

# **Auto/Steel Partnership:** *Advanced High-Strength Steel Research and Development*

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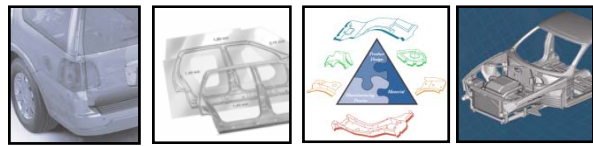
Dr. Roger A. Heimbuch  
Auto/Steel Partnership

Project ID: lm\_23\_heimbuch

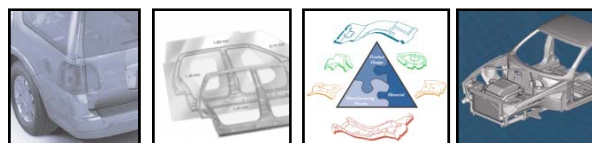


[www.a-sporg](http://www.a-sporg)

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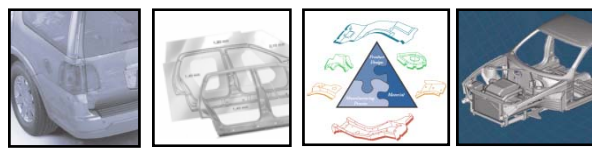


- Overview of the Auto/Steel Partnership (A/SP)
- Strategy
- Overview of Advanced High-Strength Steel Research and Development



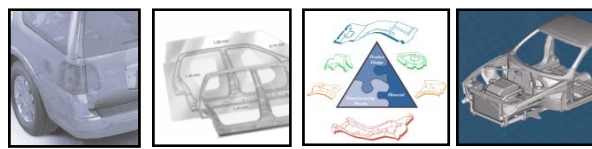
# MEMBERS OF A/SP - Chartered in 1987





The Auto/Steel Partnership (A/SP) leverages the resources of the automotive, steel and related industries and is an organization dedicated to:

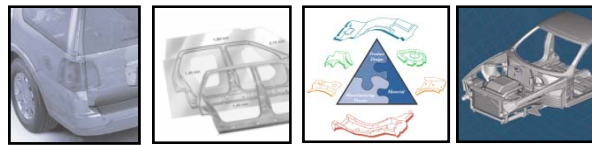
- Developing solutions where steel is the "competitive material of choice" in a changing automotive market;
- Using inter-company and inter-industry cooperative programs to ensure the success of the member companies;
- Resolving, proactively, governmental regulatory agency requirements and customer needs



To achieve the Vision, the Auto/Steel Partnership:

- Evaluate, prioritize and completes projects that meet the vision
- Communicates the technical results and benefits to the automotive industry

# THE PARTNERSHIP LINKAGES



Chrysler LLC, Ford Motor Company, General Motors Corporation

ArcelorMittal, Nucor Corporation, Severstal North America, United States Steel Corp

Contractors

Academia

**Auto/Steel Partnership**

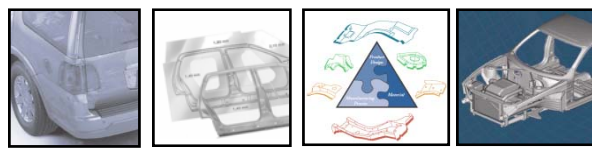
AISI, IISI, WorldAutoSteel Consortia Partnerships

Department of Energy (DOE)

CANMET

National Laboratories

NSF

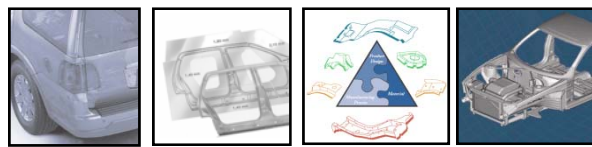


## FreedomCAR Goals:

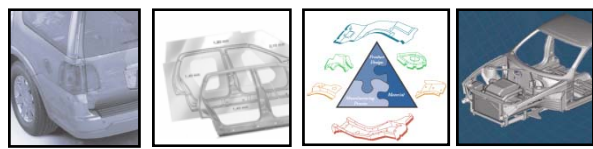
- Mass Reduction (50%)
- Affordable Cost (less to +5%)
- Durability/Life (same)
- Recyclability
- Develop/Transfer Technology



