

NEREUS

Núcleo de Economia Regional e Urbana
da Universidade de São Paulo

Building an accessibility index for São Paulo's Metropolitan Region

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Outline

- ✓ Accessibility
 - Overview of SPMR
 - Building the index
 - Results
 - Final remarks

What's accessibility?

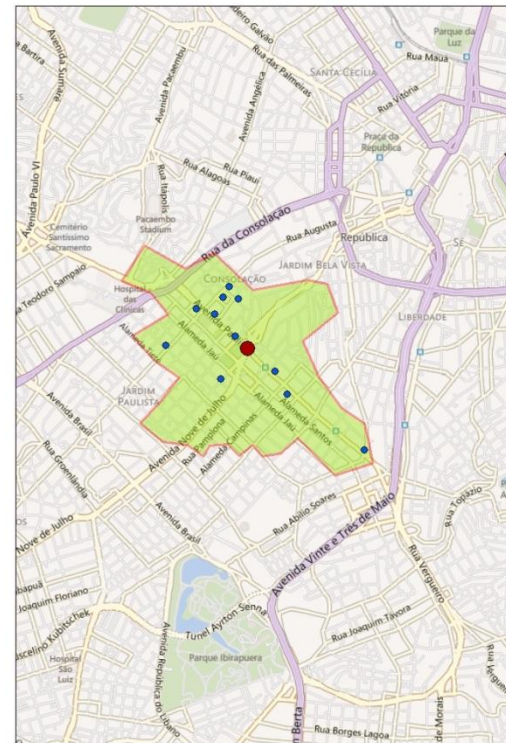
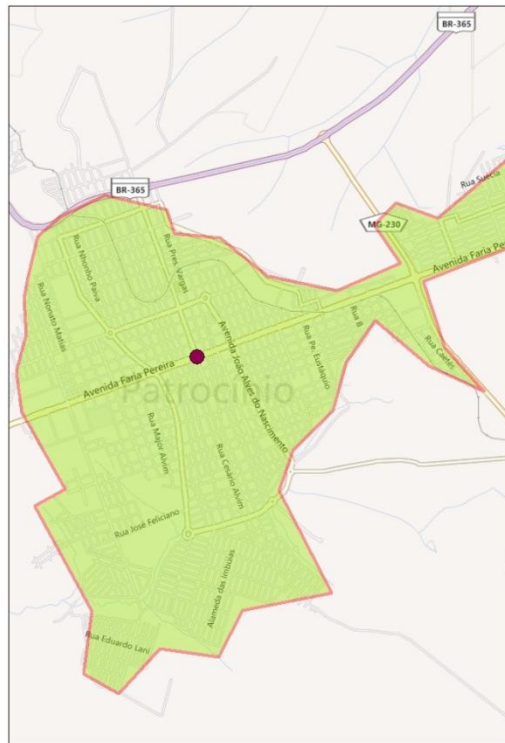
- *"accessibility is defined as the potential of opportunities for interaction."* (Hansen, 1959)
- *"Accessibility measures the interaction between the land-use and transportation systems"*
- There are several formulations of accessibility measures:

$$A_i = \sum_{j=1}^n O_j f(t) \quad , \text{ or } \quad A_i = \sum_{j=1}^n B_j a_j \quad , \text{ etc...}$$

Mobility X Accessibility

Mobility measures the *ability to move* from one place to another

High levels of mobility can, but do not necessarily reflect high levels of accessibility.



