# A-LIDS:
# AI-enabled Logistics Intelligent Decision Support

**LOCKHEED MARTIN**

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# Summary

## Current Gap

- Current JADC2 systems lack complete logistics situational awareness and places significant cognitive load on the commanders to make rapid decisions during mission execution and planning

- Sustainment data need to be synchronized across mission command systems to enable commanders to make timely informed battlefield decisions

## How is it done today?

Current systems often rely on siloed and unsynchronized data operated over isolated and un-integrated networks, aggregated manually making it hard for commanders to make timely and informed decisions
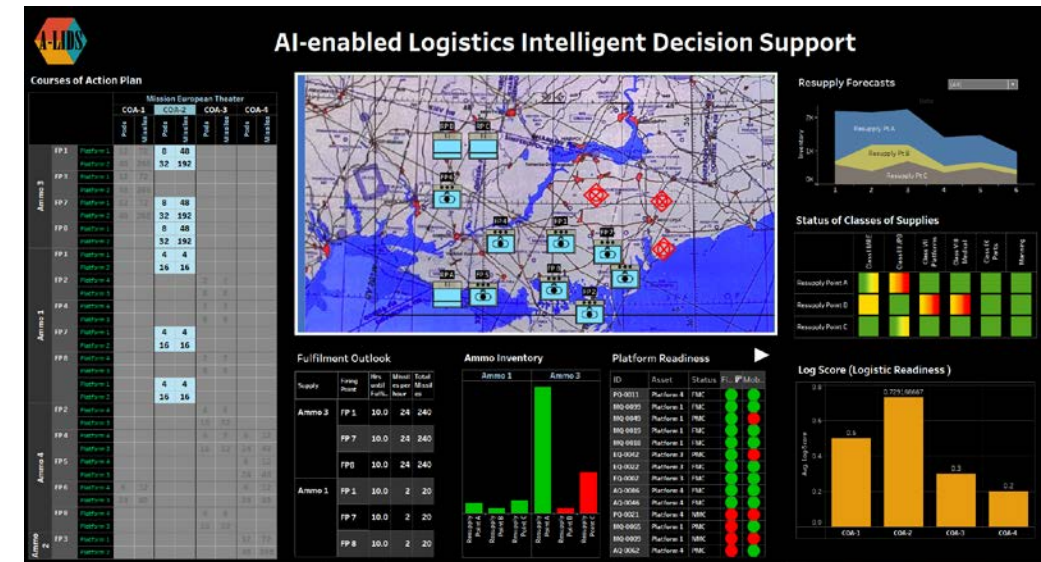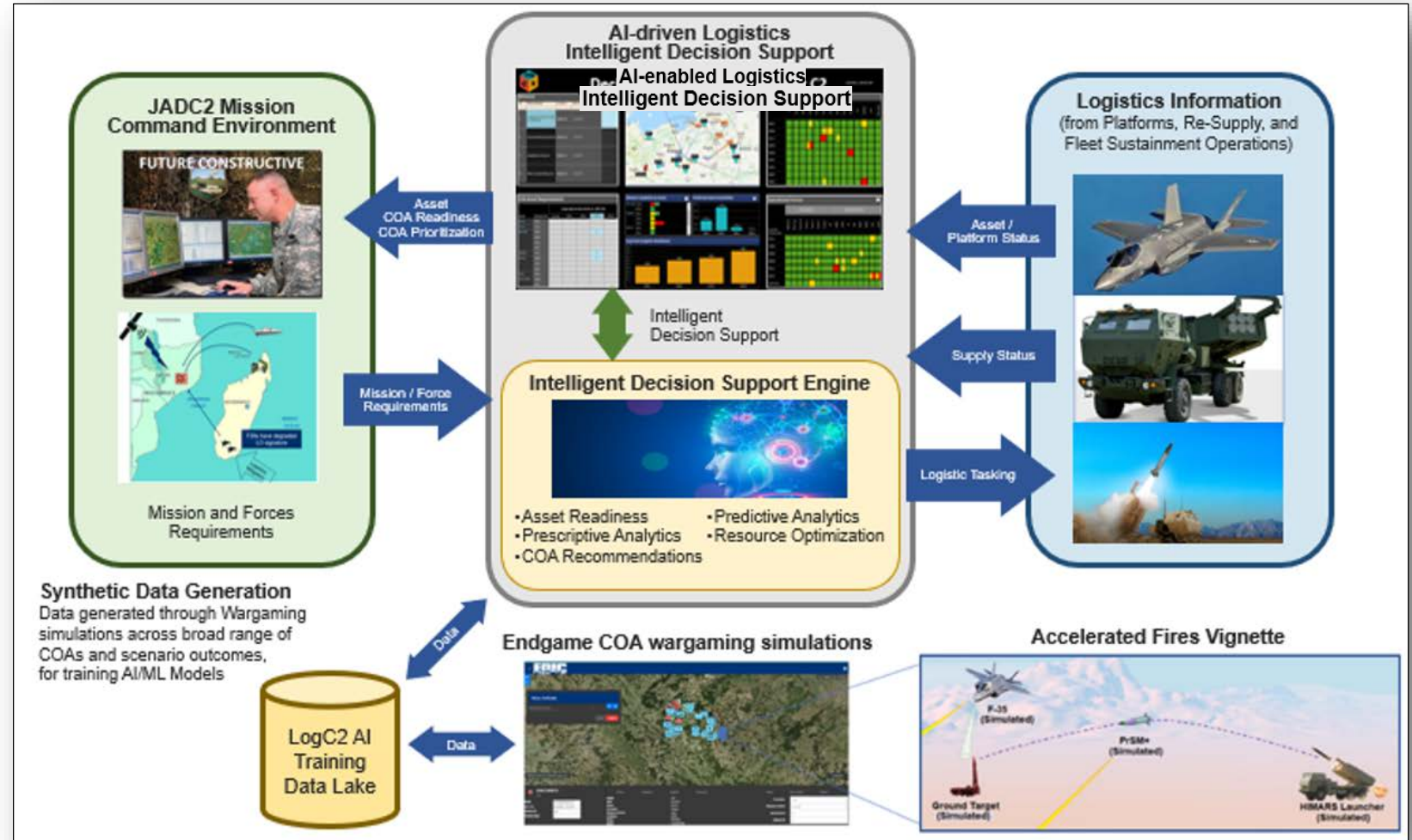


