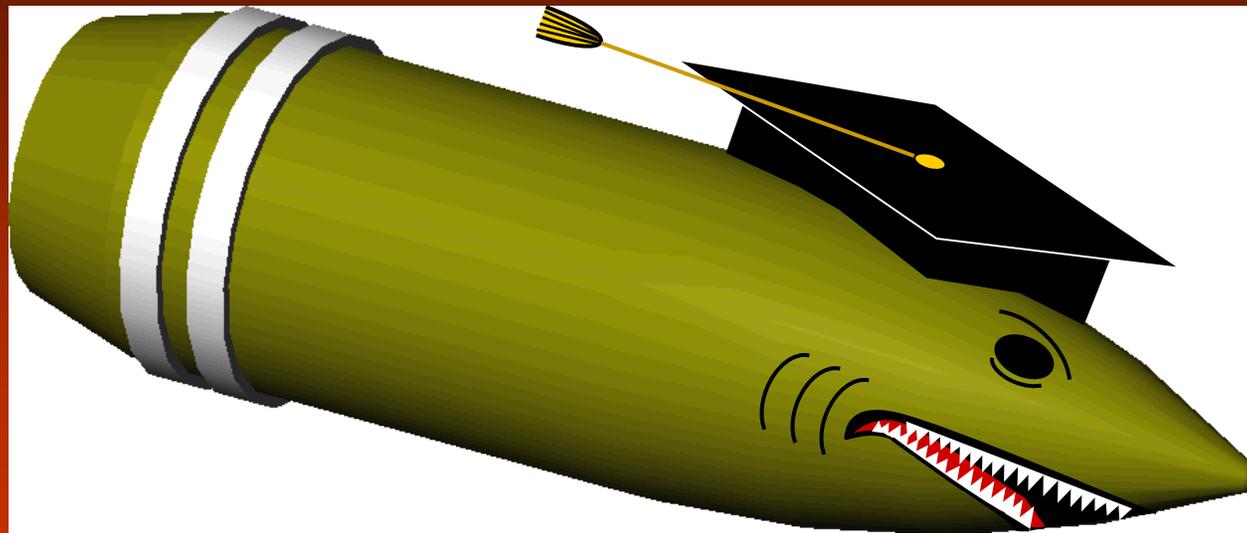




Smart Bullets





Future Vehicles Need Future Weapons

- Less armor and greater reliance on mobility, agility, and situational awareness
- Weapons requirements will change





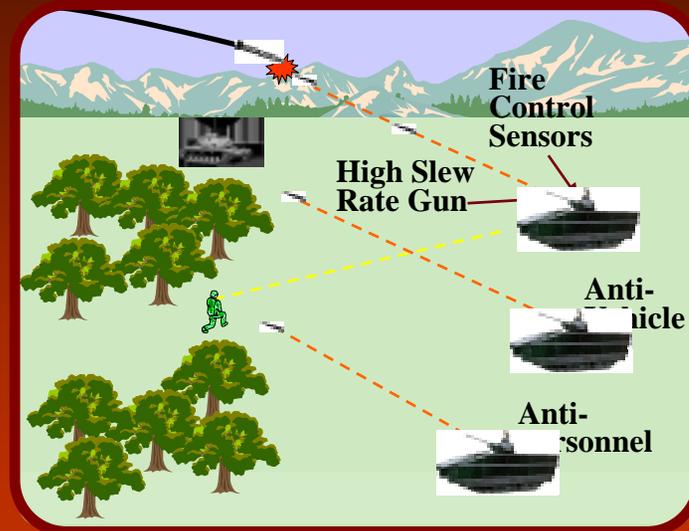
Guns Are Still Candidates

- Guns provide more stowed kills for short range targets
- Guns can provide flexible effects
 - Rate of fire
 - Choice of round



Missions

- Anti-vehicle
- Active protection
- Local air defense
- Anti-personnel
 - Lethal
 - Non-lethal





Gun Characteristics

- Agility
- Flexibility
- Accuracy
- Lethality
- Size, weight, power burdens

Existing Gun and Turret



Future Guns and Turrets





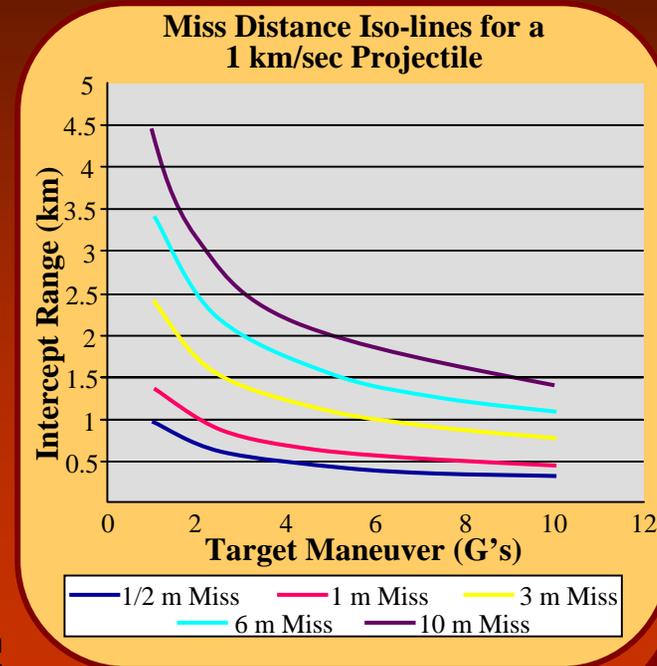
Enabling Concepts

- Guided/smart munitions
- Agile gun carriage
- High speed breech mechanism
- Novel propellants/ electric guns



