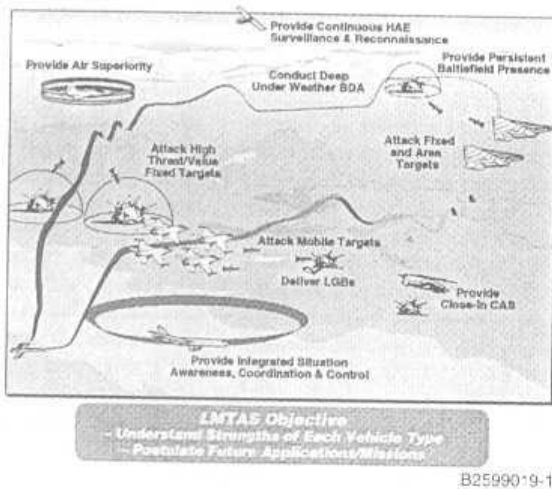


5.1 Manned and Unmanned Mix

Early in our investigations we concluded that the UCAV would not be a stand-alone weapon system. The tactical air environment is too complex and there is too much interdependency among the elements of the tactical force. The question, therefore, was what role might the UCAV play and how might it integrate operationally, logistically and technically with the rest of the tactical force.

Figure 17 shows a typical tactical air battle environment in which a number of weapon and support systems interoperate. Included are air-to-air fighters that provide overall air superiority over the battlefield, multirole fighters that attack a range of targets both fixed and mobile, standoff missiles that attack heavily defended ground targets, close air support (CAS) helicopters and aircraft that operate in direct support of ground troops, reconnaissance systems to provide the battlefield commanders with information on the developing tactical situation and various tactical support assets such as JSTARS and AWACS that help tie together and coordinate the overall air and ground battle. Included but not shown are specialized, highly-survivable deep strike aircraft that carry the air battle deep into enemy territory and attack critical command and control and other specialized targets. Also shown is a UCAV. Its role, however, is not defined although some candidate roles are suggested as shown. The question is: are these the right roles and missions for the various tactical system elements if and when the UCAV becomes a viable tactical alternative?



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Figure 17. Projected Future Force Mix

5.2 Roles and Missions

Based on the studies previously referenced, results of MITL mission evaluations and qualitative evaluation of potential mission requirements (Figure 18), we offer for consideration our preliminary assessment of potential roles and missions for three existing tactical systems (manned fighters, cruise and ballistic missiles and UAVs) in the near term (2005-2010) and how they might evolve in the longer term (after 2015) as a result of UCAV introduction.

In the near term UCAV should have only minor impact on the manned fighter and cruise and ballistic missile forces. One reason is our projection of a U.S. defense shortfall that will materialize

- **Information Dominance**
 - Gather/Assess/Decide in Near Real Time
 - Deny Adversaries Same Capability
- **Absolute Air Superiority**
 - Maintain Freedom From/To Attack
 - Increasing Emphasis on Ballistic and Cruise Missiles
- **Persistent Presence**
 - Continuous Observation/Assessment
 - Round-the-Clock Planning/Attack
 - Operate Any Time/Any Weather
- **Near Instantaneous Strike**
 - Anticipate/Dominate Changing Tactical Situation
 - Intimidate/Destroy Time Critical Targets
- **Minimum Collateral Damage**
 - Selective Force on Specific Targets
 - Discrete and Dominant Effect
- **Minimum Cost and Risk**
 - Lowest Cost Per Kill (or Other Mission Objective)
- **Maximum Flexibility**
 - Deployment/Employment

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Figure 18. Overall Goals & Requirements

during the period 2005-2015. All of the existing systems in the inventory, therefore, will be required to compensate. Another reason is our assessment that UCAV will be introduced to perform jobs that are not already being done. Therefore, assuming that UCAV has gone through a rigorous technology and operational feasibility and effectiveness evaluation that allows it make a successful entry into the force, only in the longer term would we expect to see an impact (as shown in Figure 19). From the fighter perspective, we project that the most significant far term impact will be to divert fighters away from one traditional mission, attack of fixed ground targets. But this will only occur if UCAVs have demonstrated their ability to execute these types of missions and to be cost and operationally effective. We see a similar impact on cruise and ballistic missiles, however, we project that upon entry into the force, UCAV would pick up low-threat, fixed target attack missions where missiles are used only to eliminate any risk of crew loss or capture. In the longer term, we project that UCAV would pick up all but the highest threat fixed target missions; those

Fighters	Near Term	Longer Term
Missions	Air Superiority Multi-Role Mobile Targets Fixed Targets Low-High Threat	Air Superiority Multi-Role Mobile Targets
Envelope	Subsonic/Supersonic Medium-High Altitude	Subsonic/Supersonic Medium-High Altitude
Payload	Inventory Sensors Inventory Weapons	Inventory Sensors Inventory Weapons
Survivability Features	Stealth Speed Standoff Countermeasures	Stealth Speed Standoff Countermeasures

Cruise/Ballistic Missiles	Near Term	Longer Term
Missions	High Value Fixed Targets Moderate - High Threat	High Value Fixed Targets High Threat
Envelope	Low/High Altitude Subsonic/Hypersonic	Low/High Altitude Subsonic/Hypersonic
Payload	Unitary/Cluster Munitions	Self Guided Weapons
Survivability Features	Altitude/Signature Speed	Altitude/Signature Speed

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Figure 19. Force Mix Evolution - Fighters and Missiles