# MAP MAKING WITH A LASER ENGRAVER

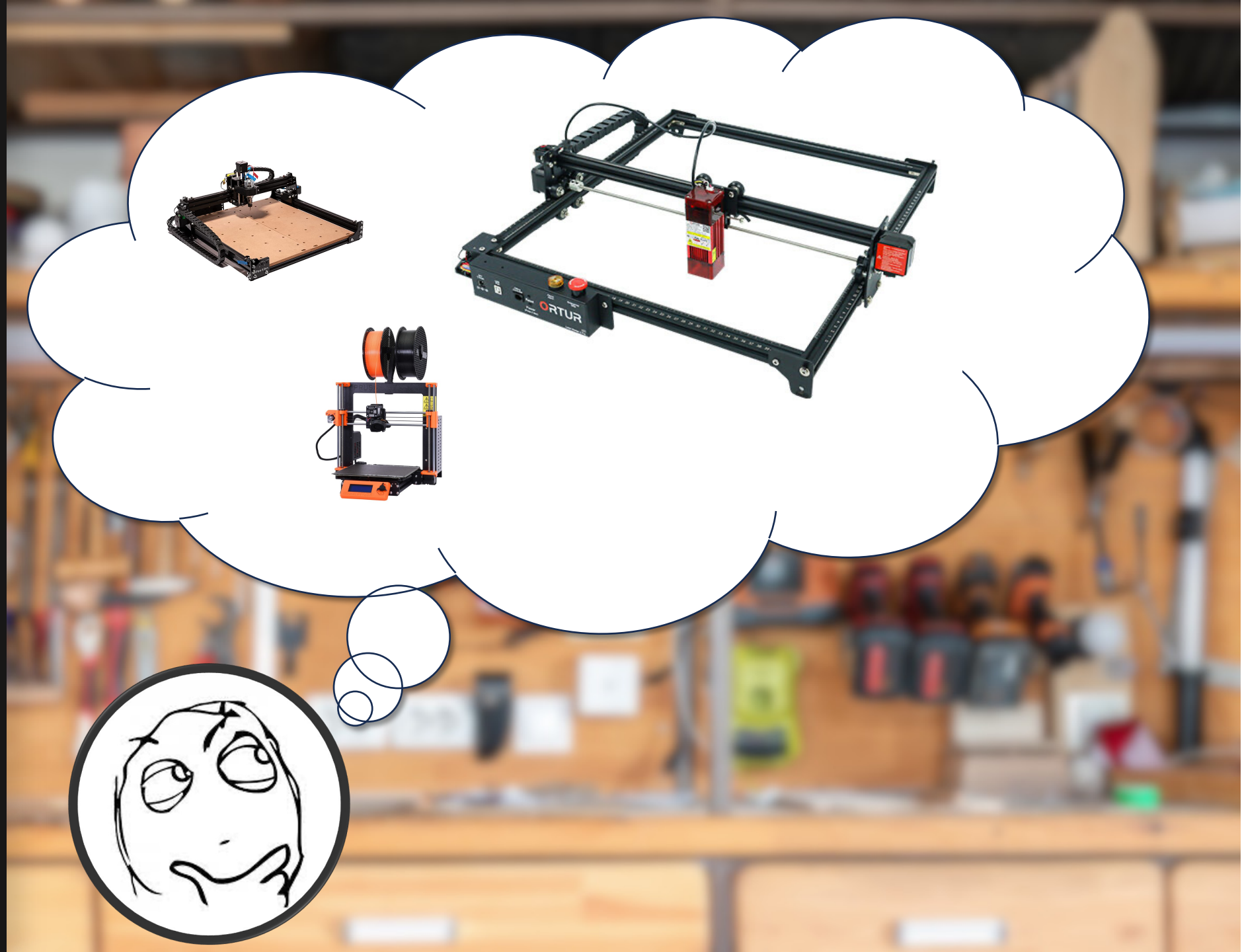

Luca Dall'Acqua
Twitter: @luca_northsouth

# WHY A LASER?

Lasers are cool!

As an hobbyist I wanted a new tool…

3D Printer, Laser or CNC?



# SAFETY FIRST

Lasers are dangerous:

