



# **Air Force Association**

**The Force Behind THE FORCE**

**WWW.AFA.ORG**

# Complementary 5<sup>th</sup> Generation Air Force

## F-22A Raptor

Lockheed-Martin (Marietta, GA)

Stealth + Supercruise + Maneuverability  
+ Integrated Avionics =

### **Air Dominance**

Aircraft, Sensors &  
Weapons Optimized to  
Seize and Maintain Total  
Air Dominance

Air Superiority, Destruction of  
Enemy Air Defenses, Intelligence  
Surveillance, Reconnaissance

## **381 F-22A required for National Military Strategy**

183 Programmed  
~105 produced to date



## F-35A Lightning II

Lockheed-Martin (Ft Worth, TX)

Stealth + Sensors + Integrated Avionics =

### **Lethal & Survivable Strike**

Aircraft, Sensors &  
Weapons Optimized for  
Air to Ground Lethality

Interdiction, Strike, Destruction of Enemy  
Air Defenses, Close Air Support, Time  
Sensitive Targets, Intelligence  
Surveillance, Reconnaissance

## **1763 (USAF) and 680 (USN) F-35 required for National Military Strategy**

Initial production

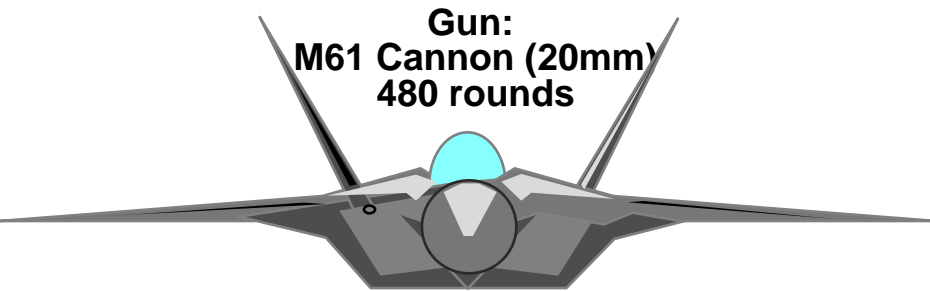
540 NM	Unrefueled Combat Radius	600 NM
1.5 Mach (2.0 Dash)	Employ Speed	0.95 Mach (1.6 Dash)
50,000'+	Employ Altitude	25,000'+
78,000 lbs	Thrust	48,000 lbs
18,300 lbs	Fuel	18,840 lbs
A/A + A/G	Weapons	A/G + A/A

**Planned Mix of Enabling & Complementary Capabilities  
To Support the National Military Strategy**

# Internal Payloads

## F-22A Internal Weapons

(More A-A Wpns Same # of A-G Wpns as F-35)



✦ 2 x AIM-9M + ✦  
✦ ✦ ✦ 6 x AIM-120 ✦ ✦ ✦

*or*

✦ ✦ ✦ ✦ ✦ ✦  
✦ ✦ ✦ 2 x AIM-9M + ✦ ✦ ✦  
✦ ✦ ✦ 2 x AIM-120/  
✦ ✦ ✦ 2 x 1000# JDAM

*or*

8 x Small Diameter Bomb (SDB)

## F-35 Internal Weapons



✦ ✦ 4 x AIM-120 ✦ ✦

*or*

✦ ✦ ✦ ✦ ✦ ✦  
✦ ✦ ✦ 2 x AIM-120/  
✦ ✦ ✦ 2 x 2000# Class  
(JDAM, JSOW)

