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The Missing Link:
Passive and Active
Safety Integration

May 2008

The Worldwide leader in
Automotive Safety Systems

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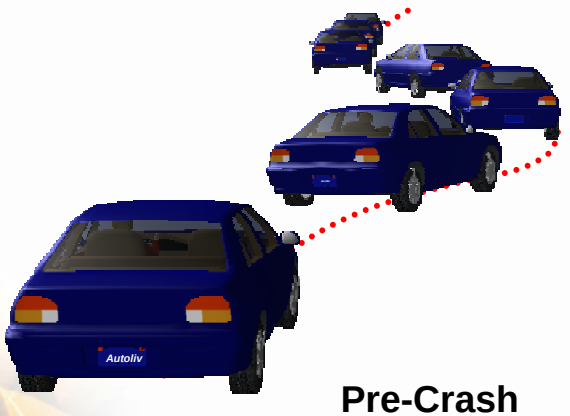
Passive to Active Safety Trends



Pre-Crash
Automatically Operated

In Crash
Automatically Operated

In Crash
Manually Operated

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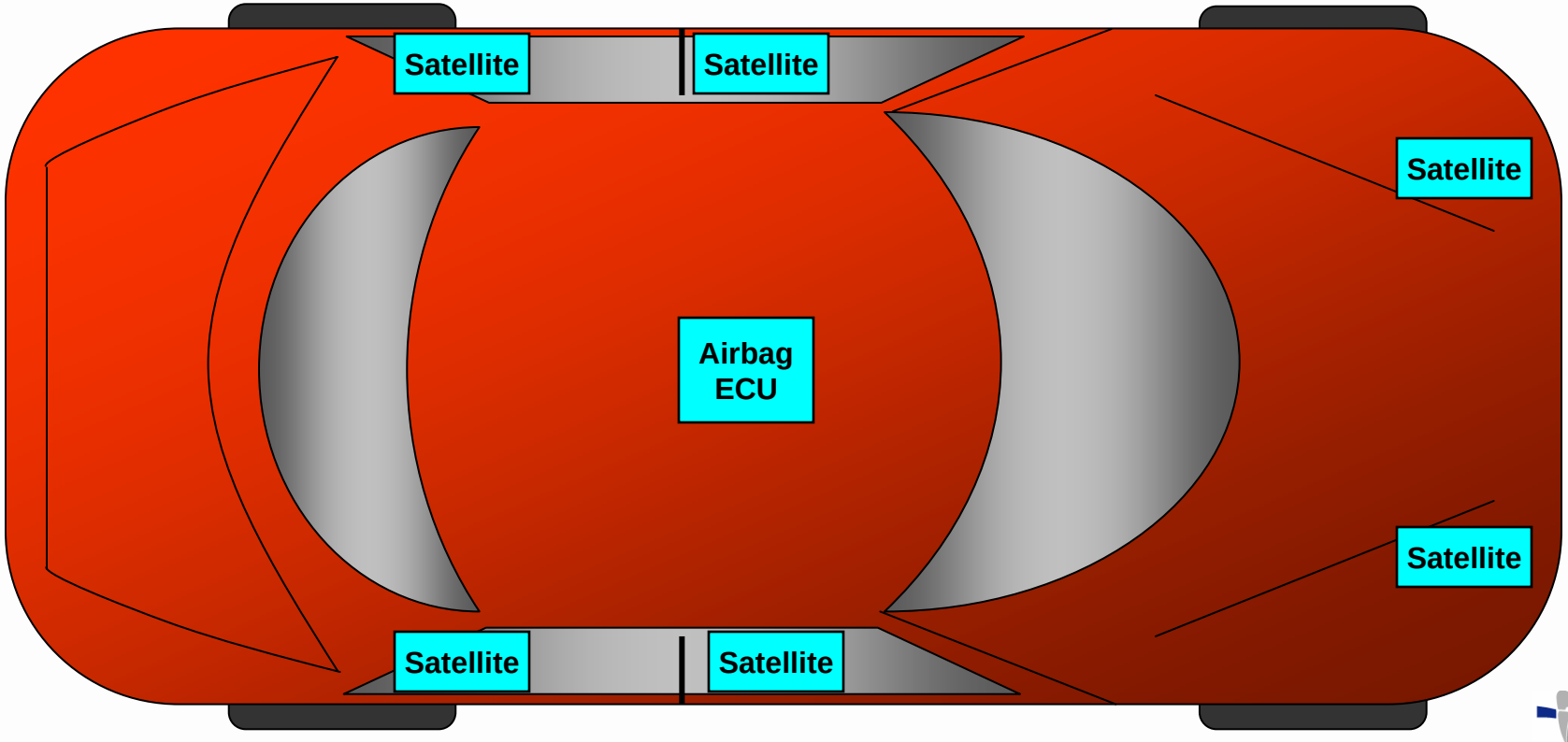
Restraint Control Electronics