# ULSAB SERIES OF PROJECTS



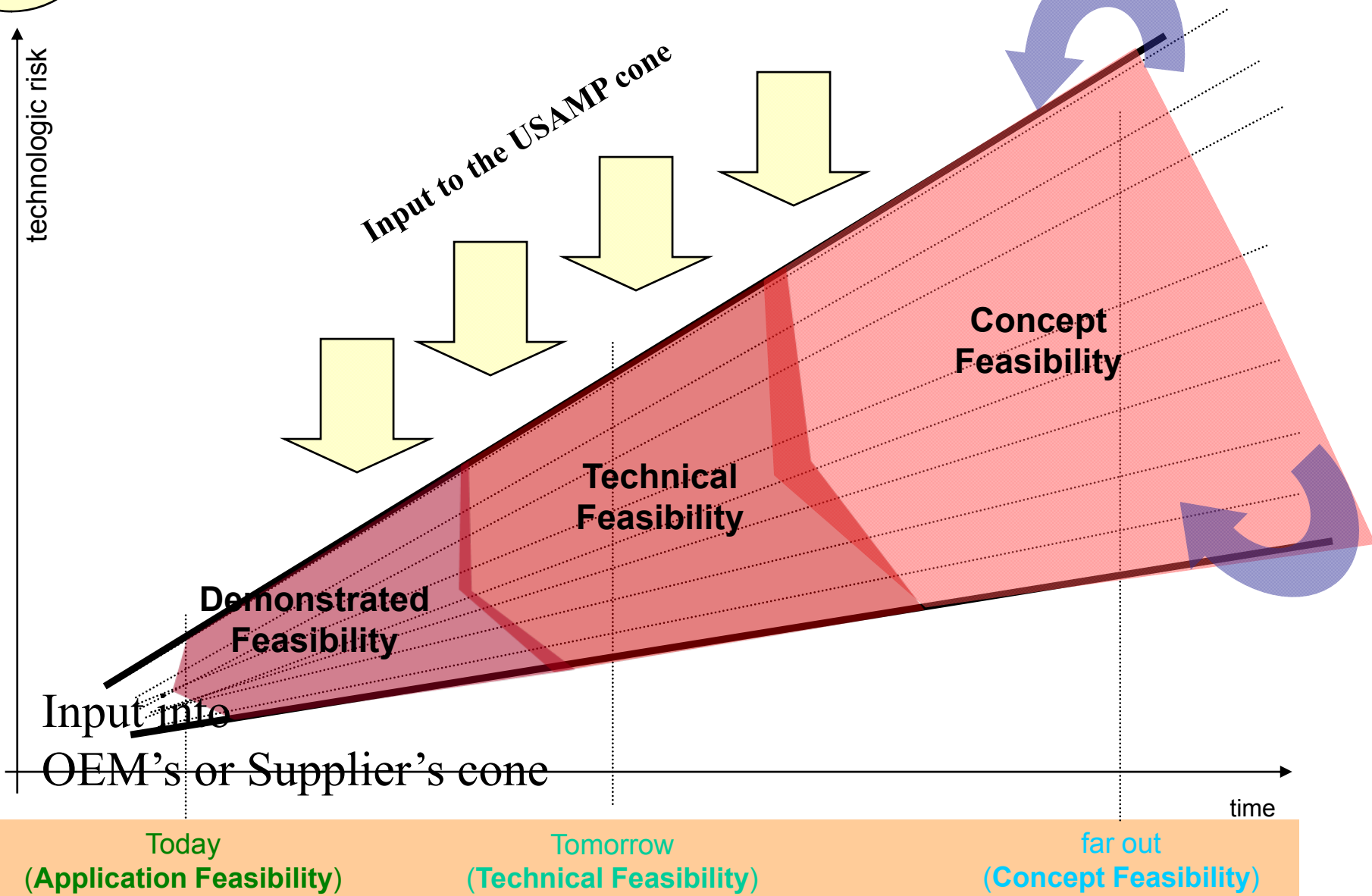


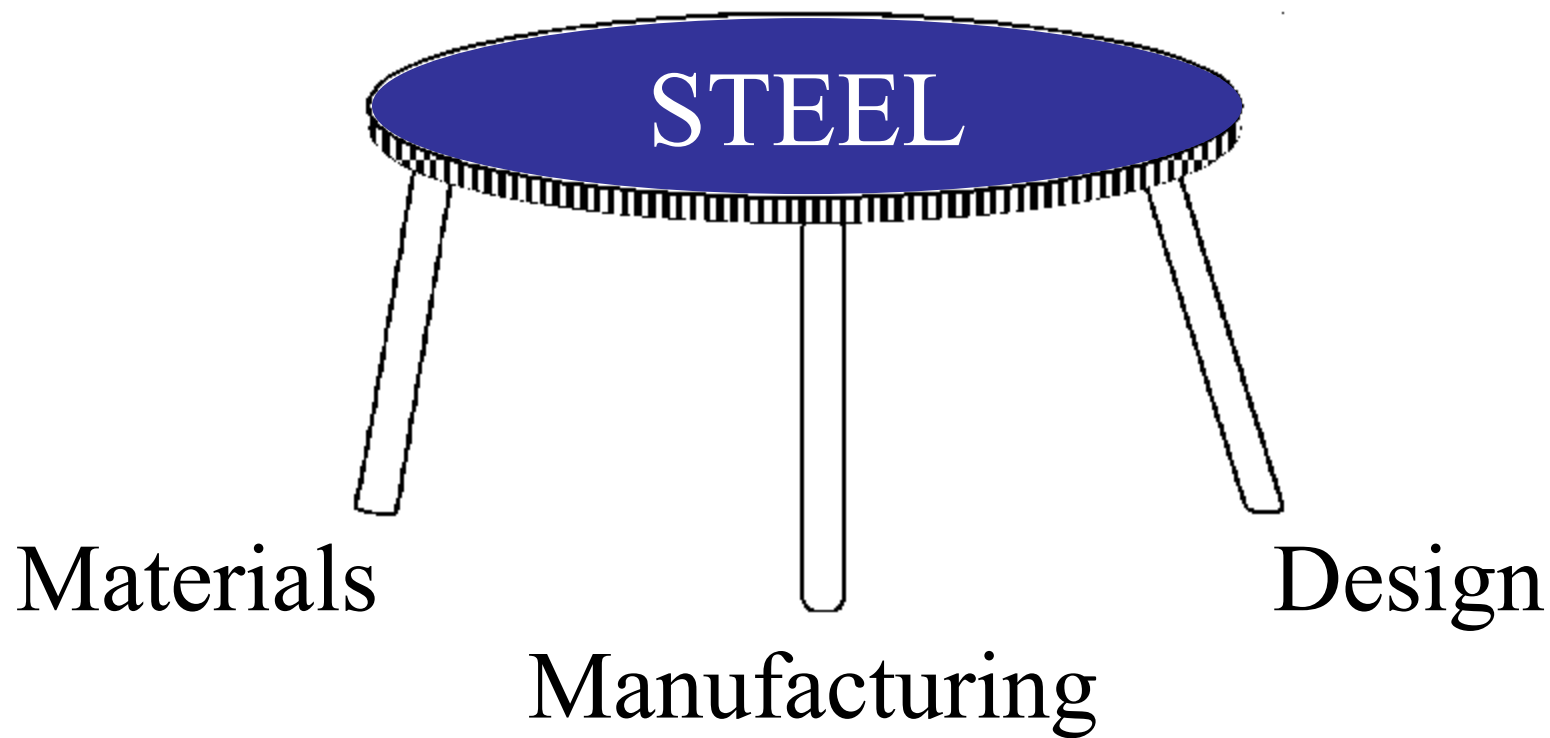
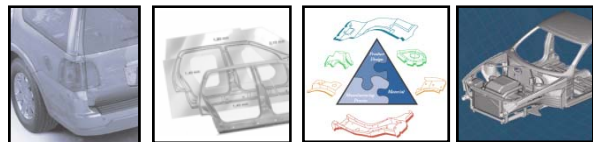


- A/SP approached USAMP for funding
- DOE agreed to fund steel projects based on potential shown by ULSAB Projects
- USAMP/DOE support is about \$18 million/year

