



***OT&E***

***Scope/Cost Process***

***Economics of T&E Conference 3 Nov 99***

**Maj Jim Przybysz  
AFTOEC/CNR  
DSN 246-0607**



# Overview

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- **New Way of Thinking about OT&E**
  - Increase emphasis on “Mission”  
(impacts on battlefield operations)
  - Bounds of OT&E - What should they be?
  - What perspective: System - Operator - CINC
  - Value of OT&E Information
- **Scope / Cost Process**
- **TRAC2ES Example**

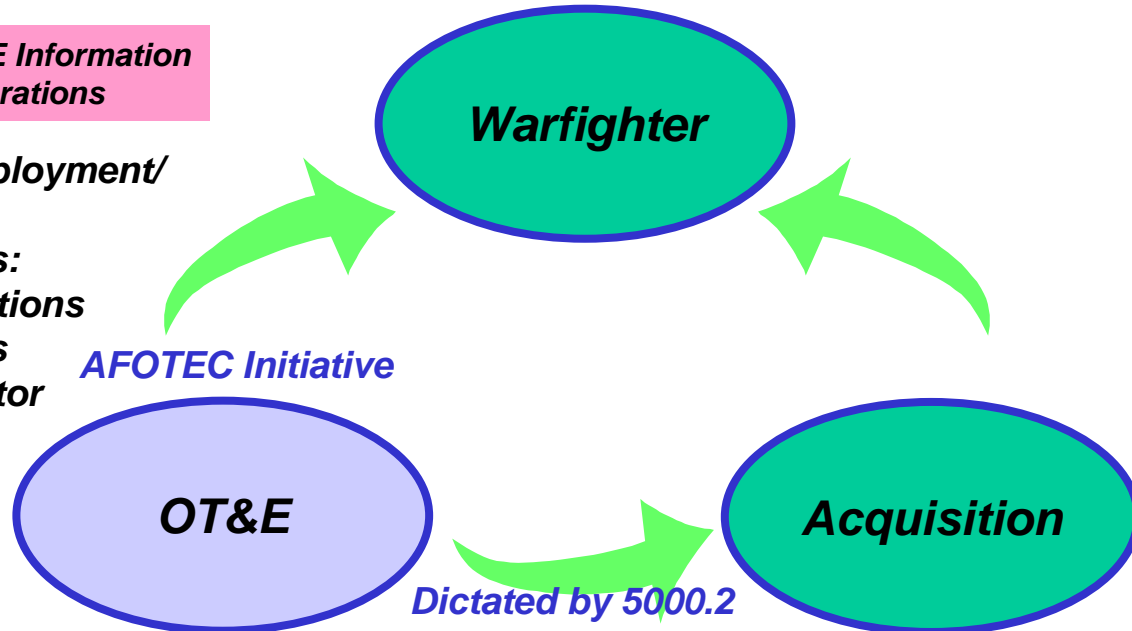


# Two Primary OT&E Customers

**Increase value of OT&E Information to Battlefield Operations**

- **Potential Force Employment/ CONOPS Issues**
- **Operational Impacts:**
  - **Battlefield Operations**
  - **Operational Units**
  - **Hands-On Operator**

*AFOTEC Initiative*



**OT&E Information to support Acquisition Decision Makers**

- **Operational Effectiveness/Suitability**
- **ORD**
- **TEMP COIs**



# *History for Mission-Level OT&E*

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- August 89 - Lt Gen Glenn Kent (USAF, Ret) “Strategy-to-Task”
- Late 80s/Early 90s - DOT&E emphasizes Mission-Level
- December 91 - AF/CV stated that AFOTEC needed to provide the “Mission-Level” answer
- Jan 92 - AF/TE - Must provide Mission-Level answer
- Summer/Fall 92 - AFOTEC/CC (Gen Anderson) briefed AF/CV and MAJCOM CC’s on AFOTEC’s Mission-Level approach
- Executive Council Sessions and the AFOTEC 97 Offsite dedicated to Mission-Level Evaluation
- AFOTEC organized to implement 1 Oct 98

*MGen Cliver’s Approach ...*

*Support the Warfighter...*

*Operationally Test the System,*

*Evaluate at the Mission Level*



# “Mission”

Late 80s  
Early 90s



What is “Mission”?





# “Mission”

## Theater Operations

STT

Nat'l Security Obj  
Nat'l Military Obj  
Regional Ops Obj

Operational Tasks

Battlefield  
Operations

Operational Mission

“Mission”  
for OT&E

“System”  
for OT&E

ORD

MPP  
Organize,  
Train,  
Equip

## MAJCOM Mission Perspectives

MAJCOM Mission Planning

MAJCOM  
Mission Areas &  
Mission Tasks

- Mission Analysis
- MAJCOM Statement

Acq

MAJCOM Ops Requirements Document  
(Operational & Support  
Characteristics of the System)

Linkage

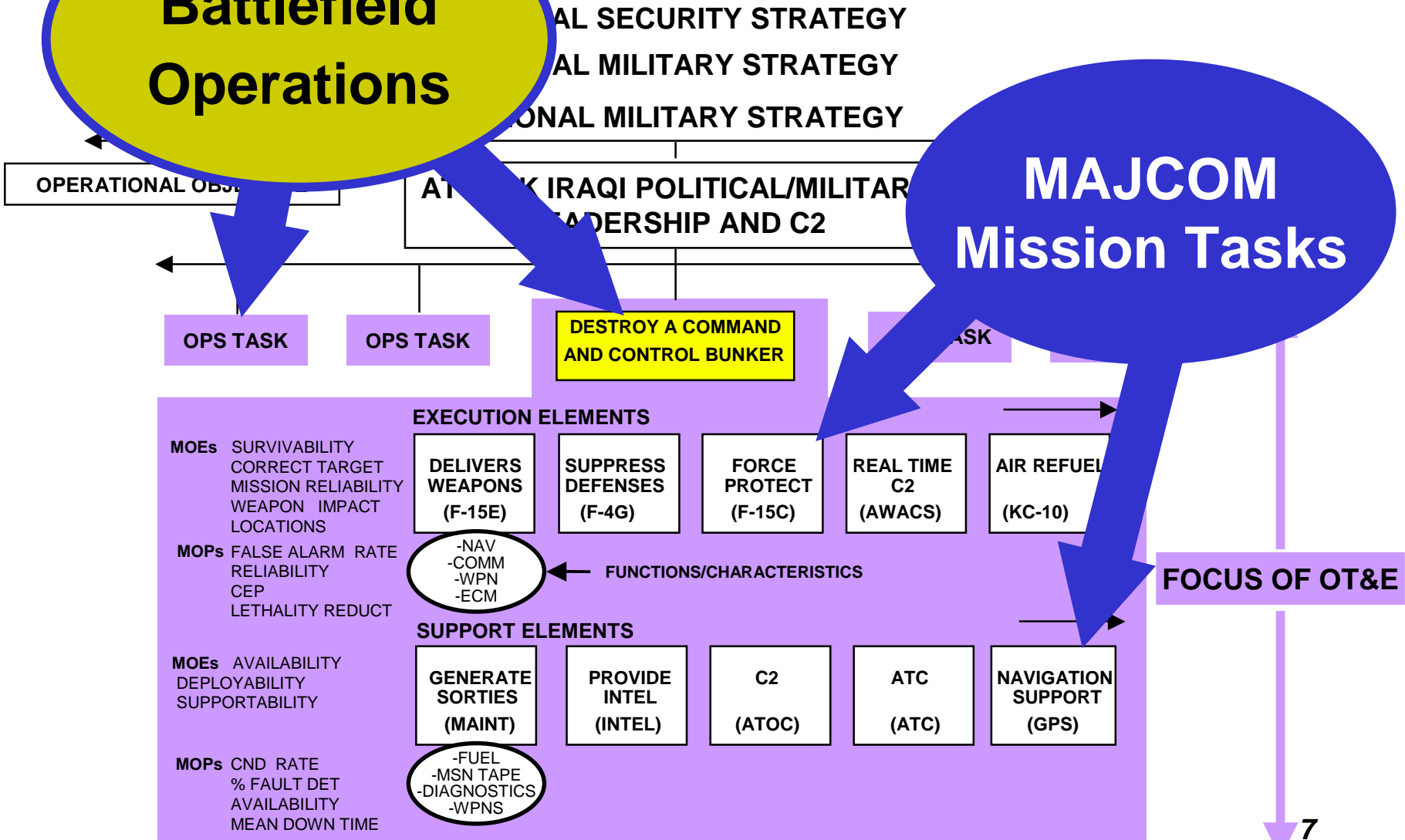


# Strategy-to-Task

1992 AFOTEC Policy - Mission/Task Level OT&E

**Battlefield Operations**

**MAJCOM Mission Tasks**

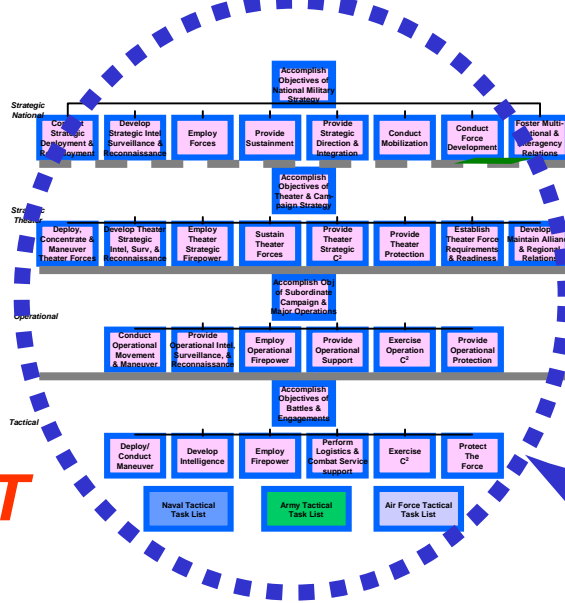




# Strategy-to-Task Development

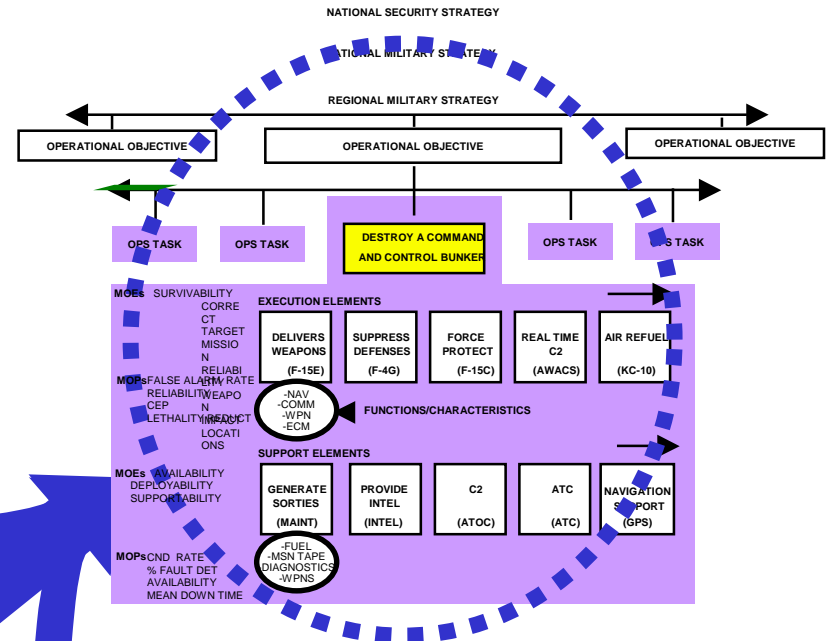
## What's Used?

