
Assessing Options to Enhance Force Protection for Mobile Forces

Presentation at C2 R&T Symposium

Dr. Stuart H. Starr
Ms. Sarah Johnson
Major Tedd Dugone
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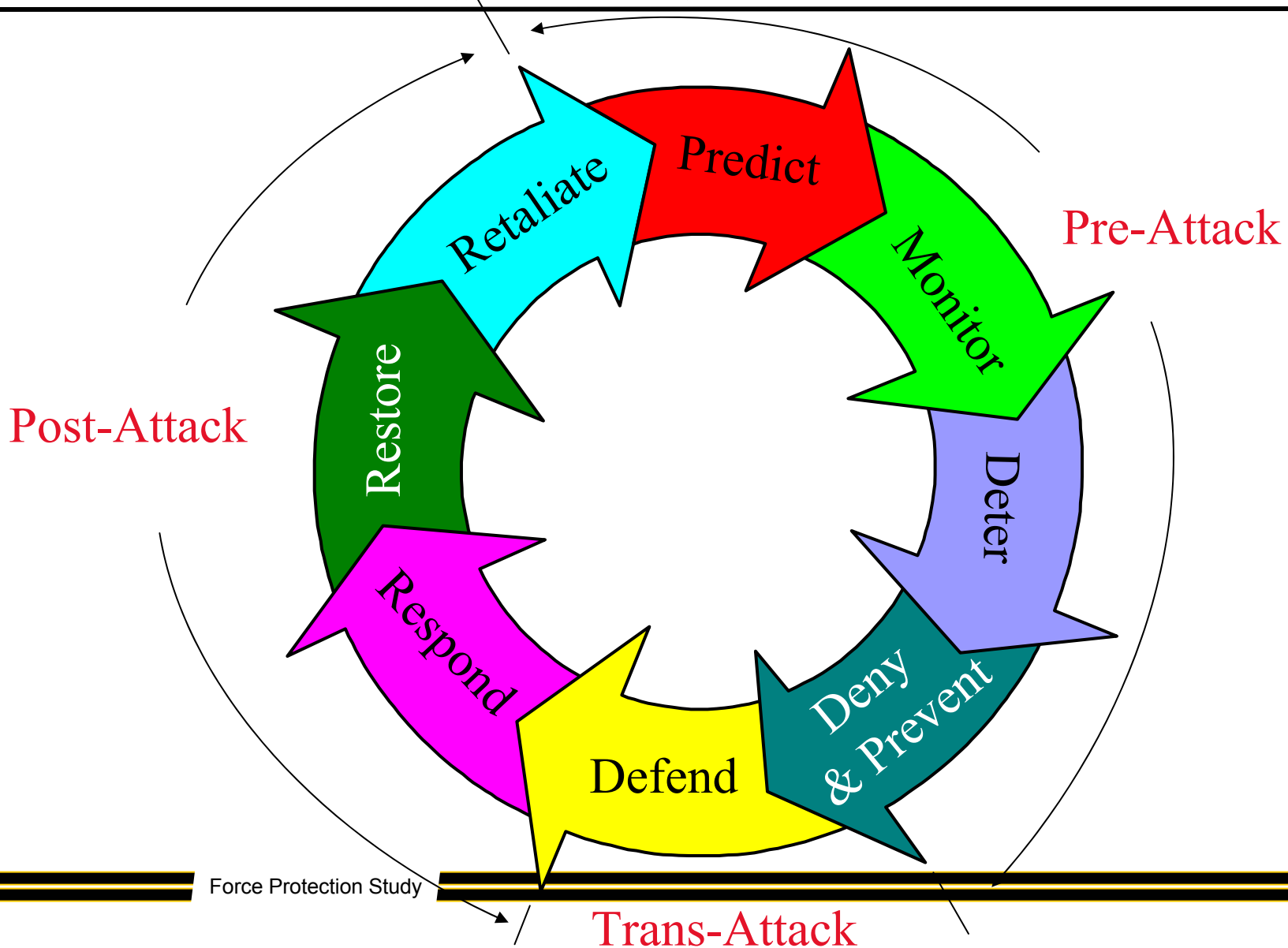
Agenda

