



Military Operations Research Society Conference

Determining Future Force Requirements for the Brigade Combat Team



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Talking Points



Objective for Future Force Facilities

- “Set the conditions” for realistic and mission effective support of WF requirements
- Gain WF confidence that we can meet functionally and operationally relevant facilities so units can concentrate on their “go to war” requirements

We were ...

Fortunate in maintaining a unity of effort for setting installation objectives and goals through numerous themes and initiatives since 2000 .. names changed, people the same



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Purpose

Provide an overview of relationships and synchronization required to forecast or predict facility and infrastructure requirements using a Brigade Combat Team; and,

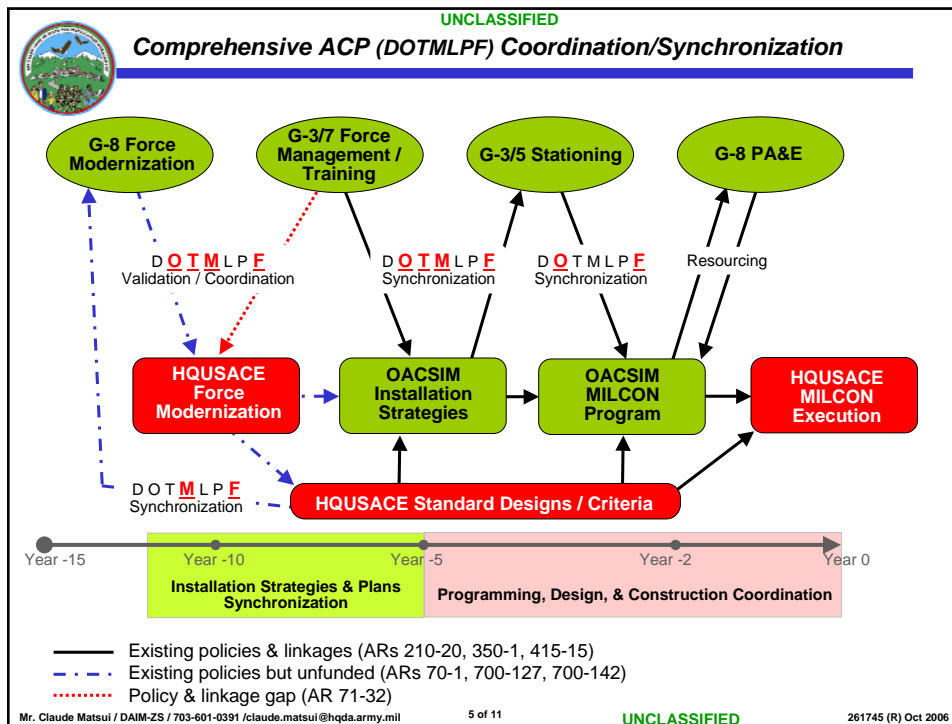
use one of it's key facilities as an example of how functional and operational requirements, the decision process, and the standardization process can lead to facility standards and criteria.



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Talking Points

- ★ Army synchronizes decisions across seven domains under DOTMLPF .. Doctrine, Organization ... etc
 - Broader “personnel” definition than just Soldiers
 - ADDs Facilities
- ★ Highlighted domains identify the intended functional integration needed for a “longer requirements view”
- ★ Timeline indicates both the traditional phase of MILCON and the extended look
 - Must “remain in contact” throughout development cycle
 - Used Materiel Development/Acquisition Milestones and Data Sets to derive “forecast requirements” and “impacts projection”
- ★ Drew comparisons on both past successes (e.g., Comanche & Crusader) and failures (e.g., RPV)
- Success is 85% experiential and 15% academic
- ★ Looking for the “common denominator” across all domains that can serve as a frame of reference for determining potential impacts



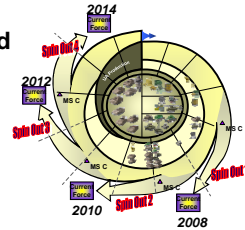
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- ### Talking Points
- Shift from a Division-centric to Brigade-centric Army included major changes in almost every decision domain
 - ✦ Facilities requirements “Validation” needed more robust functional and operational orientation .. TOE v. mission
 - Required a different approach for consistency and currency ... Warfighter Review v. charrettes
 - ✦ Needed to address Technology Spin-out while reducing construction disruption on readiness
 - Used past experience (e.g., LHX) to initiate with 2004 (COF) and refined in 2006 SDs
 - Needed flexibility to address uncertainty
 - Needed to shift from single purpose, land intensive designs whenever it made sense .. Life-cycle cost and BRAC issue
 - ✦ Adaptive, Multi-purpose SD part of the NEW solution .. A Brigade Complex commensurate with Army shift to Brigade centrality
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BCT Operations Complex Strategy

