



Developing Czech standard for smart on-street parking



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P S S S E

Promoting Open Specifications and Standards in Europe

2012-2014

Open specifications for traffic control:

German concept OCIT and **British UTMC** – lack of rules
for smart cities on street parking



European Union
European Regional Development Fund



Smart on street parking

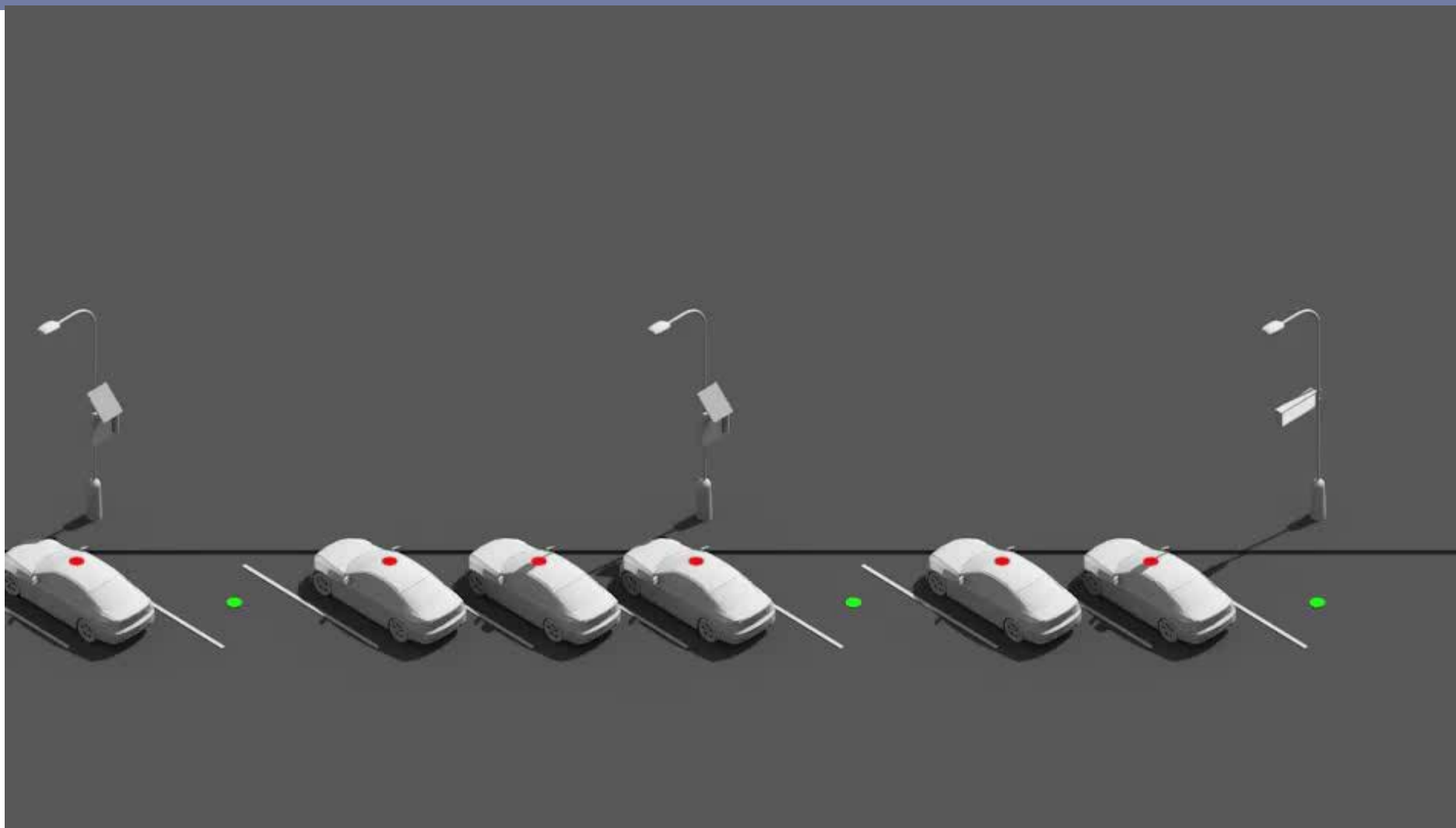


- Perspective system to be massively deployed in near future
- Real time information about parking occupancy
- Various mobile apps using the same real time data
- City strategies regulating parking based on historical data

