



# **Car Parking Strategy**

**Gehl**

Client:

Fonds Kirchberg  
[www.fondskirchberg.lu](http://www.fondskirchberg.lu)

**FONDS KIRCHBERG**



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# Prologue

The main purpose of the Parking Strategy is to outline how the management of car parking can support the delivery of the Public Space Network Plan for Kirchberg, and in effect contribute to keeping Kirchberg accessible. The Parking Strategy contains a broad range of recommendations related to carparking supply and demand.

Important input to the strategy has been provided through interviews and workshops with key stakeholders such as The City of Luxembourg, The Ministry for Development and Sustainability, residents and workplaces in Kirchberg. Furthermore IMS has been so kind to share data from their 2018 “Positive Drive” campaign in Kirchberg.

## A part of a bigger project

### The Public Space Network Plan

The objective of the overall plan document is to deliver a holistic and people centered public space network for the whole of Kirchberg area, that can serve as a tool to manage future development. The public space plan is anchored in local user patterns, identities and environments through an analysis of the potentials and challenges in the existing built fabric and planned projects.

### Toolboxes and guidelines — delivering the Plan

The Public Space Network Plan is the main frame for the project, and more specific topics - like urban furniture - will be unfolded and explained further in related toolboxes and strategic documents.

### Kirchberg Cases — applying strategies and tools

Strategies and tools are applied in depth to selected Kirchberg sites, illustrating how the tools can be combined to create synergies and how different strategic moves are balanced.



# Introduction

## Why focus on car parking?

The overall purpose of this work is to contribute to making a Kirchberg Area that is attractive to live in, work in, and visit – thereby also making an area that is attractive to invest in. One crucial element in achieving this is a high quality public space network. Then **why** a focus on car parking and car parking management? Because car parking affects quality of life and the use of the public space in many ways, including:

- Convenience of access to work, shops and homes
- Amount of people in the public realm
- The distribution of space including the amount of development that can occur on a given amount of land
- Development costs, and therefore future costs of owning and renting buildings to businesses and residents
- Motor vehicle ownership and use, and therefore pollution emissions, traffic accidents and traffic congestion

An overriding concern for Kirchberg is to keep the level of congestion down – or in other words: **to keep Kirchberg accessible**. Today there is simply too much car traffic to and from Kirchberg due to:

- Geography: Kirchberg is like an island with – in reality - only 2 entry points for cars
- Mix of functions: Unhealthy balance between workplaces and housing (too many workplaces create a relatively high volume of trips to/from)

- Historically a lack of high quality public transport
- A strong tradition of car focused planning including too many free and/or easily accessible car parking spots

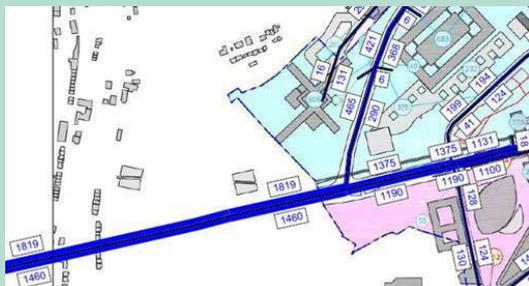
High car use is further promoted through national regulations such as low tax on gasoline and tax policies related to issues such as company parking and company cars.

Based on current trends the car traffic is only going to increase. As a result, Kirchberg’s economic growth is in danger of being constrained by growing congestion and parking problems.

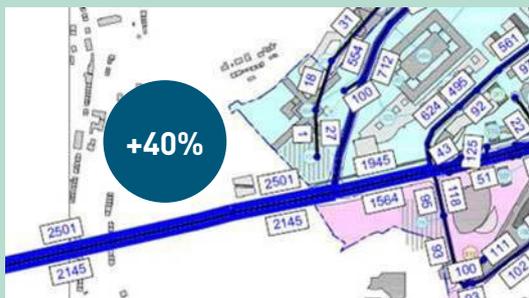
To address this, Fonds Kirchberg is working together with partners on improving the mix of functions and the quality of the public transport and cycling. By including a parking strategy in the work of Gehl, the Fonds is also taking steps toward a more focused management of the parking in Kirchberg.

Data presented later in this report indicates that Kirchberg currently has more parking spaces per capita (worker or residents), lower parking prices, and less parking management than peer cities. The strategies described in this report are commonly applied in attractive, successful cities around the world.

Red Bridge entrance: Evening peak 2018



Red Bridge entrance: Longterm Low ratio Evening peak



Modelling of expected motor vehicle volumes, afternoon peak hour. +40% increases expected. TR Engineering 2018

“In all five cities [Zurich, Vienna, Berlin, Munich & Hamburg red.] parking management has been the most important local government policy to discourage car use, especially in the central city”

Buehler et. al., “Reducing car dependence...”, p. 24.

# Carparking Paradigms

Old paradigm	New paradigm
Parking problem means inadequate parking supply.	There can be many types of parking problems, including inadequate or excessive supply, too low or high prices, inadequate user information, and inefficient management.
Transportation means car driving.	Travelers may use various modes. Not everybody drives a car.
Abundant parking supply is always desirable.	Too much supply is as harmful as too little.
Parking demand should be satisfied on-site. Walking distances should be minimized.	Parking can often be provided off-site, allowing sharing of parking facilities among various destinations.
Parking should generally be provided free, funded indirectly, through rents and taxes.	As much as possible, users should pay directly for parking facilities.
Parking should be available on a first-come basis.	Parking should be regulated to favor higher priority uses and encourage efficiency.
Parking requirements should be applied rigidly, without exception or variation.	Parking requirements should reflect each particular situation, and should be applied flexibly.
Innovation faces a high burden of proof and should only be applied if proven and widely accepted.	Innovations should be encouraged, since even unsuccessful experiments can provide useful information.
Parking management is a last resort, to be applied only if increasing supply is infeasible.	Parking management programs should be widely applied to prevent parking problems.
Land use dispersion (sprawl) is acceptable or even desirable.	Dispersed, car-dependent development can be harmful.

## Paradigm changes in parking solutions

The movement towards a new paradigm changes the way parking problems are defined and solutions evaluated. It favors reduced parking supply and more efficient management so fewer spaces are needed to serve each area. Parking management is increasingly designed to support a specific city vision, not as a "given thing".



## Car congestion is real - and will only get worse

Avenue John F. Kennedy seen from Rue Marcel Fischbach at 17:50 on a Monday evening (June 4th 2018). Current trends will increase traffic problems, unless transportation management policies such as parking management are implemented

# Purpose

The purpose of this document is dual:

1. To provide an overview of both the current and the expected future parking situation in Kirchberg.
2. To provide recommendations for a parking management strategy for Kirchberg, a strategy that can support the vision for the public life network plan in the best possible way and contribute to keeping Kirchberg accessible.

This strategy consists of the following sections:

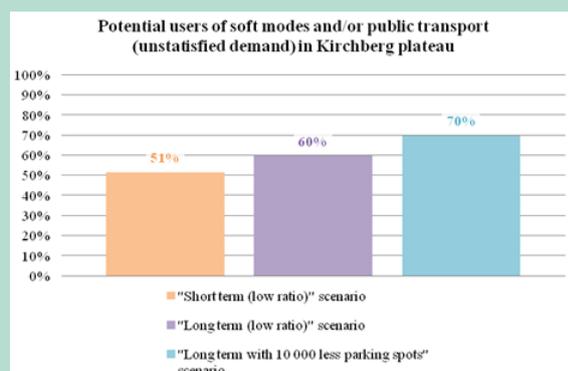
- Parking inventory including comparisons with parking in other European cities
- Parking Strategy recommendations
- An illustration of the potential effects of parking management
- How to get started

The parking strategy is both a stand-alone document and a sub-theme to the overall public network plan that Gehl has developed in close cooperation with the Fonds. Todd Litman from the Victoria Transport Policy Institute has been part of the Gehl team working on the parking strategy.

**“There is a one-word answer to why the streets of Los Angeles look so different from London and why neither city resembles Tokyo: Parking”**

The Economist: How not to create traffic jams, pollution and urban sprawl (2017)

## Effect of 10,000 less parking spots



TR-Engineering has done a modelling of how 10.000 less parking spots in Kirchberg will affect mode choice. This is estimated to increase the mode share of cycling, walking and public transport from 60% to 70%. Based on the assumptions behind the modelling, such a reduction in parking will approximately result in a decrease of 30.000 daily cartrips (per working day).

# Stakeholder Inputs

Stakeholder input on the challenges and possibilities related to car parking was provided throughout the project, starting with a workshop on car parking in October 2017. Below are highlighted some of the **challenges** and **potentials** mentioned during workshop.

Car parking is the key for modal shifts.

Different administrations have different approaches.

Have the political courage to make parking less attractive.

What should be done to the enormous numbers of existing parking?  
Regulation changes?

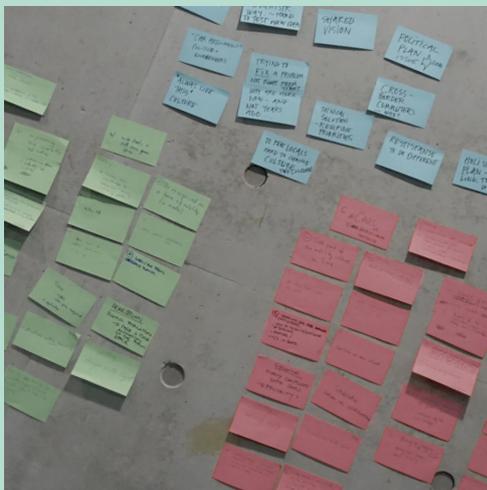
Car parking reductions -> reductions in cars driving.

Short-time parking and strategical "kiss and ride".

There is pressure on private actors (developers) to increase the numbers of places for cars.

Employee parking is not a taxable benefit, whereas company cars are subsidized and represent 50% of all new cars.

The elderly and disabled get easy and secure access to infrastructures and other public places.



Discussion and identification of challenges and possibilities related to car parking during stakeholder workshop, October 2017



A photograph of a row of cars parked in a lot, viewed from a low angle. The image is overlaid with a semi-transparent blue filter. The text '1/ Parking Inventory' is written in white, bold, sans-serif font across the center of the image. The cars are parked in a line, and the background shows green trees under a clear sky.

# 1/ Parking Inventory

# 1/ Parking Inventory

## The current parking situation in Kirchberg

This section provides an overview of the current parking situation in Kirchberg. This also includes an overview of the prognosis for parking in the full build-out scenario for Kirchberg and international comparisons.

### 1.1/ Roles and responsibilities

A wide range of actors are involved in decisions on parking in Kirchberg. The national level through two ministries and the City of Luxembourg are main actors as they are responsible for the legislative framework. Apart from Fonds Kirchberg other important actors are the EU-institutions, other large employers, developers and cultural and commercial institutions such as the Auchan Shopping Centre.

The City decides and collects the fees for all surface parking in public space, including providing licenses to residents. Generally Fonds Kirchberg is owner (or will be owner in the future) of the public garages ("Place de l'Europe", "Trois glands", "Coque 2" and the future "P&R Serra"). The garages are built and managed by an external operator. Enforcement regarding the publicly owned parking is the responsibility of the City and the police. Changes regarding public surface parking will normally happen in cooperation between the City and the Fonds.

There are large amounts of privately owned parking in Kirchberg, some belongs to companies, some to residential developments and others to commercial actors such as the Auchan Shopping Centre. It is the responsibility of these actors to manage the parking and decide if it is reserved for internal use or rented out either by the hour or on more long term agreements.

Legislation regarding tax rules on issues such as company cars, access to free carparking, provision of employee mobility passes, e-bikes or employee based cash-out of the value of a free car parking spot, etc is an important driver for the demand for parking spots. Such legislation is a national matter.

Norms concerning the amount of parking in new developments depend of the City of Luxembourg as the city holds the PAG and grant building permits. The Fonds is implementing the norms in a dialogue with developers. However, sometimes a new development (or redevelopment) involves a degree of negotiations between the City or/and the Ministry and the relevant developer/ workplace. The developers in general aim for the absolute maximum amount of parking spots within the existing norms. The exact location of the parking is proposed to the city by the developer after a consultation with the Fonds

Regarding residential developments it is normally the developer who decides if housing units are sold together with a parking spot (bundled) or if you can buy a unit without having to buy or rent a parking spot (unbundled). Though the Fonds has the option of influencing this decision by asking for the unbundling of the parking and the housing unit in calls for proposals.

# Many actors involved in parking in Kirchberg



## 1.2/ Types of parking

Kirchberg offers all kinds of parking, much of it in construction and of very high quality. Though there is also still a considerable amount of surface parking.



Good access, high quality, Philharmonie parking



Underground parking (New)



Tailormade to different users



Parking Entrances



Underground parking (Old)



Surface Parking



Parking along streets

## 1.3/ Price for parking

As part of this work, Kirchberg parking prices have been explored (construction AND land costs). The following are rough estimates:

### Construction prices:

Standard unit prices (construction AND land costs):

Surface parking; 4,000 €/spot

Underground parking; 30,000 €/spot

### User fees:

The user fees for public parking are currently in this range (2018 prices):

- On-street (meter) = 0.5-1 €/hr.
- On-street (license for residents) = Free 1st Year, 60€ to 120€ subsequent yrs.
- Off-street (hourly) = 1.6-1.8 €/hr. (based on Trois Glands, Place de l'Europe & d'Coque)
- Off-street (yearly) = 1736 €/yr. (based on Trois Glands, Place de l'Europe and d'Coque)

How much the people working in Kirchberg pay for parking varies considerably. Some people park on the street and pay the meter price each day. Other people receive free parking at their workplace yet pay for parking at work, and yet again others park at the Auchan shopping centre and go there every third hour to adjust the parking disc. This parking is free in monetary terms but is paid for with time (the time used to walk back and forth).

IMS data from companies in Kirchberg includes the following examples on parking prices paid by employees:

- Provided for free
- User fees ranging in between 25 € and 60 € per month (300-720€/yr.)\*

A parking fine is the cost of 24 €

### Danish unit prices for comparison - construction and operations

(Converted from DKR: 1000 DKR equals 130 Euros)

Parking type	Construction	Maintenance & Operation
<b>Surface Parking</b>	[Eur/parking spot]	[Eur/parking spot/year]
Street	2 600 to 3 900	130 to 260
Parking Area	2 600 to 3 900	
<b>Parking Structure above ground</b>		
Traditional parking garage (closed)	19 500 to 22 750	150 to 200
Traditional parking garage (open)	9 750 to 13 000	150 to 200
Multifunctional parking garage	22 750 to 26 000	150 to 200
Underneath urban space / development	19 500 to 26 000	150 to 200
Underneath landscape	19 500 to 26 000	150 to 200
Automatic parking garage	26 000 to 39 000	390 to 650
Temporary parking garage	6 500 to 9 750	150 to 200
<b>Parking structure below ground</b>		
Under building	32 500 to 45 500	325 to 390
Under urban space	52 000 to 91 000	390 to 520
Under courtyard	22 750 to 39 000	325 to 390
Automated parking below ground	65 000 to 91 000	390 to 780

Cost of constructing and operating parking.  
Source: Parking and Urban Quality - Inspiration catalogue, Real Dania 2014 (In Danish)

Table 1: Expenses for parking operations	
[Eur/parking spot/year]	
Cleaning, security etc.	105
Maintenance	93
Salaries	40
Mandatory service agreements	20
Overhead	12
<b>In total - operation</b>	<b>270</b>

Operational costs. Costs from the newly developed area Ørestad, Copenhagen Source: City of Copenhagen

# 1.4/ Amount of parking

Kirchberg currently (2018) has about 27.500 parking spots. Best possible estimations by the Fonds show that by 2038, this number will have grown to somewhere between 39.500 and 42.000 parking spots, when looking at the low- and high-rate prognosis respectively.

The figure below is showing the "official Kirchberg prognosis for parking". This prognosis is based on expectations related to development in traffic conditions, housing, workplaces, population etc., but does not take into account the possibility of an active parking management programme. Chapter 3 illustrates the consequences of different levels of parking management, using this prognosis as the baseline.

