

DLR TLA APP

**Traffic Light Assistant App for cooperative multimodal
signal control**

mobil.TUM 2024 – The Future of Mobility and Urban Space



Overall vision and aims

Transformation of the road traffic system

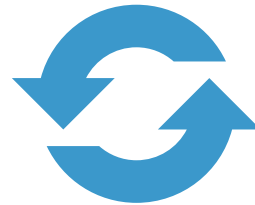


connectivity and communication



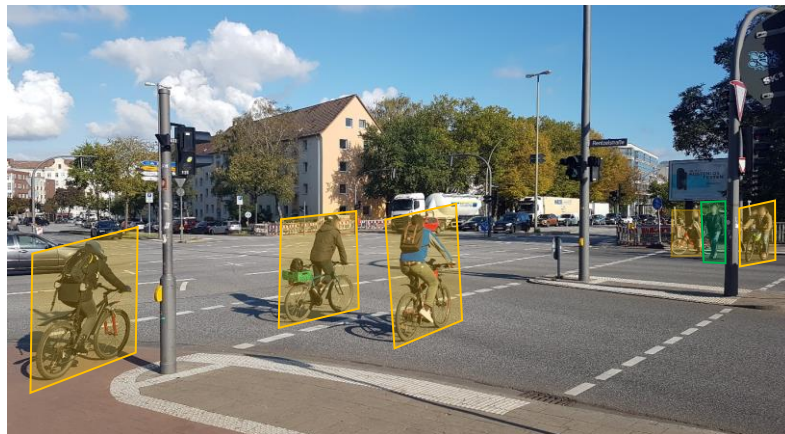
public transport

protecting climate



ensuring mobility

vulnerable / non-motorized road users

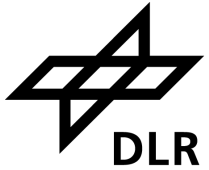


automation



Research topic and objectives

Adaptive traffic light control



connectivity and communication



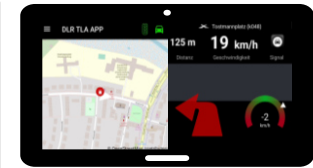
public transport



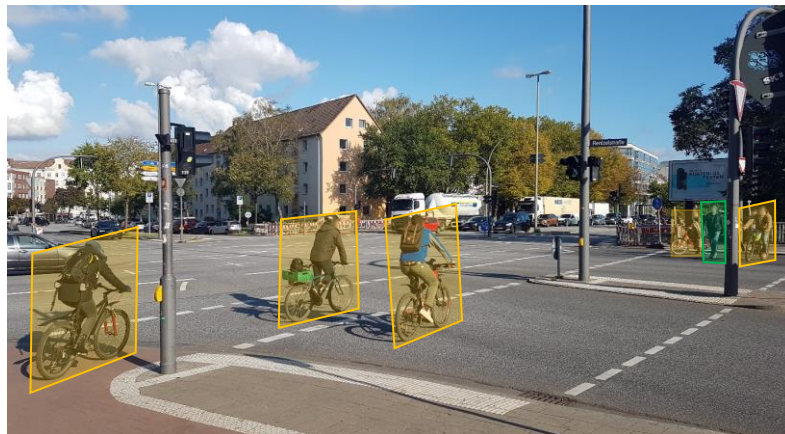
Cooperative multimodal signal control



TLA App



vulnerable / non-motorized road users



automation

Outline



- Project and Partner
- Cooperative multimodal signal control system
 - System overview
 - TLA App functions
- State of development

Project and Partner



Development Partner

Urban Software Institute



Urban Software Institute

Project

*5G Living Lab in the Mobility Region
Braunschweig-Wolfsburg*



Funding

*The project was funded by the
Federal Ministry for Digital and
Transport of Germany.*

Funded by:



Federal Ministry
for Digital
and Transport

on the basis of a decision
by the German Bundestag

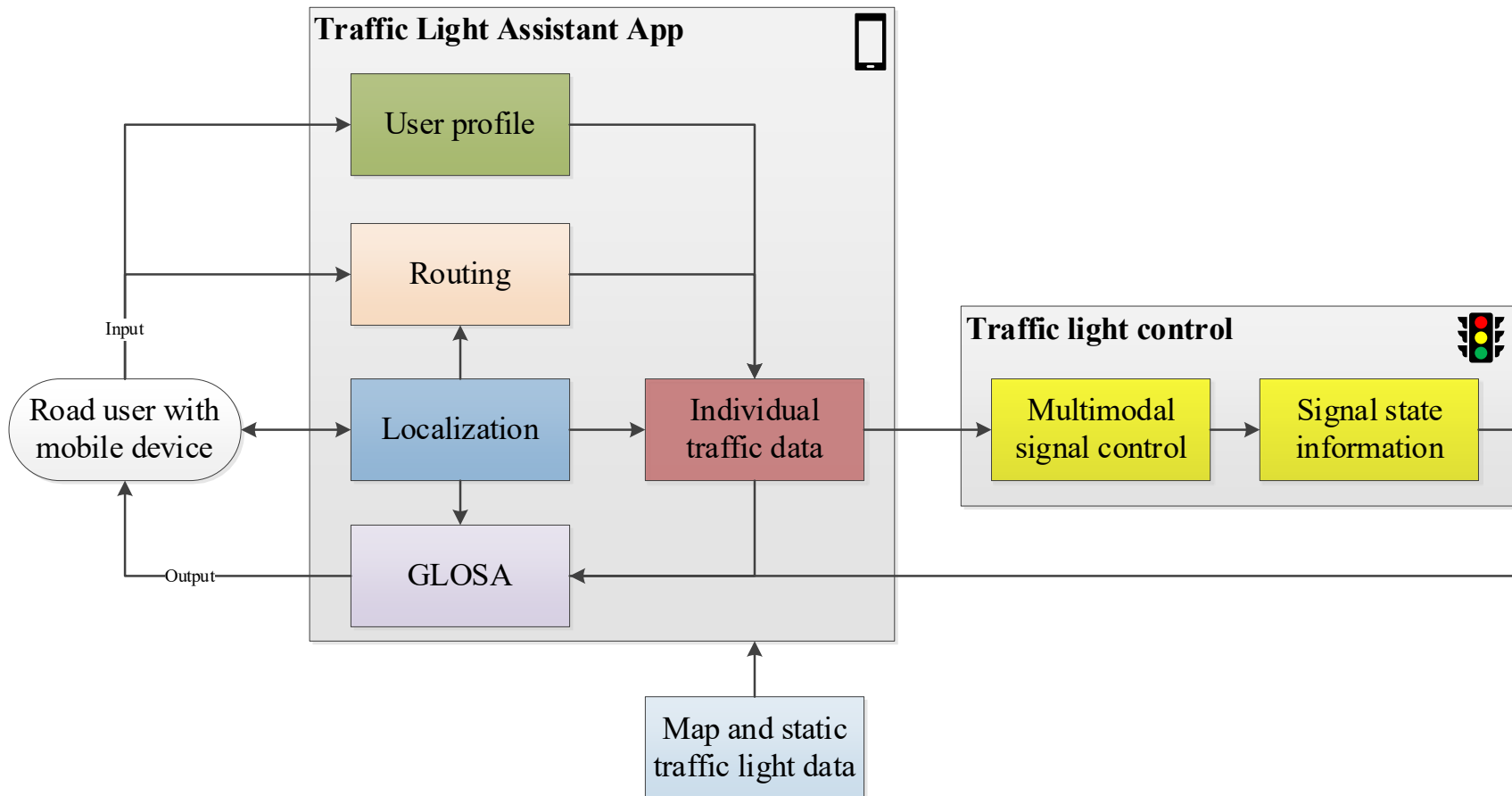


COOPERATIVE MULTIMODAL SIGNAL CONTROL SYSTEM

Cooperative multimodal signal control system

System overview: elements and architecture

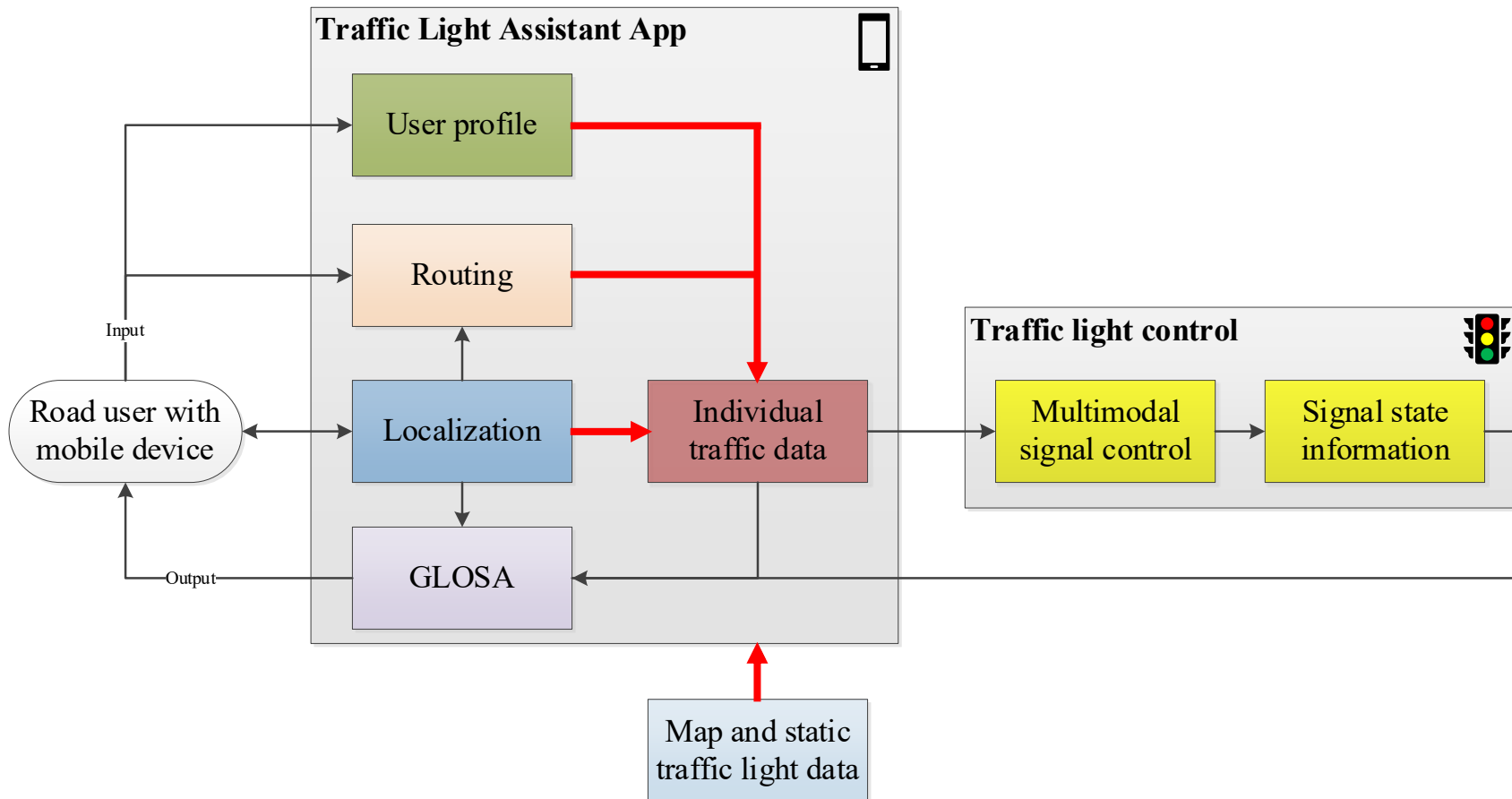
Two independent, but synchronized subsystems