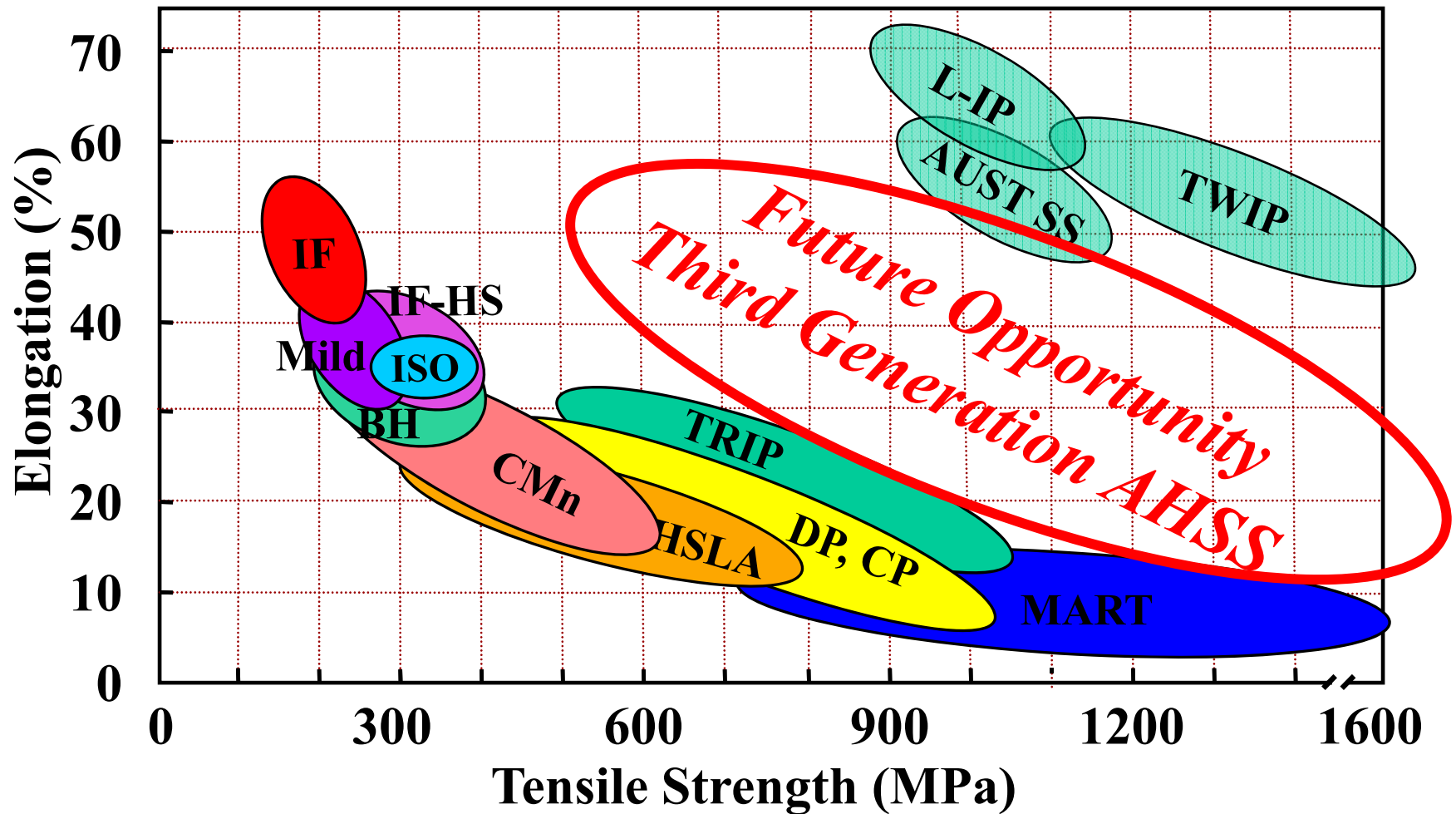
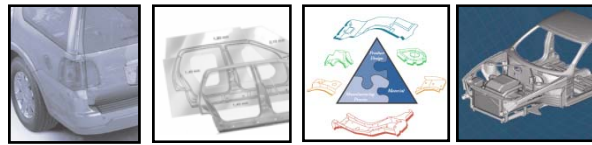


# USAMP CONE STAGES



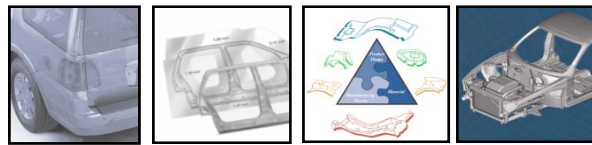


# STEEL STRATEGY - GAP



# A/SP PROJECT PORTFOLIO

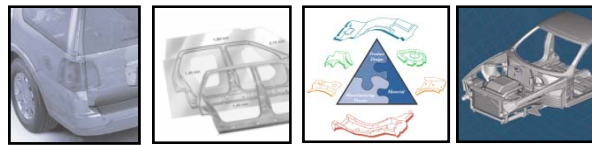
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**Lightweighting**

**Enabling**

**On-Going**



**Lightweighting**

**Enabling**

**On-Going**



**Lightweight Chassis  
Structures**

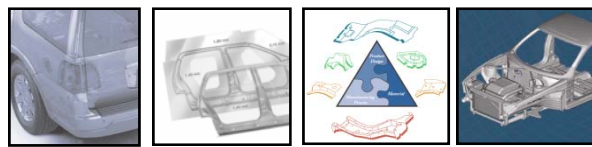
**Future Generation  
Passenger Compartment  
Validation**

