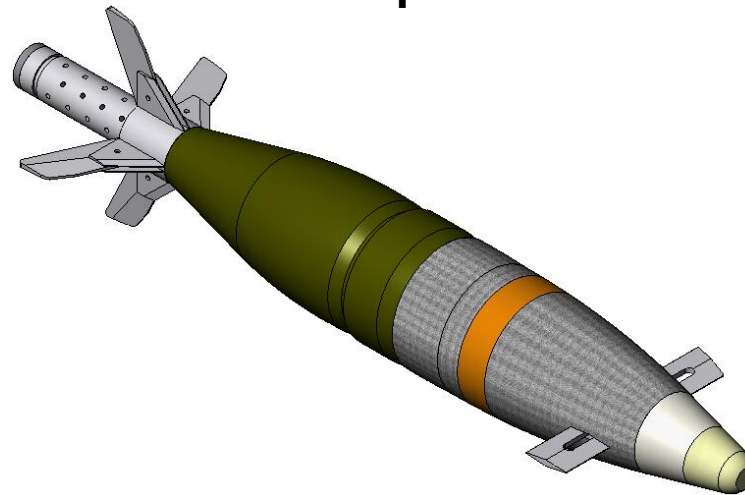




# Flight Controlled Mortar FCMortar



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# Flight Controlled Mortar FCMortar



- What is FCMortar?
  - Guidance Kit for 81mm HE ammunition
    - Adds precision capability to M821A1/A2 & M889A1/A2 Family of Ammunition
    - Upgrade performed at Depot level
- Why FCMortar?
  - 81mm mortar systems currently area fire weapons
    - Can't provide fire support in confined areas
    - No precision capability
  - Brings light-weight precision capability to the company/platoon level
    - When utilized within USMC Enhanced Company Operations (ECO) framework
    - Timely, Organic Fire Support

**Does not replace existing 81mm Mortar Inventory**



# Flight Controlled Mortar Projected Capabilities



- Precision Delivery
  - GPS & Terminal Seeker
- Access to new/difficult terrain types
  - Urban (MOUT), Canyons, Mountains, Reverse Slope
- Built on existing mortar capabilities
  - Retains fuzing functions & propulsion system
  - Comparable engagement ranges
- Cost Driven solution
  - \$3,200 - \$5,000 AUPC



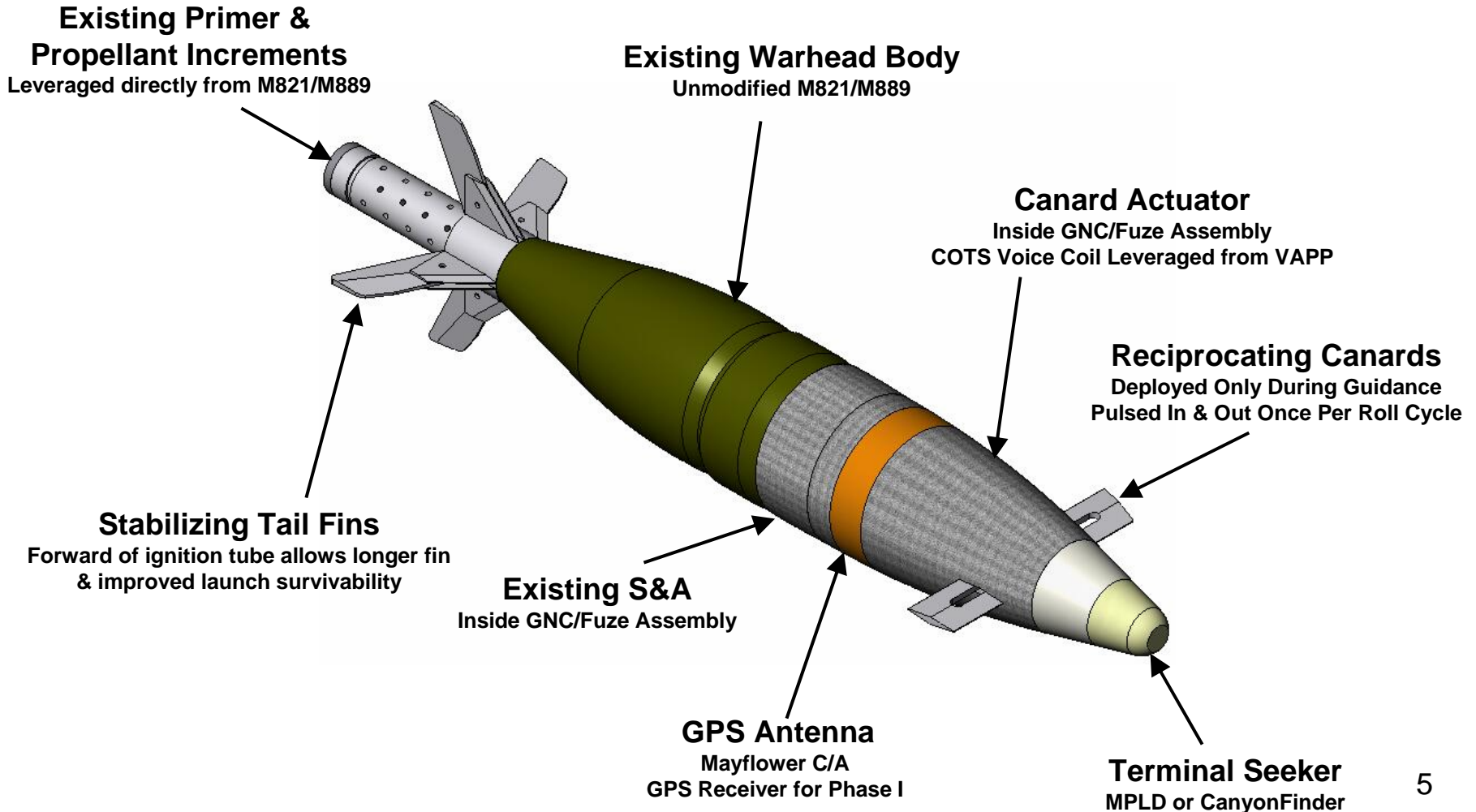
# Flight Controlled Mortar Two Products in One