Cooperative multimodal signal control system

TLA App functions

Generating individualized traffic data of the user

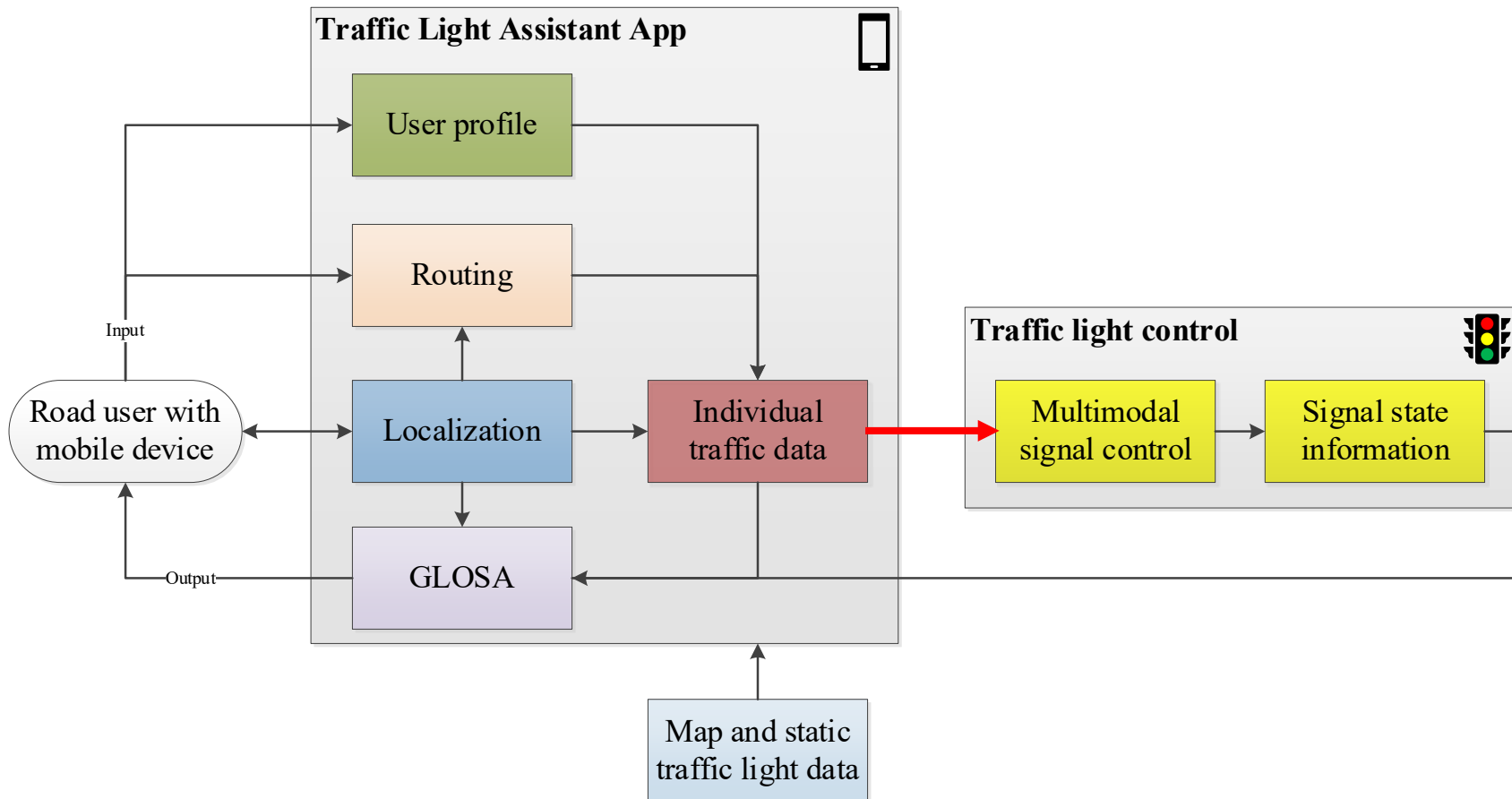


- Transport mode
- Position
- Next traffic light
- Relevant signal group
- Distance
- Speed
- Arrival time
- ...

