

NoiseModelling days 2025



Applying EU standards to noise mapping in emerging countries

Alexandra L. Montenegro, Gaetano Licitra and Enrique Suárez

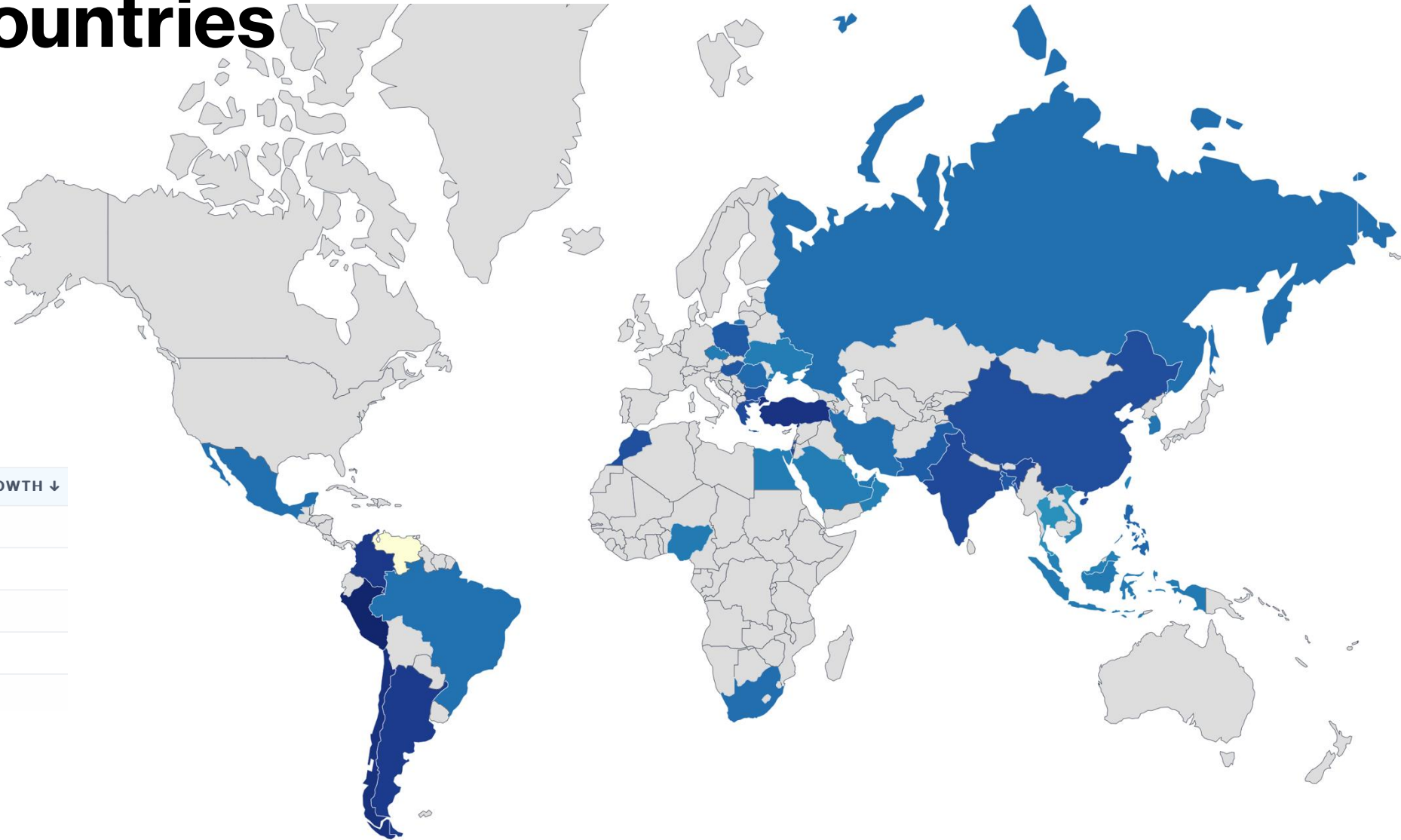
Department of Earth Sciences, University of Pisa, Italy

Environmental Protection Agency of Tuscany Region (ARPAT), Pisa, Italy

Environmental Acoustics Laboratory (LABACAM), Institute of Acoustics, Austral University of Chile, Chile

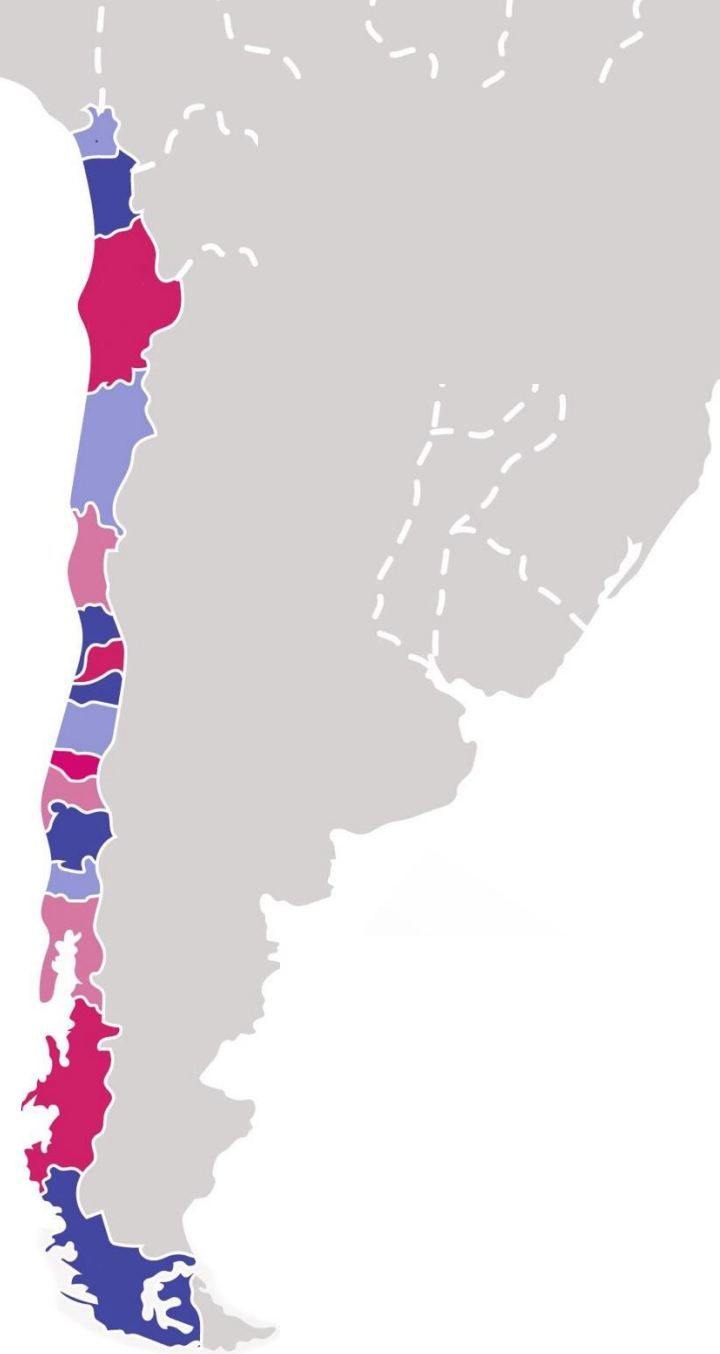
Emerging countries

COUNTRY		GDP GROWTH ↓
	Peru	13.35%
	Chile	11.67%
	Turkey	11.35%
	Colombia	10.68%
	Argentina	10.4%