**Mass Compounding**

**Mass Efficient  
Architecture for Roof  
Strength (MEARS)**

**Benchmarking**

# A/SP PROJECT PORTFOLIO



## Lightweighting



**Lightweight Chassis Structures**

**Future Generation Passenger Compartment Validation**

**Mass Compounding**

**Mass Efficient Architecture for Roof Strength (MEARS)**

**Benchmarking**

## Enabling



**Advanced High-Strength Steel Stamping**

**Hydroforming Materials and Lubricants**

**Advanced High-Strength Steel Joining Technologies**

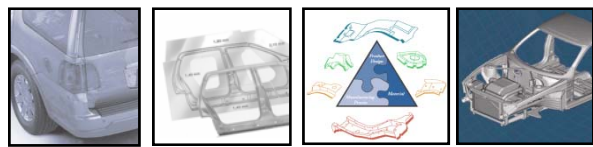
**Joining Strategy Steering Committee**

## On-Going



**AHSS Application Guidelines**

# A/SP PROJECT PORTFOLIO



## Lightweighting



**Lightweight Chassis Structures**

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## Enabling



**Advanced High-Strength Steel Stamping**

**Hydroforming Materials and Lubricants**

**Advanced High-Strength Steel Joining Technologies**

**Joining Strategy Steering Committee**

**Fatigue Characteristics**

**Strain Rate Characterization**

**Tribology**

**3rd Generation of AHSS (NSF)**

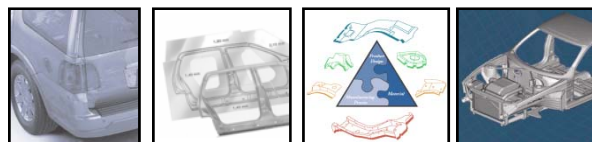
## On-Going



**AHSS Application Guidelines**



# A/SP PROJECT PORTFOLIO



## Lightweighting



**Lightweight Chassis Structures**

**Future Generation Passenger Compartment Validation**

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**Mass Efficient Architecture for Roof Strength (MEARS)**

**Benchmarking**

## Enabling



**Advanced High-Strength Steel Stamping**

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**Fatigue Characteristics**

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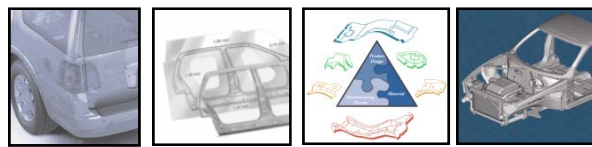
## On-Going



**AHSS Application Guidelines**

**Technology Transfer**

# A/SP PROJECT PORTFOLIO



## Lightweighting



Lightweight Chassis Structures

Future Generation Passenger Compartment Validation

Mass Compounding

Mass Efficient Architecture for Roof Strength (MEARS)

Benchmarking

## Enabling



Advanced High-Strength Steel Stamping

Hydroforming Materials and Lubricants

Advanced High-Strength Steel Joining Technologies

Joining Strategy Steering Committee

Fatigue Characteristics

Strain Rate Characterization

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3<sup>rd</sup> Generation of AHSS (NSF)