Acceleration Satellite

Pressure Satellite

Airbag ECU



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Brake-Based Stability Control Electronics

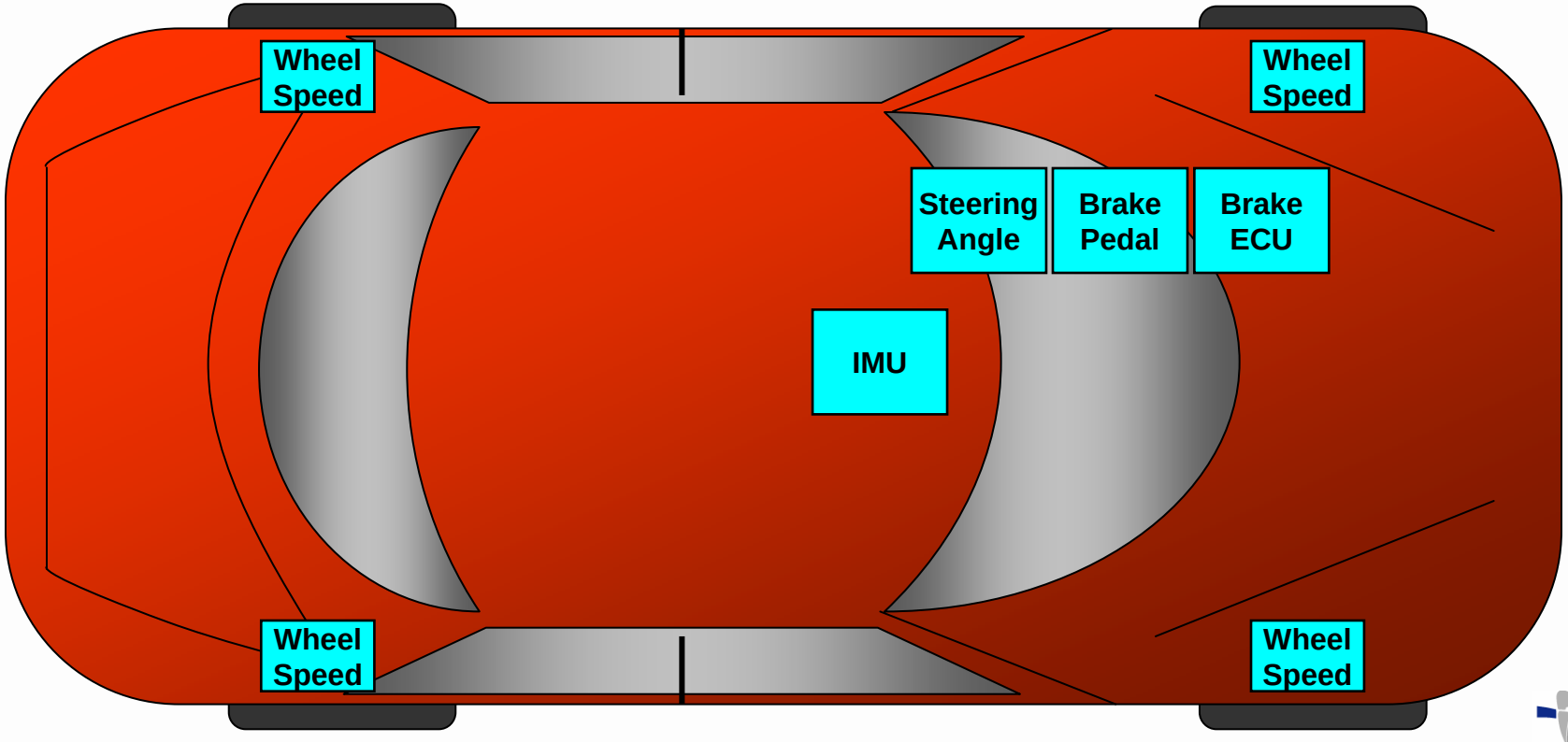
Wheel Speed Sensor

