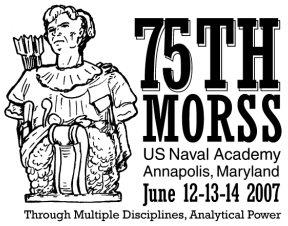

712CD

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Report Documentation Page

Form Approved
OMB No. 0704-0188

1. REPORT DATE	2. REPORT TYPE	3. DATES COVERED
01 JUN 2007	**N/A**	**-**

4. TITLE AND SUBTITLE	5a. CONTRACT NUMBER
Peak Policy for Reparable Parts	5b. GRANT NUMBER
	5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S)	5d. PROJECT NUMBER
	5e. TASK NUMBER
	5f. WORK UNIT NUMBER
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) **LMI 2000 Corporate Ridge McLean, VA 22102-7805**	8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. SPONSOR/MONITOR'S ACRONYM(S)
	11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release, distribution unlimited

13. SUPPLEMENTARY NOTES
See also ADM202526. Military Operations Research Society Symposium (75th) Held in Annapolis, Maryland on June 12-14, 2007, The original document contains color images.

14. ABSTRACT

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT **unclassified**	b. ABSTRACT **unclassified**	c. THIS PAGE **unclassified**	**UU**	**23**	

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Peak Policy for Reparable Parts

