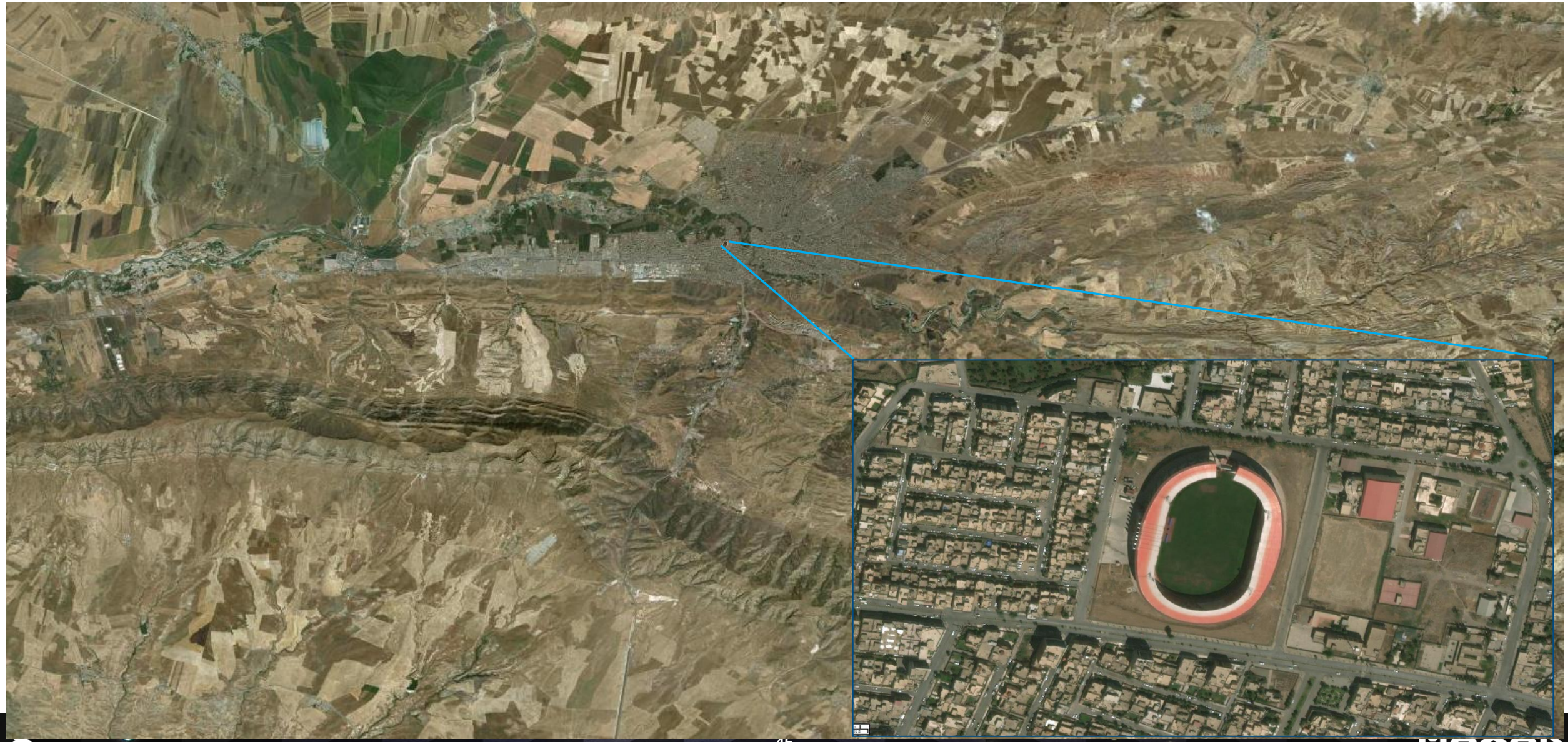
Customer Impact:
Potentially devastating errors

DigitalGlobe Accuracy



Customer Impact:
Accurate and precise positioning

High Resolution: the industries best resolution to provide critical insight



MAXAR mosaics area hosted in the cloud for easy access and integration into existing workflows

