

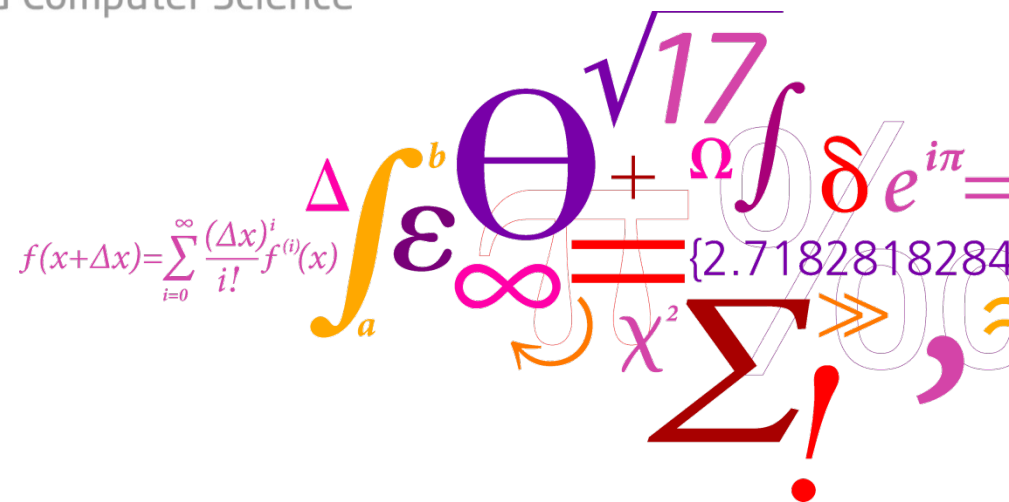
# WP3 - Production and Validation LiRA IT-infrastructure: Concepts, components and architecture

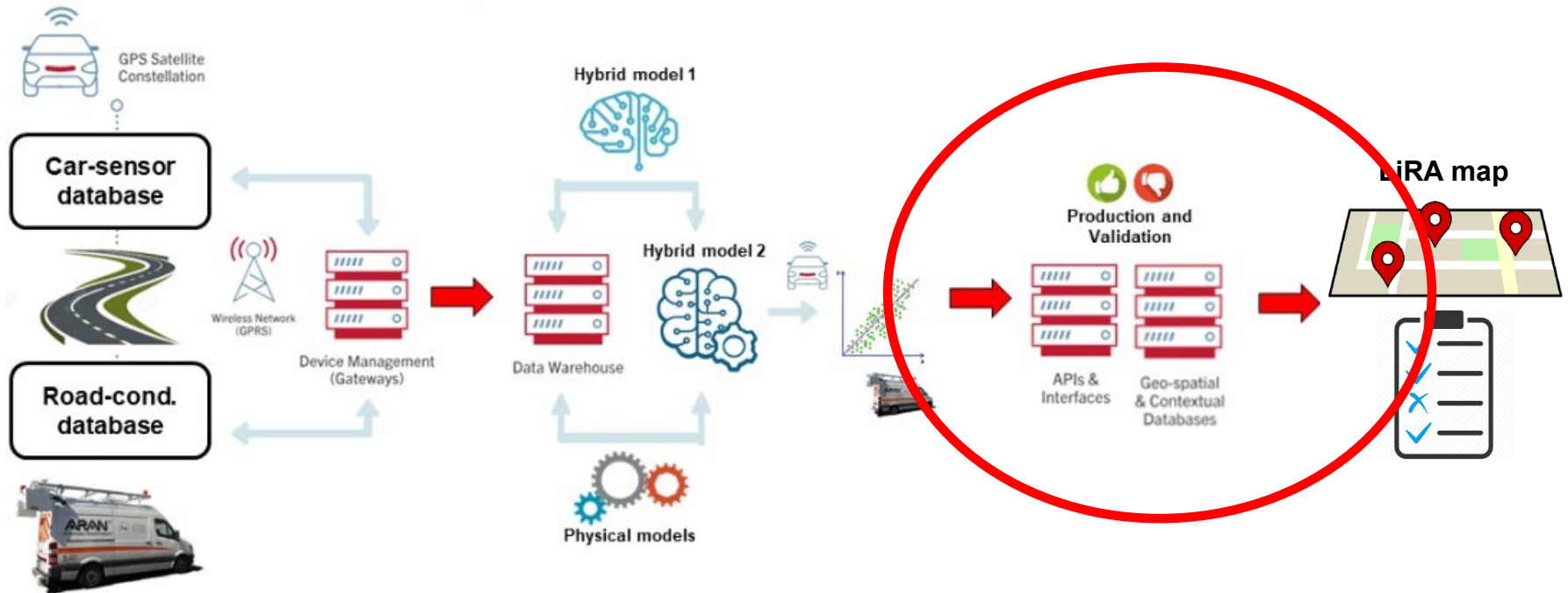
Ekkart Kindler et al.