Carol DeZwarte
Tovey Bachman

Presented at 75th MORS Symposium

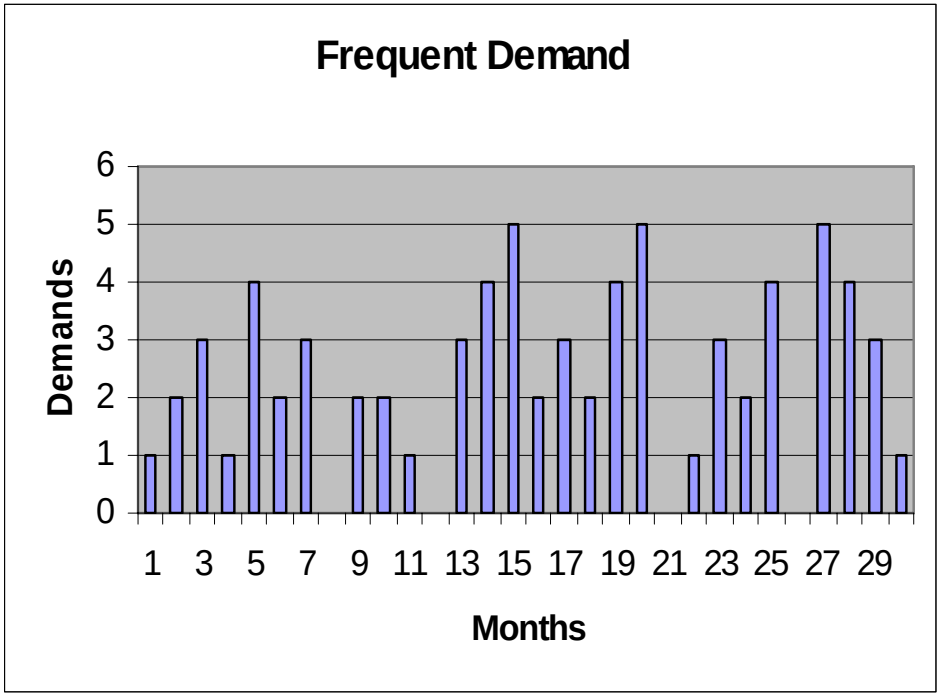
Agenda

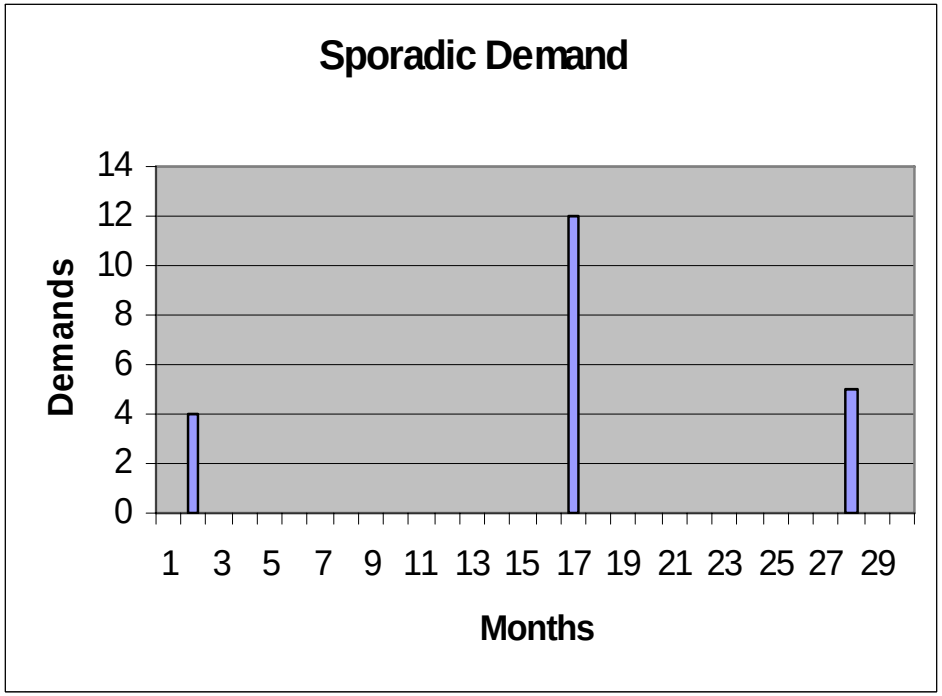
- Peak Policy Background
  - What is Peak Policy?
  - Consumable Item Analyses
- Applying Peak Policy to Reparable Items
- Preliminary Results
- Next Steps

What is Peak Policy?

- New rules for managing sporadic demand items that:
  - Set reorder points based on peak (highest in trailing # periods) demands and price-based multipliers
  - Set order quantities based on item price
  - Change the threshold between replenishment and NSO
  - Forecast *how often* future demands occur instead of *how much* demand occurs
- Above activity threshold, keep baseline policy for frequently-demanded items

What is sporadic demand?