## Goal

*Provide AI driven logistics informed decision support to operational commanders and logisticians. The intent is to leverage autonomy, reduce cognitive load of the commander, and improve mission success*

**There is a recognized need for an Intelligent Sustainment Decision Support for Resilient Logistics in a Contested Environment**

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# A-LIDS

- Goal of A-LIDS is to enhance accelerated decision making in support of sustainment operations

- Leverages AI, ML & Predictive Analytics to deliver decision making with speed and accuracy

- Provides recommendations and comparative Course of Action (COA) readiness evaluation called  LogScore



**The Goal of A-LIDS is to provide Logistics recommendations & COA evaluations with Speed and Accuracy**

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# Technical Approach

- We use AI to enhance Sustainment Decision Support to accelerate fires for Joint Sustainment Operations

- Data is synthetically generated with an Army validated Wargame-in-the-loop simulations

- Synthetic data covers extensive Joint Logistics platforms, vignettes, missions and outcomes

- Once AI models are trained, it can be used as initial models to provide logistics decision support

- During operation, it ingests real-time operational data to enhance logistics situational awareness and posture
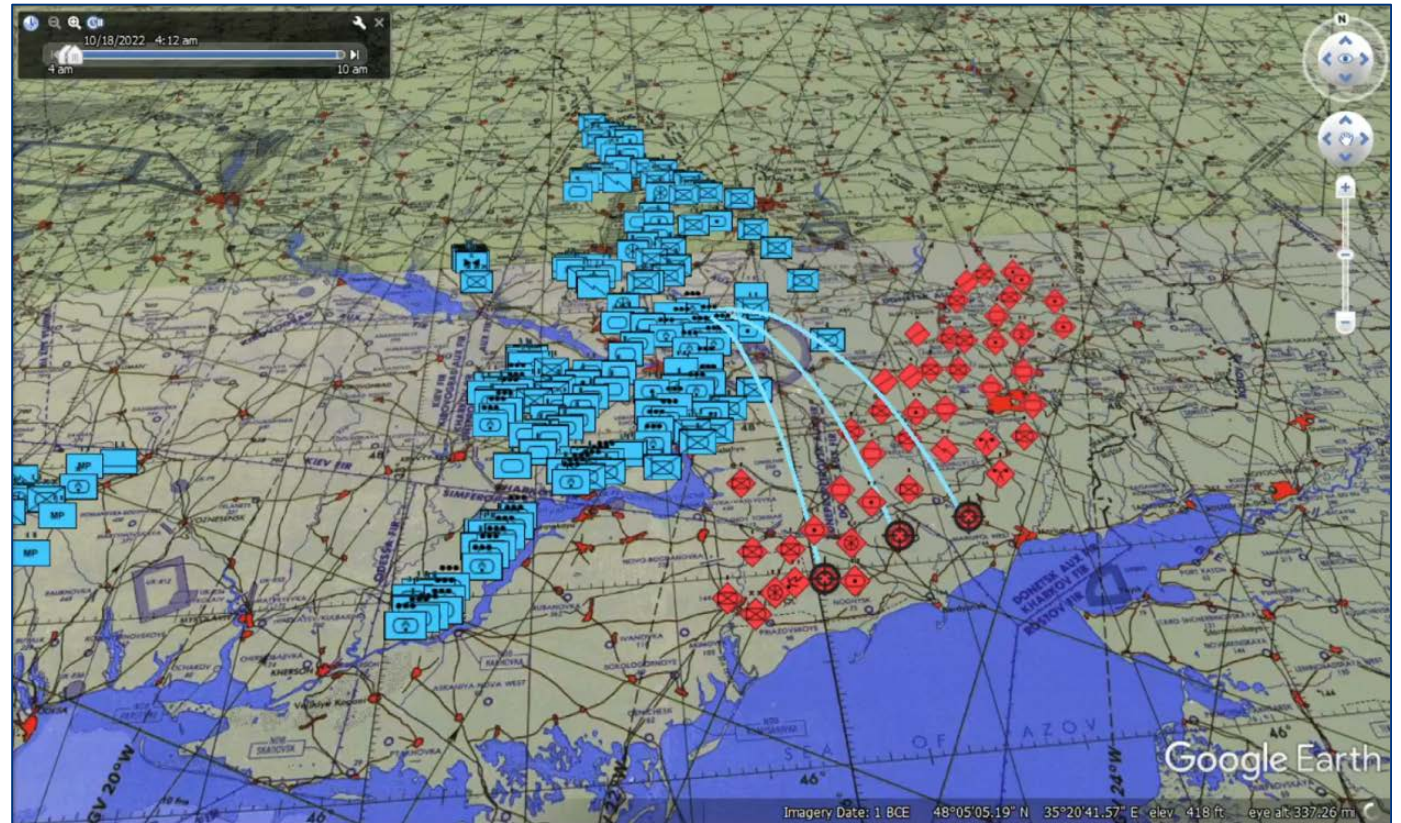


Leverages AI:
- o  Predict readiness across classes of logistics
- o  Provide Course of Action evaluation with explainability
- o  Provide actionable insights
- o  Suggest efficiencies

## Leveraging AI, ML, Predictive Analysis for Decision Aid

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# Use Cases

## USE CASE 1

- **Who**: Warfighter at the Brigade, Division, Corps level
- **What**: Logistic awareness in mission planning and execution
- **How**: Training Phase - Use WARSIM data to train initial ML models. Leverage federated sustainment data from mission command systems to supplement the training data
  Operational Phase – Provides logistic informed decision making during mission planning and execution



