

# **Digital unterstütztes Parkraummanagement**

***Digital parking enforcement***

***Experiences from Amsterdam 2009-2021***

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# Digital parking enforcement



Technical  
concept

Regulations

Security &  
Privacy



# Amsterdam

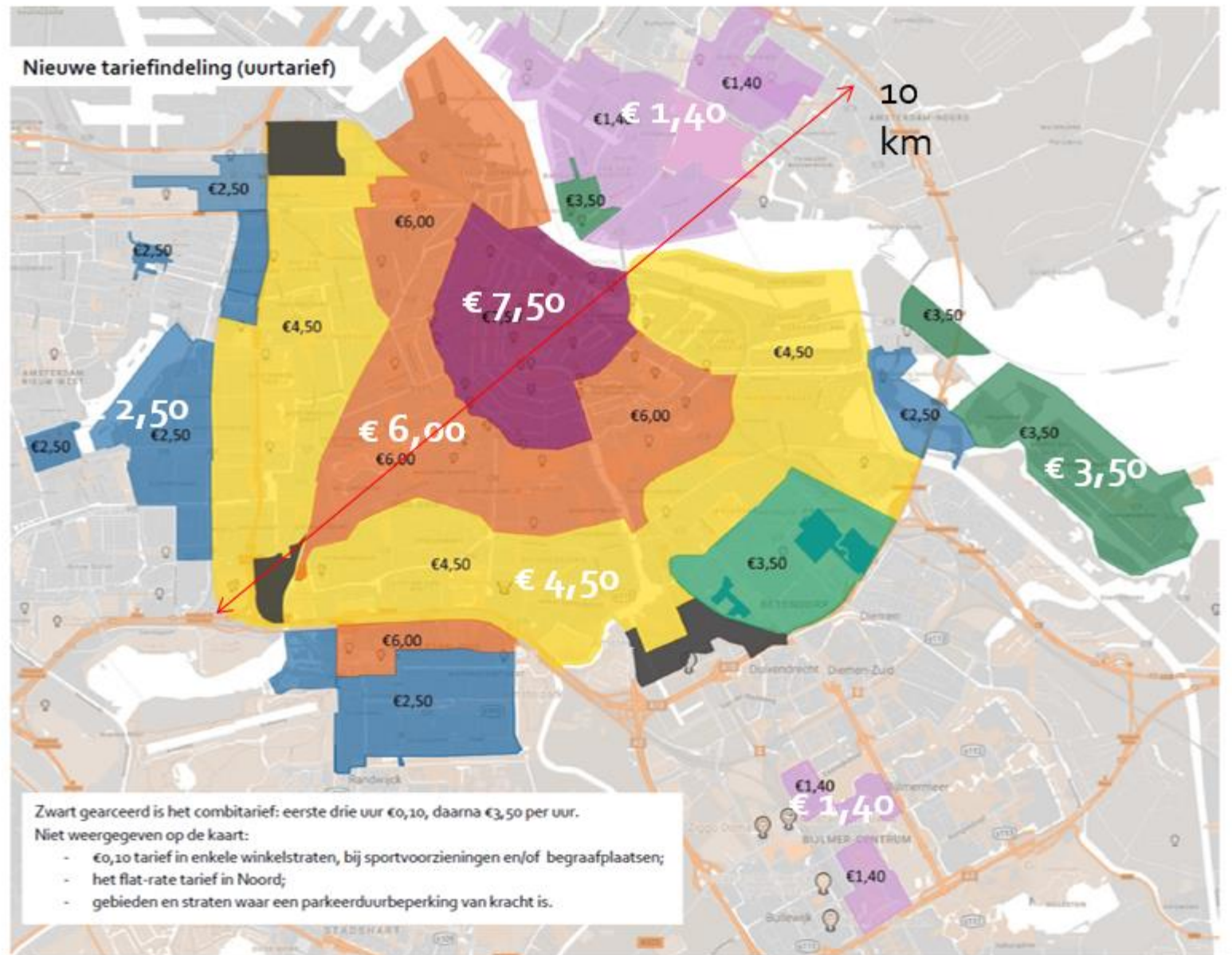


AGORA Verkehrswende / Digital Parking Enforcement 31 May 2021

- Inhabitants: 830.000
- Metropolitan region: 2 million
- 400.000 cars
- 800.000 bicycles
- Berlin: 3.6 million