### Military Capabilities UJTL/AFTL



**WHAT**

### Strategy-to-Task



**HOW**

**DOCTRINE**

**CONOPS**

**WHO**

**MAP, Field Experts, ...**

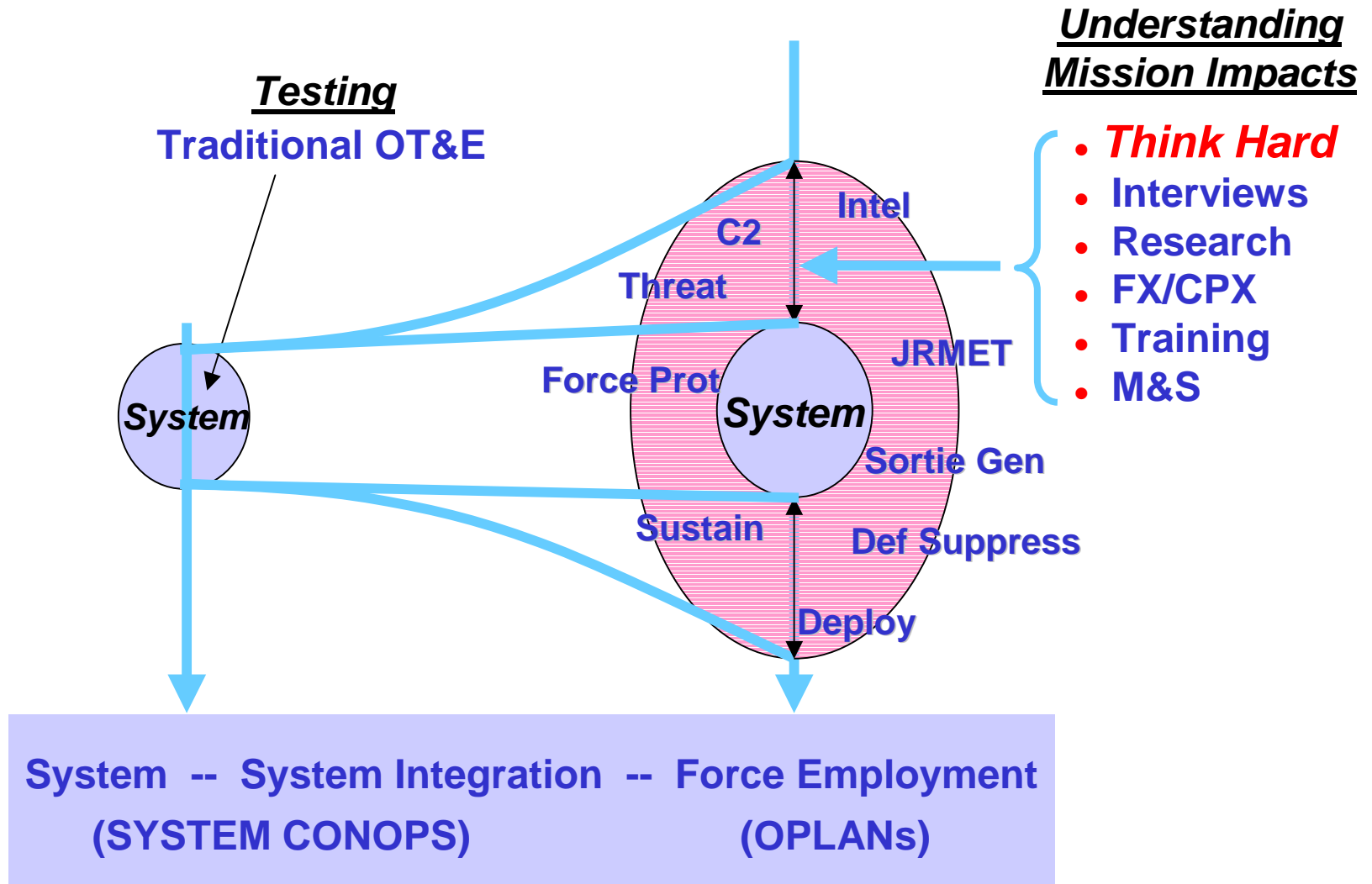
**OTHER**





# Broader Perspective for OT&E

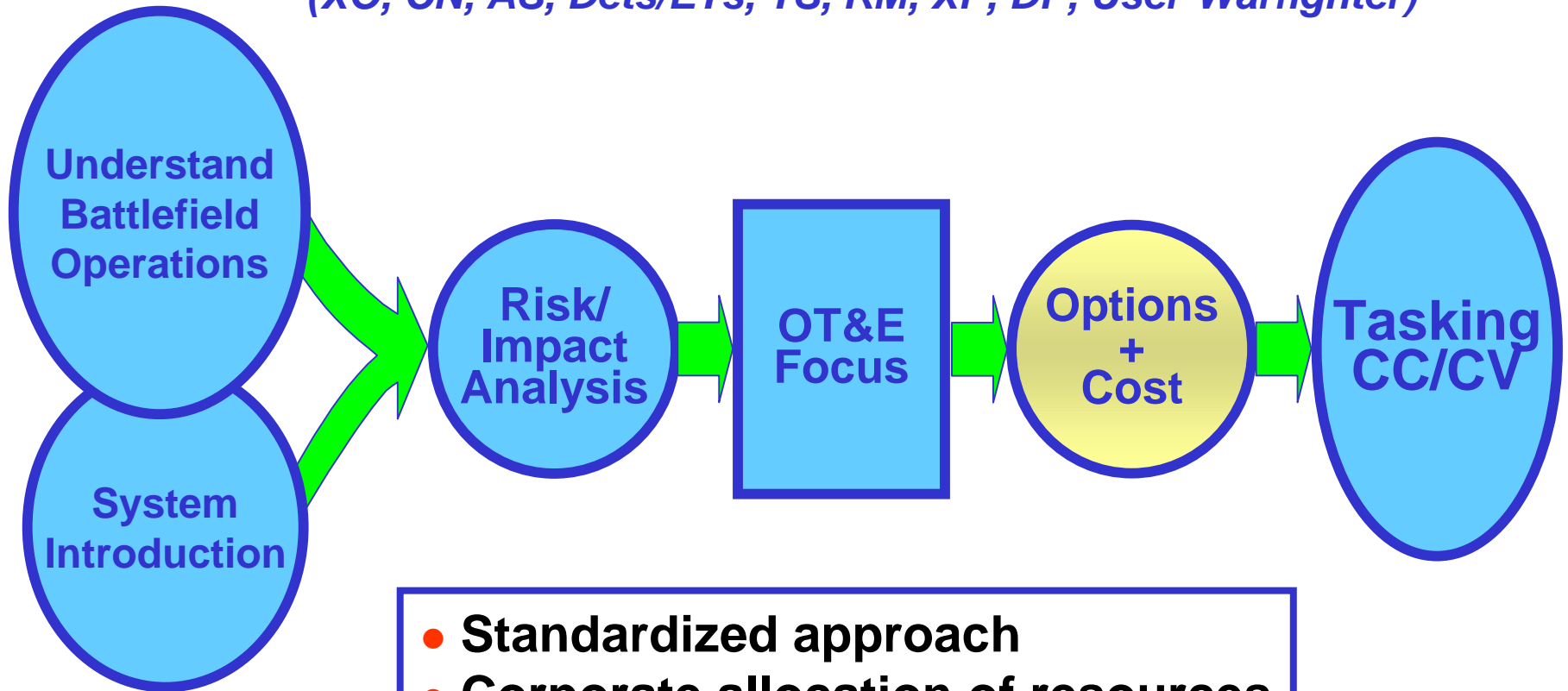
## Increasing the Value of OT&E Information





# AFOTEC Scope/Cost Process

*AFOTEC Scope/Cost Team  
(XO, CN, AS, Dets/ETs, TS, RM, XP, DP, User-Warfighter)*



- **Standardized approach**
- **Corporate allocation of resources**  
*based on*  
**Value of OT&E information**



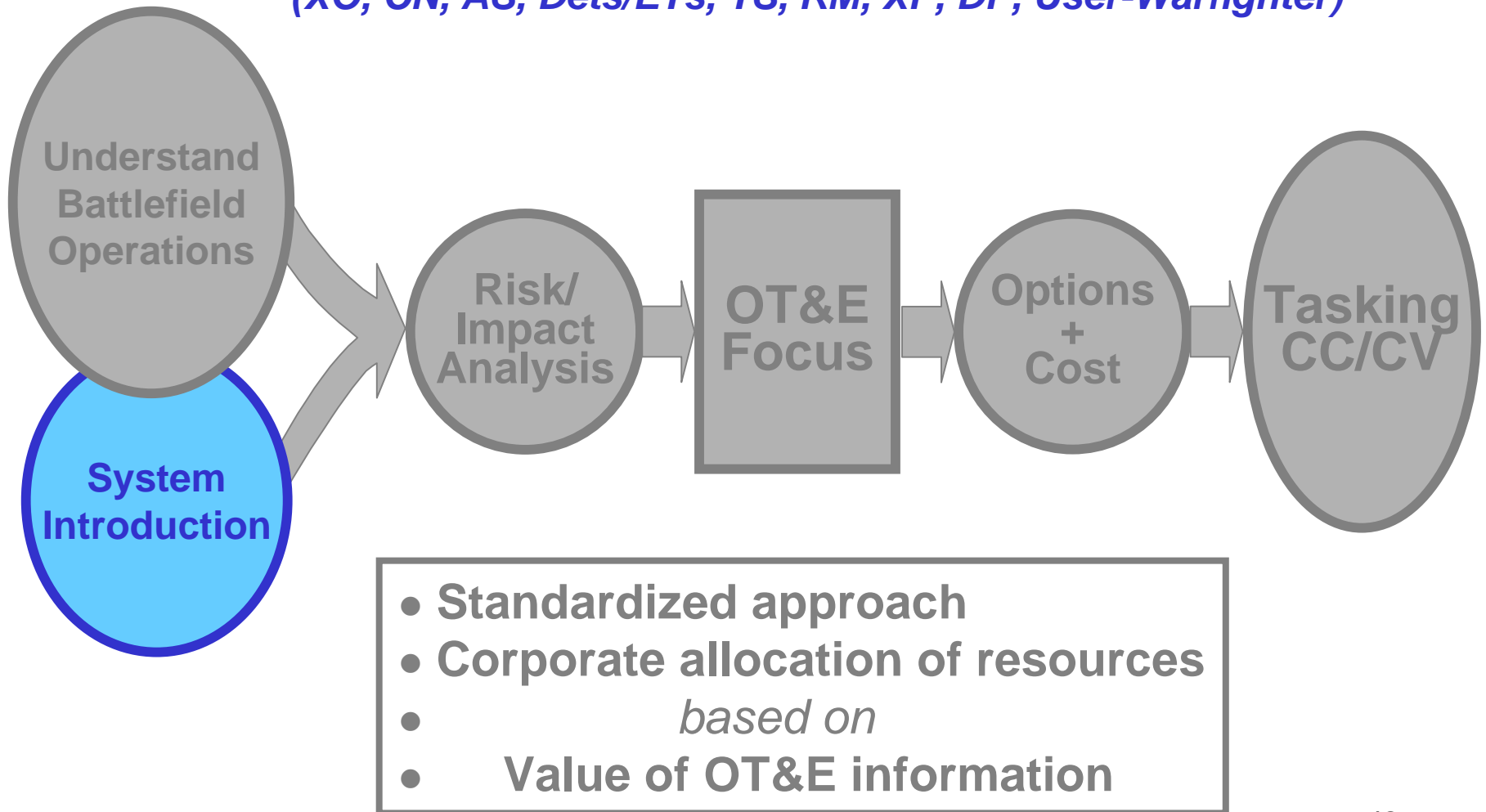
# *TRAC<sup>2</sup>ES Example*

*TRANSCOM Regulating And  
Command & Control Evacuation System  
(TRAC<sup>2</sup>ES)*



# AFOTEC Scope/Cost Process

**AFOTEC Scope/Cost Team**  
(XO, CN, AS, Dets/ETs, TS, RM, XP, DP, User-Warfighter)

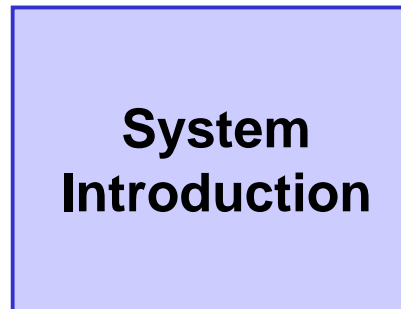




# System Introduction

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MNS  
ORD  
(RCM)  
TEMP  
(COIs)  
TPWG