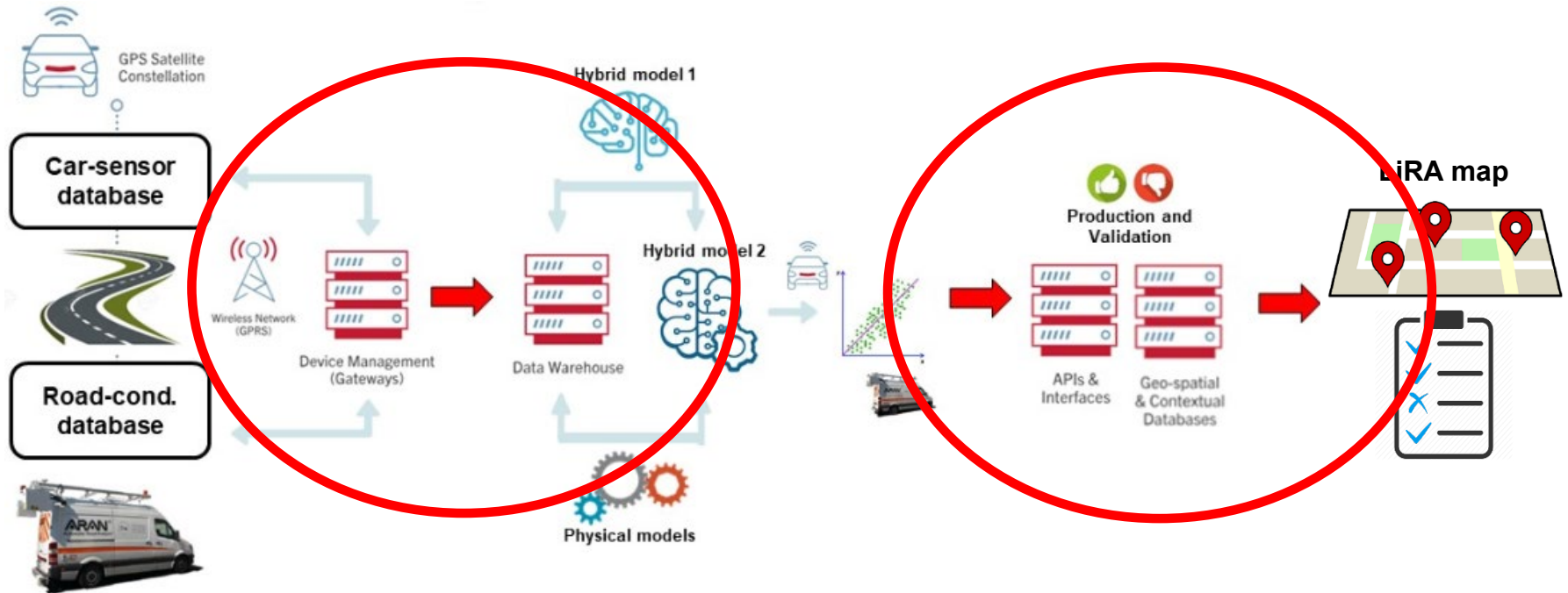
Software and Process Engineering Section

