



Invited Guest Lecture

Faculty of Technical Sciences, University of Novi Sad, 28.10.2013

# TRANSPORTATION INFORMATICS: from simple to advanced use cases

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Faculty of Civil Engineering

University of Maribor



# About Your Lecturer...

Maribor



- Assist. Prof. Dr. Andrej Tibaut
- Head of the **Chair for Construction and Transportation Informatics** (KGPI, [fg.um.si/kgpi](http://fg.um.si/kgpi)), Faculty of Civil Engineering, University of Maribor, Slovenia
- 15 y. of experience in applying IT in Engineering
- [andrej.tibaut@um.si](mailto:andrej.tibaut@um.si)
- <http://fg.um.si/osebje/andrej.tibaut>
- <http://linkedin.com/in/andrejtibaut>

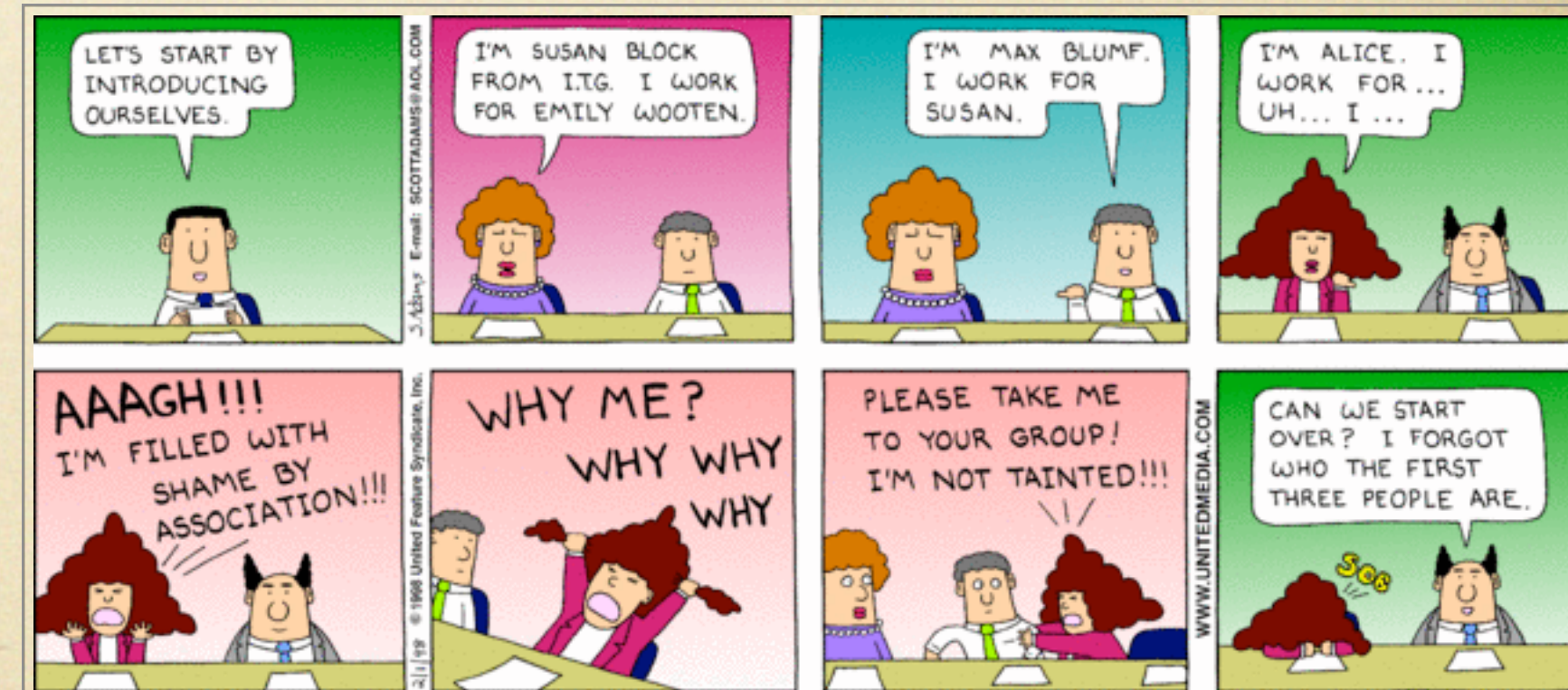
Novi Sad





# How About You...?

- Please introduce yourself?
- What are your expectations for this lecture?
- What do you want and/or need to get out of it?
- Your experience in transportation informatics?