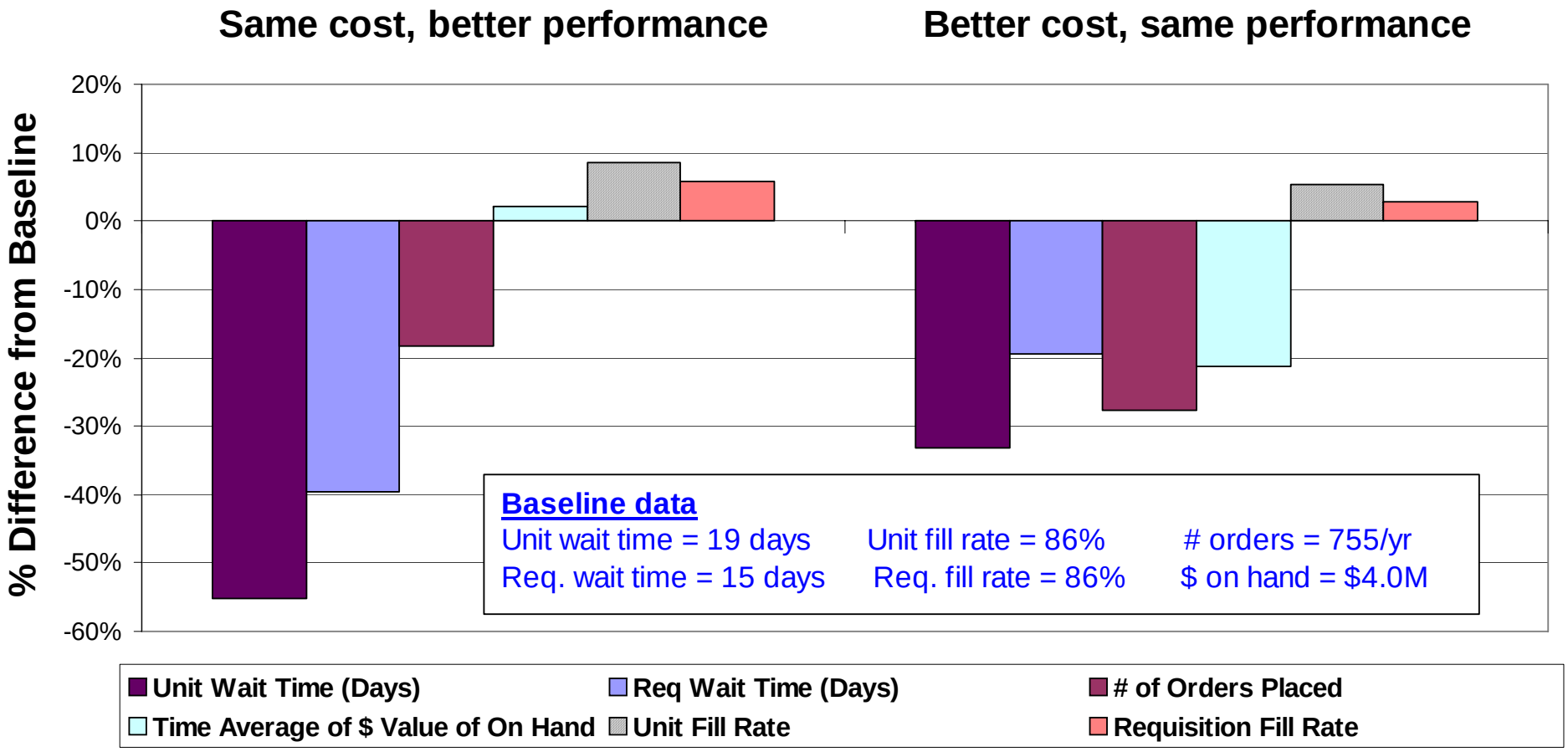
Peak Policy Background

- Developed by LMI to improved service on sporadic demand items
- Enables tradeoffs between wait time, investment, and procurement actions
  - policies tailored to customer goals
  - service level vs. investment curves aid development
- Successful pilot at DLA on initial item population
- Further implementation activities ongoing