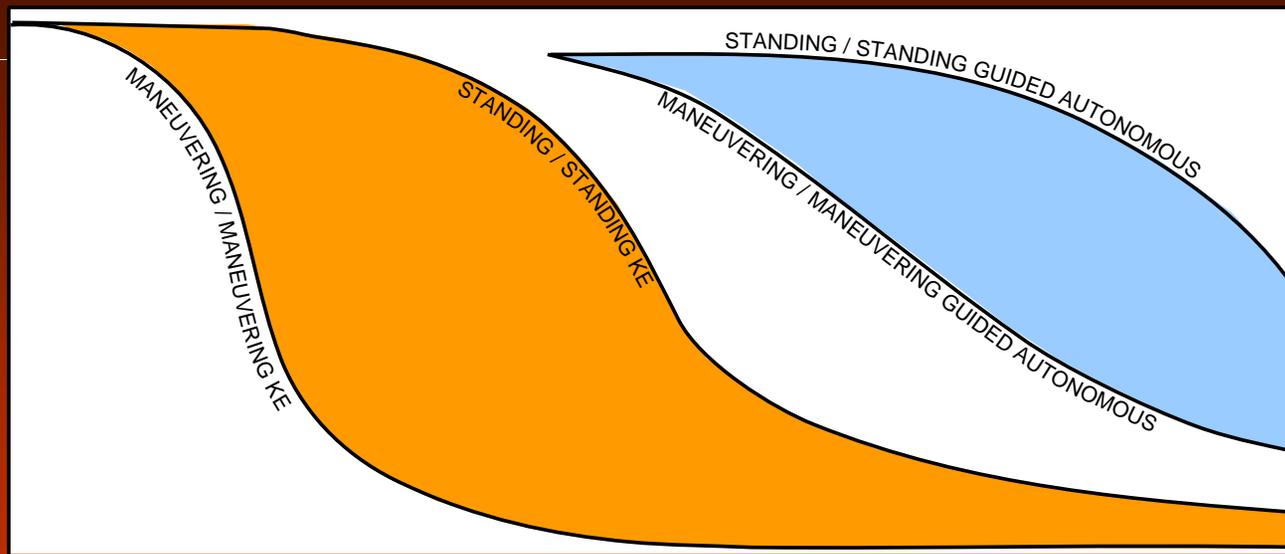
Why Smart Bullets ?

- Improved lethality with aimpoint selection
- Effective against maneuvering targets
- Novel effects with fused rounds





Example Payoff for Smart Bullets



MODE OF ENGAGEMENT	DOMINANCE IN:	
	RANGE	BATTLESPACE
STANDING-STANDING	2:1	4:1
MANEUVERING-MANEUVERING	3.5:1	12+:1

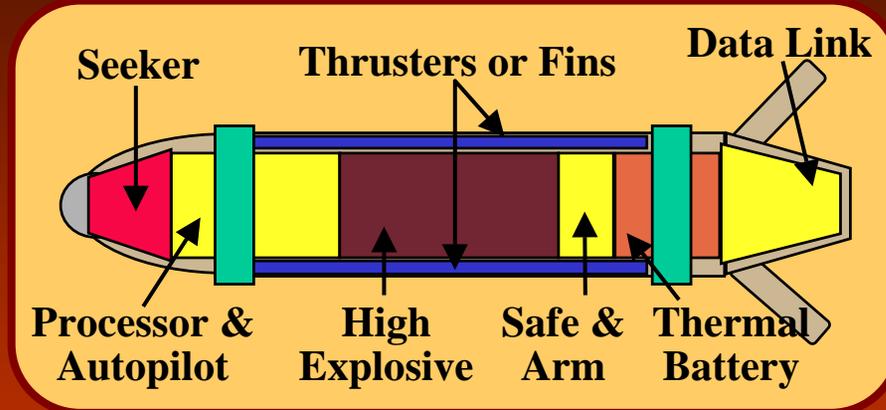
LEGEND:

- KE BALLISTIC
- KE, GUIDED AUTONOMOUS



Key Technologies

- Guidance approach
- Sensors
 - IMU's
 - Seekers
- Divert
 - Propulsive divert
 - Aero control
- Fuse and Warhead





Additional Challenges

- Cost: \$100 – \$1000 per round
- Launch Environment
 - 10 to 100 kilo-Gs
 - High Radial Gs
- Packaging Volume: $\sim 1 - 10 \text{ cm}^3$



Current Activities

- DARPA is looking for high payoff concepts around which to base a new program.
- Can accept white papers/proposals under open BAA 98-35
- Government led studies are examining operational benefits of smart bullets and other future gun concepts.