# Today's Lecture Workflow

- 1. What is transportation informatics?
- 2. Use case 1: Specification requirements for SUZA
- 3. Use case 2: Real-time GIS in public transport
- 4. Use case 3: SIJPRIS - GIS for the Management of Public Passenger Transport
- 5. Standardization of information models for public transport



# 1. What is transportation informatics?

- “Transportation informatics” (alternatively “traffic informatics”, “Verkehrsinformatik” in german) is derived from the domains of traffic (technology, planning & design, traffic safety, mobility research), logistics and navigation. It aims to apply and develop computer science and informatics to solve practical and teoretical problems in these domains.
- Early beginnings:
  - GYÖRGY WESTSIK Verkehrsinformatik. - Ein Einführung. Berlin: Transpress-Verl., 1989, 1. Aufl., 109 S., brosch. (3-344-00368-2) ISBN/ISSN 3-344-00368-2.
- Today:
  - new disciplines: freight informatics
- Our research in transportation informatics:
  - TIBAUT, Andrej, KAUČIČ, Branko, REBOLJ, Danijel. A standardised approach for sustainable interoperability between public transport passenger information systems. Comput. ind.. [Print ed.], Oct. 2012, vol. 63, iss. 8, str. 788-798, doi: 10.1016/j.compind.2012.08.002.



public  
passenger  
transport



# 1. What is transportation informatics?

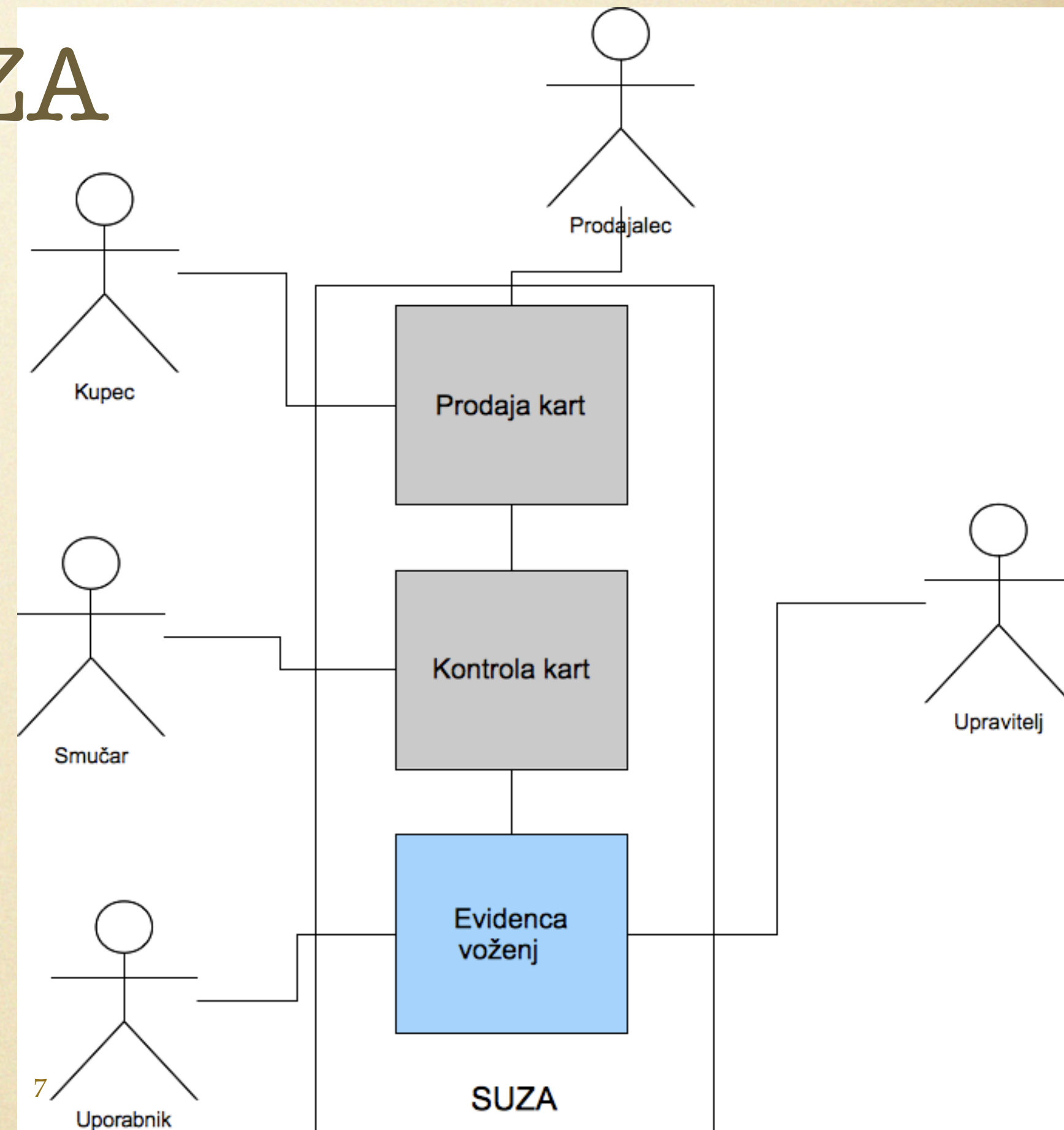
- Some fields of application:
    - management and integration of traffic/transportation systems (ITS)
    - integration of multimodal public transport systems (train, bus, coach, metro, tramway, ferry, ski lifts, aerial trams/cable cars)
    - accessibility of public passenger transport
    - public transport demand & supply
    - electronic toll collection
- 
- The diagram consists of three callout boxes. An orange box points to the first item in the list. Two green boxes point to the second item. The first green box points to the phrase 'aerial trams/cable cars', and the second green box points to the word 'accessibility'.
- What is the role of traffic engineer?
- SLO: optimal radius <500m
- UK: Thames cable car