ALL THIS RESULTS IN A NEED FOR A STANDARD



Smart on street parking system





Perspective business cases

- Navigation – Bank visit (in different city)
- Residential parking (user view and city view)
- Urban logistics – Delivery truck
- Parking statistics
- Enforcement – Terms violation and supervision (wrecks)
- User preferences and limitations – Handicapped or inexperienced drivers



Smart on street parking – user view

- One app for all national cities (similar to multimodal journey planning)
- Familiar GUI with native language
- Personalisation
- Guidance on free parking bay on trip
- Payment (no wallet)
- IT MUST BE EASY („one button solution“)

Example of future perspective



Firefox | IDOS - Vlaky + Autobusy - Vyhledání sp... | jizdnirady.idnes.cz/vlakyautobusy/spojeni/#nextanchor | Google

Seznam - Najdu tam, ... | Ovladače a položky ke ... | Nový panel | Slovník dopravní termi... | Přihlášení | ZUNO onli... | ČSN online pro jednotl... | ENGLISH FLASH GAM... | Public consultations - ... | Welcome! | LinkedIn

Přidaná spojení ↓

18:00	Datum	Odkud/Přestup/Kam	Přij.	Odj.	Pozn.	Spoje
<input type="checkbox"/>	16.1.	London Euston Manchester Piccad.		18:00 20:04		Ex
Celkový čas 2 hod 4 min jede do 16.V. v 1 - 5 1						
Detail spojení Vytisknout Poslat e-mailem Odstranit spojení Přidat do Mých spojení Mapa						

18:20	Datum	Odkud/Přestup/Kam	Přij.	Odj.	Pozn.	Spoje
<input type="checkbox"/>	16.1.	London Euston Manchester Piccad.		18:20 20:25		Ex
Celkový čas 2 hod 5 min jede do 16.V. v 1 - 5 1						
Detail spojení Vytisknout Poslat e-mailem Odstranit spojení Přidat do Mých spojení Mapa						

18:40	Datum	Odkud/Přestup/Kam	Přij.	Odj.	Pozn.	Spoje
<input type="checkbox"/>	16.1.	London Euston Manchester Piccad.		18:40 20:46		Ex
Celkový čas 2 hod 6 min jede do 16.V. v 1 - 5 1						
Detail spojení Vytisknout Poslat e-mailem Odstranit spojení Přidat do Mých spojení Mapa						

Všechny výsledky: [Vytisknout](#) [PDF](#) [Poslat e-mailem](#) [Přidat do Mých spojení](#) [Nastavení](#)

[Změnit zadání](#) [Nové zadání](#) [Hledat zpáteční spojení](#) [Trvalý odkaz](#)

[PŘEDCHOZÍ](#) [NÁSLEDUJÍCÍ](#)

[Ke stažení](#) | [IDOS v mobilu](#) | [JR v PDF](#) | [Mapa ČD](#) | [e-jízdenka](#) | [BUSsport](#) | [Řazení vlaků](#) | [Pro nevidomé](#) | [Facebook](#) | [Informační tabule](#)

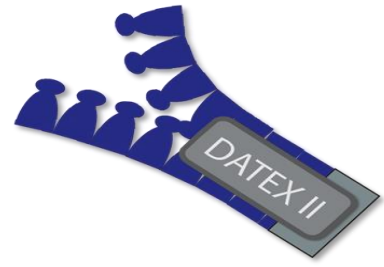
English | Deutsch

Najdete na iDNES.cz

posunout posunout



Smart on street parking – city view



- Unified technical terms for public procurement = more providers and lower price
- Standard terms for data collection, management and publication = lower management cost
- One organization to manage data – e.g. Traffic information centre = one data feed
- Parking management and payment enforcement = parking is almost never full and it is not possible not to pay



Public procurement – open system

Division of the whole issue into 3 activities:

- 1. Description of the place** (localisation and attributes of a parking bay and a parking area)
- 2. Common terms for installation** = one system can be installed by one company even for one street = Standard Real time data provision from various suppliers to the centre
- 3. Common terms for standard data publication** by the centre

This all results in the content of a standard



Draft of the standard

- Based on DATEX II, version 2.2, made as a profile
- Terms for system providers and data providers – static as well as real time
- Terms for city central system managers for data releases
- Terms for data about payment
- Static and dynamic data provision in DATEX II tested on real system deployed



Example of static data

```
...
<parkingFacility xsi:type="UrbanParkingFacility" id="519D9AAA-1EAA-4AAA-A9AA-6376C3869AAA" version="1">
  <parkingName>
    <values>
      <value lang="cs">Parkoviště CDV</value>
    </values>
  </parkingName>
  <parkingRecordVersionTime>2014-05-02T11:43:27.0</parkingRecordVersionTime>
  <parkingNumberOfSpaces>36</parkingNumberOfSpaces>
  <parkingPrincipalNumberOfSpaces>36</parkingPrincipalNumberOfSpaces>
  <parkingOccupanyDetectionType>singleSpaceDetection</parkingOccupanyDetectionType>
  <parkingLocation xsi:type="Point">
    <pointByCoordinates>
      <pointCoordinates>
        <latitude>49.197068</latitude>
        <longitude>16.661174</longitude>
      </pointCoordinates>
    </pointByCoordinates>
  </parkingLocation>
  <onlyAssignedParking>
    <parkingUserType>employees</parkingUserType>
    <parkingUserType>visitors</parkingUserType>
  </onlyAssignedParking>
  <prohibitedParking>
```

Example of dynamic data



...

```
<parkingStatusPublication>
```

```
<parkingTableReference version="1"
  targetClass="ParkingTable" id="6DFFAAAA-51AA-48AA-84AA-7A947CA90
<parkingStatus xsi:type="ParkingFacilityStatus">
  <parkingReference version="1" targetClass="Parking"
    id="8BA141D7-205A-462D-9503-C4F8537D71E3" />
  <parkingStatusOriginTime>2014-05-02T11:43:27.0</parkingStatusOriginTim
  <parkingSpaceStatus parkingSpaceIndex="1">
    <parkingSpaceStatus>
      <parkingSpaceOccupied>>false</parkingSpaceOccupied>
    </parkingSpaceStatus>
  </parkingSpaceStatus>
  <parkingSpaceStatus parkingSpaceIndex="2">
    <parkingSpaceStatus>
      <parkingSpaceOccupied>>false</parkingSpaceOccupied>
    </parkingSpaceStatus>
  </parkingSpaceStatus>
```



Calculation of the system cost

Technical terms are not enough

CZ_SK project on smart cities: www.chytremesta.sk

- a web tool for budget planning at

<http://chytremesta.sk/index.php/sk/chytre-mesto/kalkulacka-chytreho-parkovania>

SMART ON STREET PARKING INVESTMENT CALCULATION TOOL

UI language

čeština

English

The currency

CZK

EUR

USD

Purchase cost

Number of parking bays ⓘ

130

+ Hardware units details

Purchase cost of the hardware ⓘ

22643.47

Installation cost ⓘ

15303.33

Calculate purchase cost

Total purchase cost of the system

37946.80

Operation cost

Data transfer tariff per month ⓘ

7.29

Electricity bill per month

5.47

Service fee per month ⓘ

142.10



Calculate operation cost

Total operation cost per month

154.86

Return on investment (ROI)

Parking price per hour

2.00

Payment broker fee ⓘ

7

Parking payment duty period in hours per week ⓘ

77

Average occupancy ⓘ

72

Parking payment efficiency ⓘ

30

Expected parking payment efficiency ⓘ

90



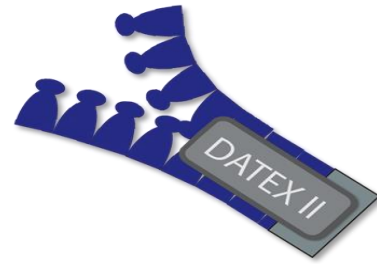
Calculate ROI

ROI in months

2



Thank you for your attention



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Software development

SOA, web services, application integration and information systems background

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