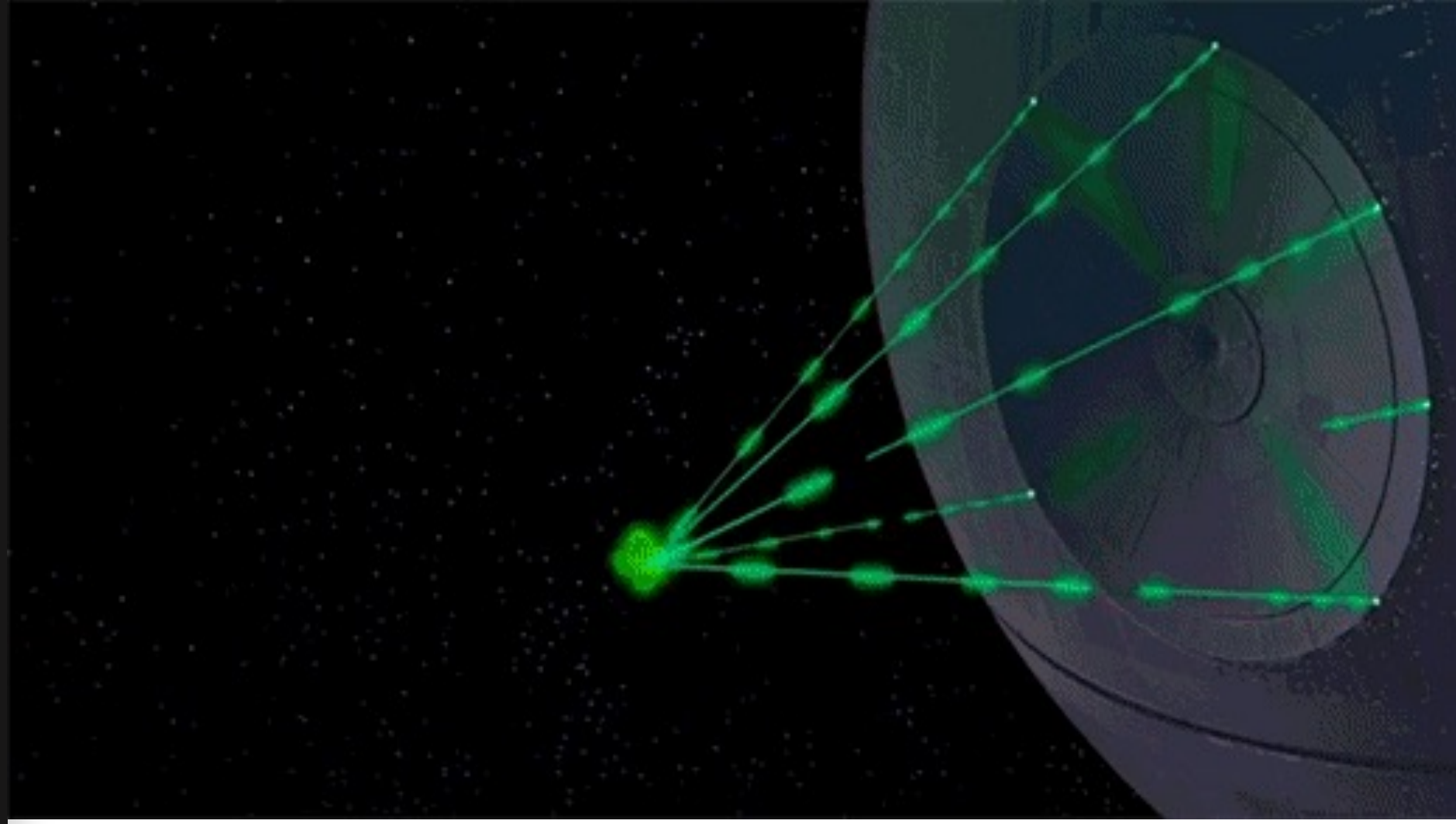
- Fire
- Eye Exposure
- Fumes and smoke

Never leave the laser running unattended

Wear protection glasses or use an enclosure

Use ventilation

Know the material you are burning



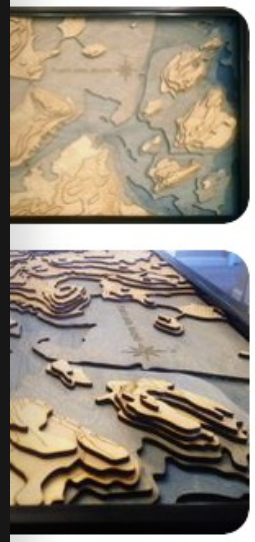


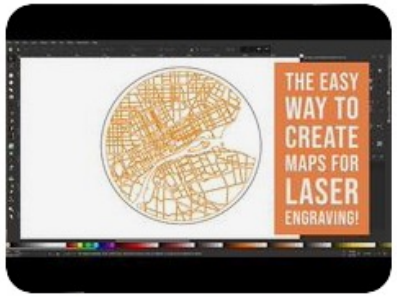

PXC

# HOW-TO

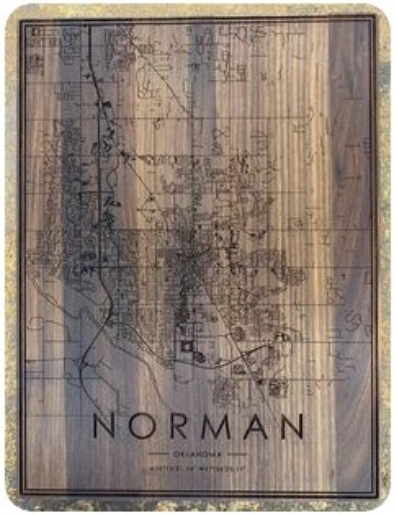
1. Have a great idea
   (or ~~steal~~ take inspiration)
2. Get the data
3. Select the geometries
4. Prepare layers for cutting or engraving
5. Burn (and fail)
6. Finish your artwork

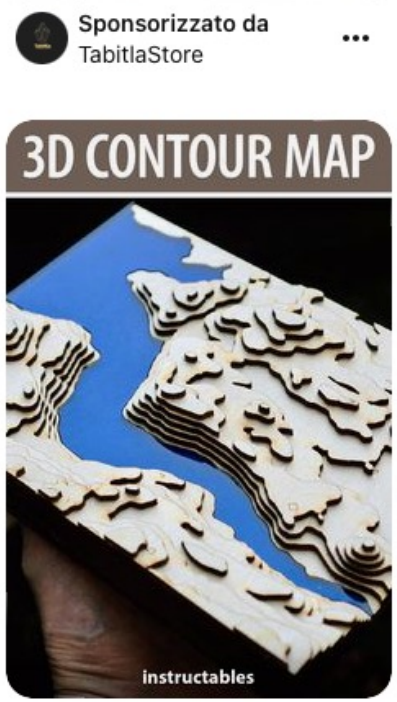




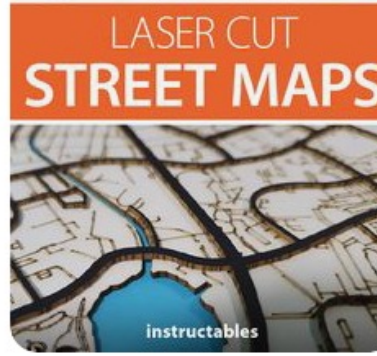










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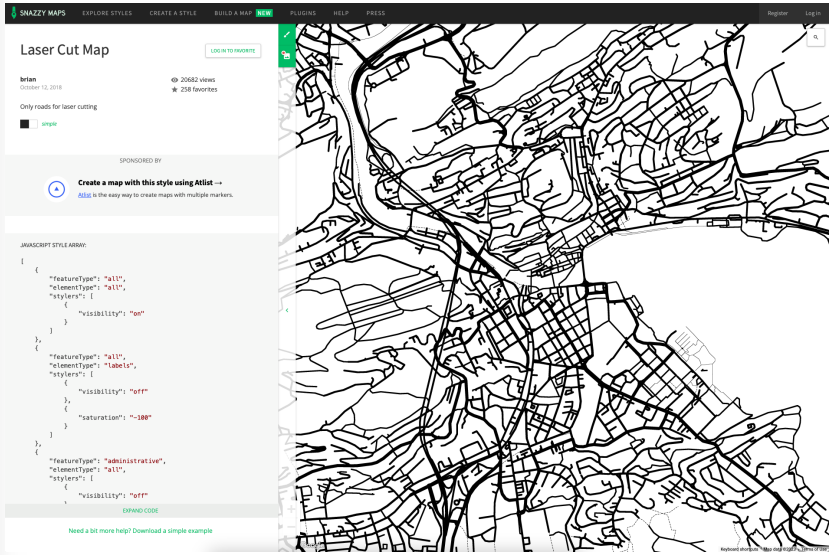