Cooperative multimodal signal control system

TLA App functions

Transferring the data to the traffic light control

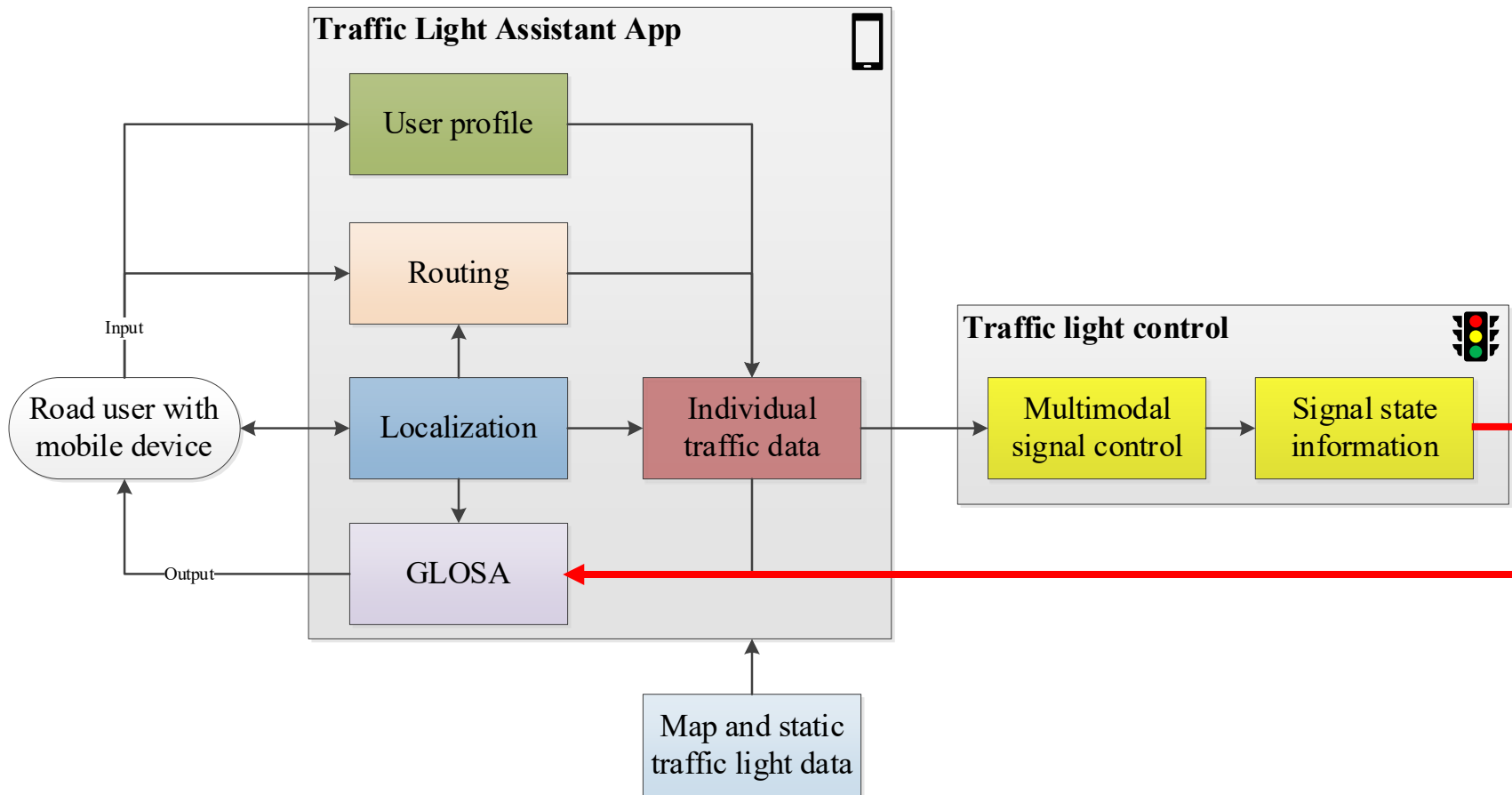


- Transport mode
- Position
- Next traffic light
- Relevant signal group
- Distance
- Speed
- Arrival time
- ...

Cooperative multimodal signal control system

TLA App functions

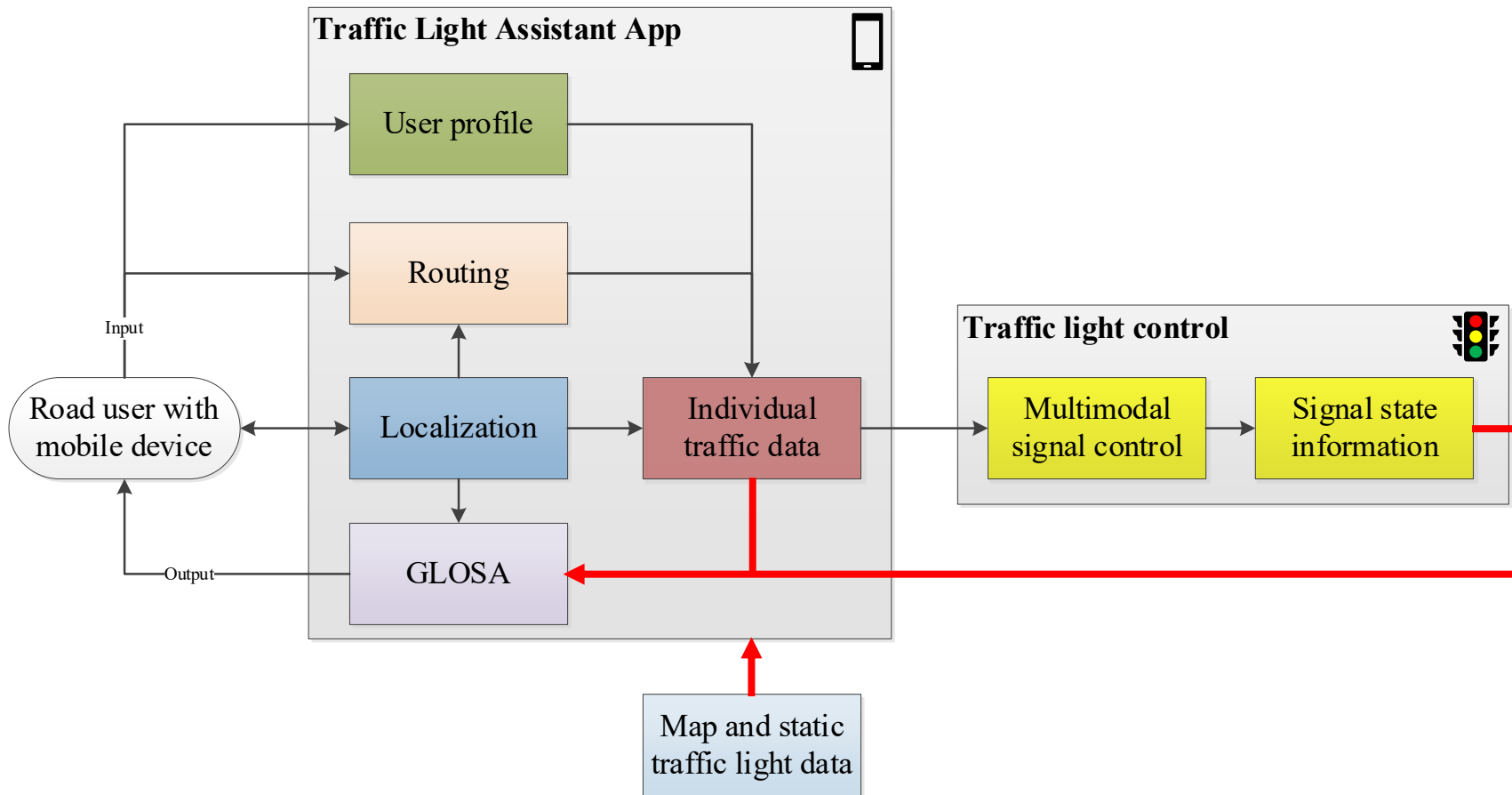
Receiving signal state information of the traffic light