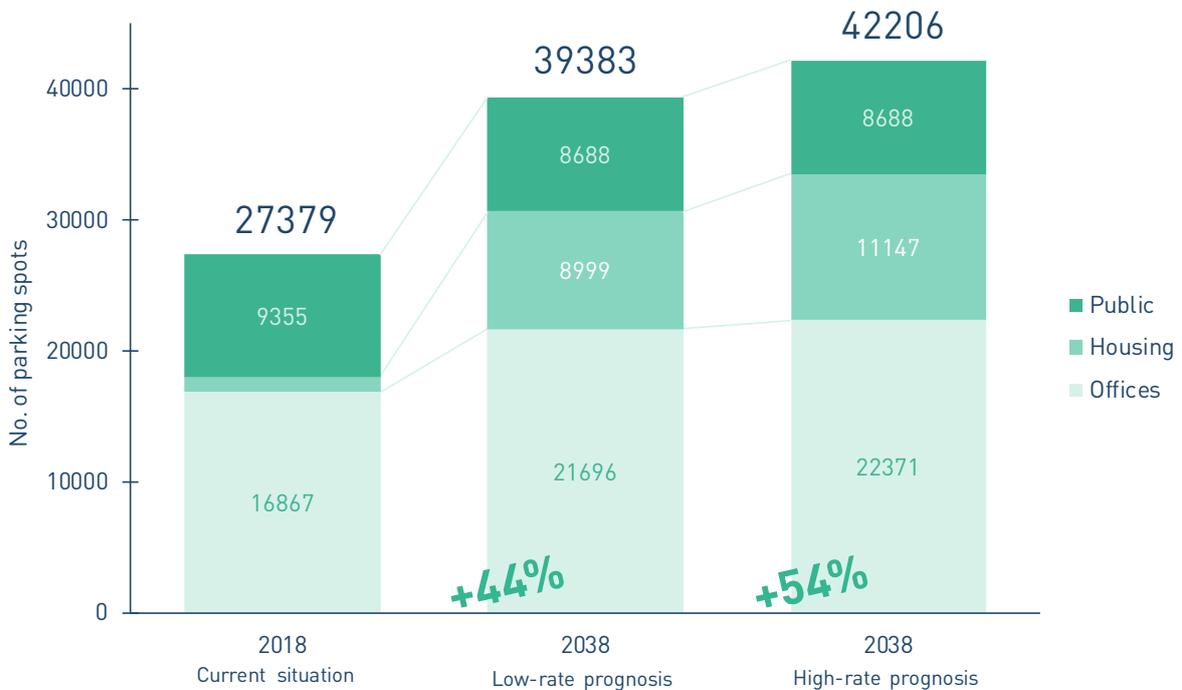
The figures presented on the next page summarize at district level A) the proportions of private office parking, private housing parking, and public parking and B) how the parking is distributed between surface and underground parking. These figures illustrate both the current situation and the prognosis.



Underground Parking



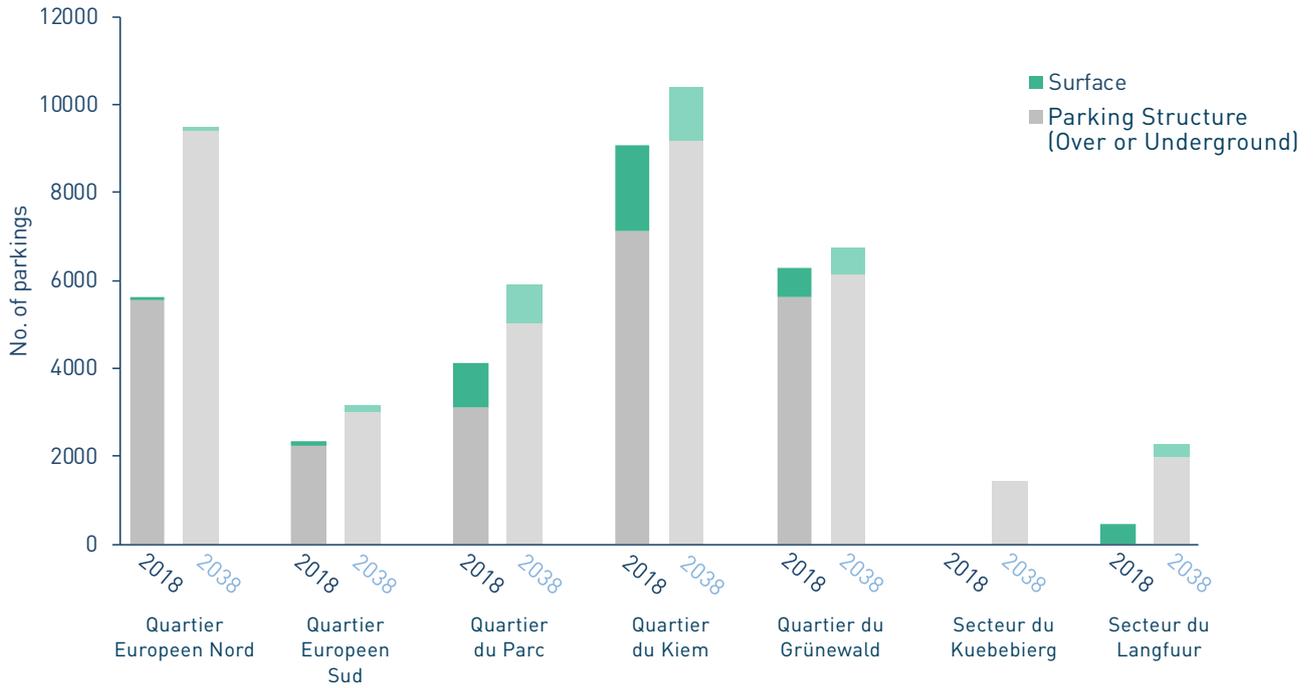
Surface Parking



### Current car parking prognosis for Kirchberg

Parking prognosis for 2038, where the low-rate (*ratio faible*) is estimated with 0.8 spots per residential unit and 1 spot per 300m<sup>2</sup> office floor area. The high-rate (*ratio élevé*) is estimated with 1.2 spots per residential unit and 1 spot per 175m<sup>2</sup> offices [source: FUAk, 2018].

PARKING INVENTORY



**In structure vs. surface parking**

The current and predicted allocation of parking in the different quartier/secteurs in Kirchberg. The parking is further divided into parking structures (below or above ground) and surface parking. The parking prognosis for 2038 is built on the low-rate prognosis (*ratio faible*) [source: FUAk, 2018].



**Allocation of parking types in Kirchberg**

The current- and predicted allocation of public-, housing- and office parking in each quartier/secteur. The parking prognosis for 2038 is built on the low-rate prognosis (*ratio faible*) [source: FUAk, 2018].

# 1.5/ Capacity use

In Kirchberg, numbers on the amounts and types of car parking are very detailed and thorough, whether current numbers or projected.

### Parking occupation rate is a puzzle:

- Capacity use for public parking garages in real time can be found online
- Sources for capacity use of on-street public parking and surface residential parking are Gehl surveys and a special study by Lux Plan concerning the Grunewald area
- Sources for capacity use at workplaces are information from companies delivered to IMS
- Sources for capacity use at garages linked to private housing are conversations with residents and sample observations

### The overall picture:

- On-street public parking is in high demand, partly because it is used for long term parking during work hours, both by people working in Kirchberg and by people parking in Kirchberg as "P&R" and then continuing to more central areas by public transport or bike
- It is difficult to generalize regarding workplaces - some have free capacity, others not. The general "feeling" among the companies seems to be a lack of parking
- Capacity is available for residents
- Cultural and commercial destinations have available capacity
- To some degree, different user groups share facilities, i.e. workplaces renting spaces for the day at Auchan or at public parking garages, and less formally by commuters parking at the Auchan or residents renting out their spot during the day. Security concern is cited as a reason why facilities like EU institutions do not share parking. These conclusions are preliminary and are based on samples rather than district wide detailed counts.



**81%**  
 occupancy rate  
 during office hours at the  
 company provided parkings\*  
 According to the  
 companies themselves

\*Average number [Source: IMS Company Parking Survey, 2018]

Luxembourg city "real-time" information on parking occupancy (includes several garages in Kirchberg):

**TROIS GLANDS**

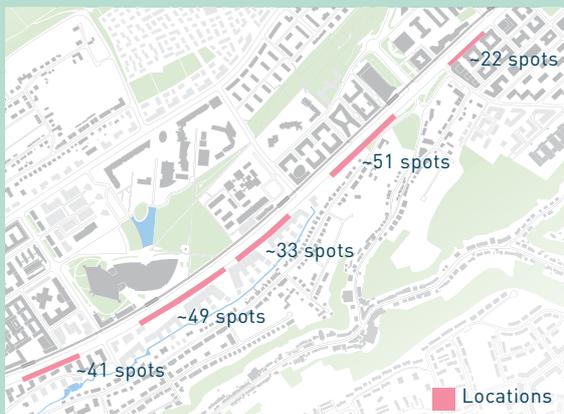
Capacité	Occupation	Libre	Tendance
500	65%	177	→

Icons for: Disabled (3), Family (6), Bicycles (10), Motorcycles (4), Euro, Visa, MasterCard, American Express, 2.0, 3.5, and vehicle restrictions (Vehicules A Carburant G.P.L., Vehicules A Carburant G.N.C.).



Real time occupation for Trois Glannds parking Source: <https://www.luxembourg-city.com/en/plan-your-stay/traveller-information/car-parks>

## On-street registrations in Kirchberg



Gehl on-street parking occupancy registration has been done along the JFK



Lux Plan parking occupancy registrations in Grunewald

## 1.6/ Rules and regulations on parking

The parking norms in Kirchberg have historically resulted in large amounts of parking in the area. Although the requirements have been significantly reduced in recent years, similar to most other major cities.

The City of Luxembourg is responsible for deciding the norms, which are implemented by Fonds Kirchberg.

Current Kirchberg parking norms (from 05/10/2017)\*:

- Min. 1 car parking per single-family home
- Min. 0.8 car parking (and max. 1.2) per unit in multi-family houses
- Min. 1 car parking per 300 m<sup>2</sup> (and max. 1 per 175 m<sup>2</sup>) offices (usable area)
- 1 car parking per 150 m<sup>2</sup> industrial buildings (usable area)
- 1 car parking per 100 m<sup>2</sup> shops / restaurants (usable area)
- 1 car parking per 3 rooms in Hotels / Hospitals / Elderly homes etc.
- For pilot projects related to housing a parking norm of zero is possible

Former Kirchberg parking norms (until 05/10/2017)\*:

- Min. 1 car parking per housing unit / apartment
- Min. 1 car parking per 125 m<sup>2</sup> offices (usable area)
- Min. 1 car parking per 75 m<sup>2</sup> shops / restaurants (usable area)
- Min. 1 car parking per 3 rooms in hotels

\*[Source: FUAk, 2018]

### Kirchberg's history of parking regulations

#### The History of Kirchberg requirements:

**Today:** Minimum: 1 spot per 300 m<sup>2</sup>, maximum: 1 spot per 175 m<sup>2</sup>  
**5 years ago:** Minimum: 1 spot per 125 m<sup>2</sup>  
**15 years ago:** Minimum: 1 spot per 50 m<sup>2</sup>



Kirchberg in the 1970s. Plenty of parking and a freeway serving the area.

Ville de Luxembourg



#### Plan d'Aménagement Général (PAG)

##### Partie écrite

Vote du conseil communal en date du 28 avril 2017

Approbation du Ministre de l'Intérieur en date du 5 octobre 2017

Arrêté du Ministre de l'Environnement, MDDI – Dép. Environnement en date du 5 octobre 2017

"The PAG". The official planning document from the City of Luxembourg containing the parking requirements

## 1.7/ International comparisons

Parking comparisons with districts in cities with a living standard comparable to Luxembourg show a clear pattern: the use of car parking in Kirchberg is the most attractive. The next couple of pages show comparisons with new city districts in cities such as London, Vienna, Malmö and Copenhagen. Parameters compared are price for parking, requirements for parking and current amount of parking.



Canary Wharf, London, huge increase in workplaces without any significant increase in parking. Source: <https://www.parkme.com/en-gb/lot/113357/canada-square-parking-london-uk>



Ørestaden, Copenhagen. All parking in centralized structures owned by the publicly owned development company.



Aspern Seestadt, Vienna. An example of an area with a broad mobility management programme

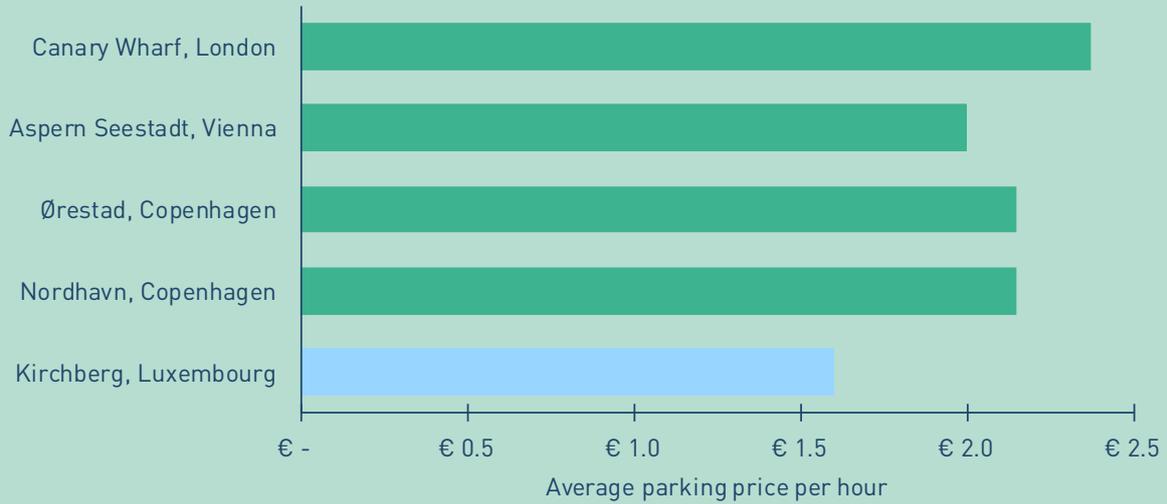


Zurich. Picture from Sihl City Shopping and residences, a best practice case for mobility management.



Västra Hamn, Malmö. A new residential area developed at old harbour areas, centralized parking.

## Hourly parking prices



### Off-street parking

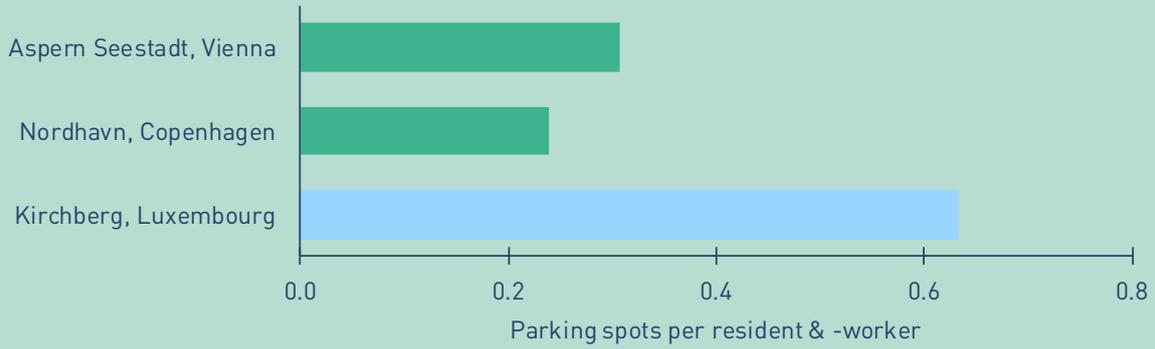
Average (assumptions) hourly fees of off-street parking during weekdays at daytime [Source: Peer Parking Policy Survey, 2018 & FUAk, 2018].