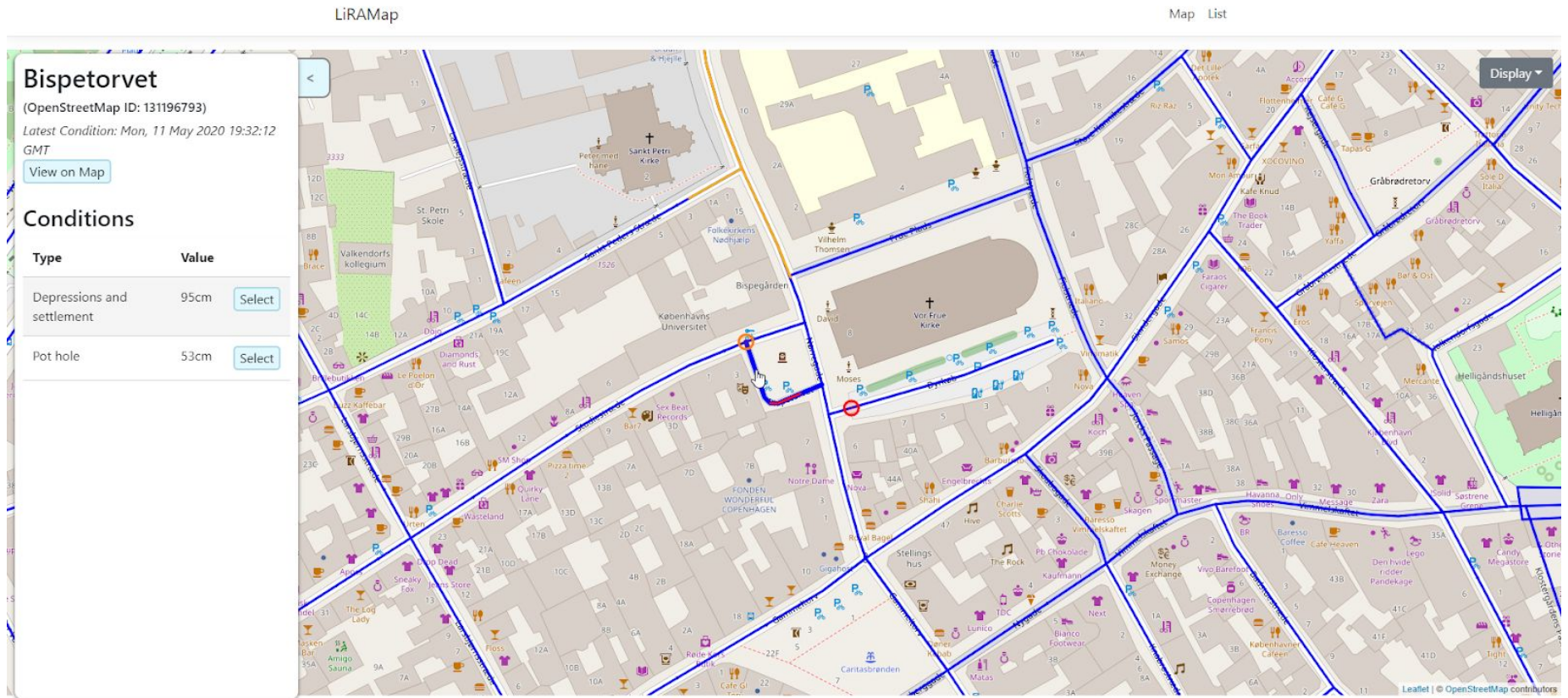
DTU Compute

Department of Applied Mathematics and Computer Science









Source: Jonathan Drud Bendsen: LiRA Map: A Cloud-based Geo-information System for Road Maintenance. BSc project 2020.

# Data Validation

Just a quick mockup!

The screenshot shows a web browser window with the URL `https://localhost:5001`. The page displays a map of Copenhagen with various points of interest and a red oval highlighting a specific area. On the left side, there is a sidebar with the following information:

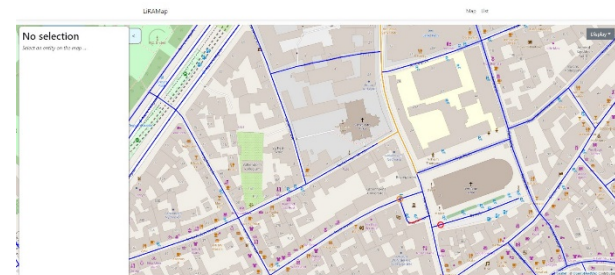
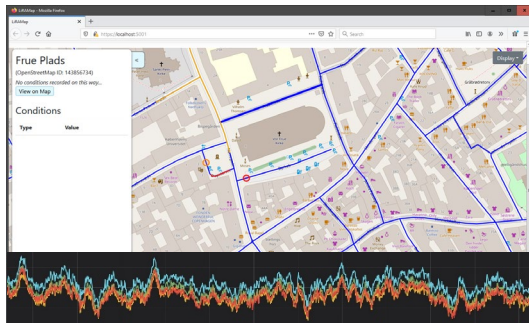
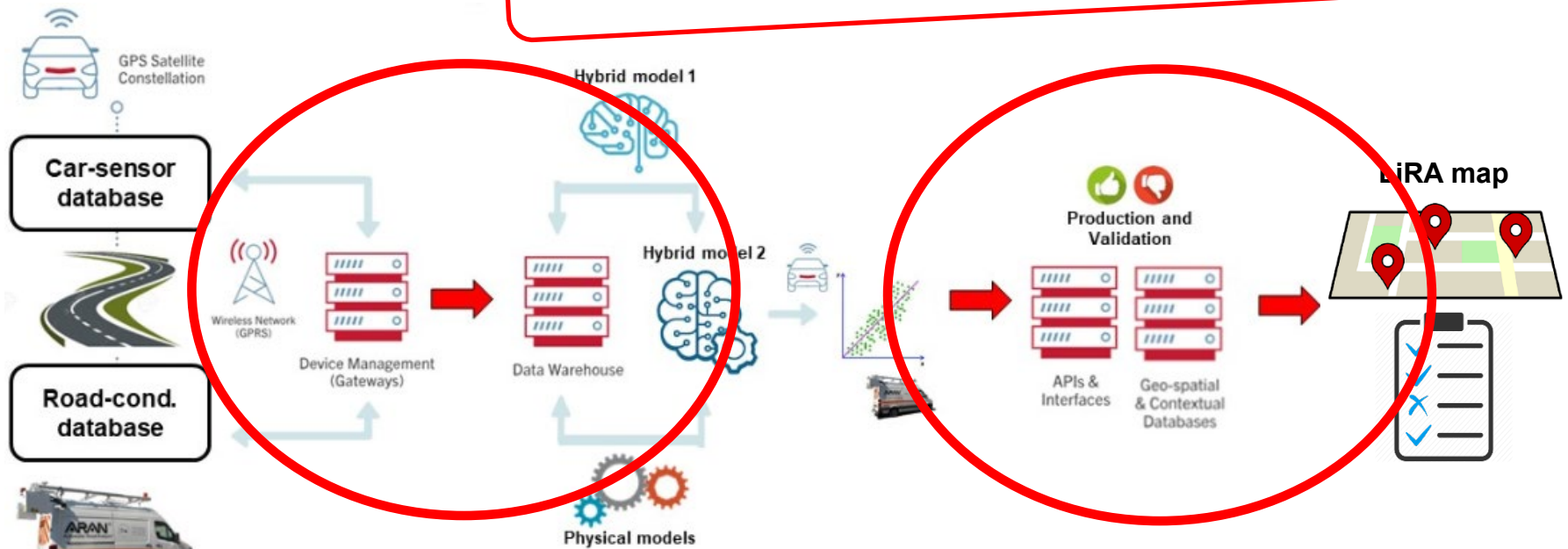
**Frue Plads**  
(OpenStreetMap ID: 143856734)  
*No conditions recorded on this way...*  
[View on Map](#)

