"The presentation to the effect that disclosure of information does not imply any specific intent or commitment on the part of the U.S. to provide further information on the topic."
What Level of Precision is Needed?

- Urban Density Can Vary Widely Over Small Distances Between Terrain Elements
- Munitions with Varying Levels of Precision May Be Most Cost-Effective

Area Munition
- 120m Radius Circle

Open Area

Cultural Area

Densely-Packed Urban
- 10m Radius Circle

Precision Guided Munition

Area Precision Munition
- 50m Radius Circle

Sparsely-Packed Urban
Cannon Artillery and Mortar Precision Effects Capabilities

- All weather 24/7 continuously “loitering” precision capability
  - Responsively and precisely attack targets… can precisely “mass” fires
  - Minimizes collateral damage…“discretion” & “close” engagements
  - Inherent scalability with multiple shooters and multi-round missions
  - Dramatically reduced logistics burdens (less qtys and transport/storage)

- Employed with current cannon artillery & mortar systems and structure…
  & accurate targeting systems (FS3, LLDR, PSS-SOF)
  - Easily additive to current systems and capabilities… “compatibility” is key
  - Maintains current Smoke & Illum capabilities
  - Maintains area fire & suppressive fires capabilities… “precise” area fires?
XM982 Excalibur

System Characteristics/Description:
- Precision Guided 155mm Cannon Ammunition (CEP < 10m)
- Fin Stabilized, Gliding Air Frame
- All Weather, Day/Night, Fire & Forget, Urban/Complex Terrain
- Compatible with NLOS-C, Paladin and LW155 Howitzer Platforms
- One Meter Length / 106 lb
Excalibur Concept of Operations

- Gun Target Location
- Trajectory Information
- GPS Crypto Keys
- Precise Time
- Fuze Setting
- Power

System Initialization

GPS Acquisition and Track

Deploy Canards prior to Apogee (Ballistic prior to Apogee)

Impact Near Vertical for Max Lethality

Structure Top Attack (Detonation after Penetration)

Top Attack, 3 Fuzing Modes:
- Height of Burst
- Point Detonating
- Delay/Penetration

Mission Planning

 latitude / Longitude / Altitude

Sensors:
- M707 Knight w/FS3
- Stryker FSV w/FS3
- M7 & M2A3 BFIST
- Shadow PIP TUAV

- Precision Delivery Regardless of Range
- Limits Collateral Damage
- Increases Range to 40 kms
- Decreases Volume of Fire Per Engagement
- Enhances Soldier Survivability
Excalibur Video

Excalibur M982
155mm Artillery
Precision Projectile
Precision Guidance Kit (PGK) 155mm Projectile Accuracy

- Increased effectiveness (kills targets quicker)
- Increased stowed kills per platform
- Reduced collateral damage
- Reduced logistics burden
- Closer support of friendly troops

CEP vs. Range

PGK Increment 1 Provides CEP Accuracy of < 50 Meters
Operational Benefits

Today’s Capability: 183m CEP*

- Village Destroyed
- Refinery Destroyed
- Target May Have Been Hit

PGK: ≤50m CEP

- Target Destroyed
- Minimal Collateral Damage

* M109A6 (Paladin) at 27km: 155mm (HE) M549A1

- Improves Accuracy – Significantly Reduces Ballistic Dispersion
- Significantly Decreases the Time Needed to Achieve Desired effects
- Minimizes Collateral Damage and Enables Closer Support to Friendly Troops
- Increases Number of Kills per Basic Load of Ammunition
- Greatly Reduces Logistics Burdens
PGK Design (Increment 1)

- Fits in standard 155mm High Explosive artillery projectile fuze wells (deep intrusion)
- GPS guidance (incorporates SAASM)
- 20 Year Storage Life (no battery)
- Proximity & Point Detonating Fuzing
Emerging Needs/ Future Requirements

IBCT Organic Precision Requirements
- 40 Plus IBCTs within Army structure...have mortars & 105mm
- PGK-2 is funded...implemented with 105mm digitization
- Need for organic very responsive precision with <10m CEP

“Cheap” or “Very Affordable” Precision
- Key technologies... GPS, Fuzing, Power, AJ, & SALs
- ARDEC/ARL CRADA efforts to mature components and integrated concepts...applicable to artillery and mortars
- Several Industry efforts ongoing...will enable competition
- Wider use in training...confidence, proficiency, and quantities

Is Very Affordable Precision “Coming Soon”? 