### On-street parking

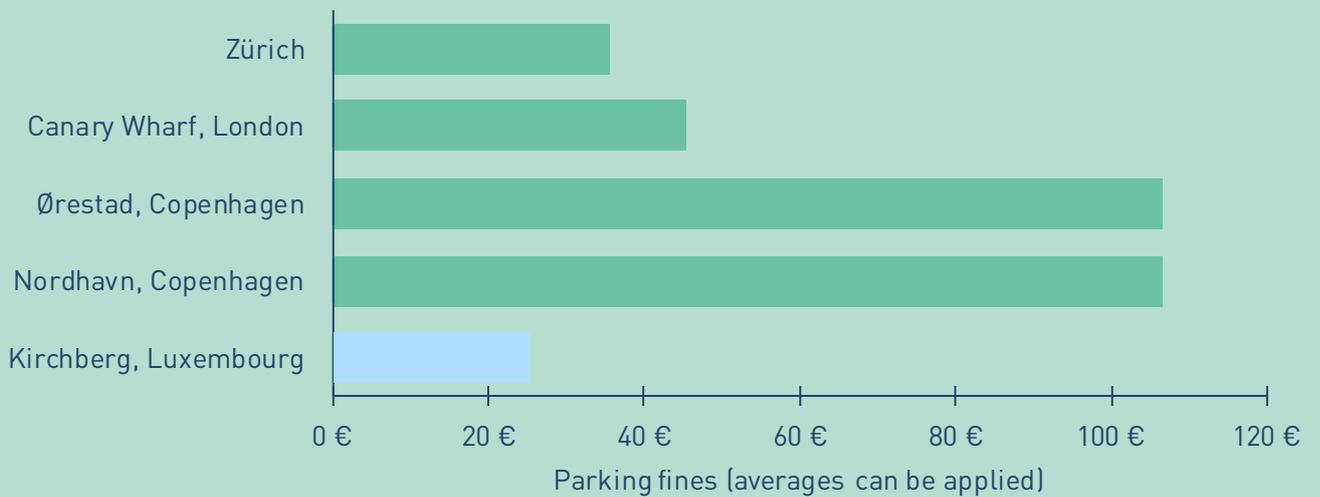
Average (assumptions) hourly fees of on-street parking during weekdays at daytime [Source: Peer Parking Policy Survey, 2018 & FUAk, 2018].

## Parking spots per person

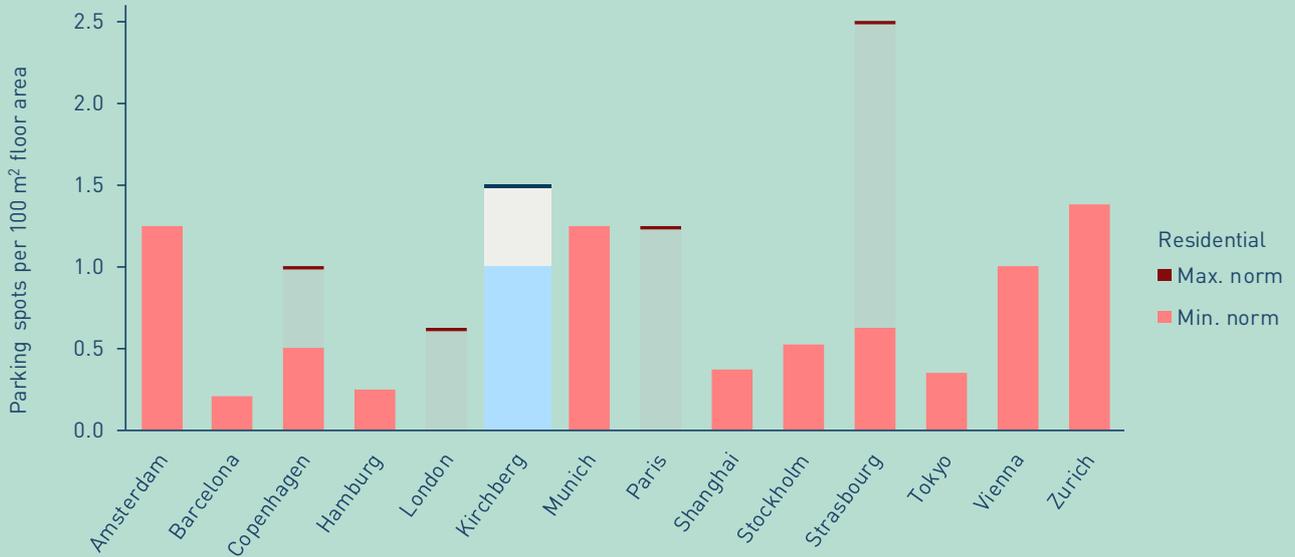


Current no. of parking spots per resident & worker, compared to 'similar' districts in Vienna and Copenhagen [Source: Peer Parking Policy Survey, 2018 & FUAK, 2018].

## Parking fines

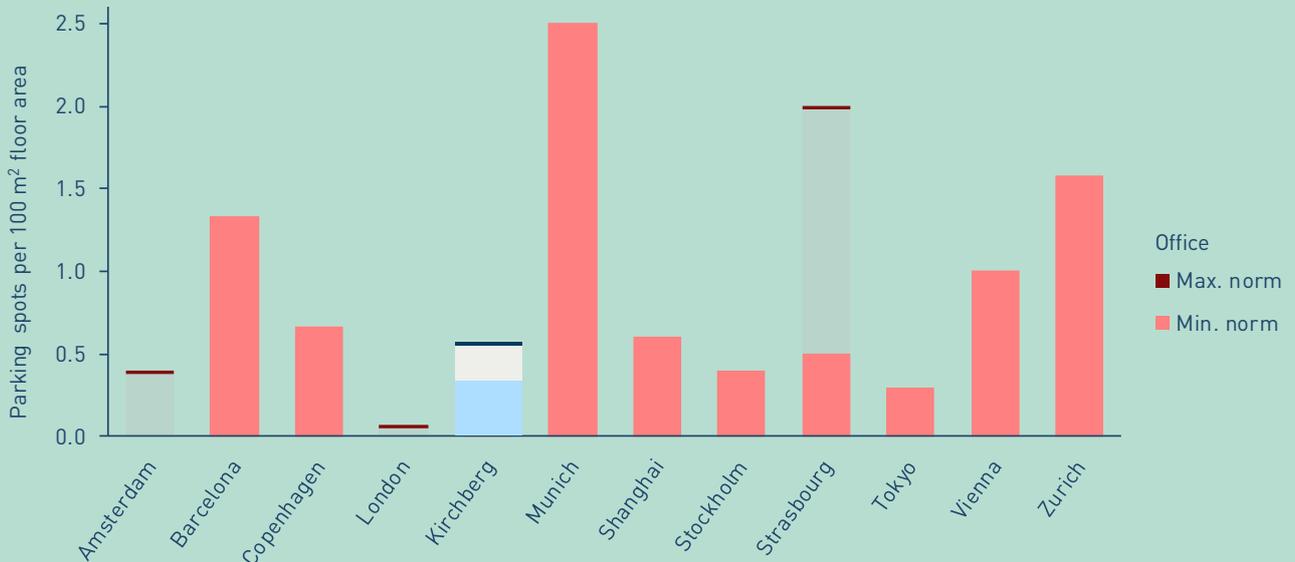


# Car parking norms



## Residential

An international comparison of residential maximum and minimum car parking norms. An average apartment unit size of 80 m<sup>2</sup> has been assumed when the parking norms have been given in parking spots per unit size. An average of 3 rooms per apartment unit has been assumed, when the norm has been given in parking spots per room. Sources are given at the bottom of the page\*.



## Office

An international comparison of office maximum and minimum car parking norms. Sources are given at the bottom of the page\*.

\* [Sources: M. Kodransky & G. Hermann, 'Europes Parking U-Turn: From Accommodation to Regulation', 2011. The City of Copenhagen, <https://kp15.kk.dk/artikel/parkering>, 2018. Transport for London, 'Residential Parking Provision in New Developments', 2012. Baudirektion Kanton Zürich, 'Wegleitung zur Regelung des Parkplatz-Bedarfs in kommunalen Erlassen', 1997. Wirtschaftskammer Österreich, <https://www.wko.at/service/w/verkehr-betriebsstandort/Stellplatzverpflichtung-in-Wien.html>, 2018. Institute for Transportation & Development Policy, 'Parking Guidebook for Beijing', 2015. FUAK, Kirchberg parking norms, 2018].



A photograph of a row of cars parked in a lot, viewed from a low angle. The image is overlaid with a semi-transparent blue filter. The text '2/ Parking Strategy' is written in white, bold, sans-serif font across the middle of the image. The cars are parked in a line, and trees are visible in the background.

## 2/ Parking Strategy

## 2/ Parking Strategy

### An action plan for Kirchberg

The historic approach in Kirchberg as expressed during a workshop:

**“In Kirchberg we have a history of first building the parking and then having to solve the traffic”**

This approach cannot continue if the goal is to keep Kirchberg accessible by car. The approach must therefore be the other way around, with this starting point: What is the traffic pattern that best supports the vision for Kirchberg, e.g. an increased marketshare for the alternatives to solo-car driving. And then (among many other measures) the task is to define how a parking strategy can help promote such a traffic pattern in the best possible way.

Furthermore, a parking strategy for Kirchberg should focus on much more than transport - it should also focus on how parking can support a better public space and more attractive neighborhoods.

#### Parking recommendations

The strategy recommendations consist of the following 10 sub-strategies:

- #1 Enforce & experiment with requirements
- #2 Share the parking
- #3 Regulate more efficiently
- #4 Ensure fair & efficient pricing
- #5 Improve alternatives to solo car driving
- #6 Improve user information
- #7 Avoid 'garage architecture'
- #8 Introduce contingency-based planning
- #9 Remember the existing parking
- #10 Ensure ability to deliver

The following pages present the 10 sub-strategies, with a range of specific recommendations and examples. Each recommendation is presented with an implementation bar, see more below.

#### Who should act?

An “implementation bar” is introduced on the next pages. Not as a final verdict but *to indicate* who are the central partners when it comes to implementing the recommended actions and kind of role (legal, “influencer” or both):

Role:

- Legally entitled body
- Main influencer
- Potential to influence

Example:

Legal Body	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>				
Influencer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Country	City	FUAK	Developer	Owner	User	Police



## 2.1/ Enforce & experiment with requirements

Reduced and more flexible parking requirements can provide large financial savings. By giving managers an incentive to implement parking and transportation management strategies, reduced and more accurate parking requirements can reduce parking demand and vehicle trips. Reductions of 10-20% are common, and increases if implemented as part of an integrated parking management program.

However, reduced parking supply may reduce car drivers' convenience and lead to spillover problems, and where alternative travel and parking options are inadequate, it may reduce the area's attractiveness and therefore the economic competitiveness.



EU institutions and other workplaces are sometimes “as an exception” allowed more parking than stated in the requirements

### A Enforce existing requirements

The parking requirements in Kirchberg have recently decreased. Short term focus should be on enforcing the new requirements and to grant less exceptions.

#### Implementation



### B Experiment with requirements

Partner up with developers on experiments involving developments with lower requirements, to test and illustrate what is possible.

#### Implementation



## BEST PRACTICE

### Ohboy - P0, Sweden



Experiment with parking requirements  
The Ohboy building in Malmö by Hauschild+Siegel is testing a car parking norm of 0 combined with high quality conditions for alternatives to the car.

The Ohboy house in Malmö was developed in a cooperation between the city and the developer. The goal was to provide and test good mobility options in a new development with a car parking norm of zero. The building has 55 apartments and 31 hotel rooms. The wider door openings and extra parking spaces make it possible to bring a cargo bike all the way to the fridge. Service stations make it easy to keep the bike clean, pumped and in good condition. An inhouse bicycle share system with specially built cargo bikes covers needs for transportation of goods and friends. Delivery boxes make online shopping convenient. Discounts on public transport and a car-share membership are also part of the concept. All of the apartments quickly sold out.

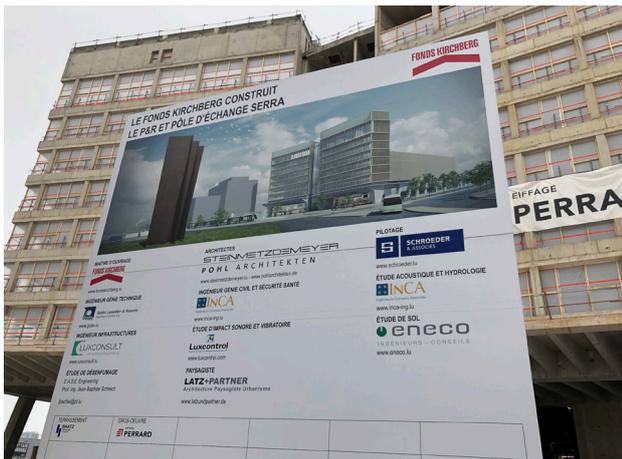
## Norm Adjustments

Factor	Typical adjustments
Residential density	Reduce requirements 1% for each resident per acre*.
Employment density	Reduce requirements 10-15% in areas with 50+ employees per gross acre*.
Land use mix	Reduce requirements 5-10% in mixed-use areas, and more if parking can be shared.
Car-sharing	Reduce residential requirements 5-10% if a carsharing service is located nearby, or 4-8 spaces for each carshare vehicle in a residential building.
Walking & Cycling	Reduce requirements 5-15% in walkable and bikable communities, and more if walkability allows more shared and off-site parking.
Pricing	Reduce requirements 10-30% where parking for end-users represent the real cost through user-fees (revenues pay parking facility costs), unbundling (parking rented separately from building space), or parking cash-out (non-car drivers are offered benefits equivalent to parking subsidies to car drivers).
Public Transport & CTR program	Reduce requirements 20-40% at worksites with high quality Public Transport or/and Commute Trip Reduction programs.
Proximity to overflow options	Reduce requirements 10-20% if reserve parking options are available nearby in case of overflow/sudden peaks in demand.
Contingency-based planning	Reduce requirements 10-30%, and more if contingency-based parking management allows developers to minimize their parking supply.

### Minimum parking norm adjustments

An example from the US on parking requirement adjustment factors. Source: Todd Litman, VTPI.

\* 1 Acre = 4047 m<sup>2</sup>



Offices next to the tram stop at Lux Expo (public transport hub "Serra"): The minimum norm of 1 parking spot per 300 m<sup>2</sup> used, differentiated norms in use.

### C Reduce - and diversify norms

In the medium-term, focus should be on following-up and gradually reducing and diversifying the norms even further. Especially Kirchberg norms related to housing are still at the higher end compared to similar cities/districts.

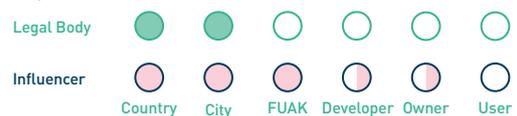
#### Implementation



### D Consider a dynamic cap

Zurich has had a cap on parking for several decades - new spots can only be established if old spots are eliminated. The possibility of a dynamic cap in Kirchberg - taking into account the ongoing development of the area - could be considered.