Brake Pedal Sensor

Inertial Measurement Unit

Steering Wheel Angle Sensor

Brake + Hydraulic ECU



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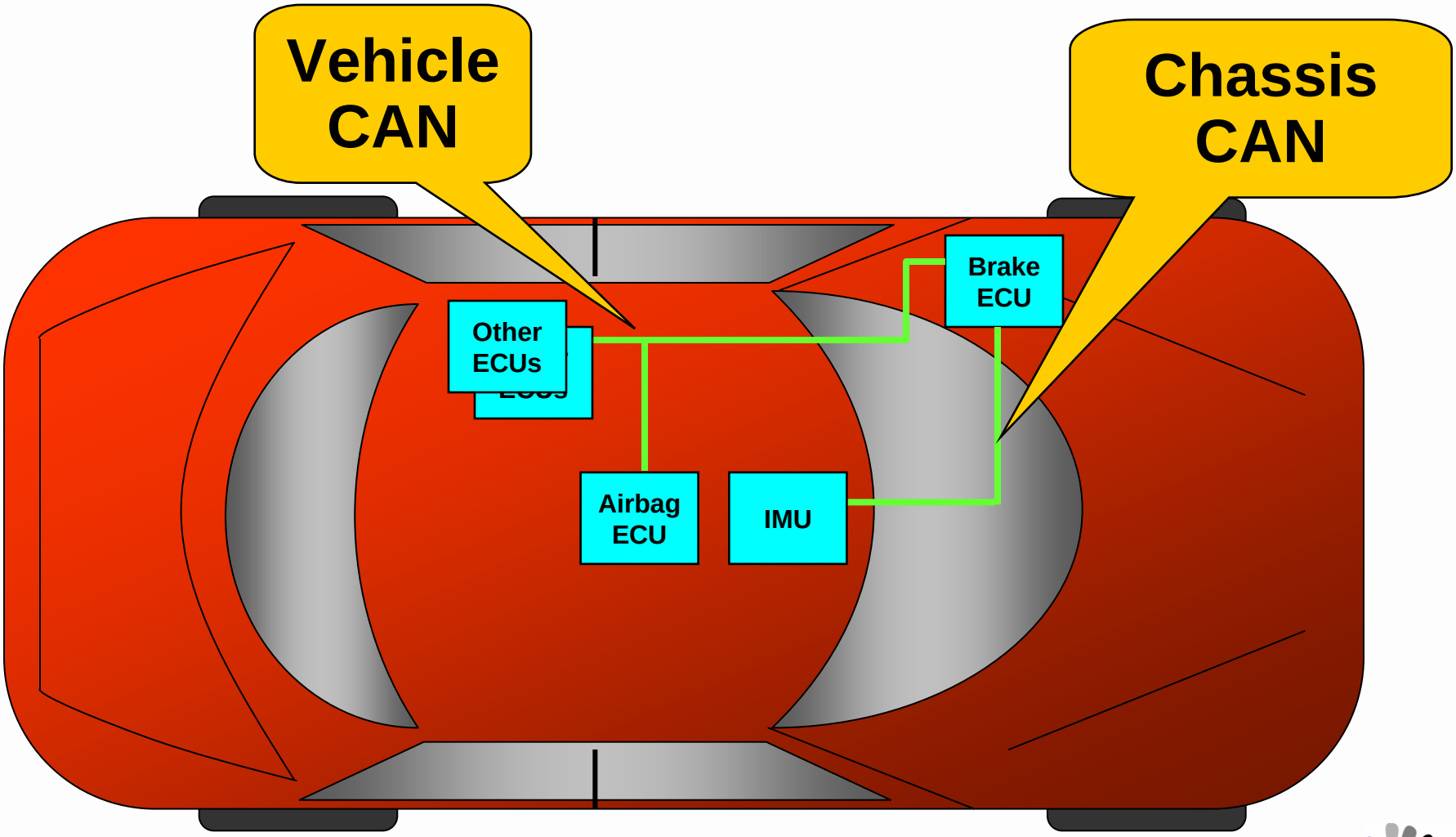
Current Vehicle Architecture