Road traffic noise mapping in Chile

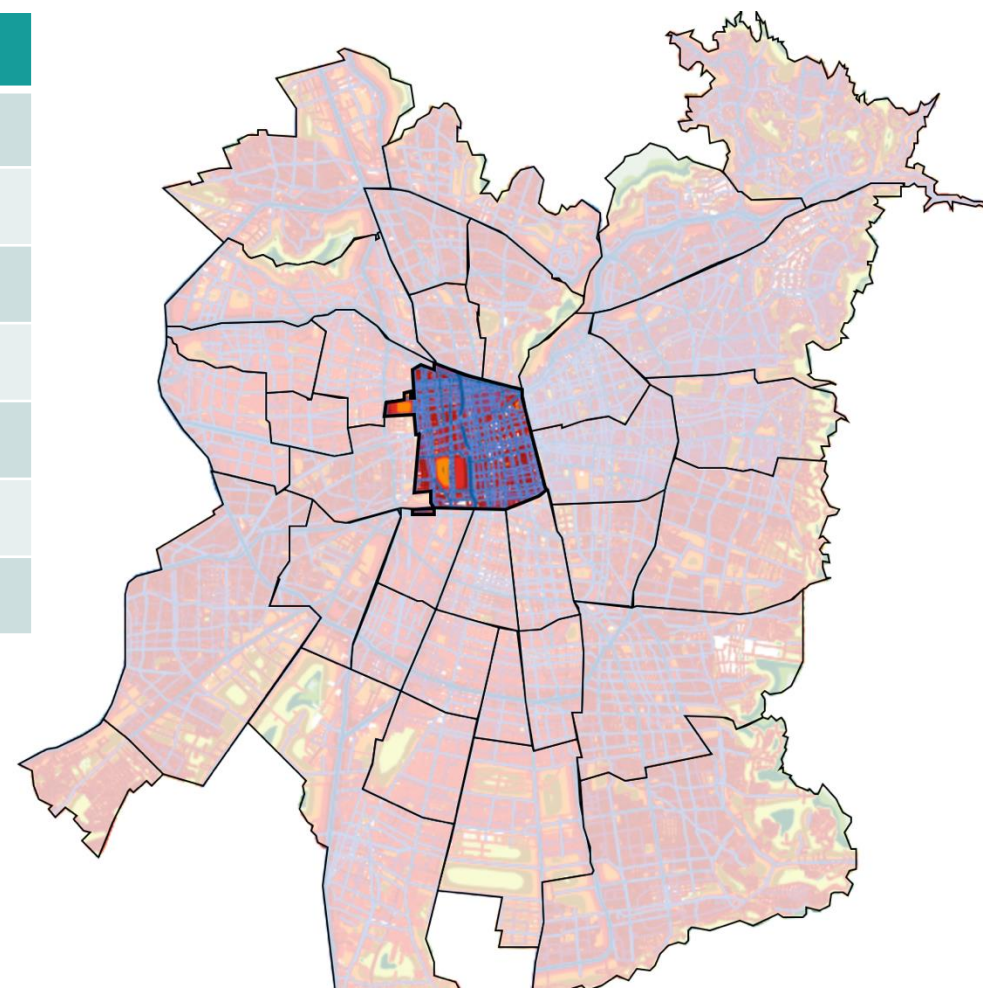
- The noise department of the Ministry of the Environment (MMA) prepares noise maps of road traffic noise of regional capitals.
- In cities, **road traffic noise is responsible for more than 70%** of environmental noise.
- Noise and Vibration studies. Environmental Impact Assessment System (SEIA). **No local regulations or common prediction model.**



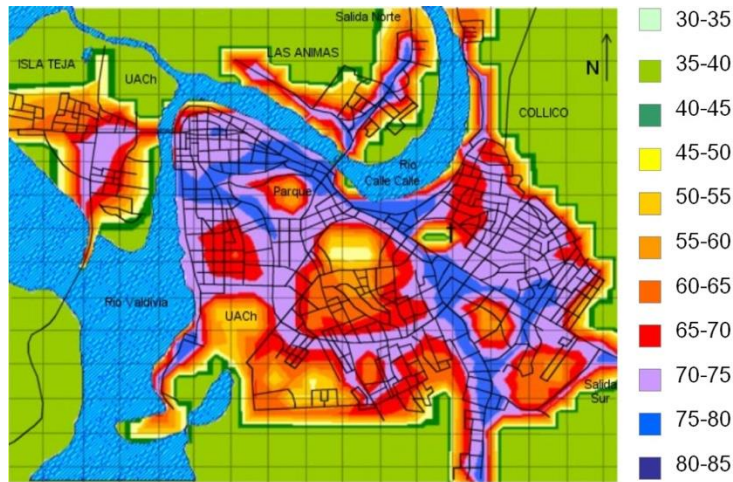
Urban road traffic noise mapping in Chile

15% > 65 dBA day
17% > 55 dBA night

Year	City	Population
2023	Gran Santiago	8,367,790
2016		7,112,808
2011		6,061,185
2019	Ruta 5 Norte – Sur	-
2015	Coquimbo – La Serena	426,754
2015	Temuco – Padre las Casas	308,608
2015	Valdivia	143,305



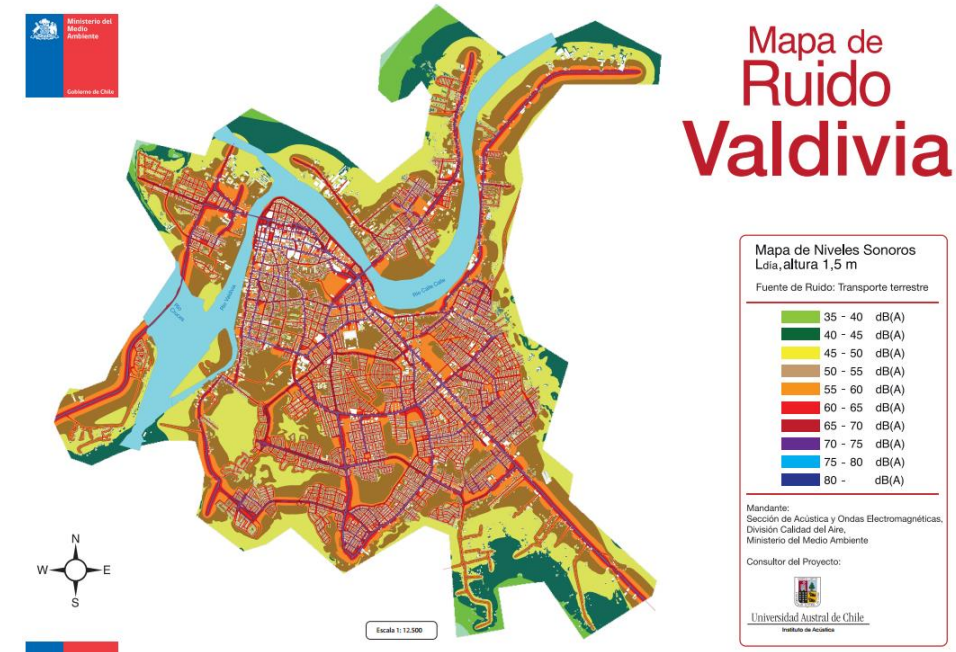
Valdivia, a medium-sized city in southern Chile



2002



2014



2010 - 2015

Open available data for noise mapping

- Digital Elevation Model (DEM)



SRTM-Downloader

Plugin ID: 1379



Downloads SRTM Tiles from NASA Server

- Road network and buildings



Planet OSM

The files found here are regularly-updated, complete copies of the [OpenStreetMap](#) database.