- Objectives, Scope
- Case Studies: Force Protection of
 - Convoys
 - Small Units in Urban Terrain
- Summary

Objectives, Scope

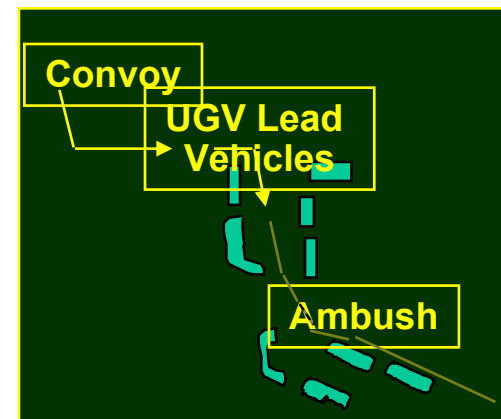
- Objectives
 - Conduct analyses to shed light on the contribution that proposed changes in Doctrine, Organization, Training, Materiel, Leadership & Education, Personnel, Facilities (DOTMLPF) can have on Force Protection (FP) effectiveness and efficiency
- Scope
 - Focus on the challenges associated with FP of *mobile* targets:
 - Convoys
 - Small units in urban terrain
 - Emphasize far term (2010) solutions

Force Protection Framework: Pre-, Trans-, & Post-Attack



Convoy Assessment

- Scenario
 - Dismounted ambush party using mine detonation to initiate attack on friendly convoy
- Key issues
 - What losses are incurred by such an attack?
 - What DOTMLPF changes are necessary to improve FP of convoys?
 - What are attractive far term materiel enhancements (e.g., armed UGV, UAV, use of obscurants, ballistic appliqué, improved C2)?
- Measure of Merit
 - Average convoy losses
- Assessment
 - Tool: MANA