Cooperative multimodal signal control system

TLA App functions

Individualized Green Light Optimal Speed Advisory (GLOSA)



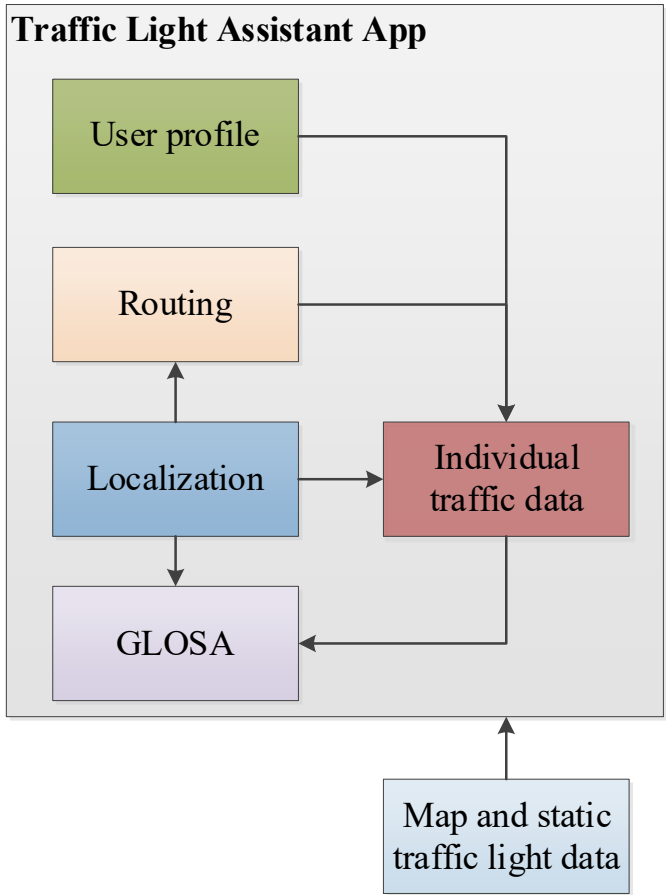
STATE OF DEVELOPMENT

State of development

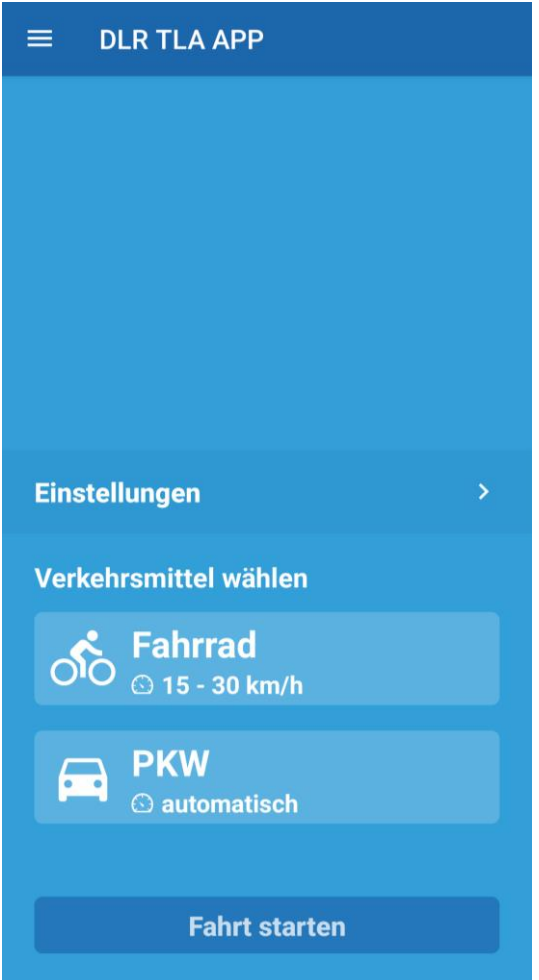
Introduction



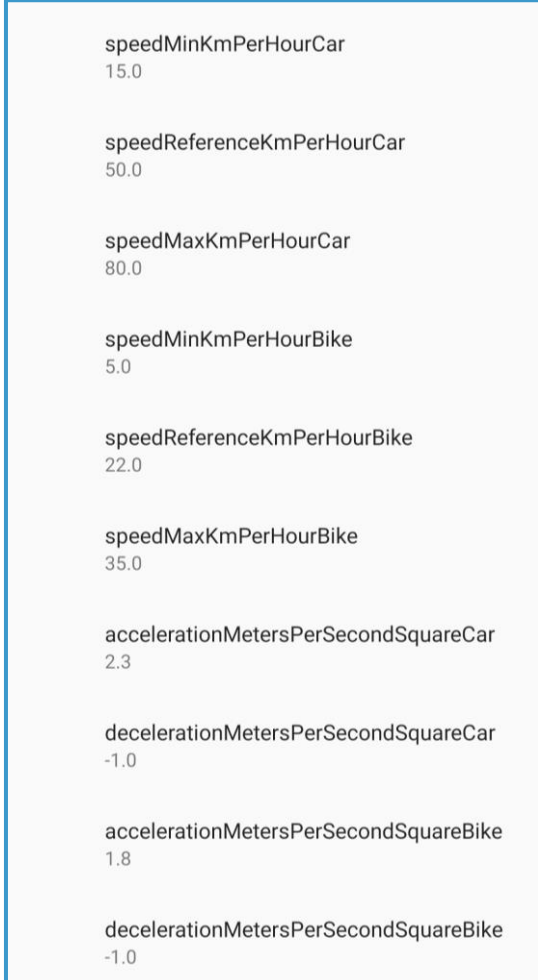
TLA App Prototype