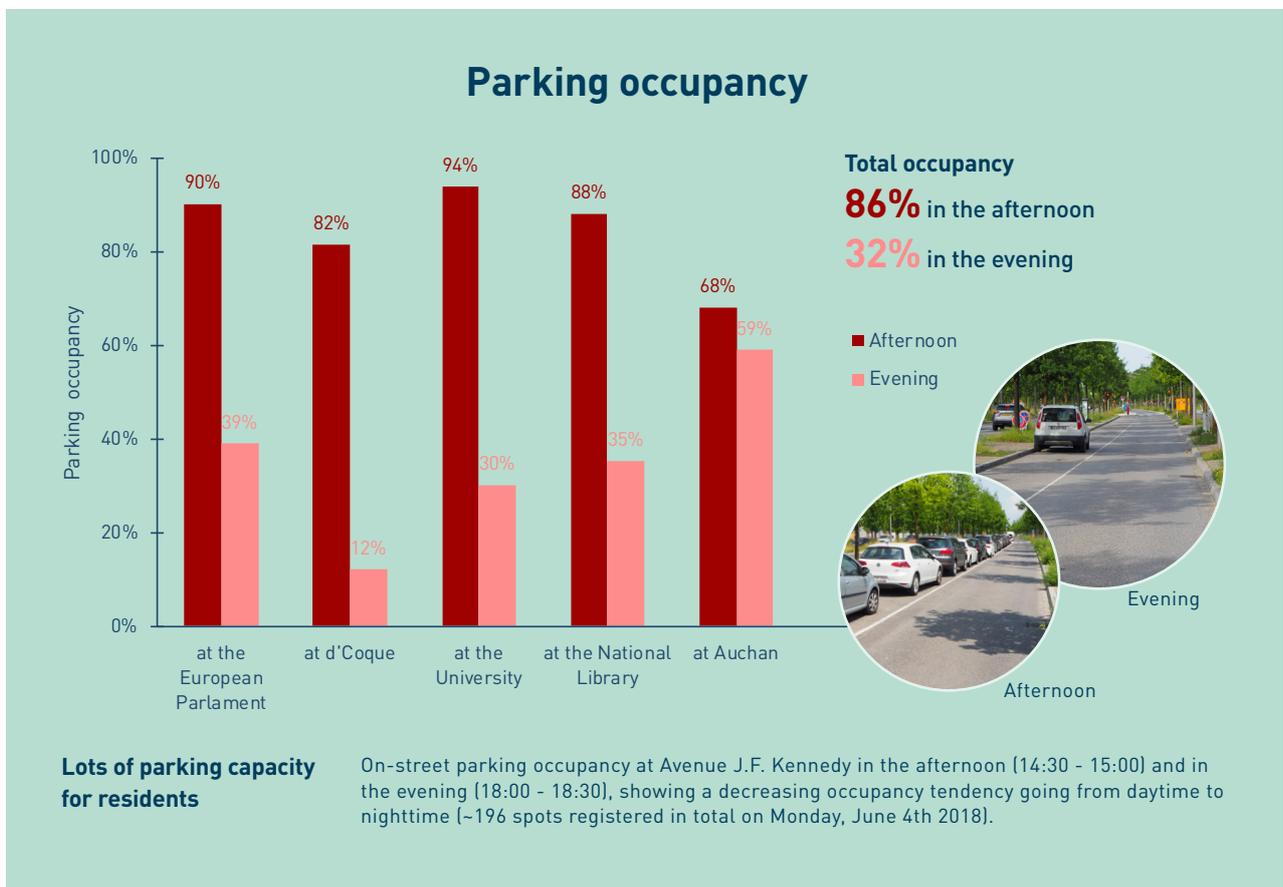
#### Implementation



## 2.2/ Share the parking

Sharing parking facilities can significantly increase their efficiency, particularly where diverse land uses (residential, office, retail, institutional, etc.) are located close together, and where municipal parking or other kinds of publicly accessible parking can be regulated or priced to serve more destinations.

Costs include additional security, liability and operational responsibilities, and the need to overcome user preferences for on-site parking. This strategy can significantly reduce the number of parking spaces needed to serve an area, often by around 20%, but does not usually reduce the amount of car trips.



Hard-working residential parking  
 Underground residential parking in Gr unewald, where some residents share their parking spot with commuters by renting it out during weekdays.

### A Create a platform for sharing

Formalize the existing informal and ad-hoc market for parking spots by implementing an "Airbnb" for parking spots, aimed at both commercial, office and residential use. One way could be to boost the existing LuxParking online marketplace and include companies.

#### Implementation



BEST PRACTICE

## Shared parking in Ørestad

In Ørestad South, a newly developed area in Copenhagen, all parking is located in shared parking facilities distributed throughout the area. This ensures coherent pricing and optimization of the use of the spots since residents, workers and visitors all use the same parking facilities. The facilities are constructed and operated by the company developing the area on behalf of the City of Copenhagen and the state ("By & Havn"). See more at [www.orestad.dk/byoghavn/parkering](http://www.orestad.dk/byoghavn/parkering). Picture: Shared parking facility combined with apartments ("Bjerget")



Front

Back

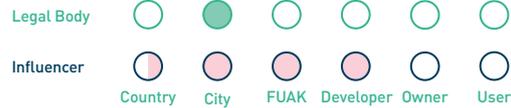


On the beaten track in Kirchberg. Good walking conditions help making shared parking facilities more attractive - and vice versa.

## B Catalyze centralized parking hubs

Aim for neighborhood parking structures (quarters garage) instead of on-site structures (including a design that can handle different user-needs and security issues related to shared structures). Do this to ensure easier sharing, better use, and minimal inconvenience for short car trips, and better public spaces. Considerations on this should include increased sharing of existing facilities such as d'Coque and Place de l'Europe. The financing model can, for example, include the FUAk operating the parking and/or to allow fees to be payed to a central parking fund in lieu of a requirement for on-site parking supply.

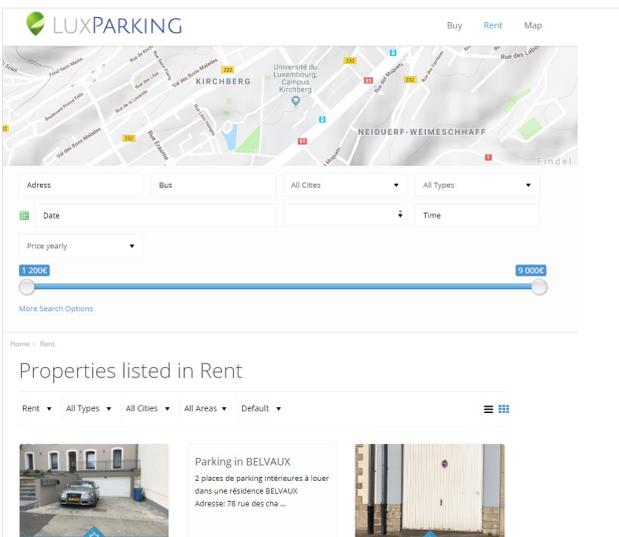
Implementation



## C Make curb parking work harder

Speed up the planned reduction of spots in areas such as Grünewald and along Avenue John F. Kennedy, by keeping a pool of spots aimed at higher-value users or special needs (shopping, restaurants, pick-up/drop-off, handicap, delivery, carsharing, etc.). Parking can be shared among multiple destinations. For example, an office building can share parking with a restaurant or theater, since peak demand for offices occurs during weekdays, and on weekend evenings for restaurants and theaters.

Implementation



Online 'Airbnb' parking marketplace  
LuxParking already has an online marketplace for parking rentals. The hosts (usually residents) list their parking spot to sublet on the marketplace.

## 2.3/ Regulate more efficiently

By favoring higher-value uses and encouraging turnover, regulations can increase efficiency and help achieve other planning objectives such as increased accessibility for handicapped people and fewer illegally parked cars blocking car lanes, sidewalks and bike lanes. To be effective, parking regulations require regular reviews of objectives and performance, thus needing comprehensive demand and occupancy data in order to identify where

performance targets are exceeded (more than 85% occupancy rates). Regulations can significantly reduce the number of parking spaces needed to serve an area, and will sometimes reduce automobile trips, particularly if implemented with improvements to alternative modes. Main costs are related to staff salary and technology to support enforcement of regulations.



**No spots for delivery and taxis**  
The delivery truck is forced to use the sidewalk, while the taxi has to park on the road, because the on-street parking is fully occupied at Rue Erasme.



**Residential area of Grünewald during weekdays**  
The curb parking is fully occupied in Grünewald during weekdays. The license shows an example of a residential on-street parking license in the Kiem area.

### A Focus on high-value users

Design regulations to favor the higher-value users with special needs (e.g., deliveries, passenger pick-up/drop-off, short errands, etc.) at the most convenient spots. This means stricter time regulation or/and higher prices and more spots reserved for specific use combined with the overall reduction of on-street parking. Curb management is only to become more important as concepts of Mobility as a Service (MaaS) develop.

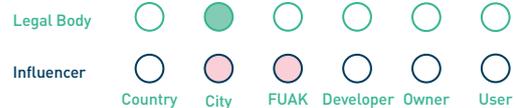
#### Implementation



### B Phase implementation

Start the implementation in areas such as along Avenue J.F. Kennedy and next to the Auchan shopping area.

#### Implementation



### C Evaluate residential permits

Evaluate if the current allocation of residence permits for on-street parking is too generous, and if price should be increased and/or if the “permit-area” should be smaller.

#### Implementation



### ④ Create an enforcement entity

Increase control and fines, and consider if the responsibility of enforcement of regulations should be allocated to a "Kirchberg parking entity" acting on behalf of the City and FUAk.

Implementation



Illegal parking on pedestrian crossing  
Car parked on top of the pedestrian and bicycle crossing at Avenue John F. Kennedy.

BEST PRACTICE

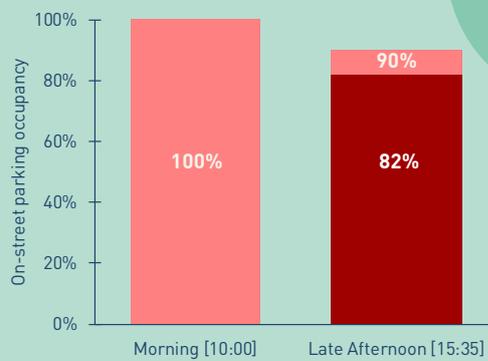
### Parking guards on bicycles



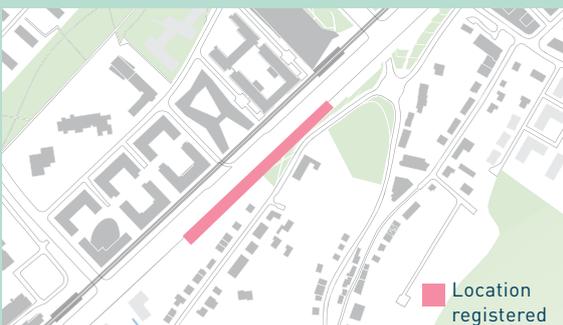
Parking guards in Kirchberg and cities like Copenhagen do their rounds on bicycles. This is efficient and puts people on the street. It is also an example of how to link different focus areas together, in this case enforcement of parking regulations and the "normalizing" of cycling. Human eyes can be combined with technology such as in Amsterdam, picture to the left.

**82%**  
park for more than  
5 hours on Avenue  
J.F. Kennedy

### "Lazy parking spots"



**On-street parking occupancy at Avenue J.F. Kennedy**  
Chalk and photo registration at Avenue J.F. Kennedy showed 82% of the parking spots had a long-term occupancy of more than 5 hours by the same car (~51 spots registered, southern side at UBS / Ernst & Young on Wednesday, June 6th 2018).



#### Lazy parking spots due to use by commuters

The price of the on-street parking along Avenue John F. Kennedy is 0,5€ per hour on weekdays from 08:00 to 18:00. There is a maximum duration of 10 hours on the parking. The price and the limit of the parking makes the parking convenient for commuters whether working in Kirchberg or using the spots as "P&R" spots. This results in 'lazy' spots with a very low turnover and mainly long-term, low-value usage of attractive space and no or very little room for short-term, high-value usage.

## 2.4/ Ensure fair- & efficient pricing

Efficient parking pricing can help achieve parking management objectives (favoring higher-value trips, increasing turnover, encouraging mode shifting, reducing total parking needs), generate revenue and reduce parking subsidies.

Parking pricing implementation can be technically and politically difficult, so it is often best to establish long-term policies and plans that incrementally expand when and where parking is priced, to raise rates to efficient levels. It is important to start with support policies, such as quality of alternative modes and user information.



**Cash-out parking subsidies**  
Can potentially take the shape of cash, e-bike or Mpass



**0,5€ per hour with a maximum of 10 hours**  
The 2018 hourly user fees and time limits of the curb parking on Rue Erasme.

### A Cash-out parking subsidies

At workplaces where parking is subsidized (free or priced less than cost recovery rates) cash, transit fares or bicycles of comparable value should be offered to non-drivers. The same principle should apply if company cars are provided for free or at very low prices.

#### Implementation



### B Unbundle the parking

Ensure that parking is 'unbundled' from the building space. This means that a resident - whether an owner or tenant - should always be able to choose whether to rent/buy parking or not (if parking available).

#### Implementation



### C Manage demand with user fees

Price public parking in order to manage demand, encourage turnover (sharing) and generate revenue. Raise prices to achieve performance targets, such as 85% maximum occupancy. Replace monthly and annual fees with hourly or daily fees so car-drivers whether parking at work or at public facilities have incentives to use alternative modes part-time.

#### Implementation



BEST PRACTICE

## Fair Pricing

**35%**  
Reduction in car driving to Lindköping Hospital, Sweden, when free parking was eliminated



The Swedish "Traffic Investigative Bureau" (Trafikutredningsbureau") 2013 report on city experiences with a tax on parking spots

"The previous findings that employer-paid parking increases the number of vehicle trips to work by about one-third thus seem perfectly reasonable"

"Parking, which raises the cost of single-occupant vehicle commuting directly, affects mode choice much more than any other factor"

Shoup 2005: Parking Cash Out



**Top: 1€ per hour with a maximum of 3 hours**  
Hourly user fees and time limits of on-street parking in the Kiem residential area. **Bottom: 5€ for 10 hours of parking on Ave. John F. Kennedy.** The hourly user fees are 0,5€ and the time limit is 10 hours on the on-street parking along the southern side of Avenue John F. Kenned

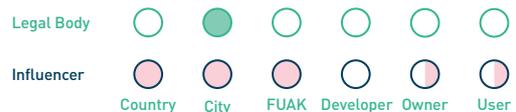


**Sydney Parking Space Levy**  
Sydney is one of several cities imposing a parking levy on each parking spot in key business districts

### ⓓ Consider local anchoring

Consider a set-up where revenue from parking (or as a minimum the extra revenue due to increased pricing) stays within Kirchberg/ Kirchberg districts and is invested in local measures to improve alternatives to car-use or/and to improve public space. This could potentially happen through a public participatory budgeting process involving citizens and workers in the area.

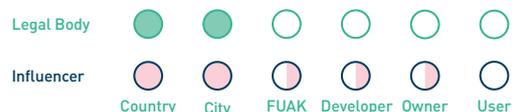
Implementation



### ⓔ Include external costs

Consider a 'parking-tax' per spot to ensure that the price of parking reflects the total cost of that spot, also including consequences for congestion, noise, pollution etc. due to the role of a parking spot as a car-trip generator.

Implementation



## 2.5/ Improve alternatives to solo car driving

To achieve behavioral change through a parking strategy – and not just, for example, increased revenue – is not just about changes in parking conditions, it is also about providing better alternatives to single car use.

At the national and city levels and at the Fonds Kirchberg, this focus already exists. The most visible element is the construction of the light rail, other initiatives are the focus on improving the conditions for walking and cycling.

To create attractive alternatives to the car demands a willingness to invest financial resources, but also a willingness to prioritize space in the public realm in new ways, sometimes decreasing space for cars and increasing space for other modes. The focus should be to increase the transport capacity for people, not for cars. This focus should also be the guideline for how the opportunities in emerging transport technologies such as Autonomous vehicles (AVs) are approached at a planning level.



**Public transport network**  
Bus stop on Boulevard Konrad Adenauer at the school. The busses complement the light rail with connections to the edges of the plateau.

### A Promote PT and ride-sharing

Continue to improve the public transport including P&R facilities. Follow the development in ride-sharing services and Autonomous vehicle technologies and gradually integrate these services in the public transport portfolio.

#### Implementation



**Walking- and cycling infrastructure**  
Intersection at Avenue John F. Kennedy, towards Auchan, has too long waiting times. This results in people crossing at red lights.

### B Promote walking and cycling

Continue to improve conditions for walking and cycling, including special consideration for connections to the surrounding areas and in between parking facilities and destinations (see other Gehl reports for more on this).

#### Implementation



### C Promote car-sharing

Promote carshare services that substitute private vehicle ownership. Work in partnership with developers to test solutions where joining a carshare upon moving into a new apartment is as simple as choosing the oven, the floortype and the wifi connection.

#### Implementation

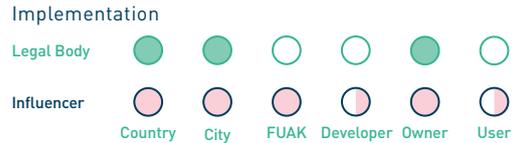




**Autonomous vehicle-shuttle bus.** New technologies as part of commuting to Kirchberg

### D Implement mobility management

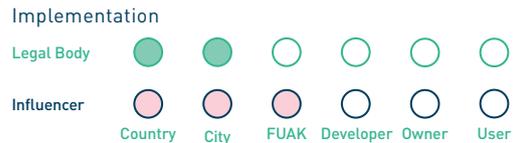
Implement a robust mobility management programme to promote alternatives to solo-driving by car. A first step could be a grant for 2-3 test companies to finance the mobility management work at these companies fully or almost fully. The effort should draw on local competences such as the Verkeiersverbond and the IMS and also draw on existing best practices among local companies.



