U.S. ARMY TANK AUTOMOTIVE RESEARCH, DEVELOPMENT AND ENGINEERING CENTER

Annual Merit Review Inter-Agency Activities Panel Session

14 June 2018

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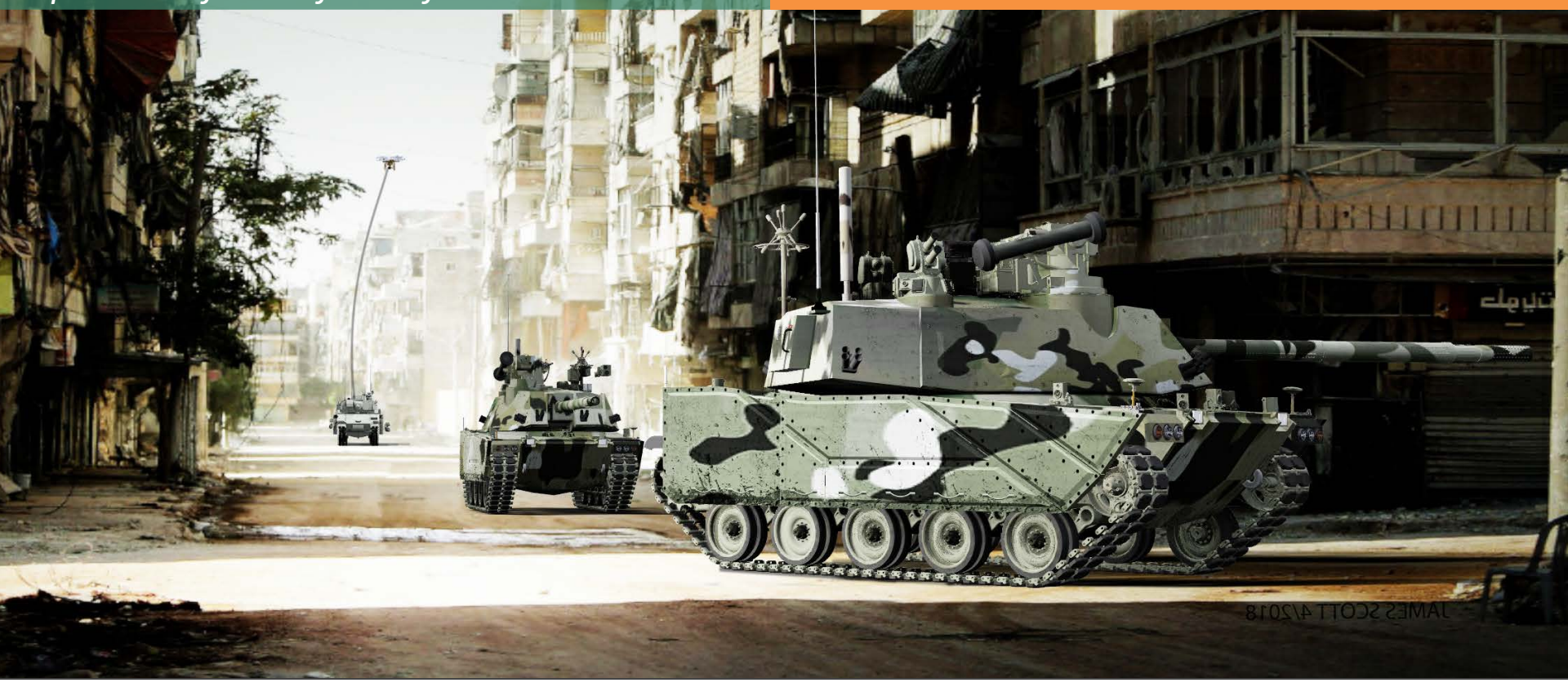
Director, TARDEC

Shaping the Defense Ground System Landscape

MISSION:
Develop, integrate & sustain the right technology solutions for all manned & unmanned Department of Defense ground systems & combat support systems to improve current force effectiveness & provide superior capabilities for the future force.

VISION:
Be the first choice of technology & engineering expertise for ground vehicle systems & support equipment - today & tomorrow.