## 2. Use case 1: SUZA

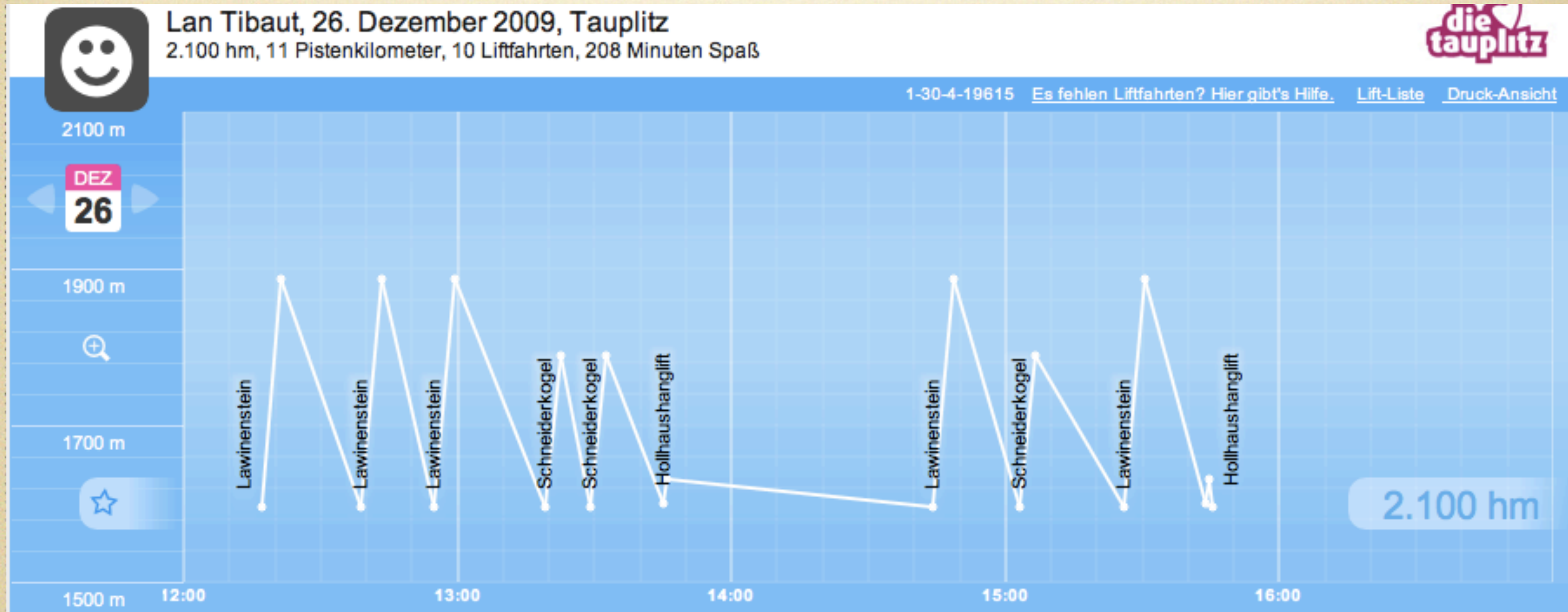
- SUZA = Sistem za Spremljanje Uporabe Žičniških Naprav (System for monitoring of ski lift usage)

