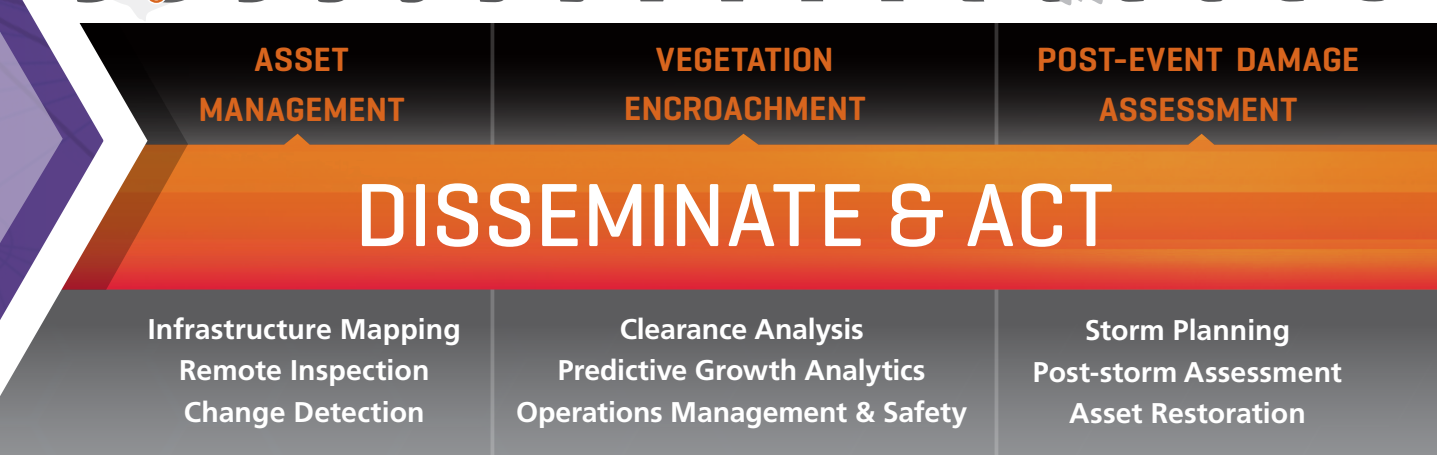
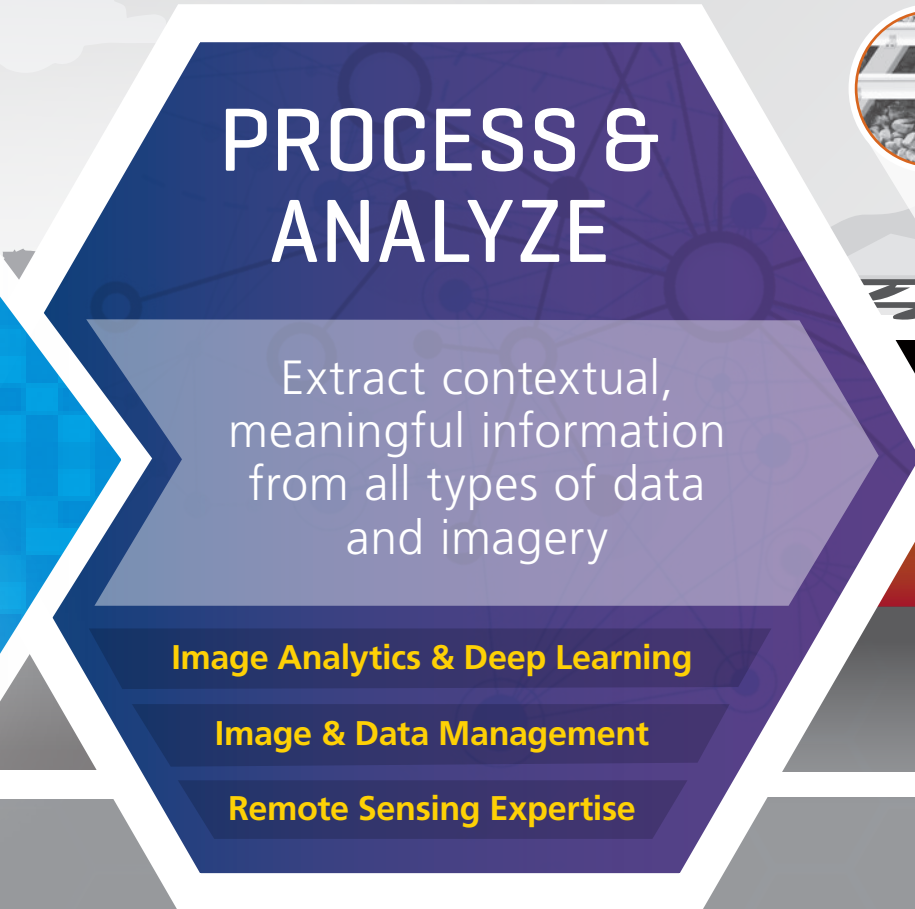