**Conditions**

Type	Value
------	-------

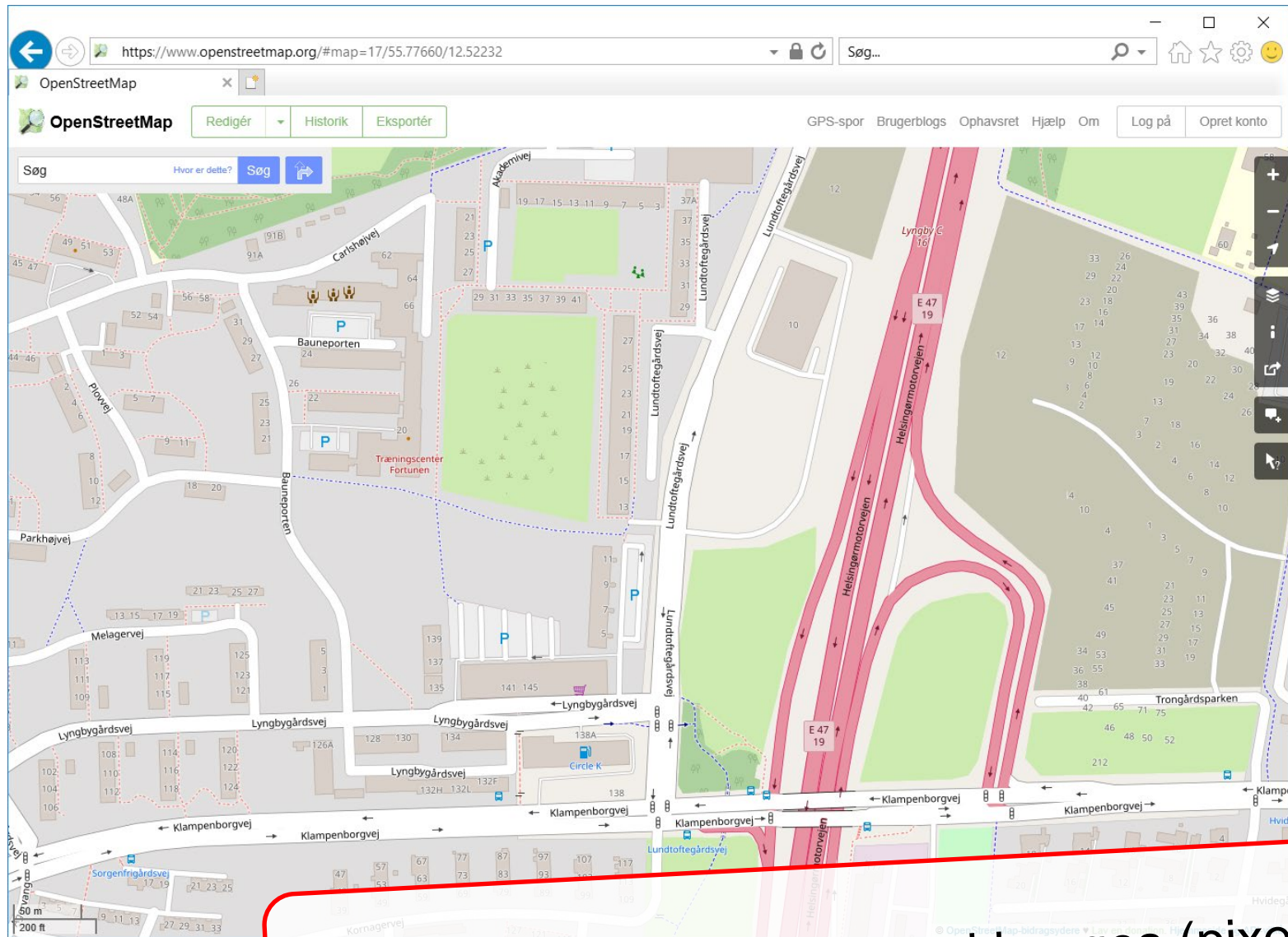
At the bottom of the screenshot, there is a line graph with multiple colored lines (red, orange, yellow, green, blue) showing a fluctuating data series over time.

