AEM
Association of Equipment Manufacturers

# Data Layers for Non-Road Equipment

This document serves to provide a common language for the Association of Equipment Manufacturers (AEM) and its members to discuss data layers in non-road equipment, educating and informing both internal and external stakeholders. **It is not intended to be all-inclusive or all-encompassing in nature, but instead should serve as a glimpse into the access of data in the non-road industry.**

Non-road equipment is designed to execute specific functions relative to its intended applications and tasks in non-road environments in agriculture and construction. Construction worksites, farm fields, dairies and feedlots, areas of animal husbandry, etc., are dynamic environments defined by fences or other boundaries with some level of restriction for access or entry. **These layers do not apply to on-road operation of non-road equipment.**

It is important to note that a fleet includes a system of connected IoT devices (machines) and external data inputs (weather monitoring, ground conditions, project progress trackers, etc.). **Proprietary levels of machine data are out of scope for this document.**

## About AEM

The Association of Equipment Manufacturers (AEM) is the North American-based international trade group representing non-road equipment manufacturers and suppliers, with more than 1,100 member companies and over 200 product types across five diverse industry sectors, including agriculture, construction, forestry, mining, and utility.

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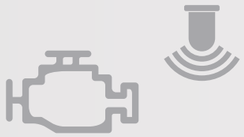
## ON-BOARD DATA

LAYER 0

### INDIVIDUAL DATA INPUT

**Description:** Individual sensors or controllers gathering asset-level data
**Primarily Responsible for Cybersecurity Strategy:** Manufacturer of individual sensor
**Examples:** Individual sensors or controllers on a machine providing diagnostic codes, speed, location information, RPMs, and other machine level data

LAYER 1



### INDIVIDUAL ASSET SUB-SYSTEM

**Description:** Sub-system of sensors and controllers gathering and "packaging" asset-level data
**Primarily Responsible for Cybersecurity Strategy:** Manufacturer of sub-system of sensors
**Examples:** Network of sensors on a machine and electronic control modules for specific machine applications (BUS)

## TRANSFER LAYER

LAYER 2

### INDIVIDUAL ASSET TRANSFER LAYER

**Description:** On-board asset system transferring packaged asset-level data as performance and production data to or from individual system
**Primarily Responsible for Cybersecurity Strategy:** System integrator as the manufacturer of machine system
**Examples:** Collection of data from machine networks and production systems transferred off the machine

## OFF-BOARD DATA

LAYER 3

### INDIVIDUAL ASSET IN A SINGLE SYSTEM

**Description:** Asset system accessing and interpreting packaged asset-level data for an individual machine
**Primarily Responsible for Cybersecurity Strategy:** Manufacturer of individual system off-board the asset (specific to brand of machine)
**Examples:** Collection of data from a single machine in a web-based system, cloud network, vendor system, or asset management system

LAYER 4

### MULTIPLE ASSETS IN A SINGLE SYSTEM

**Description:** System gathering and "packaging" individual asset system data for an entire field or fleet of assets
**Primarily Responsible for Cybersecurity Strategy:** Manufacturer of system consolidating system data off-board the asset
**Examples:** Collection of data from a fleet of machines in a web-based system, cloud network, vendor system, or asset management system (can be mixed fleet, including multiple manufacturers)

LAYER 5

### ENTIRE ECOSYSTEM

**Description:** System of systems accessing data from a group of fields or fleets of assets, including any external data inputs and sensors
**Primarily Responsible for Cybersecurity Strategy:** Manufacturer of system consolidating system data off-board the asset
**Examples:** Collection of data from multiple web-based systems, cloud networks, vendor systems, or asset management systems, including external data inputs and in-field sensors