Technology for tomorrow’s ground-transportation challenges

**Challenges for Ground Transportation**

- **Reliability**
  - Electronics architecture, battery management systems
  - Vision and lighting systems
- **Materials, assembly, and characterization**
  - Sensor systems and integration
- **Carbon-free energy production**
  - Storage systems
- **Software**

**Infrastructure**
- Smart roads, multi-modal transportation, charging stations and network connectivity, tolls, weather stations, signage, traffic management

**Green Transportation**
- Lightweight vehicles, energy efficiency, waste treatment, recycling, traction and energy-recovery systems

**Safety and Reliability**
- Braking assistance, embedded systems reliability, wear monitoring, driver assistance

**E-services**
- Internet connectivity, vehicle-to-vehicle connectivity, secure communications

**Manufacturing and maintenance**
- Production line ergonomics, training, process optimization/flexibility/control, in-operation monitoring and maintenance of infrastructures and equipment

CEA Tech can help the following businesses:

- Automotive component manufacturers and subcontractors
- Car manufacturers
- Network manufacturers and operators
- Digital technology companies
Here are some of the ways CEA Tech can support your development:

**Cabling diagnostics**
- Embedded diagnostics, cable network maintenance, electrical fault and electric arc detection

**Sensor systems**
- Air quality, VOC detection, airbag systems, safety systems, skid prevention, seating comfort

**HMI (virtual and augmented reality, touch screens)**
- Dashboard instrumentation, texture feedback, functionalization of glass surfaces (projected GPS, soundproofing), displays

**On-board vision systems**
- Night vision for safety, geolocation, detection of pedestrians and obstacles, rear-view cameras, distance measurement

**Materials and assembly**
- Lightweight structures, deformable materials, enhanced molds for manufacturing, magnets for motors

**Energy (batteries, fuel cells, organic photovoltaics)**
- Electric traction systems, battery management systems, energy recovery, auxiliary consumption reduction, organic photovoltaics, vehicle-network and vehicle-home charging

**Power electronics**
- GaN-based component manufacturing and circuit design

**Advanced manufacturing**
- Workstation ergonomics, training, automated loading, maintenance

**Software and communication**
- Vehicle-to-vehicle and machine-to-machine communication, smart tolls, internet connectivity

**Software and embedded systems design**
- Software development tools (software robustness and reliability, error detection); electronic components

**Non-destructive testing**
- Material defect detection, characterization of composite materials, predictive maintenance

**Data analysis**
- Optimized vehicle range for each route, information and multimedia

**Recycling**
- Materials recycling (metals, plastics), lifecycle analysis, waste-to-biomass

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