MANA Convoy Scenario

MANA - AmbushUAYwpnSA1Armor

File Setup Display View Extra Data Help

Pause Run

MultiRun Reset

Step Delay[ms] 2

Max. Steps 250

Seed

Lock -1741912212

Width: 200 Height: 200

Sound Flags LOS BG Int Fire

Dead Anim Path

STOPPED

RecAgt RecSteps RecDets

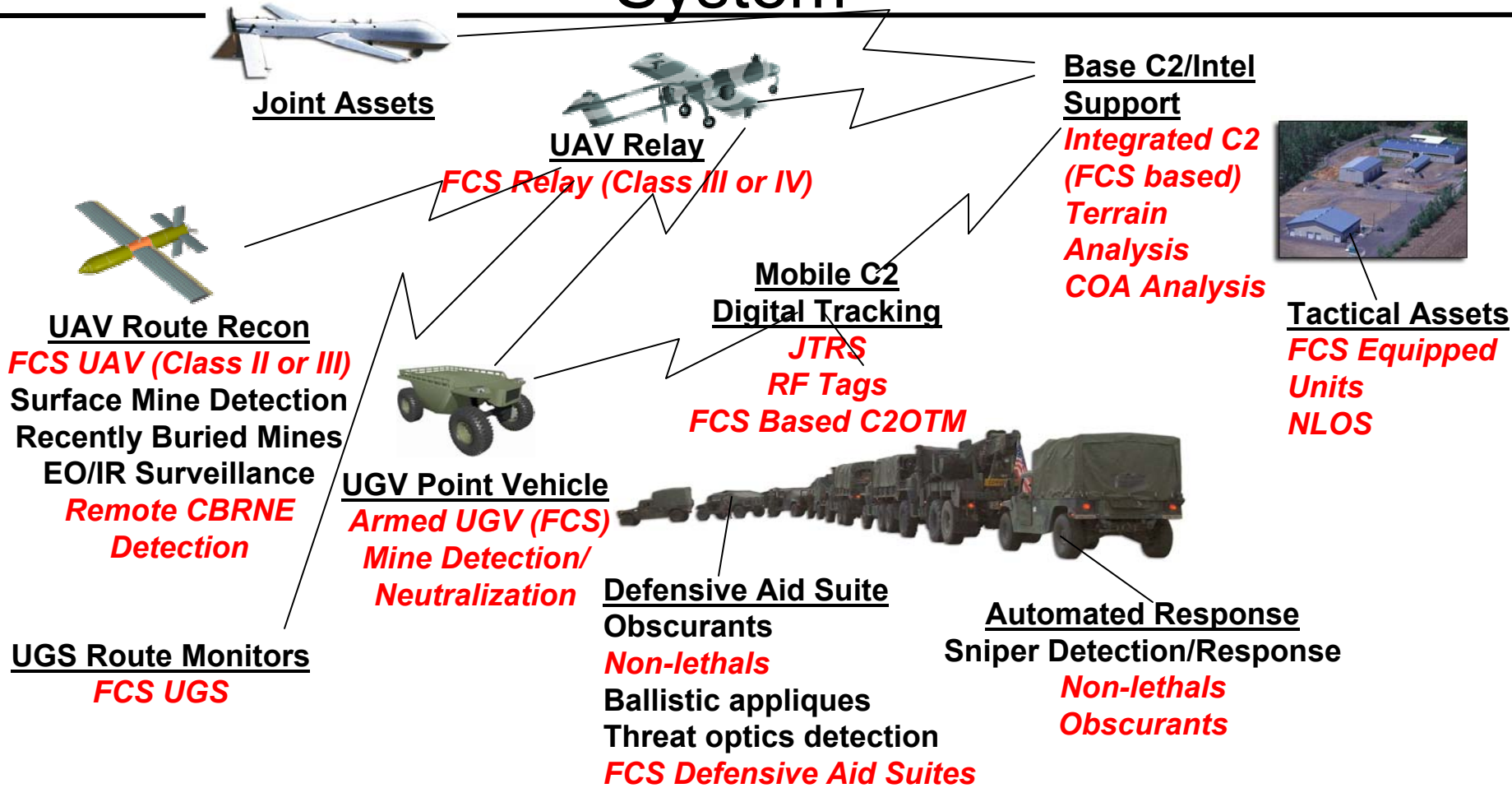
