OpenModelica Applications at VTI

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vti

The Swedish National Road and Transport Research Institute

VTI is an independent and internationally prominent research institute commissioned by the Swedish Government. Our principal task is to conduct research and development related to **infrastructure**, **traffic** and **transport systems**.

We have approximately 240 employees and offices in Linköping, Gothenburg, Stockholm, and Lund

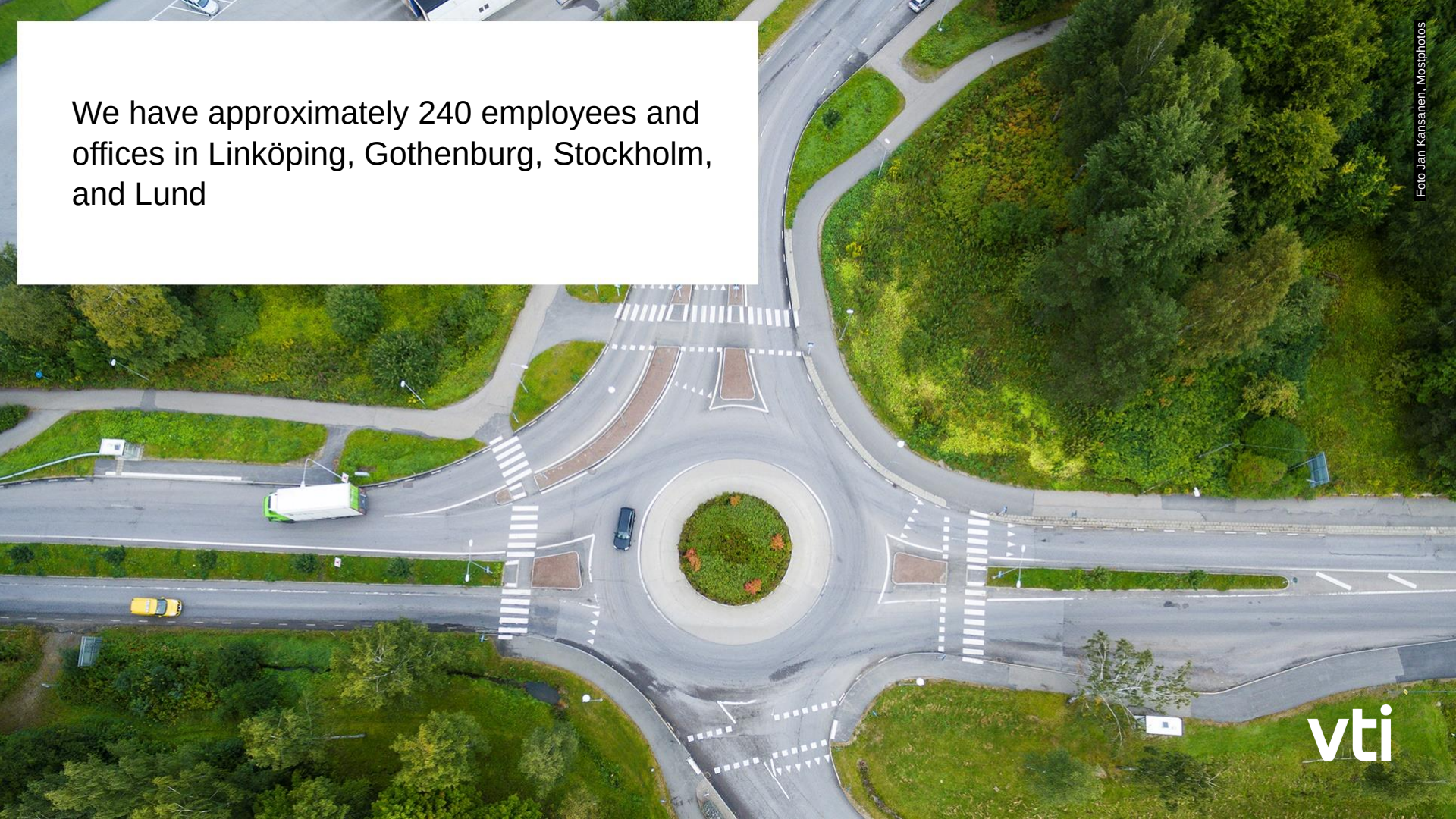

Foto Jan Kansanen, Mostphotos

Traffic and road user (TRAF), one of VTI's 3 research departments. Focus on **traffic safety**, the **human in the transport system**, **vehicle and simulation technologies,** and a **sustainable transport system**.

