



Smart Distribution

A System of Systems For The Objective Force

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Purpose

FTTS Industry Day briefing on the collaborative efforts to develop an Objective Force
Smart Distribution System





The Smart Team

- **CASCOM**

- Howard Burnette, DCD-CSS
- LTC Steve Lindahl, DCD-QM
- Cris Myers, DCD-QM
- MAJ Greg Graves, DCD-CSS
- MAJ Vic Evaro, DCD-OD
- Jay Abernathy, DCD-TC
- CPT Chris Abbott, CSSBL
- Jon Quinn, ISD

- **TRADOC CDE**

- Jeff Higgins

- **TRADOC-MSM**

- Jim Kisner



- **TACOM-ARDEC**

- Bill Allen
- Doug Chesnulovitch
- Frank Chan
- Greg Ferdinand
- Al Galonski
- Gregg Peters
- Mike Pipkin
- Bob Rossi
- Al Santucci

- **TACOM-TARDEC**

- Jeff Carie

- **PM-HTV**

- **PM-Force Projection**



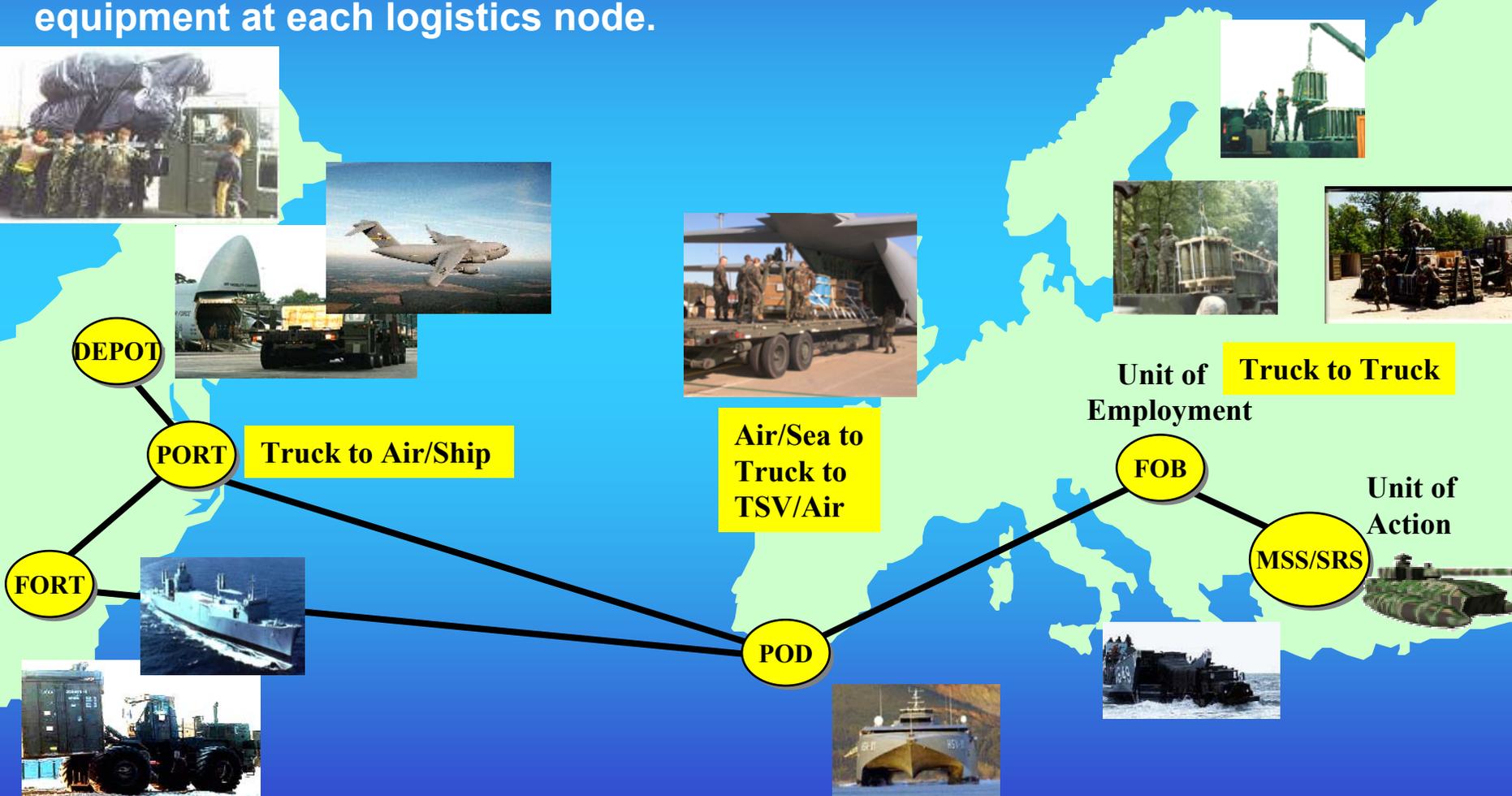
Reviews and Comments

- **GEN Kern**
 - “You’ve got some good ideas. Now make them happen.” – 30 June
- **MG Juskowiak**
 - “I fully support this concept” – 9 May
- **MG Dail**
 - “The potential impact is enormous” – 15 May
- **MG Stevenson**
 - Enables “Ordnance Corps Transformation: Configured Load Concepts” – 6 June
- **Mr. Edwards**
 - “An excellent concept” – 6 May



Problem Statement

Objective Force operations require a logistics system with timely, rapid and pulsed delivery of supplies. Incompatibilities between transportation modes, Materials Handling Equipment (MHE) & cargo platforms in the current system will force the inefficient re-handling of supplies by soldiers and a variety of equipment at each logistics node.



The pipeline is too slow and the Army's logistics footprint is too large!