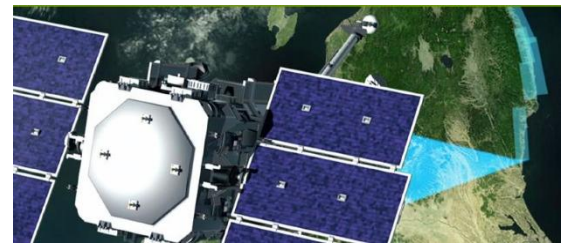


Image Collection

DigitalGlobe Image Library

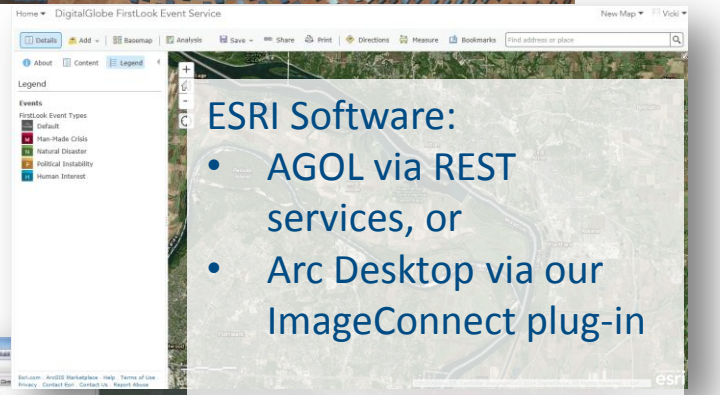
Image Processing

DigitalGlobe Cloud Services

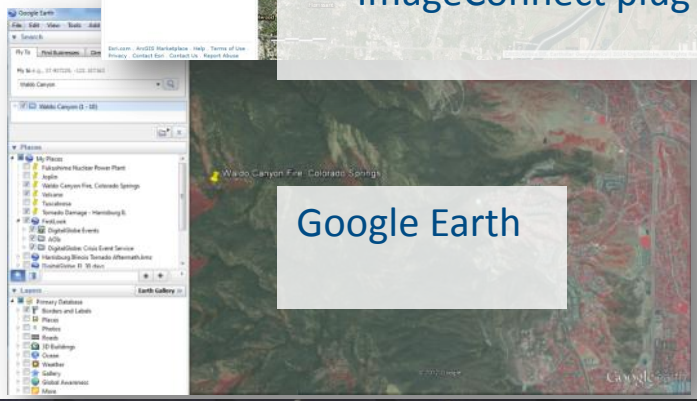
OGC Services:
WMS
WMTS
WCS
WFS

Offline Delivery via FTP, SecureFTP, AWS S3

EarthWatch interface



ESRI Software:
- AGOL via REST services, or
- Arc Desktop via our ImageConnect plug-in



Google Earth

Mosaic Product Specification Table

	Vivid	Metro	Dynamic
Coverage	Global	6,000 metro areas	Anywhere, on demand
Product Type	Orthomosaic	Orthomosaic	Orthomosaic
Image Bands	3-band pan sharpened natural color	3-band pan sharpened natural color	3-band pan sharpened natural color
Spatial resolution	50cm	30cm (3,000+ areas), 50cm (remaining areas)	50cm
Accuracy	<8.5m CE90	<4.2m CE90, <10.2m CE90	<8.5m CE90
Cloud Cover	<5% globally	<3% target; <20% allowed	<5% target
Off Nadir Angle	<30 deg	<30 deg	<30deg
Sun Elevation	>30 deg	>30 deg; >15 deg allowed	>30 deg
Bit depth	8	8	8
Projection/Datum	Geographic/WGS84	Geographic/UTM	Geographic/WGS84
Image Age	Average <30 months	<12 months, <24 months	Best available
When can I see new images?	Online/Offline: as soon as the mosaic is completed	Online/Offline: as soon as the mosaic is completed	Per delivery schedule

CURRENCY

CLARITY

COMPLETENESS

CONSISTENCY

MAXAR

MAXAR.COM