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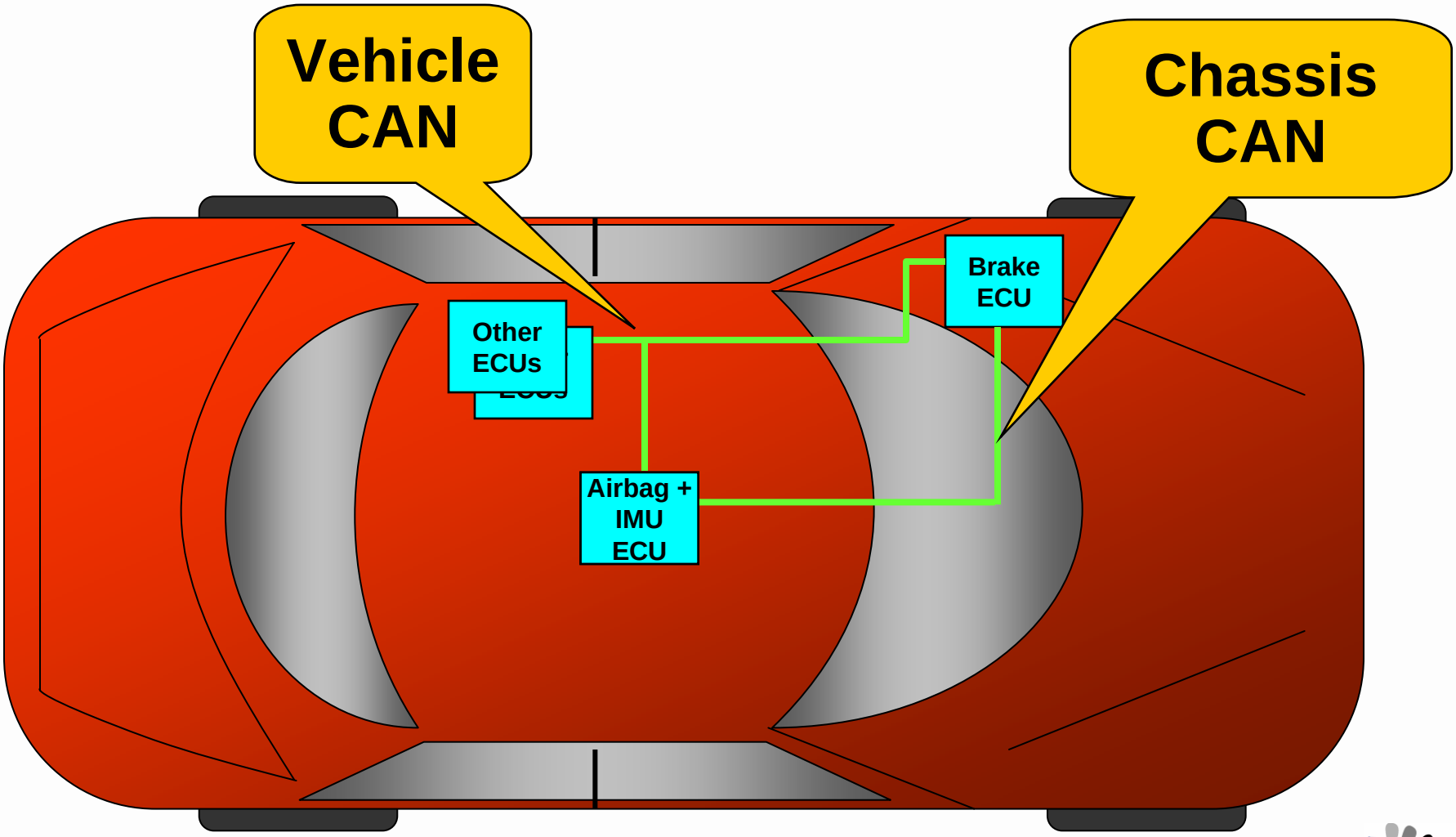
Integrated Architecture



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Industry Trends

- **At least 3 global vehicle manufacturers already decided to integrate the IMU into the Airbag ECU.**
- **Several other vehicle manufacturers are planning studies/tests in 2008**