## USE CASE 2

- **Who**: Trainers, Simulation Scenario Designers
- **What**: Automated Assessment for Mission Command Training
- **How**: Training Phase - Use WARSIM data to train ML models
  Operational Phase – Provides decision support during mission command training, enabling Automated Assessment
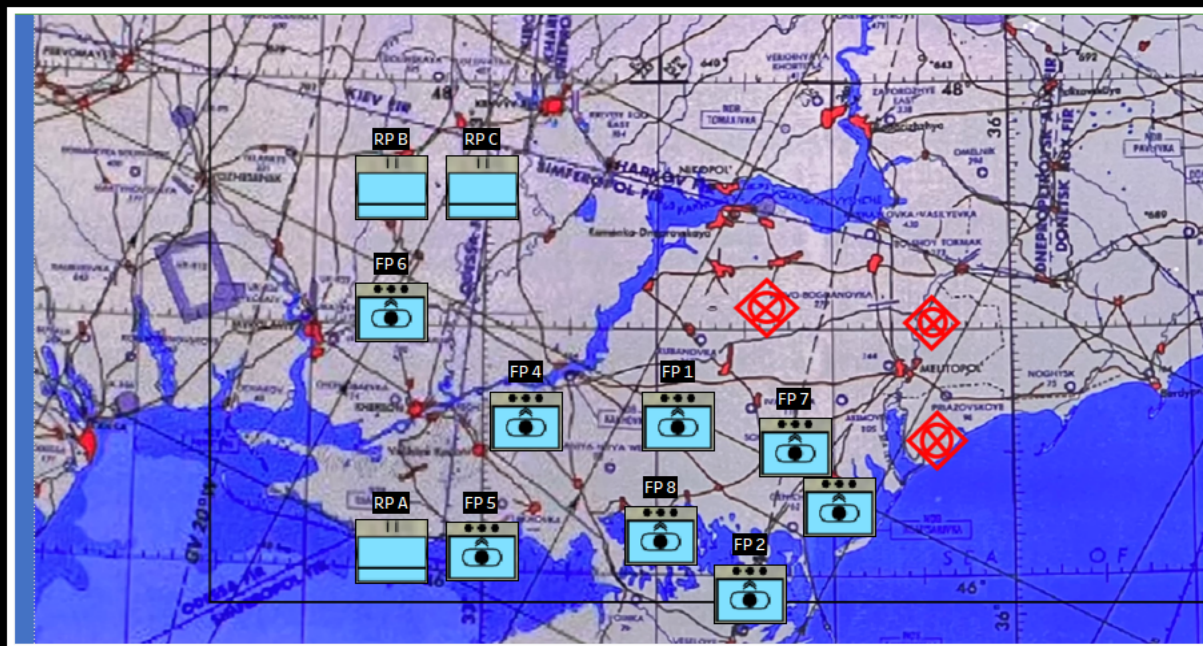


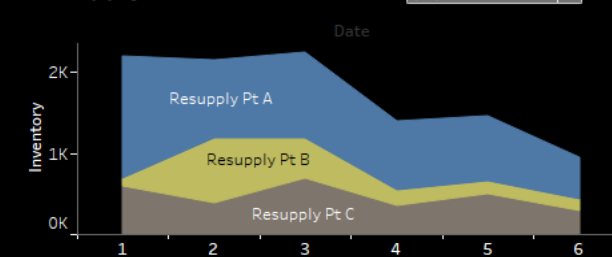## Applicability of this technology for Warfighter as well as Trainers