# XXX Tariffs & Zones

160.000 regulated parking places *on street*  
100.000 *unregulated*







# Enforcement by scan car:

- License plate + GPS-position of the car

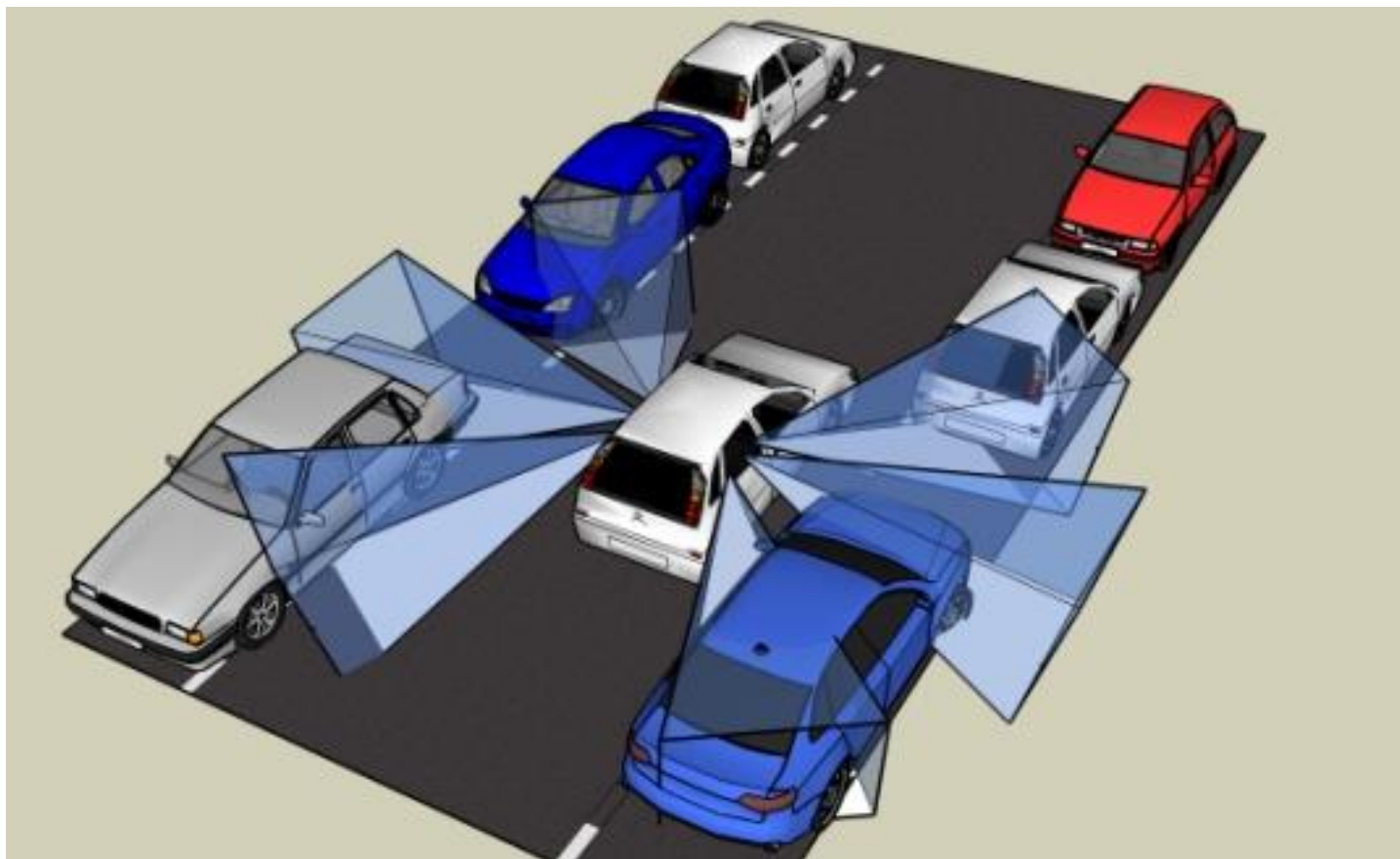


*Photo: Egis Parking Services BV*



# Enforcement by scan car:

- License plate + GPS-position of the car



# Parking machines with license plate number input



- Numberplate input obligatory
- 2600 parking machines
- Card only
- Smart phone payments: >70%
- 17 different providers (Parkmobile, SMS-parking etc)





# Digital parking enforcement - concept

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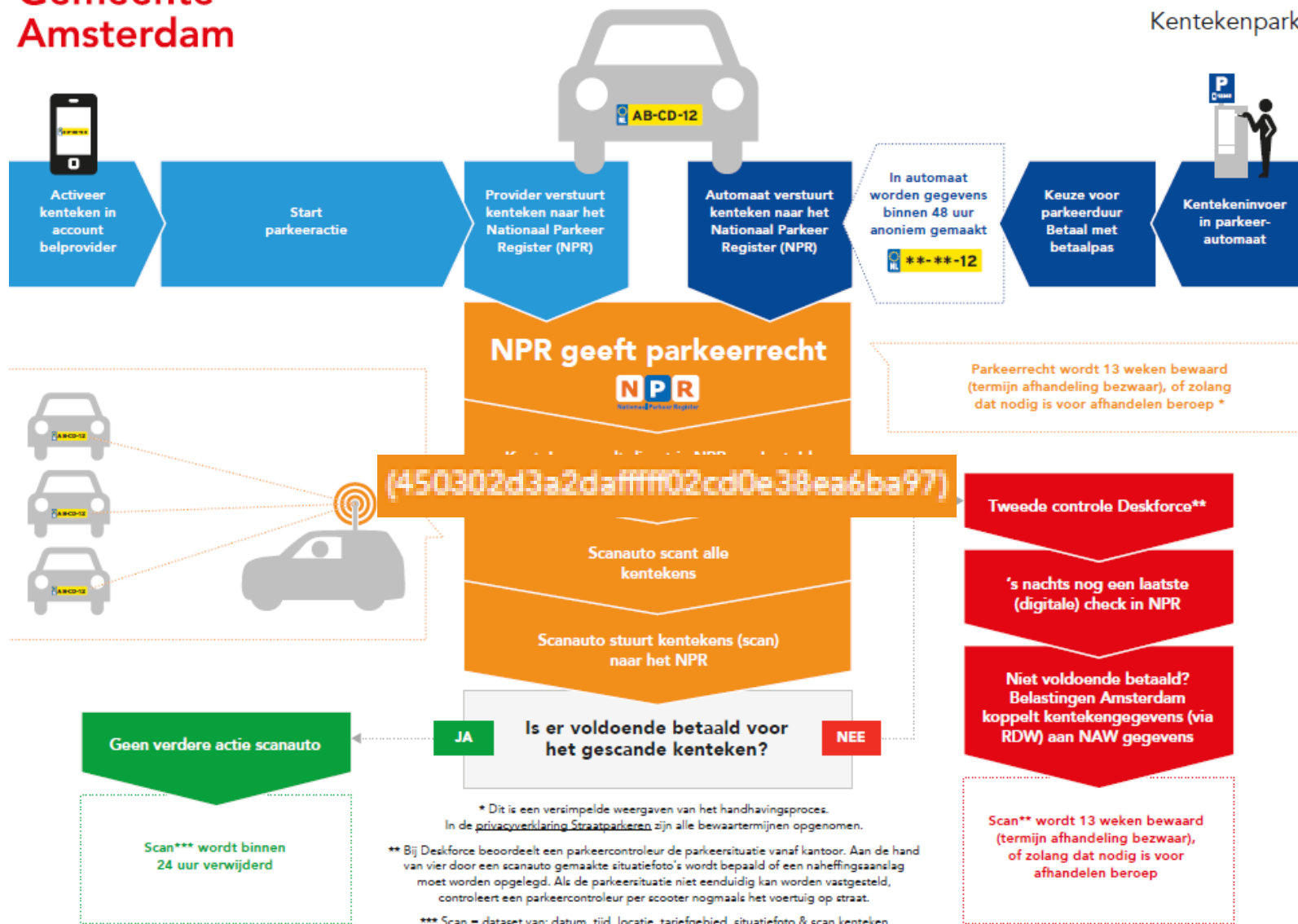