Two systems – one user interface



- Introduction and overview
- Concepts (data model)
- Features and priorities (discussion)

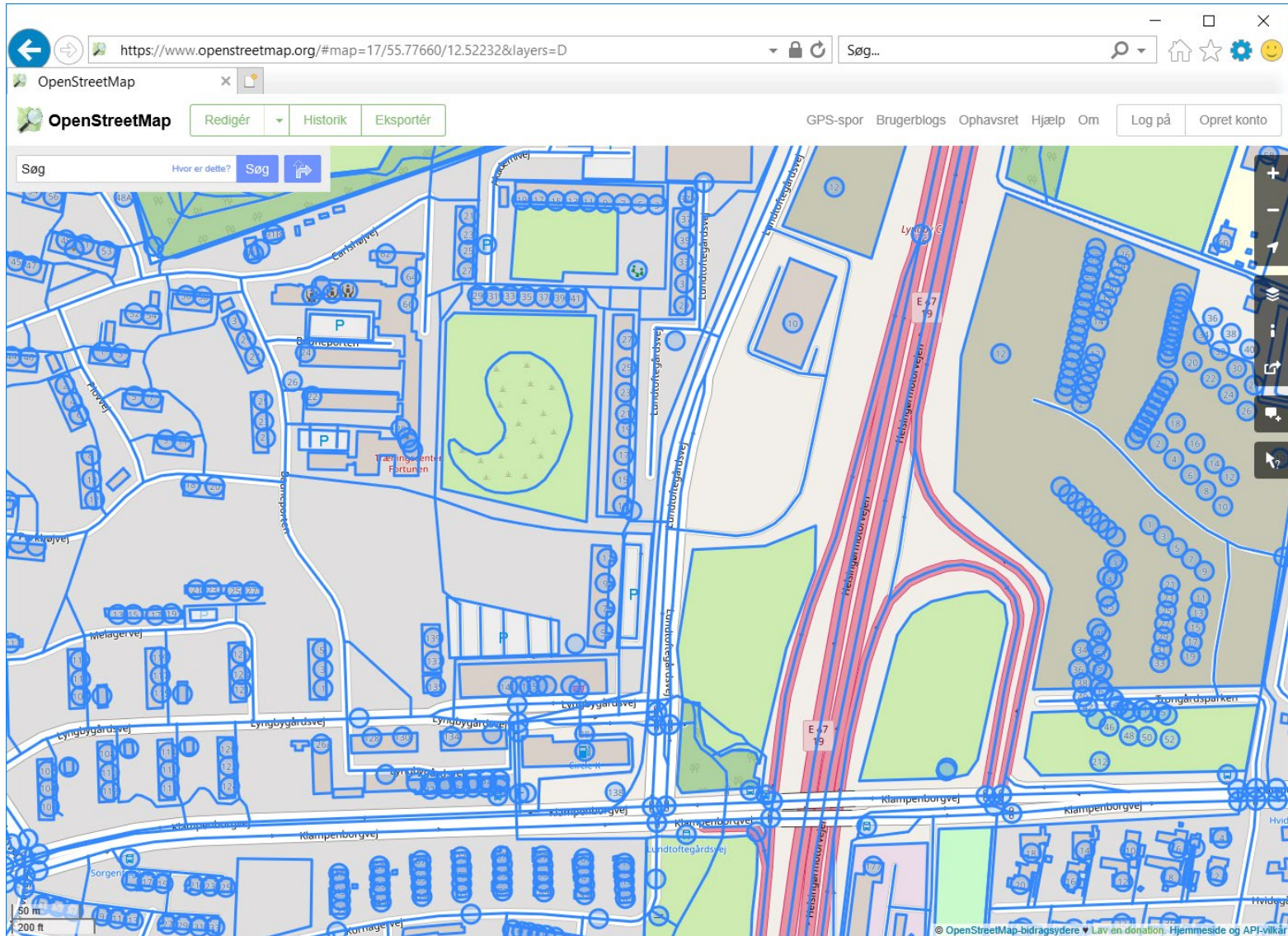
# Open Street Map (OSM)



Basically, just geo-referenced images (pixels)!



# OSM: Map Data



# OSM: Way (Section) with Tags

The screenshot shows the OpenStreetMap interface. The browser address bar displays the URL: <https://www.openstreetmap.org/way/48931467#map=17/55.77660/12.52151&layers=D>. The page title is "OpenStreetMap". The navigation bar includes "Redigér", "Historik", and "Eksportér". The search bar contains "Søg". The main content area shows a map of a residential area with a road highlighted in blue. A red circle highlights the metadata panel on the left, and another red circle highlights a specific road segment on the map.