Technology to transform the current cumbersome, seamed, and inefficient distribution system to...



Numerous Truck Variants

4 to 1



Load Handling System



FTTS

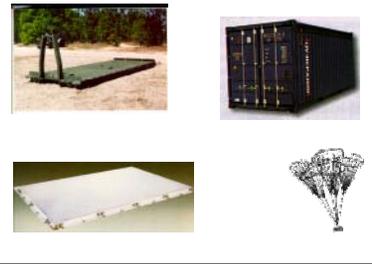


Modular Platform



Numerous Materials Handling Equipment

8 to 1



Numerous Delivery Platforms

4 to 2



Numerous Interface Devices

5 to 1

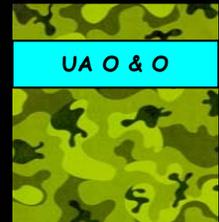
... a seamless intermodal Smart Distribution System



Documented Need in Objective Force



- **Unit of Action O&O, Draft, v.98, Jun 02**
 - Configured loads capable of either ground or aerial delivery
 - Intermodal platforms and ground transport capabilities



- **Objective Force UE Concept, Draft, 12 Apr 02**
 - Flexible multi-modal sustainment
 - Refined procedures for accelerated throughput
 - Strategic base configured to support deployed forces with configured loads to tactical (unit of action) level



- **TRADOC Pam 525-66, Draft, 17 Jun 02**
 - Innovative, multi-modal distribution concepts
 - Revolutionary means of transporting and sustaining people and materiel to leverage new ground and aerial concepts for delivery
 - Enable quick cross leveling of supplies between platforms and units in contact and on the move
 - Leverage pre-configured packaging and platform-embedded materiel handling and lift for rapid, accurate and agile resupply that minimizes demand on soldiers





Smart Distribution System Video





Intelligent Load Handling System



Articulated Load Handling Arm

Robotic handling system to:

- Load modular containers and platforms on FTTS
- Configure modular packaged loads on platforms