## On-Going

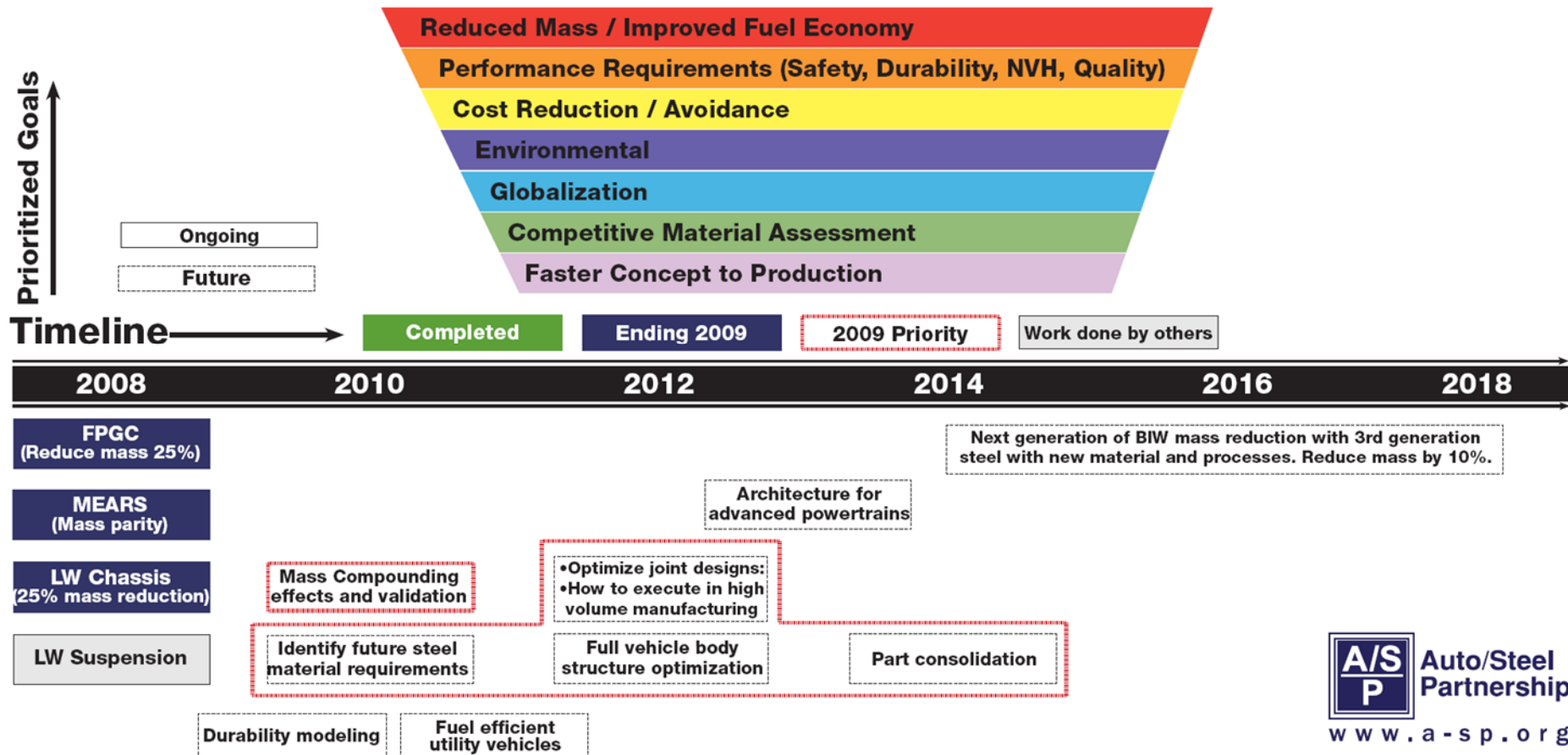


AHSS Application Guidelines

Technology Transfer

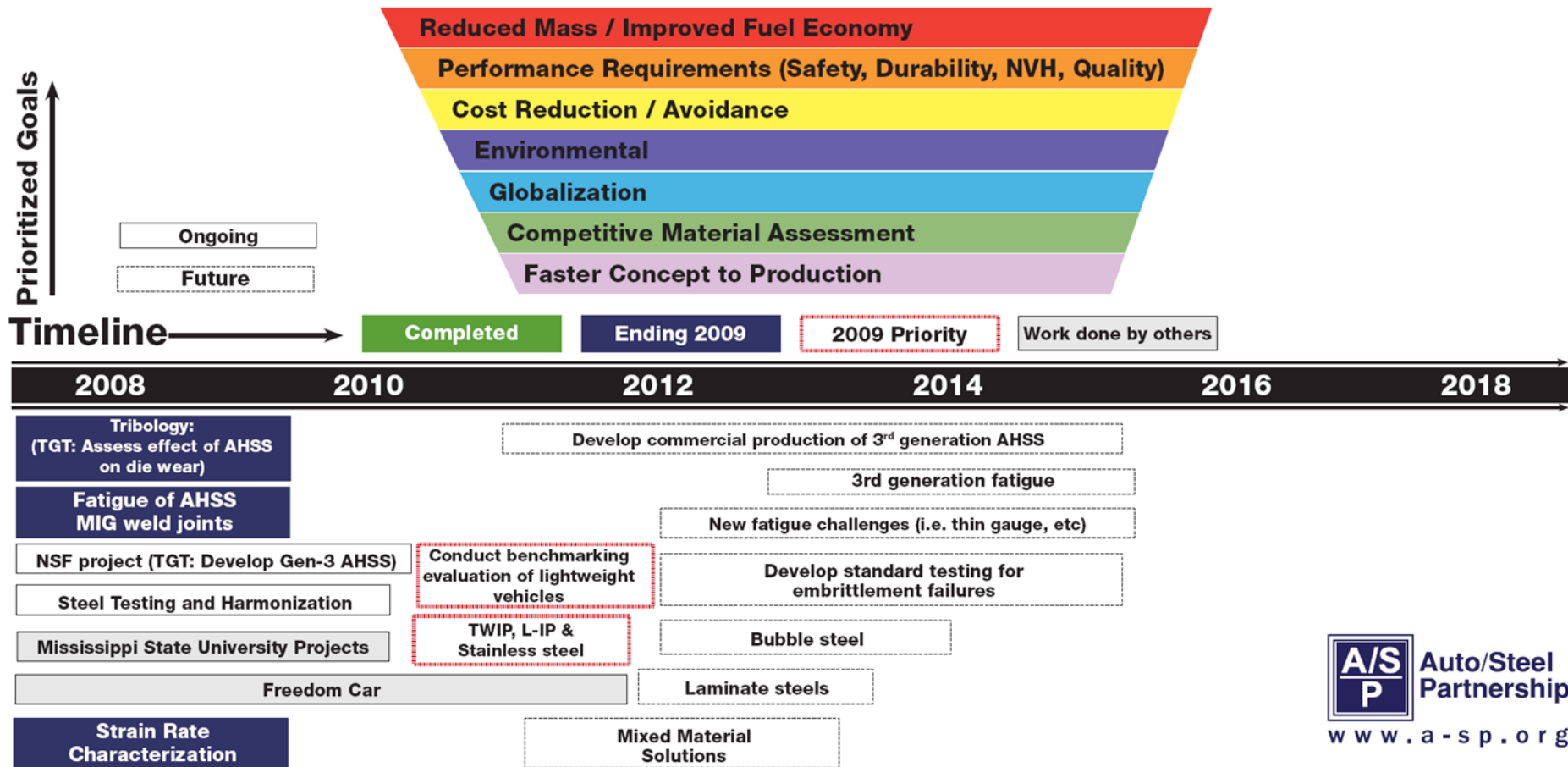
# A/SP TECHNOLOGY ROADMAP

## Preliminary A/SP Technical Roadmap: Design



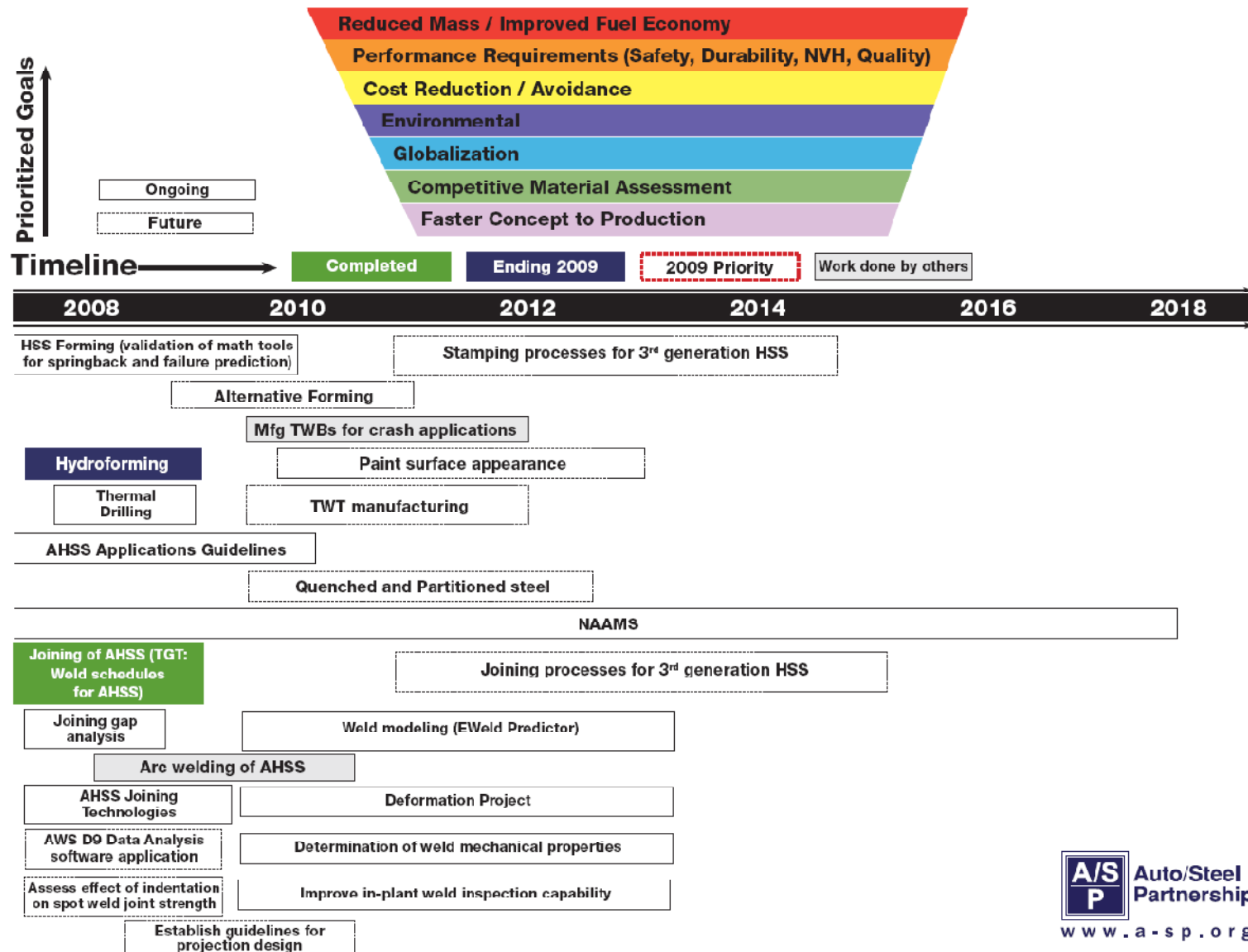