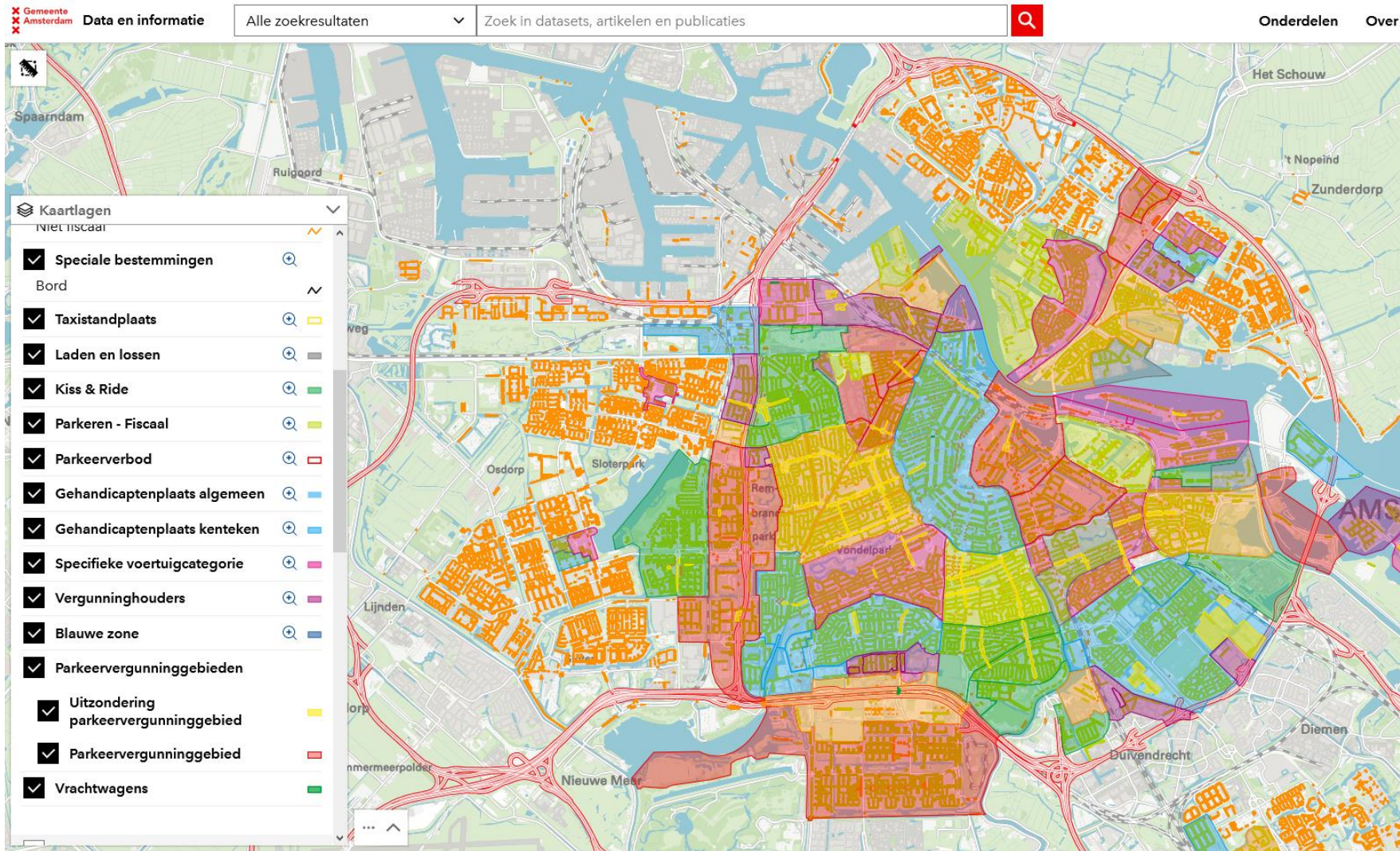
# Gemeente Amsterdam

## Infographic Kentekenparkeren

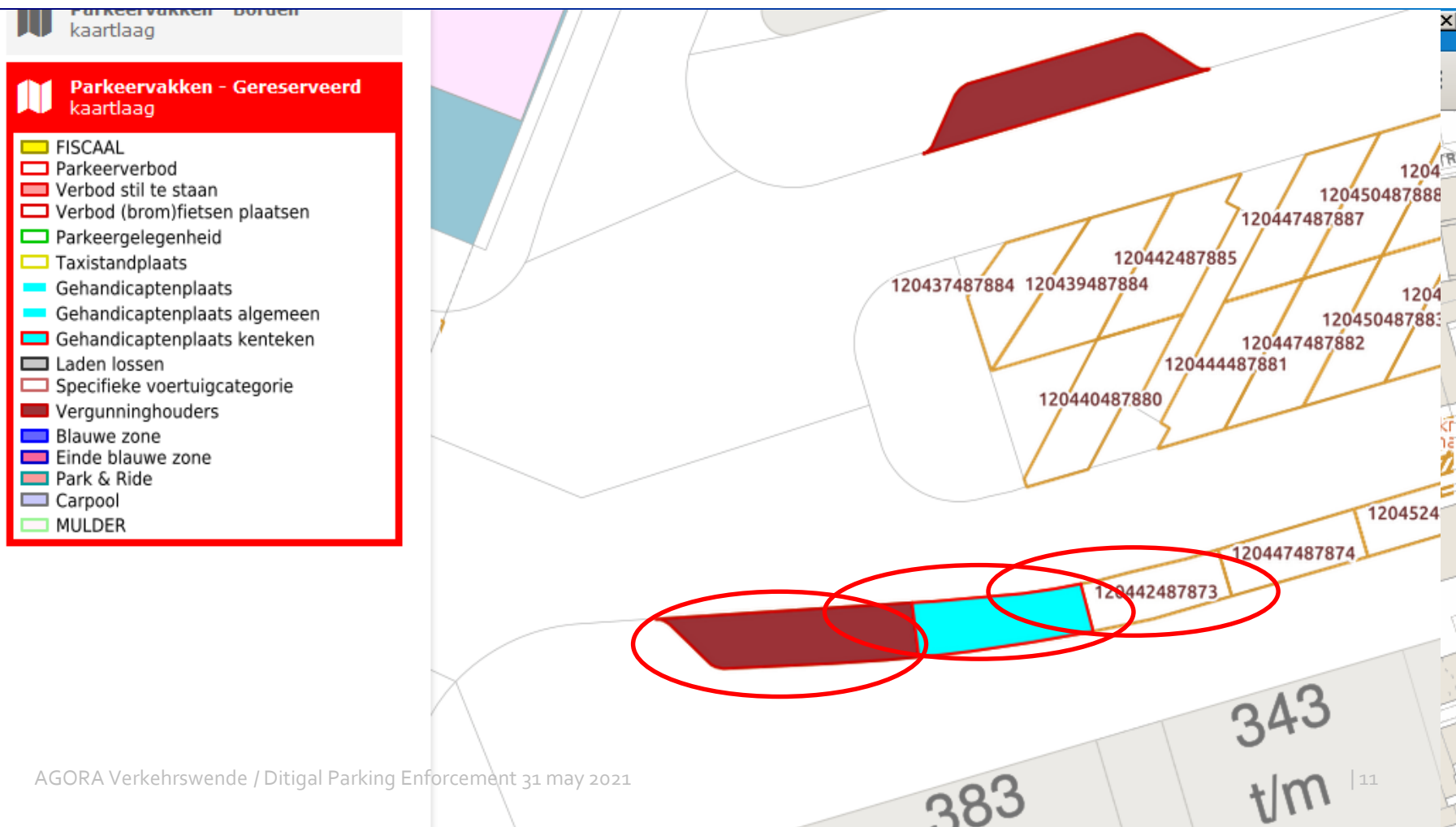