*Leap forward -
Integrate backward*

Configured Load Building Software

- Software application interfaces with GCSS-Army supply module
- Enables battlespace reconfiguration of all classes of supply for optimal delivery within the UA





Future Tactical Truck System (FTTS)



Virtual Prototyping

- Virtual prototype engineering design solutions (cab design, integrated C4ISR, Smart Distribution components)
- Provide inputs to operational analyses



Interfaces with:

- TSV, C-17, C-130, CH-47
- ISO Containers, Modular Platforms, CROP



Vehicle Alignment System

Enables rapid alignment of the FTTS with:

- Modular platforms
- Containers
- USAF K-loaders
- USAF aircraft
- Other trucks

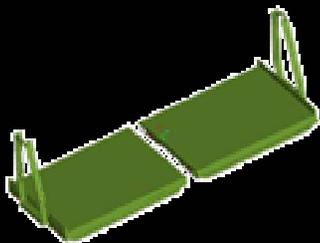


Modular Platform System



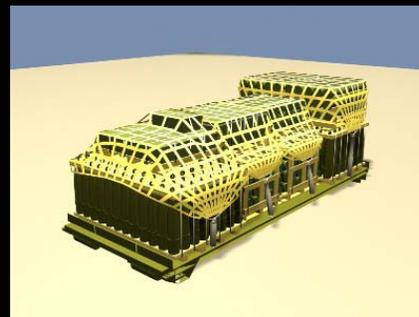
Modular Platform

- Reconfigurable to meet user needs
- Intermodal platform:
Air/Land/Sea/Airdrop/Slingload
- Lightweight material design
- Allows multiple deliveries with one vehicle



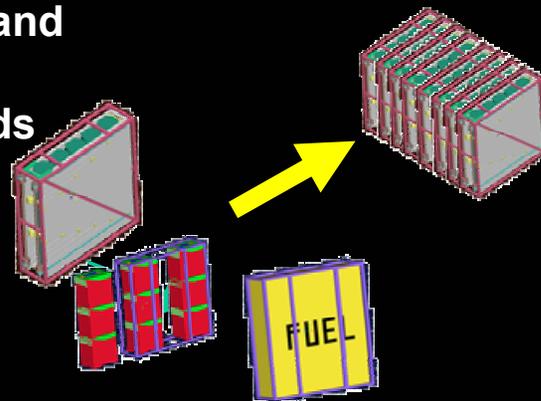
Smart Tiedown

- Load conforming tie-down system
- Enable rapid securing of configured loads



Modular Packaging

- Compatible w/Modular Platform
- Interlocking concept for storage and transport of all classes of supply
- Reconfigurable to meet user needs
- Automation friendly
- Automatic identification technology
- Airdrop capability





Objective Force Resupply Vision

1



- Family of 3 munition types
- Wt : 60-70 lbs
- Length: 900 mm

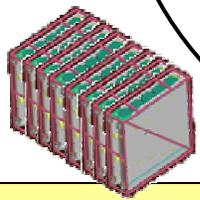
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Clip

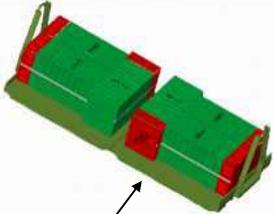
- 5 Round clip of lightweight composite materials
- Module mix is tailorable with 3 munitions: KE, MP-ERM & Smart Cargo
- 1 Clip ~ 35 gal fuel, water or food

Resupply Module



- 1 Resupply Module for each FCS:
- 8 Ammo Clips “snap” together to form a Resupply Module (40 rounds)
 - 5 KE rounds
 - 35 Round mix of MP & Smart Cargo
- Alternate: 30 round mix plus fuel, water or food

4



Modular Platform

- 6 FCS Resupply modules per Modular Platform
- Modular load compatible with future Load Handling Systems on FTTS and C130