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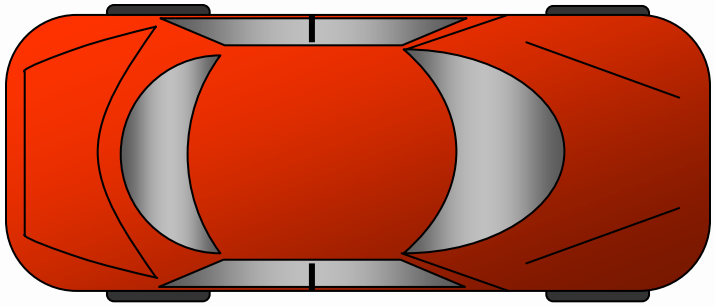
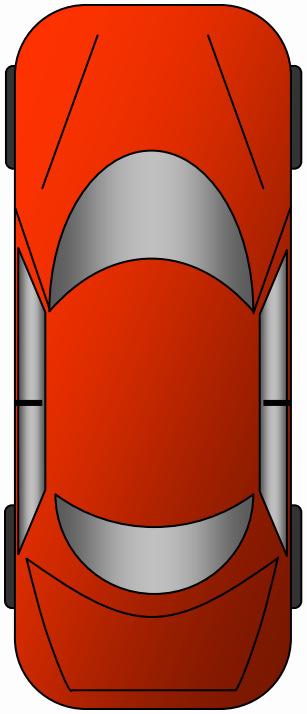
Off-Zone Side Impacts





Sensing off-zone side-impacts could be improved with yaw rate data.

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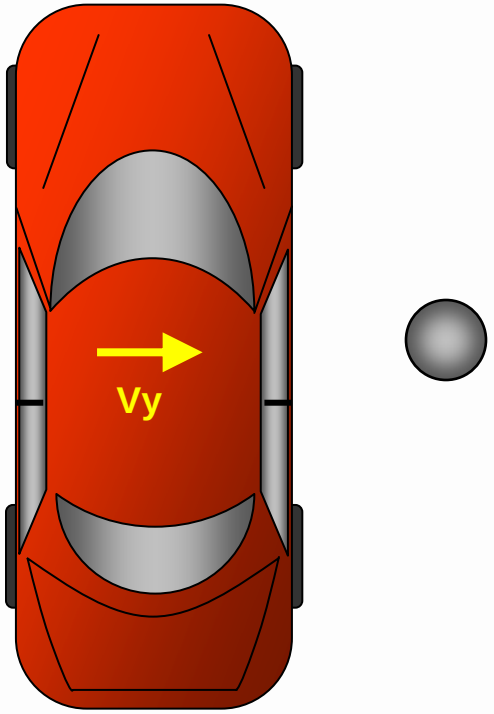
Side Pole Impacts



Sensing side pole could be improved with yaw rate data.

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The Next Integration

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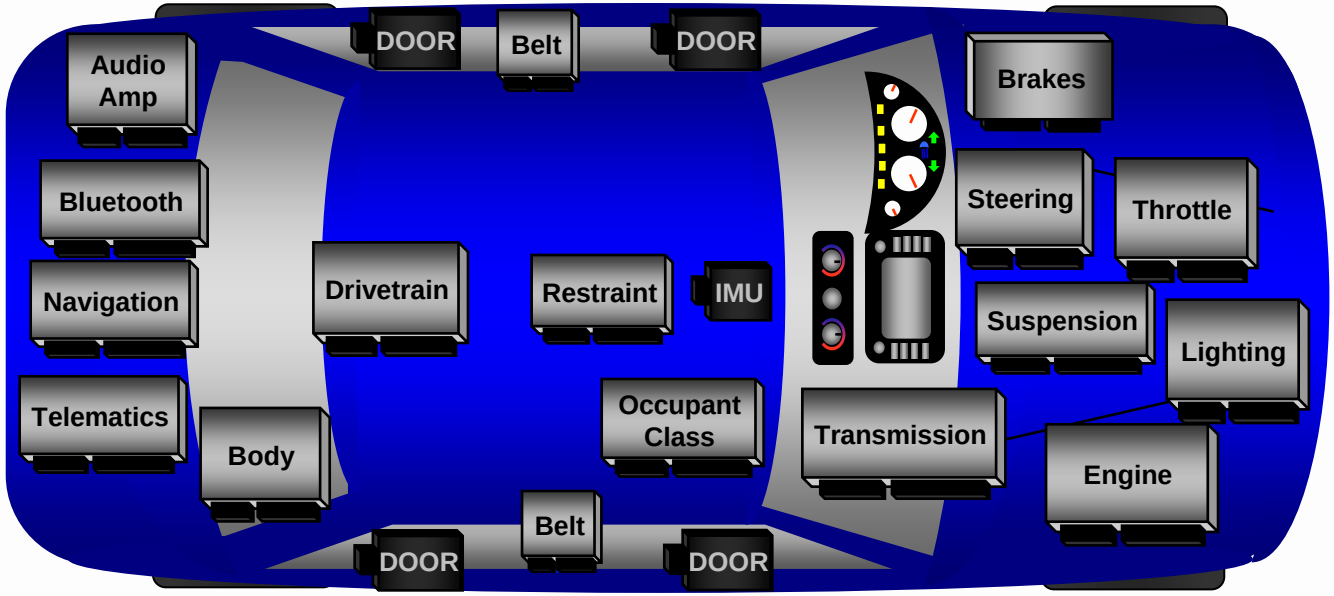
Electronics Proliferation