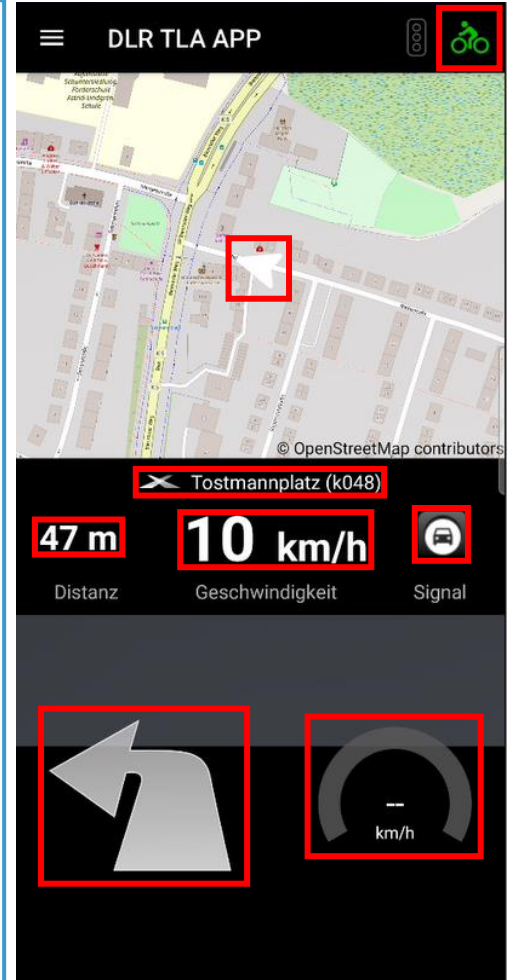
Home screen



Road User Profile



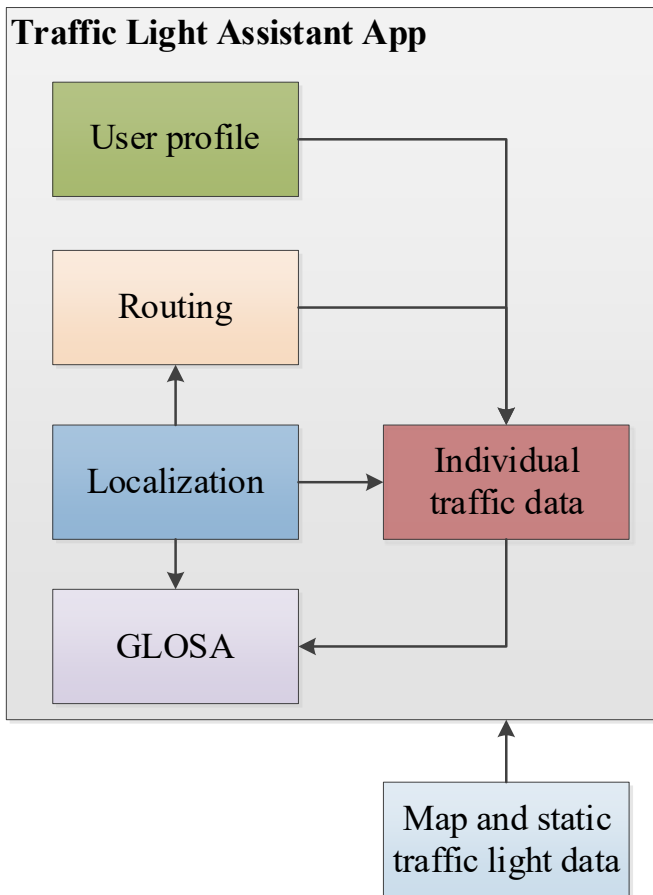
Driving mode



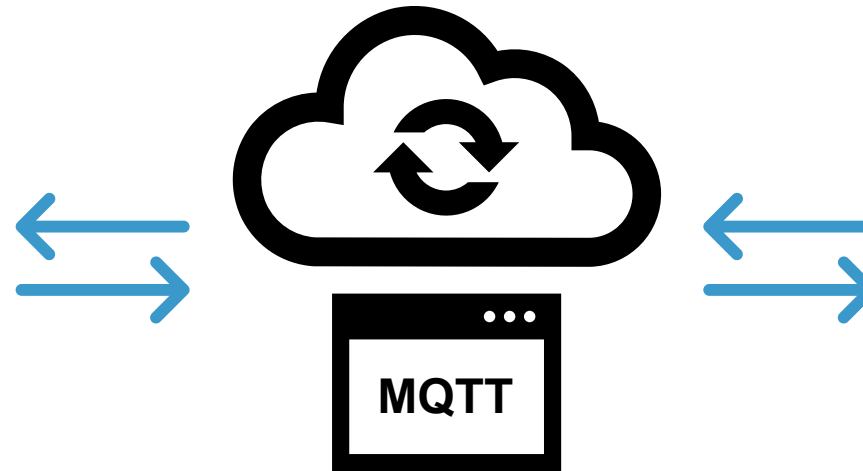
State of development

System overview

TLA App Prototype



U2X Communication



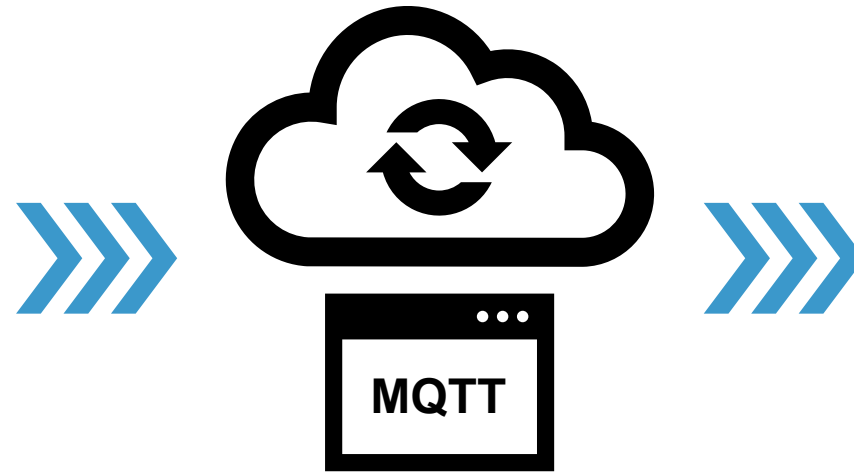
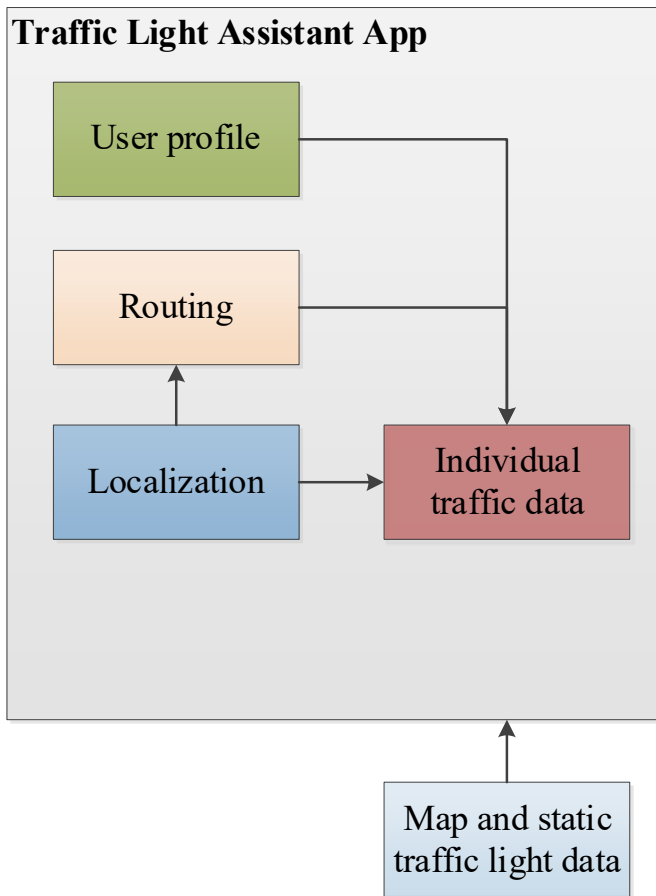
Research intersection