RecLocs RecMDets RecNet

RecPos

Terrain= LightBush, Elevation= 0.0m 199, 148 0.0, 0.0 Step: 0 Run: 1

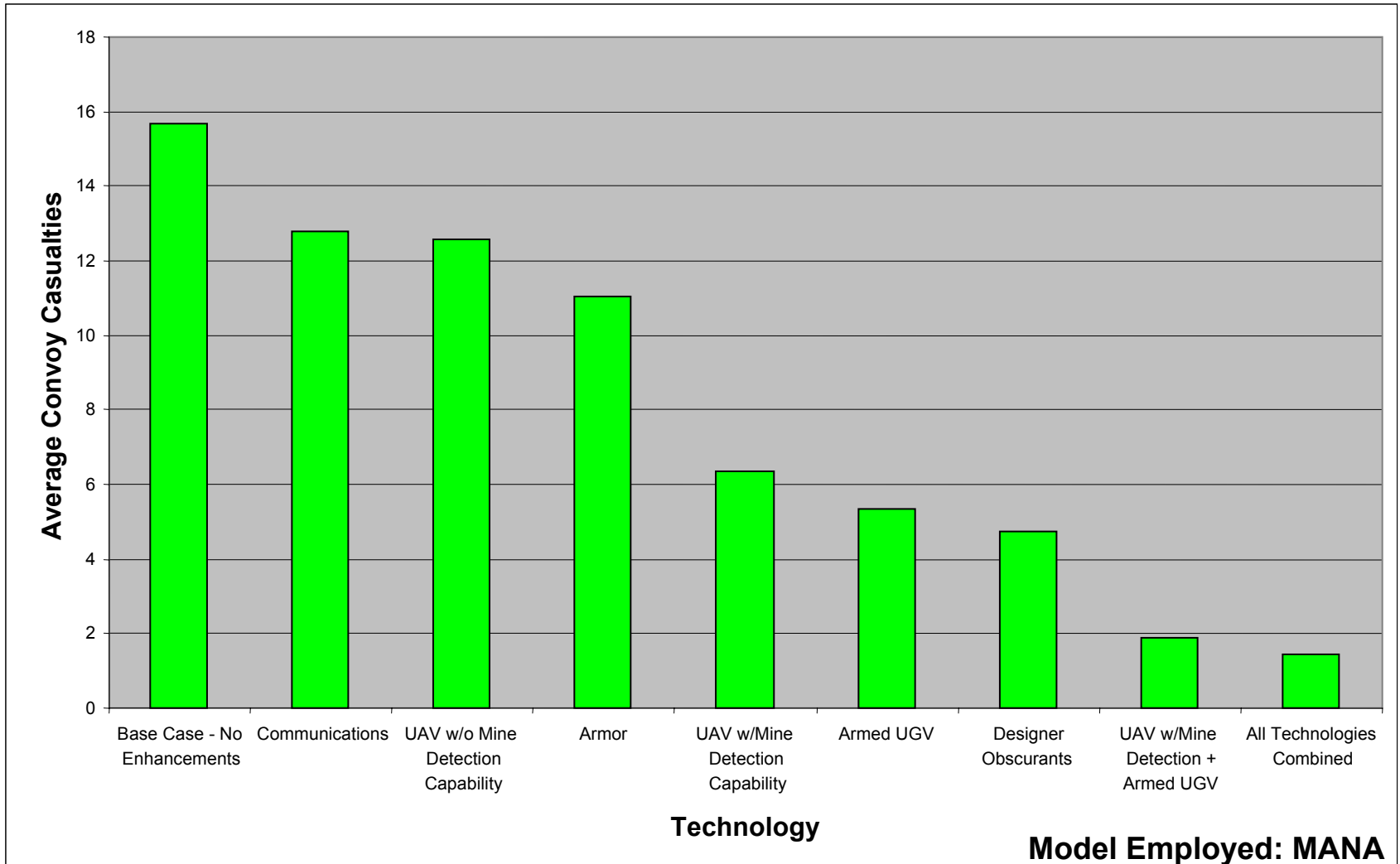
Force Protection Study

Convoy: Far-Term Integrated FP System



Long-term additions shown in *Red/Italics*
Reliance on FCS based components and technologies