Outline

Accessibility

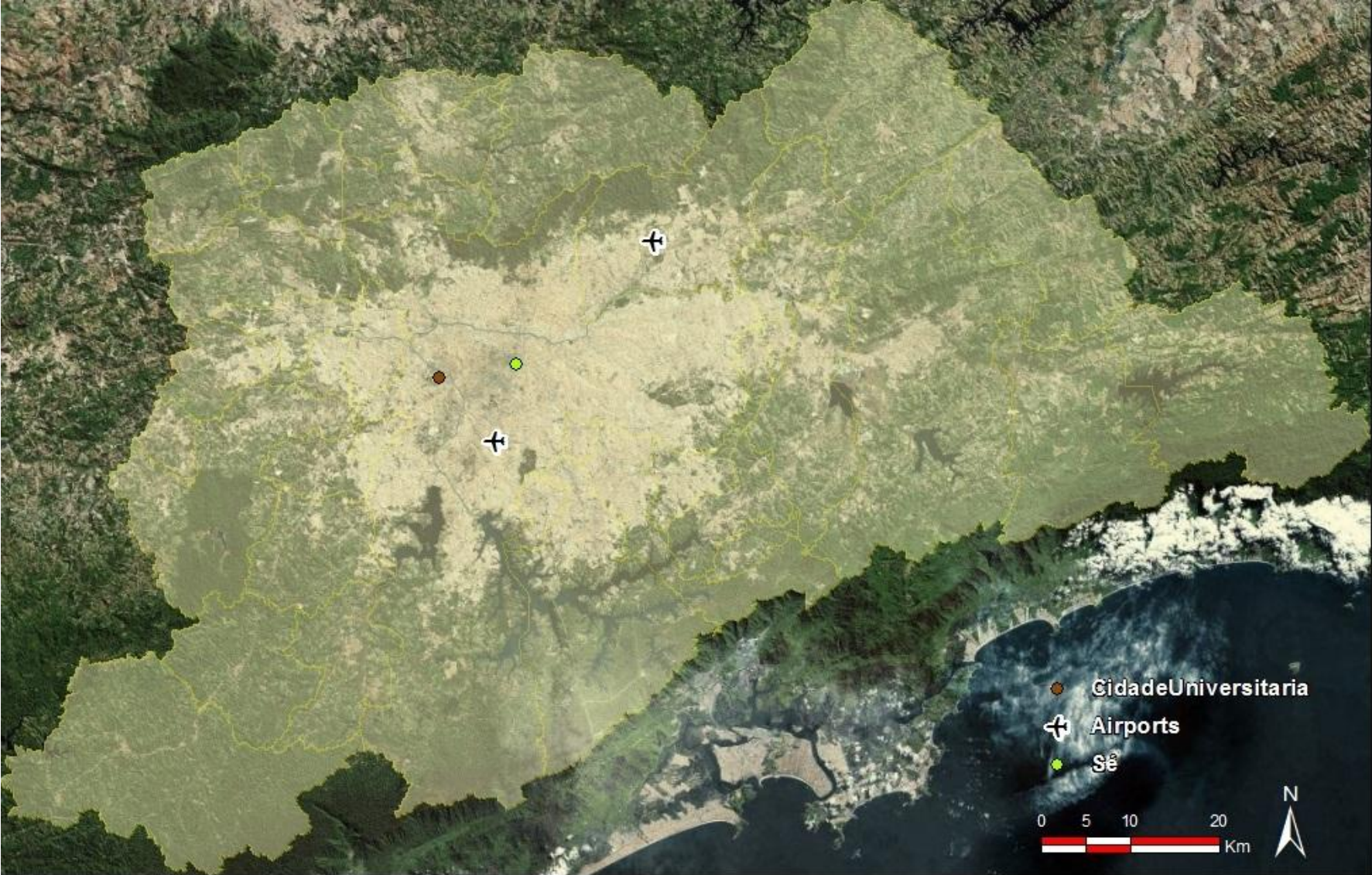
✓ Overview of SPMR

Building the index

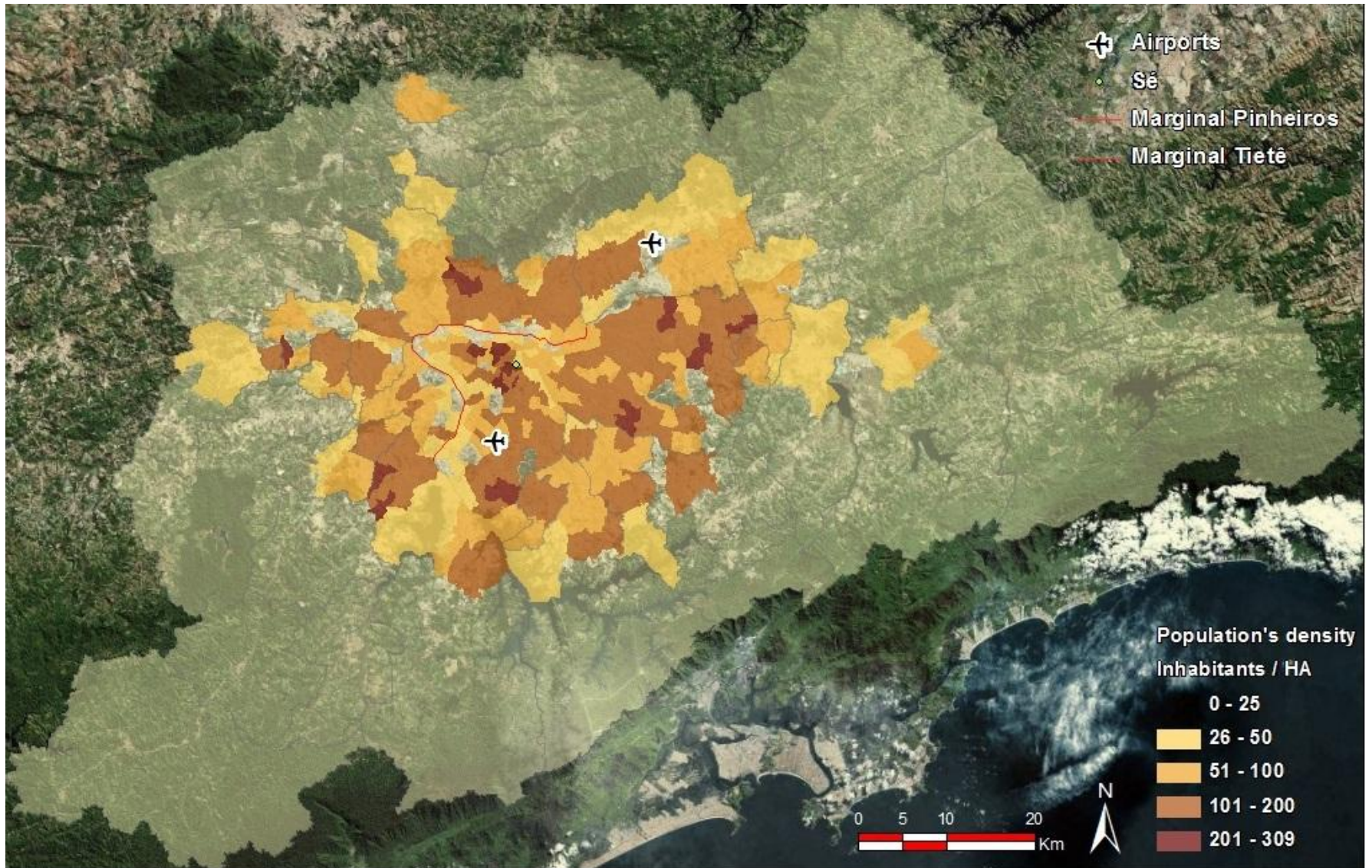
Results

Final remarks

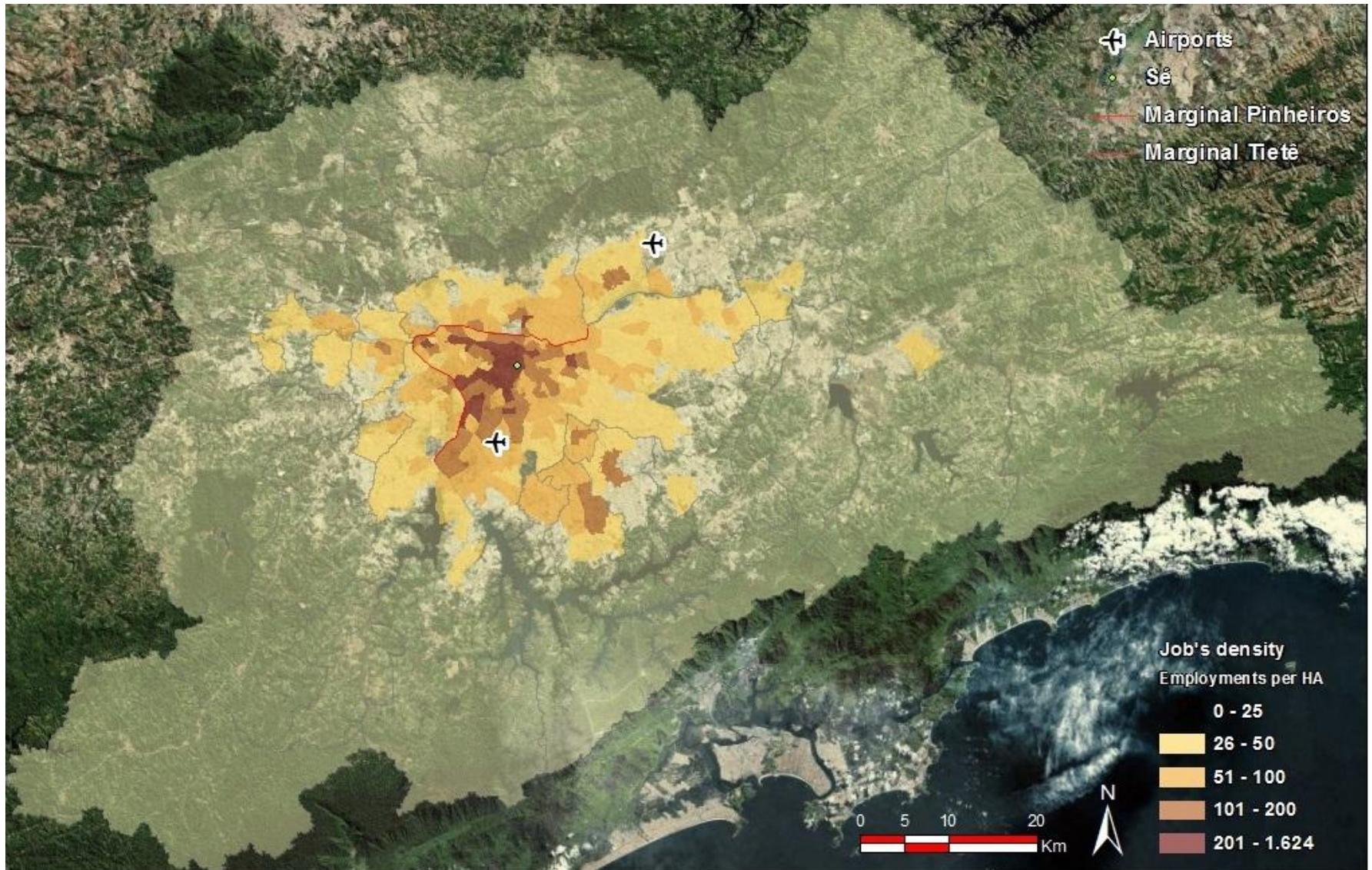
SPMR