Driving Simulators

Driving Simulators

- Vehicle, train, bicycle and pedestrian applications
- Vehicle and train dynamics
- Active safety and automated driving
- Road and environment
- Rail and signals
- Human-machine interface and interaction
- Driving and driver performance

Train Simulator

Train simulator, desktop set up

Passenger train simulator

Freight train simulator

Bicycle Simulator

- Research on the impact of infrastructure to comfort and safety
- Study of interaction between bicycles and other vehicles

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Bicycle Simulator

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Sim IV

Bicycle

Volvo XC60

Volvo FHM

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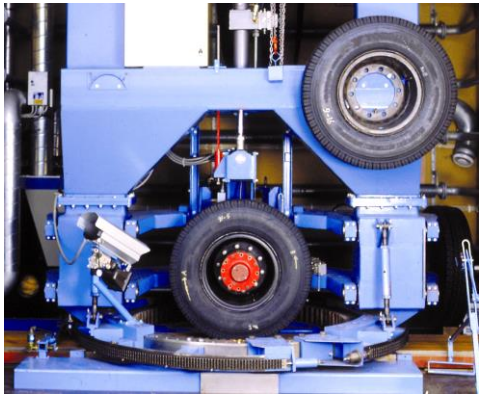
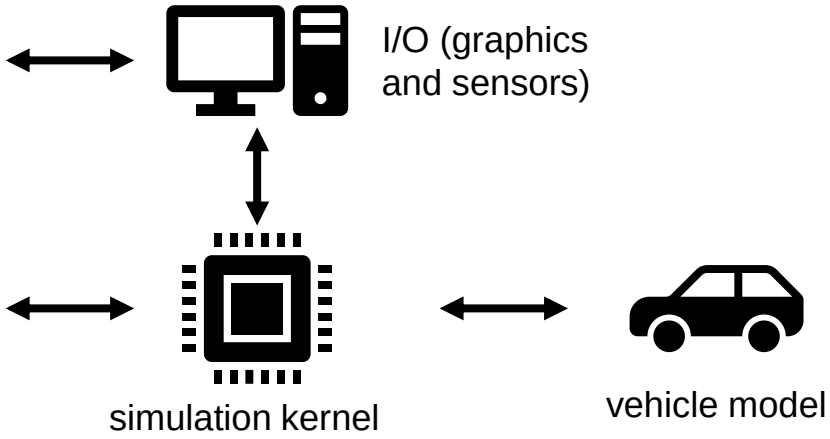
Modelling of vehicle dynamics

- We have our own low and medium-fidelity models for average car and truck dynamics
- We measure and calibrate the models in our own facilities



Simulator – Simulation interface



Standard interfaces!

vehicle model

Matlab/SIMULINK

vehicle model

Modelica

vehicle model

C++ model

fmi Functional Mock-up Interface

& ssp

Foto Louis Lo, Unsplash

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What do we use OpenModelica for?

- Modeling of vehicle dynamics (fmi export)
- Executing of vehicle dynamics models (fmi/ssp)
- Continuous integration and testing
    - Vehicle dynamics model

And what is next?

- Modeling of vehicle dynamics (fmi export)
- Executing of vehicle dynamics models (fmi/ssp)
- Continuous integration and testing
  - Vehicle dynamics model
  - Motion cueing
- Development process for FMI
  - Traceability
- dcp Distributed Co-Simulation Protocol