Cumulative Effects of Far-Term Materiel Enhancements



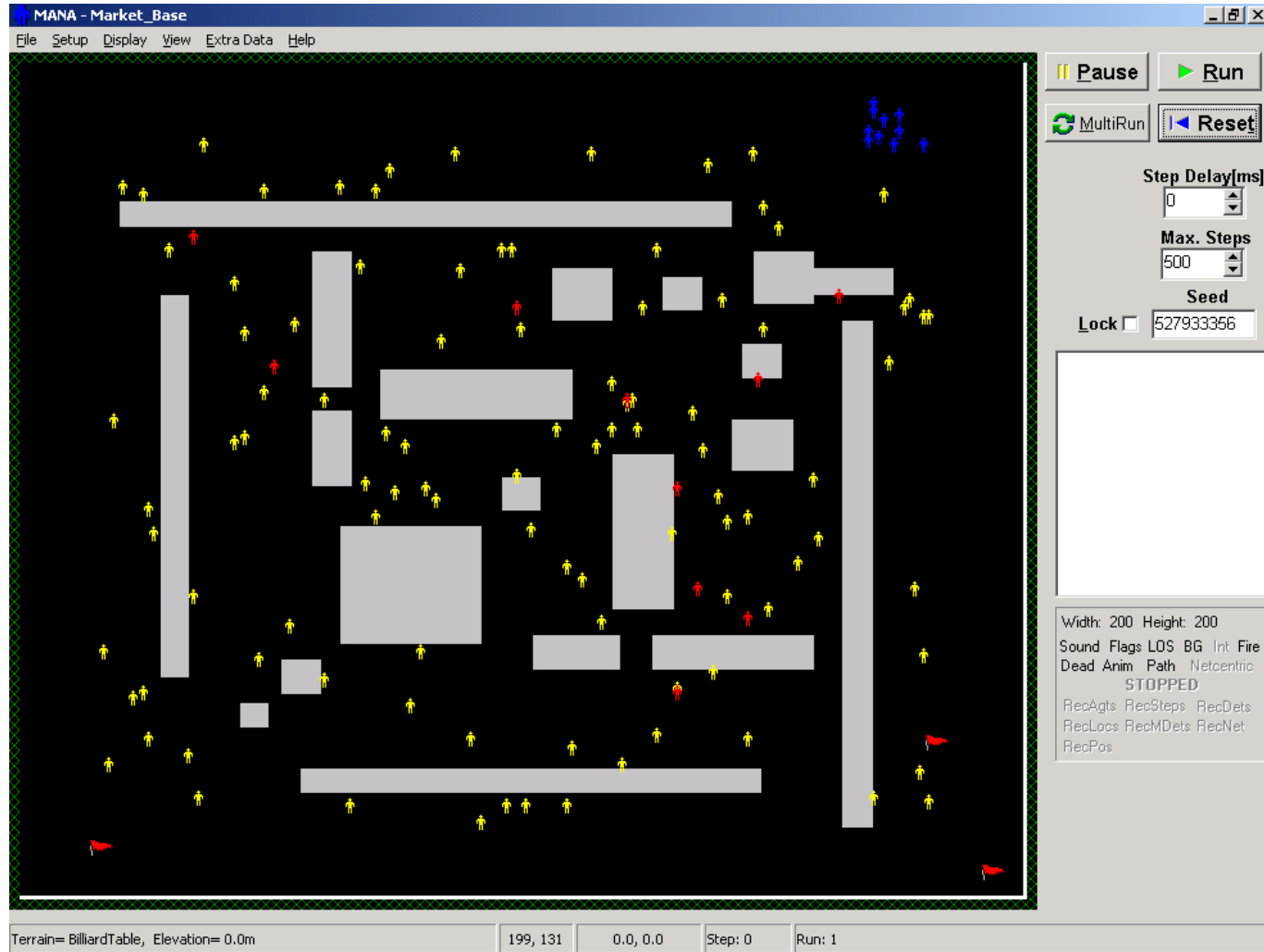
Observations

- Lessons Recorded
 - Convoys are highly vulnerable to ambushes, mines
 - There exist a relatively extensive set of mitigating options; hence, a portfolio approach may be needed to identify an affordable, effective mix
 - Enhanced Blue situation awareness appears to have a significant impact on convoy survivability (e.g., a UAV with mine detection capabilities)
- Additional Mitigating Options
 - Family of decision aids to support planning; e.g.,
 - Prediction of likely ambush locations
 - Route planning tools (with alternative routing to avoid ambushes)
 - DOTMLPF variants (note: there is “no silver bullet”; a *mix* of options is needed);
 - Modified TTPs (e.g., use precursor force to sanitize area)
 - Materiel (e.g., robots, with and without weapons; hardening; obscurants)
 - C2 enhancements (e.g., improved Blue force tracking)