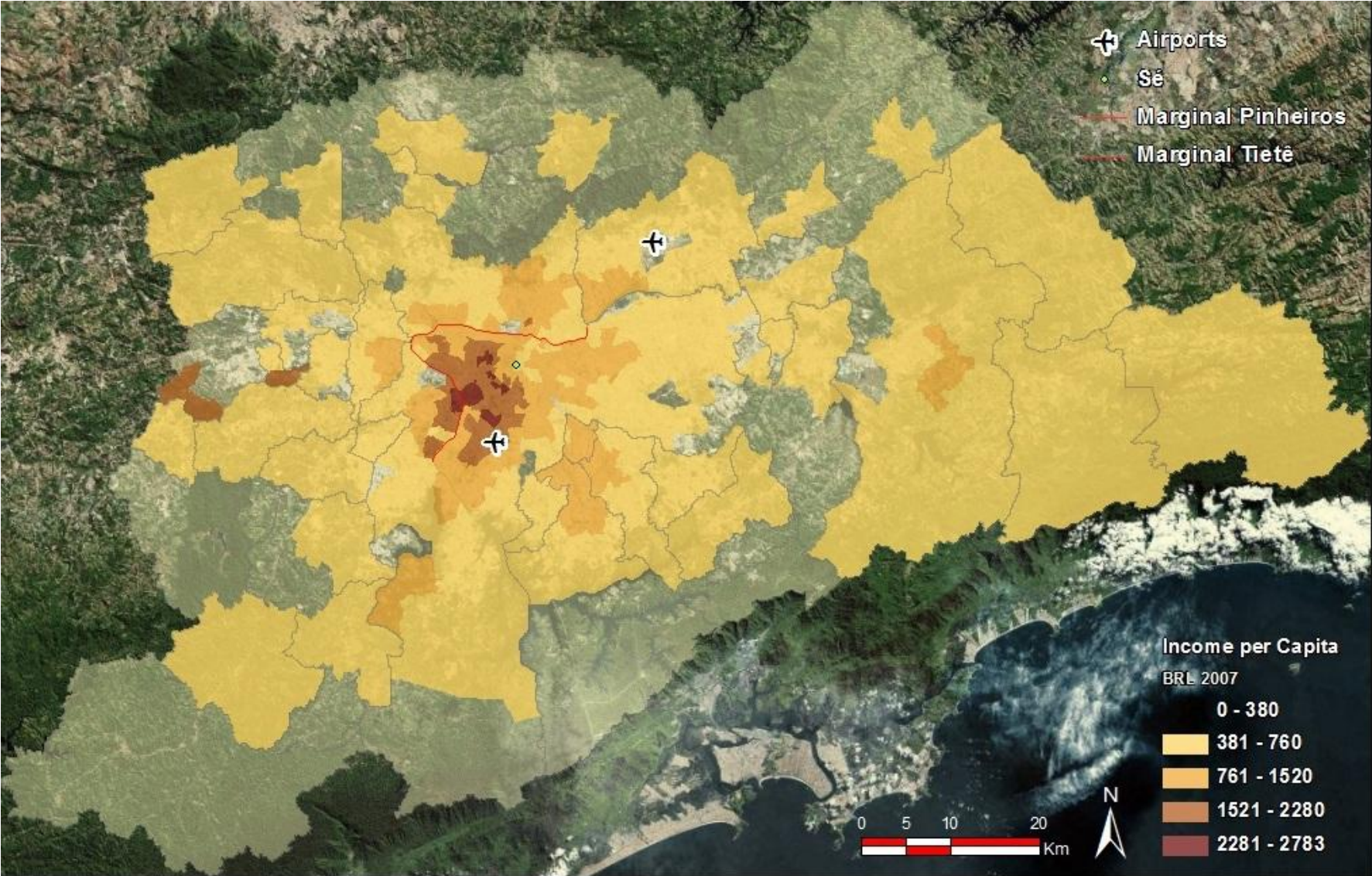
Population



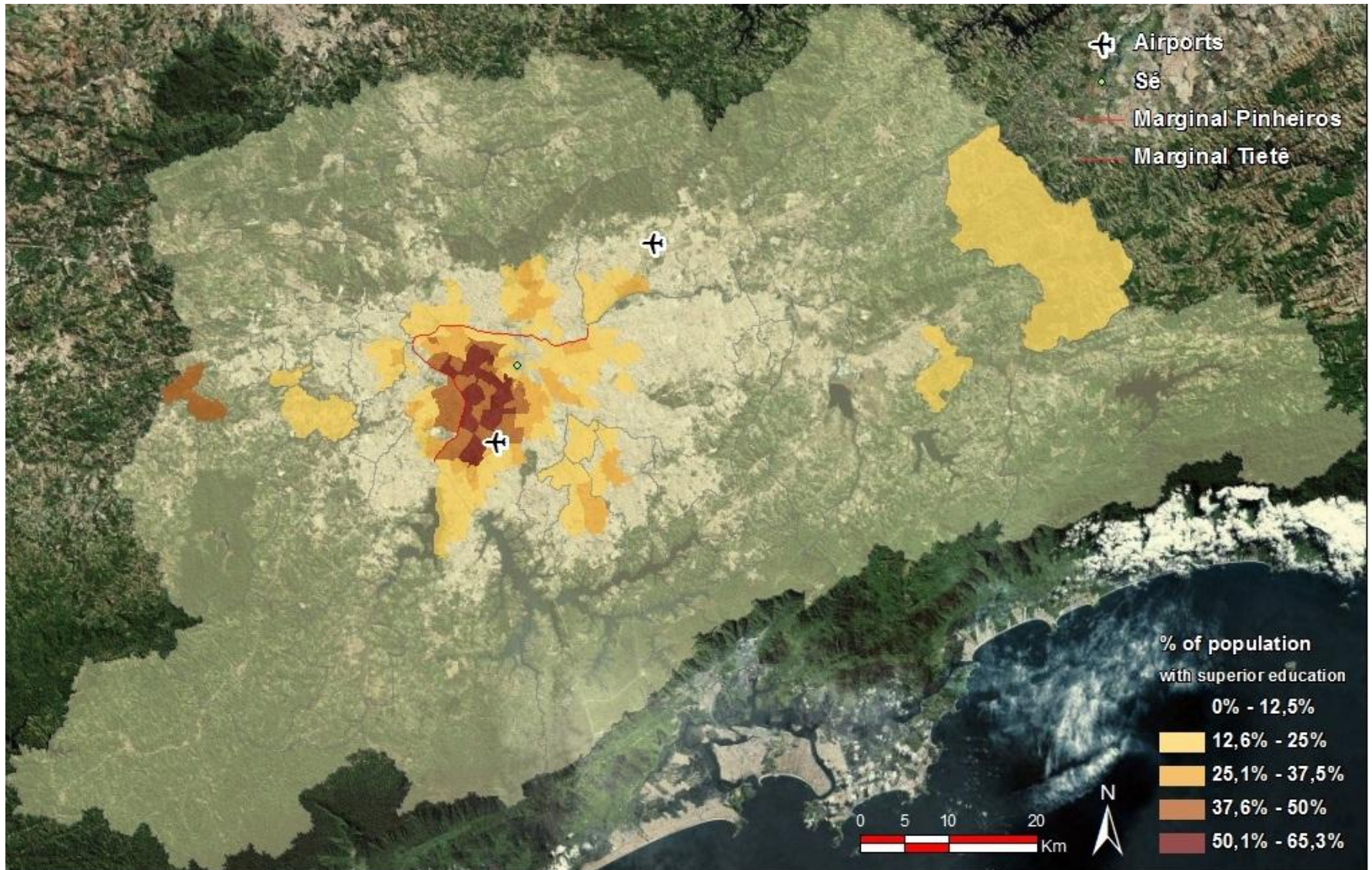
Jobs



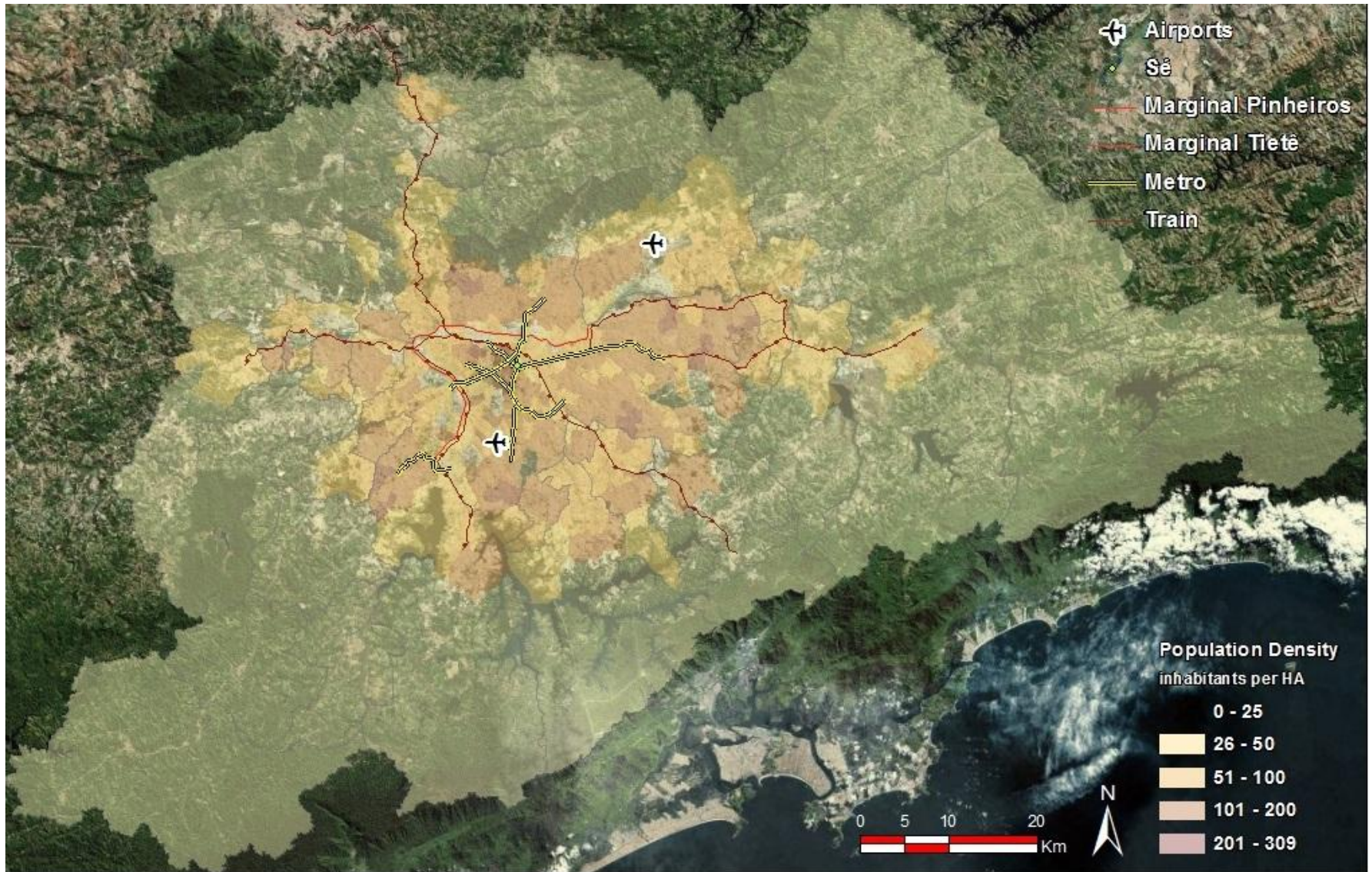
Income



Education



Rail Network



Outline

Accessibility

