

Parking requirements. Parking demand

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Sustainable Transportation within the Framework of Green Deal - SPHERE

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Introduction

Parking is a fundamental component of transportation systems and urban planning. Every trip made by a private vehicle begins and ends at a parking space. Therefore, adequate parking facilities are essential for ensuring efficient traffic flow, supporting economic activities, improving accessibility, and enhancing the quality of urban life.

Poor parking planning can lead to traffic congestion, illegal parking, increased travel time, fuel wastage, environmental pollution, and safety hazards. Conversely, well-designed parking systems improve traffic operations, reduce congestion, encourage sustainable transportation, and support urban development.

Parking planning involves determining **where parking should be located, how many parking spaces are required, and how parking demand changes over time**. Transportation engineers and urban planners analyze parking demand to provide sufficient parking while avoiding excessive land use and unnecessary construction costs.

This lecture introduces the concepts of parking requirements and parking demand, explains methods for estimating parking needs, and discusses modern parking management strategies.



Understanding Parking

Definition

Parking is the temporary storage of vehicles when they are not in motion.

Parking facilities provide designated spaces where vehicles can remain safely until they are needed again.

Parking serves many purposes, including:

- Residential parking
- Commercial parking
- Industrial parking
- Institutional parking
- Public parking
- Recreational parking

Efficient parking systems support both transportation and economic development.

TráficoTest

Madrid Parking Guide: Understanding the Blue & Green Zones

A clear guide to Madrid's color-coded street parking system (SER), including rules, costs, and payment.

Blue Zone (Visitors & Everyone)

Who Can Park: Anyone

Maximum Stay: Up to 4 hours

Primary Use: General public parking

Green Zone (Visitors & Residents)

Who Can Park: Anyone

Maximum Stay: Up to 2 hours

Primary Use: Prioritizes area residents

Pay Mon-Fri (9am-9pm) & Sat (9am-3pm)

Free on Sundays, public holidays, and outside these hours.

Electric Cars Park for FREE

Hybrids up to 75% off

High-pollution cars pay a surcharge.

Use Mobile Apps for Easy Payment

Apps allow remote time extensions and send alerts to help you avoid fines.

Fines Start at €90

Pay within 20 days 50% reduction to €45.

Parking Requirements

Definition

Parking requirements refer to the **number, size, location, and design of parking spaces required to serve a particular land use or development.**

Parking requirements are usually established by local governments through zoning regulations, building codes, and transportation planning standards.

The objective is to provide sufficient parking without encouraging excessive automobile use or wasting valuable urban land.

Types of Parking Facilities

A. On-Street Parking

Vehicles park along public roads.

Advantages

- Convenient access.
- Low construction cost.
- Supports local businesses.

Disadvantages

- Reduces road capacity.
- Increases congestion.
- Creates safety conflicts.
- May obstruct cyclists and pedestrians.



Parking Demand

Definition

Parking demand is the **number of parking spaces required at a particular location during a specific period.**

Demand varies according to:

- Time of day.
- Day of the week.
- Land use.
- Population.
- Economic activity.
- Transportation alternatives.

Parking demand is rarely constant throughout the day.

Factors Affecting Parking Demand

Several factors influence parking demand.

A. Land Use

Different land uses generate different parking needs.

Examples:

- Residential areas
- Shopping centers
- Office buildings
- Hospitals
- Universities
- Airports
- Stadiums

Each type has unique peak parking periods.

Parking Demand Indicators

Transportation engineers use several indicators to evaluate parking performance.

A. Parking Accumulation

The total number of parked vehicles at a specific time.

This indicates how full a parking facility is.

B. Parking Volume

The total number of vehicles using a parking facility during a given period.

C. Parking Duration

The length of time each vehicle remains parked.

Typical categories include:

- Short-term parking (less than 2 hours)
- Medium-term parking (2–6 hours)
- Long-term parking (over 6 hours)

Conclusion

Parking is an essential element of transportation systems and urban planning. Effective parking requirements ensure that adequate parking is provided for different land uses while minimizing negative impacts on traffic flow, safety, and the environment. Parking demand varies according to land use, population, transportation alternatives, and time of day, making careful analysis necessary for efficient planning.

Modern parking management emphasizes sustainable mobility through pricing policies, smart parking technologies, shared parking, and integration with public transportation. By understanding parking demand and applying appropriate management strategies, transportation engineers can create parking systems that support efficient, safe, and environmentally responsible urban development.

THANK YOU!