# Digital parking map



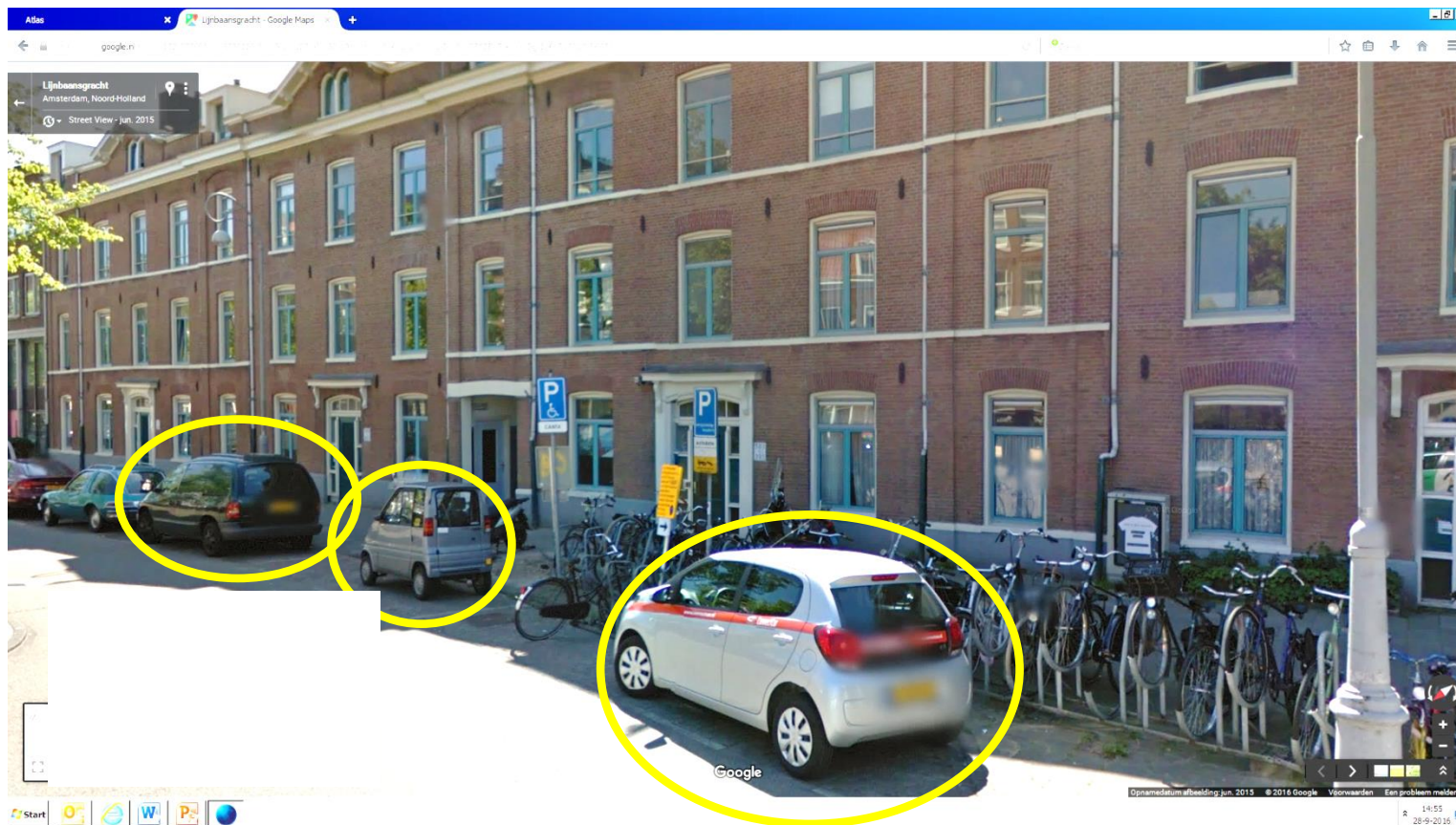
260.000 parking places,  
with specific status, GPS-location and  
information