**Vej: 16 (48931467)**

adding details in Lyngby-Taarbæk based on survey and <https://www.tu.dk/infrastructure/vejart/>

Redigeret 11 måneder siden af Henrik PS  
Version #9 · /Endringsæt #65592825

**Egenskaber**

highway	motorway_link
lanes	1
oneway	yes
operator	The Danish Road Directorate
ref	16
surface	asphalt

**Punkter**

- 202458304 (del af vejen — 48942316)
- 1584802303 (del af vejen — 14501197)
- 202456779
- 20245005
- 202450695
- 1359412928
- 29924910 (del af vejen — Helsingørmotorvejen (143771038))
- 29924912
- 29924914
- 202390667
- 3798428228
- 202390668
- 202390669
- 3798428227
- 202390670

# Car data (after pre-processing)

https://www.openstreetmap.org/way/48931467#map=17/55.77660/12.52151&layers=D

OpenStreetMap Redigér Historik Eksportér

Søg

Vej: 16 (48931467)

adding details in Lyngby-Taarbæk based on survey and <http://www.ltk.dk/kommende-vejarbejde>

Redigeret 11 måneder siden siden af Henrik PS  
Version #9 · Endringsæt #65592825

Egenskaber

highway	motorway_link
lanes	1
oneway	yes
operator	The Danish Road Directorate
ref	16
surface	asphalt

Punkter

- 202400304 (del af vejen 48942316)
- 1584802303 (del af vejen 145011971)
- 202456779
- 1359412928
- 29924912
- 29924914
- 202390667
- 3798428228
- 202390668
- 202390669
- 3798428227
- 202390670

**Add positions & align positions with map data:  
→ Interpolation / Map matching**

https://www.openstreetmap.org/way/48931467#map=17/55.77660/12.52151&layers=D

OpenStreetMap Redigér Historik Eksportér

Søg

Vej: 16 (48931467)

adding details in Lyngby-Taarbæk based on survey and <http://www.ltk.dk/kommende-vejarbejde>

Redigeret 11 måneder siden siden af Henrik PS  
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Egenskaber

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- 1359412828
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- 29924914
- 202390667
- 3798428228
- 202390668
- 202390669
- 3798428227
- 202390670

Attributes (“dynamic sections”):

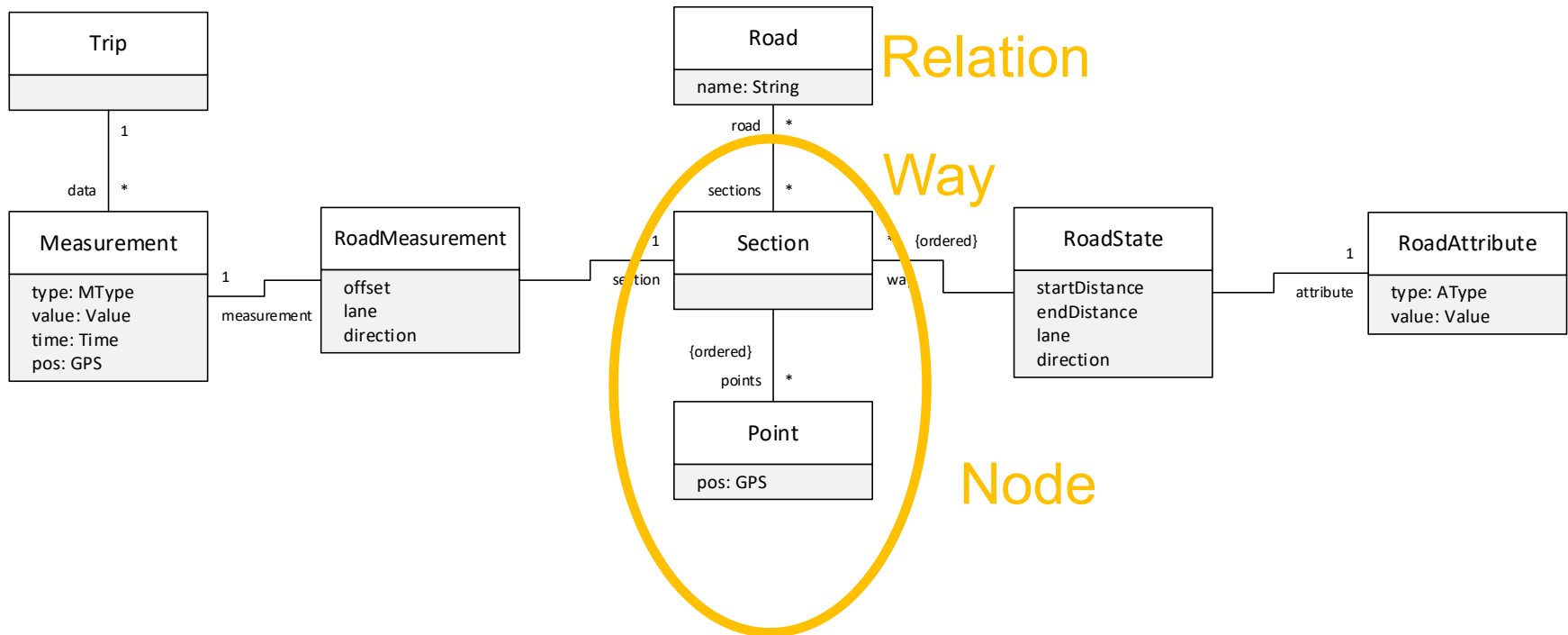
- span parts of sections
- can span more than one section