**Traffic engineer  
contributes to the writing  
of Software  
Requirements  
Specification Document**





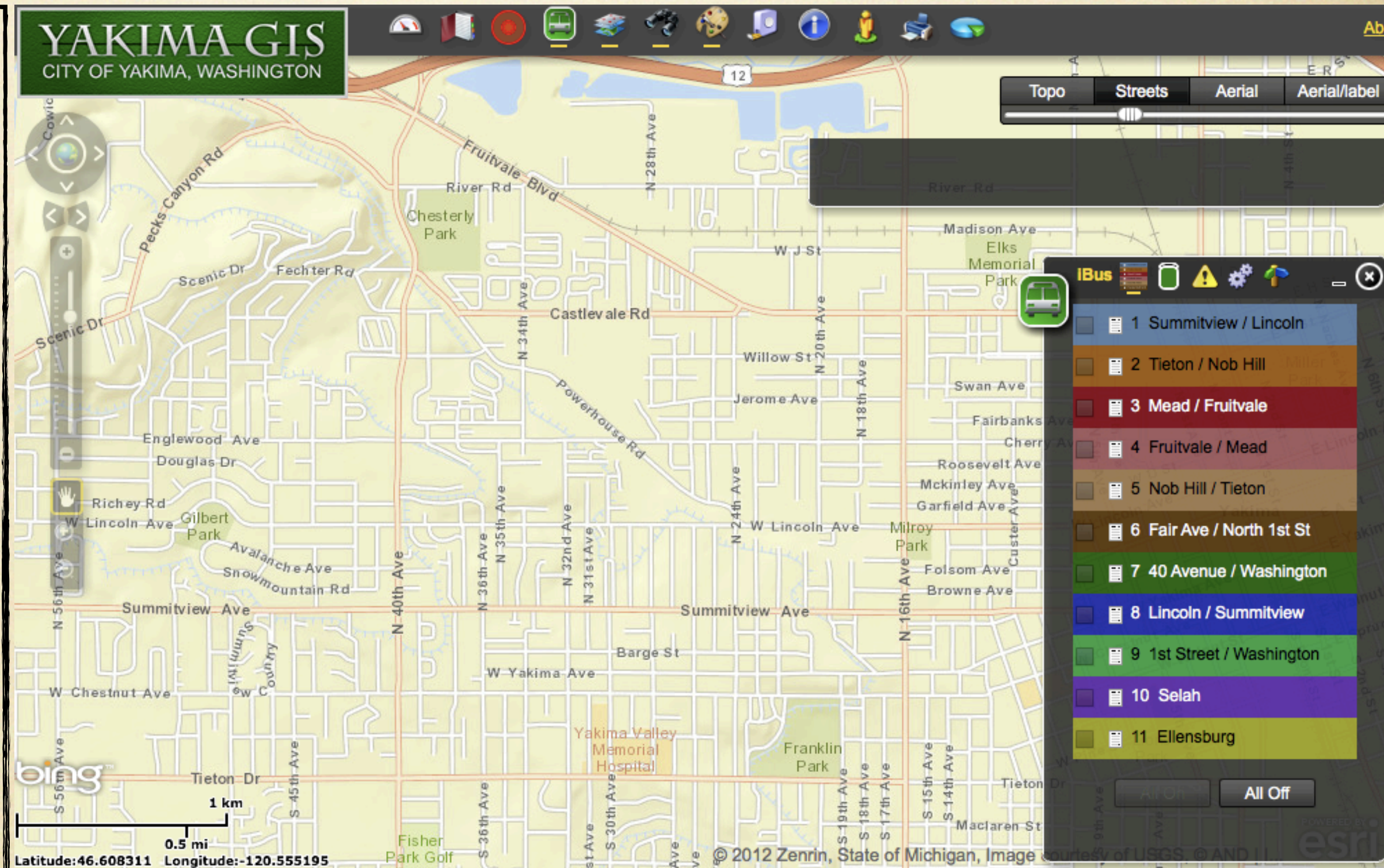
## 2. Use case 1: SUZA





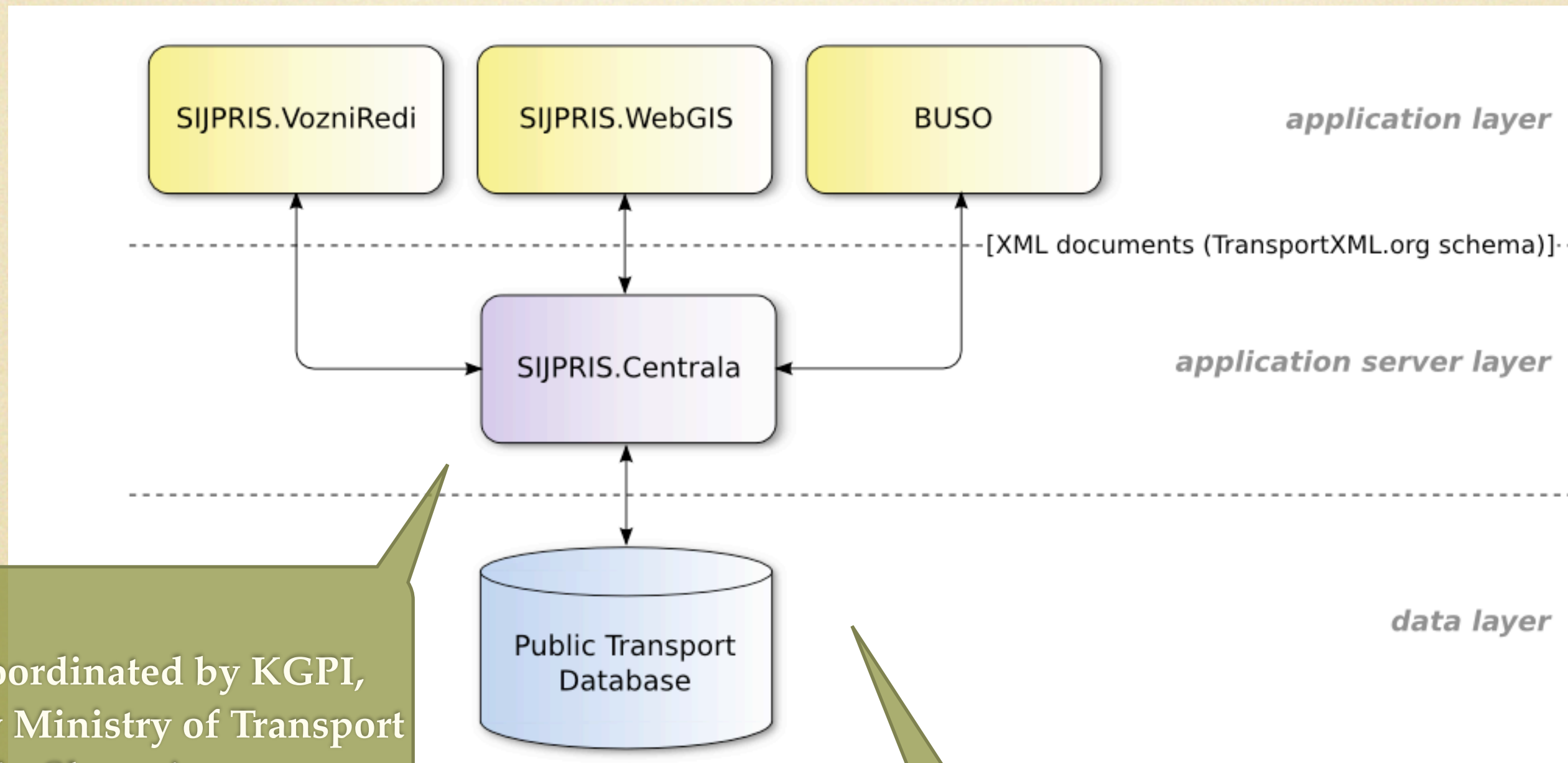
# 3. Use case 2: Real-time GIS in public transport