# City Data: 100% accuracy required







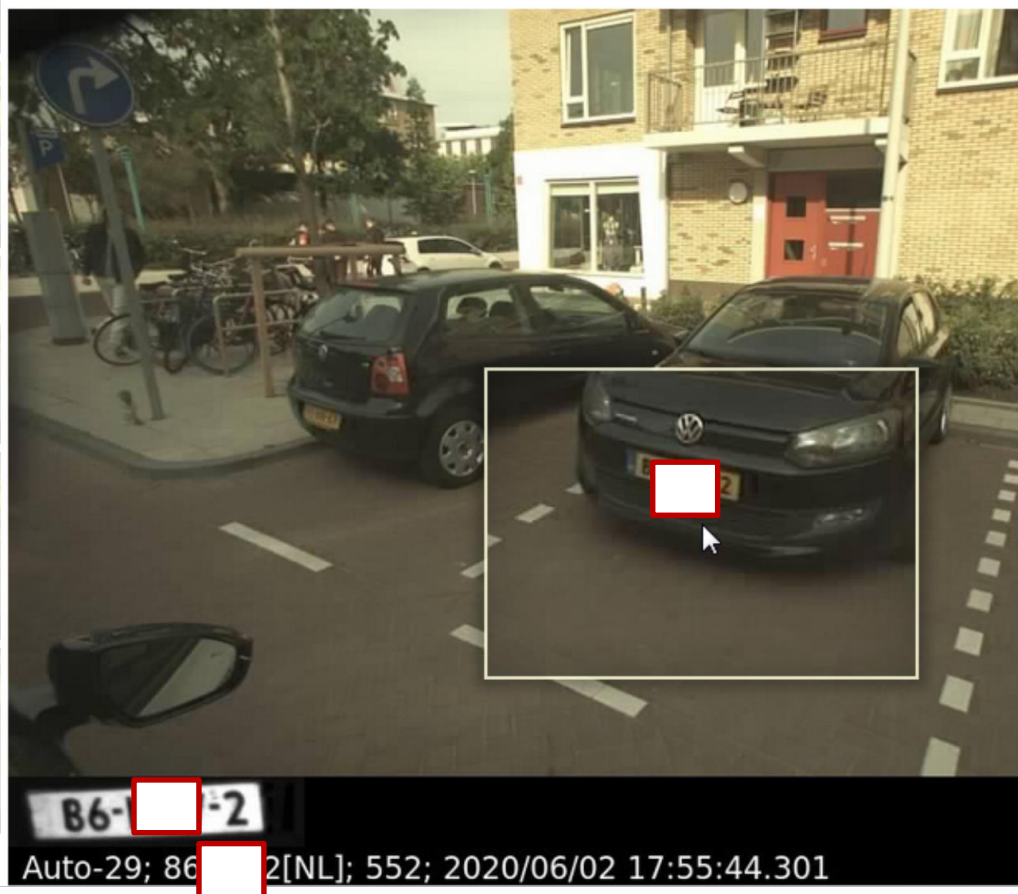
# No permit or payment found?

## Always a employee of Desk Force will assist:

### Desk Force Room:

- Authorised personel only
- Logging of all actions
- Job rotation:
  - Scan Car
  - Scan Scooter
  - Desk force
- Fraud detection

Adres	Ernest Staesstraat 9	Merk	TOYOTA
Zone	e39c, De Kolenkit	Voertuigtype	Personenauto
Scannummer	15 [redacted] 30	Kleur	ROOD





**Extra care:**

**“Parking or stopping to unload passengers?”**





## Only samples, no full surveillance 24/7

- Only samples are taken ('*stichprobe*')
  - Any single parkingspot (or car) is scanned 1 – 40x per week
    - Residential areas: 1x per week.
    - City centre: up to 6 times per day (@ ~ 5 seconds);
- = ca. 5 - 200 seconds every week per parking spot / car.
  - (less than 4 minutes per week, combined)!



