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Simulation and Autonomy for a Sustainable Mobility Future

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MOST

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Miljøpakken
– åpner nye muligheter

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NTNU

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M.Sc. in Computer Science, Thesis in **Computer Vision** and **Deep Learning** for quality assurance in vehicle production

Ph.D. candidate in **Simulation** and **Autonomy**

Why Autonomous Driving?

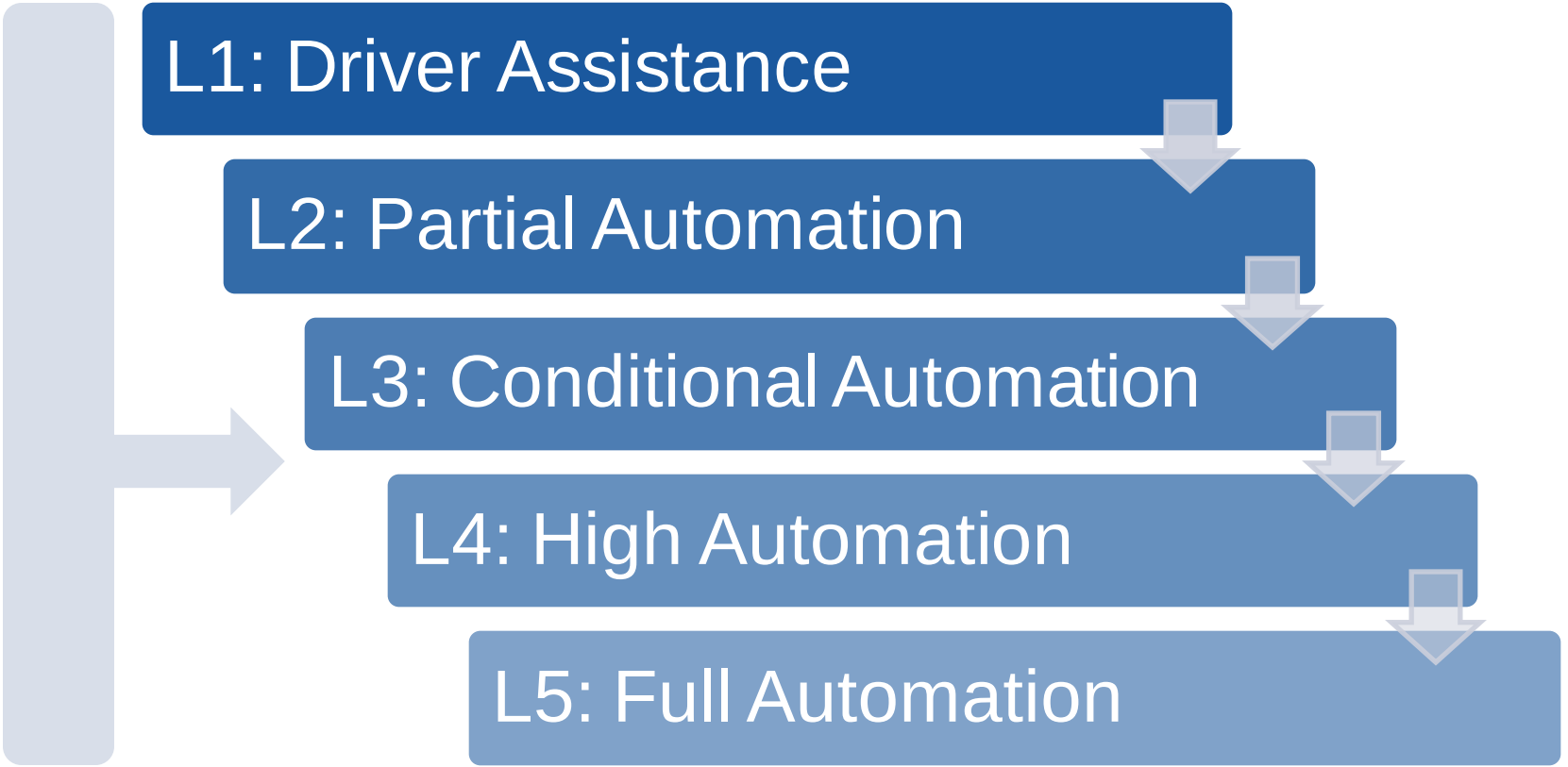
EFFICIENT RESOURCE USAGE

IMPROVED ROAD SAFETY

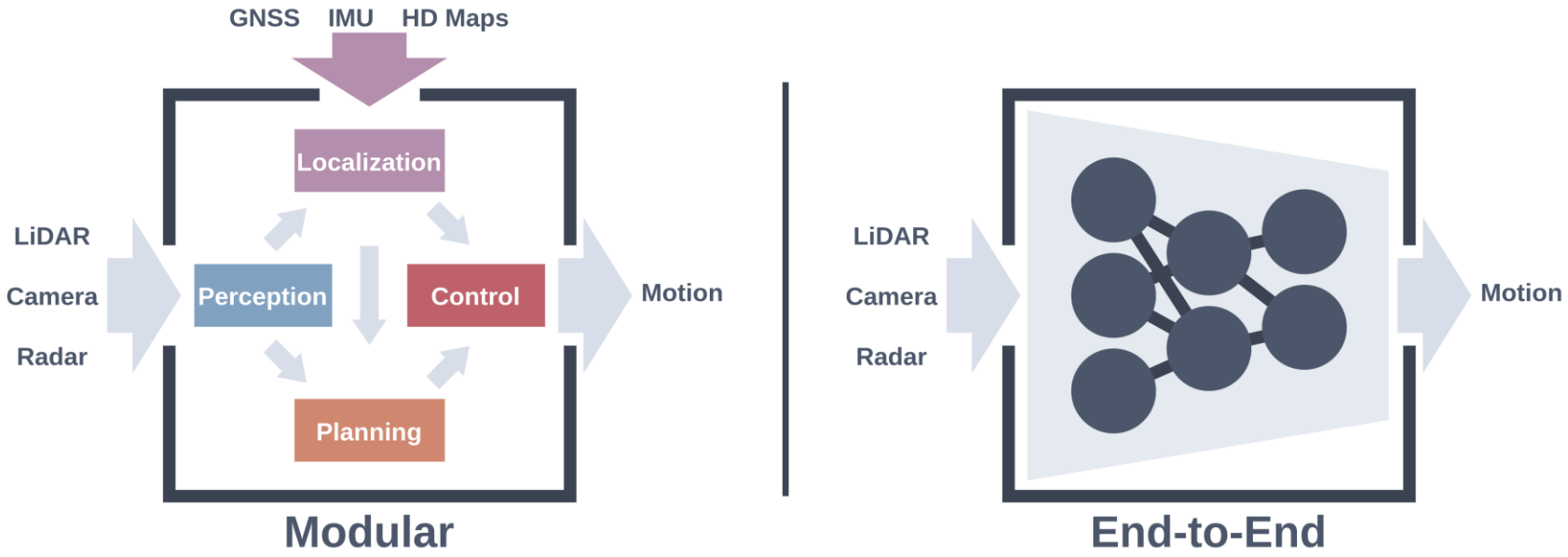
LOWER CARBON EMISSIONS

INCREASED ACCESSIBILITY

Where are we now?



Learning to Drive



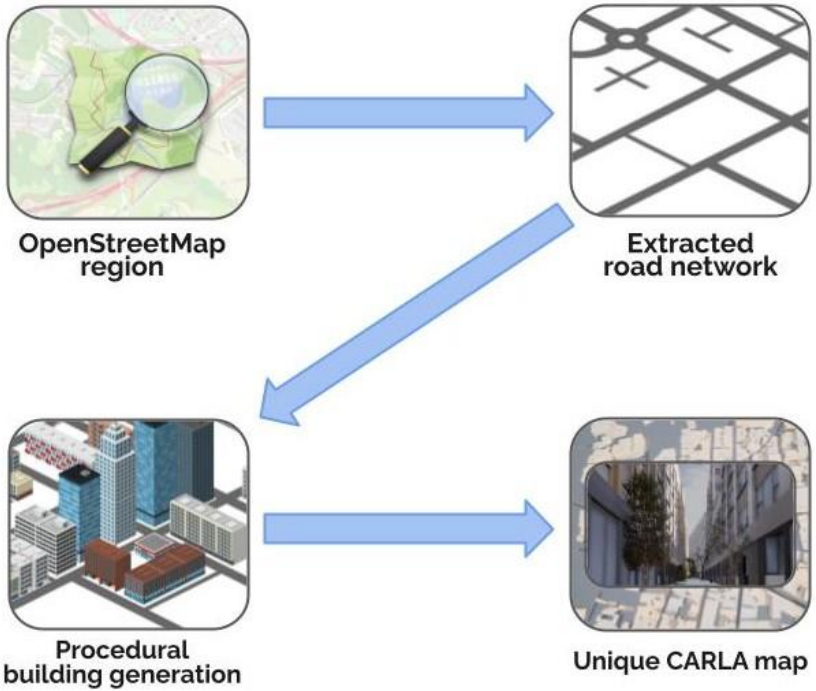
Inspiration: A. Tampuu, T. Matiisen, M. Semikin, D. Fishman and N. Muhammad, "*A Survey of End-to-End Driving: Architectures and Training Methods*" in IEEE Transactions on Neural Networks and Learning Systems, vol. 33, no. 4, pp. 1364-1384, April 2022, doi: 10.1109/TNNLS.2020.3043505.

Simulation in CARLA

- Quick data generation for machine learning
- Cost-effective and scalable training
- Safe, controlled environment
- Iterative variable manipulation for testing

Logo CARLA: https://github.com/carla-simulator/carla-simulator.github.io

Simulation contd.



Replicate **real-world** infrastructure

Answer **"What if...?"** questions

Digital twin from **road network**

Figure "digital-twin-tool": https://carla.org/2023/11/10/release-0.9.15/#digital-twin-tool

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THANK YOU!