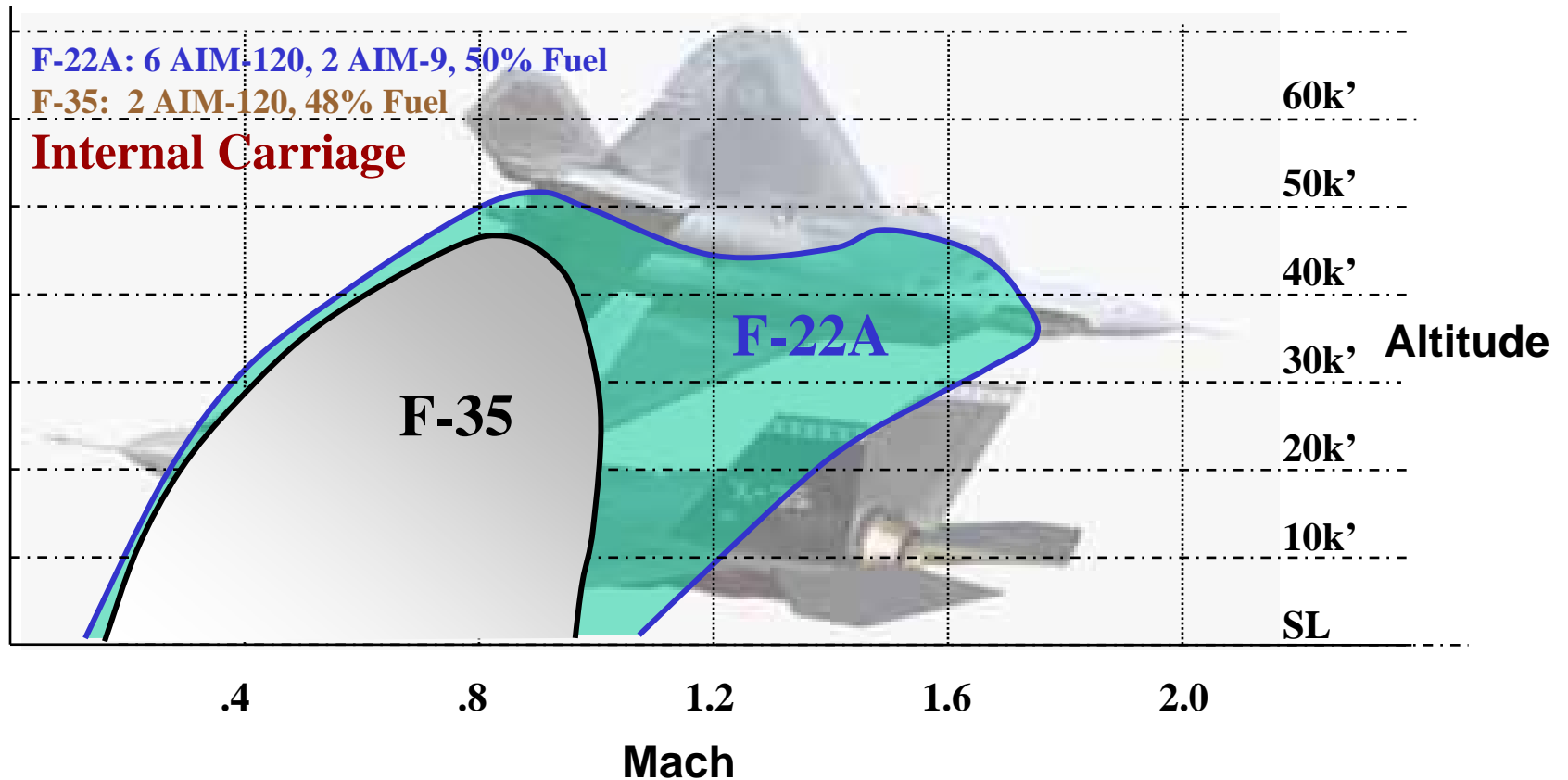
*or*

8 x Small Diameter Bomb (SDB)



# F-22 / F-35 Flight Envelope

## Military Power



# *Additional Points*

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- F-22A carries twice as many air-to-air missiles as the F-35A
- F-22A tactically employs at nearly twice the altitude and at 50% greater airspeed than the F-35A
  - Gives air-to-air missiles a 40% greater employment range and increased lethality
  - Increases air-to-ground weapons employment range
- F-22A can control more than twice the battle space of the F-35A
- F-22A AESA radar has more T/R elements than F-35 radar
- F-22A in production...F-35A initial operational capability date is 2013...key in considering F-15Cs need to be replaced now
- Only the F-22 features vectored thrust, giving it twice the maneuverability of an F-35
- The F-22 can turn at twice the rate of an F-35

