

United States Army
Logistics Integration Agency



**Autonomic Capabilities and
Logistics Transformation**

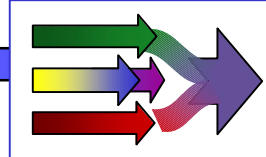
**Briefing
to
19th NDIA Logistics Conference**

6 Mar 03

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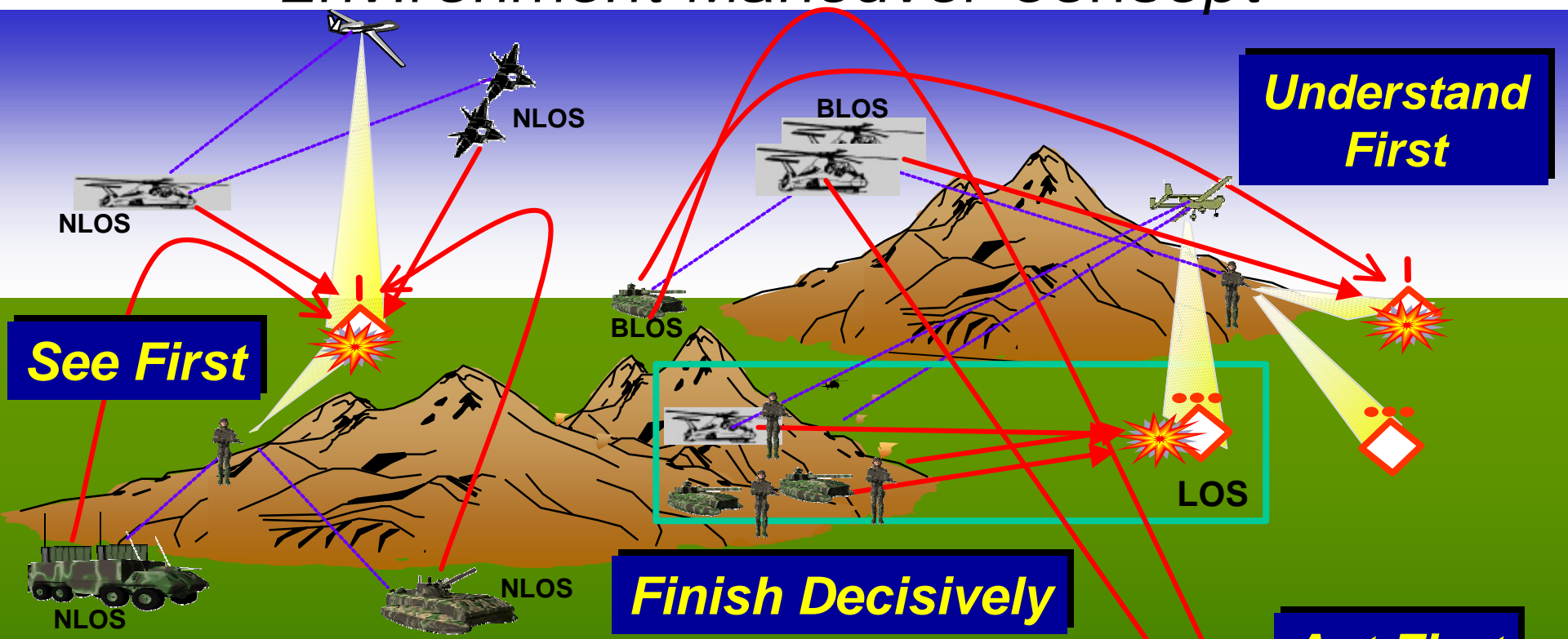
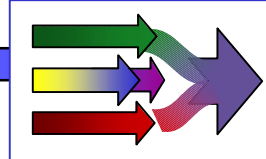
Outline



- **The Objective Force and Future Logistics**
- **Logistics Demand Drivers**
- **Army Autonomic Logistics Efforts**
- **Where We Are Going**