- Focus on functional and operational requirements & priorities
- Use a Warfighter Review Process .. *schoolhouse-functional user-leader*
- Simultaneously address “yesterday’s” issues and “today’s” needs with flexibility to accommodate “tomorrow’s” requirements
- Future technologies fielding strategies help forecast key technologies for traceability; define facility implications; determine “when” change will occur
- Opportunity for reduced land area consumption through consolidation of functions habitually provided as separate buildings
- Accommodates limited requirements uncertainty



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Talking Points

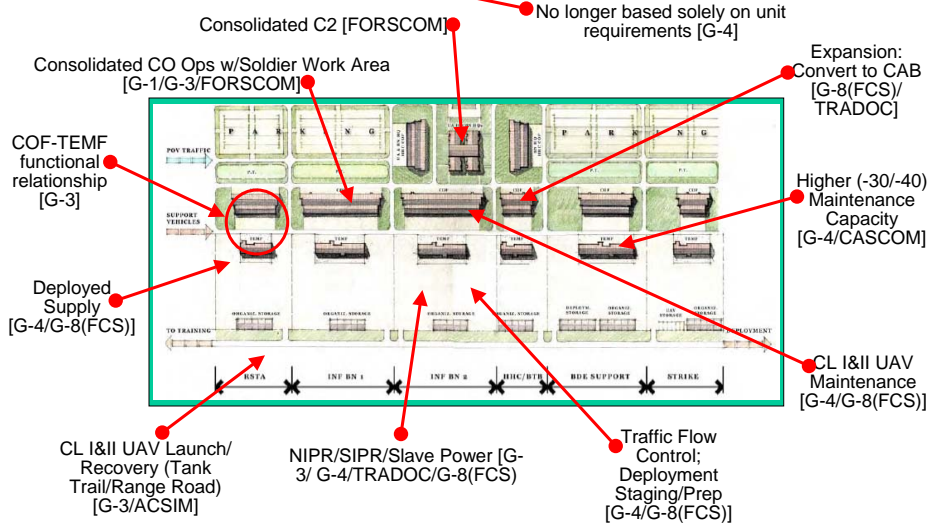
- ★ BCT Complex required looking at a functional and spatial inter-relationships between buildings
 - As depicted ... numerous Domains affected the brigade complex
 - The broader view offered opportunities to build on capabilities required by others .. Connectivity, ET/DT & Msn PIng/Rehearsal
 - Boarder view also allowed functional consolidations thereby multiplying spatial use thru multi-purpose design concepts .. 2LM maintenance corridor, 30/40 maintenance in 20-level shops
- ★ Unit configuration stability lowered risk of brigade-centric approach, BUT further substantiated need for longer view out from 6-years to 10-years .. Modular HBCT v. FBCT
- ★ Materiel look shifted from current plans & stationing 6-year look to 15-year look



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BCT Complex – Major Features

Primary functions: command & control, reach operations, maintenance/repair, embedded/ distributive training, deployment equipment & supply storage, unit and Soldier storage, and higher echelon repair. Includes 2LM, focused logistics, CBM and E2E initiatives.



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Talking Points

- Some idea of how our longer view changed how we addressed requirements .. Single purpose facilities assumed some requirements would be addressed by another facility type .. No synergy
- Opportunities for consolidation or multi-purpose use of space more obscure or counter-intuitive
- ✦ Immediate challenge was how to assess risk of uncertainty with a longer view

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BCT Requirements Comparative Analysis

Functional Requirement	Past Methodology	Emerging Methodology
	Attributes Meeting Need	Resolution/Approach
Force structure, functions, & workflow requirement changes	Individual buildings, no operational relationships	COF-TEMF workflow & functions relationships; prescribed C2 spatial relationships
Reach operations, mission planning/rehearsal connectivity, training		NIPR/SIPR connectivity from Bde UOC/NOC to parking pad
UAV launch/recovery		Proximity to training area; reduction of chase aircraft necessity
AT/FP land area consumption	Applied to individual structures	Consolidation of common functions; establishment of security line
Repetitive technology spin-off/insertion training		Dual use NIPR/SIPR enabled TEMF space
OPTEMPO/deployment staging timelines		Proximity to Soldier equipment storage (COF); 3-5 day deployment storage select supply classes; dual use of materiel handling/lift capabilities for load out, turn-in/issue, & supply; prescribed traffic flow



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Talking Points

- ★ **A significant change for the decision environment was cost**
 - Current models are geared toward “first cost” impacts rather than “life-cycle” avoidances
 - Raises questions like .. 100-year roof on a building with a 50-year replacement milestone
 - Unit cost complicated as consolidation requires multiple line items to achieve accuracy .. If too broad = too expensive; often means less scope
- ★ **Risk became a major issue and remains somewhat unresolved as we determine what is “acceptable” and what isn’t**
- ★ **Sometimes, the issue is clouded by other economic considerations ... sustainability cost avoidance thru increased MCA first cost has become the “practice”**



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BCT Operations Macro Cost Analysis

