

## **Breakout #3**

### **Multifunctional energy storage/vehicle structures:**

Multifunctional energy storage systems that enhance vehicle and driver safety (battery protecting driver)

# Breakout #3: Multifunctional energy storage/vehicle structures

## Scenarios that battery packs contribute to vehicle safety

- **Today:**

- Packs are generally placed between the axles and provide improved vehicle handling due to a lower center of gravity
- Battery packs pass Federal Motor Vehicle Safety Standard (FMVSS) No. 305: No loss of electrolyte into cabin and maintain electrical isolation

- **New battery capabilities desired:**

- Load bearing member of vehicle
- Ability to absorb deformation
- Leveraging hollow and honeycomb structures in vehicle for energy storage



# Breakout #3: Multifunctional energy storage/vehicle structures (cont.)

- **Potential multifunctional designs: energy absorption, deflection?**
  - Battery pack components could be multifunctional by contributing to energy absorption – and deflection.
  - The more energy that the pack can absorb, the less energy the vehicle structure needs to absorb.
  - A vehicle design should absorb energy to its limit, and deflect what it needs to.
- **Can lithium ion based systems be included in multifunctional designs?**
  - There was a disagreement between participants about the possibilities of using lithium ion based systems.
  - Distributing the cells seems easier to implement than changing body in white (vehicle frame).
  - Possibility of distributing the cells to improve safety – challenge of connecting
- **Quantify the system benefits and/or success criteria?**
  - Weight reduction is important metric.
  - Some percentage of energy absorption by pack versus vehicle structure.
  - Maximize battery weight per unit vehicle and be safe.