## Only samples, no full surveillance 24/7 (2)

- Total scan volume per year = ~ 40 million scans
- Circa 80% is permit holder 32 M scans
- Circa 20% is short stay 8 M scans  
– Payment rate is 82% (6,5 M scans)
- To Desk Force (no parking right) 1,5 M scans per year
- Circa 0,5 M fines per year – ***only these*** are matched to name, adress.





## Results of digital enforcement:

- Payment rate: up from 72% to 82% (excl. Permitholders)
  - Net result 2020: ca. 200 milion euro
- 50% savings on enforcement costs (!)
- Less aggression against enforcement officers
- Better use of enforcement as a tool to regulate parking rate



# Digital parking enforcement



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Regulations



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**✖ ✖ Regulations**

- **Parking regulation**
    - Permits (14 different types)  
*resident, business, handicap, care giver, visitor, 'green', etc*
    - Requirements, per permit type
  - *Numberplate input is mandatory*
  - *Mobile phone app is allowed*
- Tariffs & Zones**



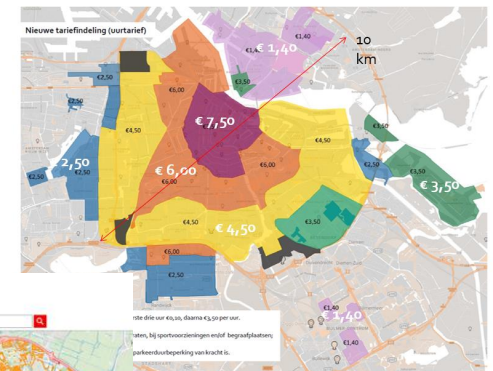
Nieuwe tariefindeling (uurtarief)

€1.40

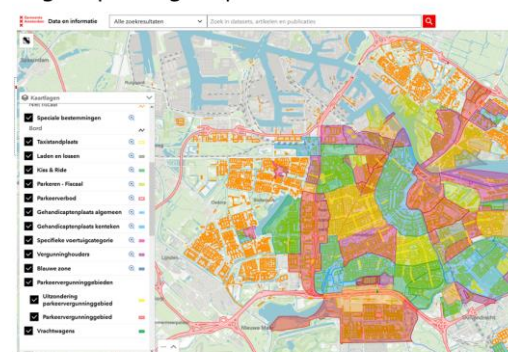
## ■ Parking Tax regulation

- Permittzones
- Tariffs
- Fines

## Tariffs & Zones



## Digital parking map





# Digital parking enforcement



Technical  
concept



Regulations



Security &  
Privacy





# Privacy & Security

*'license plate number = personal data'*

- Privacy protocol / (European Convention on Human Rights)
- Compliant with 'General Data Protection Regulation' (GDPR) /  
*Datenschutz-Grundverordnung DSGVO*
- Privacy by design / privacy by default:
  - Numberplate encryption to 40 characters
  - One-Way queries only: number plate →  
parking right / location / time
  - No back tracking: "time + location = number plate"

# Legal certainty, 8 lawsuits

- 2012-2018: 8 consecutive law suits
- Initiated by Dutch foundation 'Privacy First .nl'.
- **'data storage of number plates':**
  - *Yes, allowed.*
- **'obligation to enter number plate':**
  - *Yes, but errors are permissable, and payment is accepted*
  - *no refund of legal assistance cost*
- **'anonymity in public space':**
  - *Yes, but not unconditional (i.e. show ID when asked, etc)*

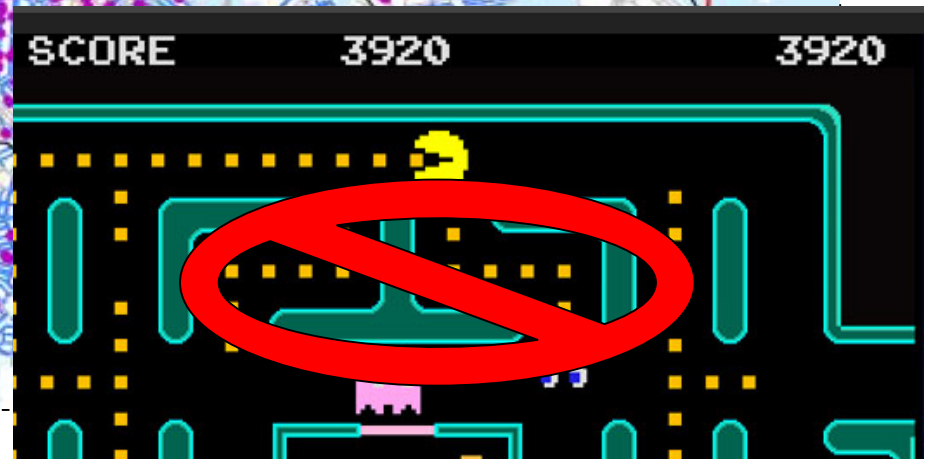
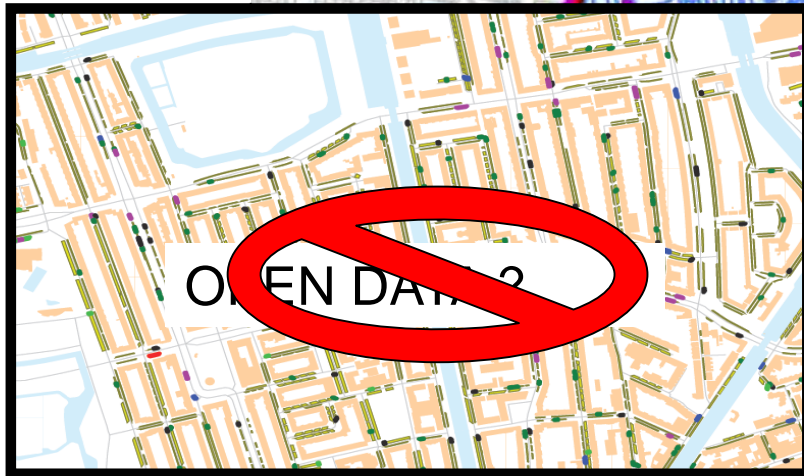
# XXX Legal certainty, 8 lawsuits (2)