- Smart Mortar (SMortar)
  - GPS Based Guidance Kit for 81 & 120mm mortars
  - Conceived by ARL as low-cost alternative to PGMM
  - Leverages technologies developed under Very Affordable Precision Projectile (VAPP) program (ARL/ARDEC/PM-CAS)
  - Could be transitioned as GPS only guidance if desired
- CanyonFinder
  - Terminal Seeker for FCMortar
  - Minimizes TLE & GPS errors during terminal phase of guidance
  - Risk reduction effort with Micro-Pulse Laser Designator (MPLD)
  - Currently in source selection
  - Modular design occupying minimal real estate
    - Technology easily transportable to other weapons

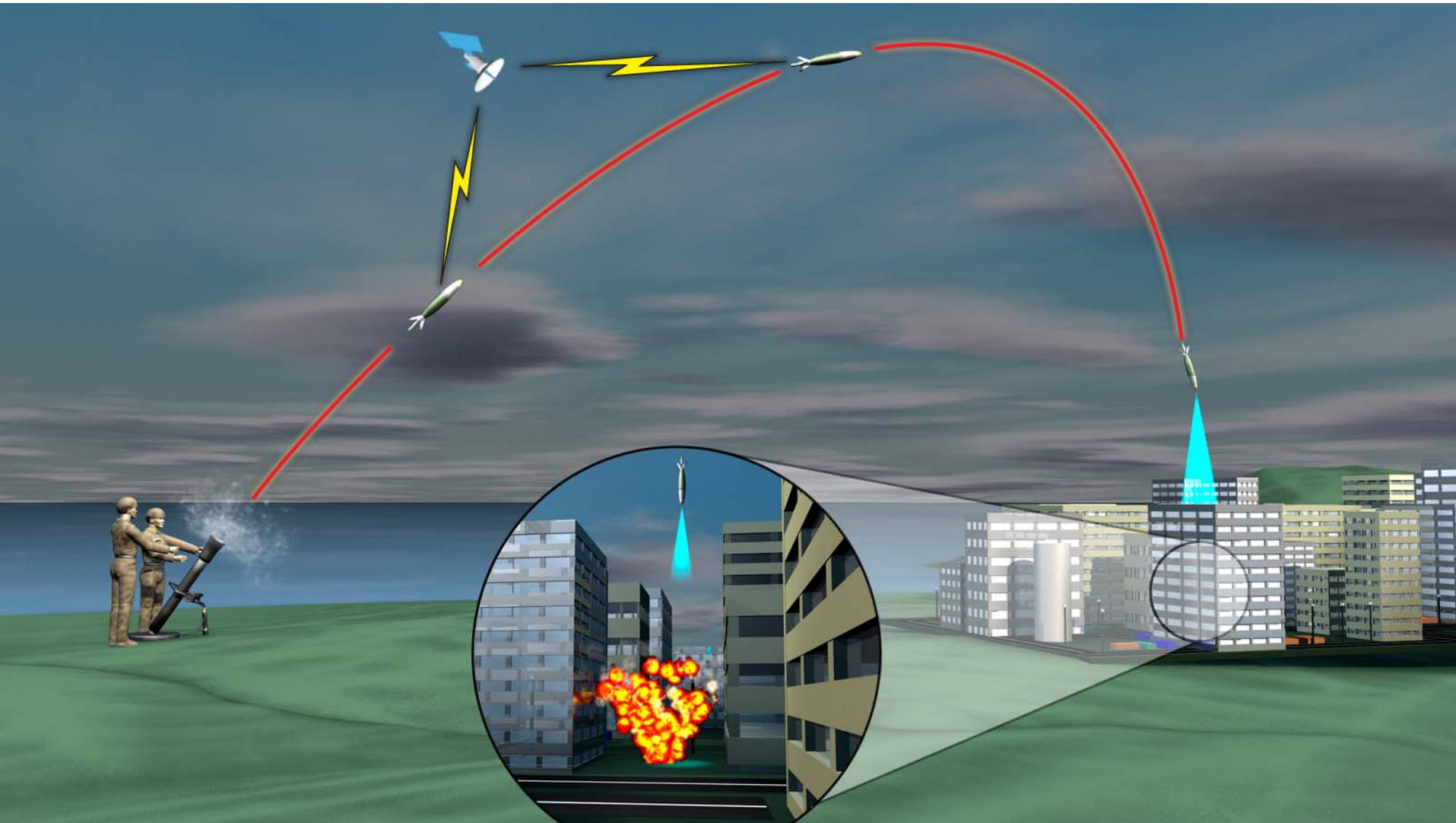


# Flight Controlled Mortar Baseline Design Overview





# Flight Controlled Mortar Urban (MOUT) Mission





# Flight Controlled Mortar DoD Development Team



- Sponsor
  - Office of Naval Research, Code 30 Fires
- Principal Investigator
  - Naval Surface Warfare Center Dahlgren Division
    - Code G33 – Precision & Advanced Systems Branch
- Guidance Kit Development, Integration, & Testing
  - Army Research Lab, Aberdeen Proving Ground
    - Advanced Munitions Concepts Branch
- Terminal Seeker Development
  - Micro-Pulse Laser Designation
    - Naval Surface Warfare Center Dahlgren Division
      - Code G31– Expeditionary Weapon Systems Branch
        - » Targeting Engagement Systems Center of Excellence (TESCE)
  - CanyonFinder
    - TBD – Currently in Source Selection





# Flight Controlled Mortar Program Schedule



- Phase I (FY09-11)
  - Development of system architecture
    - Sub-system development & demonstration
  - Terminal seeker technology maturation