- Use of GIS (Geographic Information Systems) for realtime GIS display of bus time schedules and vehicle positions
- city of Yakima (Washington, USA)
- <http://www.ci.yakima.wa.us/gis/iBus/index.html>





## 4. Use case 3: SIJPRIS - GIS for the Management of Public Passenger Transport

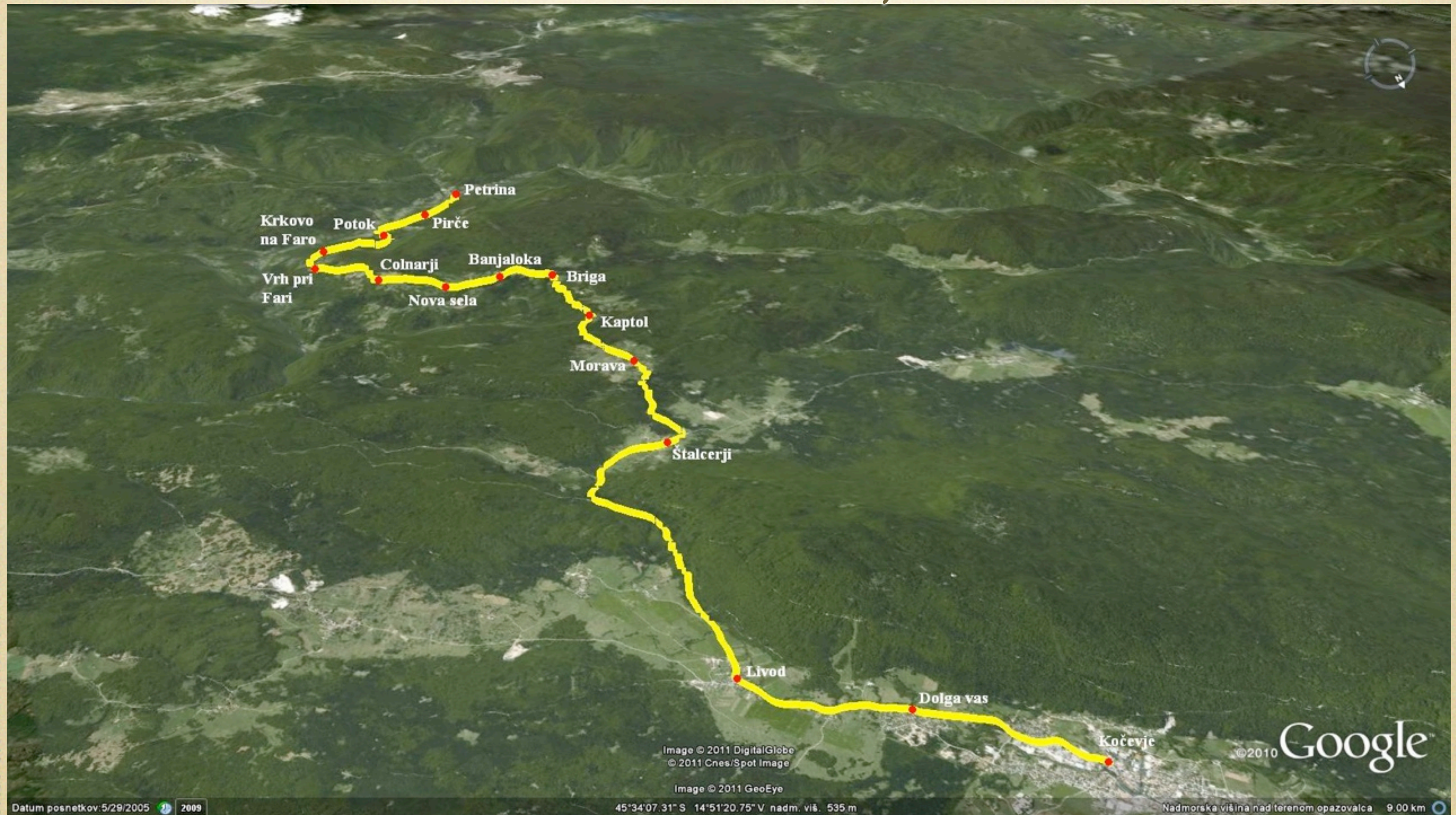


Project coordinated by KGPI,  
financed by Ministry of Transport  
in Slovenia

[More about SIJPRIS in a paper here](#)