6



FCS Automated Rearm Concept

5



- FTTS drops Resupply Modules on Modular Platform or single module at rearm site
- Natick RDEC Guided Parafoils provide precision stand-off resupply





FCS Multi-Role Armament and Ammunition System (MRAAS) Rearm Concepts





Warfighter payoffs

- **Lethality** - increased **combat power** through reduced resupply time - 60% quicker SRS
- **Agility** - able to respond to changing unit needs to maintain **battle rhythm** - 70% quicker reconfigure
- **Deployability** - reduction in MHE reduces **deployment footprint** by 100 tons/brigade or 6 C-130J lifts





Smart analysis

Analysis based on:

- **Objective Force support concept**
- **SBCT consumption and CSS force structure**
- **3-day pulse of all classes of supply less water and fuel = 360 ST**
- **25% of CROPs require reconfiguration at FOB**
- **No MHE forward of FOB**



OF Resupply without Smart Distribution System

Truck
Rail
Depot

C-17
Air

Forklift
K-Loader
Shoe
463L
RPADS
FRAIK
CHU
HEMTT
CROP
Multiple
Classes of
Supply
Manpower

Forklift
CROP
Multiple
Classes of
Supply

Port

Forklift
CROP
Manpower

ATT
C-130
AMT
CH-47
TSV

POD

Forklift
K-Loader
Shoe
463L
RPADS
FRAIK
CHU
HEMTT
CROP
Manpower

ATT
C-130
AMT
CH-47
PEGASYS

FOB

Forklift