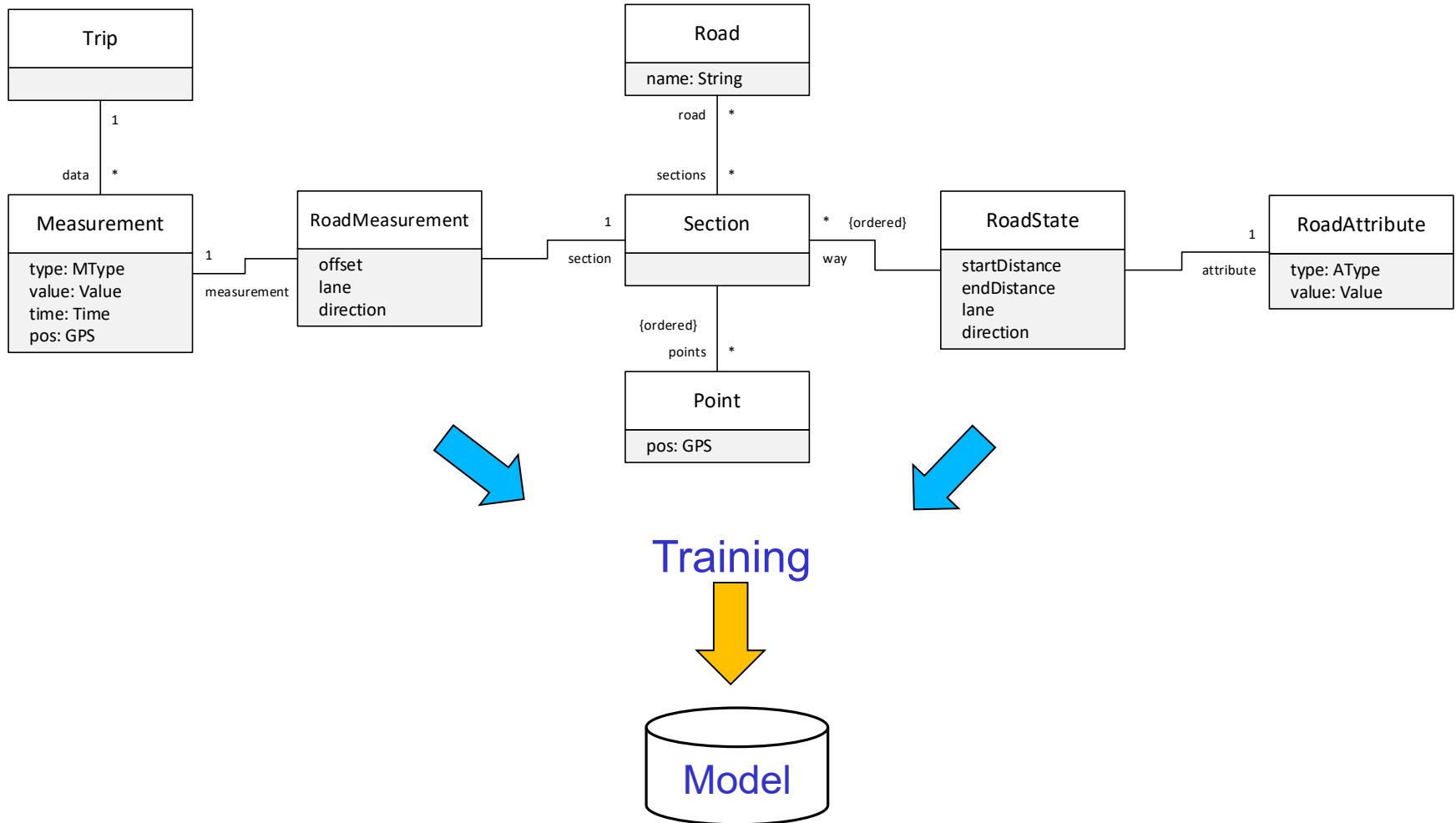
© OpenStreetMap-bidragydere · Lav en donation, Hjemmeside og API-vilkår

