

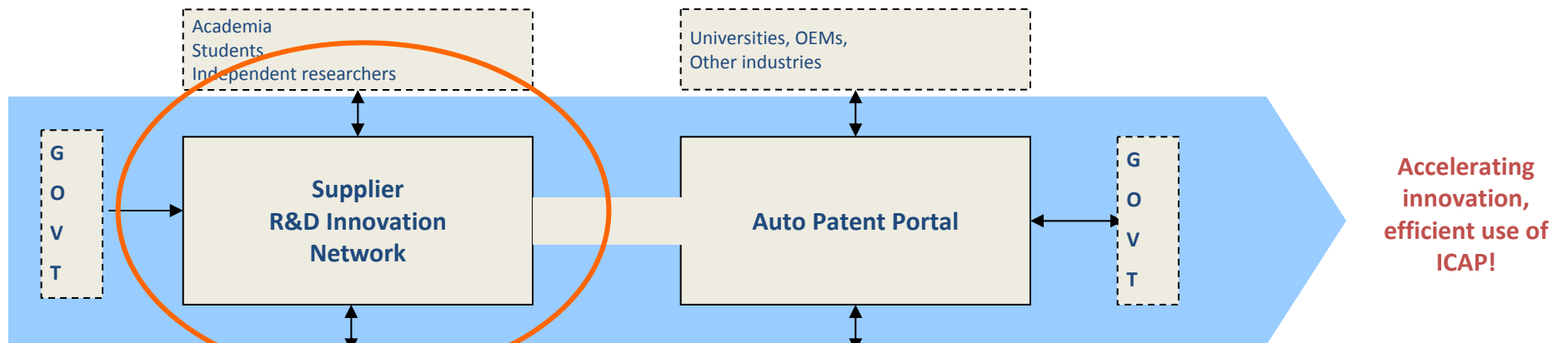
US Automotive Partnership for
Advancing Research & Technologies
(USAutoPARTs)



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Executive Director

A New Business Model for Collaborative Supplier R&D

USAutoPARTs: Co-opitition Accelerates Innovation



Supplier R&D Networks

- **Government funds & resources**
- **University & student researchers**
- **Independent and national labs**

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- **Partners:** Oak Ridge National Labs, US DOD, WSU, Automation Alley and suppliers
- **Research Consortia:** thermal management, light weight materials, and engine combustion
- **Value Prop:** leverage supplier dollars 3 to 1 and build a resource network tied into energy efficiency
- **Facility:** conversion of a closing Delphi R&D facility in Shelby Township, Michigan

Source: OESA/IBM Automotive Supplier Jam, March 2007

One Solution: Leverage Collective Strength through Federal-State-Industry Partnership

The **US Automotive Partnership for Advancing Research & Technologies** will be a collaborative, pre-competitive research and development alliance that cost-effectively...

- Advances promising new technologies into performance-specified, factory-ready materials, processes, and designs
- Meets imperative needs associated with energy efficiency, emissions, safety, and/or automotive OEM mandates
- Establishes a network to the Department of Defense, prospective student recruits and potential customers
- Benefits the automotive original equipment supplier industry
- In partnership with the U.S. Department of Energy, Automation Alley, TARDEC, Original Equipment Suppliers Association, Wayne State University, NextEnergy, and SAE International

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Benefits

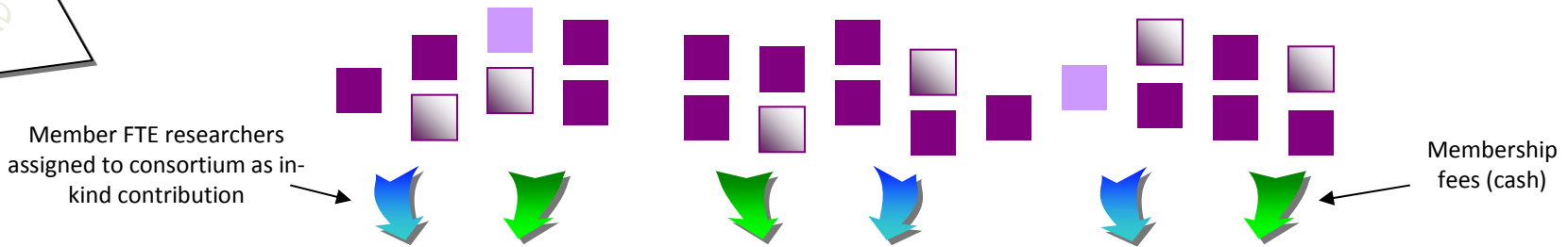
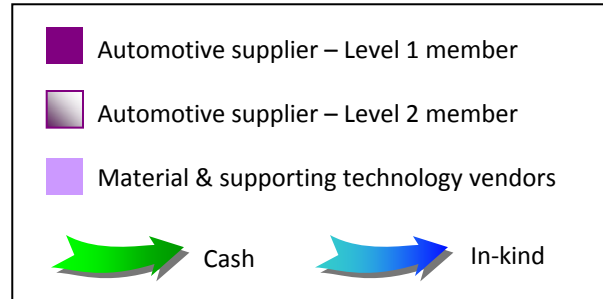
- **This site for collaborative automotive R&D between industry and government helps suppliers:**
 - Advances promising new technologies into performance-specified, factory-ready materials, processes, and designs
 - Leverage other resources to supplement suppliers research
 - Obtain access and first use to pre-competitive research results
 - Use USAutoPARTs as a portal for DOE to Automotive Supplier Industry
 - Gives suppliers first access to technical developments as well as technical resources at ORNL and the other National Labs
 - Establishes a network to Federal Government
 - Strengthen relationships with DOE and its national laboratories, ORNL as well as DOD/TACOM
 - This initiative fills a void/need of the DOE to do more collaborative work with suppliers
 - Helps DOE to get more technologies in vehicles on the road
 - Advances DOE's need to "Accelerate commercialization of energy-efficient, environmentally sustainable vehicle technology"
 - Strengthen supplier's relationship with the State of Michigan
 - Delphi's organizing role as well as contribution of facility lease-hold improvements and equipment helps support the states need to:
 - Create high tech jobs and new investment in Southeast Michigan