*Knowledge of  
System Under  
Test*



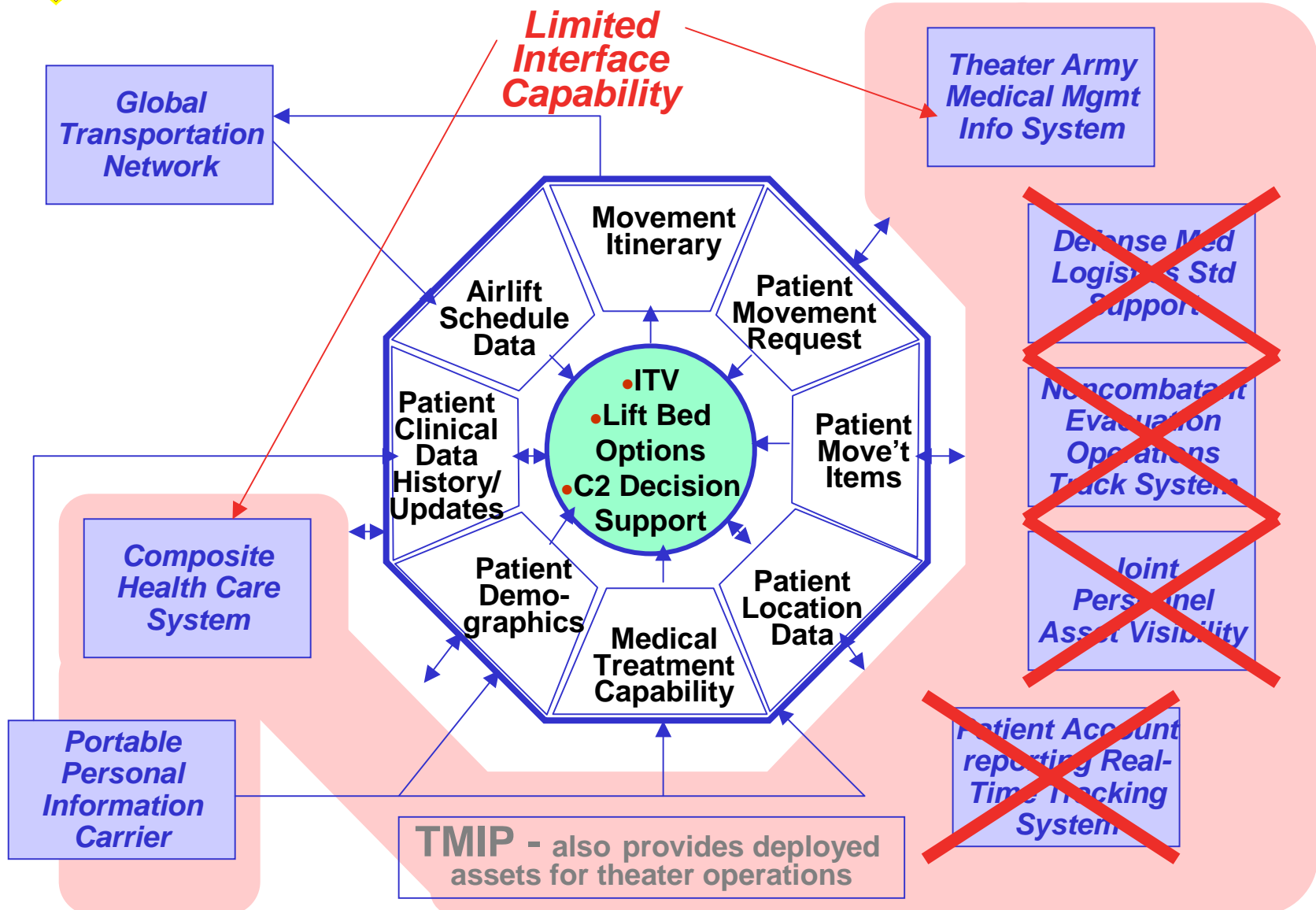
# Mission Need Statement

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- **Geographic CINCs, CJTFs, or their medical support -- insufficient data to support medical regulating and medical evacuation decision making**
  - *Insufficient interoperability (integration of medical regulation and aeromedical evacuation)*
  - *Limited electronic data collection (integrated patient movement solution)*
- **Current systems (DMRIS & APES) cannot fully support medical operations**
  - *Manual inputs*
  - *Separate command and management structures*
  - *Limited flexibility*
- **Inadequate comm support - (Comm Support is a key mission need)**
- **No deliberate planning capability**



# TRAC<sup>2</sup>ES IOC System





# Requirements Correlation Matrix (16 Requirements)

## RCM Parameter

## Threshold Criteria

★ ● Plan Patient Move't	400 patients - 30 min (Peacetime + one SSC)
★ ● Patient ITV	Last reported positions & itinerary (10 min/95%)
● Decentralized Planning	Support intra/inter theater planning
● Deliberate Planning	Support forecasting & what-if analysis with notional data
● Reasonableness of LBP	70% rating of effectiveness for meeting user reqts
● LBP Dissemination	Capability to transmit within 10 min 90% of time from PMRC to originating & destination MTFs
● Asset Status	95% data availability in 15 min, 90%of time
● Data Qualification	95% confirmed (field definitions - size, type, values, charact....)
● Audit and Trend Analysis	Ability for manual audits & trend analysis
● Global Visibility	Integration of global theater plans
● Forecasting	Identify potential resource shortfalls (1-7 days in future)
● Total Patient Asset Vis	10 min 90%of time
● PMRC Availability	Unscheduled downtime < 10 hours/30 days 95% of time
● Achieved Data Retrieval	Within 3 hours 90%of time
● On-Line Data Storage	30 Days
● Archival Data Storage	5 Years

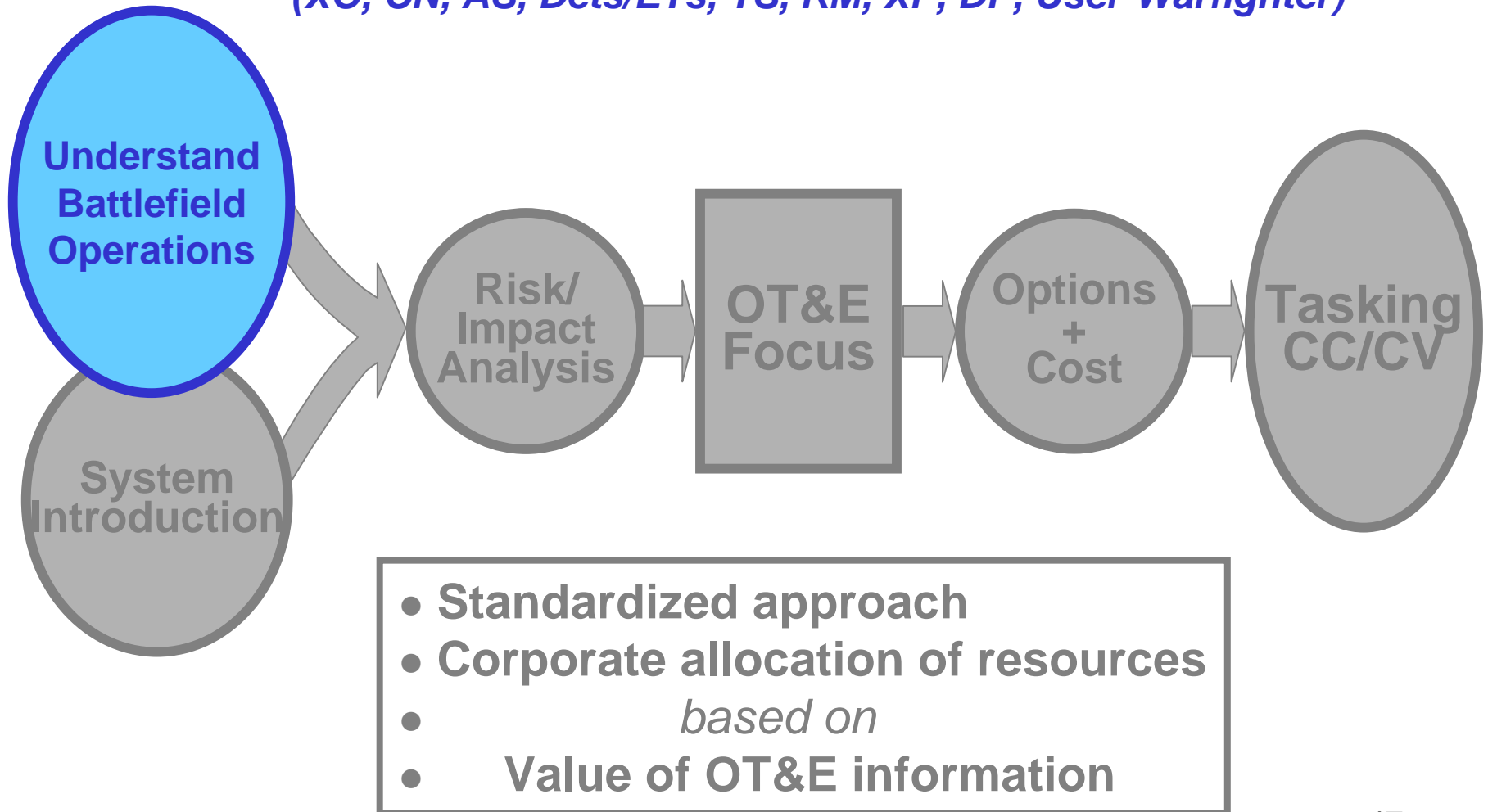
★ Key Parameter





# AFOTEC Scope/Cost Process

**AFOTEC Scope/Cost Team**  
(XO, CN, AS, Dets/ETs, TS, RM, XP, DP, User-Warfighter)





# *Understand Battlefield Operations*

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**System Intro**

**UJTL  
Joint Doctrine  
CONOPs  
SMEs**



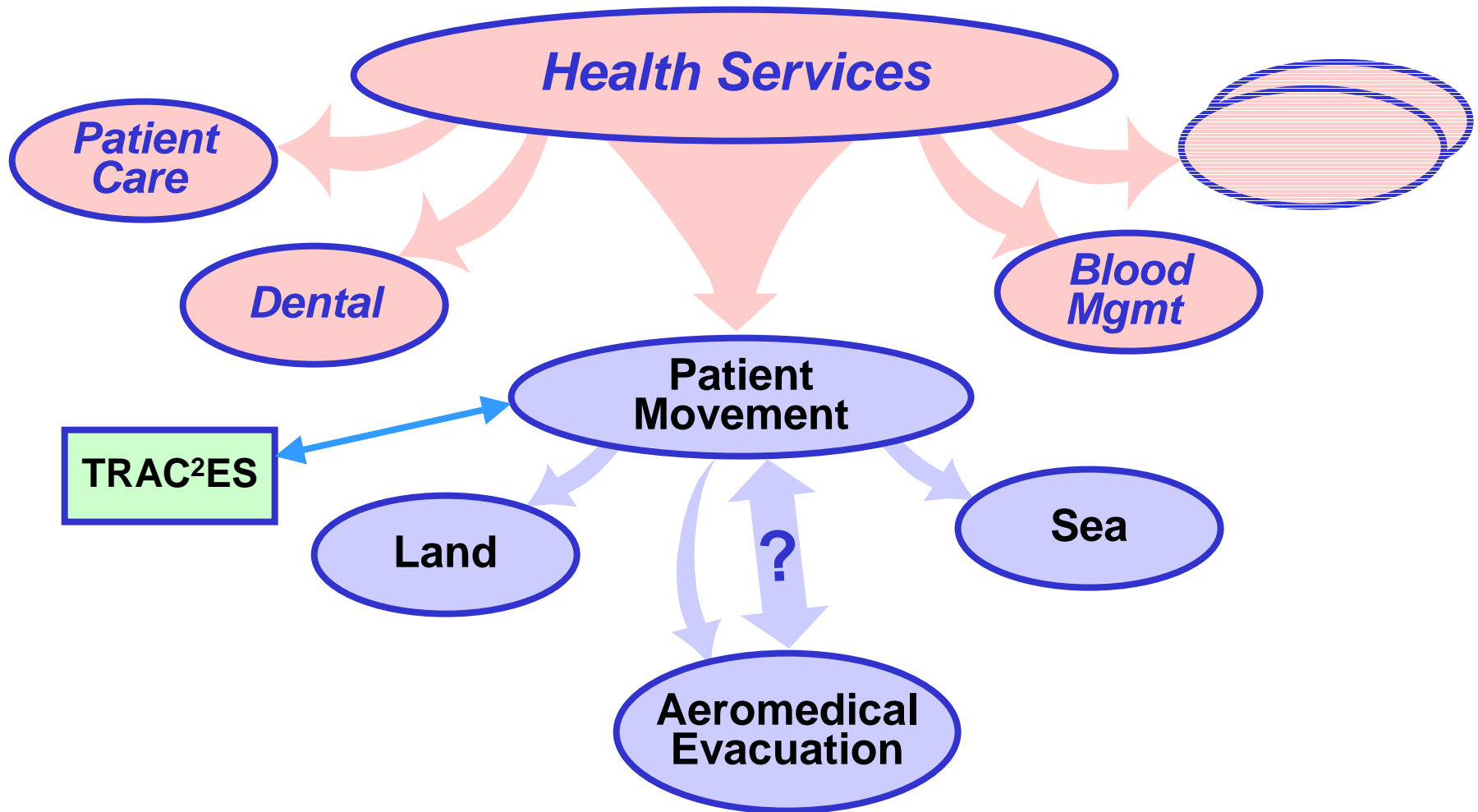
***Knowledge of  
Operation  
Tasks***

**STT Dendritic**

**Attributes of  
Elements in Dendritic**



# Mission-Level Starting Point





# Fundamentals of Patient Movement

Joint Pub 4-02.2

## PATIENT MOVEMENT MISSION -

- *Minimize the effects of wounds, injuries and disease on unit effectiveness*  
by
- ***Rapid evacuation of injured personnel***