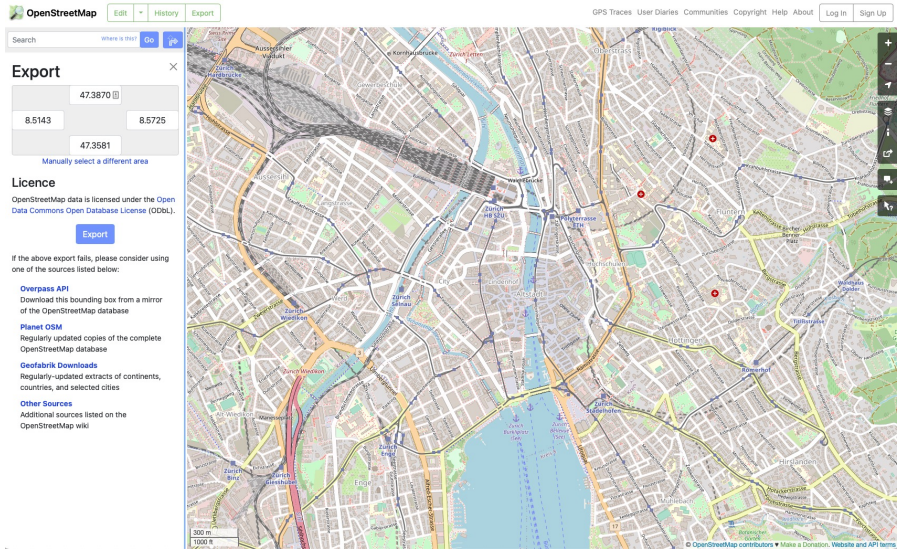


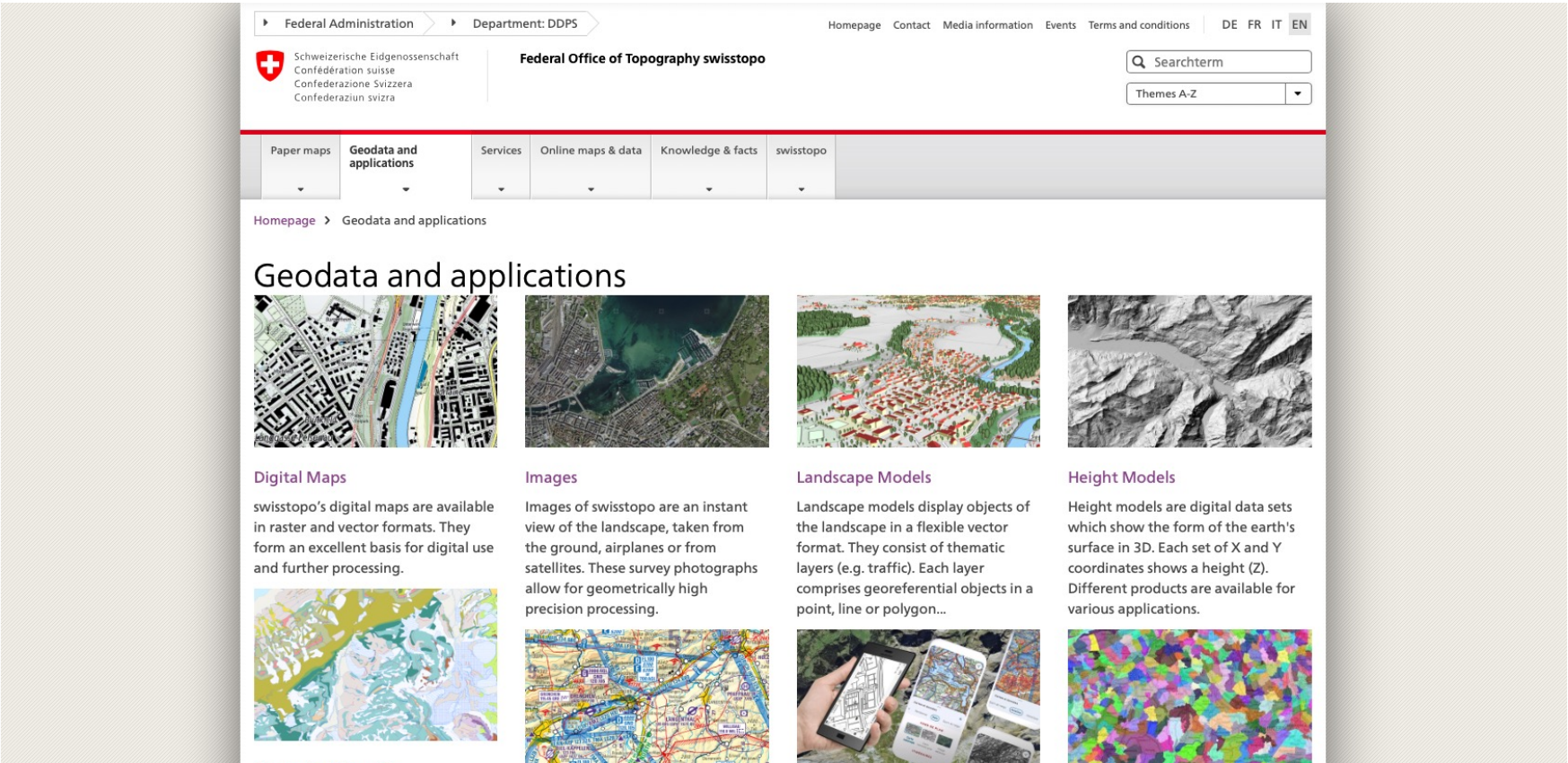

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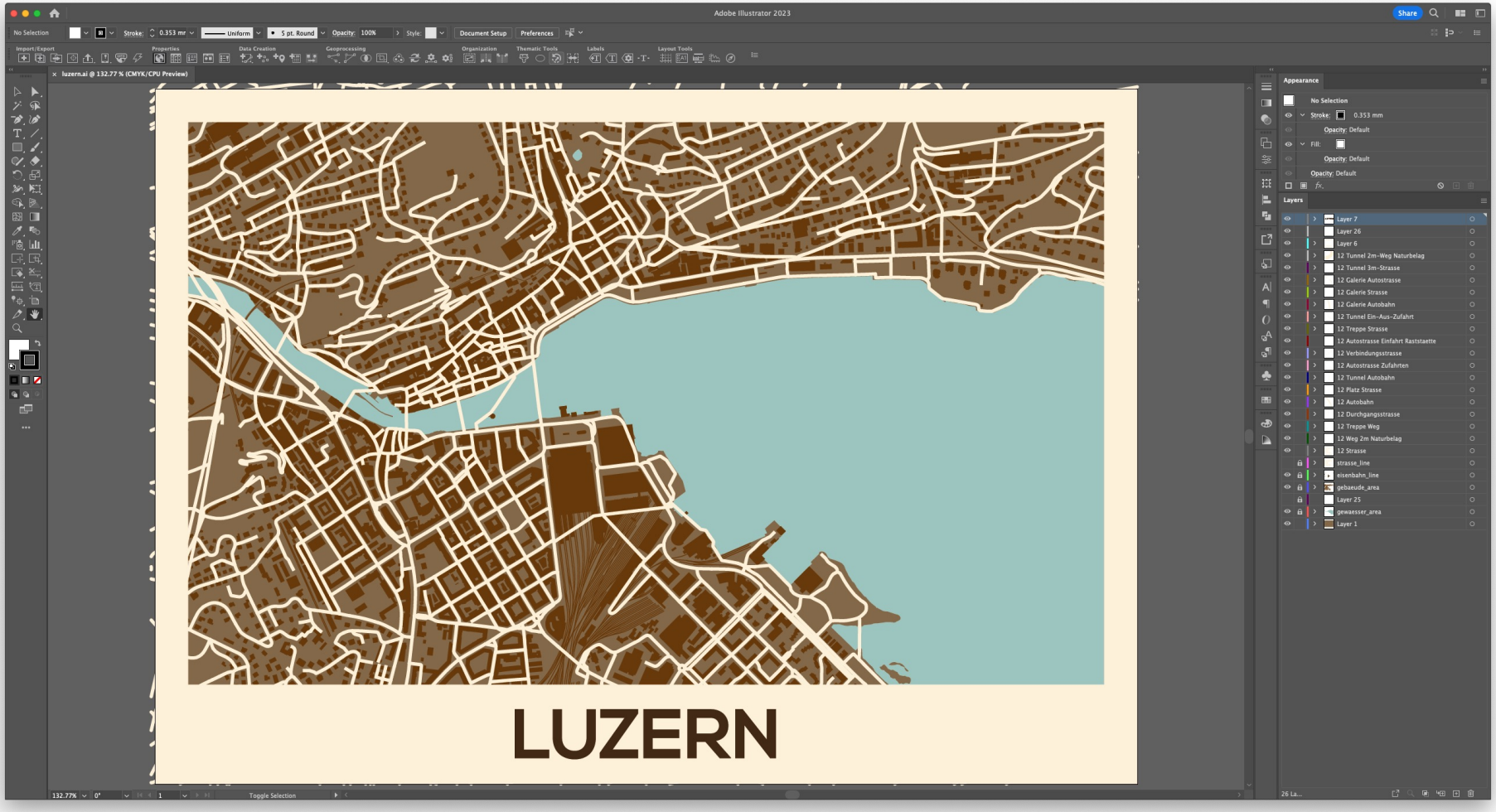