- Land cover



- Population (local)



Resultados CENSO 2017 - Manzanas y Entidades
Instituto Nacional de Estadísticas

Digital Elevation Model (DEM)



SRTM-Downloader

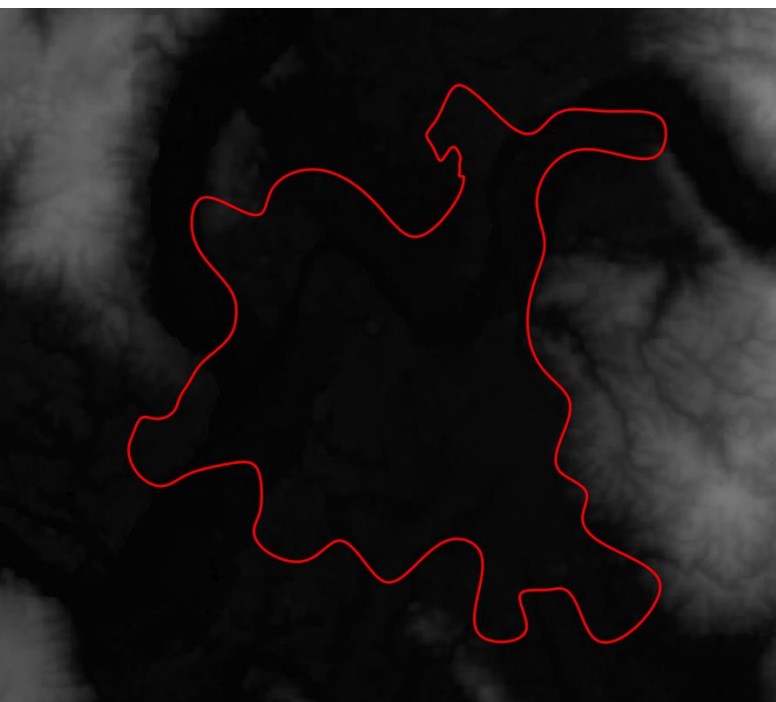
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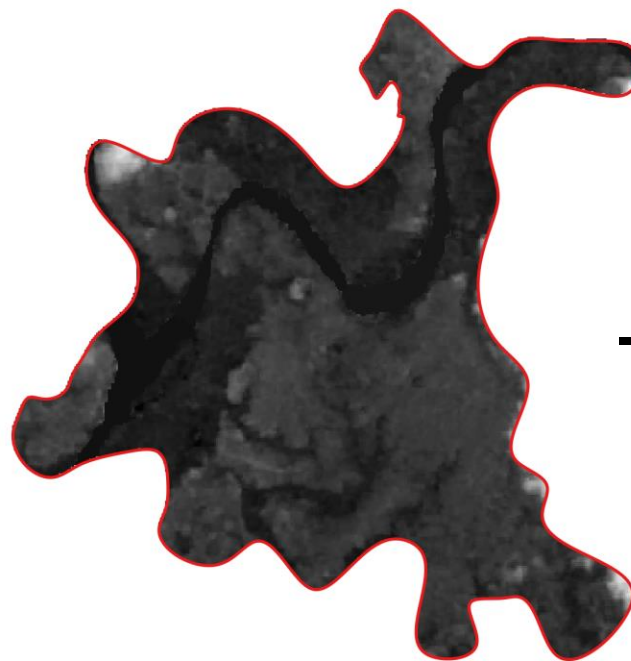
Downloads SRTM Tiles from NASA Server



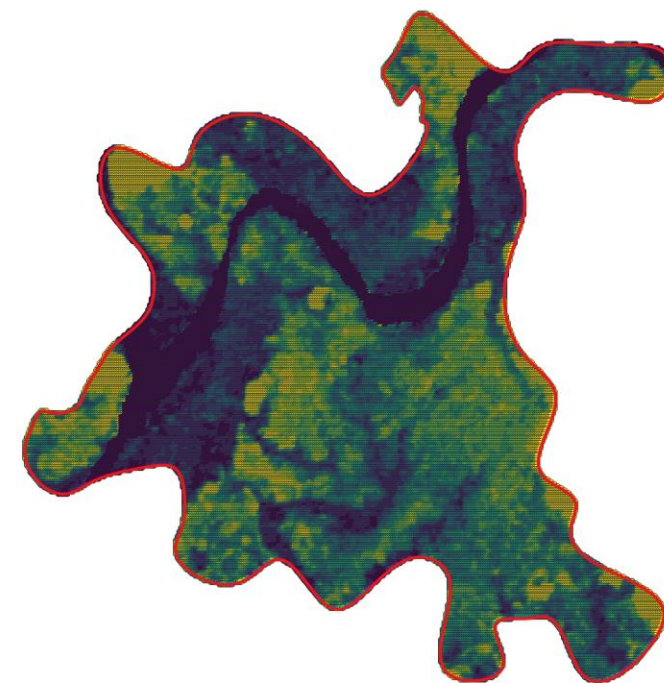
plugin



Raster



Pixel 25 m



Vector

Z (m)

Land cover



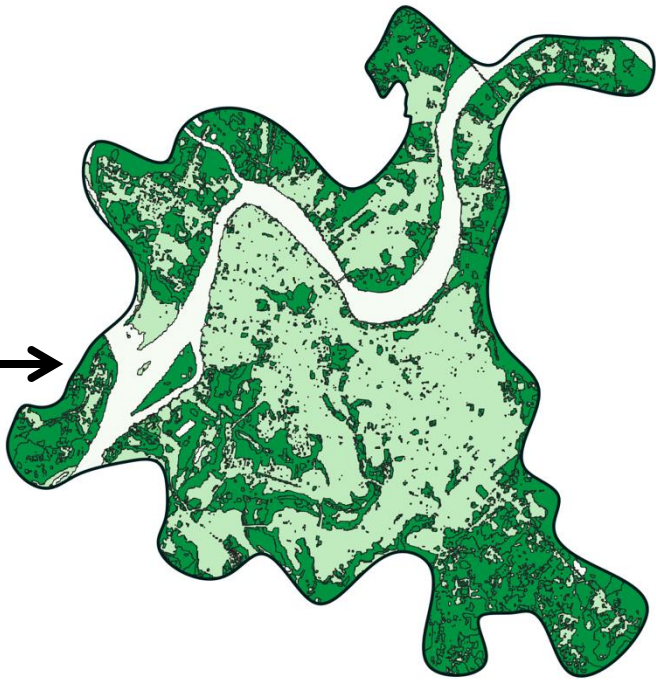
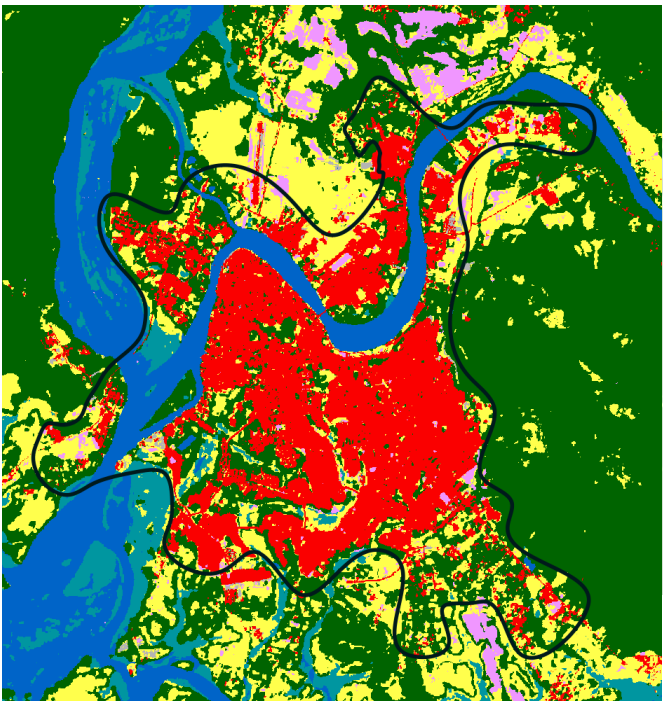
European Space Agency

Product User Manual



G

Acoustic ground's
absorption



G values for different types of ground (extracted from “Common Noise Assessment Methods in Europe (CNOSSOS-EU)”, p86)

Description	G
Very soft (snow or moss-like)	1
Soft forest floor (short, dense heather-like or thick moss)	1
Uncompacted, loose ground (turf, grass, loose soil)	1
Normal uncompacted ground (forest floors, pasture field)	1
Compacted field and gravel (compacted lawns, park area)	0.7
Compacted dense ground (gravel road, car park)	0.3
Hard surfaces (most normal asphalt, concrete)	0
Very hard and dense surfaces (dense asphalt, concrete, water)	0