  - GPS only guided flight & trajectory shaping demonstrations
- Phase II (FY12-13)
  - Terminal Seeker Integration
  - Guided flight & trajectory shaping demonstrations w/ Terminal Seeker
  - Capstone Demonstration
    - End-to-end demonstration including external systems
    - Intended to be as realistic as feasible
  - Transition to Acquisition

**Technical Maturity will be gauged through a series of 21 demonstration events**





# Flight Controlled Mortar Airframe Wind Tunnel Test (WT1)



- First Demonstration Event
  - ARDEC Sub-Sonic Wind Tunnel, Picatinny Arsenal
    - 9-12 February 2009
- Validated most aerodynamic predictions
  - Supports simulations showing vertical approach & range extension capabilities
  - Need minor design change to enhance static margin





# Flight Controlled Mortar Integrated Mortar System Family of Programs



- M252E1 Light-Weight Mortar System
  - Reduces weight by 1/3
- Extended Range Mortar Ammunition (ERMA)
  - Advanced propellants
    - Increased Initial Velocity for Extended Range
    - Improved IM characteristics
- Marine Corps Mortar Fire Control System (MCMFCS)
  - Integrated Mortar Section, Automated FDC capability
  - Reduced Mortar Laying Time
  - Future space claim for FCMortar Mission Setter
- Distributed Operations Precision Engagement (DOPE)
  - Local Wind Sensing
  - Initial Velocity Sensing



# Flight Controlled Mortar Summary



- Supplements existing 81mm mortar inventory with precision capability
- Allows engagement of targets in previously inaccessible terrain
- Lower cost & more mobile alternative to existing precision fire support systems
- Supports Enhanced Company Operations (ECO) Framework