Objective Force Operational Environment Maneuver Concept



See First

Understand First

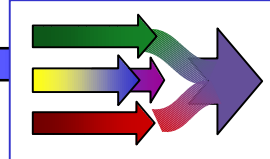
Finish Decisively

Act First

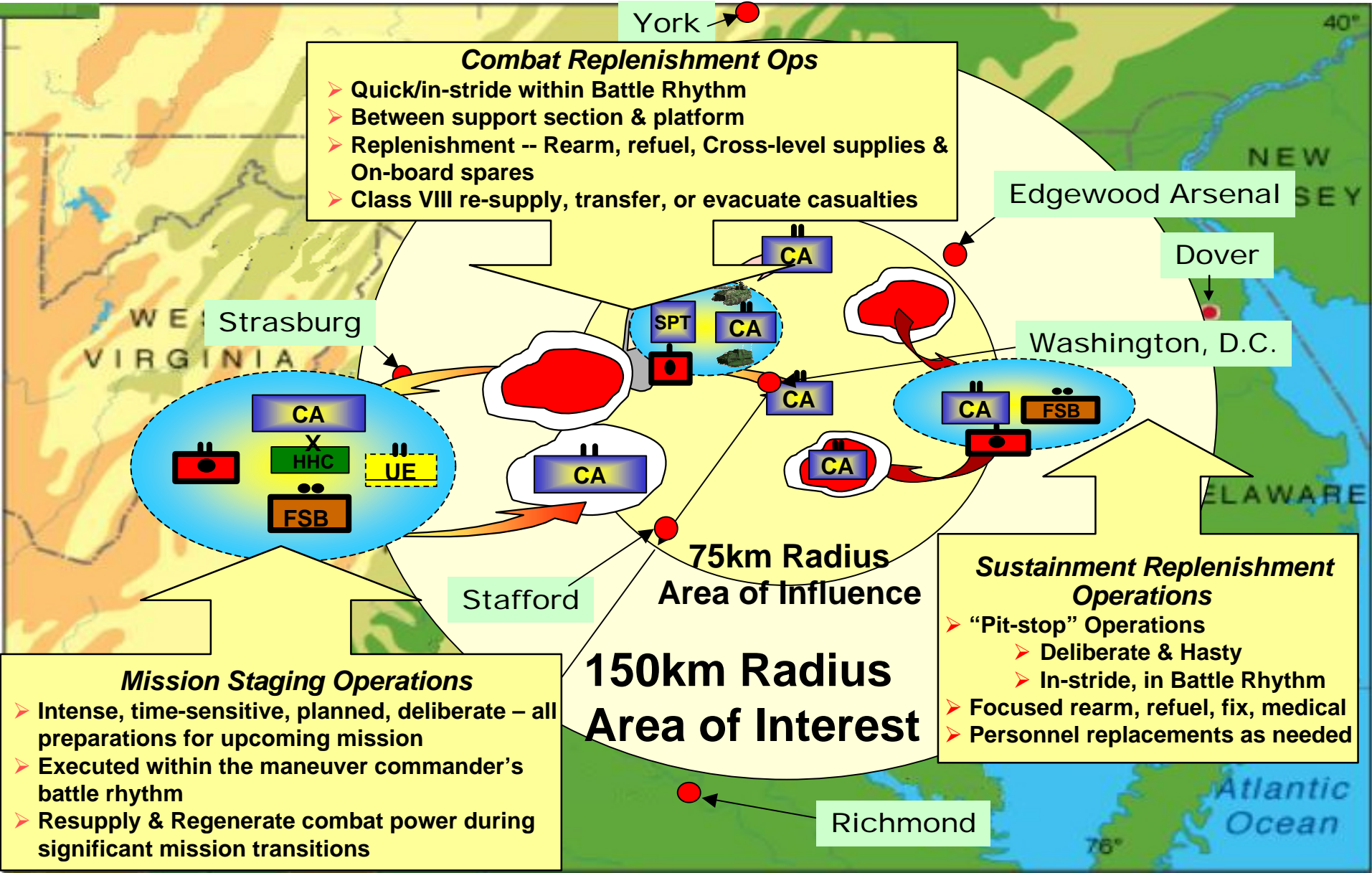
Concept of Operation

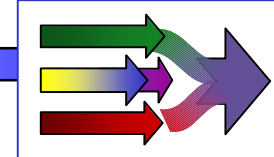
- Deploy rapidly from strategic distance
- Ready to Fight shortly after arrival
- Develop the situation out of contact (COP)
- Maneuver to a position of advantage
- Acquisition and lethality overmatch
- Operator Crew Chief (Maintainer)