**Light rail in action, on the Kirchberg Plateau**  
The light rail is to be extended with a connection to the city center, which will improve the public transport commute to and from the city center significantly.

### E Time the implementations

Efforts to reduce parking should be timed with substantial improvements to the alternatives for solo-driving by car, such as the opening of the light rail connection to the city center.



## BEST PRACTICE

### Active mobility management



In Luxembourg there is considerable experience with mobility management through the work of actors such as the Verkeiersverbond and the IMS, recently exemplified with the IMS Positive Drive campaign in Kirchberg involving several major workplaces. The next step is to build on these competences and at the same time implement a considerably more robust programme including financial measures on an ongoing basis.



“Try-it”: Many mobility management projects are focused on getting people to try alternatives to the car. One such project with good results is “Test an e-bike,” implemented in the Greater Copenhagen area. The poster says: “Active and healthy everyday on an e-bike”

## 2.6/ Improve user information

Kirchberg already provides a variety of information on parking availability and pricing. If more active parking management is implemented, it is crucial to continuously upgrade the information on parking and make it available on more and more platforms and increasingly in real time. The information should be coordinated with the

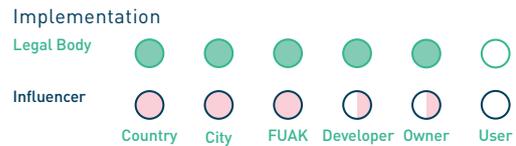
information provided by both the Fonds and other stakeholders on alternatives to the car and on parking in nearby districts such as the city center.



**Parking option signage**  
Signage with indication of available parking spaces at d'Coque on Rue Erasme.

### A Increase emphasis on parking information

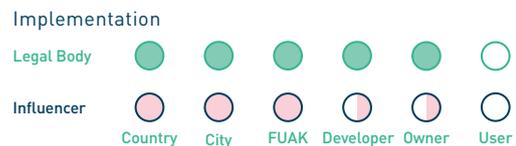
Improve the information available to travellers concerning travel and parking options. Improving user information directly benefits travellers, and supports parking and transportation management. Costs include additional planning and administration, websites, apps, mapping and infrastructure (such as signs).



**Parking option signage**  
Larger workplace

### B Coordinate information across platforms and stakeholders

It is important that relevant information reaches the relevant users where they are, therefore the information should be distributed both through a range of platforms (from apps to physical signage) and coordinated not only with public stakeholders but also private partners such as workplaces and developers.

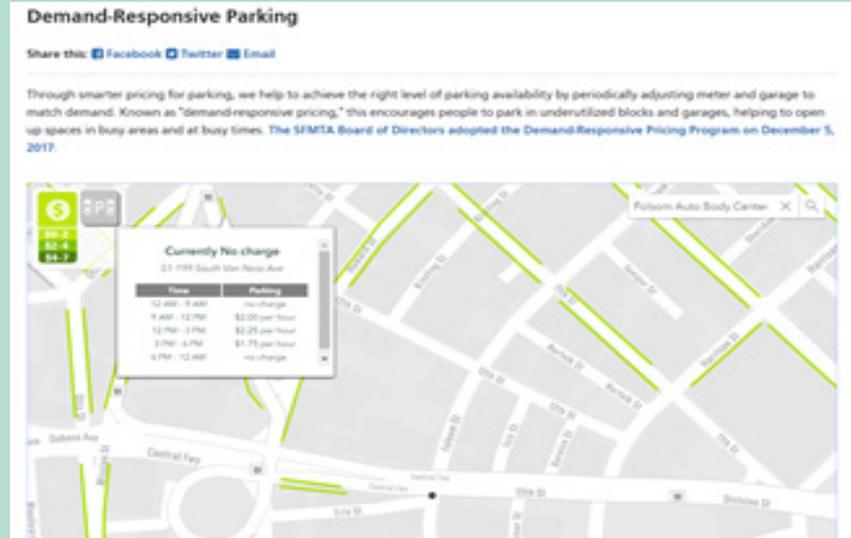
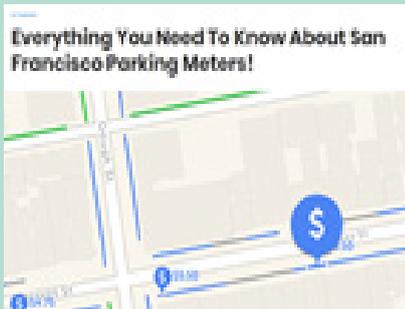


# User information

Various examples

## San Francisco

In San Francisco, parking prices are updated in real time based on demand, responding to the need for updated information.



## Ørestad, Copenhagen

“By & Havn” the parking administrator in the Ørestad area in Copenhagen, has developed an app solution aimed at all who need to park in the area. The app covers most of the parking in Ørestad, and all parking in Ørestad South.



# 2.7/ Avoid 'garage architecture'

## Community building through parking

In Calgary they call it 'garage architecture' - houses almost hidden behind huge garages for 2-3 cars. The way car parking is integrated in the urban fabric has huge consequences, not only on transport choices but also for a lot of other factors. Already in his classic "Life Between Buildings" from 1971, Jan Gehl showed how the way parking is located affects community building. If the parking is located in garages in front or below buildings, very few people will be in the street and meet there. Whereas if the parking is located at the end of the street or

at a local hub, people will meet in the street when walking to and from the parking. Social relations will be more naturally established and conditions for play and activity in the local street will be greatly enhanced. Likewise as illustrated in the *Densification Toolbox*; how access to and from underground parking at offices is organised has a large effect on public life. So in short, there is much more to parking than parking.

**K** See more about this theme in the *Densification Toolbox*



**Row houses designed for cars**  
Kiem row houses: Parking underneath the buildings, parking in front of the buildings AND parking on the street

### A Change the architectural approach

Introduce guidelines for housing to ensure that attractive space is allocated to housing and public space, not to parking. This should be coordinated with the push for a more dense Kirchberg.

**Implementation**



**Access ways blocking an important link**  
There is no pedestrian/bicycle access to and from Avenue J. F. Kennedy in between the buildings, due to the parking access ramps.

### B Parking size, location, and use

Continue and strengthen the focus on parking constructions that are compact, multipurpose and located in a way that supports public life, not the contrary. And that are at the same time nudging people towards use of other modes for shorter trips by adding a bit of distance between the parking and the destination, potentially combined with short term drop-off/pick-up directly at destination

**Implementation**

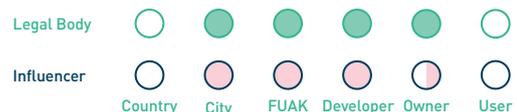


**Parking access on the front side of Auchan**  
The parking access way at the Avenue J.F. Kennedy side of Auchan is cutting through an important pedestrian link.

### C Access ways

Require access to parking structures to be located on the backside of buildings and with a clear right of way for pedestrians and people cycling along the street; see sub-strategy on density.

**Implementation**



# Parking and urban quality

## Various examples

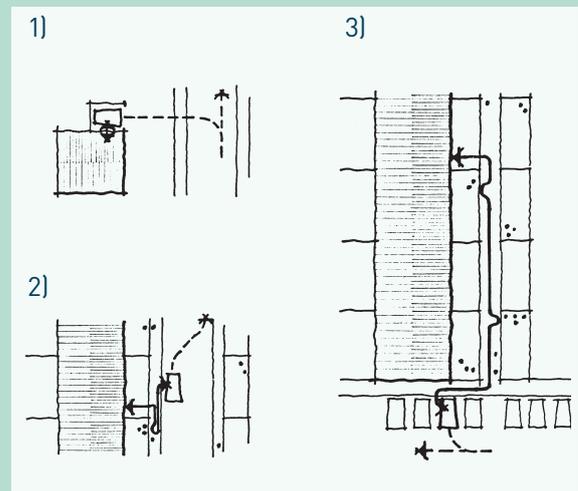
The right parking design solutions can make a neighborhood or district more attractive by not only providing parking but by a parking design which also supports living and attractive city spaces with good conditions for walking, cycling, play and human interaction. In 2014 the Danish non-profit fund Realdania By did an inspiration catalogue on how to design good car parking structures in new developments. As part of this work they developed the following check list of aspects to think through as part of the design process:

- Assess the combined economy and business case for the full development - and create good conditions for

- construction, ownership and operation of the parking
- Include parking in the early design phases and integrate parking in the visions and strategies for the development
- Assess the link with the city and the immediate surroundings
- Determine location. Consider scattered parking or larger hubs either in the periphery or central in the development
- Determine construction type - above surface, below surface or on-surface
- Determine the parking need in relation to functions, users and overall city transport strategy



Multi-purpose facilities increase the urban quality  
A surface parking construction with integrated bicycle parking, green walls, recycling station and a playground on the roof. Located in Nordhavn, Copenhagen.



### Car parking and activity patterns

Already early research by Jan Gehl illustrated how parking design affects public life: 1) When cars are parked at entrances, only cars will be found in the street. 2) When cars are parked at the curb, people as well as cars will be found in the street. 3) When cars are parked at the end of the road, pedestrian traffic replaces vehicular traffic. Illustration from "Life between buildings", [Jan Gehl, 1971].



### More to parking than parking

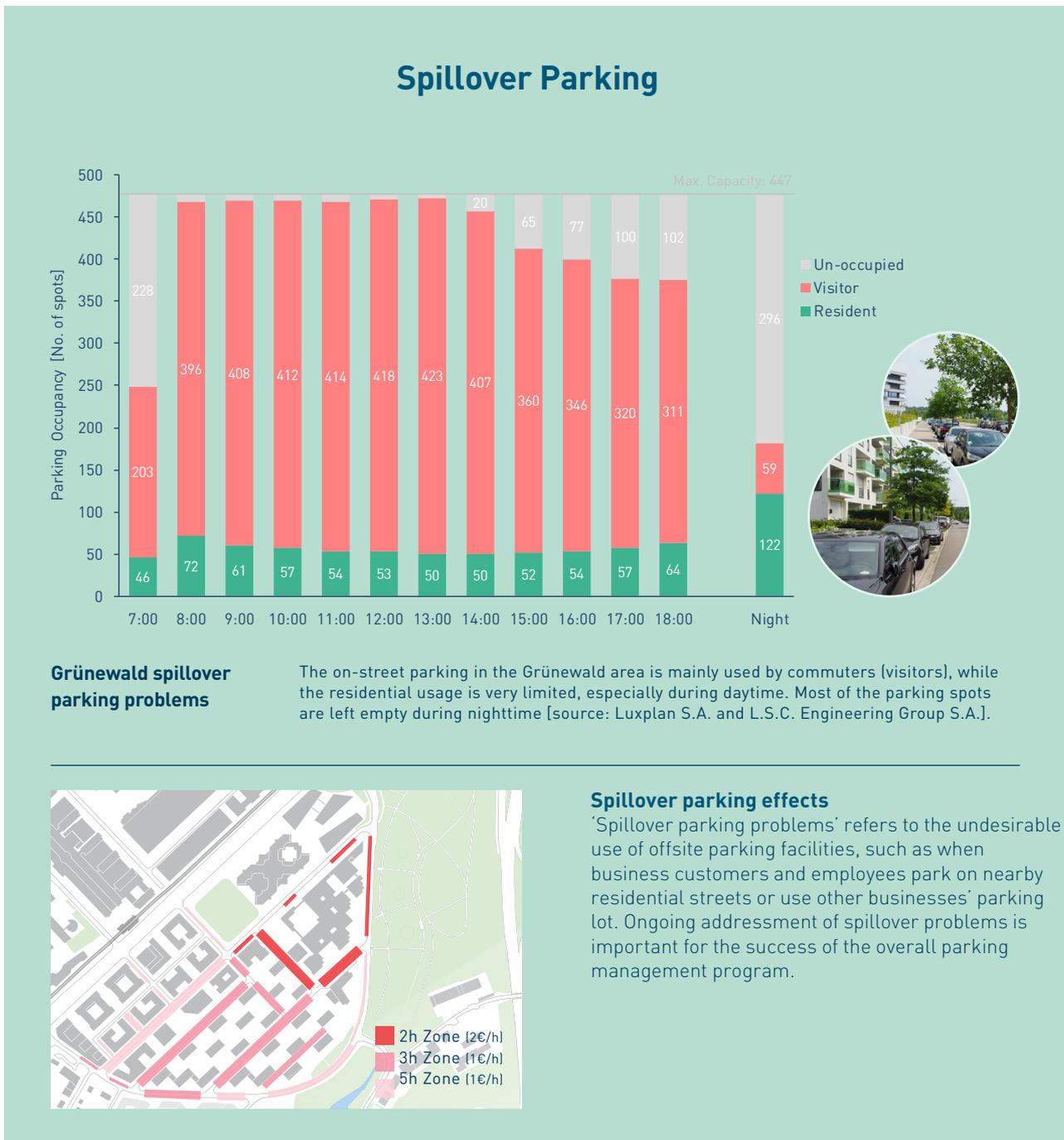
Life between the buildings, Sluseholmen, Copenhagen 2017. Social relations between residents are promoted by deliberately forcing people to pass through the semi-public yard on the way to and from the staircase for underground parking (one of two staircases to the the underground parking can be seen in the back (the low wooden building).

## 2.8/ Introduce contingency-based planning

### Planning for the unknown

Allow and encourage contingency-based parking planning to be prepared for shifts in demand. Parking is often oversupplied due to the fear of possible shortages. Planning that takes into account how special peak periods, whether expected or unexpected, will be handled can significantly reduce the number of parking spaces needed

and/or help to avoid excessive amounts of parking spaces. The need for contingency planning is only increasing due to uncertainty on how emerging transport technologies such as automated vehicles and ridesharing services will affect parking demand.





Autonomous vehicle technology is one emerging transport technology that adds to the challenge of predicting tomorrow's parking needs

### A Create flexible infrastructure

Ensure flexibility in large infrastructure investments related to parking, as emerging transport technology such as autonomous vehicles and Mobility as a Service (MaaS) might drastically alter the demand for parking. Develop guidelines for how existing parking can be converted to other purposes whether commercial or cultural. Guidelines can be qualified via citizen involvement, e.g. a competition calling for good ideas.

Implementation

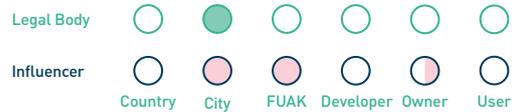


Curbside utilized for goods- and parcel deliveries  
On-street parking along Rue Carlo Hemmer at Auchan are used for delivery of goods

### B Review, adjust, and enforce

Continually review and adjust pricing, restrictions, enforcement parking requirements and other protocols to address new opportunities or challenges such as spillover parking problems. The latter is currently a case in the Grunewald area, where the bulk of the on-street parking is a result of commuters working at nearby working places parking in Grunewald.

Implementation



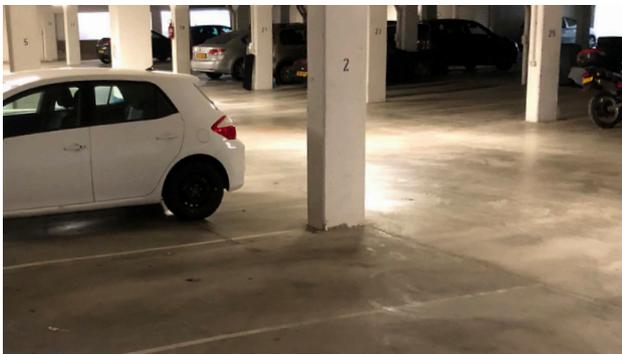
So much space

Nobody knows the future, though in a decade or two a challenge could be how to convert obsolete parking garages to new uses due to the effect of autonomous vehicle technology and better alternatives to the private car. Picture: LuxExpo construction above grounds

## 2.9/ Remember the existing parking

The current amount of parking in Kirchberg is extremely high. Earlier maximum norms have been very generous – and non-existent before that. If only applied to new developments, parking supply will need to increase in the future. However, if parking management is applied to existing, as well as new developments, it is possible to accommodate significant growth in office space and residences with no or only little increase in total parking supply in the district, which has also occurred in peer

cities such as London, Strasbourg and Zurich. To also work with the existing parking – where the main bulk is private - is a special challenge, and close dialogue with existing companies combined with innovative solutions and a long-term approach will be needed. Several of the aforementioned recommendations affect both new and existing parking. The four recommendations listed below are especially relevant when it comes to influencing the existing non-public parking.