**NOTE: Complete detailed comparison requires clearance to special access programs**

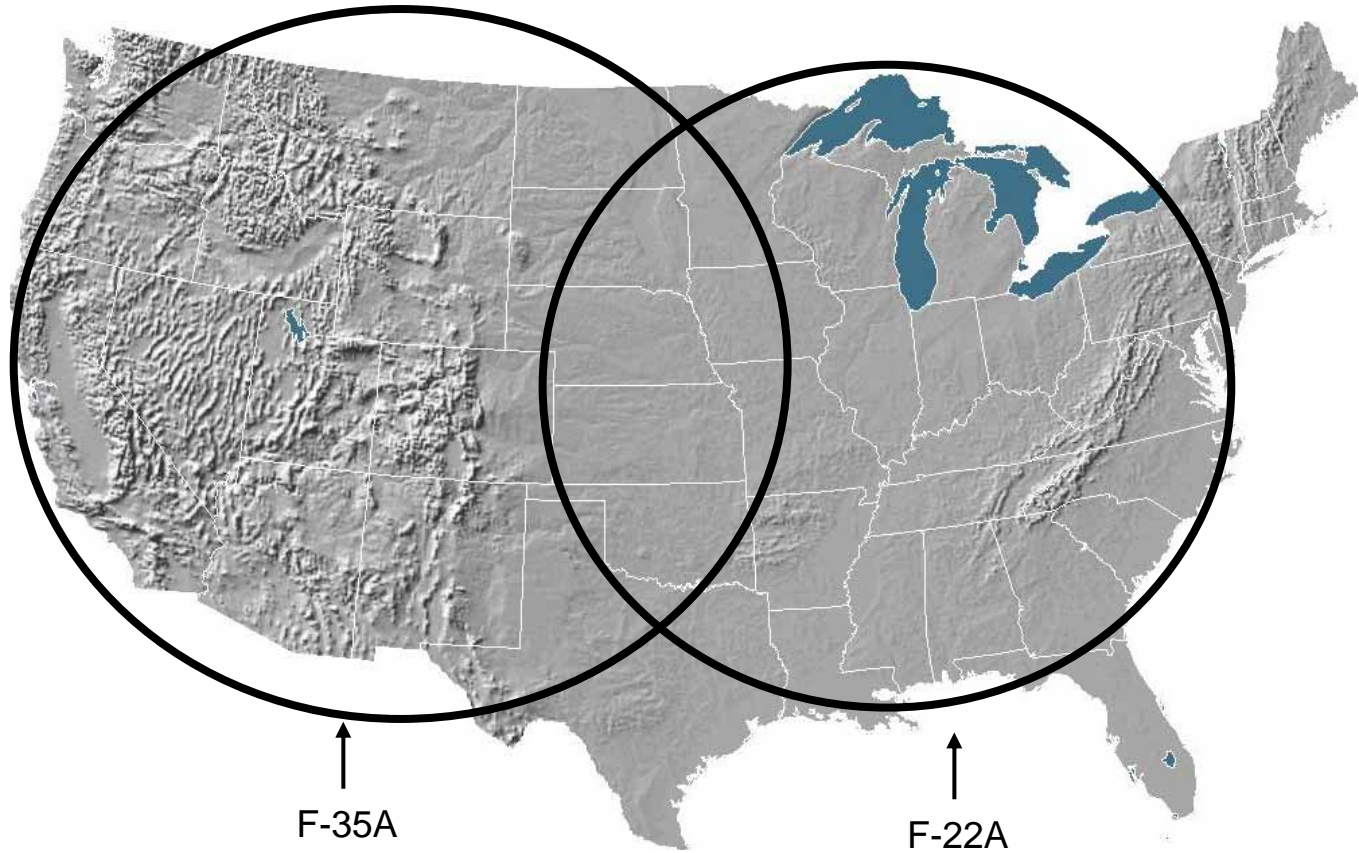
# Cost Comparison

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- Average cost of a currently produced F-22A \$142.7M per A/C
  - After substantial reduction to total program of record and currently produced at a rate below minimum economic order quantity of 24/year
  - Based on average flyaway cost of Lots 7-9, currently produced at 20 A/C per year
- The F-35A is estimated to cost \$78M per aircraft if
  - All 1,763 USAF/680 Navy variants/foreign partner sales are purchased