Objective Force Maneuver Sustainment





Future Army Logistics Environment

Logistics Transformation Imperatives

- Enhance Strategic Responsiveness:
 - One Brigade in 96 hours
 - One Division in 120 hours
 - Five Divisions in 30 Days
- Reduce Combat Zone CSS Footprint
- Reduce Cost of Logistics Without Impacting Warfighting Capability or Readiness



Future Environment

- Provide Maneuver Sustainment from Strategic Distances
 - Anticipate the Need
 - Provide at Critical Time, Place
- Fight Shortly After Arrival – Sustainment Fully Integrated into Combat Maneuver
- Operationalize Sustainment to Match Unit of Action OPTEMPO and Mission
 - Sustainment OPTEMPO = Maneuver OPTEMPO

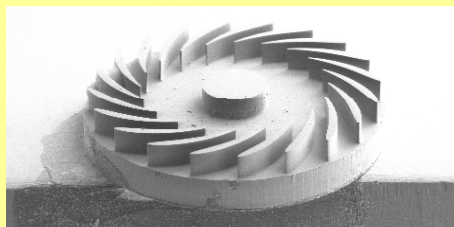
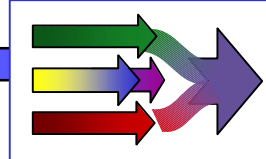


Essential Qualities

- Employment Shortly after Arrival
- In Combat Zone, Equal in Mobility & Agility to Combined Arms Counterparts
- Distribution Based
- Joint, Interagency, Combined Interoperable
- Common Logistics Operating Environment
 - Anticipatory, Platform-Soldier Based
- Reduced Need for Maintenance
 - “Pit-stop” Engineering & Crew Chief
 - Embedded Diagnostics & Prognostics



Leveraging Autonomic Capabilities



Reduce Battlefield Distribution
Power & Energy

Commonality of
Major Systems

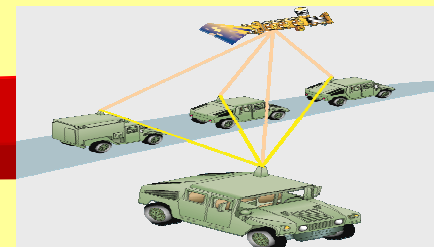


Increased
Availability

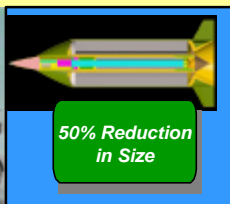


Reliability & Maintainability,
Embedded Diagnostics &
Prognostics

*Demand is a
Function of Platforms
and Operational
Employment*



Responsive, Capable Log C²



50% Reduction
in Size

Reduce Battlefield Distribution
Increased P_k, Smaller, Smarter,
Multi-functional Munitions



Reduce Battlefield
Distribution -- Water, Food



Precision Air Drop



Robotics

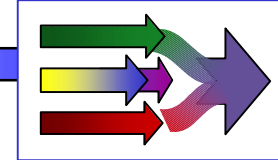


Intermodal Transfer
Distribution

Sustaining The Transforming Army



Increased Availability

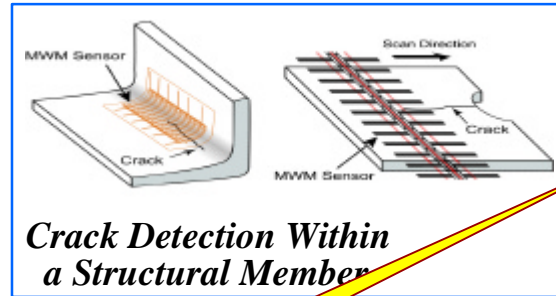


Reliability & Maintainability

- "Smart" Materials
- Design Technologies
- Commonality Across Platforms

Prognostics

- Autonomous System "Health Monitoring"



Crack Detection Within a Structural Member

- Future Component Failure
- Current Consumable Status
 - Ammunition
 - Water
 - Fuel

Self-Reporting Prognostic & Diagnostic Knowledge

- On-board Processing & Fusion of Select Sensor Array Data
- Using Artificial Intelligence
- Physics-of-Failure Based

