

Some quick facts about parking and private car ownership...

- ... every car trip/journey starts at a parking space and ends at a parking space*
- ... a privately owned car is used on average 4 % of the hours of the day*
- ... there are approx. 41 million regulated parking spaces in Europe, with additional 190 million unregulated parking spaces available*
- ...the European parking industry generates an annual turnover of approx. 23 billion EUR and provides direct employment to around 500,000 workers*
- ... an estimated 15-20% of smaller and medium-sized European cities still lack regulated parking systems*
- ... in 2021, nearly 80% of total journeys across Europe were made in a private car*
- ... in these journey's an average of 1.2 to 1.9 people occupy passenger cars traveling leads to an average utilization of less than 2 percent of all vehicle seat capacity*
- ... free parking increases solo driving by 60%*
- ... approx. 19 500 new apartments will be built in Sweden 2024 = required 390 000 (243 770) m2 parking space demand*
- ... in Sweden there are 42 m2 living space & 50 m2 parking space / capita*
- ... in Sweden car usage decreases but car ownership increases (in average)*
- ... the average majority car trip length in Sweden is between 3-6 km*
- ... and adding 10 percent more road capacity leads to 3-10 % more vehicle km travelled (induced traffic demand)*





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The cost of parking for affordable housing

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Its unfair to have cities where
parking is free for cars and housing
is expensive for people.

— Donald Shoup —



Myths on parking

#1 Residential parking is not that expensive

#2 Increasing parking in a housing project can develop and protect the character and quality of life in a neighborhood

#3 Affordable housing (in particular) needs more parking

#4 People will own the same amount of cars regardless of mobility service, neighborhood qualities and amount of parking spaces

#5 Adding more parking to a housing development will reduce impact on congestion and traffic flow



Importance of implementing sustainable streetscapes in the local micro-geography

- Green urban nature-based solutions for resilient cities

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SHARE-North Squared (SN²) aims to increase the sustainability, resource and spatial efficiency of real estate developments as well as the affordability of housing by integrating shared mobility as a means of supporting multimodal travel behaviour and for reducing car ownership, car dependency and the demand for parking.

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Keywords

Sustainable streetscapes, Urban nature-based solutions, sustainable development, micro-geography, ecosystem services, resilient cities, SHARE-North squared.

Parking for sustainable cities



- How to understand innovative parking development

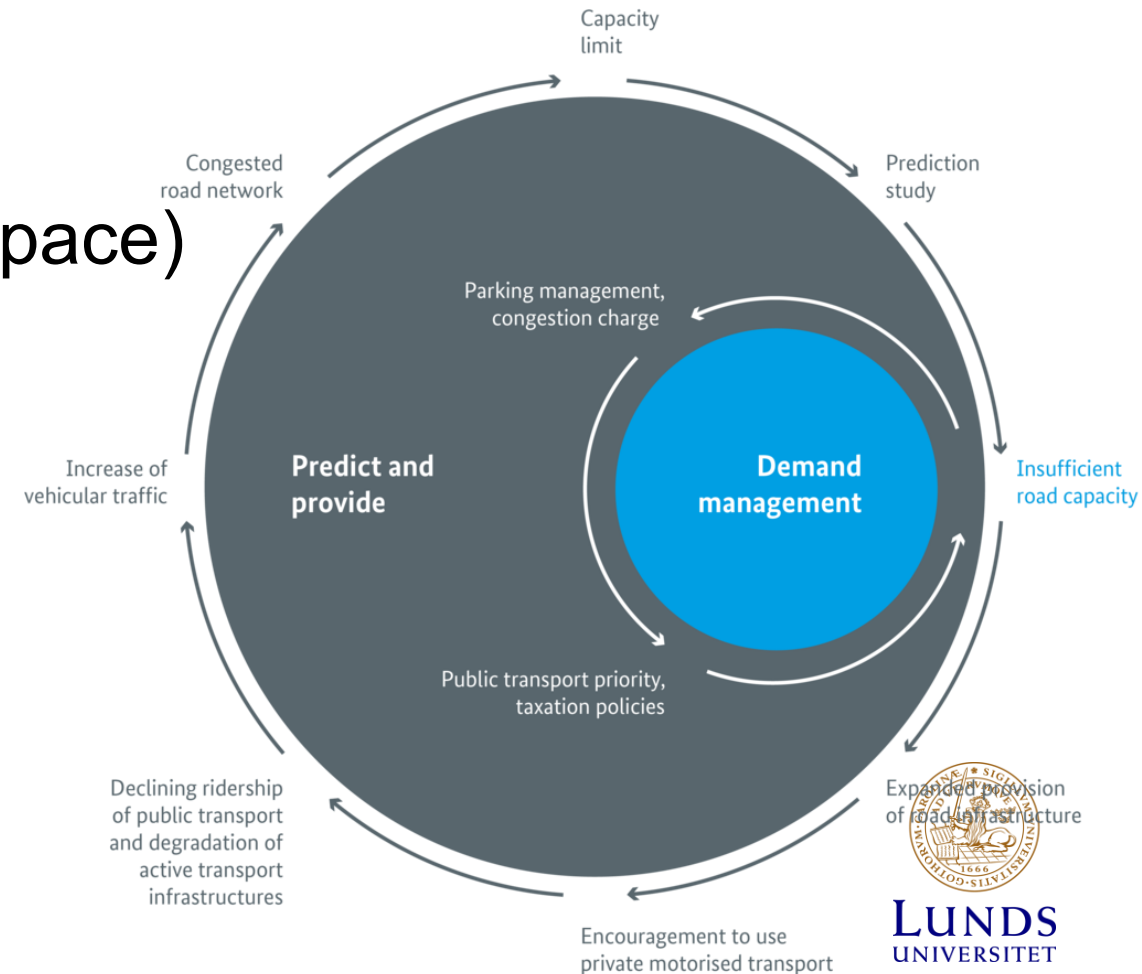
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Issues with high parking pressure