# 4. Use case 3: SIJPRIS, bus line K6





# 4. Use case 3: SIJPRIS

Timetable exchange

http://192.168.255.48:7005/sijpris/gis/map.html - Windows Internet Explorer

http://192.168.255.48:7005/sijpris/gis/map.html

Direkcija Republike Slovenije za ceste

28.09.2009

**Navigacija**

**Sloji**

- ☒ KARTOGRAFSKE PODLOGE
  - ☐ DOF5
  - ☐ TTN 5/10
  - ☐ DTK 25
  - ☒ DTK 50
  - ☒ PK 250
  - ☒ PK 250 (DRSC)
  - ☒ PK 500
- ☐ PROMETNIH PODATKOV
- ☐ INFRASTRUKTURA
  - ☐ Linjski segmenti
  - ☐ Linjski odseki
  - ☐ Planirani
  - ☐ Postajne točke
  - ☐ Staje
- ☐ INFRASTRUKTURA PREDLOGI
- ☐ OVPRASEVANJE
- ☐ E
- ☐ ZNICE
- ☐ STER PROSTORSKIH ENOT

**Rezultat poizvedbe**

Itinerar - 28.09.2009

| LINJA | OZNAKA | NAZIV                                          | LINIJSKI ODSEKI | POSTAJNE TOČKE | VOŽNJE | GRAFIKA |
|-------|--------|------------------------------------------------|-----------------|----------------|--------|---------|
| K6    | 01     | Petrina - Kocevje                              | Linjski odseki  | Postajne točke | Vožnje | Grafika |
| K6    | 02     | Kocevje - Petrina                              | Linjski odseki  | Postajne točke | Vožnje | Grafika |
| K6    | 03     | Kocevje - Crni Potok - Kočevska Reka - Petrina | Linjski odseki  | Postajne točke | Vožnje | Grafika |
| K6    | 04     | Kočevska Reka - Kocevje                        | Linjski odseki  | Postajne točke | Vožnje | Grafika |
| K6    | 05     | Kočevska Reka - Stara Cerkev                   | Linjski odseki  | Postajne točke | Vožnje | Grafika |
| K6    | 06     | Kocevje - Kočevska Reka                        | Linjski odseki  | Postajne točke | Vožnje | Grafika |
| K6    | 07     | Crni Potok - Kocevje                           | Linjski odseki  | Postajne točke | Vožnje | Grafika |
| K6    | 08     | Kocevje - Crni Potok                           | Linjski odseki  | Postajne točke | Vožnje | Grafika |
| K6    | 09     | Kocevje - Livold                               | Linjski odseki  | Postajne točke | Vožnje | Grafika |
| K6    | 10     | Livold - Kocevje                               | Linjski odseki  | Postajne točke | Vožnje | Grafika |

