Two-Wheel Drive

Description: Two wheels are controlled by two motors. If both wheels turn in the same direction, the vehicle moves forward or backward. If the wheels turn in different directions or at different speeds, the vehicle turns.


Example: Segway

Advantages
- Only uses two motors
- Easy to repair

Disadvantages
- Unstable
- Difficult to maneuver over obstacles

Differential Drive
(Two Wheels and a Caster)

Description: Two wheels are controlled by two motors. The vehicle can move forward and backward, and turns are adjusted by the speed and direction of the wheels. A caster is used to provide stability to the vehicle, but it is not independently controlled.
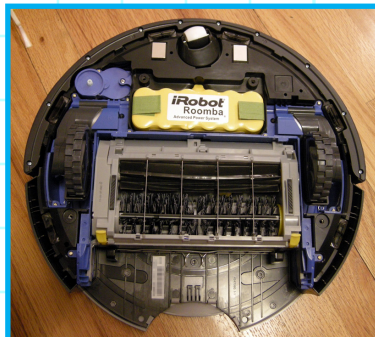
Example: Roomba

Advantages
- Simple
- Can rotate in place
- Easy to program
- Only uses two motors

Disadvantages
- Hard to drive straight
- Less consistent

Four-Wheel Drive

Description: Four wheels receive power from the motor or motors. For the vehicle to turn, there must be at least two motors.

Advantages

- Good traction
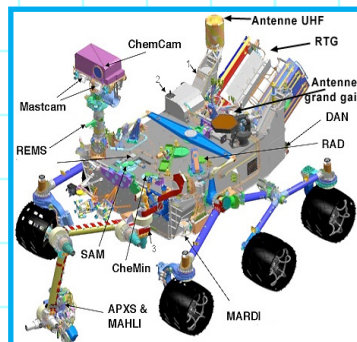- Stable
- Good at going over obstacles

Disadvantages

- Difficult to steer
- Complex design
- More parts

Example: ATV

Six-Wheel Drive

Description: Six wheels receive power from the motor or motors. Wheels can be evenly spaced, or there may be two wheels at the front and four at the back of the vehicle. For the vehicle to turn, there must be at least two motors.

Advantages

- Extremely stable
- Good at going over obstacles
- Supports more weight

Disadvantages

- Difficult to steer
- Complex Design
- More parts

Example: Curiosity Rover

Track Drive

Description: A continuous band of treads is driven by two or more wheels. Track drive systems are most common on vehicles that need to drive over rough terrain.

Example: Excavator

Advantages
- Good at going over obstacles
- Only requires two motors
- Evenly distributes weight
- Vehicle less likely to get stuck in soft ground

Disadvantages
- Difficult to steer
- Bad traction on some surfaces
- Low speed