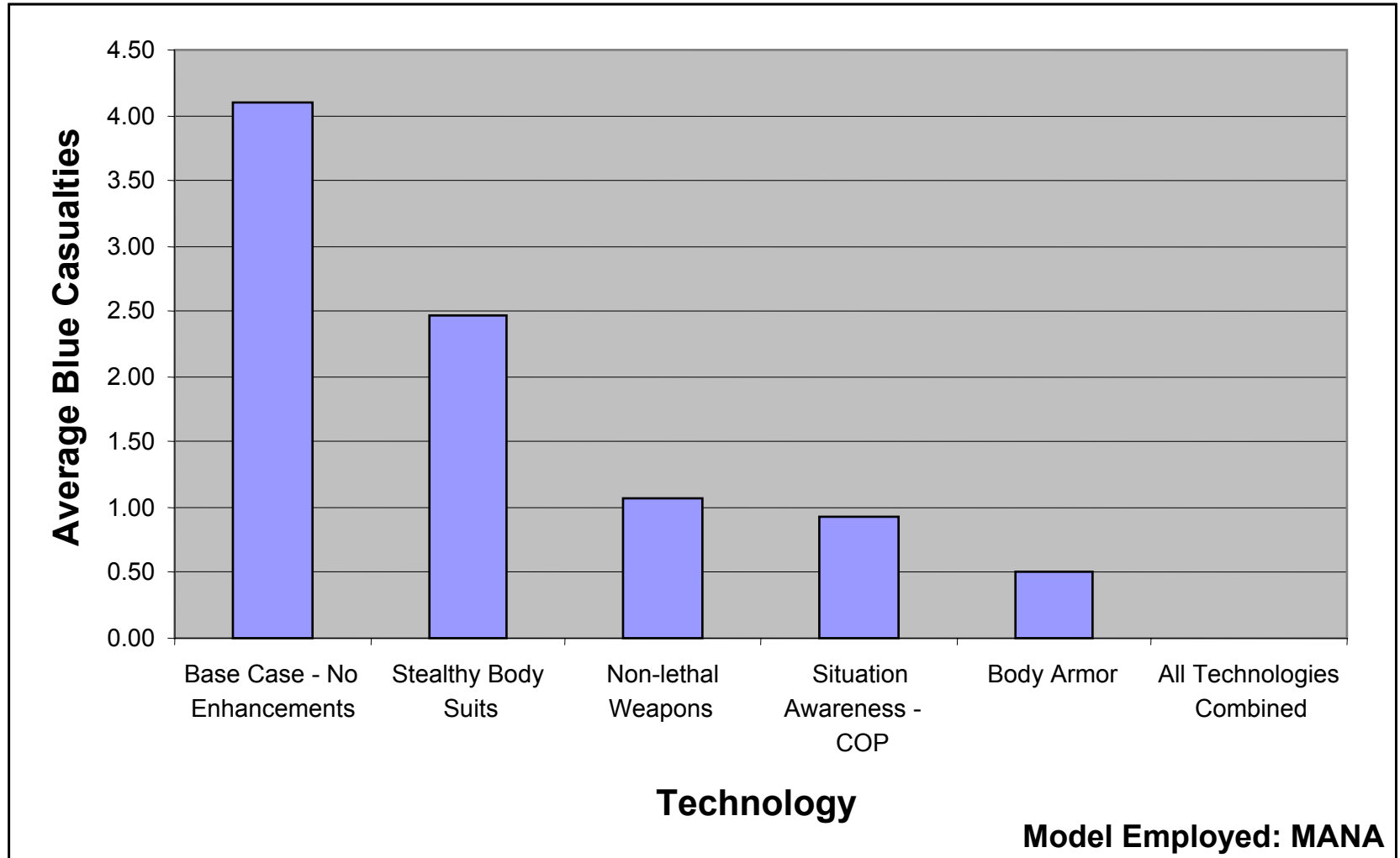
Small Unit Operations in Urban Terrain

- Scenario
 - Small Blue force patrolling a market place
 - Selected elements in market place engage Blue with small arms
- Key issues
 - Selection of S&T options to mitigate casualties to Blue forces
 - Value of materiel options (e.g., use of non-lethal weapons, enhanced situation awareness) to minimize collateral damage
- Measures of Merit
 - Losses sustained by Blue forces
 - Red killed, injured
 - Neutrals killed, injured
 - Time to traverse market place