Cost Parameter	Past Methodology	Emerging Methodology
	Current Cost Fidelity	Cost Variables
No established comparative analysis cost model for multi-functional facility	By Individual FCC	Multiple FCCs or components of FCCs used in standards
Intangible benefits – Functionality and Operability (DOTMLPF integration)	Not previously a facilities cost consideration	<ul style="list-style-type: none"> • Land area consumption • AT/FP security line • Reduction in deployment response timeline (BCTs as "first responder") • Mission planning/rehearsal enabled • C2 proximity and spatial relationship • UAV launch/recovery chase aircraft avoidance
No life-cycle cost avoidance model	Not previously a facilities cost consideration	<ul style="list-style-type: none"> • Technology spin-off repetitive modification avoidance • Reconfigurable interior space; • Multi-use buildings & structures • Initial facilities oriented throughput model



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Talking Points

- ★ **Brigade complex perspective changes some individual facility component perspectives as well**
 - Mission consolidations substantially altered the previous facility type definition
 - Complicating cost and scope comparisons and execution risk assessments
 - Primary measures for the facility changed from manpower = capacity to thru-put = capability
 - Using solely unit strength or organizational documentation no longer adequate
- ★ **However, adopting other domain metrics appear promising ..**
Size, duration, and frequency drive space allowance algorithms



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Tactical Equipment Maintenance Facility (TEMF)

- TEMF no longer **just** a maintenance-repair-supply complex
- Brigade-centricity consolidates functions with majority impacts on TEMF complex .. *where Soldiers spend most of their working day*
- *Reduced deployed footprint* places greatest demands on Brigade HQ and TEMF standards & criteria
- Adaptive, multipurpose approach provided significant impact reduction .. *accelerated Transformation, technology spin-outs, OPTEMPO*
- Facility throughput a design priority
- Log Transformation (*e.g., 2LM, E2E, CBM*) requires capabilities beyond just the unit to be supported
- TRADOC (*USAOMMCS, CASCOM*), FORSCOM (*Ft Lewis, FRC G-4*), DA G-4 provided capability to use a **“living”** developmental environment



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Talking Points

- ✦ Graphical depiction of the major changes to the design philosophy used with a thru-put orientation v. capacity
- ✦ Multi-purpose space use based on mission consolidation opportunities
- ✦ Facility capacities included higher echelon support thereby eliminating need for a separate, dedicated facility
- Connectivity supports multiple mission requirements using same ports .. Embedded/Distributed Training, reach operations, New Equipment Training, troubleshooting, long-haul diagnostics



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TEMF Complex – Major Features

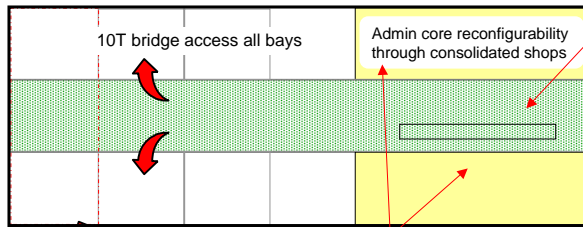
Security line: Between COF admin core & readiness modules encompasses BCT parking/training area

BSB (or equivalent):

- 2d Tier Field Maint -One dual use bay
- 35T bridge one wing

Power & data connectivity: All bays, admin core, & tactical vehicle parking for ET/DT, mission planning/rehearsal & reach operations

Maintenance/Inspection bay:



- Rapid turn-around time maintenance & inspection bay
- Recurring NET Training (technology spin-outs)
- Deployment inspection, staging, & preparation w/ immediate proximity to COF Readiness Module
- Traffic flow control in to/out of parking

New out building/ services:

- Deployment supply storage
- UAS launch/recovery proximity to training complex (tank trail)

32' x 96' bay module with repair bays perpendicular to rapid maintenance & inspection bay

Admin Core:

- Non-Sensitive Secure Storage (pilferable, accountable, serial numbered, technology sensitive)
- Includes CLS factor
- Production control & quality assurance/control (2d floor)
- Dockside access to SATS (Standardized Army Tool Set) & ASLMS (ASL/PLL) vans
- IFTE capable dock
- Multi-function classroom, training management, node control
- Unmanned Aircraft Systems (UAS) maintenance, storage

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Conclusions

- ★ **“Longer view” offers greater opportunity to explore concepts and strategies while identifying key decision points to reduce uncertainty**
- ★ **Advantages to ability to forecast or predict impacts requires resourcing commitment “stay in contact”**
- ★ **Facility Standards and Standard Designs-Criteria likely “common denominator” across decision domains**
 - **Subject matter expertise requires a broader range of understanding decision (force management) process**
- ★ **Synchronization and coordination across decision domains still needs refinement .. Gaps still exist**
 - **Documentation process lags behind**
 - **Prioritization and investment decision (life-cycle) model needs to be developed to maximize participation and eliminate surprises**
- ★ **Sunk costs (manpower, time, & dollars) are inevitable**

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Questions??