

# SAE LEVELS OF DRIVING

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The Waymo One autonomous ride-hailing service is an exemplary vehicle system that showcases advanced automated driving capabilities. This service operates a fleet of Chrysler Pacifica minivans equipped with Waymo's proprietary automated driving system (ADS).

## Key Functionalities

Waymo One provides several key functionalities that enhance the passenger experience and ensure safety:

- **Autonomous Navigation:** The vehicle can navigate complex urban environments, including traffic signals, pedestrians, and cyclists.
- **Ride-Hailing Service:** Passengers can summon a vehicle via a mobile app, similar to traditional ride-sharing services.
- **Safety Features:** The system includes advanced sensors (LiDAR, cameras, and radar) for 360-degree perception and obstacle detection.

## Automated Driving Features

Waymo's automated driving features include:

- **Level 4 Automation:** The vehicle can operate autonomously in specific conditions without human intervention, although a safety driver may be present during testing phases.
- **Geofencing:** The service is limited to predefined operational areas (geofenced regions) where the vehicle can safely navigate.
- **Emergency Maneuvering:** The ADS is capable of executing emergency maneuvers when necessary to avoid obstacles or hazards.

## Level of Driving Automation

According to the SAE J3016 standard, Waymo One corresponds to Level 4 automation. At this level, the system can handle all driving tasks within its operational design domain (ODD) but may require human intervention outside this domain. Unlike Level 3, where the driver must be ready to take over at any moment, Level 4 allows for complete autonomy in designated areas.

## Operational Design Domain (ODD)

The ODD for Waymo One includes:

- **Urban Environments:** The service operates primarily in urban settings with complex traffic patterns.
- **Specific Geofenced Areas:** The vehicles are restricted to certain geographical areas where they have been extensively tested and validated for safety.
- **Weather Conditions:** While designed for various conditions, the system may not operate in severe weather (e.g., heavy rain or snow) that could impair sensor functionality.

## REFERENCES

- Waymo's official page on Waymo One in San Francisco, which outlines the service's features, operational areas, and the technology behind it. [Waymo One - San Francisco](#) 1.
- The FAQ section on Waymo's website, which answers common questions about the autonomous ride-hailing service, including operational details and vehicle specifications. [Waymo FAQ](#) 2.
- Waymo's description of its self-driving car service in Phoenix, highlighting the operational area and features of the vehicles used. [Waymo One - Phoenix](#) 3.