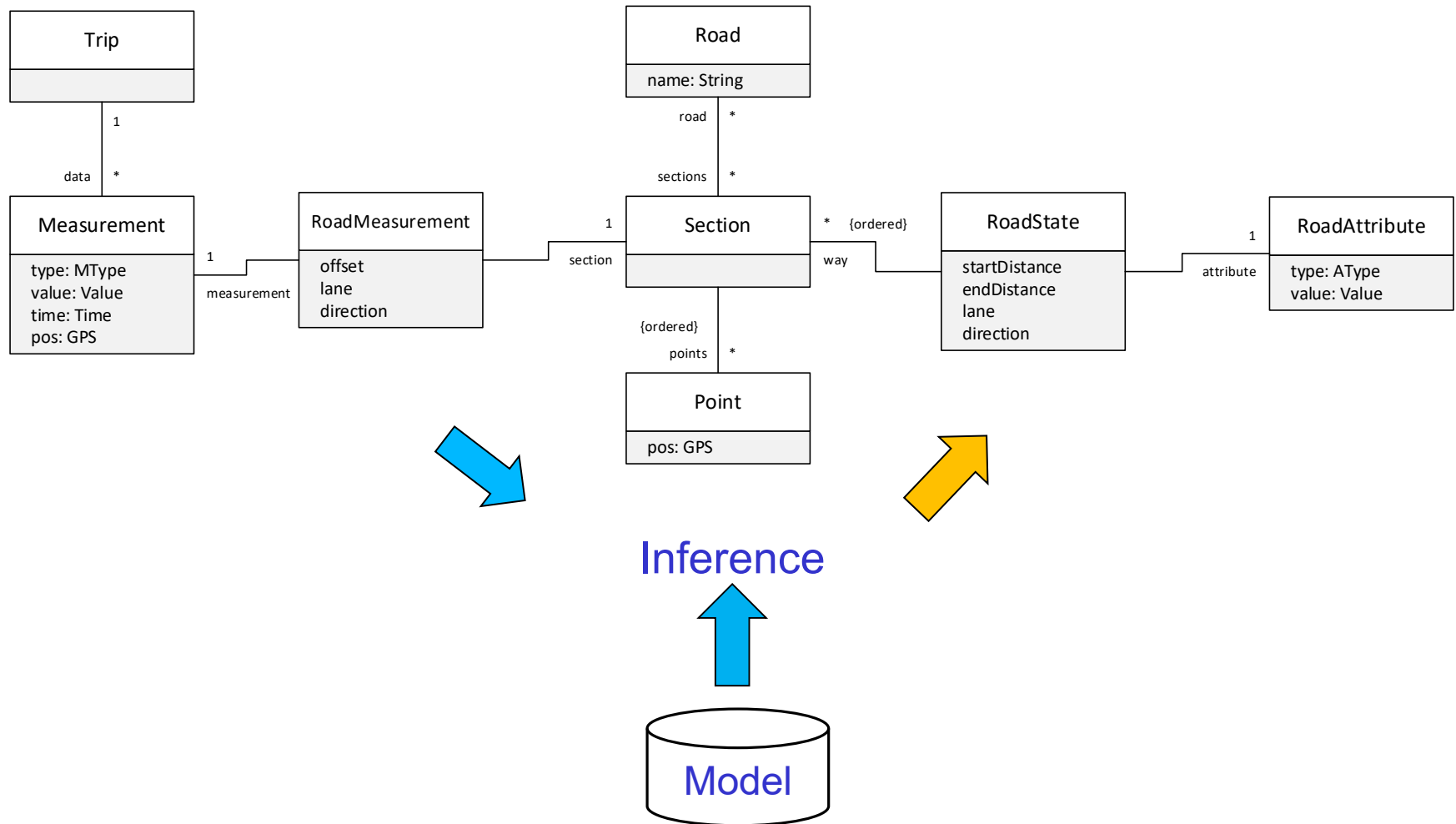
Car Data  
(from GM, ...)

Static road data  
(OSM, Sweco, ...)

Dynamic road data  
...







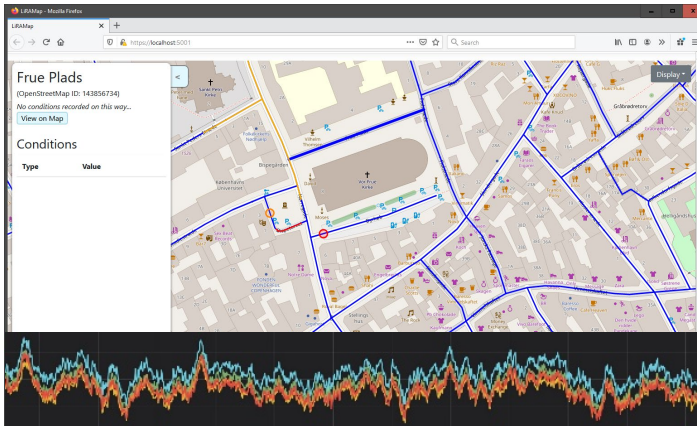
- Introduction and overview
- Concepts (data model)
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## LiRA Data Warehouse

## LiRA Map

LiRA PMS?



## LiRA Data Warehouse

- Collection, processing, storage
- Access, validation, export, manipulation (meta data)
- Support for manual reporting
  - visual inspection
  - crowd sourcing

Cf. talk by S.M. Pour earlier this morning!

## LiRA Map

- Road Status/Conditions
  - Map and other views
  - History
  - Decision support
- Road maintenance (PMS)
  - Planning
  - Execution

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One specific pipeline: learning in production!

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  - Execution

How could the more current and frequent availability of data form and shape the process of road maintenance planning and execution?

- Which of these ideas is most important?
- Which features are most relevant / most urgently needed?
- How could/should the new process for road maintenance planning and execution look like?

Input from today's webinar and  
penal discussion.

Feel free to contact us!