Underground parking in Kiem  
New buildings should be able to rent existing parking spaces being left over, due to strict management.



Parking above ground in Kiem  
Could some of this space in the future be used more productively? Maybe...

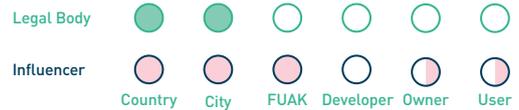


The tram  
A key element in the ongoing improvements of the alternatives to solo car driving.

### A Create financial incentives

Have an extra focus on incentives that also work on existing parking. This could be tax per parking spot (see section 2.4 on pricing). Develop guidelines and regulations to ease the conversion from parking to other purposes (commercial or cultural).

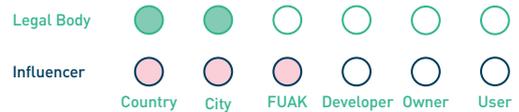
#### Implementation



### B Introduce parking caps

Introduce a dynamic cap on parking that slowly pushes down the Resident/Employee: Parking ratio each time an existing building change purpose of use/new companies move in. A cap should be differentiated by neighbourhoods.

#### Implementation



### C Think long-term by acting now

Consider a gradual implementation if a quick implementation is not considered realistic. This means some measures only apply to new staff/residents/companies moving into the area, step by step more and more will be included, and in 10-15 years the majority will probably be included.

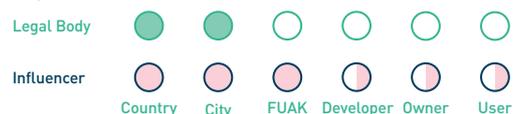
#### Implementation



### C Improve alternatives to solo car driving

People who would like to do something other than sitting in a car - or have unattractive parking options, need a good alternative before a shift of transport mode becomes a possibility. For this reason improvements in cycling, walking, carshare and public transport are key, also regarding the effect of the existing parking.

#### Implementation



# Touching on Existing Parking

Various examples



**REPORT SUMMARY**

This strategy responds to longstanding on-street parking issues identified in the West End Community Plan and to direction from Transportation 2040 to better manage parking in neighbourhoods. Nine actions are proposed that will help residents and their visitors find parking more easily and provide other benefits to the broader West End community.

The nine actions are presented in three categories:

A) Managing Demand with Market Based Permit Prices

1. Charge a market-based rate of \$30 per month for new parking permits
2. Exempt existing permit holders from the market-based rate
3. Spend new permit revenue within the West End on community identified needs

## The “Vancouver Westend Parking Strategy

The strategy is aimed at parking in an existing area, including further restrictions on parking, and managed to gain considerable citizen support. Key to that success was both the introduction of a participatory budgeting process related to revenue from parking, and a gradual implementation so increased parking prices will only effect new users of parking. In total, it was a way of gently but steadily implementing new rules on existing parking.

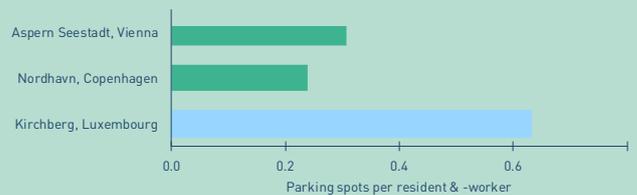


The European Investment Bank: One of many EU institutions in Kirchberg with a long tradition of offering free parking to the employees, sometimes guaranteed in the contract.

## EU Institutions - a special case

The EU institutions are a theme on their own. They are very large workplaces with a huge amounts of parking. Special regulations apply to these institutions. Depending on the degree that EU institutions choose to be frontrunners when it comes to applying parking management, they can make a big difference both in their own right due to volume, but also as inspiration to other workplaces. This would also be a match with transportation policies expressed by the EU:

“Cars still represent 72% of all passenger transport. While cars provide an available door-to-door transport mode, they are rarely the optimal mode to use from an energy efficiency and sustainability perspective...To encourage a change of habits, citizens need to be given the right incentives”  
 Violeta Bulc, EU Commissioner for Transport



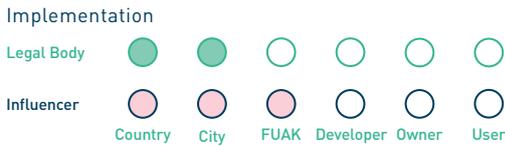
Today’s picture: Amount of parking in Kirchberg in comparison to similar but newer areas

## 2.10/ Ensure ability to deliver

Active parking management is crucial not just for the quality of public space and public life in Kirchberg, but also to ensure access to Kirchberg in the future. A clear mandate, coherent organization, and sufficient resources to deliver on parking management are key. Several parties are central in making this happen. Actions at national and city level are crucial and the Fonds role should be defined in dialogue with these partners. Workplaces, commercial and cultural institutions, and residents are other important stakeholders to involve.

### A Create a clear line of responsibility

It is easy to do a strategy. The hard thing is to implement it. The first step is to build the organizational capacity to run a parking management programme in Kirchberg with a wide set of integrated actions and a strong political mandate.



Parking lot at Boulevard Konrad Adenauer  
438 parking spots, at the northern side of Boulevard Konrad Adenauer in the Langfuur area, with hourly user fees of 0,5€ and a time limit of 10 hours.

#### WHAT IS A TMA?

#### Transportation Management Associations (TMAs):

- are public-private partnerships that address localised transport-related issues;
- operate under a variety of organisational structures and are funded through membership dues or some combination of other sources;
- provide an institutional framework for travel demand management programmes and services including parking management;
- provide services to a well-defined and limited area.

#### Key benefits

The development of a properly-conceived, efficiently-operated and adequately funded TMA...

- solves concrete and perceived problems and proposes practical solutions at an appropriate scale;
- creates a positive environment for efficient stakeholder involvement;
- increases mobility choices to users at low cost and helps create good transport infrastructure.

#### Source:

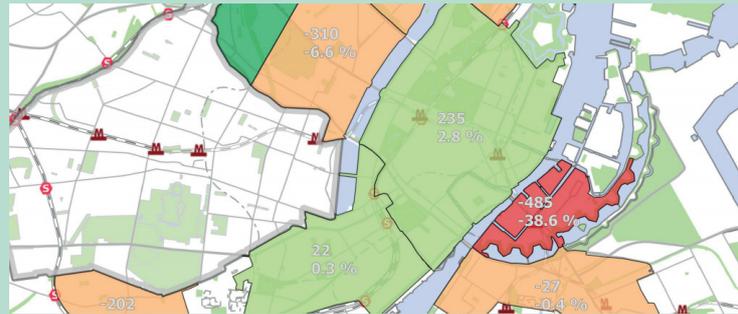
Innovative Demand Management Strategies - Transportation Management Associations (TMAs), Policy Notes, EU Sixth Framework Programme.

BEST PRACTICE



**A yearly status**

In Copenhagen the city administration do a yearly status report with a parking inventory and special themes covered in more depth. The status provides solid information for political decisions on parking.



Buildings and parking takes many shapes and colors

**B Consider a district based unit**

It should be considered to establish a dedicated unit with the responsibility for the Kirchberg Parking management. Such a unit could be modelled based on the US concept of TMA's. These are non-profit and often public-private partnerships, and as such combined with being anchored locally are more commonly acceptable and effective than a traditional government agency.

Implementation



**C Ensure good data**

Create a parking data collection programme, including information such as numbers on all existing and planned parking spaces, occupancy rates, user prices, ownership and management status, etc.

Implementation



Deutsche Bank, One of many financial institutions in Kirchberg

**D Ensure sufficient resources**

Parking represents very large fixed investments. According to the current 2038 prognosis, around 80 million euros will be spent yearly in Kirchberg on construction and management of parking. A well-run parking management programme will need robust staff resources to match the financial, political and user interest in parking.

Implementation





A photograph of a row of cars parked in a lot, viewed from a low angle. The image is overlaid with a semi-transparent blue filter. The text '3/ Effects of Parking Management' is written in white, bold, sans-serif font across the center of the image.

# 3/ Effects of Parking Management

### 3/ Effects of Parking Management



**Rough estimates:  
Medium level parking  
management effects**

Potential reductions in total number of parking spaces, total annual costs and daily trips to and from Kirchberg. Reductions are calculated with the existing long-term low ratio parking prognosis for 2038 as the starting point, with a medium level of parking management applied to both existing and new parking in Kirchberg.

This section contains a rough estimate of the effect of a parking management program matching the recommendations in chapter 3. The focus is on the effect measured at the level of the entire Kirchberg Plateau.

**Measuring effects**

The following pages outlines effect estimations on:

- Total parking spaces
- Total car trips
- Total parking construction and operation costs

These estimates are based on rough assumptions about parking management impacts and benefits. Actual results may be very different. However, the results are well within the scope of impacts reported in peer cities and districts, where aggressive transportation and parking management programs have allowed substantial economic growth while total parking supply and vehicle trips were reduced. These parking management impact

calculations are all about getting a rough scale of the effects. It is not an exact science, but rather a method to illustrate the potentially achievable benefits, by implementing the outlined strategies.

Key variables in the estimates include the magnitude of the parking management programs (low, medium or high level), and whether parking management applies only to new development or to both new and existing buildings.

The figure above is summarizing the potential effect if a medium level parking management is implemented on all of the current and projected parking spaces on the Kirchberg Plateau. The figure shows the potential reductions on the total number of parking spaces, the reduction in annual parking construction costs, and the reduction in daily car trips to and from Kirchberg.

### How are the impacts estimated?

The estimated parking effects are calculated on the current trends predicted in the long-term low ratio prognosis (*ratio faible*) provided by the Fonds. The impacts are based on the current situation (2018) and the long-term prognosis is assumed to be the parking supply in 2038. The total parking supply is expected to grow 41%, from the current 27.919 parking spots to a total of 39.383 parking spaces in 2038.

The underground parking spaces are assumed to have an average land- and construction cost of 30.000 € per spot, while the surface parking is assumed to cost 4.000 € per spot. The average annual operating costs are estimated to be 500 € per underground spot and 160 € per surface spot. The total annual cost per space is calculated with an interest rate of 2% over a period of 20 years and the estimated costs borne by the users of the different parking types are assumed to be:

- 40% on commuter parkings
- 100% on residential parkings
- 60% on public underground parkings
- 80% on public on-street parkings

The potential parking supply reductions and reductions in trip generations due to parking are estimated on three different parking management levels:

- Low management level
- Medium management level
- High management level

The estimated reductions are shown in the table below. An additional assumption of an average 85% parking space occupancy is used for trip calculation reductions, alongside the estimated potential reductions in trip generations.

## Potential reductions

Potential parking reductions	Low level	Medium level	High level	Trip reductions
Shared parking	10%	15%	20%	
Improved regulations and requirements	5%	10%	15%	✓
Efficient pricing (incl. cash-outs and unbundling)	10%	15%	25%	✓
Improve public transport and ride-sharing	10%	15%	25%	✓
Improve active modes (walking & bicycling)	5%	10%	15%	✓
Total reduction potential in no. of parking spots	34%	50%	67%	
Total reduction potential in trip generations	27%	41%	59%	

### Reductions due to parking management

This table indicates typical reductions in parking requirements and vehicle trips compared with conventional practices. The estimates are based on a number of sources such as CROW, the Dutch Knowledge Platform for Transport, Parking Figures 2018 and Parking Demand Calculator; Evidence (2017), Parking Summary Review, Economic Benefits of Sustainable Transport; Michael Kodransky and Gabrielle Hermann (2011), Europe's Parking U-Turn: From Accommodation to Regulation; Todd Litman (2017), Parking Management: Comprehensive Implementation Guide, VTPI; Gregory Pierce and Donald Shoup (2013), "Getting the Prices Right: An Evaluation of Pricing Parking by Demand in San Francisco"

### 3.1/ Effect on number of parking spots

The figures on the opposite page illustrate the estimated effect on the amount of parking spaces at Kirchberg if stricter parking management is introduced. Since new development only represents a minor part of the parking in Kirchberg in 2038, parking management that is applied to existing as well as new development can be more than twice as effective in reducing total district-wide parking facility needs as a strategy only focusing on new developments.

The figure below illustrates that the estimated effects of a medium level parking strategy will result in a level of parking spots per person slightly below current numbers in new areas in Vienna and Copenhagen. A reduction labelled here as the result of a low management level will result in a number of parking spots per person comparable to the current numbers in the Vienna and Copenhagen areas.

**Amount of space for other uses**

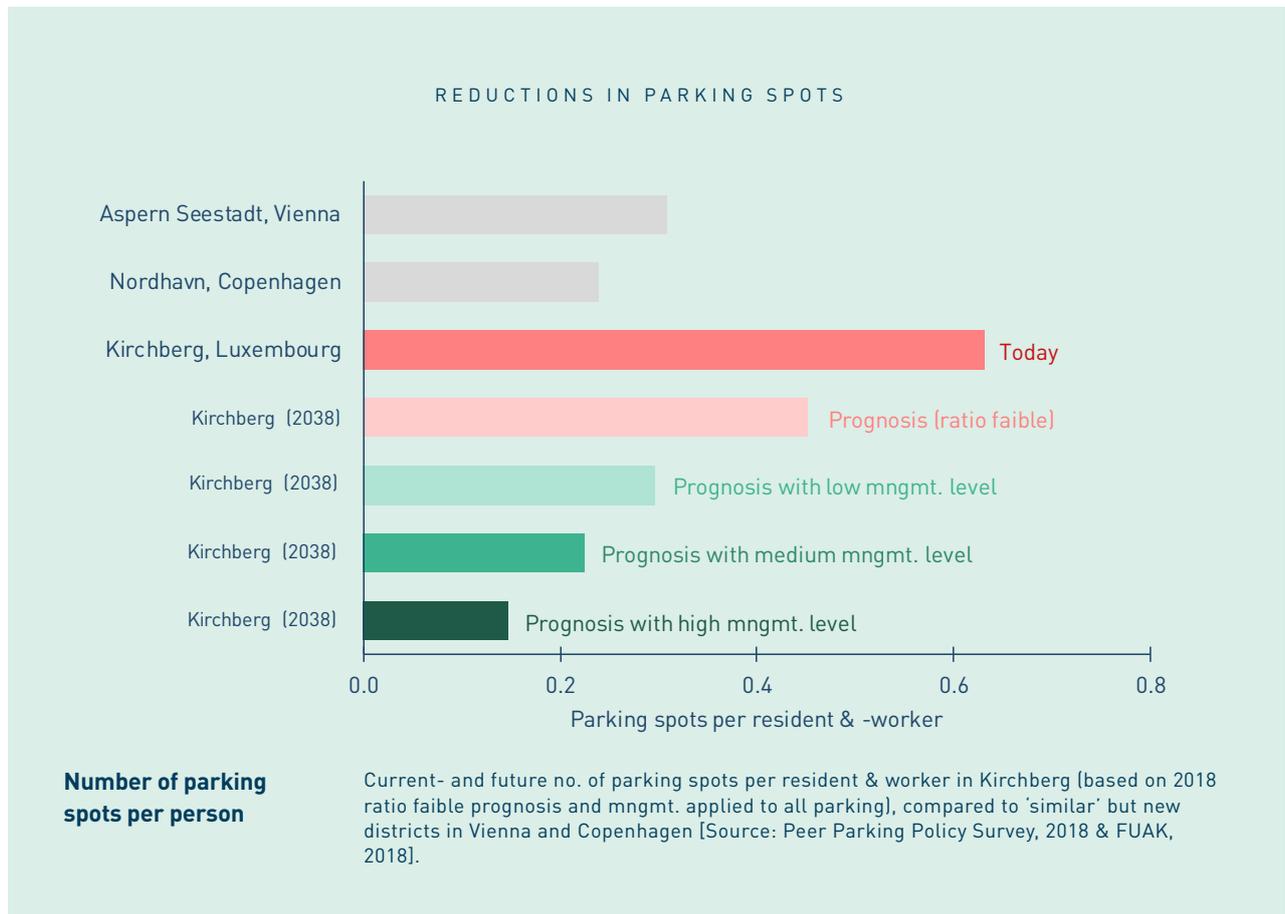
An assumption of an average area use of 4.8x2.4 m per parking space and half of 6.0x2.4 m access way results in a total area use of 18.7 m<sup>2</sup> per parking spot. The estimated area used for parking on the Kirchberg plateau is therefore:

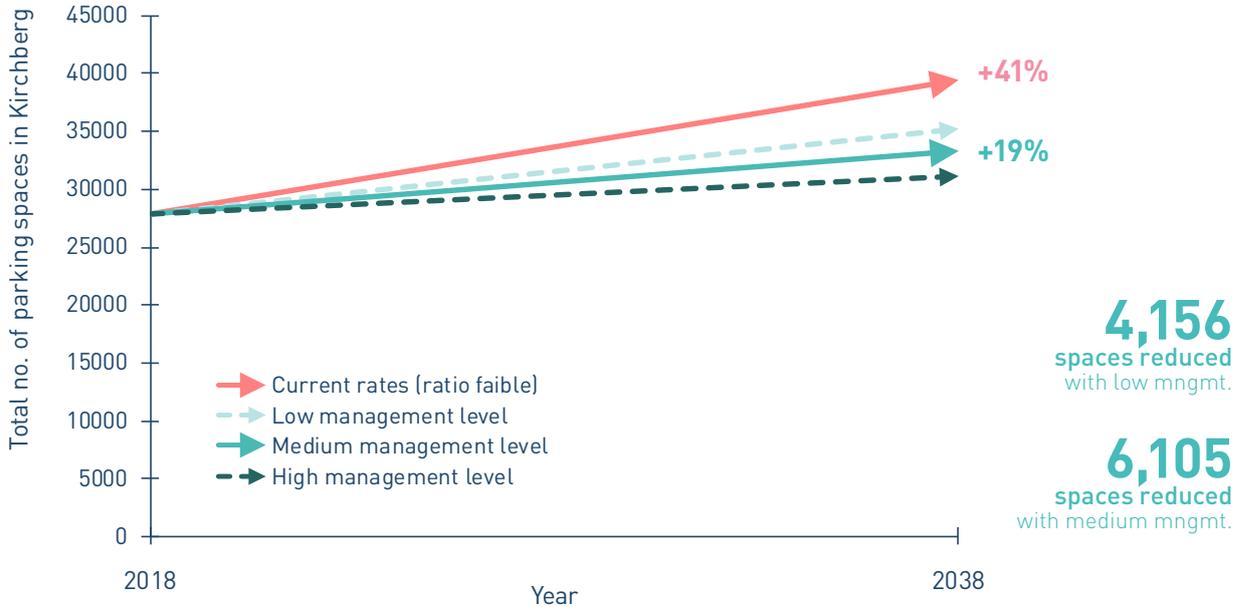
- Current area (2018): 522,644 m<sup>2</sup>
- Prognosed area (2038): 737,250 m<sup>2</sup>

When a medium management level is applied, the following reductions for the prognosed area (2038) would be made:

- Applied on new developments: -114,287 m<sup>2</sup>
- Applied to all parking: -370,511 m<sup>2</sup>

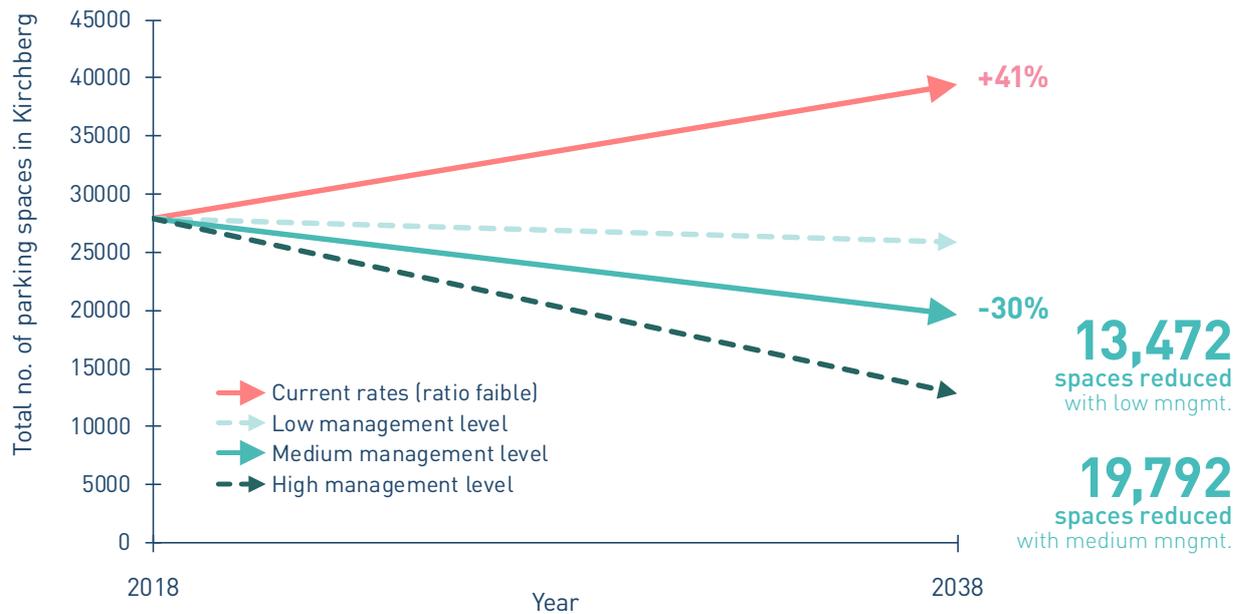
N.B. Floor area NOT surface area (numbers includes underground and multi-storey facilities)





**Management applied to new developments**

The trend in the total number of parking spaces in Kirchberg. The calculations are based on the predicted long-term situation, when parking management is applied to new developments [Source: FUAk, 2018].



**Management applied to all parking**

The trend in the total number of parking spaces in Kirchberg. The calculations are based on the predicted long-term situation, when parking management is applied to all parking [Source: FUAk, 2018].

## 3.2/ Effect on number of car trips

Parking management that results in more sharing of parking facilities does little to reduce car trips. For example, if an office building makes its parking facilities available to restaurant workers in the evenings and weekends, or if apartment residents are encouraged to rent their unused parking spaces to commuters, the total number of car trips is not reduced. Though most of the recommendations in chapter 2 will, through sticks (incentives) or carrots (improvements), reduce total car trips and in turn traffic problems. Some strategies encourage both. For example, efficient pricing of city center parking may cause some motorists to park elsewhere and others to shift to public transit. Because reducing car trips provides additional benefits (reduced traffic congestion, accidents and pollution emissions), this justifies favoring trip reducing parking management strategies.

The graphs to the right illustrate the potential daily car trip reductions if stricter parking management strategies are applied at Kirchberg. Below is a very rough indication on the overall effect on traffic flows by stricter parking management; to what degree will a reduction in car parking spots affect the overall accessibility to Kirchberg.



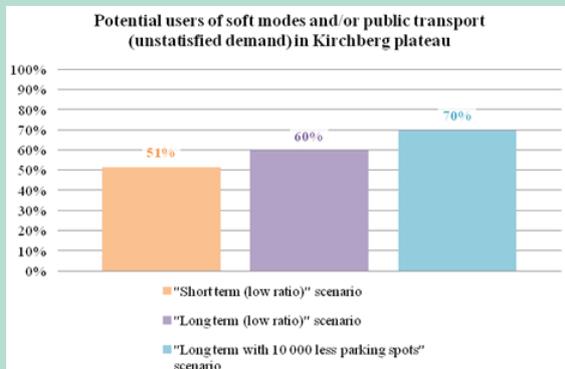
Congestion in Kirchberg: Avenue John F. Kennedy (seen from Rue Marcel Fischbach) at 17:50 on a Monday (June 4th 2018).



Pinchpoints: The drop-off lane at the international school at 16:30 on a Monday (June 4th 2018).

### Effect - A sense of scale

#### Effect of 10.000 less parking spots



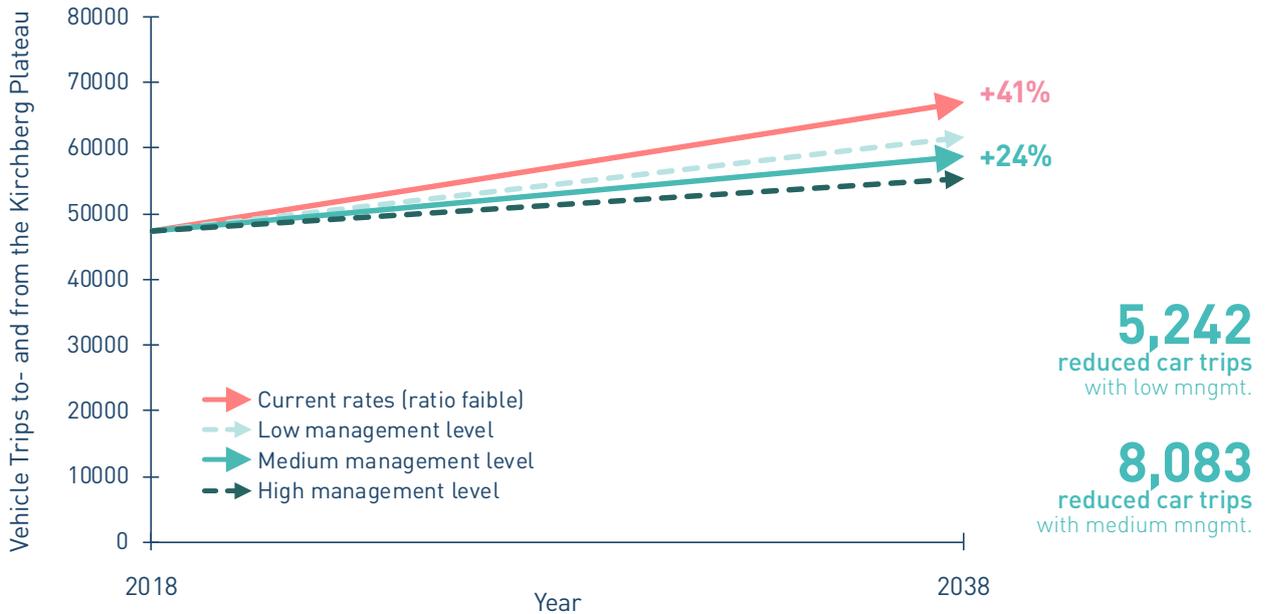
TR-Engineering has done a modelling of how 10.000 less parking spots in Kirchberg will affect mode choice. As illustrated above, this is estimated to increase the mode share of cycling, walking and public transport from 60% to 70%. Based on the assumptions behind the modelling, such a reduction in parking will approximately result in a decrease of 30.000 daily cartrips (working day).

#### Potential 10-20% reduction of car trips in key bottlenecks

The roughly estimated effect of the medium level parking management is a daily reduction of 27770 car trips. For the sake of scale if can be assumed that 20.000 of these will enter Kirchberg either at the roundabout or at the Red Bridge, the rest via the other much smaller entrances to Kirchberg.

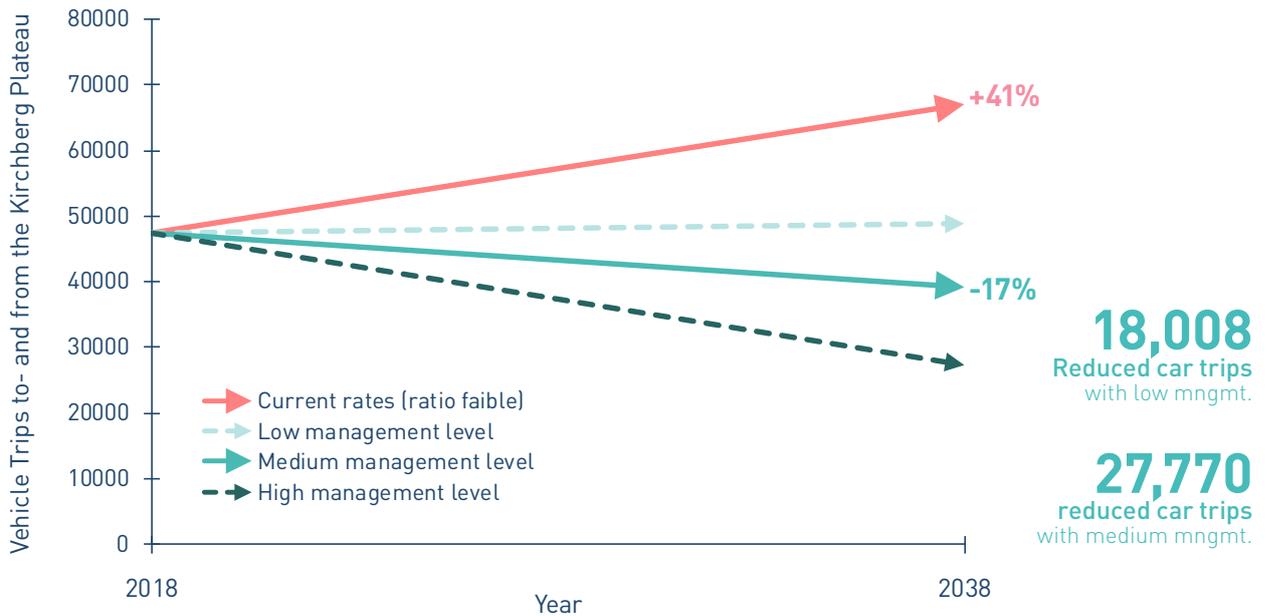
All this leads to the conclusion that - as a rough estimate - **medium level parking management can reduce the traffic in the two major bottlenecks to/from Kirchberg by 10-20%**

The above estimates have as a starting point traffic modelling done by TR engineering. TR engineering estimates in the long-term scenario, 4700 motor vehicles an hour on the Red Bridge in the morning peak hour and the similar number through the "Turbo Roundabout" to be around 6000. Roughly speaking these numbers can be converted to daily volumes of 47.000 and 60.000 trips passing these two points, or in total around 110.000 trips.



**Management applied to new developments**

The trend in the daily number of vehicle trips to and from the Kirchberg Plateau, generated by parking spots on the plateau. The calculations are based on the predicted long-term situation, when parking management is applied to new developments [Source: FUAk, 2018].



**Management applied to all parking**

The trend in the daily number of vehicle trips to and from the Kirchberg Plateau, generated by parking spots on the plateau. The calculations are based on the predicted long-term situation, when parking management is applied to all parking [Source: FUAk, 2018].

### 3.3/ Effect on costs for construction and maintenance

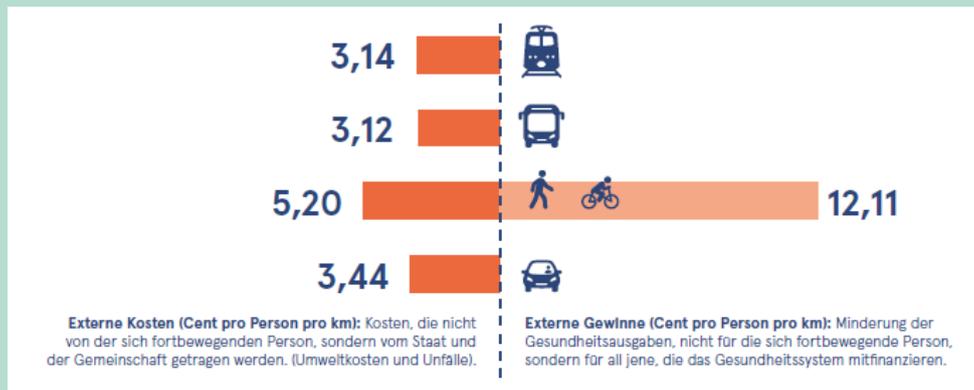
The costs of constructing and maintenance of parking in Kirchberg are huge. The graphs to the right illustrate the estimated potential reductions in construction and maintenance costs provided by stricter parking management. 42 million euros a year, every year until 2038.