Dozens of Stand-Alone ECUs

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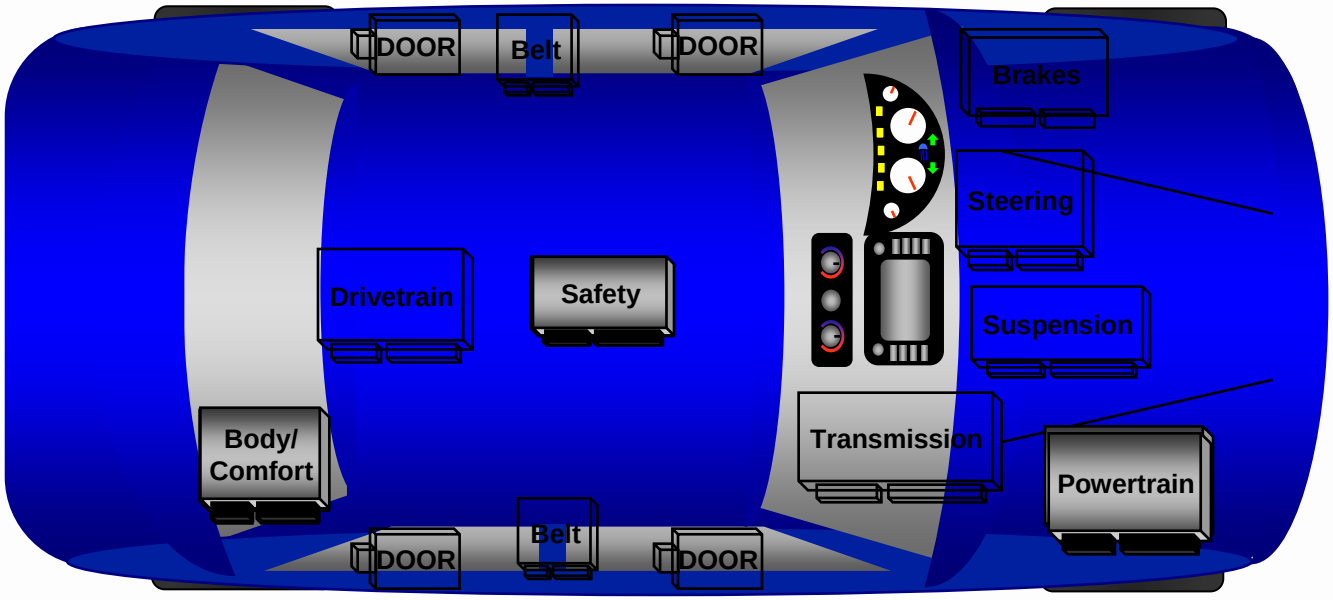
Control Integration



Two main types of electronics will emerge:

Central Controller — Centralized Decision Maker

Actuator Controller — De-Contented Slave Located at Actuator

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Integration Path

Integration happens when:

- Different ECUs have same/similar components.
- Performance can improve.
- Suppliers can deliver and/or cooperate.
- OEM costs are reduced !!