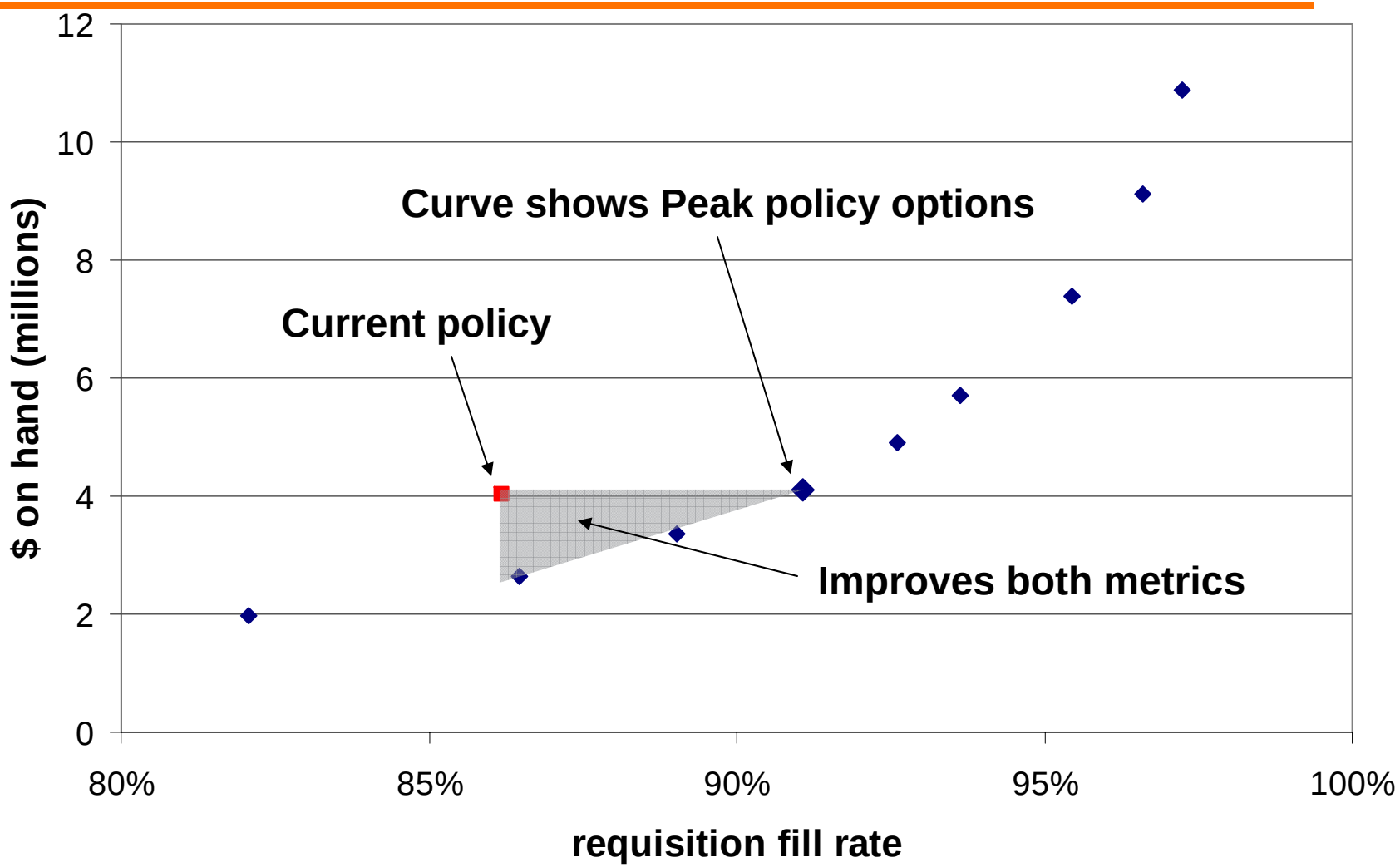
Consumable Item Analyses

- Analyses on over 20 consumable item populations show significant potential
  - 25-50% wait time reduction
  - Up to 15% reduction in inventory investment
  - Up to 35% reduction number of orders placed