***Proactive Patient  
Movement Program***

***Phased health care  
system (echelons of care)***

***Movement Requirements***

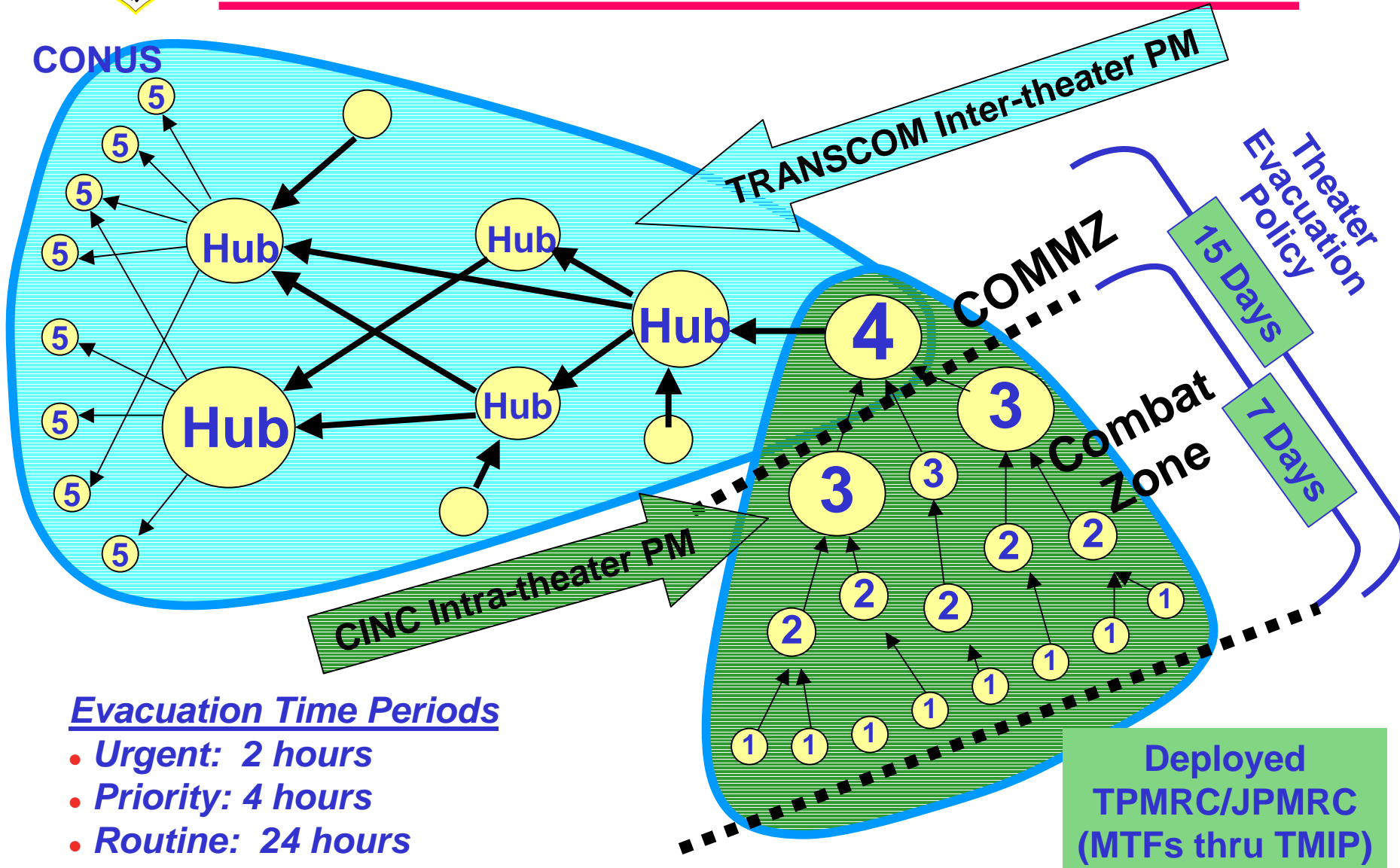
**TRAC<sup>2</sup>ES**

***Locations/capabilities for  
medical care***



# Patient Movement - Major Theater of War

(Re: Joint Pub 4-02.2 - Joint Tactics Techniques and Procedures for Patient Movement in Joint Operations)





# *Efficiency of Global Aeromedical Evacuation*

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- **Ref Lt Gen Roadman's APICS Presentation, April 95**
  - **AE system came under regular criticism for inefficiency**
    - *Operated below load capacity and clinical potential*
    - *No incentive for cost-effective use by referring providers*
    - *Command structures fragmented*
    - *Lack of accountability by those requesting AE*
    - *Disconnects between patient scheduling and transportation processes*
- **TRAC2ES Mission Statement** -- *“Combine transportation, logistics, and clinical decision elements into a seamless patient movement infosphere capable of visualizing, assessing, and prioritizing patient movement requirements , assigning proper resources, and distributing relevant data to **efficiently deliver patients**”.*
- **ORD:** *“... ensure the **efficient** operation of a system for **global patient movement**.”*



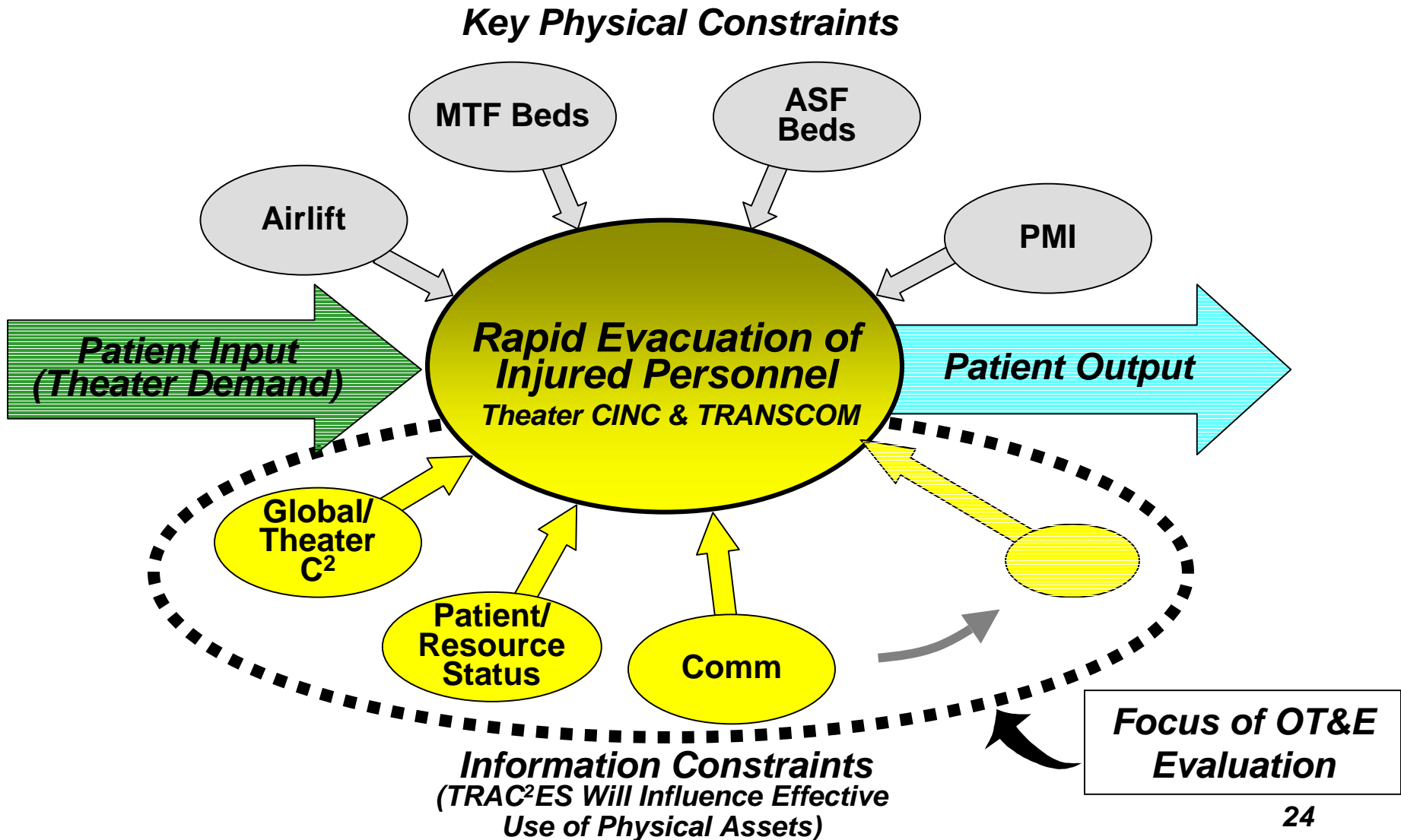
# Key Areas

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- **Joint Doctrine - *Rapid evacuation of injured personnel***
- **ORD - ... ensure the efficient operation of a system for global patient movement**



# Patient Movement Mission - Constraints -







# Understand Patient Movement Operations

## Military Capabilities UJTL

SN 1.2.8 Provide Global Patient Movement AE  
 SN 4.2.3 Provide defense-wide health service  
 ST 4.2.2.2 Coord patient evac from AOR  
 OP 4.4.3.2 Manage flow of casualties in theater of ops

**WHAT**

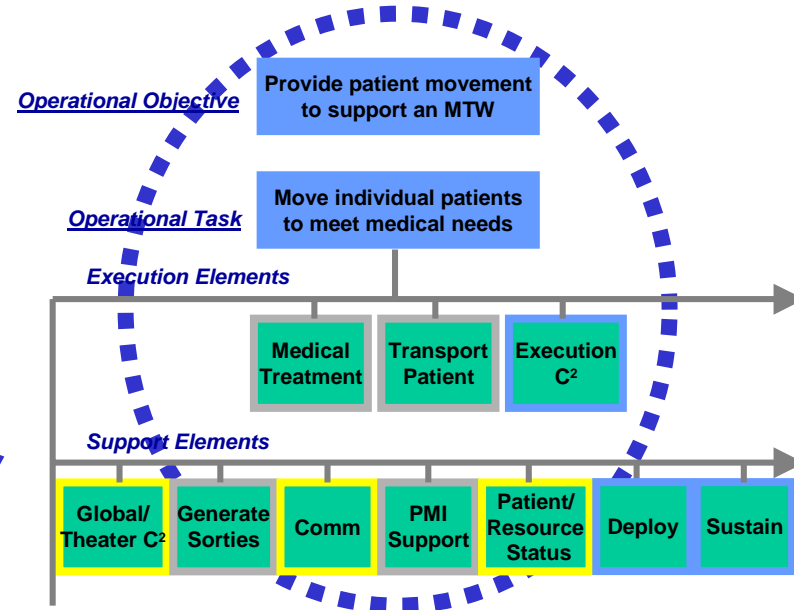
## Joint Doctrine

### JT Pubs

3-0: Doct for JT Ops  
 3-07 Other than War  
 4-02 Health Svc  
 4-02.1 Health Svc Log Supt  
 4-02.2 Patient Mvmt

**HOW**

## Patient Movement



## CONOPS

- CINC OPLANS (Not Reviewed)
- Annex Q to AMC Omnibus OPLAN-Medical Svc
- TRANSCOM TRAC<sup>2</sup>ES CONOPS

**WHO**

- Interview Experts
- TRANSCOM Process Map
- Telephone Interviews
- Investigated Exercises

**OTHER**



# Patient Movement

## Mission Decomposition - Rapid Evacuation of Patients out of Theater

*Have patient movement demand requirements been met?*

### Operational Objective

**Provide patient movement to support an MTW**

- Battlefield medical casualty rate vs theater exit rate
- Battlefield medical casualty rate vs move to theater staging locations (Theater CINC)
- Theater exit rate (TRANSCOM)
- Percent of patients moved within theater policy guidelines

*How well are patients handled medically?*

### Operational Task

**Move individual patients to meet medical needs**

- Percent of patients moved within requirements established by treating facilities
- Time from decision to move to out of Theater