Raster

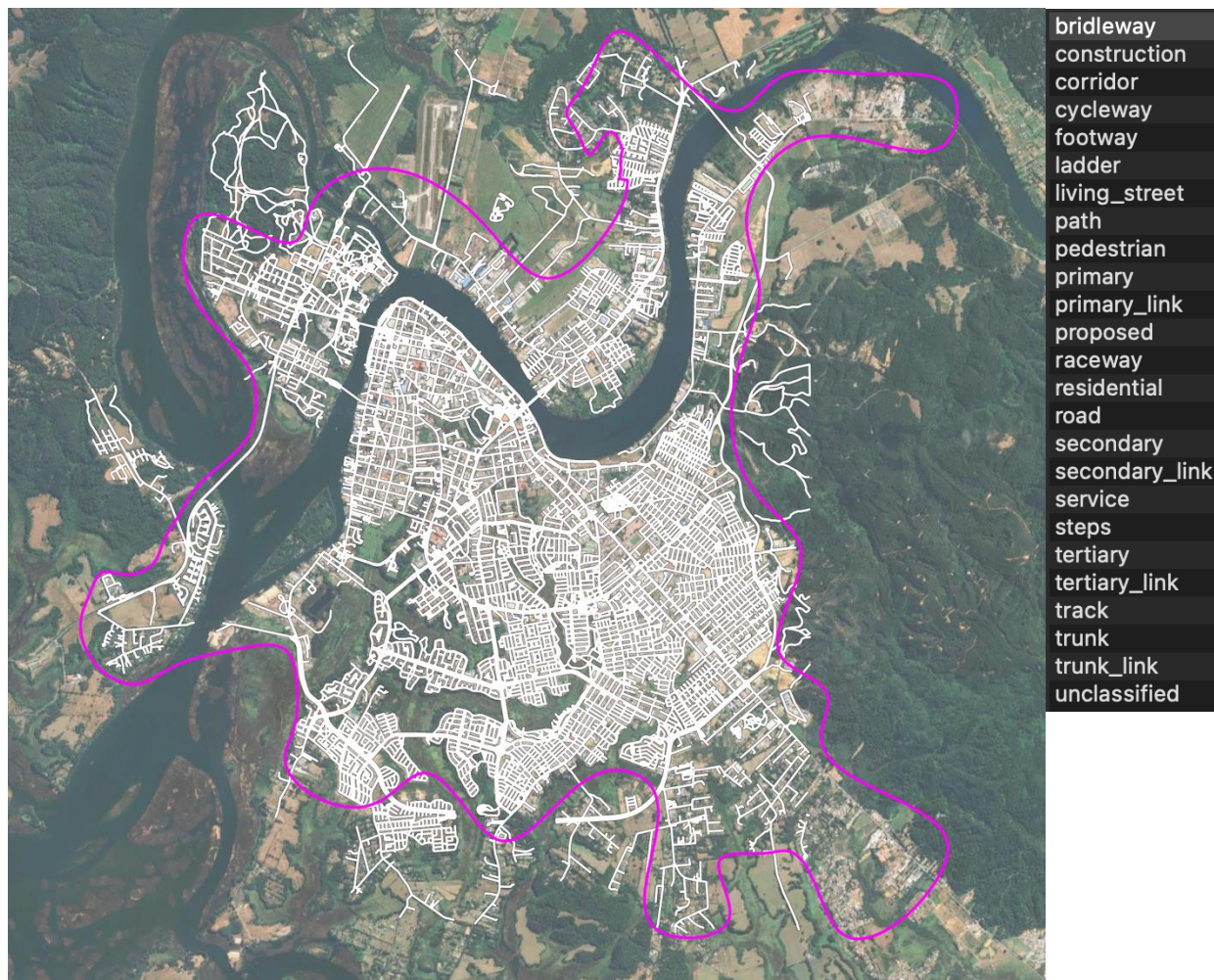
Vector

Road network and buildings



Planet OSM

Line, ID, type, name, max speed



bridleway
construction
corridor
cycleway
footway
ladder
living_street
path
pedestrian
primary
primary_link
proposed
raceway
residential
road
secondary
secondary_link
service
steps
tertiary
tertiary_link
track
trunk
trunk_link
unclassified

Polygons, ID, type, name

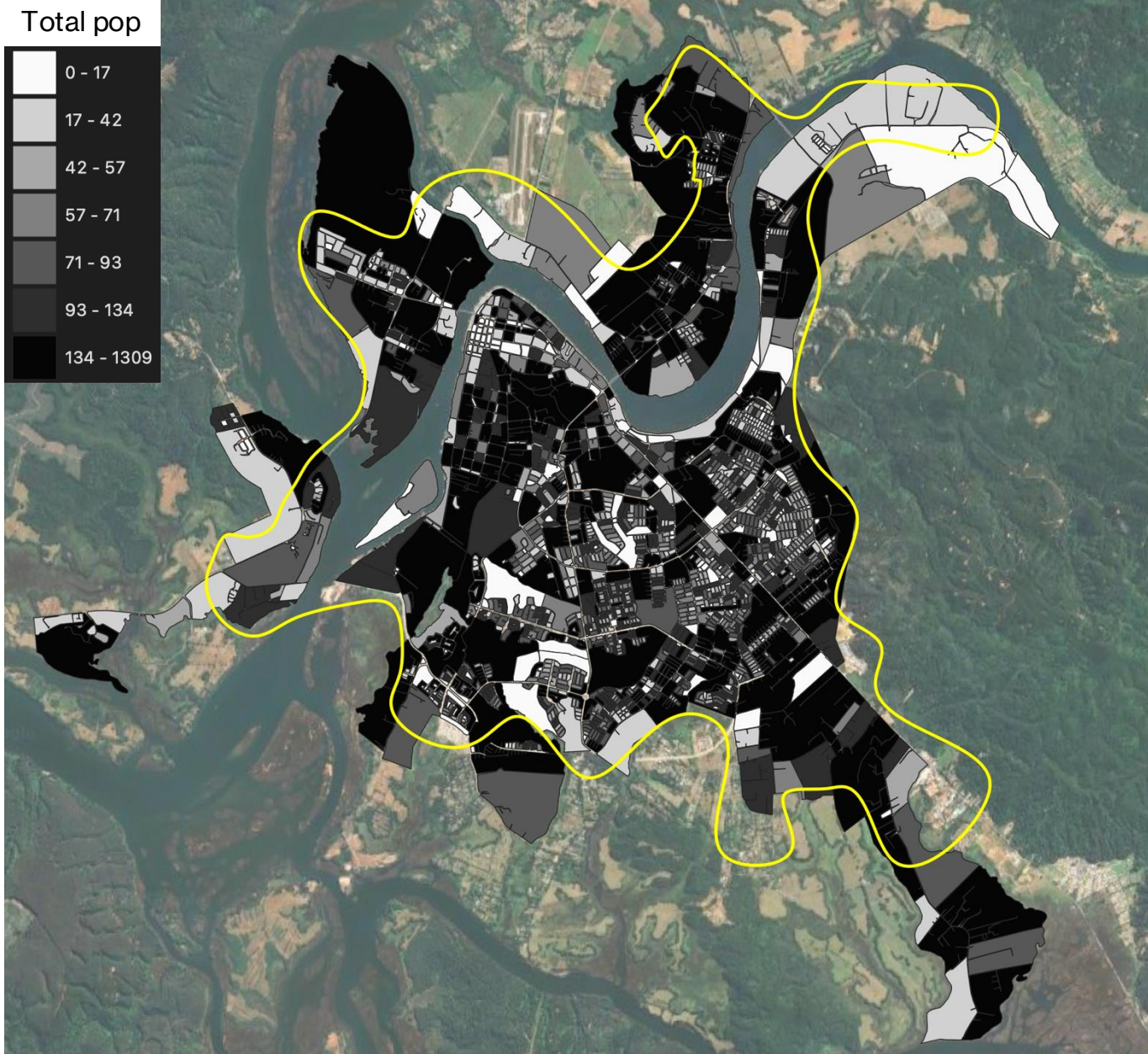


Population

Polygons, block ID, total population



Microdata level: min. 4 private dwellings responding to the population census



Open available data for noise mapping

✓ Digital Elevation Model



✓ Land cover

• Road network and **buildings**



• Population (local)