Merilo 1:100000 1 2 km 488001.95, 43591.52

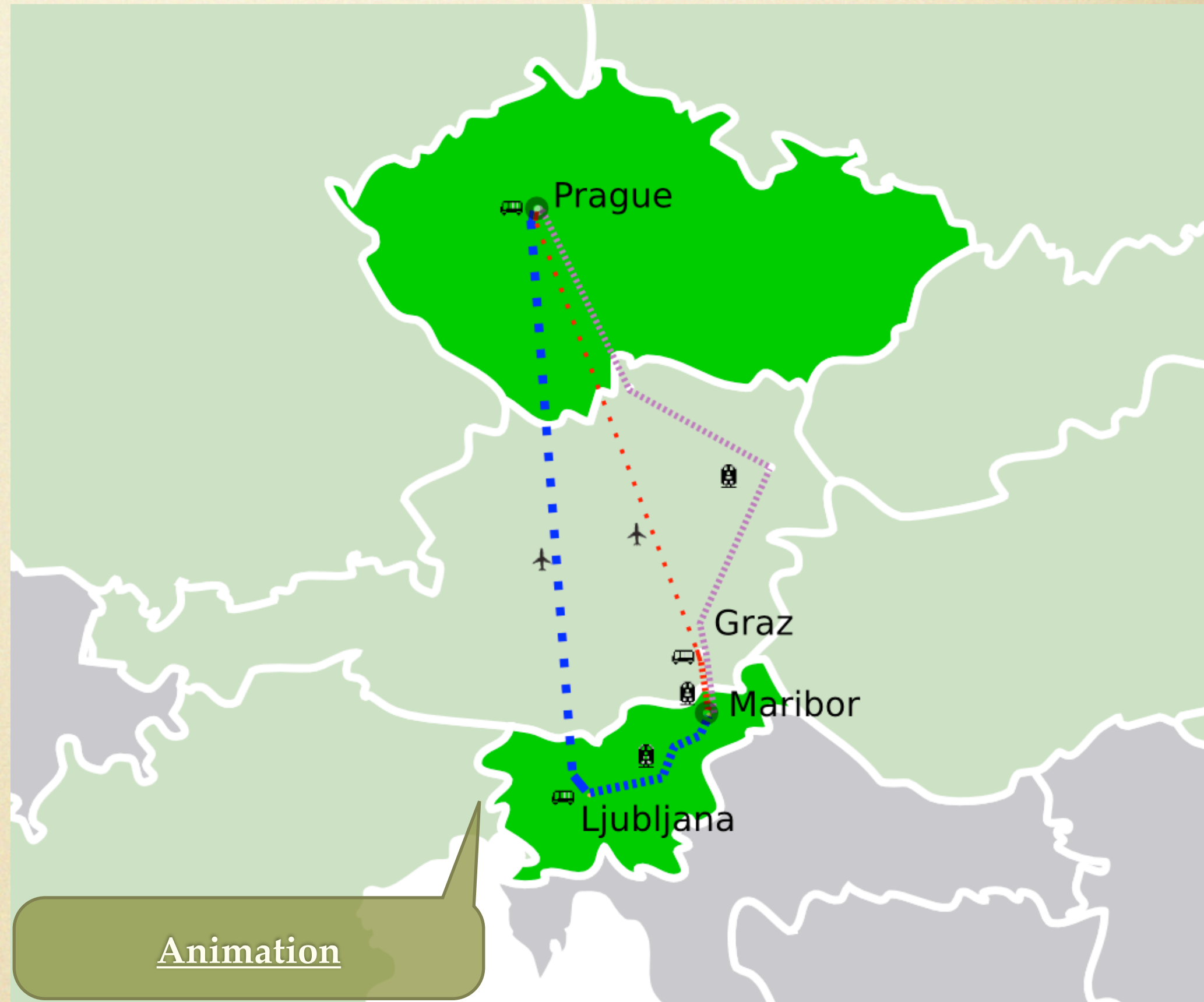
Izbriši označene objekte

Internet | Protected Mode: On 125%



## 5. Standardization of information models for public transport

- Three possible itineraries between Maribor and Prague
- Can we use single information service to plan entire journey?
- **NO!**
- Why not?
- **Data are not interoperable!**
- How to integrate data from all different passenger information systems when planning a journey?