### Execution Elements

Medical Treatment

Transport Patient

Execution C2

### Support Elements

Global/Theater C<sup>2</sup>

Generate Lift Acft

Comm

PMI Support

Patient/Resource Status

Deploy

Sustain

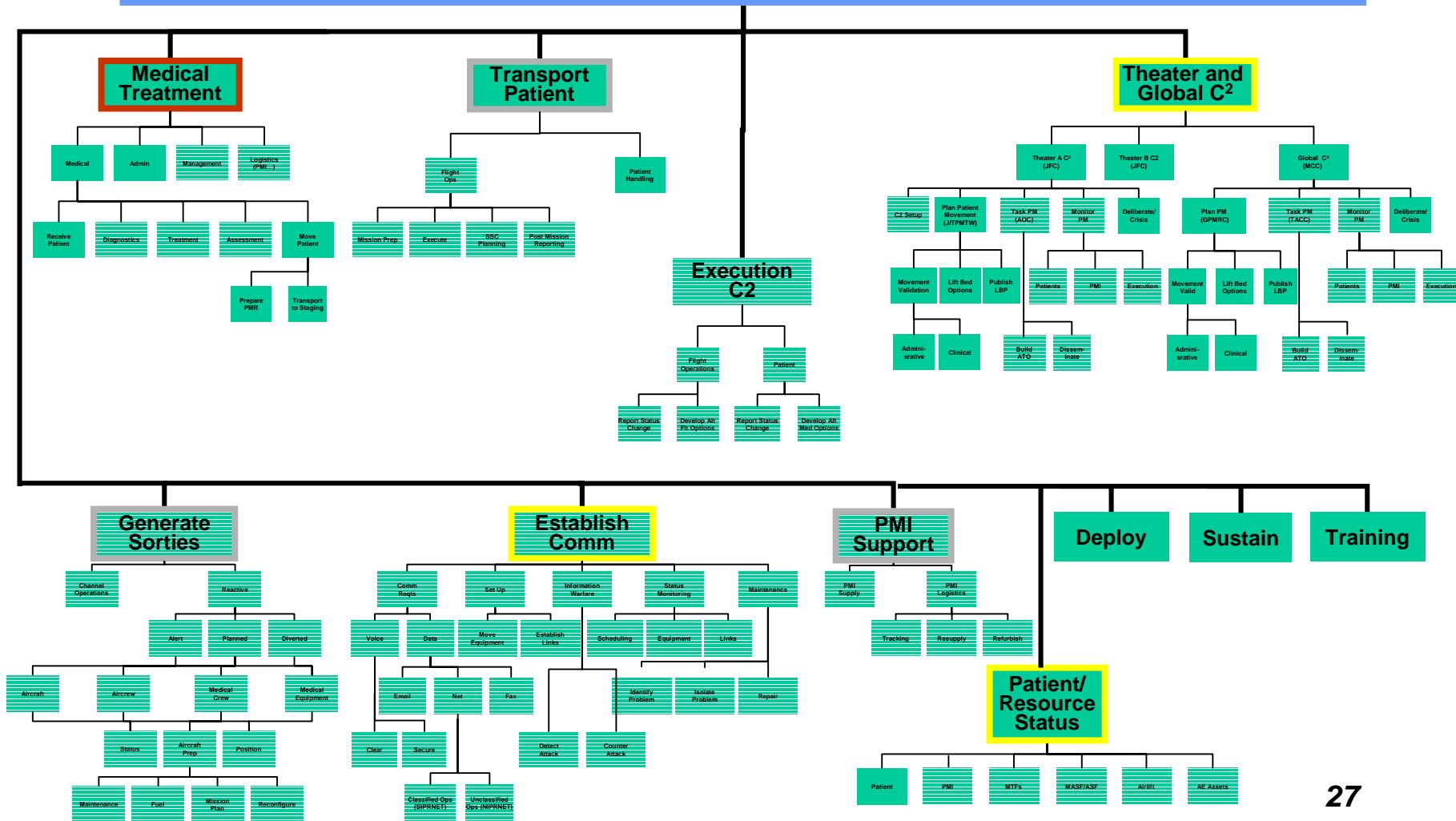
Training



# Operational Mission Decomposition

(Objective -- Provide patient movement to support an MTW)

## Operational Task -- Move individual patients to meet medical needs





# Medical Treatment

## Mission Decomposition

Are PMRs being submitted in a timely manner?  
 How good a job is being done to support ITV/resource statusing?  
 How efficiently are comm resources being utilized?

•Percent of patients awaiting PMRs

**Medical Treatment**

- Time delays for resource status updates
- Time delays for patient ITV updates

### Medical Echelons

- 1: Emergency/Life Saving
- 2: Basic Resuscitation & Stabilization
- 3: Restore Functional Health
- 4: Definitive Care
- 5: Convalescence/ Restore/ Rehabilitate



**Medical**

**Admin**

**Management**

**Logistics (PMI ...)**

- Medical time delays for patient ITV/resource update

- Admin time delays to update resource status
- Admin time to transmit PMR
- Admin time delays for patient ITV updates
- No. of PMRs not transmitted due to comm

**Receive Patient**

**Diagnostics**

**Treatment**

**Assessment**

**Move Patient**

- Time delays for patient ITV updates

- Time from decision to patient move

**Prepare PMR**

**Transport to Staging**

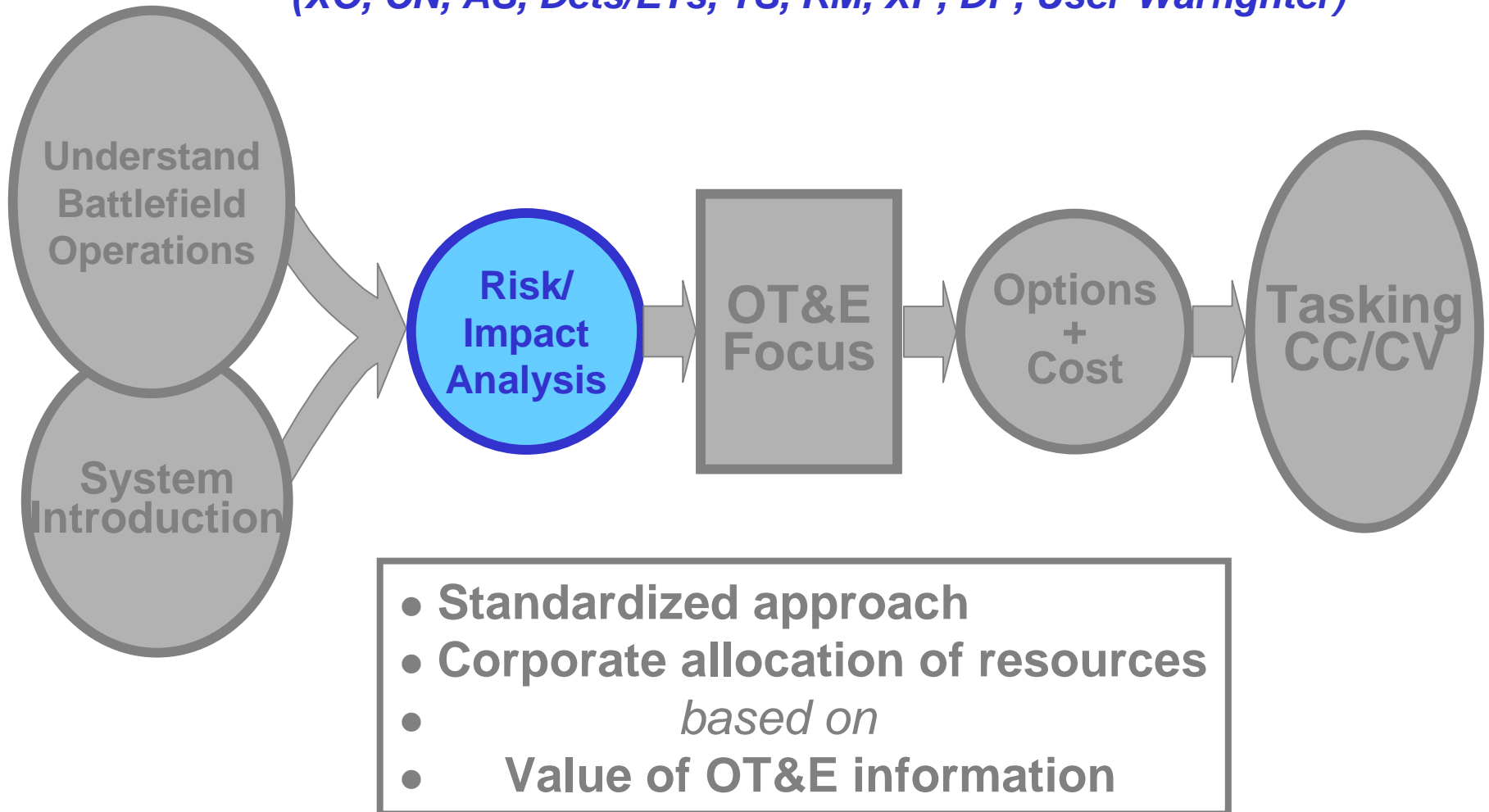
- Time to complete PMR
- Percent of patients awaiting PMR

- Time delays for patient ITV updates



# AFOTEC Scope/Cost Process

**AFOTEC Scope/Cost Team**  
(XO, CN, AS, Dets/ETs, TS, RM, XP, DP, User-Warfighter)





# *Risk / Impact Analysis*

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**Knowledge of SUT**

**STT Dendritic  
(*element attributes*)**

**System-to-Element  
Element-to-System  
Element-to-Mission**



**Mission  
Essential  
Elements**



# Medical Treatment

## Impact Analysis

*Are PMRs being submitted in a timely manner?*  
*How good a job is being done to support ITV/resource statusing?*  
*How efficiently are comm resources being utilized?*

• *Percent of patients awaiting PMRs*

**Medical Treatment**

• *Time delays for resource status updates*  
• *Time delays for patient ITV updates*

**TRAC<sup>2</sup>ES  
on Element**

- **Time to deal with inputs & outputs from TRAC<sup>2</sup>ES**
- **Who is coming & condition**
- **Movement - Where (treatment), When, Handling**
- **Manning, Training, Equipping, Sustainment**

**Element  
on TRAC<sup>2</sup>ES**

- **MTF inputs for patient tracking**
- **MTF inputs for PMI tracking**
- **Loading on TRAC<sup>2</sup>ES**
- **Resource status input**

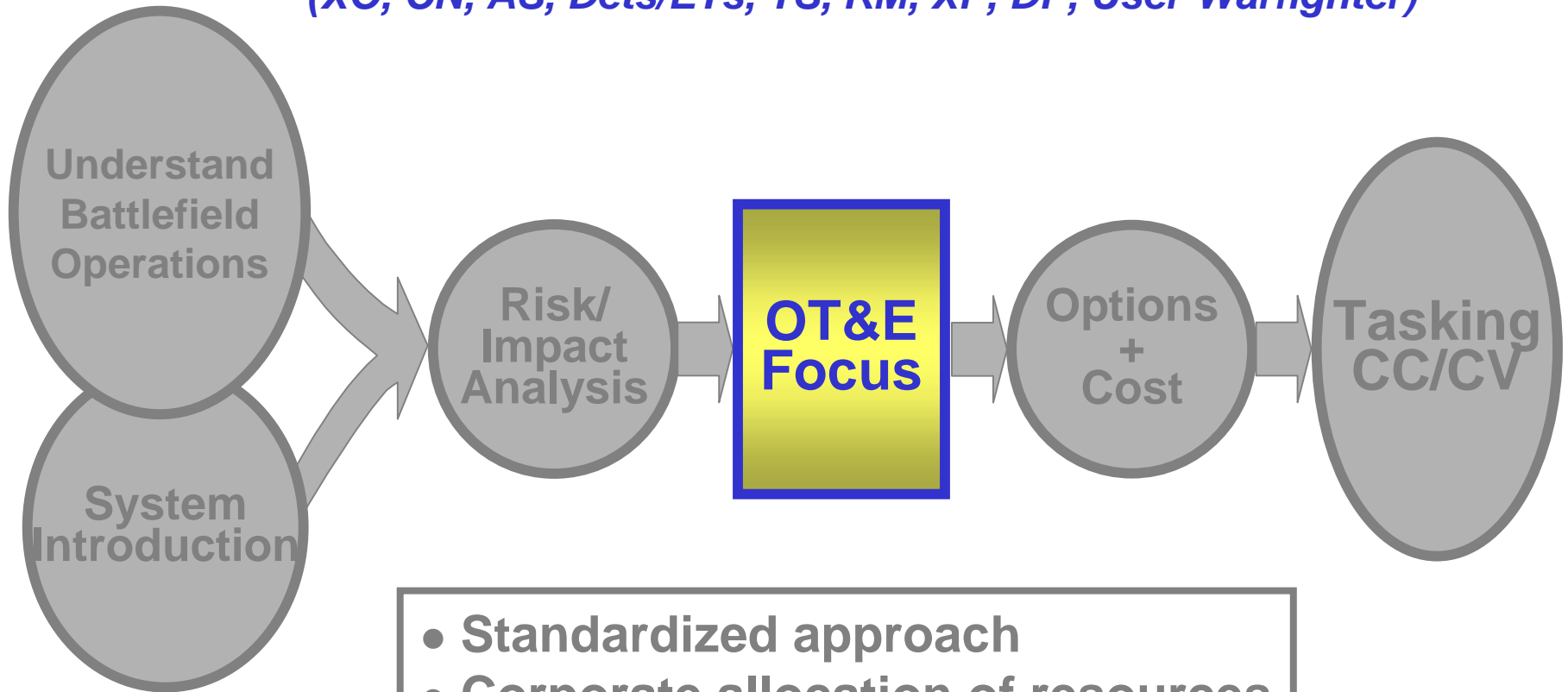
**Element  
on Mission**

- **Delays in moving patients (not related to TRAC<sup>2</sup>ES)**
- **Lack of beds/capabilities to treat**