Buildings and population

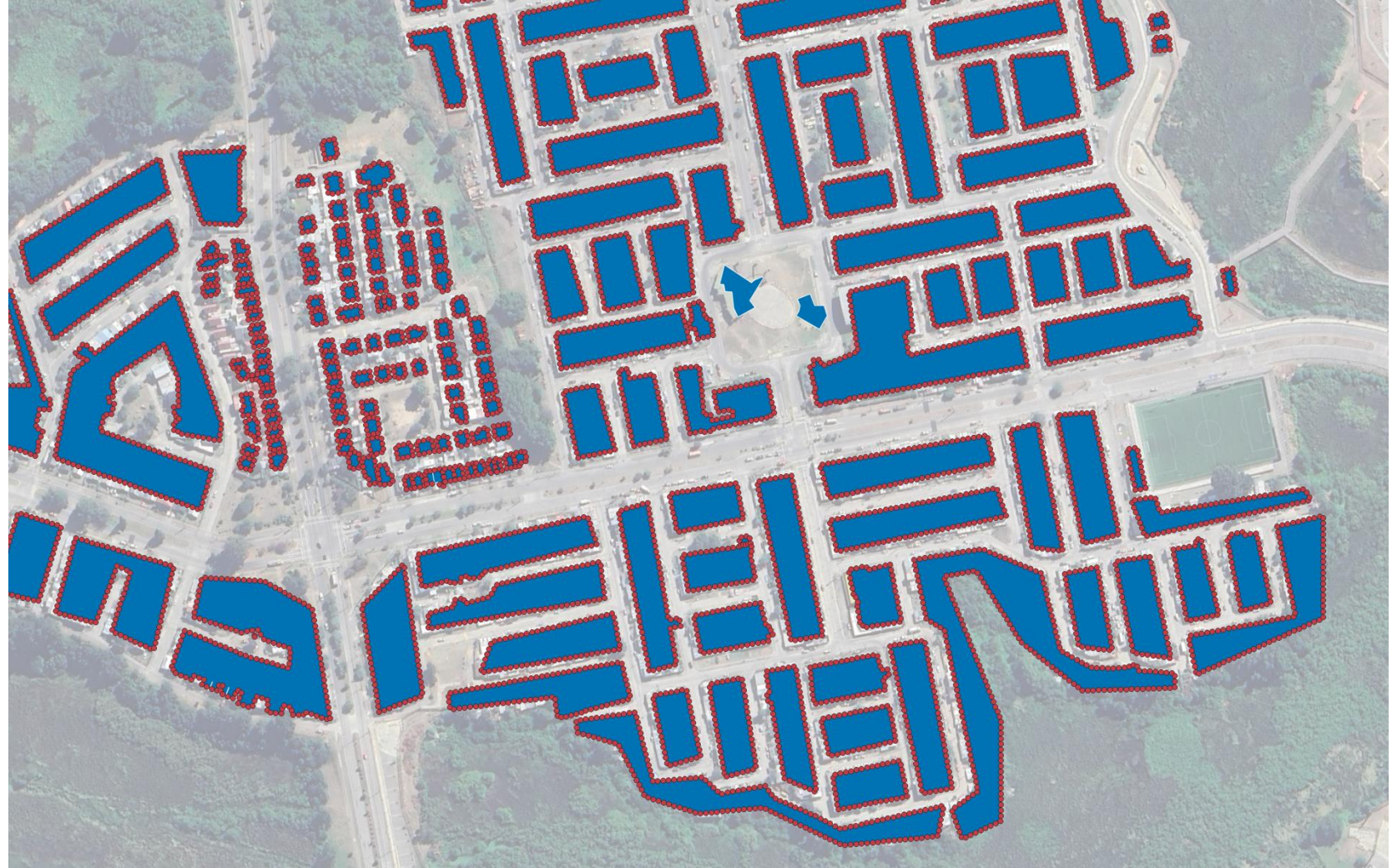
- Block simplification
- Households clustering
- Common height (4 m)



Buildings and **population** (receivers)

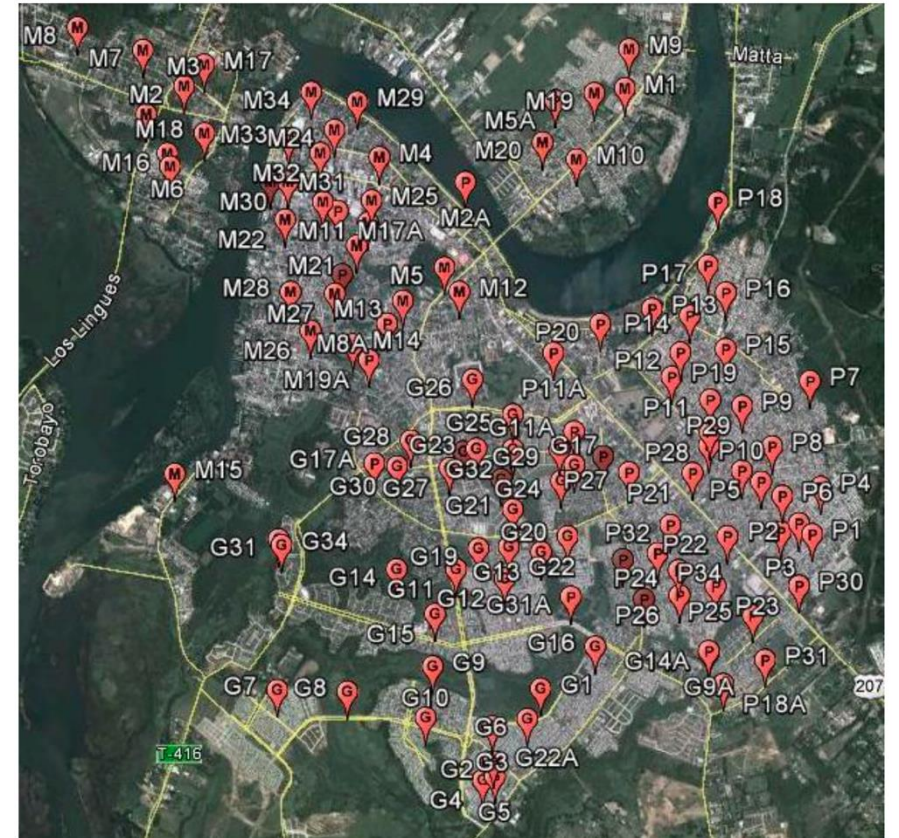
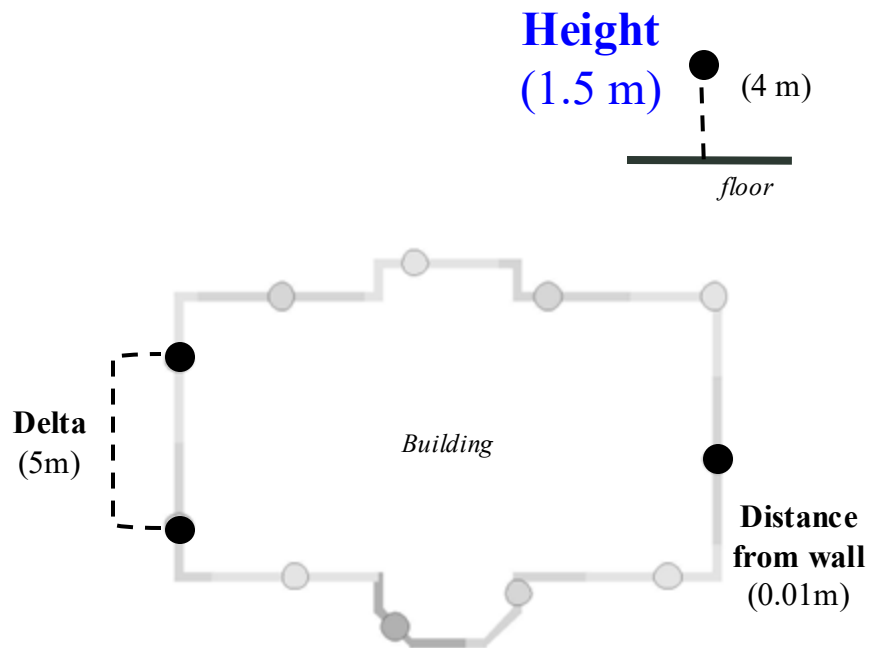
Case 2

- Residents
- Census block
- Volume



Receivers

- Points around buildings



100 measurement points

Open available data for noise mapping

✓ Digital Elevation Model

✓ Land cover

✓ Road network

✓ Buildings

✓ Receivers (population)