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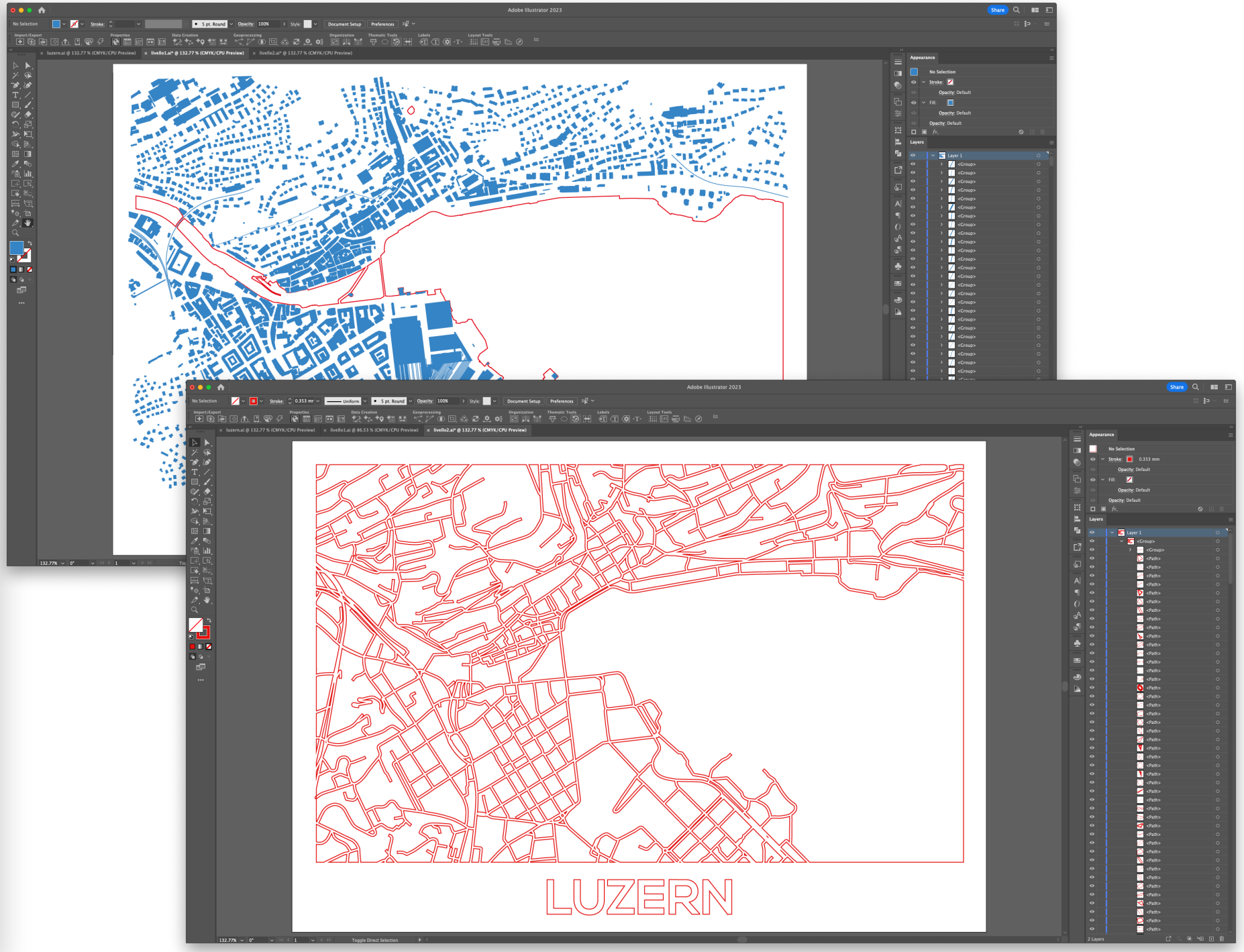

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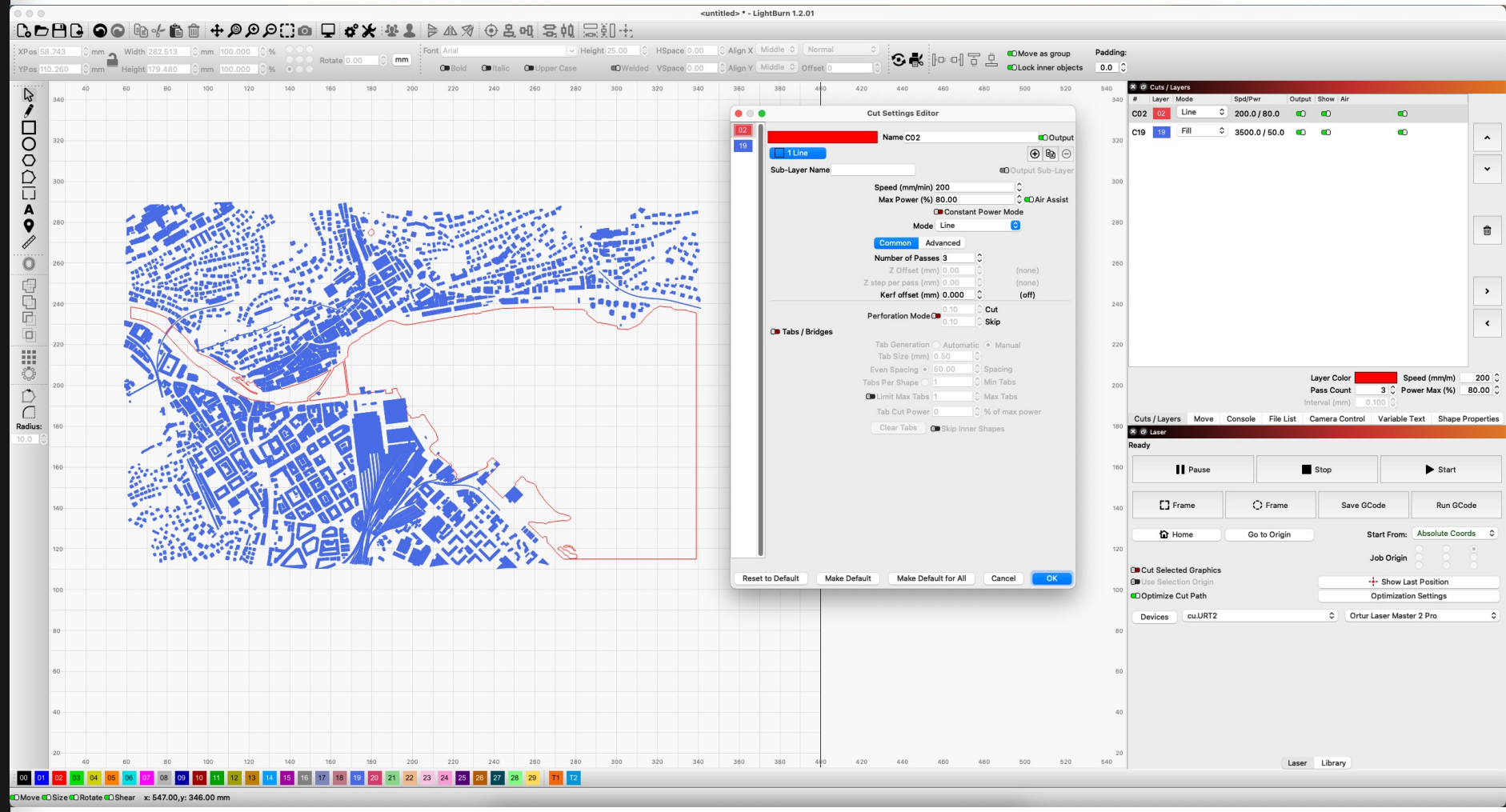