- Tactical Support Plan
- Scheduled Maintenance
- Auto-Requisition
 - Parts
 - Consumables

Intelligent Decision Support Tools

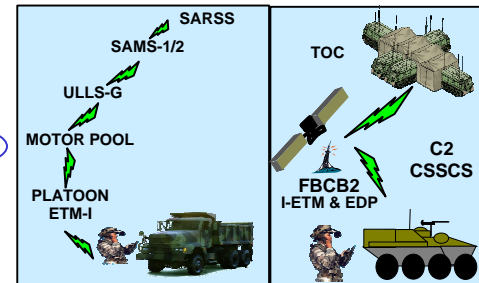
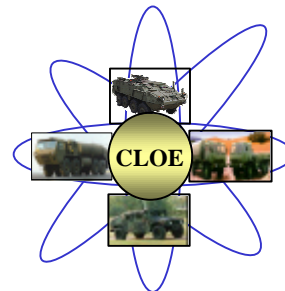
Combat Equipment System Health In Real-Time



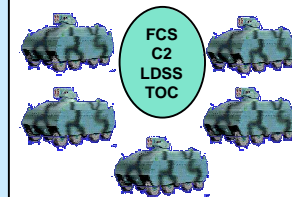
Platform & Soldier Level Assessment

Army Efforts to Achieve This Endstate:

- Common Logistics Operating Environment
- Tactical Logistics Data Digitization
- Stryker Demo
- Future Combat System