- Benefits shown at wholesale AND end-user levels of supply chain
- Pilot program showed benefits quickly
  - Long lead times typically delay improvements

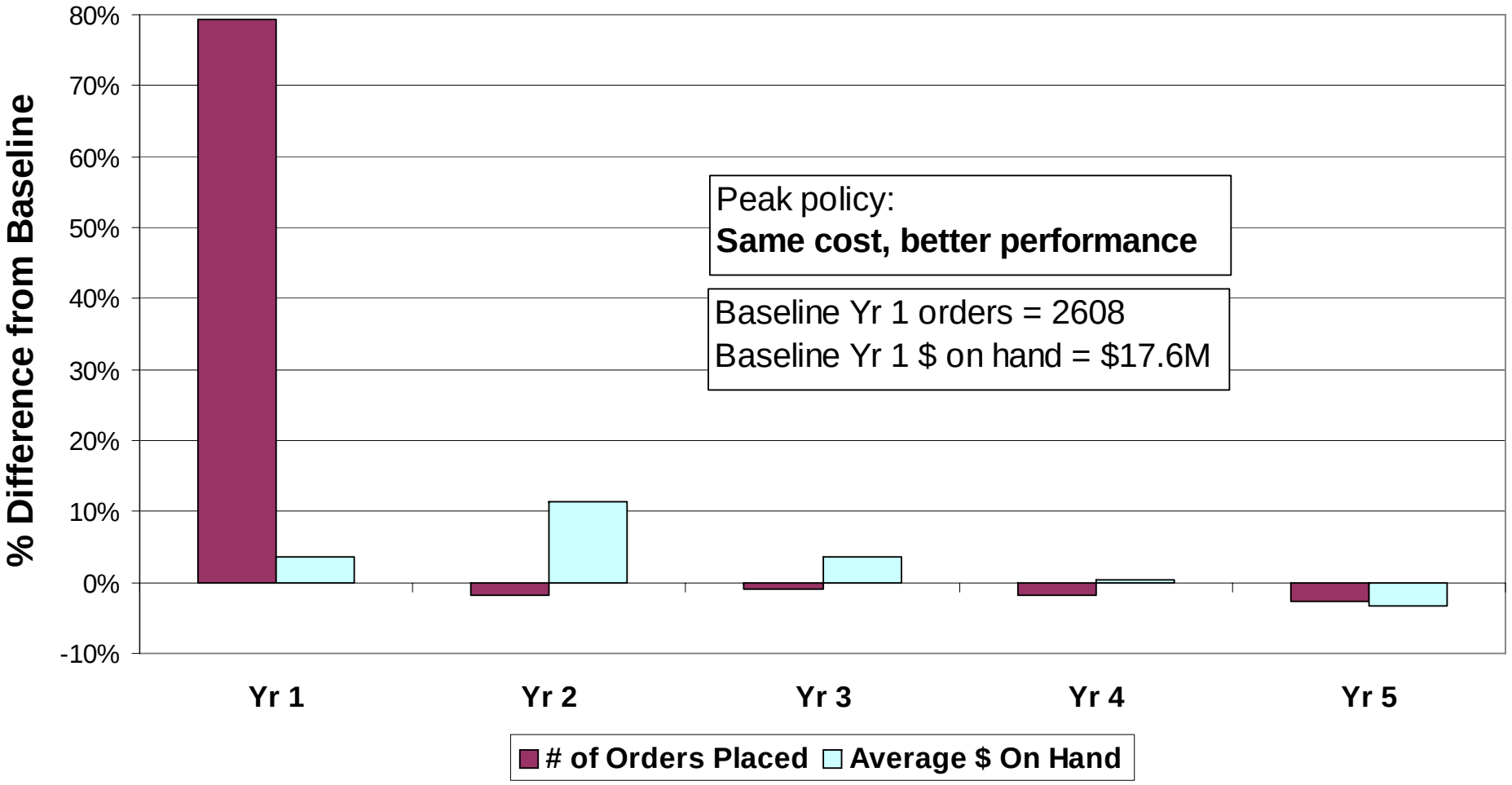
Two Policies' Projected Performance Sample Item Population