- Challenge of high costs
- Increased competition of valuable urban space (overconsumption of space)
- Traffic congestion and bottlenecks
- Illegal parking
- Reduced quality of life



The high cost of building parking in Europe

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- Surface Parking:

Building a surface parking space typically costs between €3,000 and €5,000 per space

- Multi-Storey Car Parks:

The cost for a space in a multi-storey car park ranges from €10,000 to €20,000 per space

- Underground Parking:

This is the most expensive option, with costs ranging from €20,000 to €50,000 per space, and in some cases, it can go up to €72,000 per space

+ Annual operating costs between 2 % and 8 % of the building costs

Above ground structured parking often costs about US\$10,000 per space and underground parking often costs about US\$25,000 per space (Shoup, 2011)



Effective solutions to reduce parking pressure

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- Smart parking systems
- Dynamic pricing
- Improved public transportation
- Car-sharing
- Bicycle and pedestrian infrastructure
- Parking maximums
- Residential parking permits
- Shared parking



High cost of building parking in Sweden

Type of parking	Construction cost (Euros/parking space)	Example of cost for 100 new parking spaces
On-ground (asphalt parking)	2 000–3 000 Euros	200 000-300 000 Euros
Parking house	7 000–10 000 Euros	700 000-1 000 000 Euros
Parking garage (1 level underground)	30 000–75 000 Euros	3 000 000-75 000 000 Euros

Fig. 2: Example of construction cost in Sweden depending on parking options (Norrköpings kommun, 2015)

Expected cost in Stockholm (Stockholmshem) when producing parking spaces is approximately 400 000 SEK (40 000 Euros) in a garage (more common in new construction) and 75 000 SEK (7 500 Euros) outdoors per parking space.

Expected cost in Umeå (Umeå parking AB) for 1 parking space in a parking house SEK 250 000-350 000 (25 000 – 35 000 Euros)

Who will pay?

What influences parking building cost

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- Type of parking
- Location
- Construction materials and methods
- Reduced Housing Supply
- Higher Rent and Purchase Prices
- Inefficiency and underutilization
- ... among many many other factors...



Factors behind influencing the cost of building parking spaces

- Regulatory requirements (*example Germany*)
- Land costs (*example Netherlands*)
- Construction materials and methods (*examples France & Italy*)
- Environmental considerations (*example Scandinavia*)
- Operational costs (*example Switzerland*)

Minimum parking requirements

- Increased costs
- Inefficient land use
- Environmental impact
- Inflexibility economic inefficiency



Alternatives to minimum parking requirements

- Flexible parking requirements
- Shared parking
- Parking maximums
- Improved transportation alternatives
- Car-sharing programs/initiatives
- Landscaped reserves
- Unbundling parking

which basically means separating the cost of parking from the cost of renting or owning a home



Unbundling parking

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which basically means separating the cost of parking from the cost of renting or owning a home

- Reduced housing costs
- Encourages alternative transportation
- Decreased car ownership
- More efficient land use
- Environmental benefits
- Economic (equitable) efficiency



Flexible parking norms and mobility measures

- *Is a local strategy for municipalities to let the developer decide the total number of parking places in a new housing development area, other than what the local parking policy suggests, in order to promote sustainable mobility measures for accessibility to other transport modes and to reduce car dependency*
- *Important factors in consideration: tenant target group, localization of project, accessibility to public transport and other service functions*

Hard measures and services	Soft measures and services
Provide parking for car- and bicycle sharing	Provide membership in car- and bicycle sharing and travel coach
Intelligent delivery boxes for home deliveries (of both food and goods)	Discount public transport, rental cars and taxi



Figure 4. Table of expected population increase through urbanisation, car ownership parking figures and expected need for parking space in the form of football pitches.

Urbanization (population growth)	Car ownership (441 cars/1,000 inhabitants)	Parking number (parking lot/apartment)	Expected need for parking space
1 000 inhabitants	441 cars	1	1.2 football pitches
		0.5	0.6 football pitches
		0.3	0,37 football pitches
10 000 inhabitants	4 410 cars	1	12 football pitches
		0.5	6 football pitches
		0.3	3,7 football pitches
25 000 inhabitants	11 025 cars	1	31 football pitches
		0.5	15.5 football pitches
		0.3	9,2 football pitches
50 000 inhabitants	22 050 cars	1	62 football pitches
		0.5	31 football pitches
		0.3	18,5 football pitches

Green space instead of parking space

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441 cars X 20 m² = 8 820 m² / 10 000 (1 hectare) = 0.9
ha X 19 tonne CO₂-uptake (per hectare) =
17,1 tonne loss of CO₂-uptake per year due to parking
space instead of green space



What is the potential of efficient parking policies and sustainable mobility can have in reducing building costs and increasing affordable housing?

- Reduced construction costs
- Increased land availability / Land utilization
- Sustainable urban development & Encouragement of alternative transportation
- Higher density development
- Environmental benefits
- Economic efficiency & Revenue generation
- Improved quality of life



Busting myths on parking



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Thank you!

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