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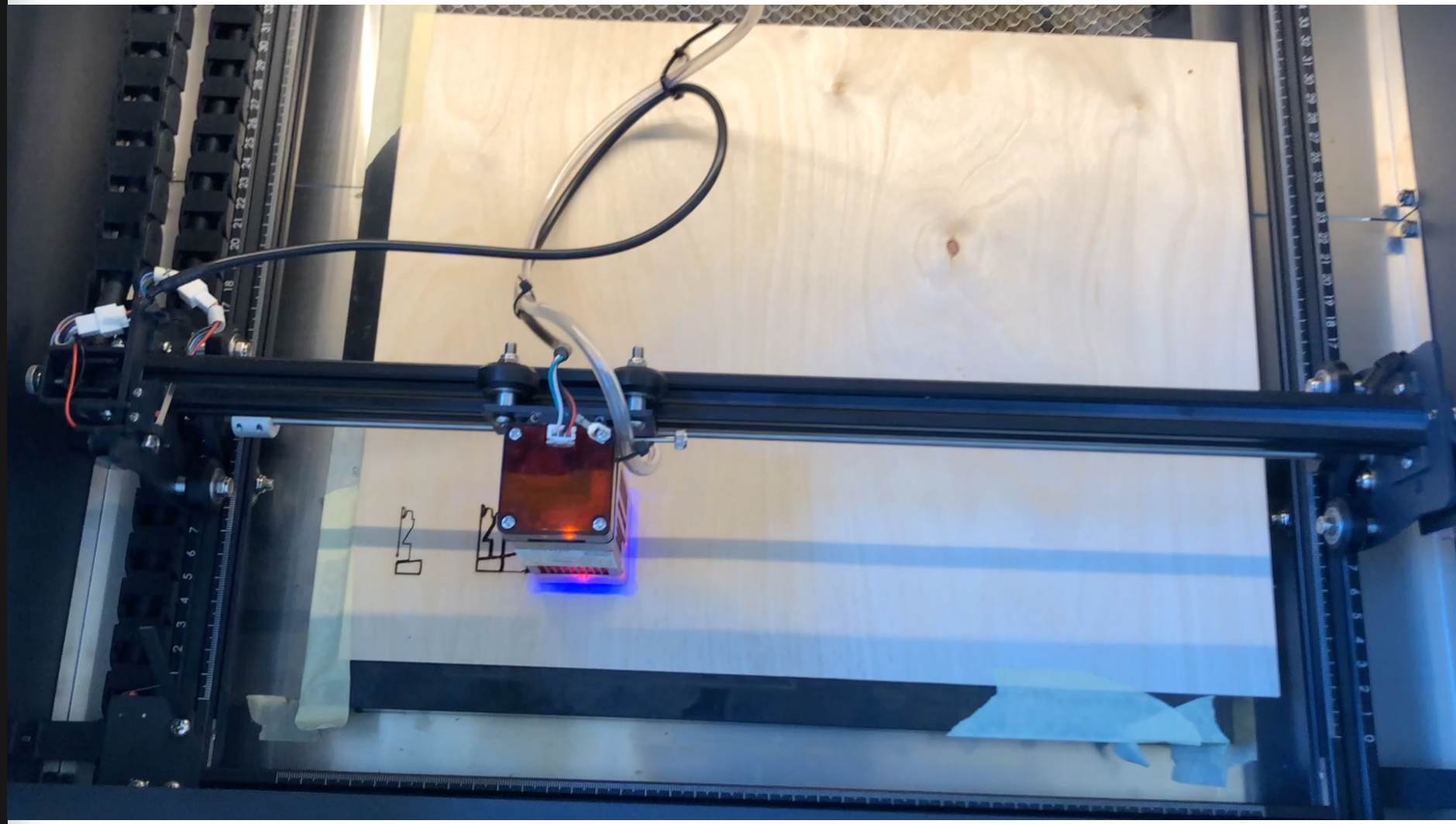

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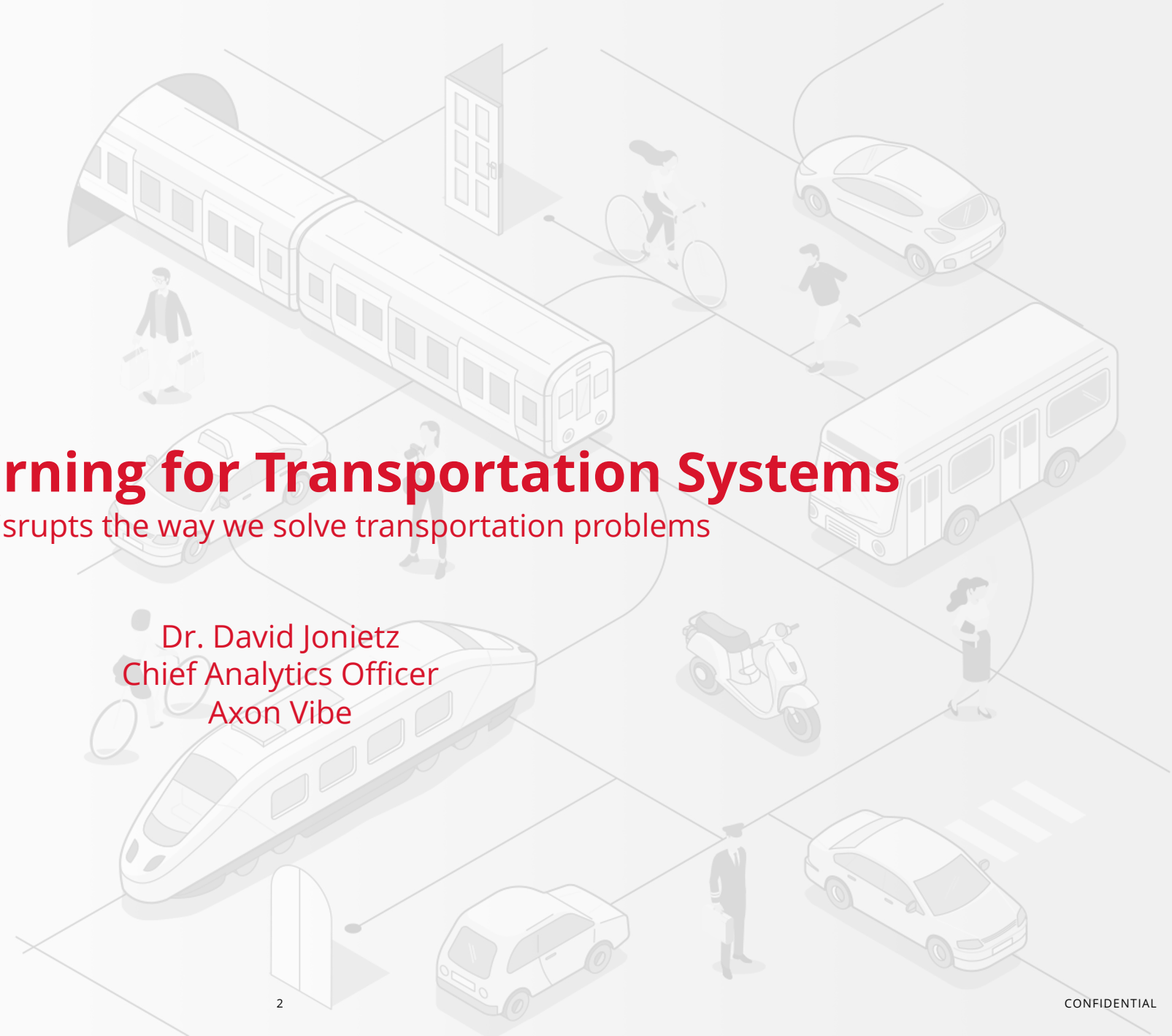
AXON VIBE