These figures also illustrate that the largest effect will be achieved if parking management is applied to all parking facilities, not just new facilities. It is important to underline that for the parties constructing and operating parking, there is also

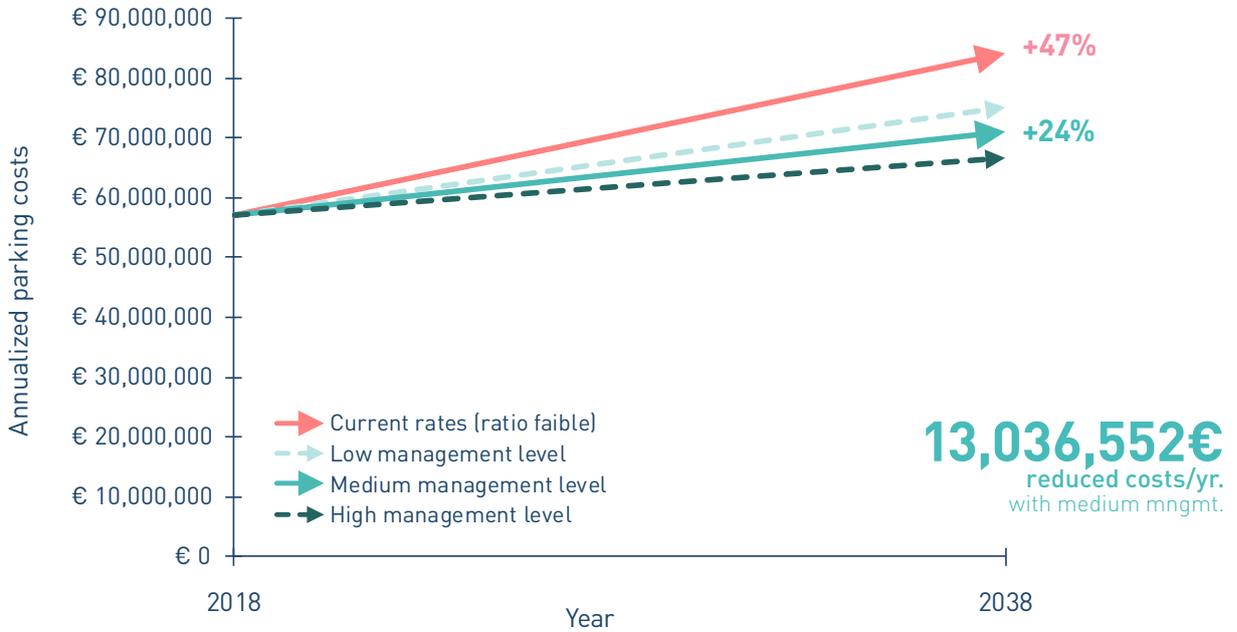
considerable income to gain, either through renting or selling the parking spots. The numbers still clearly illustrate the sheer scale of the investments in car parking in Kirchberg.



Die Auslastung der Autos, die zwischen 6:00 Uhr und 10:00 Uhr zur Arbeit in die Hauptstadt fahren, liegt bei 1,16 Personen pro Wagen für die Einwohner Luxemburgs und bei 1,22 Personen pro Wagen bei den Grenzgängern.

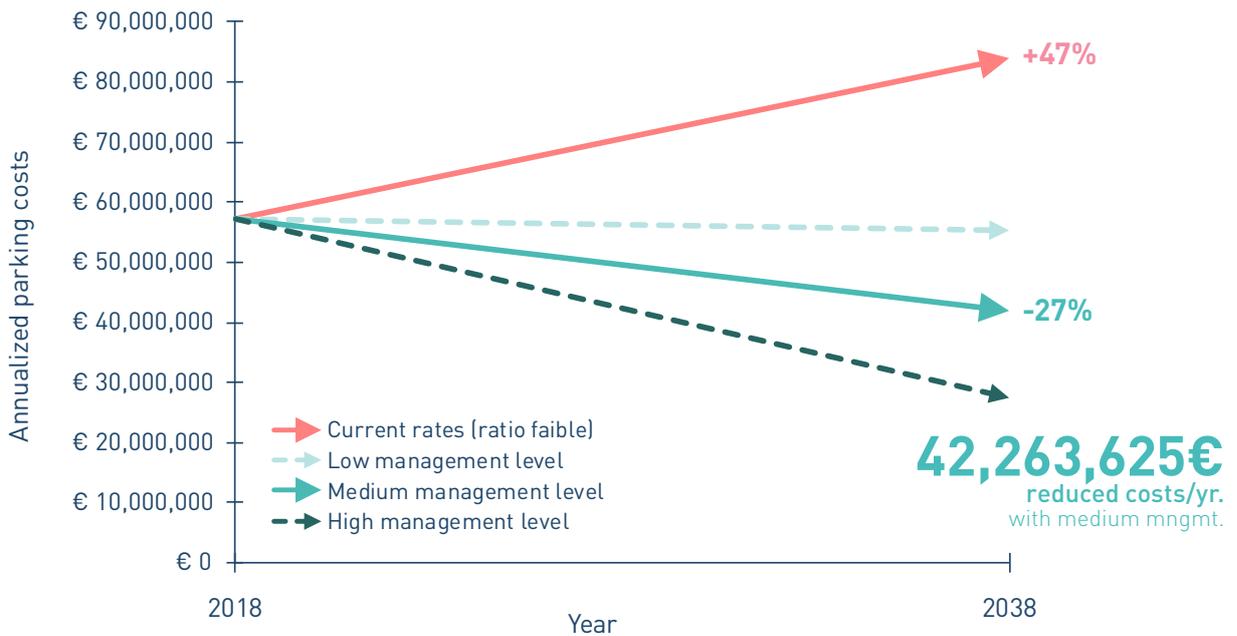


The monetary effects of parking management are not isolated to construction costs. Parking management also affects the modal split. The consequences of this effect can also be calculated in monetary terms based on unit prices, as illustrated in the figure from Modu 2.0 shown above.



**Management applied to only new developments**

The trend in the total annual parking costs in Kirchberg. The calculations are based on the predicted long-term situation, when parking management is applied to new developments [Source: FUAk, 2018].



**Management applied to all parking**

The trend in the total annual parking costs in Kirchberg. The calculations are based on the predicted long-term situation, when parking management is applied to all parking [Source: FUAk, 2018].

## 3.4/ A company and developer angle

### “What’s in it for me”



An important aspect is the overall interest of Fonds Kirchberg and public planning entities for introducing stricter parking management as part of the mission to keep Kirchberg accessible by car, but “what’s in it” for companies and developers? Engaging them in the work happens not just through regulations and rules, but also by ensuring and communicating some benefits for them in this work.

Some initial reflections on this are provided below. To work with this topic in more detail will be an important element of a parking management programme in Kirchberg, as companies and developers together with retail and cultural institutions are crucial partners in the development of the Kirchberg area.

#### Companies

The main benefits for the individual workplace would include the following:

- Reduced parking cost by having to pay for less parking; by being able to rent out/sell off parking to other users due to a reduced in-house demand; and/or by being able to grow without needing to add new parking places
- Improved mobility options for the employees through improved alternatives to car use
- Less sick days due to a higher % of employees using active transport to get to work
- And in the longer run the ability to keep attracting talent brought by Kirchberg having good accessibility – also by car for those who really need it and are willing to pay the real price for using the car, including parking

The benefits obviously have to be compared with the “costs”. The main cost would probably be resistance from those employees used to having access to parking at work, especially employees used to having access to cheap or even free parking. Quite likely, this group of employees also has a higher proportion with management responsibilities and with a salary level above average; this might only make the resistance stronger. In fact, surveys from the Verkeiersverbond, IMS, and experience with mobility management elsewhere indicate that a substantial group of employees are actually relatively positive towards making parking less attractive, as long as this happens in coordination with improvements of alternative mobility options.

#### Residential developments

The main benefits for the individual developer are currently limited to the parking spots that can be sold off or rented out with a profit. This might change if pricing of parking is modified so it actually mirrors the costs in broader terms i.e. linked to congestion and pollution, and if alternatives to the car become so attractive that the market for residential units with no or very little parking also becomes attractive.

A rough estimate indicates that depending on level of parking management, the construction costs per unit can be reduced by 10.000-25.000 euros. This calculation is based on a hypothetical development with around 100 apartment units.





A row of cars parked in a lot, with a blue overlay and white text. The cars are parked in a line, and the background shows trees and a clear sky. The text is centered over the image.

# 4/ Where to Start

# Where to Start

## Get the basics right

- A** First step is to decide if willingness exists among key stakeholders to implement a more active parking management in combination with mobility management. Considering the importance of parking management - both when it comes to keeping Kirchberg accessible by car and the overall vision for Kirchberg - our verdict is that the arguments for such a role are considerably stronger than the opposite.
- B** Second step is to build the organizational capacity to run a parking management programme. The set-up and planning of the organization should be done in close dialogue with the City of Luxembourg to ensure coordination of tasks and responsibilities. How to organize and staff the part of the programme related to mobility management should be done in dialogue with the Verkeiersverbond and also based on the experience of the IMS and companies in the City of Luxembourg who have successfully implemented mobility management. Competences should include planning and data skills, but also skills in engagement, dialogue and communication. The ability to communicate the “why parking management” will be crucial for being able to involve the relevant partners.
- C** Third step is to formulate a parking management programme including actions and goals for both the short and long term. This should be formulated in dialogue with Kirchberg stakeholders, transport authorities, the City of Luxembourg and the national level; the latter because national legal structures related to tax and other issues play a large role for the parking management.



More to parking than parking...



Close cooperation with stakeholders...

### Then what...

Below are the recommended, more specific, short-term actions:

- 1 Create a comprehensive Kirchberg parking data collection programme, including a database of all existing and planned parking spaces, availability, ownership and management status, their condition and maintenance needs etc., plus a plan for how the data is to be updated on an ongoing basis.
- 2 Implement more efficient regulations and pricing, particularly for on-street spaces in high demand areas such as Grunewald and along Avenue J.F. Kennedy. This should be done in cooperation with the City of Luxembourg which is also currently updating its parking policies.
- 3 Start reducing on-street parking supply, for example in the Grunewald neighborhood where LuxPlan has already done comprehensive analyses. From the start, this should be closely linked to public space improvements, so benefits from day one are visible to local residents and visitors.



Test and experiment. Quick benefits...

- 4 Implement a robust mobility management programme that includes both carrots (improvements to non-auto modes) and sticks (incentives to reduce car-driving). A first step could be a comprehensive pilot project with a couple of companies that have the motivation to engage in this work.
- 5 Test and gradually implement / upgrade a parking sharing platform that facilitates the sharing of parking spaces. This will also help communicate that parking management is not only about “disturbing” car-users but also about better use of resources and increased convenience.
- 6 Create a transportation management association or similar to create a forum where stakeholders in the area can discuss and qualify initiatives related to parking and other transport matters. Experiences from the work with projects such as the “eco-quartier” could potentially be useful.
- 7 Ensure that thorough review of the parking design and location becomes standard when it comes to new developments, and that the review is based on the recommendations in this strategy, potentially supplemented with more specific guidelines and a catalogue of good examples.
- 8 Identify 1-2 interested developers and work with them to develop a pilot project on very low parking requirements combined with measures to improve the convenience of transport alternatives (should be closely linked to the mobility management programme).
- 9 Identify and focus on special hot-spots with local parking challenges. One such example is the drop-off/pick-up zone in front of the European School. A separate analysis is needed here to suggest improvements that at the same time can strengthen walking, cycling, public transport and public space qualities.
- 10 From the start, work on short term results and long term strategies in parallel, and time larger parking changes with the opening of the light rail to the city center and other major improvements to the alternatives to solo-car use.
- 11 Use tests, pilot projects and competitions as an ingrained working method.
- 12 Get going!



A row of cars parked in a lot, with a blue overlay and the text "5/ Summary". The cars are parked in a line, and the background shows trees and a clear sky. The text is in a large, white, sans-serif font.

# 5/ Summary

# Recommendations for Car Parking

## 1/ Make use of valuable space

## 2/ Share the parking

## 3/ Regulate more efficiently

Needs

By giving managers an incentive to implement parking and transportation management strategies, reduced and more accurate parking requirements can lower parking demand and vehicle trips. However, where alternative travel and parking options are inadequate, it may reduce the area's attractiveness and therefore the economic competitiveness.

Increase and formalize sharing of parking. Sharing parking facilities can significantly increase their efficiency, particularly where diverse land uses are located close together, and where municipal parking or other kinds of publicly accessible parking can be regulated or priced to serve more destinations. This strategy can significantly reduce the number of parking spaces needed to serve an area, often by around 20%, but does not usually reduce the amount of car trips.

By favoring higher-value uses and encouraging turnover, regulations can increase efficiency and help achieve other planning objectives such as increased accessibility for handicapped people and fewer illegally parked cars blocking car lanes, sidewalks and bike lanes. Regulations can significantly reduce the number of parking spaces needed to serve an area, and will sometimes reduce automobile trips, particularly if implemented with improvements to alternative modes.



Actions

- Enforce existing requirements
- Experiment with requirements
- Reduce - and diversify norms
- Consider a dynamic cap on amount of parking

- Create a platform for sharing
- Catalyze centralized parking hubs
- Make curb parking work harder

- Focus on high-value users
- Phase the implementations
- Evaluate residential permits
- Create an enforcement entity

## 4/ Ensure fair- & efficient pricing

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Efficient parking pricing can help achieve parking management objectives (favoring higher-value trips, increasing turnover, encouraging mode shifting, reducing total parking needs), generate revenue and reduce parking subsidies. Parking pricing implementation can be technically and politically difficult, so it is often best to establish long-term policies and plans that incrementally expand when and where parking is priced.



- Cash-out parking subsidies
- Unbundle the parking; a resident should always be able to choose to rent or buy parking (if parking is available)
- Manage demand with user fees
- Consider local anchoring through participatory budgeting
- Include external costs in the pricing

## 5/ Improve alternatives to solo car driving

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To achieve behavioral change through a parking strategy – and not just, for example, increased revenue - is not solely about changes in parking conditions, it is also about providing better alternatives to single car use. At the national and city levels and at the Fonds, this focus already exists. The most visible element is the construction of the light rail, and other elements focus on improving the conditions for walking and cycling.



- Promote Public Transport and ride-sharing
- Promote walking and cycling
- Promote car-sharing
- Implement a robust mobility management program
- Time the implementation of parking restrictions with improvements of alternatives

# Recommendations for Car Parking

## 6/ Improve user information

Kirchberg already provides a variety of information on parking availability and pricing. If more active parking management is implemented, it is crucial to continuously upgrade the information on parking and make it available on more and more platforms and increasingly in real time.

### Needs

- Increase emphasis on parking information
- Coordinate information across platforms and stakeholders

### Actions

## 7/ Avoid 'garage architecture'

Already in his classic "Life Between Buildings" from 1971, Jan Gehl showed how the way parking is located affects community building. If the parking is located in garages in front or below buildings, very few people will be in the street and meet there. Whereas if the parking is located at the end of the street or at a local hub, people will meet in the street when walking to and from the parking. Likewise as illustrated in the Densification Toolbox; how access to and from underground parking at offices is organized has a large effect on public life. So in short, there is much more to parking than parking.

- Change the architectural approach to parking
- The amount and location of parking is about much more than parking, this should be part of criterias for design
- Avoid access ways as barriers for people cycling and walking

## 8/ Introduce contingency-based planning

Allow and encourage contingency-based parking planning to be prepared for shifts in demand. Parking is often oversupplied due to the fear of possible shortages. Planning that takes into account how special peak periods, whether expected or unexpected, will be handled can significantly reduce the number of parking spaces needed and/or help to avoid excessive amounts of parking spaces. The need for contingency planning is only increasing due to uncertainty on how emerging transport technologies such as automated vehicles and ridesharing services will affect parking demand.

- Create flexible infrastructures
- Consistent reviews, adjust and enforce

## 9/ Remember the existing parking

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If only applied to new developments, parking supply will need to increase in the future. However, if parking management is applied to existing, as well as new developments, it is possible to accommodate significant growth in office space and residences with little or no increase in total parking supply in the district, which has also occurred in peer cities such as London, Strasbourg and Zurich. Several of the beforementioned recommendations affect both new and existing parking. The four recommendations listed below are especially relevant for the existing parking.



- Create financial incentives
- Create good alternatives to travelling by car
- Consider introducing a dynamic parking cap
- Think long term by acting now

## 10/ Ensure ability to deliver

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Active parking management is crucial not just for the quality of public space and public life in Kirchberg, but also to ensure good accessibility to Kirchberg in the future. A clear mandate, coherent organization, and sufficient resources to deliver on parking management are key. Several parties are central in making this happen. Actions at national and city level are crucial - the Fonds role should be defined in dialogue with these partners. Workplaces, commercial and cultural institutions, and residents are other important stakeholders to involve.



- Create a clear line of responsibility
- Consider a district based transportation management association
- Ensure good data
- Ensure sufficient resources