• Traffic

• Speed

• Noise

Noise

- LAeq 15 min dB at 1.5 (m)
Lmax, Lmin, L10, L90
- Weekday daytime

Traffic

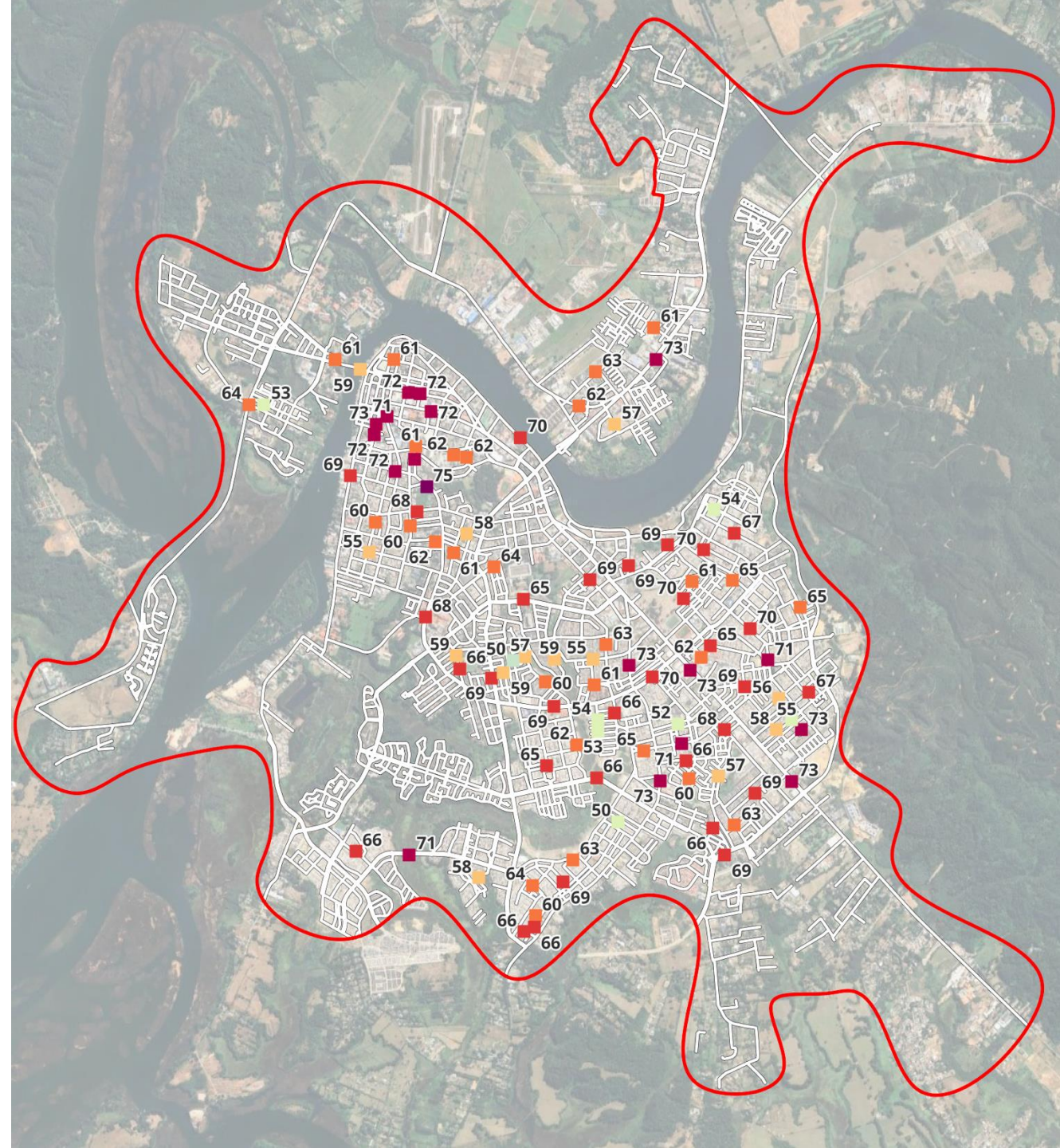
LV, HGV, WAV

- Light
- **Bus**
- Heavy
- Motorcycles

2015

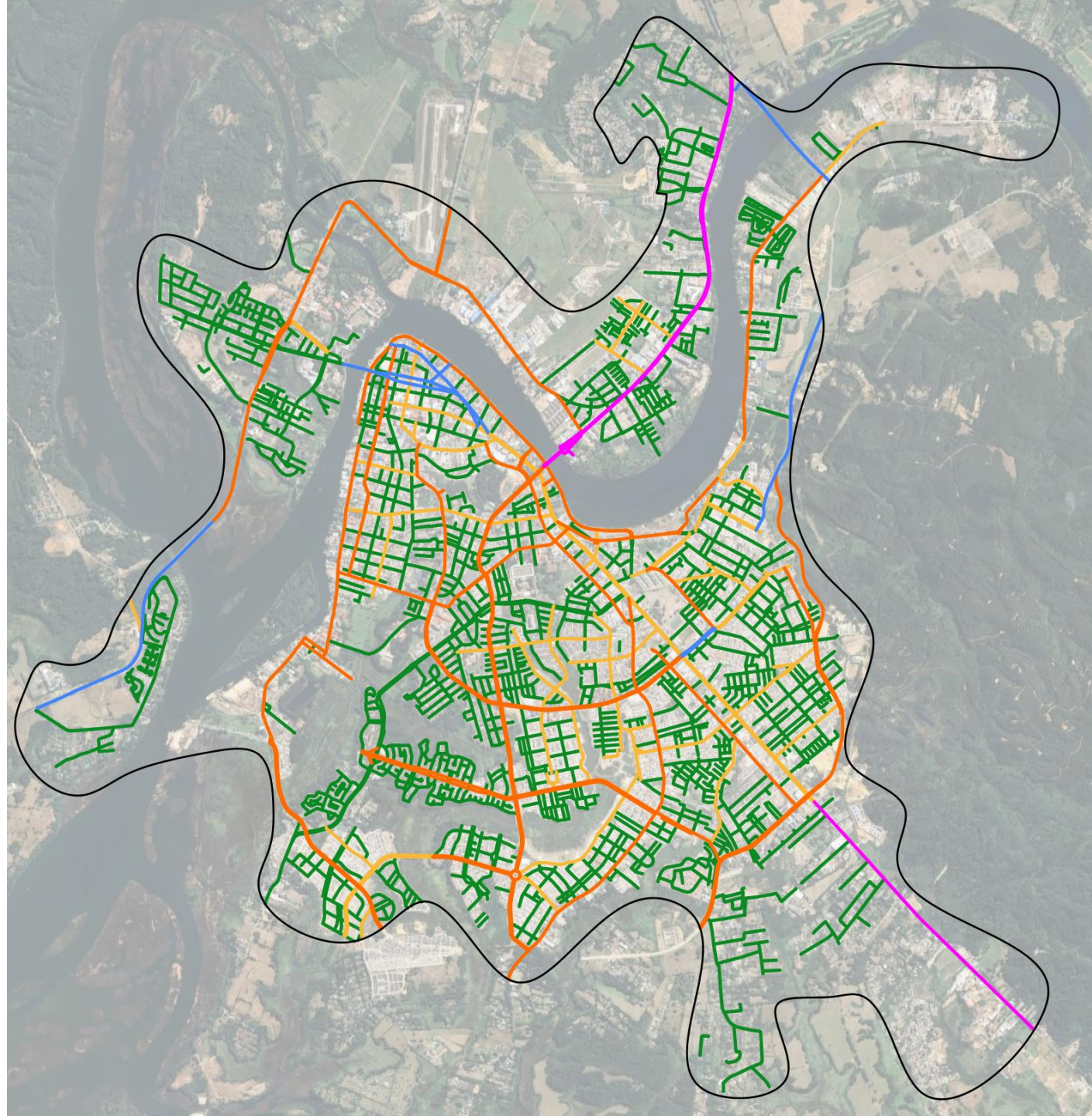


2025



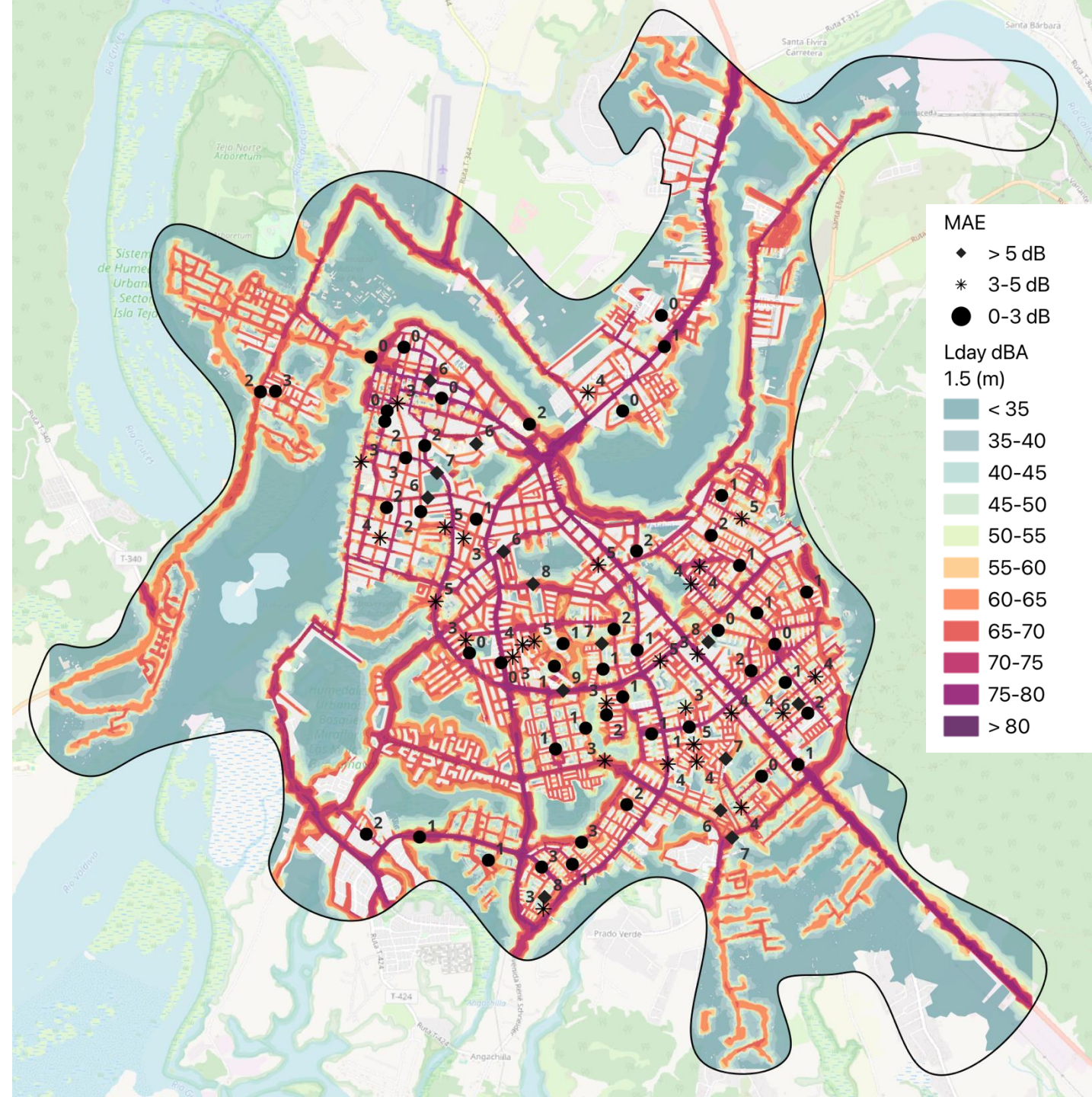
Traffic

1. Nearest road segment
2. Roads with the same name
3. Multiple points average