What would USAutoPARTs do?

- Based on the initial capabilities of the Shelby Township facility, as well as the nature of many of the projects likely to be of mutual interest among Suppliers DOE, and TARDEC it is anticipated that project areas will include light weight materials, thermal management, fuels, combustion, emission, hybrid technology and processes.
- With a strategy of leveraging other organizations (material suppliers, national labs, members' labs, and universities) as a source of “raw” advanced technologies, many projects could involve validation, characterization, or adaptation of a particular technology – as opposed to basic research. For illustration, the following activities might typify a lightweight materials project at USAutoPARTs:
 - Performance & characterization testing (strain rate, accelerated life, etc)
 - Comparison of several candidate materials for a given application
 - Evaluation of suitability for extant manufacturing processes that Suppliers would need to perform depending on the application (forming, casting, coating, etc); adaptation of manufacturing processes to accommodate novel materials as needed.
 - Development of procurement specifications for new materials
 - Certification against existing performance specifications
 - Evaluation of recycle-ability

Partnership Model & Funding Flow

NOTE: Funding arrows for public entities are shown as illustrative in some cases. Participation and contributions of some public entities still evolving.



Supporting research; research management

ORNL and other DOE National Laboratories

Program funds

DOE

TARDEC

Automation Alley

Economic development grants

State and Local Support

NextEnergy

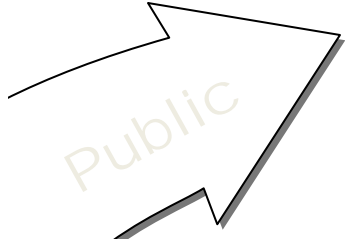
Revenue from non-member sources (services, licensing sub-leased space)