Future Electric Tank Study

Propulsion Weight & Volume Estimates

- Future Tank 2A — Parallel Diesel Hybrid

Feasible for a mid 20's demonstration

- Future Tank 2B — Series Diesel Hybrid

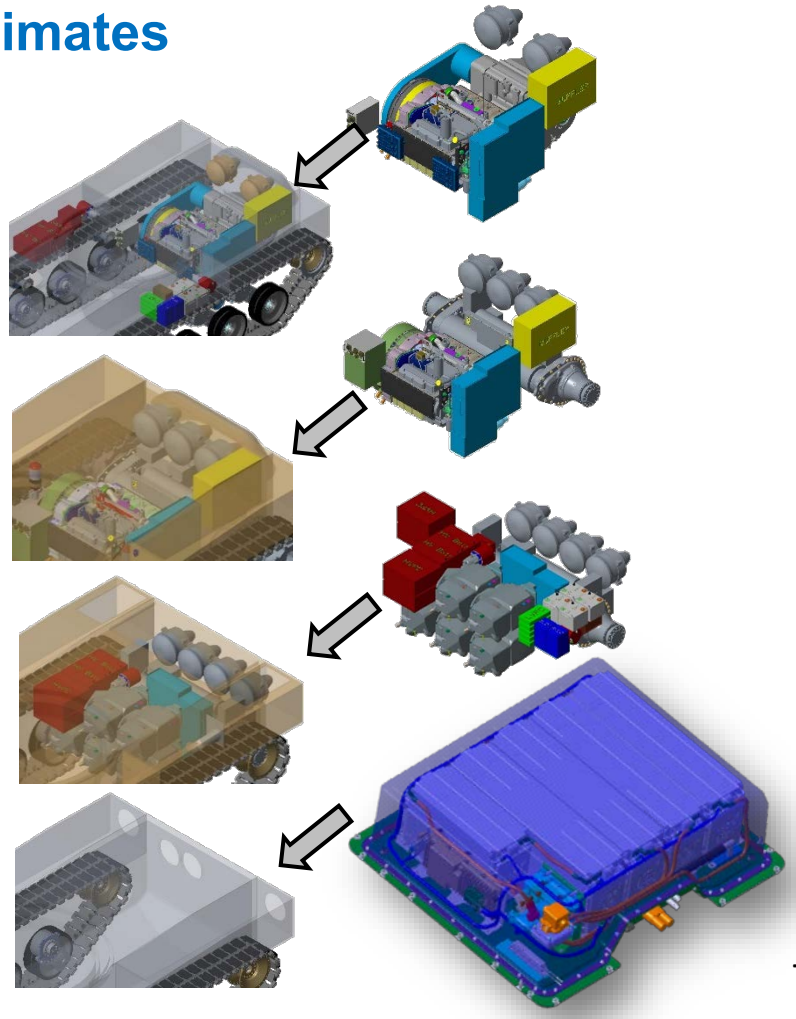
Feasible for a mid 20's demonstration

- Future Tank 2C — Series Fuel Cell Hybrid

Feasible for a late 20's demonstration

- Future Tank 2D — All Electric

Not Feasible for 2020's demonstration



262 ft^3
+210 lbs

267 ft^3
+530 lbs

350 ft^3
+125 lbs

850 ft^3
+28,000 lbs

Propulsion volume estimates for ~48T combat system with fuel for 300 mile range.

- Baseline volume is 225ft^3.
- Baseline weight is 15,000 lbs.
- Does not include armor for external hydrogen fuel tanks

Fuel Cell Technologies at TARDEC

Public-Private Partnership Between TARDEC and GM to Assess Operational Value of Fielding Fuel Cell Powertrains

Payoff:

- ❑ *Reduced Logistics Burden*
  - *More Efficient*
  - *Hydrogen Reformation*
- ❑ *Improved Signature Management*
  - *Acoustic and Thermal*
- ❑ *Exportable Power*
- ❑ *Water Generation*

Current Activities/Capabilities:

- ❑ *ZH2 Fuel Cell All Electric Vehicle*
- ❑ *Ground Systems Power and Energy Lab*

Leveraging Expertise Through Robust Public/ Private Partnerships

Looking Forward

- Vehicle Electrification Forum
- H2 Workshop 2 scheduled to convene at TARDEC in mid-Sep 2018
- JP-8 Fuel Cell Power Project
- Exploring opportunities to build and operate hydrogen fueling stations with the State of Michigan and MEDC.
- Series Fuel Cell Hybrid Tank Concept

Bolstering Public/ Private Partnerships to Advance Fuel Cell & Hydrogen Technologies