# A-LIDS DASHBOARD (with representative data)

**A-LIDS**

# AI-enabled Logistics Intelligent Decision Support

## Courses of Action Plan

| | | | COA-1 | | COA-2 | | COA-3 | | COA-4 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Pods | Missiles | Pods | Missiles | Pods | Missiles | Pods | Missiles |
| Ammo 3 | FP 1 | Platform 1 | 12 | 72 | 8 | 48 | | | | |
| | | Platform 2 | 48 | 288 | 32 | 192 | | | | |
| | FP 3 | Platform 1 | 12 | 72 | | | | | | |
| | | Platform 2 | 48 | 288 | | | | | | |
| | FP 7 | Platform 1 | 12 | 72 | 8 | 48 | | | | |
| | | Platform 2 | 48 | 288 | 32 | 192 | | | | |
| | FP 8 | Platform 1 | | | 8 | 48 | | | | |
| | | Platform 2 | | | 32 | 192 | | | | |
| Ammo 1 | FP 1 | Platform 1 | | | 4 | 4 | | | | |
| | | Platform 2 | | | 16 | 16 | | | | |
| | FP 2 | Platform 4 | | | | | 2 | 2 | | |
| | | Platform 3 | | | | | 8 | 8 | | |
| | FP 4 | Platform 4 | | | | | 2 | 2 | | |
| | | Platform 3 | | | | | 8 | 8 | | |
| | FP 7 | Platform 1 | | | 4 | 4 | | | | |
| | | Platform 2 | | | 16 | 16 | | | | |
| | FP 8 | Platform 4 | | | | | 2 | 2 | | |
| | | Platform 3 | | | | | 8 | 8 | | |
| | | Platform 1 | | | 4 | 4 | | | | |
| | | Platform 2 | | | 16 | 16 | | | | |
| Ammo 4 | FP 2 | Platform 4 | | | | | 4 | 8 | | |
| | | Platform 3 | | | | | 16 | 32 | | |
| | FP 4 | Platform 4 | | | | | 4 | 8 | 6 | 12 |
| | | Platform 3 | | | | | 16 | 32 | 24 | 48 |
| | FP 5 | Platform 4 | | | | | | | 6 | 12 |
| | | Platform 3 | | | | | | | 24 | 48 |
| | FP 6 | Platform 4 | 6 | 12 | | | | | 6 | 12 |
| | | Platform 3 | 24 | 48 | | | | | 24 | 48 |
| | FP 8 | Platform 4 | | | | | 4 | 8 | | |
| | | Platform 3 | | | | | 16 | 32 | | |
| Ammo 2 | FP 3 | Platform 1 | | | | | | | 12 | 72 |
| | | Platform 2 | | | | | | | 48 | 288 |

## Resupply Forecasts

(All)

Resupply Pt A · Resupply Pt B · Resupply Pt C — Inventory vs Date (1–6)

## Status of Classes of Supplies

| | Class I MRE | Class III JP8 | Class VII Platforms | Class VIII Medical | Class IX Parts | Manning |
|---|---|---|---|---|---|---|
| Resupply Point A | | | | | | |
| Resupply Point B | | | | | | |
| Resupply Point C | | | | | | |

## Fulfilment Outlook

| Supply | Firing Point | Hrs until Fulfi.. | Missil es per hour | Total Missil es |
|---|---|---|---|---|
| Ammo 3 | FP 1 | 10.0 | 24 | 240 |
| | FP 7 | 10.0 | 24 | 240 |
| | FP 8 | 10.0 | 24 | 240 |
| Ammo 1 | FP 1 | 10.0 | 2 | 20 |
| | FP 7 | 10.0 | 2 | 20 |
| | FP 8 | 10.0 | 2 | 20 |

## Ammo Inventory

Ammo 1 / Ammo 3 — Resupply Point A, Resupply Point B, Resupply Point C
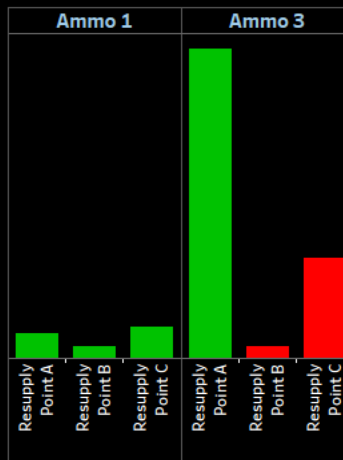
## Platform Readiness

| ID | Asset | Status | Fi.. | Mob.. |
|---|---|---|---|---|
| PQ-0011 | Platform 4 | FMC | | |
| MQ-0099 | Platform 1 | FMC | | |
| MQ-0049 | Platform 1 | PMC | | |
| MQ-0019 | Platform 1 | FMC | | |
| MQ-0018 | Platform 1 | FMC | | |
| EQ-0042 | Platform 3 | PMC | | |
| EQ-0022 | Platform 3 | FMC | | |
| EQ-0002 | Platform 3 | FMC | | |
| AQ-0086 | Platform 4 | FMC | | |
| AQ-0046 | Platform 4 | FMC | | |
| PQ-0021 | Platform 4 | NMC | | |
| MQ-0065 | Platform 1 | PMC | | |
| MQ-0009 | Platform 1 | NMC | | |
| AQ-0062 | Platform 4 | PMC | | |

## Log Score (Logistic Readiness)

| COA-1 | COA-2 | COA-3 | COA-4 |
|---|---|---|---|
| 0.5 | 0.729166667 | 0.3 | 0.2 |

Avg. Log-Score