K-Loader
CHU
HEMTT
PLS
CROP
Manpower

SRS

HEMTT
CROP
Manpower

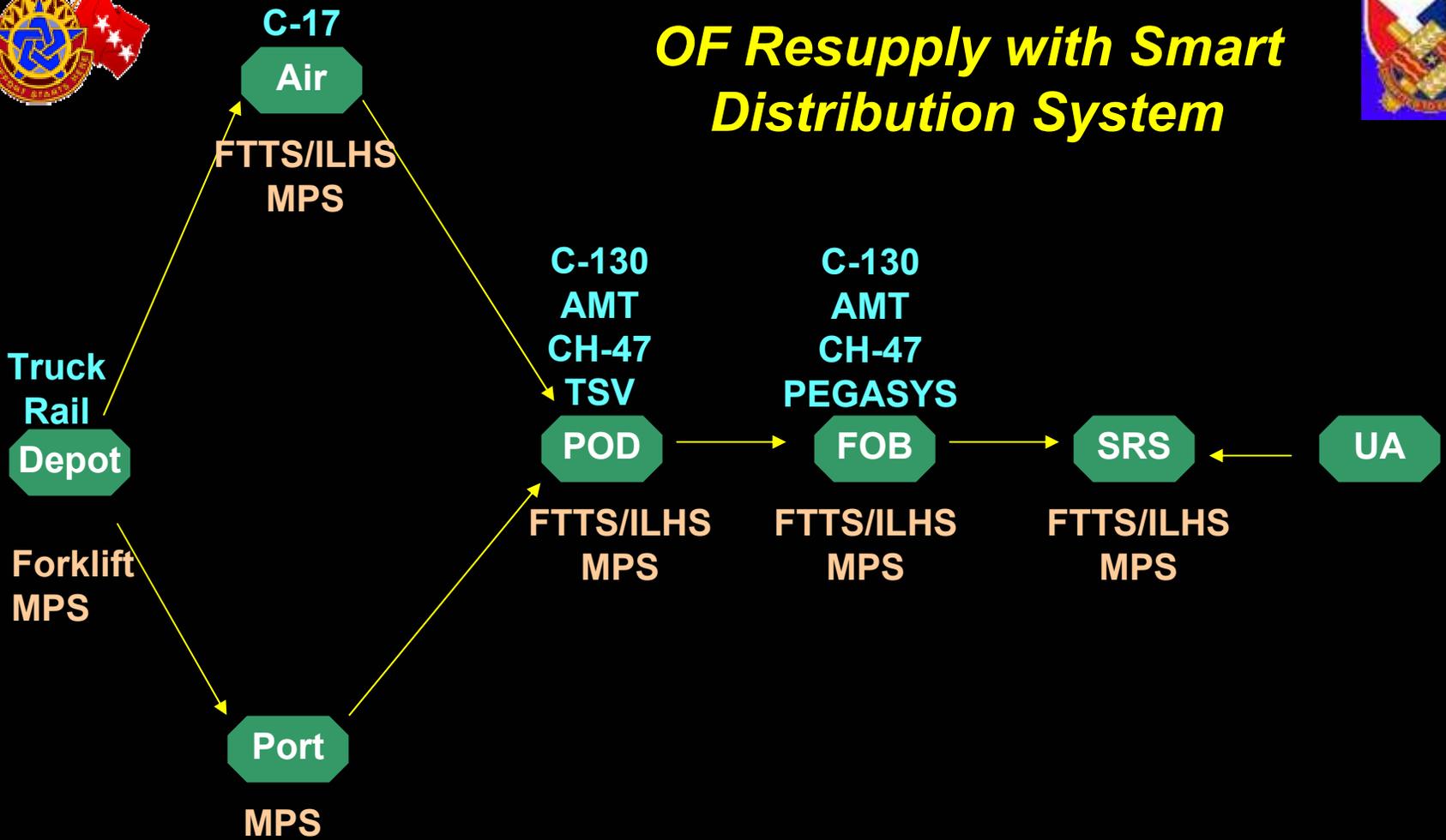
UA

Handling Hours

	APOE	APOD	FOB	SRS	Total
Clock	20.2	7.7	3.9	6.7	38.5
Equipment	48.2	22.7	40.1	200.0	311.0
Personnel	90.5	51.3	40.1	333.0	515.3



OF Resupply with Smart Distribution System



	Handling Hours				
	APOE	APOD	FOB	SRS	Total
Clock	8.1	6.3	1.1	2.4	17.9
Equipment	22.7	11.0	15.2	48.0	96.8
Personnel	53.0	35.0	15.2	48.0	151.2

FOR OFFICIAL USE ONLY



Smart benefits

	<u>Baseline</u>	<u>Smart</u>	<u>Change</u>
Clock Hours	38.5	17.9	-54%
Equipment Hours	311.0	96.8	-69%
Personnel Hours	515.3	151.2	-71%
Pallet Positions	120	80	-33%

*Dramatic improvements
in all areas!*



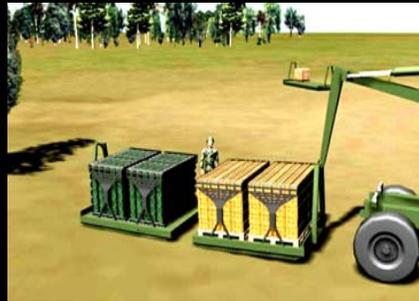
RDTE 6.3 S&T Components



Intelligent Load Handling System

Technology challenges:

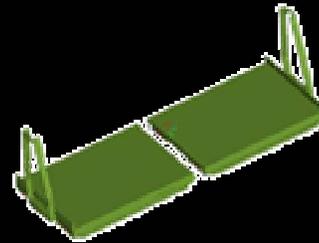
- Rugged, vehicle mounted, lightweight materials handling capability
- Precision placement capacity
- High payload capability
- Lightweight to meet vehicle deployment restrictions



Modular Platform

Technology challenges:

- Lightweight Materials
- New design capabilities
- Structural integrity to provide for modular capability
- Meet design and survivability requirements for air drop