Trading Off Fill Time vs. $ On Hand Sample Item Population



Near Term Impacts
Sample Item Population



Agenda

- ✓ Peak Policy Background
  - ✓ What is Peak Policy?
  - ✓ Consumable Item Analyses
- Applying Peak Policy to Reparable Items
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Peak Policy for Reparable Items

- Two areas where policy may be applied
  - Setting procurement levels
  - Setting repair levels
- Activity threshold for reparables may be different from consumables
- Several echelons of supply chain can be analyzed
  - Wholesale procurement only
  - Depot-level repairs
  - Local repairs

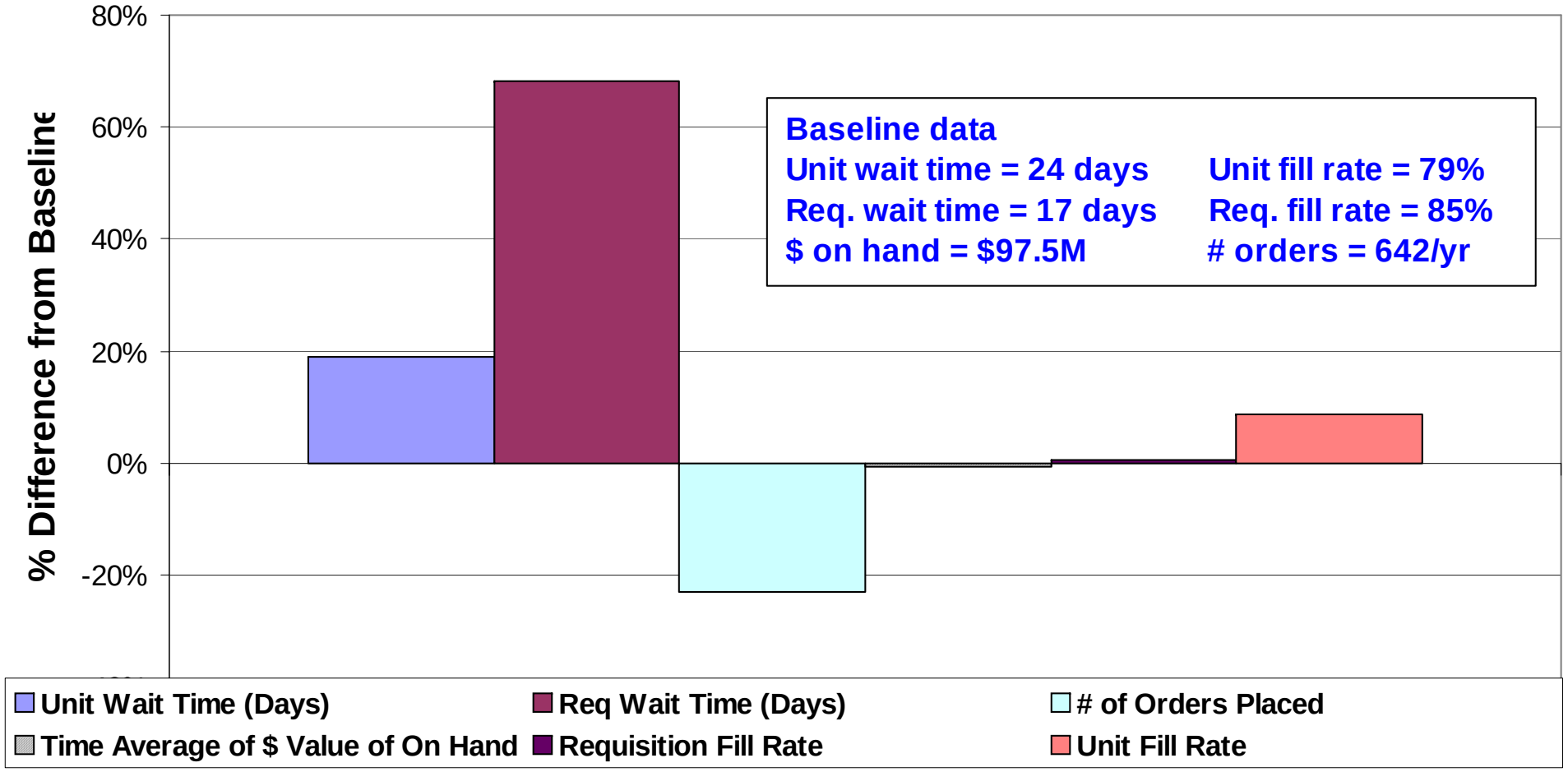
Pilot Study with Army

- Use depot-level reparables only: 12,152 parts
  - Data collection for field-level reparables too involved for initial studies
- Initial simulations ignore effect of migration, so limited to the 1,372 NSO-2 items
  - Prevent movement across activity threshold between NSO-2 and demand-supported items
- Apply several computational simplifications to make policy emulation easier at early stages
- “Peak” demand considers condemnations only

Simulated Reparable Results

- Unit fill rates improved up to 8% (30% reduction in non-fills)
- More difficult keeping dollars in inventory under control compared to consumable items
  - Item prices much larger than for consumables
- Procurement actions reduced by up to 30%
- Unable to reduce wait times
  - Long lead time items driving high average WTs
- Next: can we address reduce wait times by treating long lead time items differently?