4. OSM road type



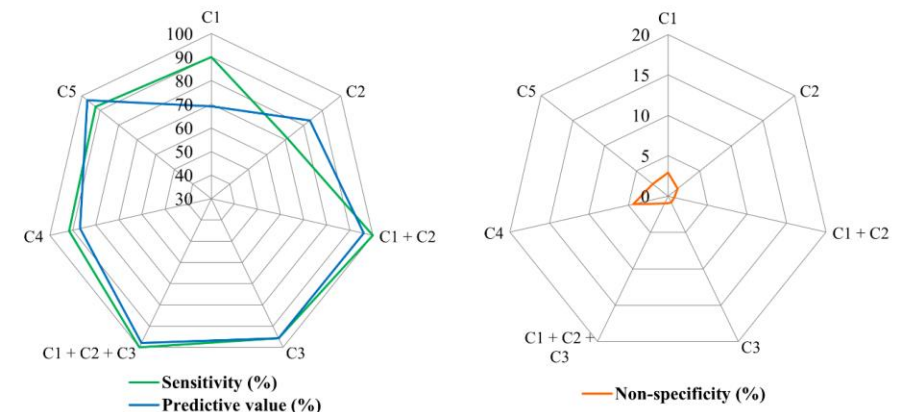
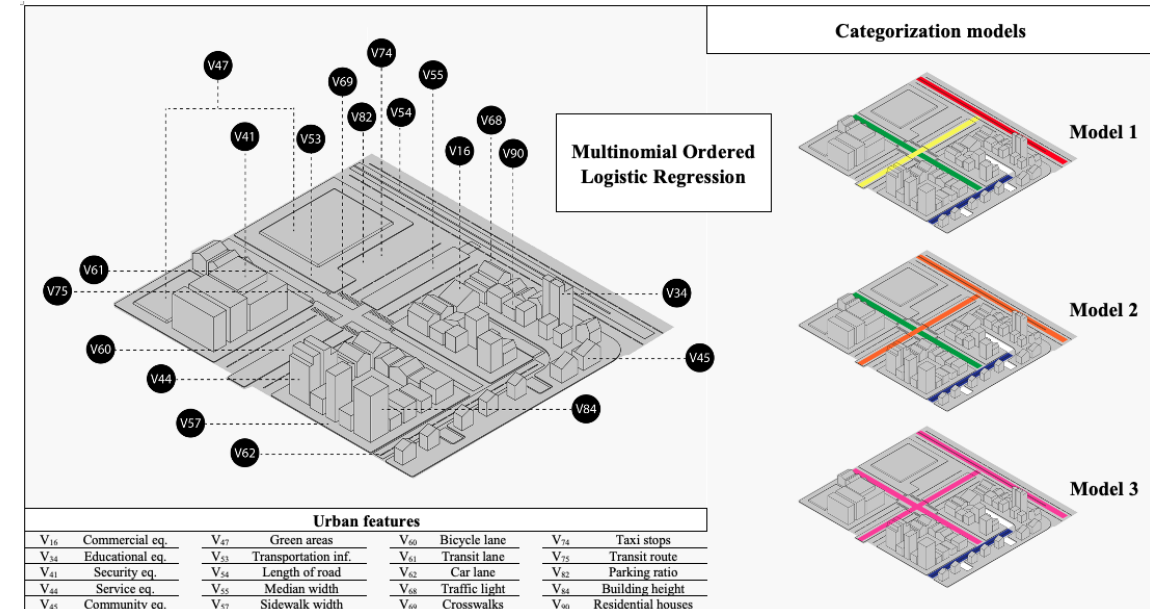
Noise

- Mean Absolute Error (MAE) = 2.9 dB
- MAE official noise map = 1.8 dB



Improvements

- **Road classification by urban features**
 - Trans. Infrastructure (parking, bus and gas station)
 - Length of road
 - Median width
 - Sidewalk width
 - Traffic lights
 - Transit routes (bus)
 - etc