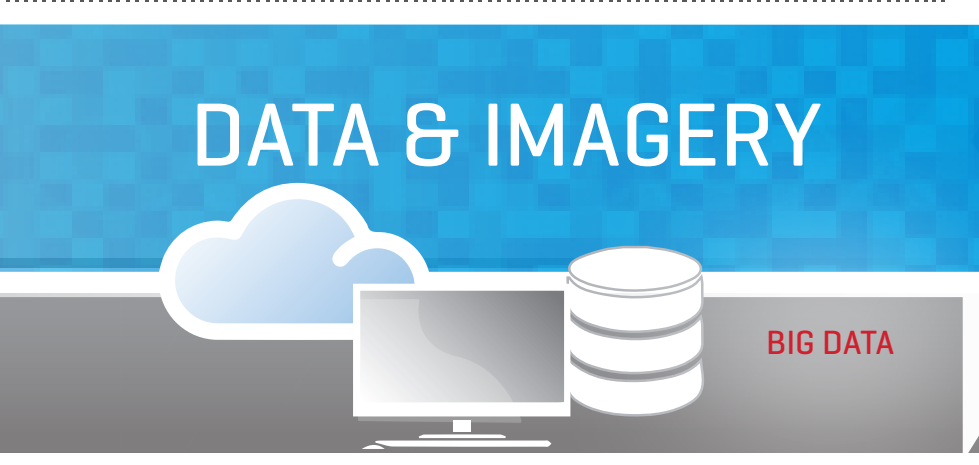
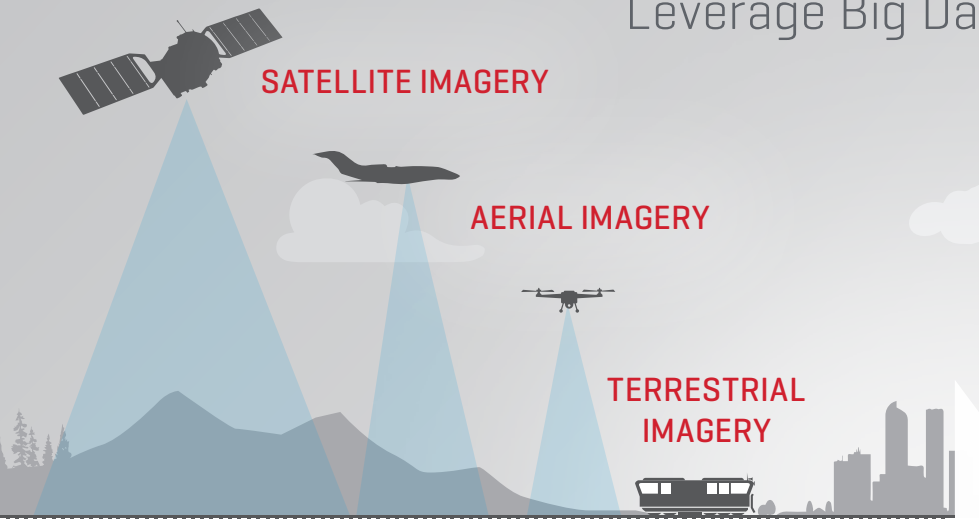