Admin. & facility management; state and local support

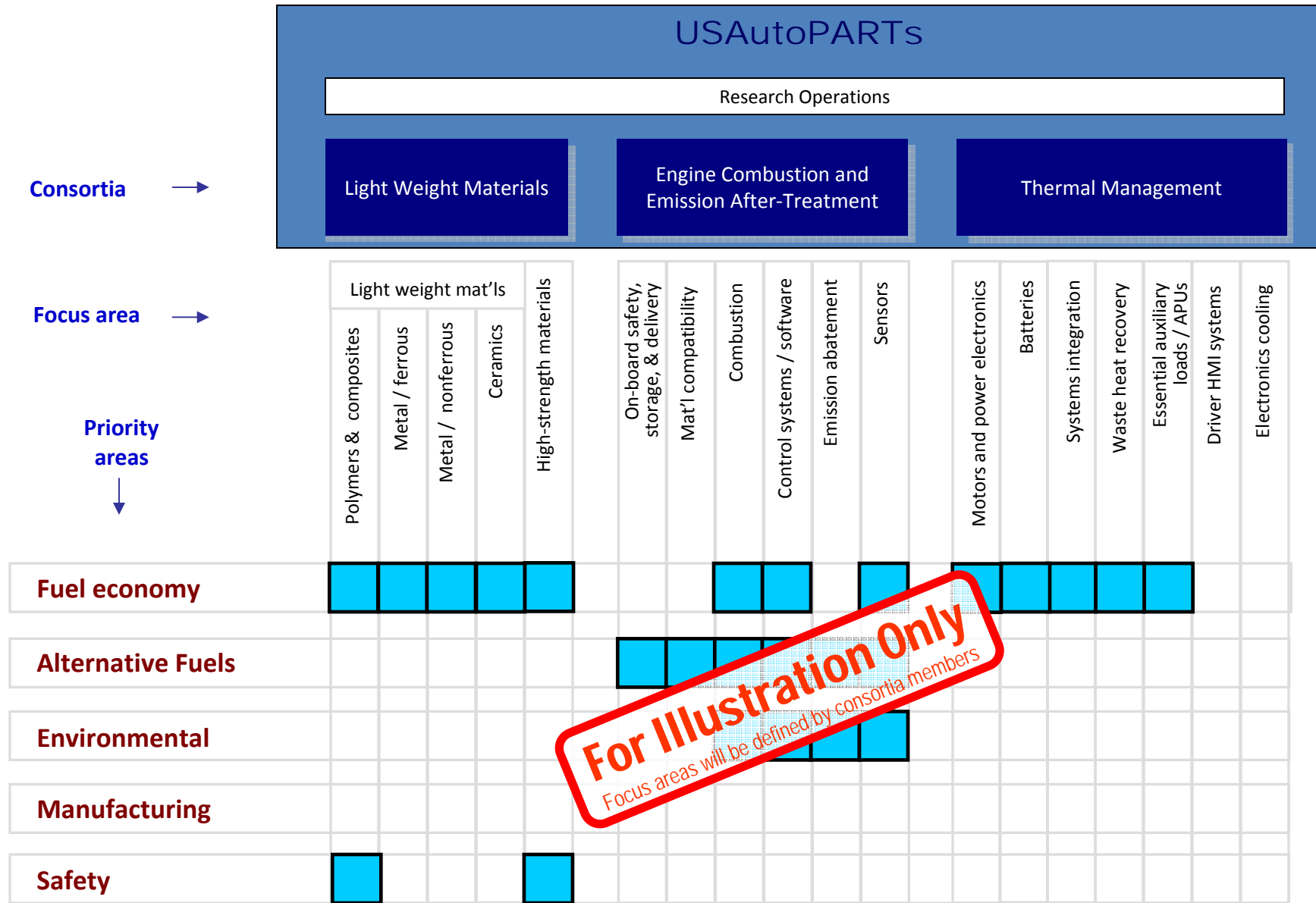
Innovation management; new business creation

Wayne State and other universities

Faculty and student research support



USAutoPARTs will Comprise Consortia Aligned with Members' Businesses and National Priorities for Energy, Environment, and Competitiveness



Light Weight Materials Consortium

- **Need:** With the increased market and regulatory pressure to increase fuel efficiency, there is a need to lower vehicle mass in a cost effective manner without sacrificing safety or creating other trade-offs. For all light weight applications there is a need for:
 - design criteria (e.g., fatigue, corrosion, etc.) and math-based modeling capabilities
 - lower cost raw materials and processing methods
 - reduced tooling cost and improved tool life
 - improved cycle times
- **Objective:** To lower the cost and risk of reducing vehicle mass
- **General Scope of Work:**
 - Development of materials, design methods and production processes for:
 - Magnesium
 - Polymer and polymer composites
 - Metal Matrix Composites (MMC)
 - Bio-based materials
 - Other light weight materials
 - Development of math-based modeling capabilities that facilitate the use of all light weight materials
 - Integration of functionality (e.g., smart materials such as shape memory alloys and piezo-electric materials)

Thermal Management Consortium

- **Need:** With the increasing electronic content of vehicles, there is a need and opportunity to:
 - prevent thermal breakdown of electronic components to improve reliability and durability
 - increase the potential for energy harvesting (e.g. waste heat recovery) to increase vehicle efficiency
 - develop industry-wide testing standards for performance and reliability of electronic devices
- **Objective:** Improve the thermal performance of electronic devices and systems for better reliability and durability, and to harvest energy
- **General Scope of Activity:**
 - Improve efficiency of electric and electronic devices
 - Develop materials and devices that offer higher operating temperatures thus reducing cooling requirements
 - Develop active approaches for thermal management in electrical and electronic devices (e.g., development of thermo-electric devices)

Engine Combustion and Emission After-Treatment Consortium

- **Need:** A thorough understanding of the fuel-combustion-emission effects for diverse fuel options to facilitate development of clean, energy-efficient engine technology to reduce dependency on foreign energy sources
- **Objective:** To facilitate implementation of clean, energy-efficient vehicles with a variety of fuel options through a systems approach encompassing fuels, combustion and emissions control research

General Scope of Activity:

- develop sensor technologies to enable advanced engine and emissions control strategies
- develop understanding of fuel-combustion-emissions effects for diverse fuel types and their impact on potential after-treatment approaches
- provide consistent assessment of potential ethanol blends on legacy fleets using partners' distributed chassis dynamometer capacity

Benefits of Membership

- Leverage your scarce R&D \$'s 3-6x
- Access National lab scientist and experts
- Influence overall technology priorities
- Participate in projects
- Accelerate R&D transfer to your products

Next Steps

- Visit our Website www.USAutoPARTs.US
- Call Steve Zimmer 248-225-7218
- Email us at szimmer@usautoparts.us
- Attend one our Introduction Consortia meetings

Thank You