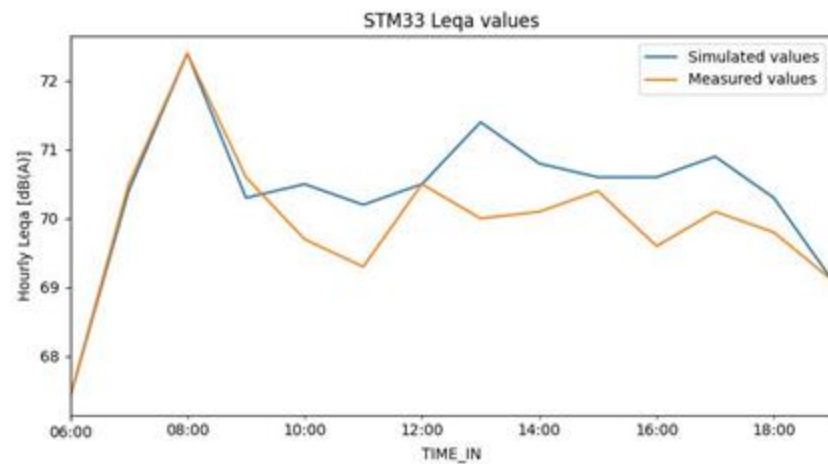


Improvements

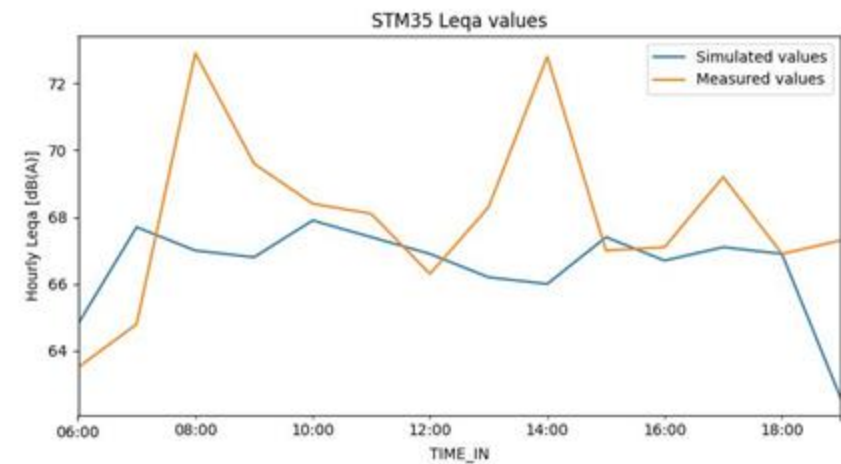
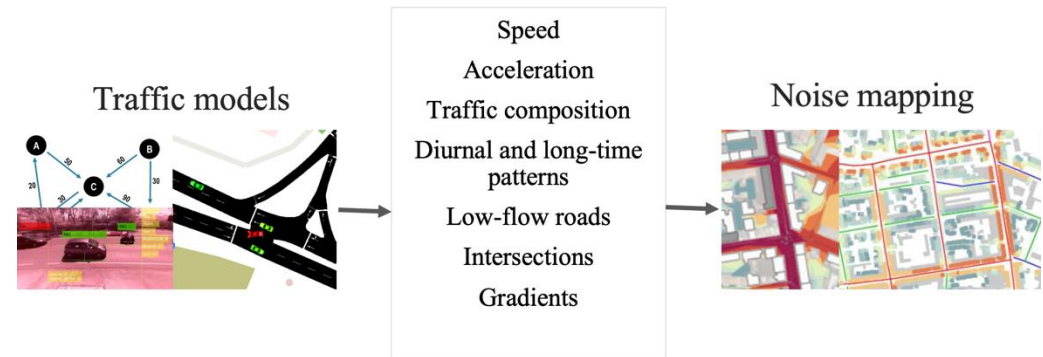
The need of inclusion of noise as a
key factor in traffic simulation
modelling



A.L. Montenegro, M. Bolognese, A. Panci, M. Cerchiai, D. Vatteroni
and Gaetano Licitra

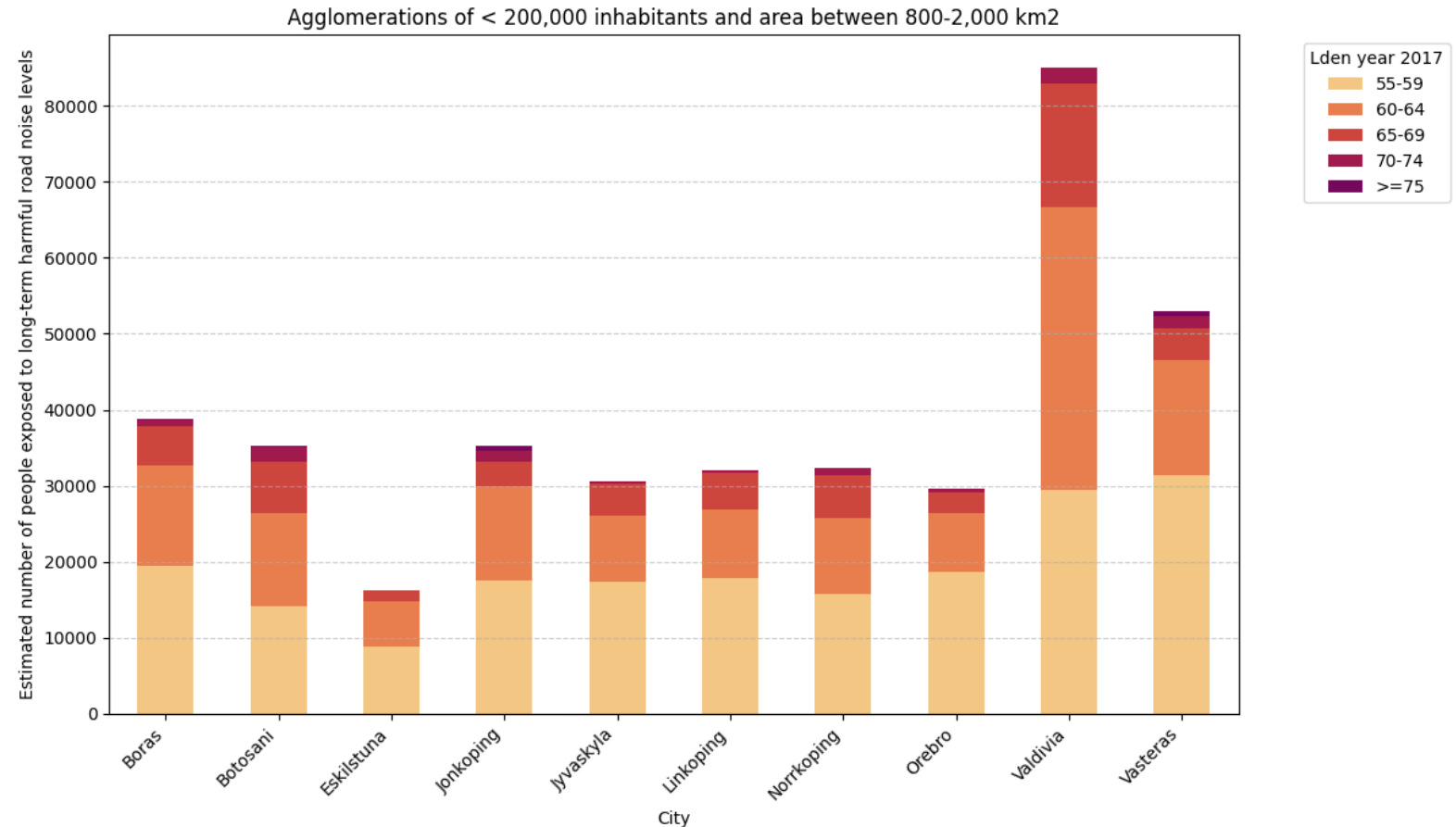


Critical variables for accurate noise
mapping in Agglomerations



Opportunities

- New evidence
- Negative health effects estimation



**Noise data reported under Environmental Noise Directive
(END)**

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alexandra.montenegro@dst.unipi.it

Alexandra L. Montenegro

PhD student in Geoscience and Environment
Department of Earth Science, **University of Pisa**

Research fellow

Agenzia regionale per la protezione ambientale della
Toscana (**ARPAT**)

MSc. Acoustics & Vibrations | Civil Acoustic Engineer
University Austral of Chile