# AFOTEC Scope/Cost Process

**AFOTEC Scope/Cost Team**  
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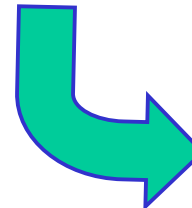
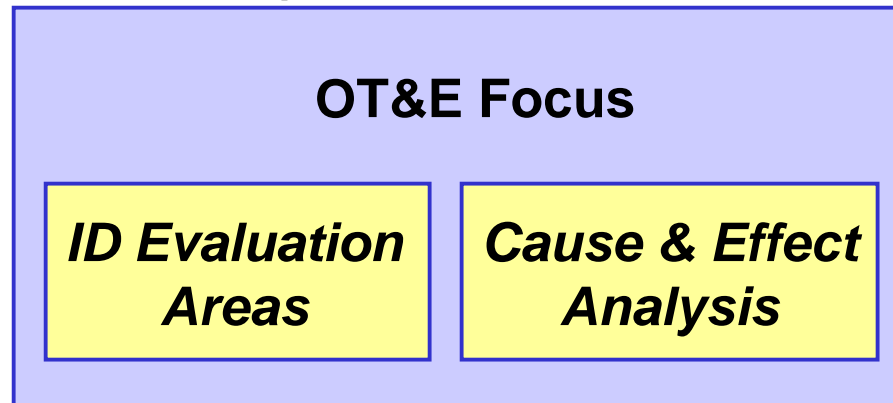
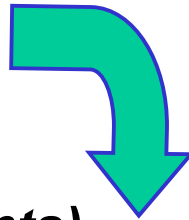
- Standardized approach
- Corporate allocation of resources
- *based on*
- Value of OT&E information





# OT&E Focus

Knowledge of SUT  
*(attributes)*  
Knowledge of Mission  
*(attributes)*  
Knowledge of Impacts  
*(Mission Essential Elements)*



***Evaluation Structure  
for OT&E***



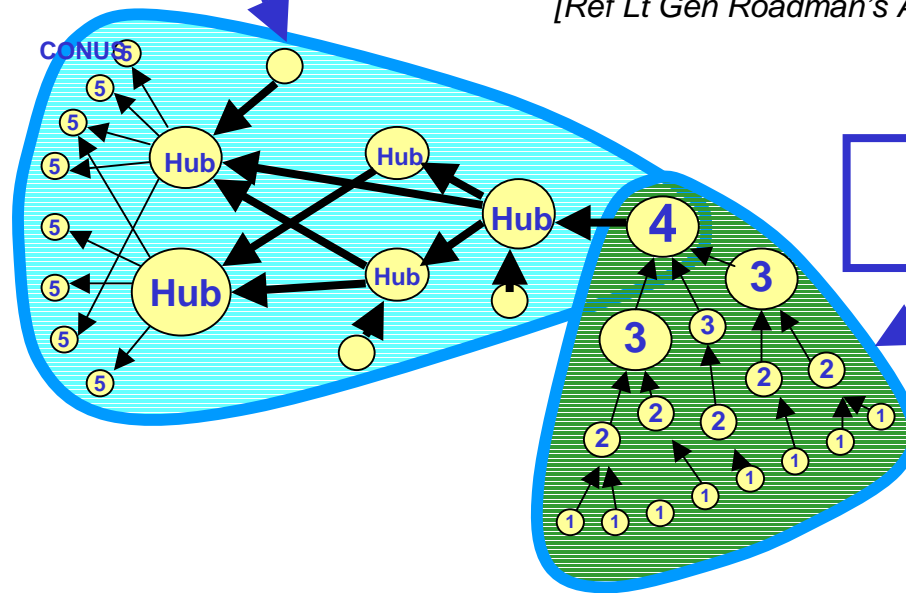
# Evaluation Areas for Patient Movement

## Issues

- *AE system came under regular criticism for inefficiency*
- *Operated below load capacity and clinical potential*
- *No incentive for cost-effective use by referring providers*
- *Command structures fragmented*
- *Lack of accountability by those requesting AE*
- *Disconnects between patient scheduling and transportation processes*

[Ref Lt Gen Roadman's APICS Presentation, April 95]

**Efficiency of Global Aeromedical Evacuation**



**Rapid Evacuation of Patients out of Theater**



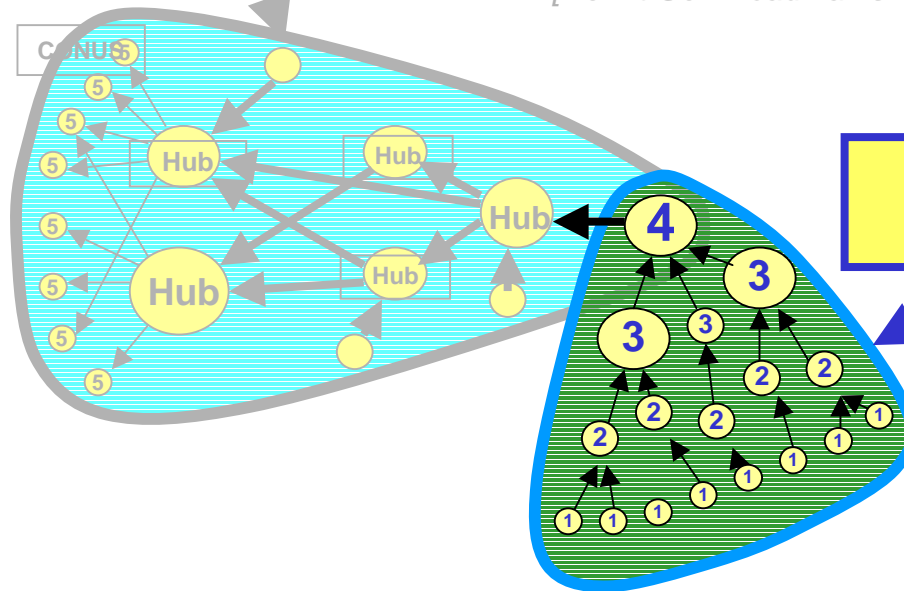
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**Efficiency of Global Aeromedical Evacuation**



**Rapid Evacuation of Patients out of Theater**



# Not Getting Patients out of Theater Quickly Enough

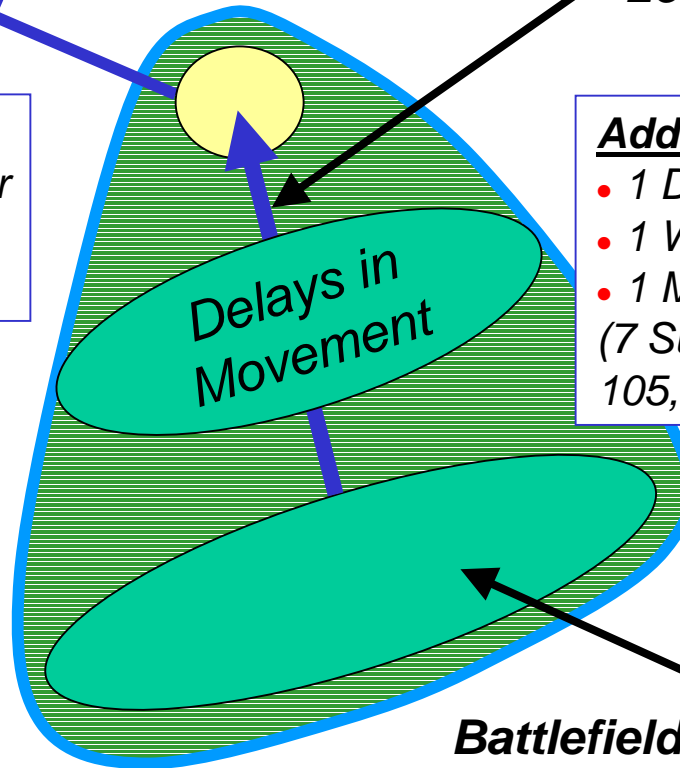
## Notional Patient Movement Example

**Theater Exit Rate**  
2000/day

**Staging Area Arrival Rate**  
2500/day

### Possible Solutions:

- More beds & MTFs in theater
- Move patients out of theater more quickly



### Additional Patients in Theater

- 1 Day - 500
  - 1 Week - 3,500
  - 1 Month - 15,000
- (7 Support Personnel/ patient = 105,000 additional in 1 month)

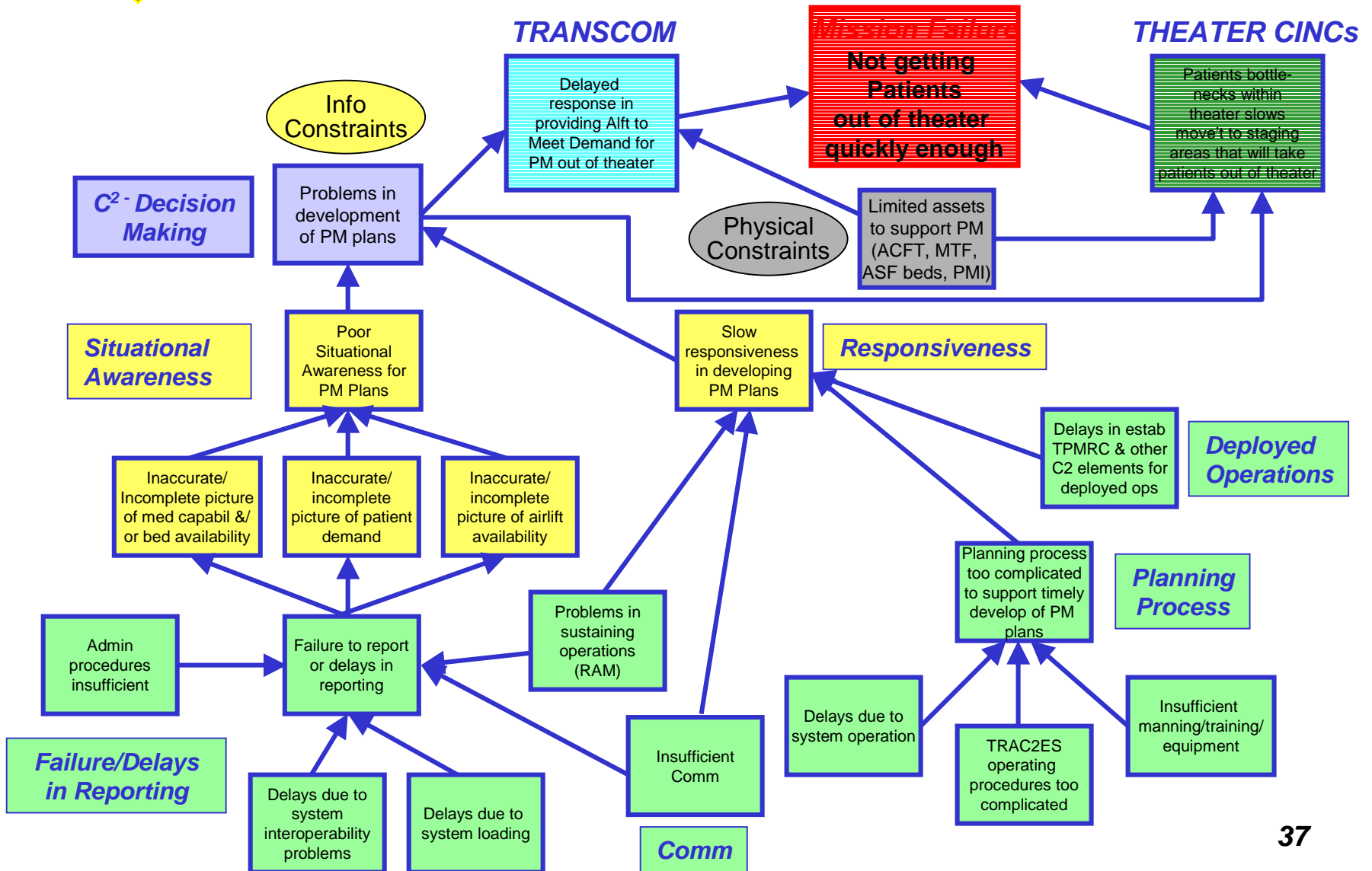
**Battlefield Medical Casualty Rate**  
3000/day