State of development

TLA App prototype

Individual traffic flow data as customized CAMs

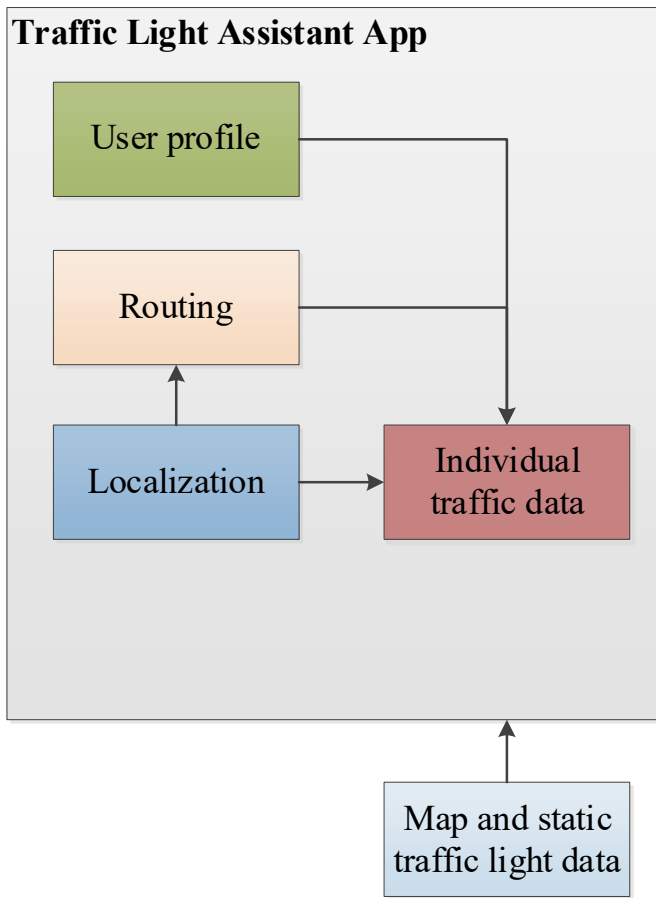


State of development

TLA App prototype

Individual traffic flow data as customized CAMs

Traffic Light Assistant App



```

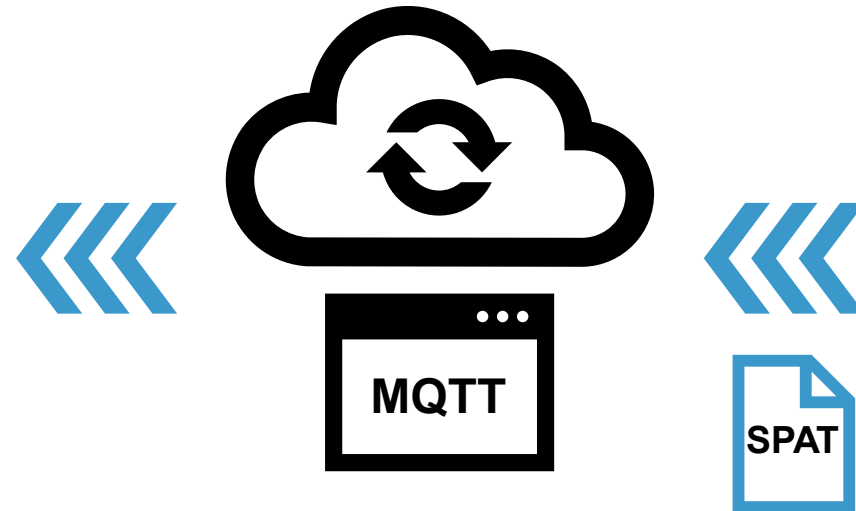
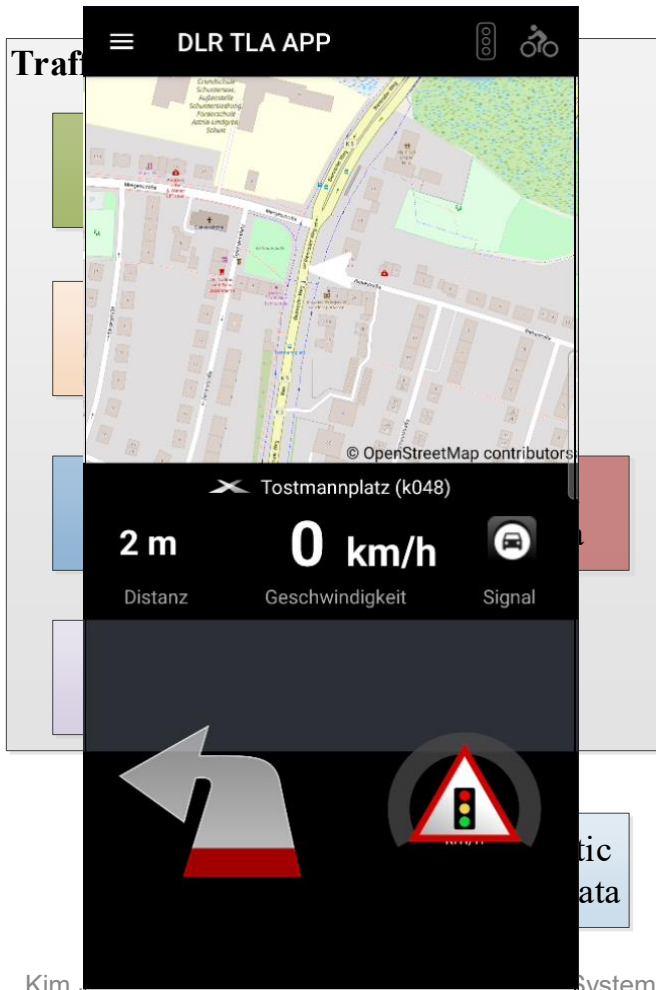
[...]
"header":{
  "messageID":2,
  "stationID":40363905350796427
  [...]
}
[...]
"camParameters":{
  "basicContainer":{
    "referencePosition":{ [...] },
    [...]
  },
  "highFrequencyContainer":{
    "basicVehicleContainerHighFrequency":{
      "speed":{ [...] },
      [...]
    }
  },
  "specialVehicleContainer":{
    "tlaVehicle":{
      "intersection_id":k048,
      "ingress_id":1,
      "intended_direction":left,
      "signal_id":1,
      "distance_to_stopline":500,
      "eta_stopline_current_speed":1678183072102,
