

TPS Technology

Space Propulsion Technology  
Assessment Workshop

April 2001

# Current Baseline TPS Technology

- Current TPS is extremely labor intensive
  - Inspection, replacement, waterproofing
  - Unique shapes
  - Gen 2 and Gen 3 goals can not be met without improvement in this technology



# Technologies to Implement Solutions (TRLs)




## TPS Technology

- Focus on high heat load areas
- Cross range ability is enhanced with higher heat load capability
- Avoid active cooling in airbreather propulsion parts
- Minimize moving surfaces in airbreather propulsion system
- Examine aircraft nozzle flap technology and use their experience
- Develop more robust, lighter weight, less complex TPS (2-4)
  - Eliminate need for waterproofing
- Hydrogen cooled leading edges (4)
- Ceramic composites (4)
- Titanium aluminide (3/4)

# Cost to Mature Technology

## TPS Technology

\$100K	
\$500K	
\$1M	
\$5M	
\$10M	
\$30M	
\$50M	
\$100M	
\$500M	

6 Mo	
1 Yr	
18 Mo	
2 Yr	
3 Yr	
4 Yr	
5 Yr	
5 Yr+	