Note: Casualty rates shown are for illustration purposes only



# Rapid Evacuation from Theater

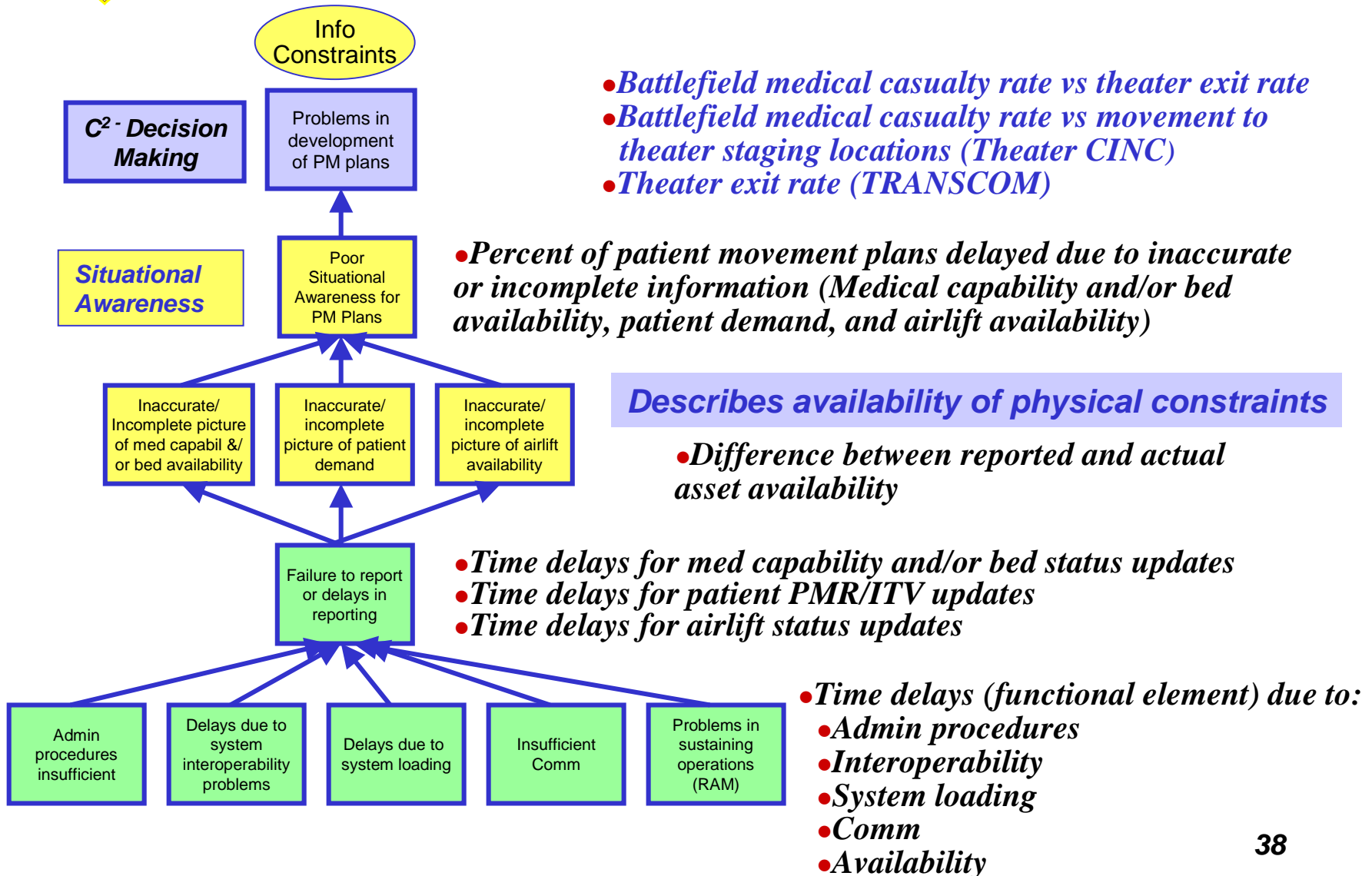
## Cause-Effect Analysis - Major Conflict w/Heavy Casualties





# Situational Awareness Evaluation Structure

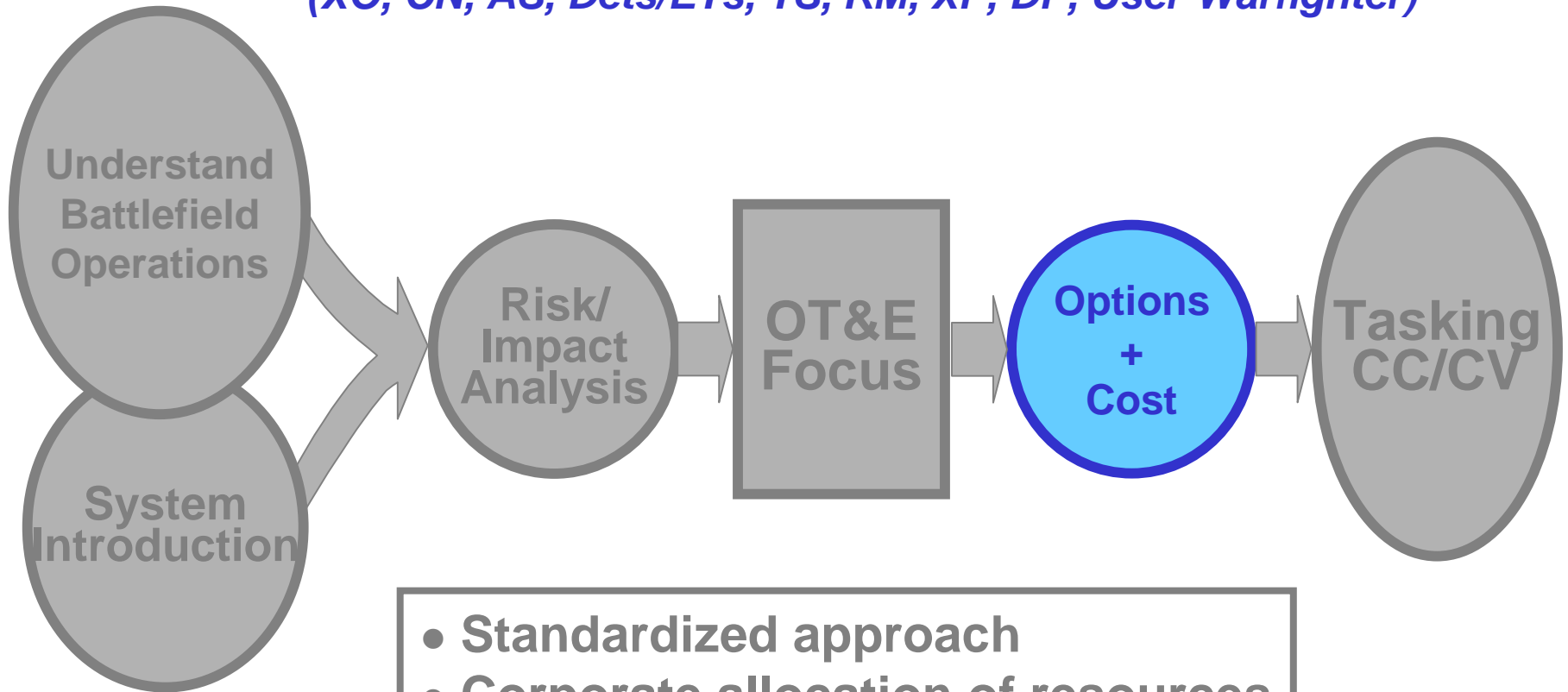
## Major Conflict w/Heavy Casualties





# AFOTEC Scope/Cost Process

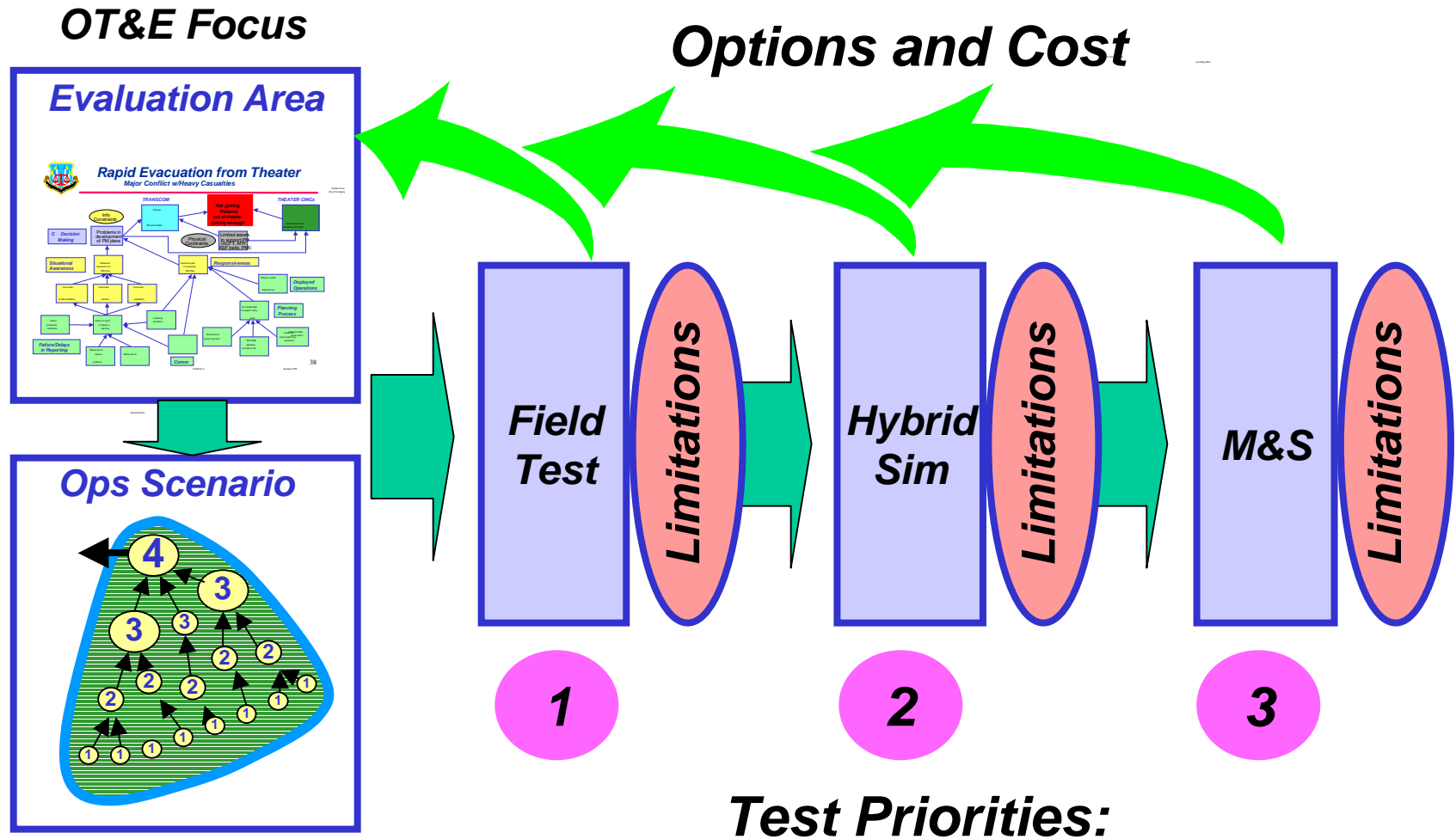
**AFOTEC Scope/Cost Team**  
(XO, CN, AS, Dets/ETs, TS, RM, XP, DP, User-Warfighter)



- Standardized approach
- Corporate allocation of resources
- based on
- Value of OT&E information