three more smiles



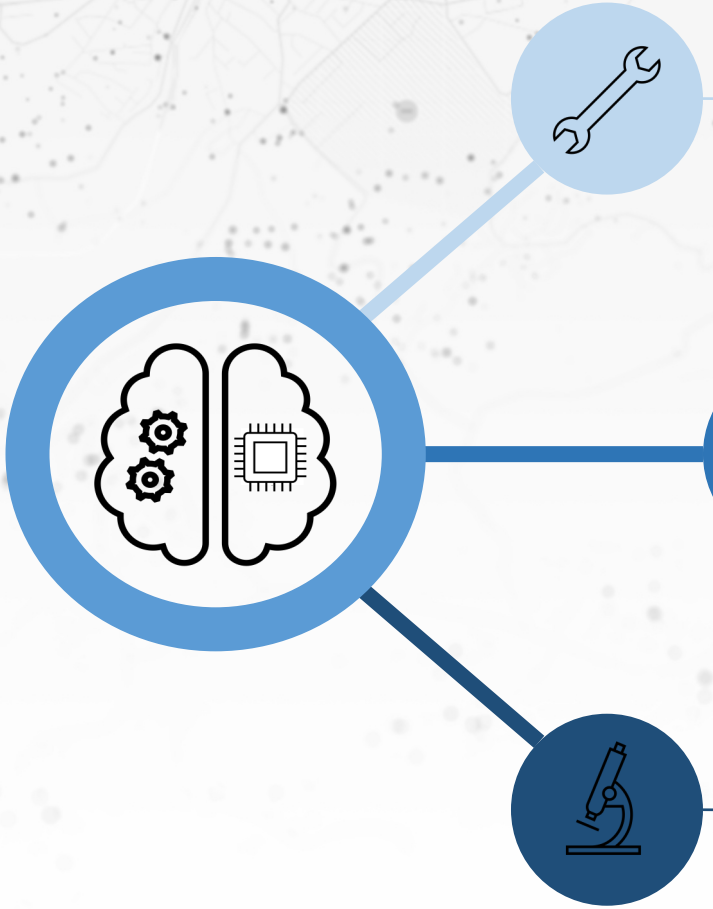
# Machine Learning for Transportation Systems

How ML disrupts the way we solve transportation problems

Dr. David Jonietz
Chief Analytics Officer
Axon Vibe

# Potentials of ML for Transportation Systems

## Where AI/ML can make a difference



### Analysis and Optimization

- Traffic prediction & analysis
- Fleet routing & ETA prediction
- Network planning
- Demand & supply prediction
- …

### Real-time Management

- Route adaptation to current conditions
- Management in case of disruptions
- Intelligent Transportation Systems (ITS)
- …

### Innovative Modes of Transport

- Autonomous vehicles & drones
- Hyperloop
- …

# Computer Vision for Large Scale Traffic Prediction

## The Traffic4Cast Competition at NeurIPS

- Traffic prediction as a central prerequisite for traffic management
- Traditional methods based on a road network graph
- What if we got rid of the road graph and predicted traffic on pixels of a map/image?

Traffic prediction ≈ Video prediction

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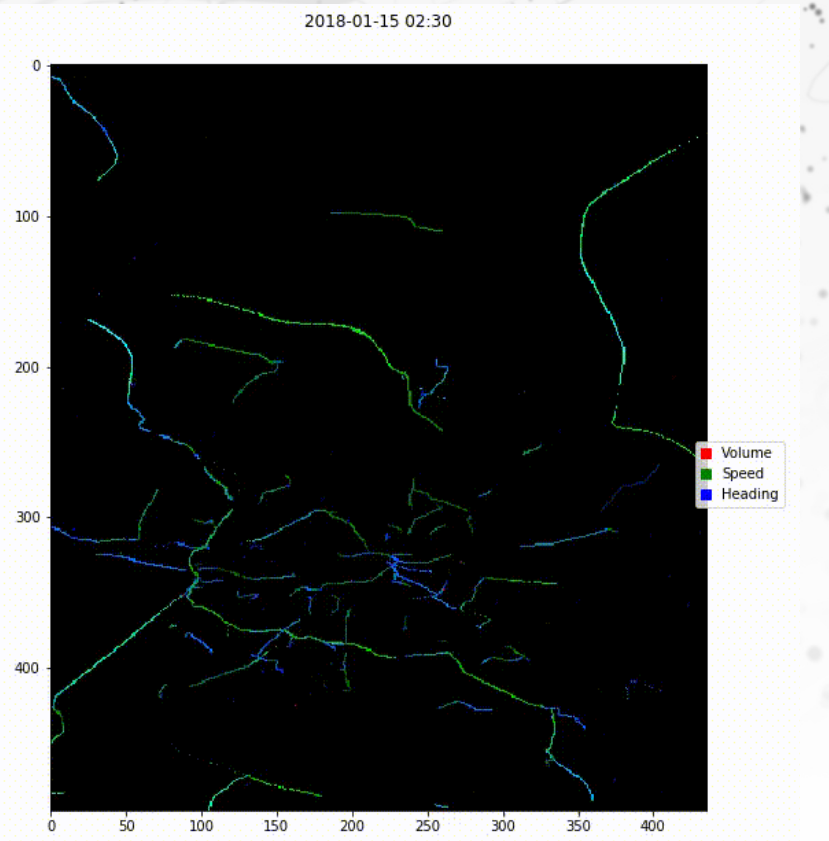