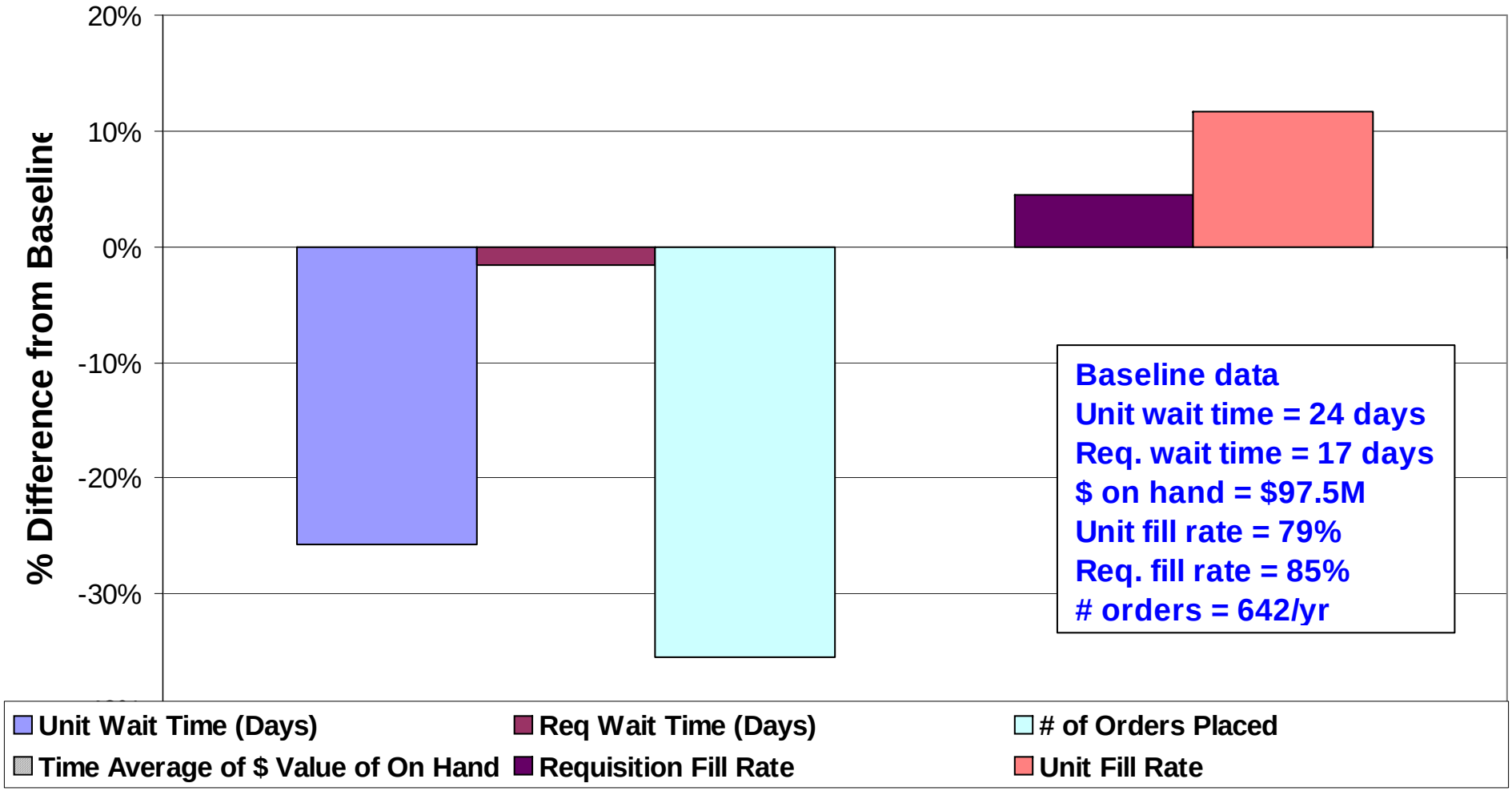
Preliminary Peak Policy
NSO Reparable Item Population