- F-22 program is at most mature point of production compared to the early stages of development of the F-35, which has high non-recurring costs
- If the F-35A program is accelerated to replace the F-15C, the cost of these early F-35's would be higher than the current cost of the F-22A
- 'Apples to Apples' or normalized comparison on unit cost would have to consider equal production quantities. Unit costs based a F-35 buy of 183 and an F-22 buy of 1763 would result in significantly greater F-35 unit cost than current estimates

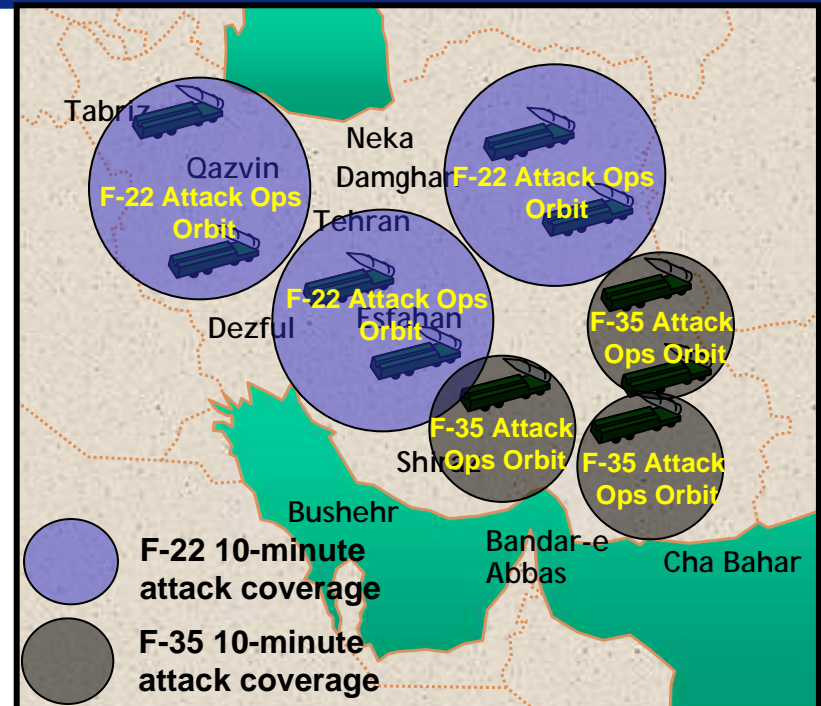
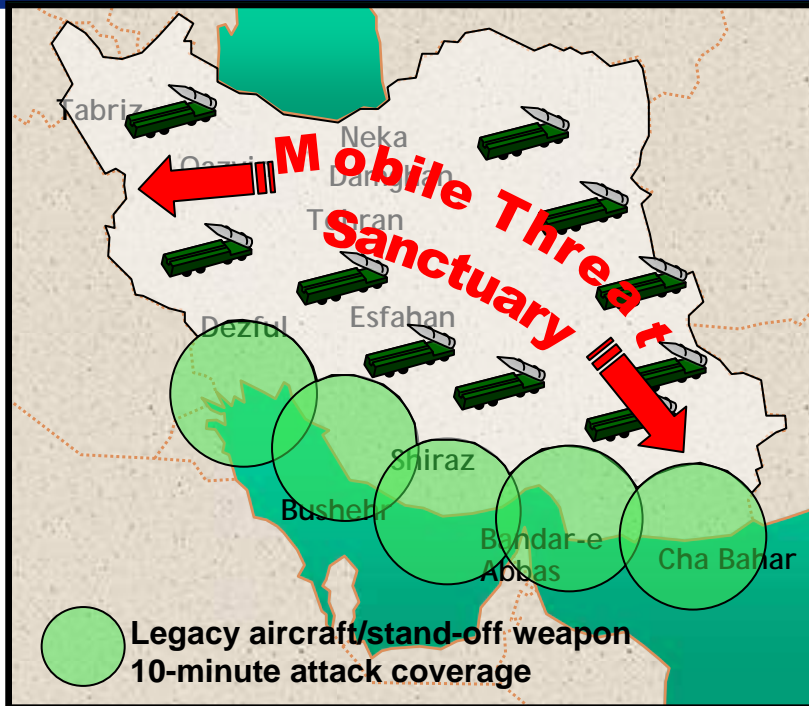
# *Unrefueled Combat Radius*