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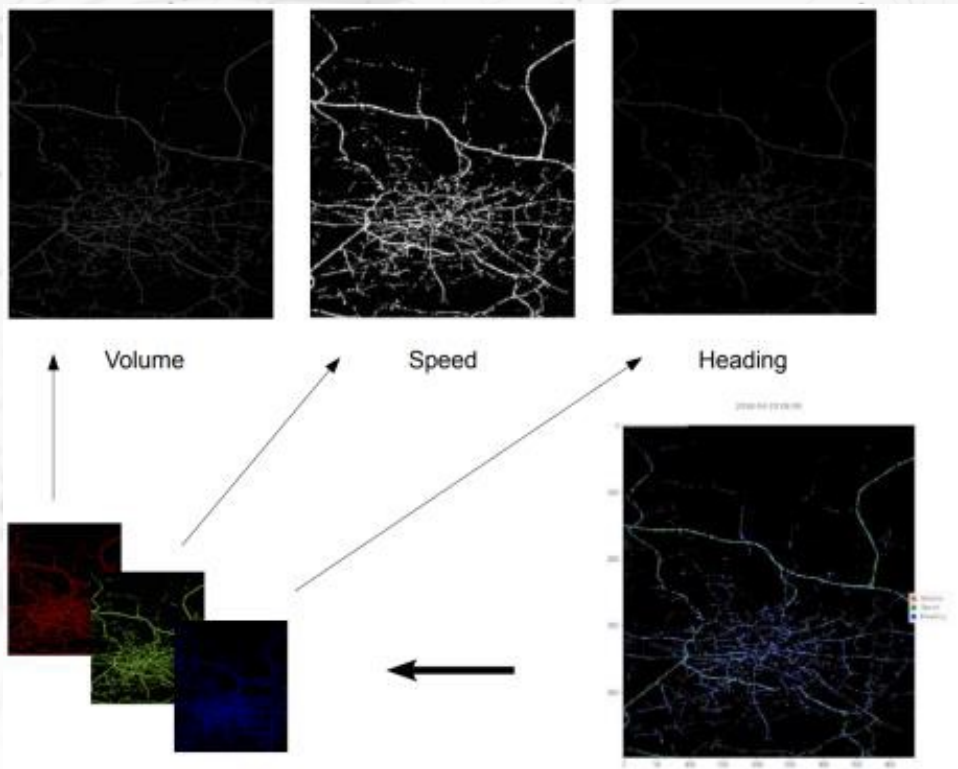


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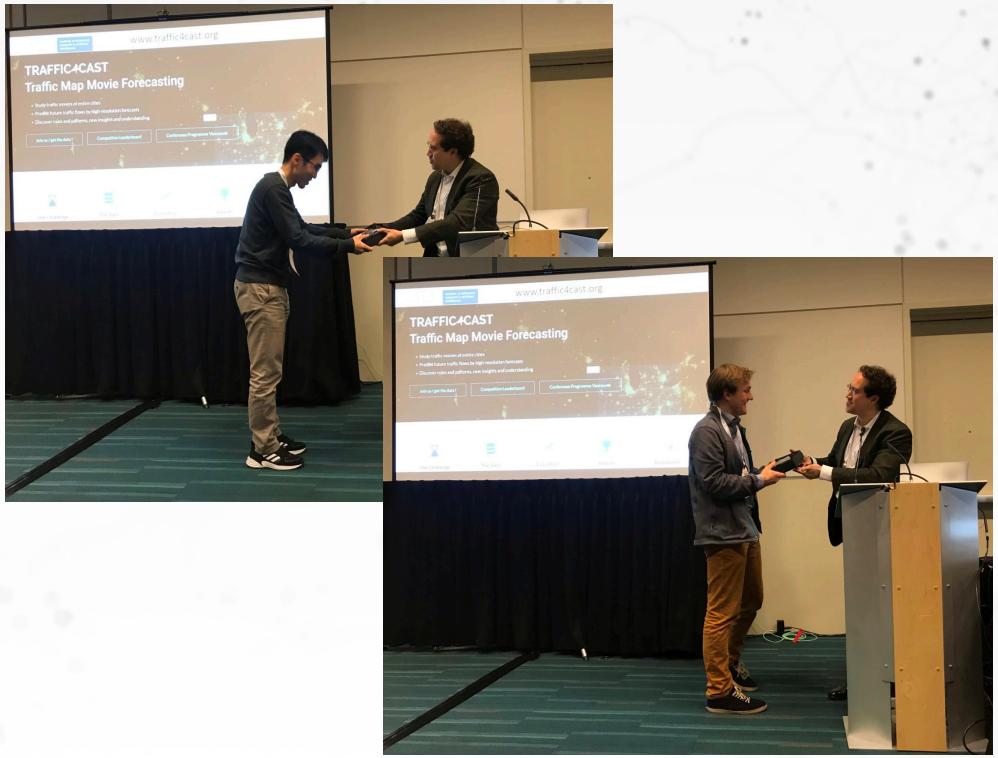
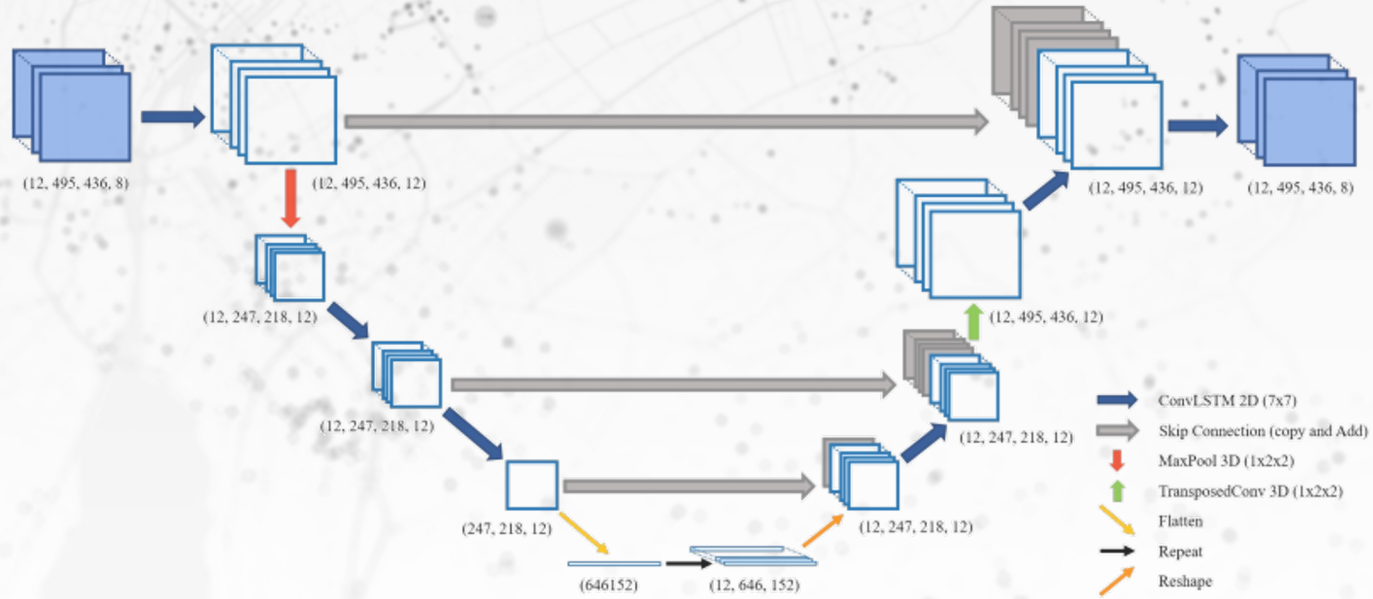


