Transmission and Drive-train Layout
Automobile layout describes where on the vehicle the **Engine** and **Drive Wheels** are found.
Engine and Drive Layout

- Front Engine/Front Drive (FF)
- Front Engine/Rear Drive (FR)
- Rear Engine/Rear Drive (RR)
- Mid-Engine/Rear Drive (MR)
Key Design Factors

- Cost
- Complexity
- Reliability
- Packaging
- Weight distribution
- Intended handling characteristics

Rigid links
Flexible links
Rear Engine / Rear Drive (RR)
Characteristics

Engine located at the Rear driving the Rear wheels
Fiat 500

- Short Drive-train
- Flat floor pan
VW Beetle

• In-efficient use of front compartment
BMW 600

- Front ingress
- Articulated steering column
Tata GenX Nano

- Balance between safety and cost
Smart fortwo

- *Tridion Safety Cell* to activate the **Crumple Zones** of a colliding vehicle
Volvo and VW Bus
Porsche 911

• Unique handling characteristics
Front Engine/Front Drive (FF)
Characteristics

Engine located at the Front driving the Front wheels
Mini Cooper

- Transverse-mounted engine
- Tunnel-free floor-pan
Honda Civic

- Transverse-mounted engine
- Low and flat floor pan
- Large luggage compartment
Front Engine / Rear Drive (FR)
Characteristics

Engine located at the **Front** driving the **Rear** wheels
Nissan 350Z

- Longitudinally-mounted engine driving the Rear wheels
- 2+2 seating
Mercedes-Benz SLA AMG

- **Front-mid** engine
- **Rear transmission** gearbox
Mercedes-Benz 190

- Longitudinally-mounted engine driving the Rear wheels
- Long front and rear over-hang
Mid Engine / Rear Drive (MR)
Characteristics

Engine located at the Middle driving the Rear wheels
Toyota MR2

- Short front and rear overhang
- 2 or 2+2 seating
- In-efficient use of front compartment
All-Wheel Drive (AWD, 4WD)
Characteristics

Engine locates at the **Front, Rear, or Middle** drives **All** the wheels

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**PolyU**
Porsche 997

Engine located at the Rear driving All the wheels
Electric Vehicle
Chevrolet Volt

- Battery in tunnel
- Front engine and motor, front drive
Honda Civic Hybrid

- Battery in rear trunk
- Front engine and motor, front drive
Volkswagen Touareg

• Battery in rear trunk
• Front engine and motor, rear drive
Peugeot Hybrid4

- Battery in rear trunk
- Front engine, front drive
- Rear motor, rear drive
Mitsubishi iMIEV

- Battery below seats
- Rear motor, rear drive
Mercedes-Benz SLA AMG E-Cell

- Dumb-bell-shaped battery unit
- Front and rear motor drive
Rolls-Royce 102EX Phantom

- Battery at the front
- Front and rear motor drive