- **'card only payment':**
  - *Yes, as 'gift cards' are available for cash and work with parking machines*
- **'European Charter of Human Rights': High court:**
  - *Yes, digital parking enforcement is an infringement of personal privacy, but allowed by and restricted by municipal regulations.*



# Data

- Spread of tickets:







**Digital parking enforcement:**

**Positive reception by local media, public and politicians:  
(2012):**



**Local  
Media**



**Residents &  
businesses**



**City Council**



# Additional enforcement tasks:

- **Ghost vehicles:** '*stolen*', '*exported*', '*scrapped*', etc (2017)  
Result: 100's of vehicles returned to owners/ insurance company
- '**Illegal Parking**', for example: on pedestrian area etc. (2017)  
Result: -90% illegal parking in specific area.



**End.**



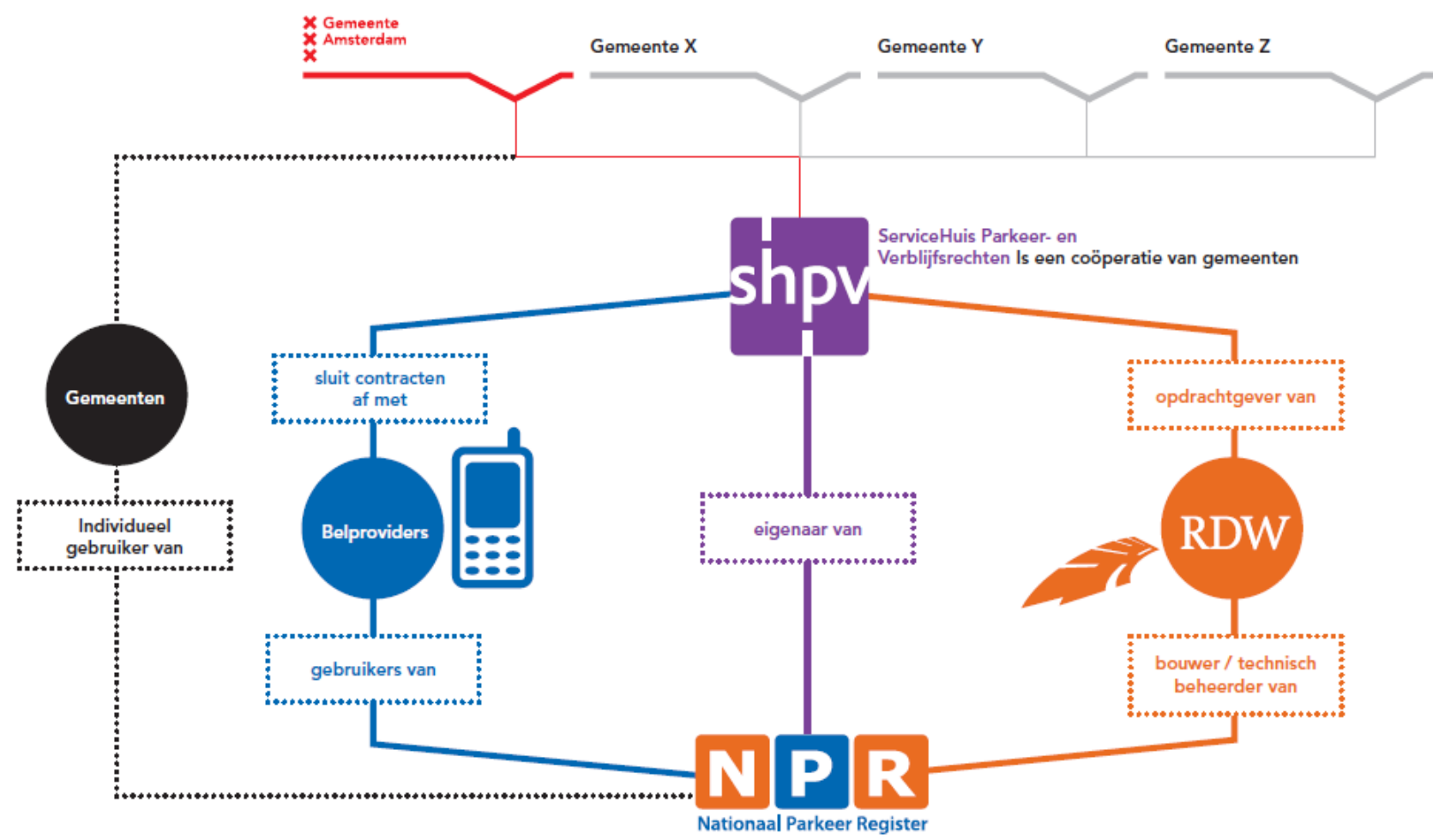


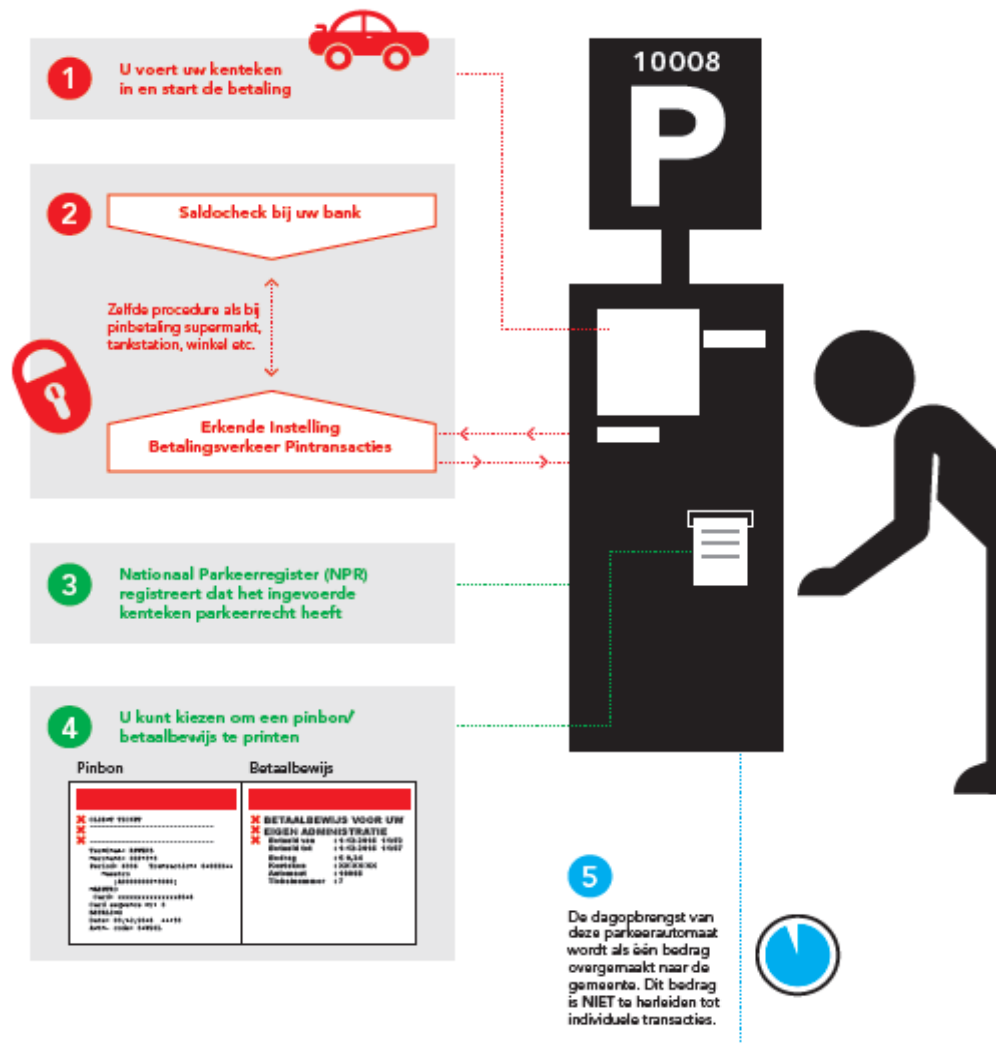


# Contract Parkingservices

*City of Amsterdam*  
&  
*Egis Parking Services GmbH*

- **Permits** *back office*, (front office is City of Amsterdam)
- **Customer contact center** (telephone, internet, email)
- **Enforcement** (scancar etc)
- **Parking machines availability** (ownership: City of Amsterdam)
- **Webshop**: day-, week-, month tickets
  
- *Bonus / malus system*
  - *Key performance indicator: Payment rate per zone*