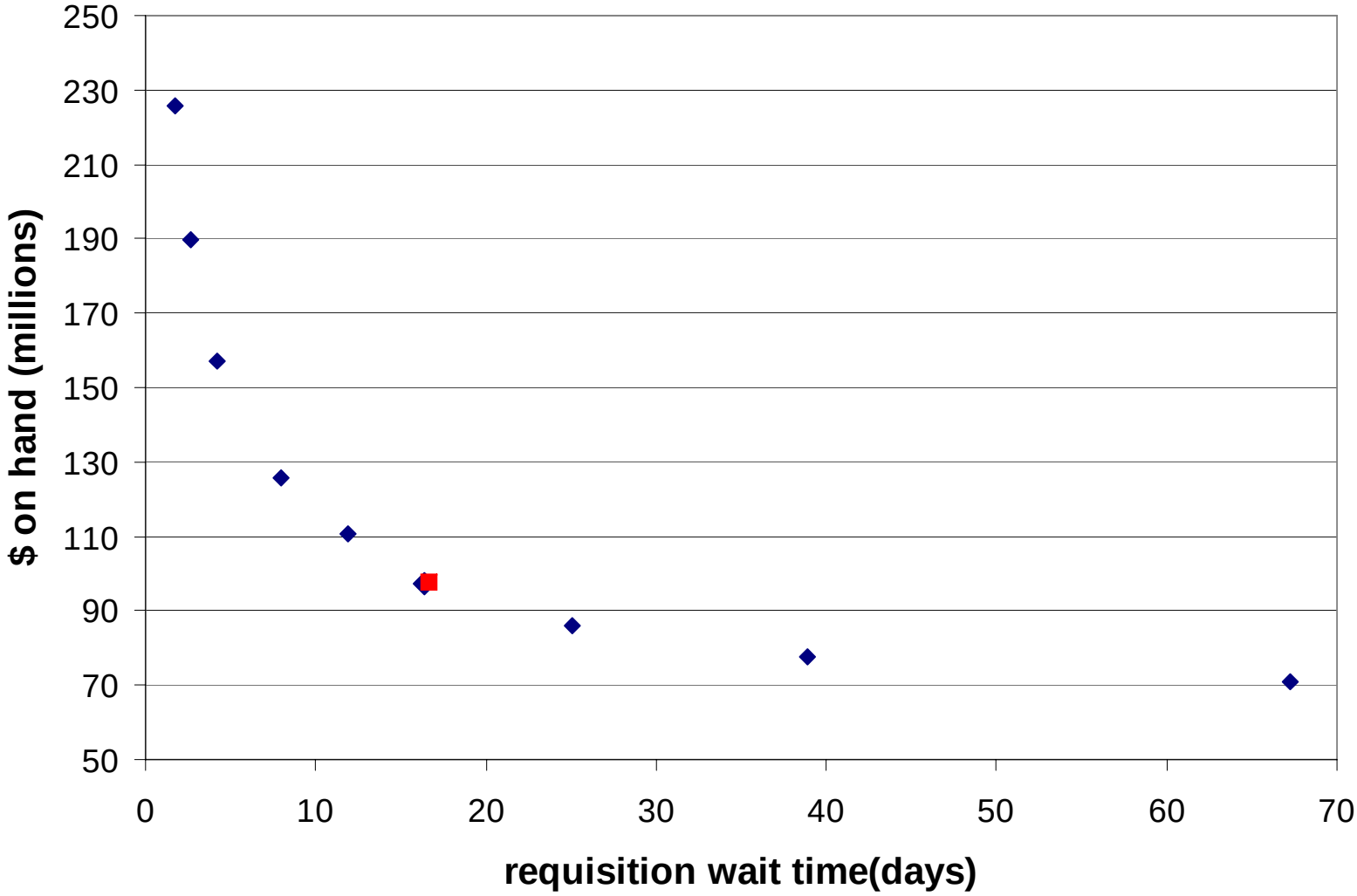
Addressing Long Lead Times

- Tried several variations of scaling factor*ROP for lead time > x
  - ROP = 1.4*PeakROP for LT>12 months,
  - ROP = 2.0*PeakROP for LT>24 months,
  - Otherwise keep PeakROP
- Reduced unit and requisition lead times, but very expensive compared to equivalent Peak policy with no LT adjustments
- Create new peak policy settings to lower cost

LT-Adjusted Peak Policy
Reparable Item Population



Trade-Off for LT-Adjusted Peak Policy Reparable Item Population



Challenges

- All services have condemnation vs. rotable demand data available, BUT
  - Some data not recorded in national databases
  - Condemnation data not always collected at NSN level
- Army computations complex with many exceptions
  - Needed to simplify some rules; figure out where duplication was necessary to retain integrity of emulation
- Interaction of repair pipelines and levels with procurement pipelines and levels complex

Next Steps

- Further explore handling of lead times
- Implement migration for Army policy across NSO/demand-supported threshold
- Discuss what policy simplifications should be removed (i.e. make simulation more accurate)
- Expand exploration to other organizations
  - Air Force
  - Navy
  - FAA
- Expand exploration to repair policies

Credits

- AMSAA team
  - Mike Johnson, Eric Wehde, Meyer Kotkin, Tom Hagadorn

Backup – Population Data

- 1372 NSO-2 items
- $69.3M annual demand
  - total demand qty * unit price for each item
    - NSO items treated as if repair is not an option so all demands are modeled as condemnations
  - Treating all demands as repairs instead, annual demand @ 15% repair prices = $10.4M
- Item price percentiles
  - 25% = $713.62
  - 50% = $2079.00
  - 75% = $6963.18
  - 90% = $26399.38

Backup: Computation Simplifications

- Wilson EOQ calculation used for order quantities
- War reserves and below-depot assets excluded
  - Below-depot activity not modeled
- Repair safety level calculation uses same shadow price as procurement safety level
- Shadow prices static