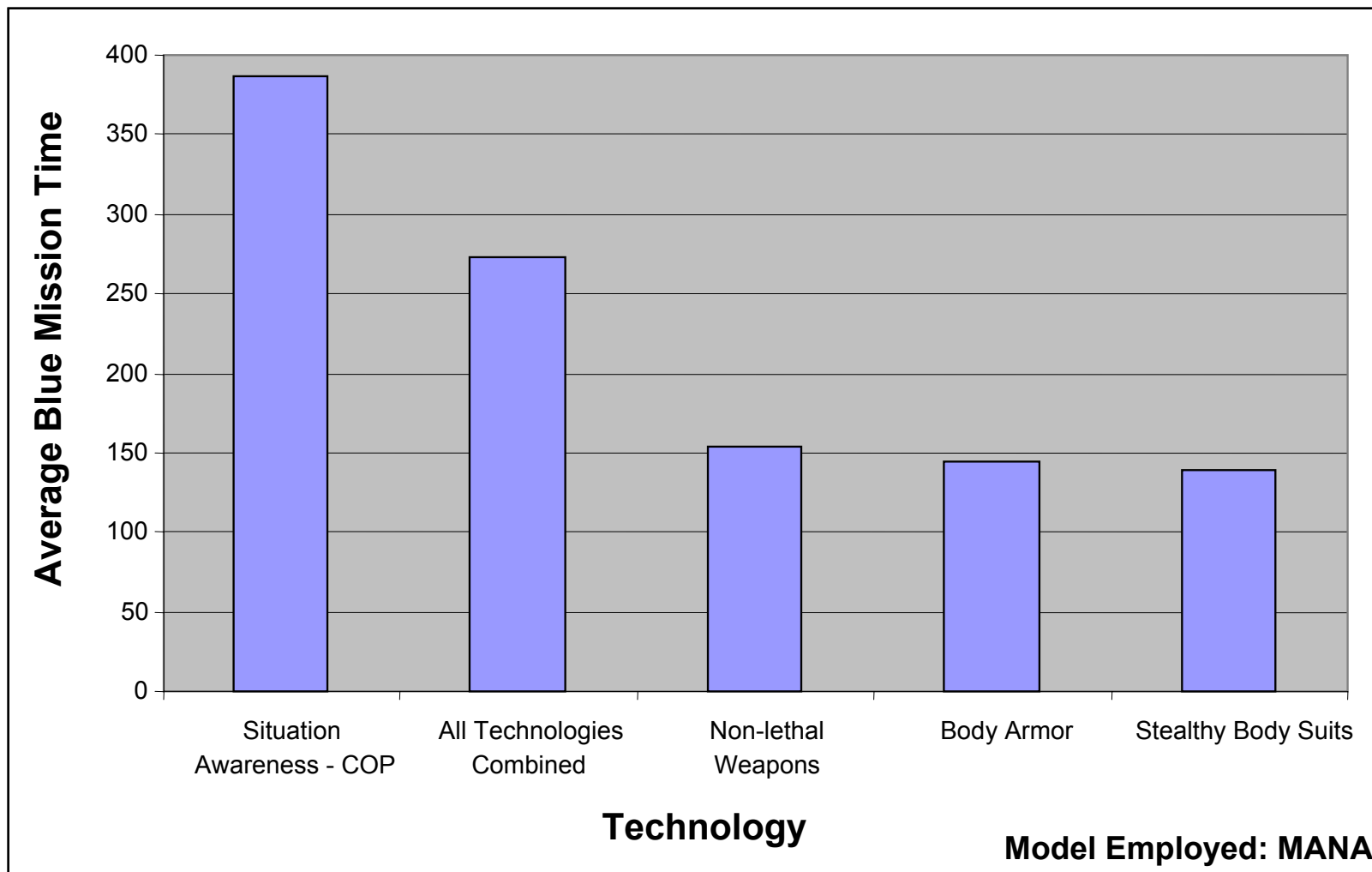
MANA Marketplace Scenario



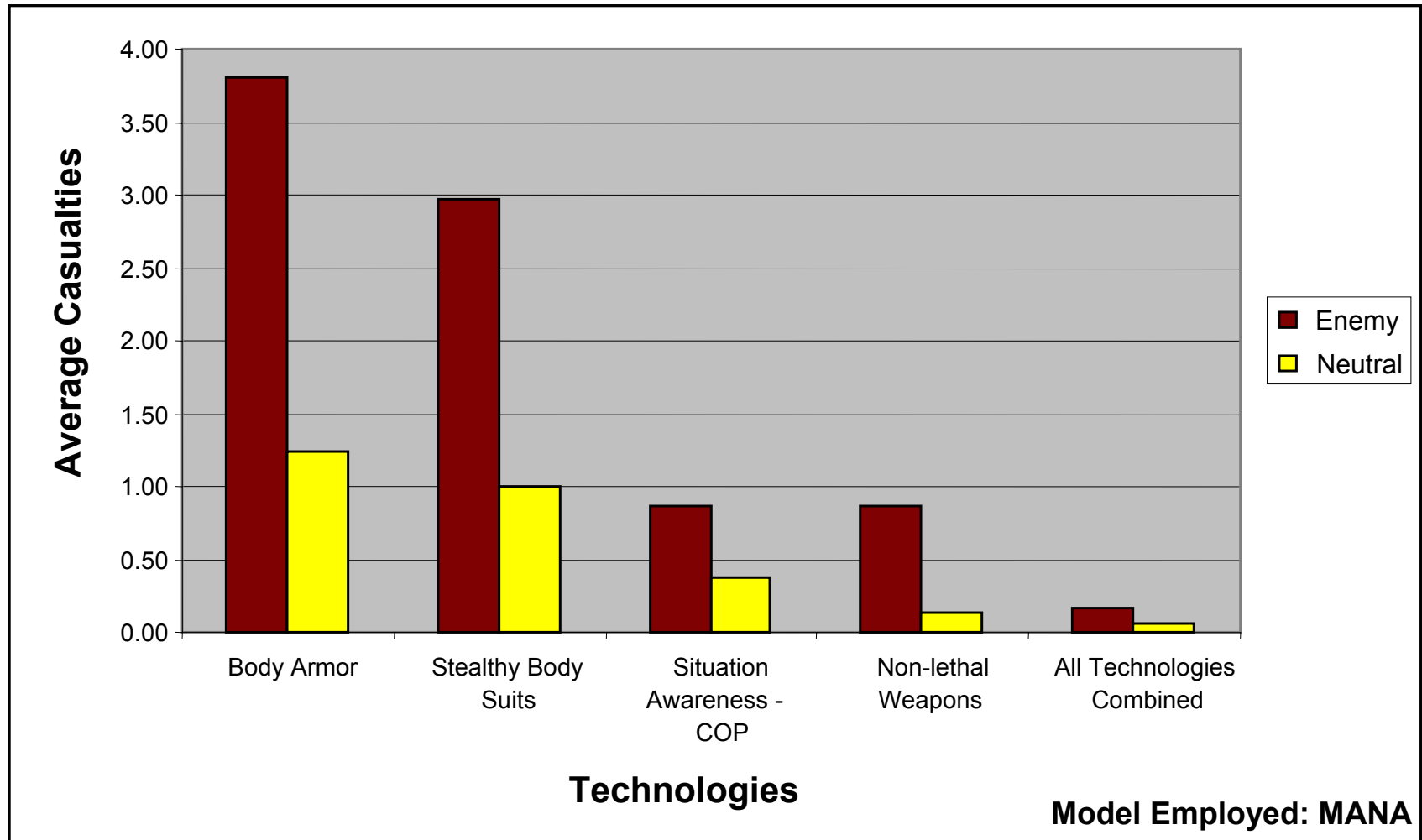
Market Scenario: Cumulative Effects of Far-Term Materiel Enhancements



Cumulative Effects on Blue Force Mission Time for Far-Term Materiel Enhancements



Cumulative Effects of Blue Force Materiel Enhancements on Enemy, Neutral Casualties



Observations

- Lessons Recorded
 - No single materiel enhancement is preferred for all of the measures of merit (i.e., minimize Blue, neutral casualties; maximize Red casualties)
 - For the options that minimize Blue casualties, the more attractive options include
 - Near-term: enhanced Situation Awareness, body armor
 - Far-term: enhanced body armor, improved Situation Awareness, non-lethal weapons
 - Options subsuming *all* of the technology options manifest low numbers of casualties for Blue, Red, neutral
- Additional Mitigating Options
 - Explore options to enhance the quality of HUMINT to support the identification of friends, foes, and neutrals
 - If confirmed by further study, consider implementing the most cost-effective mix of DOTMLPF options, cited above
 - Pursue options to enhance the training of small Blue units

Summary

- Preliminary assessments have been conducted using an Agent Based Model to identify DOTMLPF opportunities to enhance long-term force protection effectiveness and efficiency; these results suggest the value of
 - Convoy protection, employing
 - Armed UGVs and UAVs with mine detection capabilities
 - “Designer” obscurants
 - Small unit protection, employing
 - Enhanced body armor
 - Enhanced situation awareness
 - Non-lethal weapons
- Follow on, rigorous analyses should be performed to confirm and extend these preliminary findings