## Toelichting parkeerticket

<div><div></div><div><div><div>X</div><div>X</div><div>X</div></div><div>CLIENT TICKET</div><div>-----</div><div>-----</div><div>1 Terminal: R8WZK5</div><div>2 Merchant: 0097373</div><div>3 Period: 0330 4 Transaction: 01003311</div><div>5 Maestro</div><div>(A0000000043060)</div><div>6 MAESTRO</div><div>Card: xxxxxxxxxxxxxxxx6010</div><div>7 Card sequence Nr: 3</div><div>BETALING</div><div>8 Date: 03/12/2016 11:53</div><div>9 Auth. code: 31W20L</div></div></div>	<div><div></div><div><div><div>X</div><div>X</div><div>X</div></div><div>BETAALBEWIJS VOOR UW EIGEN ADMINISTRATIE</div><div>Betaald van : 1-12-2016 11:52</div><div>Betaald tot : 1-12-2016 11:57</div><div>Bedrag : € 0,34</div><div>Kenteken : XX-XX-XX</div><div>Automaat : 10008</div><div>Ticketnummer : 17506</div></div></div>
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Op de linkerzijde van het parkeerticket staat de informatie van de betaaltransactie. Deze is niet voor de gemeente inzichtelijk.

- 1 Code van de pinautomaat in de parkeerautomaat. Deze wordt ook op uw bankafschrift vermeld
- 2 Code voor de soort betaling; in dit geval parkeren
- 3 Boekingscode van de bank
- 4 Deelcode van de transactie
- 5 Code van de soort betaalmiddel die is gebruikt
- 6 Uw rekeningnummer versleuteld
- 7 Laatste cijfer van het volgnummer op uw bankpas
- 8 Datum en tijdstip van betaling
- 9 Deelcode van de transactie die op uw bankafschrift wordt vermeld

Op de rechterzijde van het parkeerticket staat de informatie van het gekochte parkeerrecht.