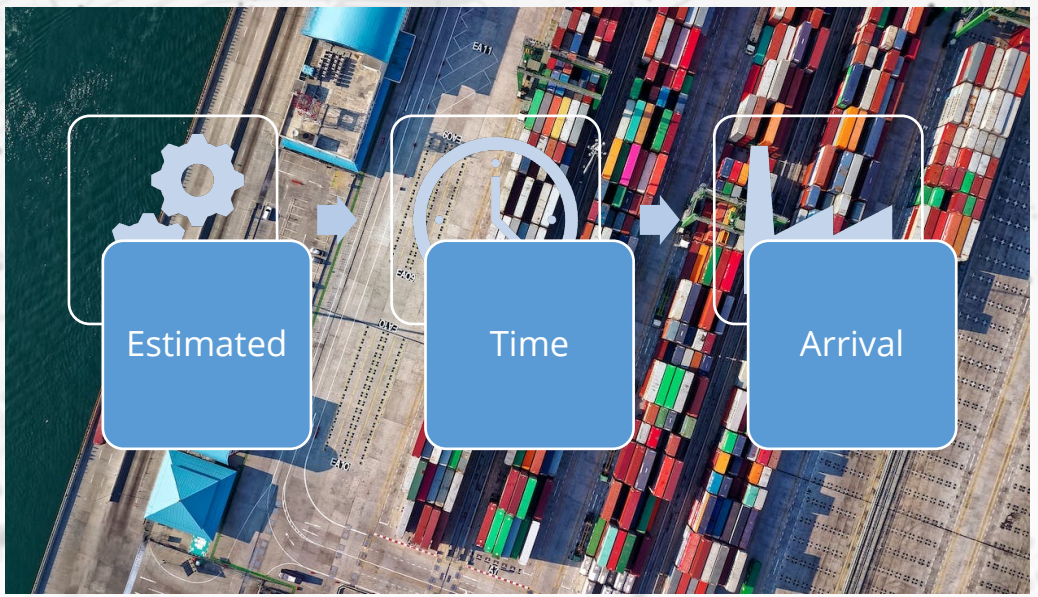

https://www.iarai.ac.at/traffic4cast/

# STAMP – ETA Prediction with Machine Learning

## Spatio-Temporal Aggregated Machine-learning Prediction (STAMP)

- Estimated Times of Arrival as essential information for logistics, fleet management and navigation
- Traditionally based on pre-defined route (e.g., fastest path)
- What if we predicted robust ETAs without routes?

Historical Trips – Routes = ETA

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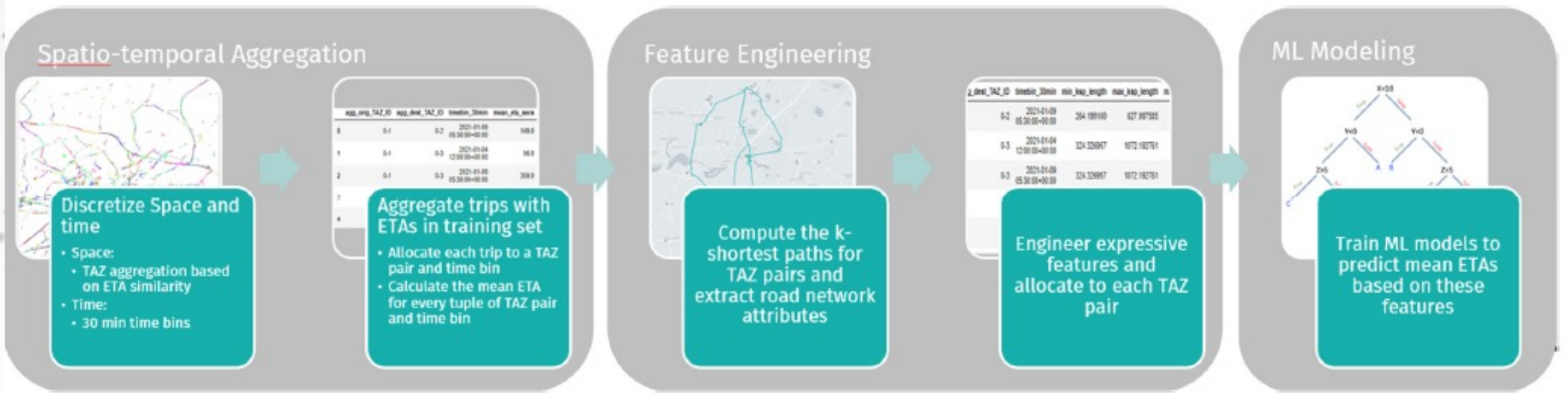


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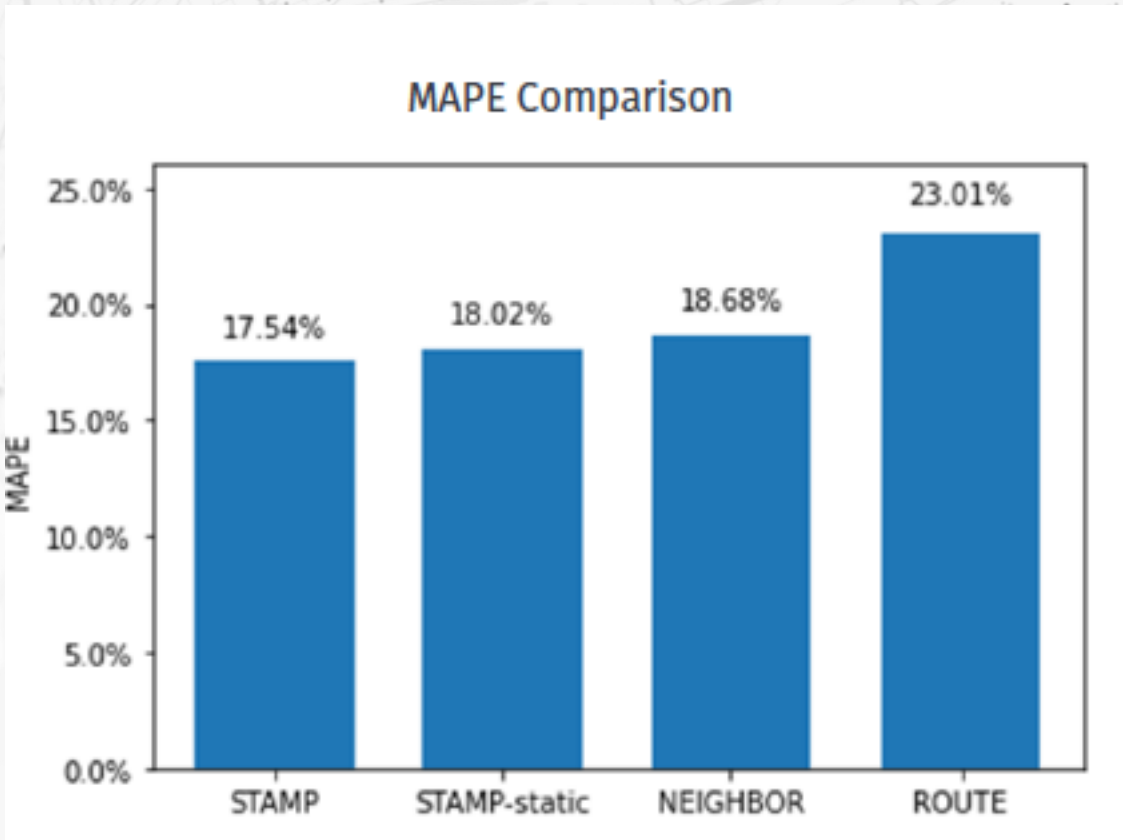


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# Summary

- ML not only allows to address new tasks, but can also fundamentally disrupt the way we solve established problems
- ML is data hungry → effort required for compiling large-scale geospatial datasets
- What do we need for true geospatial ML?
- Challenge of root-cause analysis and reliable prediction of rare events