      "eta_stopline_likely":1678183071886,
      "eta_stopline_max":1678183071886,
      "eta_stopline_min":1678183071886,
      "eta_stopline_reference":1678183071335,
      [...]
    }
  }
}
[...]
```



State of development

TLA App prototype

Receiving SPATs and recommendations for intersection approach (GLOSA incl. TTG)



State of development

Testing GLOSA function

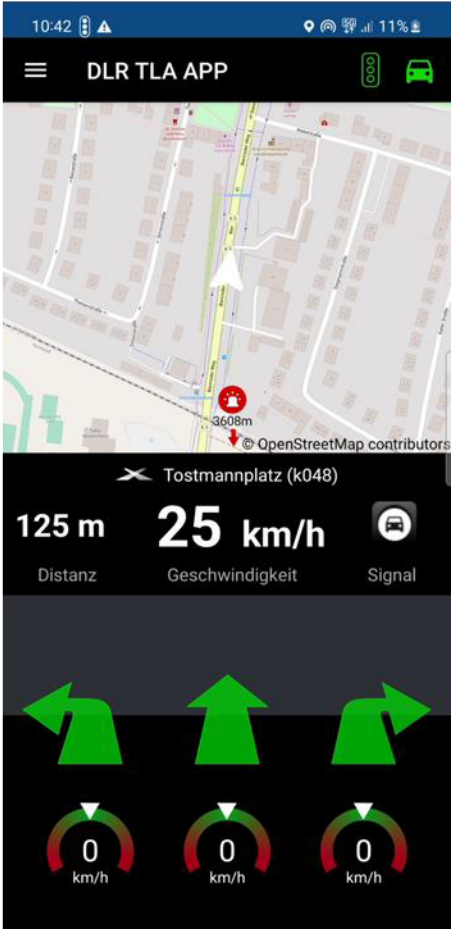
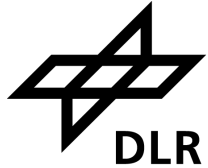


Image sources: DLR



THANK YOU FOR YOUR ATTENTION!

Contact

Traffic Light Assistant App for cooperative multimodal signal control



German Aerospace Center (DLR), Institute of Transportation Systems

Kim Jannik Eggers

- Mail: Kim.Eggers@dlr.de, phone: +49 531 295 2113

Maik Halbach

- Mail: Maik.Halbach@dlr.de, phone: +49 531 295 3823

Urban Software Institute

Jürgen Mück

Mail: juergen.mueck@the-urban-institute.de