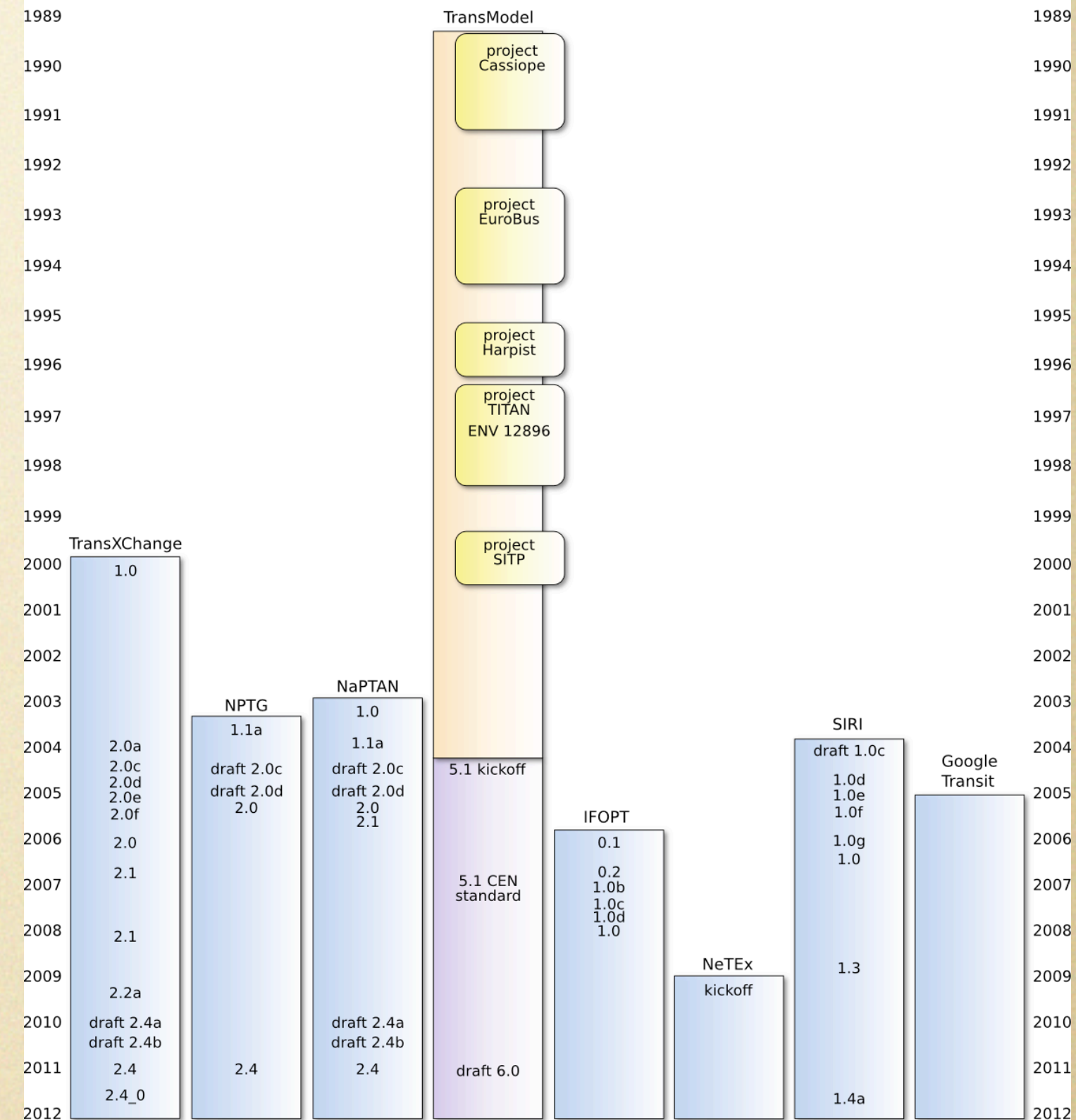




## 5. Standardization of information models for public transport

- Standardization work at CEN (European Committee for Standardization) enables exchange of public transport data across different public passenger information systems
- Diagram shows generations of information models in different countries for data exchange in public transport

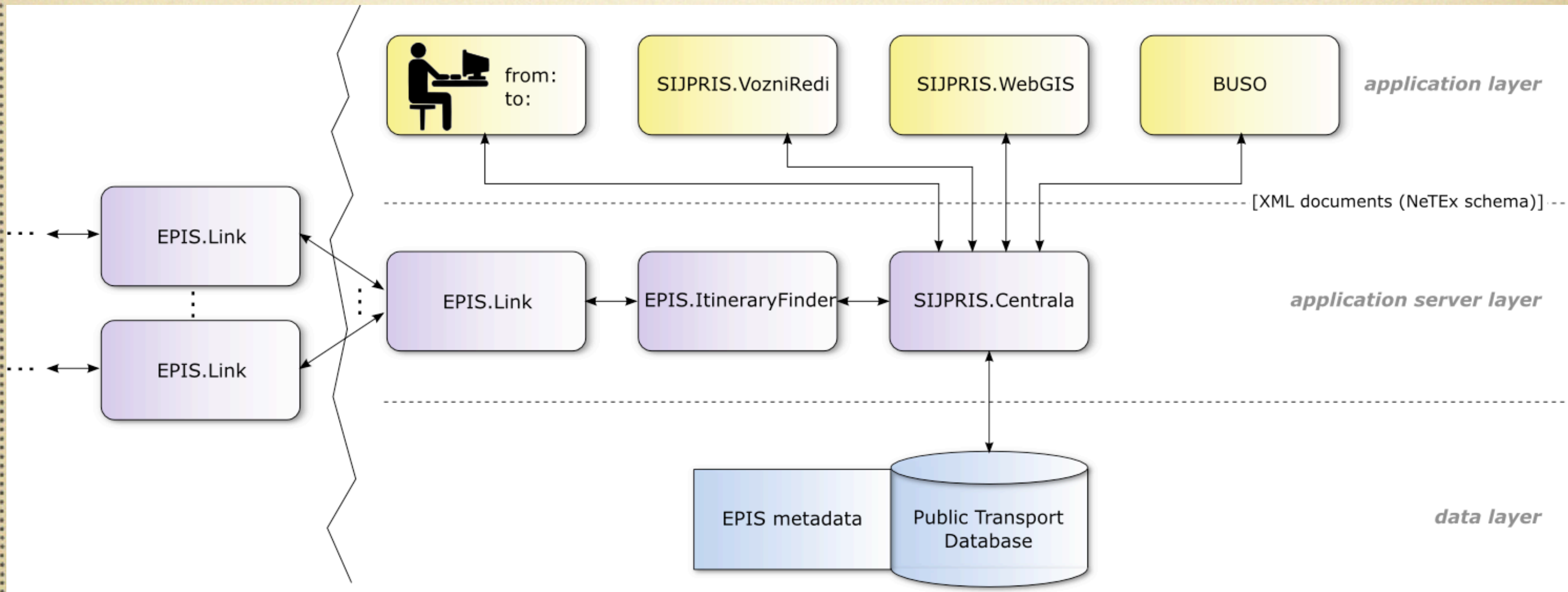
- **More about the topic in our paper published in Computing in Industry: TIBAUT, Andrej, KAUČIČ, Branko, REBOLJ, Danijel. A standardised approach for sustainable interoperability between public transport passenger information systems. Comput. ind.. [Print ed.], Oct. 2012, vol. 63, iss. 8, str. 788-798, doi: 10.1016/j.compind.2012.08.002.**





## 5. Standardization of information models for public transport

SIJPRIS upgrade for passenger information systems interoperability





I wish you to be great traffic  
engineers!

**THANK YOU!**

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