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# F-22A and F-35A Eliminate Threat Sanctuary

## Unique Capability Against Time-Sensitive Targets

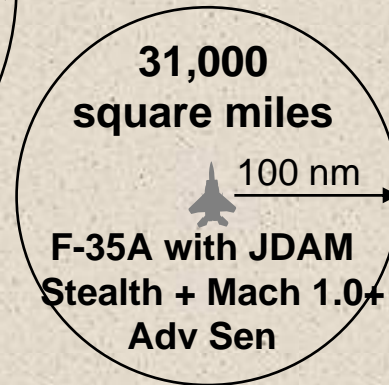
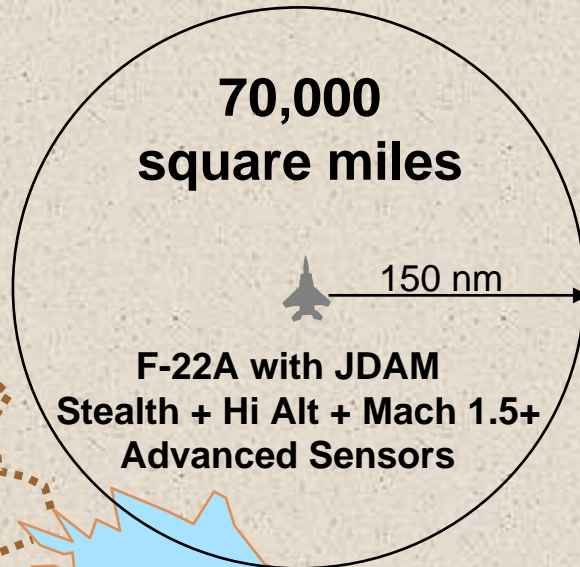


- Non-stealth aircraft and/or external carriage weapons
- Requires stand-off munitions to penetrate advanced threats--increases response time and vulnerable to GPS jamming
- Limited range to meet 10 minute timeline for successful attack of time-sensitive targets
- Creates large sanctuary for hostile mobile threats

- Full- Aspect Stealth with internal carriage weapons enables attack throughout hostile territory
- **Supercruise expands potential kill zones; half as many F-22s needed as F-35 to cover same area**
- Mitigates impact of “unknown” threats
- Eliminates sanctuary for enemy mobile threats



# ***Value of F-22A & F-35A vice Legacy Fighters Against Time-Sensitive Targets--Mobile SAMs, TBMs, CMs\*: Potential target coverage within 10 minutes of initial detection***



**Advanced SAM Coverage: SA-10, SA-20**

A red dashed line with 'X' marks indicates the coverage area of advanced Surface-to-Air Missiles (SAMs), specifically SA-10 and SA-20. The line follows the coastline of the United States.



**F-15, F-16, F-18:  
Not survivable**

A small grey silhouette of a legacy fighter aircraft is shown below the text, which states that these aircraft are not survivable against the SAM coverage.

\*SAM—Surface to Air Missile  
TBM—Theater Ballistic Cruise Missile  
CM—Cruise Missile