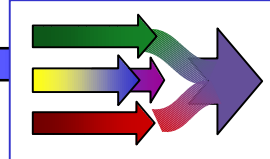


Objective Force



Platform & Soldier -- Part of the Enterprise

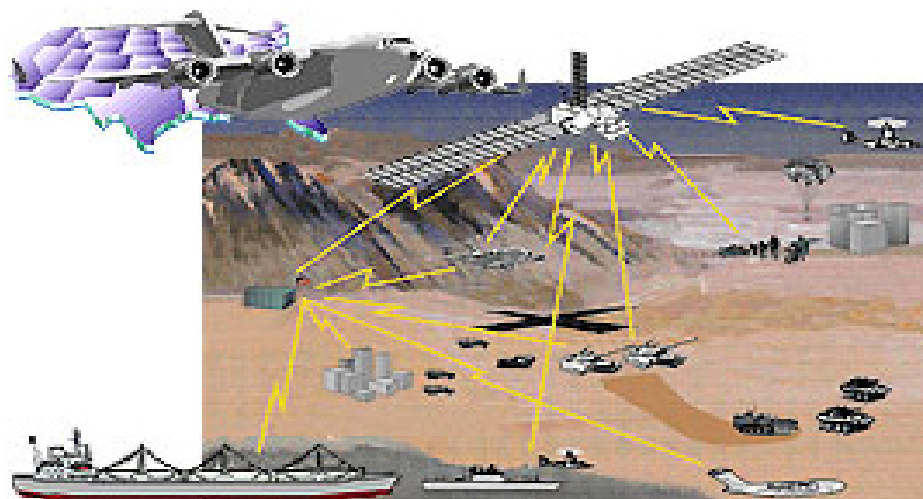
Sustaining The Transforming Army



Global Log C2

Global Log C2

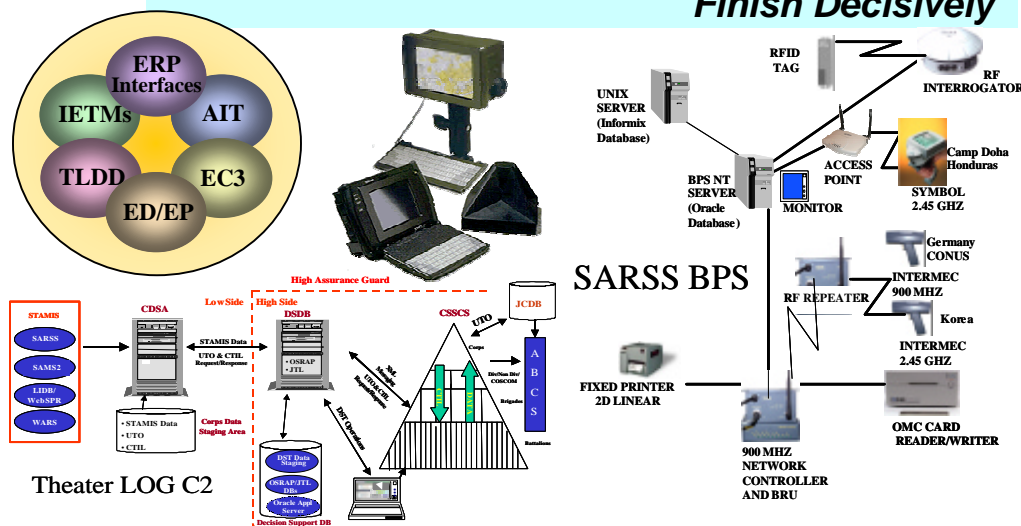
- Knowledge Based
- Integrated Enterprise
- Common Relevant Operating Picture
- Knowledge Creation & Management
 - Near Real-Time Status of Platforms and Soldiers
 - Intelligent Decision Support Systems
- Bandwidth
- Enables Integrated, Responsive Support
 - Agile, Intuitive, and Adaptive
 - Full Spectrum Operations
- Focus: Improving & Accelerating the Decision-Action Cycle



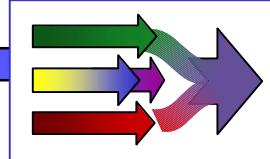
See First
Understand First
Act First
Finish Decisively

Army Efforts to Achieve This Endstate:

- Army Enterprise Integration Office
- Logistics Common Operating Picture
- Theater Log C2
- Automatic Identification Technologies
- Standard Army Retail Supply System-Business Process Server
- Movement Tracking System/Defense Transportation Reporting & Control System



Sustaining The Transforming Army



Distribution

Airdrop

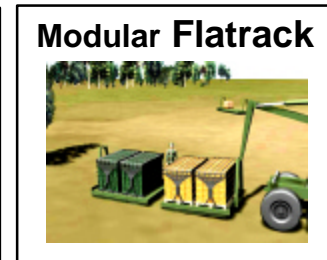
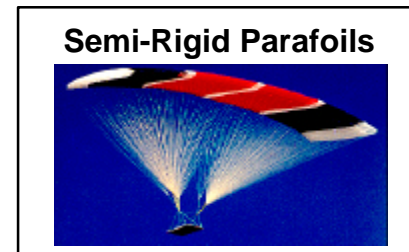
- Soft Landing Technologies
- Precision Guidance
- Rapid Rigging-Derigging Technologies

Intermodal Interfaces

- Configured Load Planning Capability
- Shorten Times to Perform
 - Weigh-In-Motion
- Modular to Deliver Configured Loads

Robotics

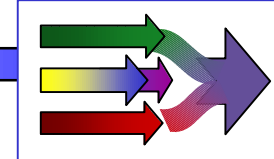
- Leader-Follower
- Embedded MHE on Platform
 - Articulated Arm
 - Tied to Load Planning Capability
- Unmanned Aerial Delivery
- Reduced Manpower



Army Efforts to Achieve This Endstate:

- Pegasus
- Smart Distribution
- Leader-Follower Robotics





Where We Are Headed

- **Autonomic Capabilities Transform Logistics Demand Drivers to Meet Objective Force Requirements:**
 - Ensure Availability Through Reliable Equipment and Prognostics
 - Anticipate and Predict Logistics Need Through Global C2
 - Provide End-to-End, Global, Seamless Continuum for Distribution
- **The Army is Integrating Autonomic Capabilities into the Logistics Systems of Tomorrow**
 - Fielded Capabilities Need to be Translated from Concepts
- **Anticipatory, Predictive Logistics – Achieving the Full Spectrum of Sense & Respond**
- **Need Industry Help to Solve Demand Reduction for Future & Current Platforms through Autonomic Technologies**
 - New and Novel Technologies
 - Leverage Civilian Technology Advances
 - Innovations and Expertise in Manufacturing/Remanufacturing Processes
 - Agreed-Upon Business Rules
 - That result in:
 - Reduced Demand
 - Efficient, Effective Processes