# A/SP TECHNOLOGY ROADMAP

## Preliminary A/SP Technical Roadmap: **Materials**

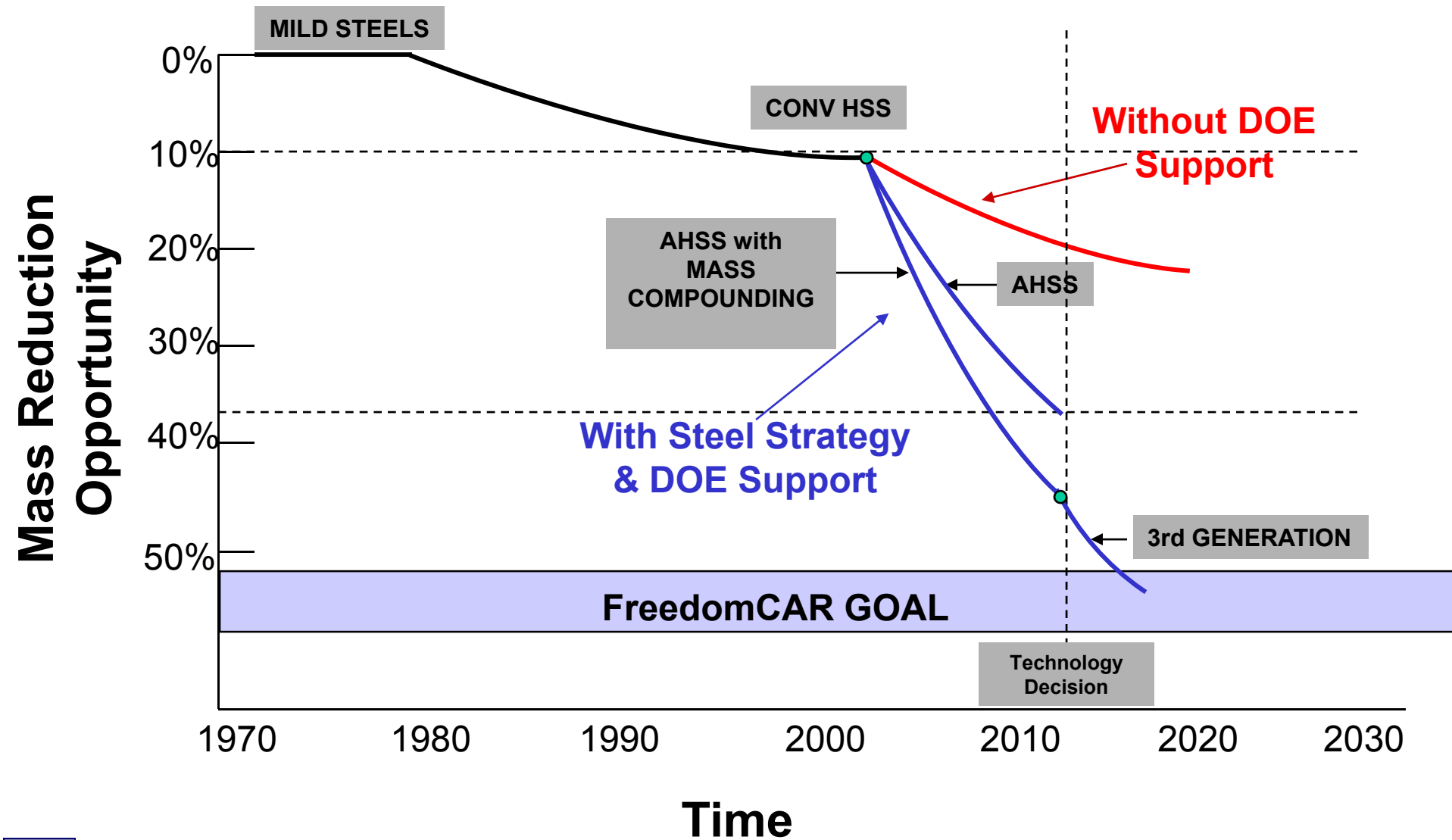
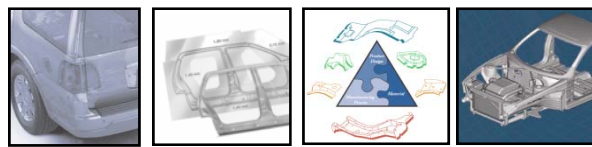


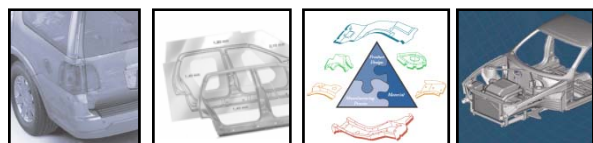
# A/SP TECHNOLOGY ROADMAP

## Preliminary A/SP Technical Roadmap: **Manufacturing & Processing Enablers**



# SUCCESS AND FUTURE OPPORTUNITIES





# FreedomCAR & A/SP GOAL ALIGNMENT

## FreedomCAR:

- 50% Mass Reduction
- Affordable Cost
- Life/Durability
- Develop/Transfer Technology
- Recyclability

## Auto/Steel Partnership:

- 40% Mass Reduction
- Affordable Cost
- Life/Durability
- Develop/Transfer Technology
- Recyclability