# OT&E Scope/Cost Process



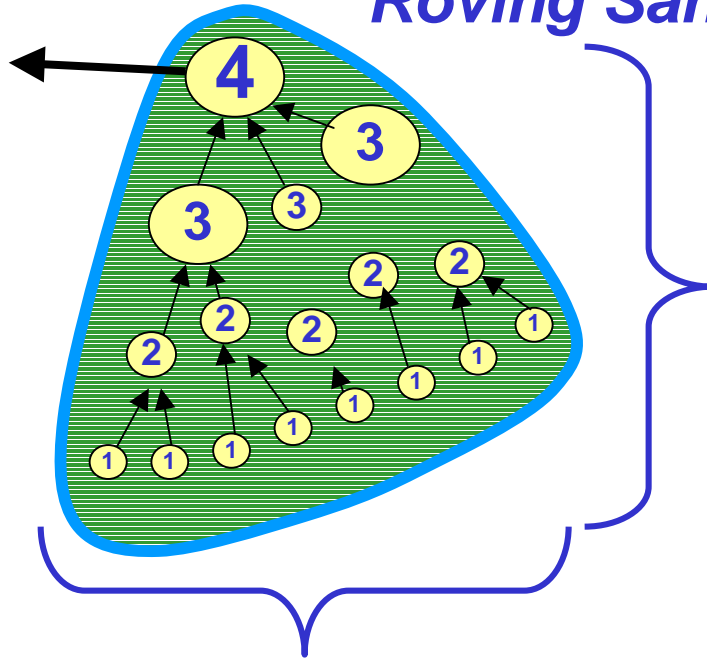




# Test Execution

## Field Test - Theater Operations - MTW

### Roving Sands-00



### Elements of Operations:

- Battlefield Casualties
  - ↑ RTD
  - ↑ **Evacuated**
- Deployed Ops/Setup
- Pre-Exercise Training
- Background Loading
  - ↑ Comm
  - ↑ TRAC<sup>2</sup>ES (Global)
- Information Warfare(?)
- Security

### Template Considerations:

- TRAC<sup>2</sup>ES/TMIP
- External Data Sources
  - ↑ GTN
  - ↑ TAMMIS
  - ↑ ....
- Physical Assets
  - ↑ Airlift (AE)
  - ↑ MTF (Incl host country & ships)
  - ↑ ASF
  - ↑ PMI (Cells)
- AE Cmd & Control
  - ↑ GPMRC
  - ↑ JPMRC/TPMRC
  - ↑ AECC
  - ↑ ....
- AOC
  - ↑ Planning
  - ↑ Execution
  - ↑ ....
- Comm
- Allied Operations

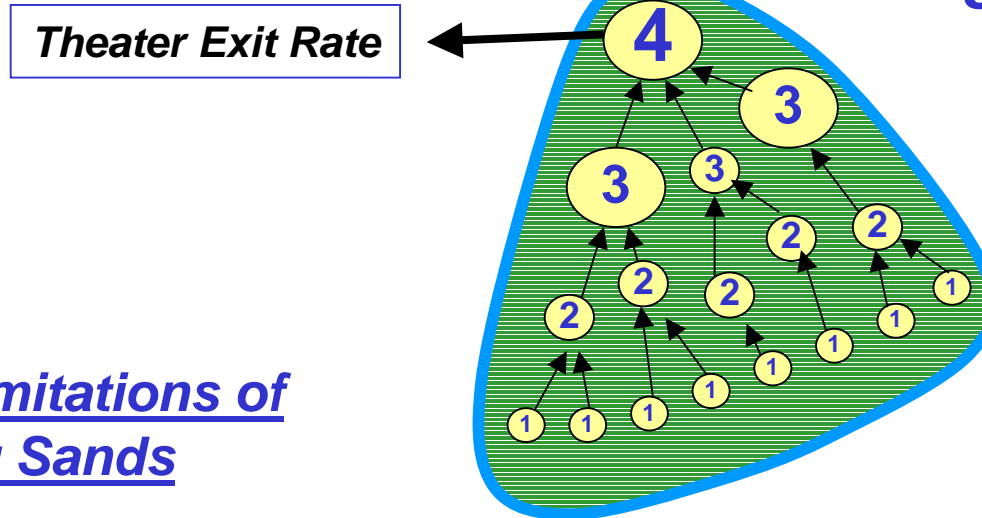
**Rapid evacuation of injured personnel**



# Potential Limitations

## Field Test - Mission Level - MTW

### Roving Sands-00



### Potential Limitations of Roving Sands

- Theater Exit Rate
- Status updates from outside of theater - Airlift and MTFs
- TRANSCOM interface for PM planning
- Comm loading
- TRAC2ES system loading
- TRAC2ES beyond IOC interoperability
- Effect of situational awareness variations on PM planning

**Note: Potential limitations will be addressed during additional field exercises, command post exercises, CTF/OFT, and/or peacetime operations.**



# TRAC<sup>2</sup>ES Evaluation Summary

Peace → **Military Operations** → SSC → MTW

- **Patient Movement Issues**
  - Rapid Evacuation from Theater
  - Efficient Global Operations
- **Execution & Support Elements Supported by Unit Tasks/Subtasks**
  - Medical Treatment
  - Transport
  - Execution C2
  - Global/Theater C2
  - Generate Sorties
  - Comm
  - PMI Support
  - Resource Status
  - Deploy
  - Sustain
  - Train
- **TRAC<sup>2</sup>ES Functional Characteristics**

**ORD/RCM**

**OT&E**  
*Patient Movement Mission*

**OT&E**  
*Unit Operations*

**DT&E and CTF**



# Summary

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- **Increased Emphasis on “Mission”**  
*(Impacts on Operations)*
- **Maintain traditional Role - Operator/System OT&E**
- **Focus on Value of OT&E information**
  - **Warfighter**
  - **Acquisition**



***OT&E***

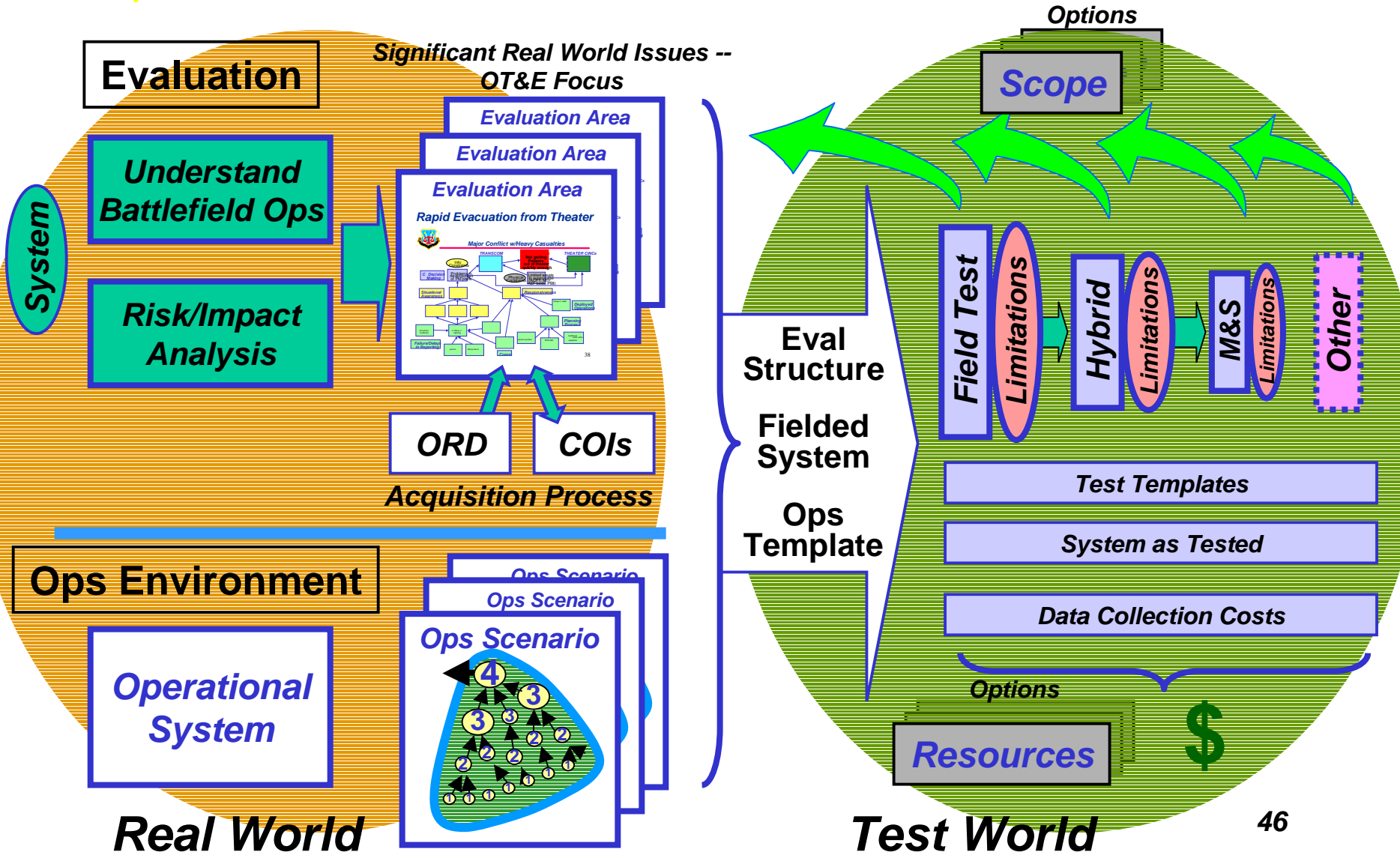
***Scope/Cost Process***

***Economics of T&E Conference 3 Nov 99***

**Maj Jim Przybysz  
AFTOEC/CNR  
DSN 246-0607**



# OT&E Scope/Cost Process





# *Risk/Impact Analysis*

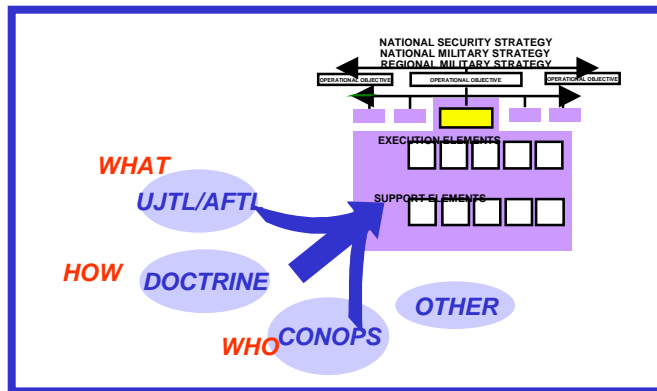
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- **Start: Ops Task & Execution/Support Elements**
- **Methodology: Three perspectives for risk/impact analysis**
  - **System (TRAC<sup>2</sup>ES) impact on the Element**
  - **Element impacts on system (TRAC<sup>2</sup>ES)  
(System dependence on the Element)**
  - **Element impacts on mission (Patient Movement)**
- **Output: Mission Essential Elements - Focus of evaluation**

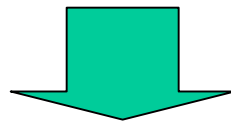
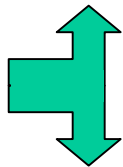


# OT&E Scope/Cost Process

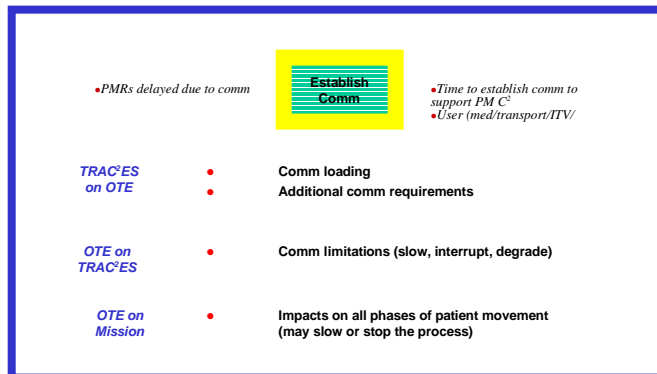
## Battlefield Ops



System

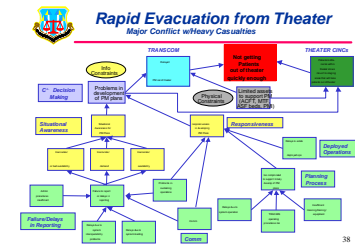


Risk/Impact

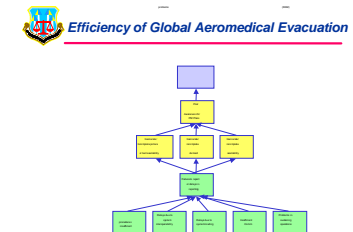


## OT&E Focus

### Evaluation Area 1



### Evaluation Area 2







# Strategy-to-Task

**Background: 1992 AFOTEC Policy - Mission/Task Level OT&E**