**L3HARRIS**

# Railway Asset Management Solutions

Leverage Big Data, Image Science, and Deep Learning to Deliver Critical Business Answers



## Modernize Rail Asset Inspection and Maintenance Operations

Today, rail companies spend millions of dollars manually inspecting infrastructure. Remote sensing applications offer an efficient and cost-effective alternative. Imagery from satellites, fixed-wing aircrafts, terrestrial and Unmanned Aerial Vehicles (UAVs) can provide a tremendous amount of data. But having data is not enough – information needs to be extracted from the data to answer specific questions.

L3Harris Geospatial continues to advance its rail-specific technology to support asset management, vegetation management, subsidence monitoring, and rail car tracking. L3Harris leverages its core data management, machine learning, and geospatial analytics technologies developed and proven over a period of more than three decades to deliver critical business answers to rail companies of all sizes. This rail-centric focus enables L3Harris to integrate big data and image science analytics to modernize the way rail companies inspect and maintain their assets, with a goal to help improve safety, increase cost effectiveness and reliability, and achieve greater customer satisfaction.

## AMPLIFY FEATURE SUMMARY

L3Harris Geospatial's asset management platform (Amplify™) helps rail companies automate, scale, and optimize asset management operations to meet business challenges. Amplify can manage, process, and analyze geospatial imagery, apply deep learning, and deliver actionable intelligence at the right time, in the right place, to the right people.

### MANAGE BIG DATA

As rail companies capture and consume more remotely sensed data, establishing a centralized data management system is core to the foundation of their business. Amplify fully utilizes L3Harris' core competency in processing, storing, discovery, and exploitation of geospatial data at scale and is able to ingest imagery, video, LiDAR and other forms of remotely sensed data to analyze rail infrastructure. With Amplify, users in the field or in an operations/data center can quickly locate critical intelligence with advanced discovery and filtering capabilities so they don't waste time and can make informed decisions with a high degree of confidence.

### PROCESS AND ANALYZE DATA

L3Harris' industry-leading, scientifically-proven remote sensing analytics are chosen by image scientists, geospatial analysts, and GIS professionals around the world to extract accurate and meaningful information from any type of remotely sensed data. Amplify is architected to deploy any number of L3Harris analytics including image classification, multi and hyperspectral analysis, and LiDAR feature extraction. These capabilities are brought together in Amplify with rail-specific workflows, so rail companies can leverage the power of L3Harris' remote sensing analytics without requiring a staff of image scientists.

### APPLY DEEP LEARNING TECHNOLOGY

L3Harris' advanced deep learning technology can quickly and accurately extract insights from remotely sensed data. Beyond standard libraries designed to detect common anomalies on rail infrastructure, new classifiers can be developed with specific data collected by the rail company and deployed within Amplify to provide tailored inspection analytics. These analytics can be automated to run on data ingest in real time, or used interactively by analysts to review

[L3HarrisGeospatial.com](http://L3HarrisGeospatial.com)

## RAIL USE CASES:

### ASSET INSPECTION & MAINTENANCE

Using terrestrial and UAS imagery collected over a period of time, L3Harris' rail specific analytics can identify relevant changes that augment the manual inspection of rail lines. This change detection analysis identifies broken ties, fouled ballasts, missing fasteners, and more. When deep learning technology is applied to terrestrial based LiDAR, assets along the rail corridor can be extracted, and using aerial LiDAR data, this capability can extract the rail lines themselves. When SAR data is analyzed, subsidence can be monitored along rail corridors to enable rail operations to correct issues before they become costly problems.

### VEGETATION ENCROACHMENT

Using remotely sensed data, L3Harris' rail solution supports a vegetation management workflow by identifying dead or dying vegetation along rail corridors that could become hazardous and fall onto rail lines. Output from this analysis provides prioritized areas for crews to remediate.

### POST-EVENT DAMAGE ASSESSMENT

Leveraging the big data archive available in Amplify, change detection analytics can be executed to detect anomalies between a baseline and data collected immediately after an event, whether that is a storm or accident. This automated approach to post-event damage identification allows an organization to better position repair crews to restore service faster.

This same change detection capability can be utilized for any time period, providing proactive insights on changes occurring on the network. This comparative data can be used for the purpose of predictive analytics.



## KEY BENEFITS

- OPTIMIZE COSTS
- ENSURE RELIABILITY
- IMPROVE SAFETY
- CUSTOMER SATISFACTION

## INTEGRATION WITH UTILITY OPERATIONS

L3Harris understands the requirements around operations integration and has developed Amplify to work seamlessly with other operational systems such as GIS, work management, and asset management.

### GIS INTEGRATION

- Support for mission planning by accessing the GIS data representing the distribution infrastructure
- Automatically tag data ingested by Amplify with GIS information such as asset IDs and other basic metadata to create associations between assets
- Provide hyperlinks to specific images of assets based on the associations create so that GIS analysts can review current and historical images of assets
- Update GIS assets with information derived from Amplify's analysis tools

### ASSET MANAGEMENT

- Integrate with maintenance management systems to compare analytics results with historical inspections and repair records
- Compare current asset configurations as detected by analytics with as designed specifications or as-built records

### WORK MANAGEMENT

- Integrate with ticketing system to create work orders when anomalies are detected

### FOR MORE INFORMATION:

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