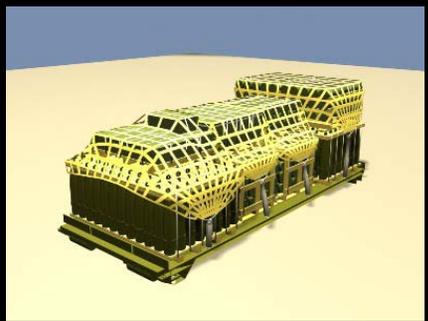
RDTE 6.6 Components



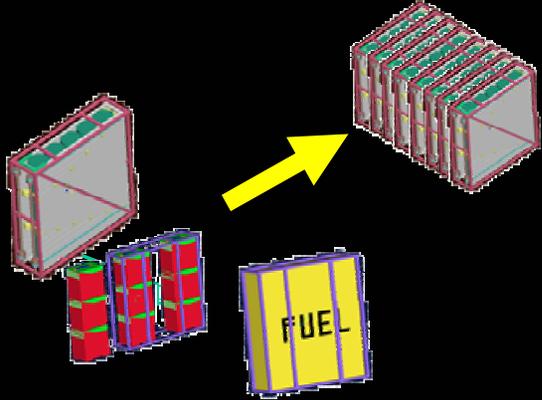
Configured Load Building Software



Smart Tiedown



Modular Packaging



Vehicle Alignment System

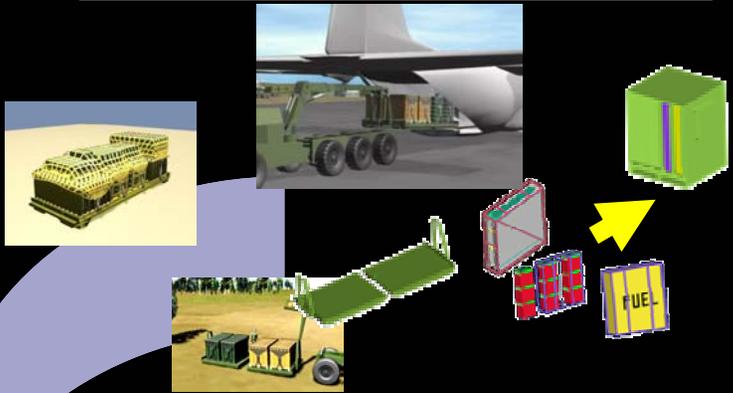




TECHNOLOGY FOCUS



TACOM-ARDEC



- Vehicle Alignment System
- Intermodal Flatrack
- Intelligent Load Handling System
- Smart Tie Down
- Pre-Configured Packaging
- Robotic Trailer

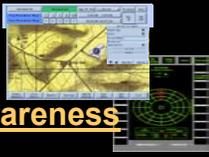
60% Reduction in Resupply Time

100% in Situational Awareness

TACOM-TARDEC



Advanced Crew Station
Integrated C4ISR
Enhanced Situational Awareness



Imbedded Diagnostics/Prognostics
Imbedded Training and Simulation
Automated Maintenance

25% or greater Mobility



Active Suspension
In-hub Motor

Zero unscheduled Maint. actions



On-board Power Generation
Hybrid Electric Drive
Advanced Propulsion
Clean Diesel Engines

50% in Fuel efficiency

18% more survivable



Modular Armor
Objective Crew Served Weapon
Transparent Armor
NBC Overpressure
Mine Blast protection

FCS Leveraged Technologies

GOAL: LEVERAGE FCS TECHNOLOGIES FOR BLOCK 1 FTTS



Summary

Smart Distribution is a *System of Systems* addressing the supply and sustainment needs of the Objective Force on the future battlefield. Smart Distribution is enabling technology which breaks down traditional stovepipes-

...to deliver multiple classes of supply

...in mission configured loads

...across a noncontiguous battlefield

...with minimal material handling

Smart Distribution – A Revolution in Logistic Distribution



Revolution

There's no revolution without

in military

SMART DISTRIBUTION!

logistics!