SPMR overview

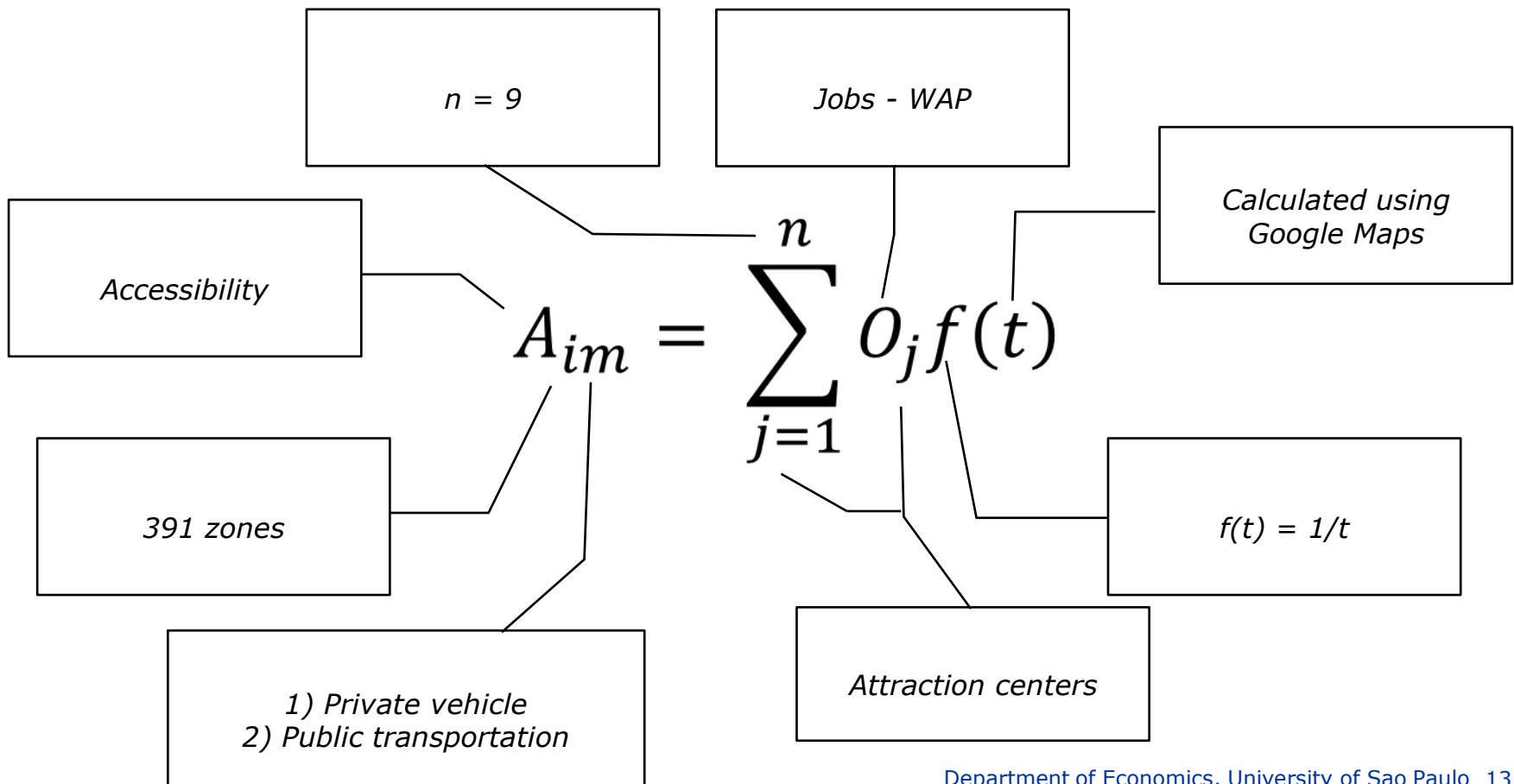
✓ Building the index

Results

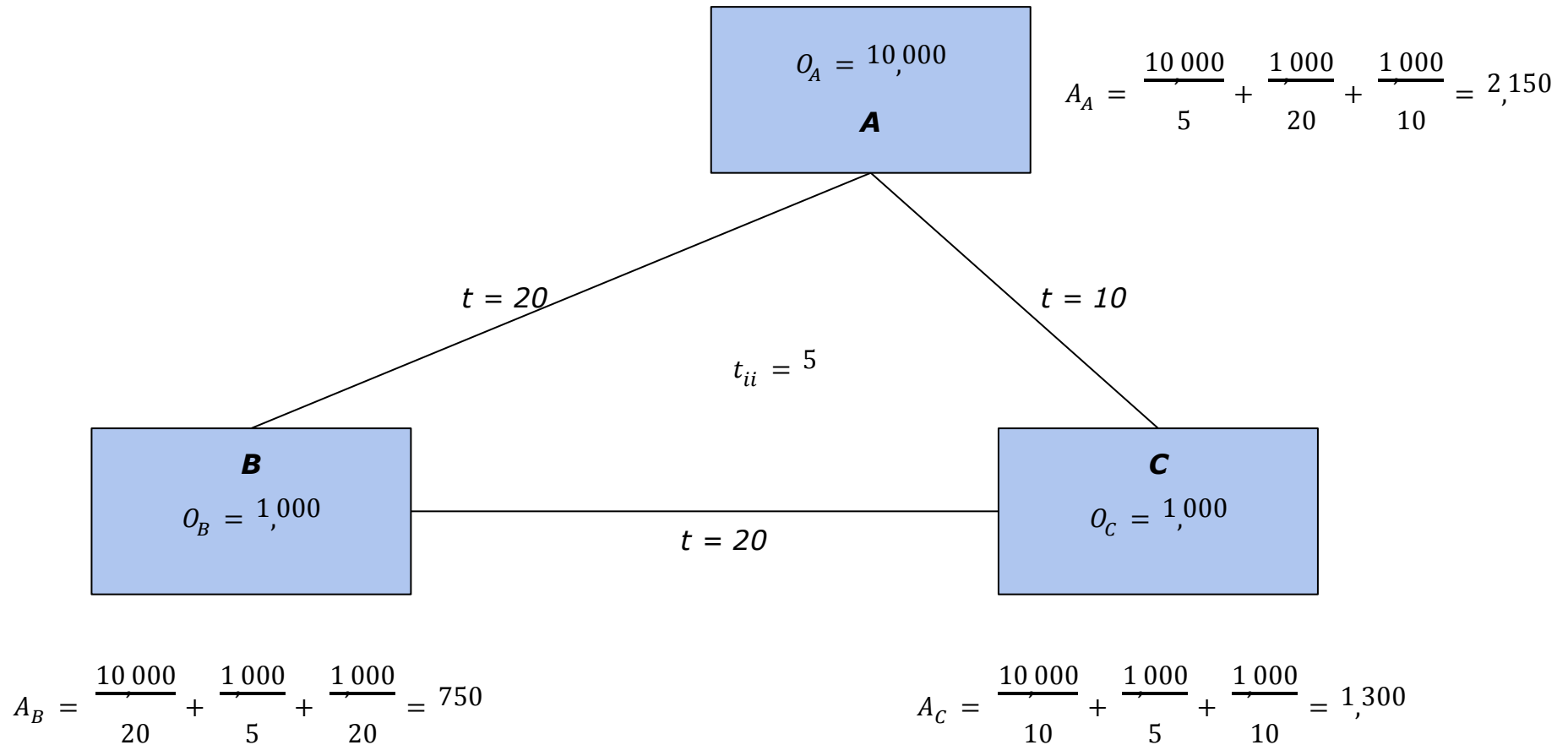
Final remarks

Applying Hansen's formulation

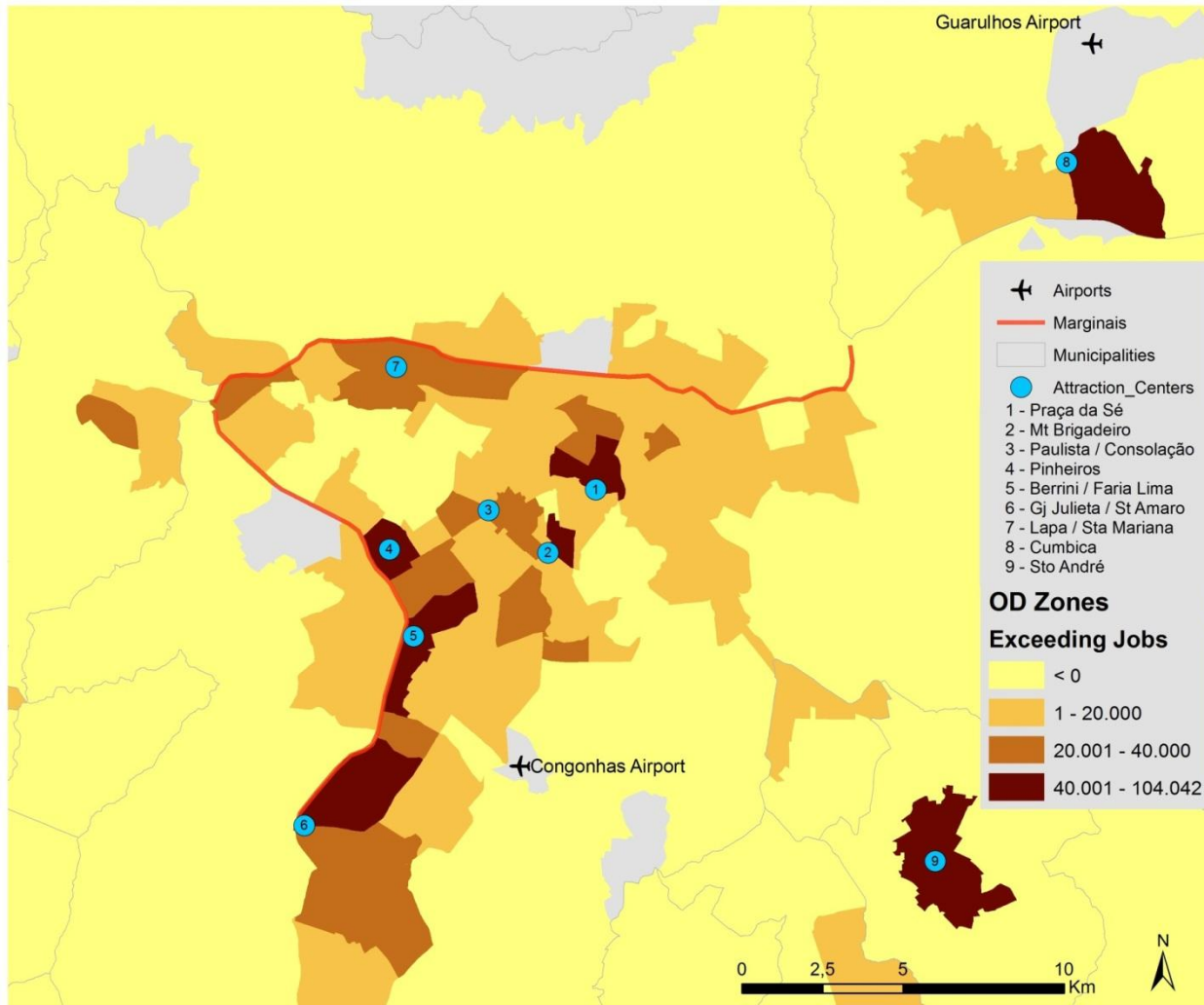
Hansen's formulation:



A simple example



Attraction centers



Using Google Maps to collect travel time

The screenshot shows the Google Maps interface with a route from Av. Vital Brasil (Point A) to R. Benjamin Constant (Point B) in São Paulo. The selected route is highlighted in red circles. The interface includes a search bar, navigation controls, and a list of suggested routes.

Como chegar Meus lugares

Av. Vital Brasil (A)
R. Benjamin Constant (B)
Adicionar destino - Mostrar opções
COMO CHEGAR

Trajetos sugeridos

Route	Distance	Time	Notes
Av. Rebouças e R. da Consolação	9,6 km	18 min	No tráfego atual: 26 min
Av. Vinte e Três de Maio	18,3 km	21 min	No tráfego atual: 22 min
Ou use o Transporte público (uma transferência)		35 min	

Rota de carro para R. Benjamin Constant

Av. Vital Brasil (A)
1. Siga na direção nordeste na Av. Vital

Outline

Accessibility

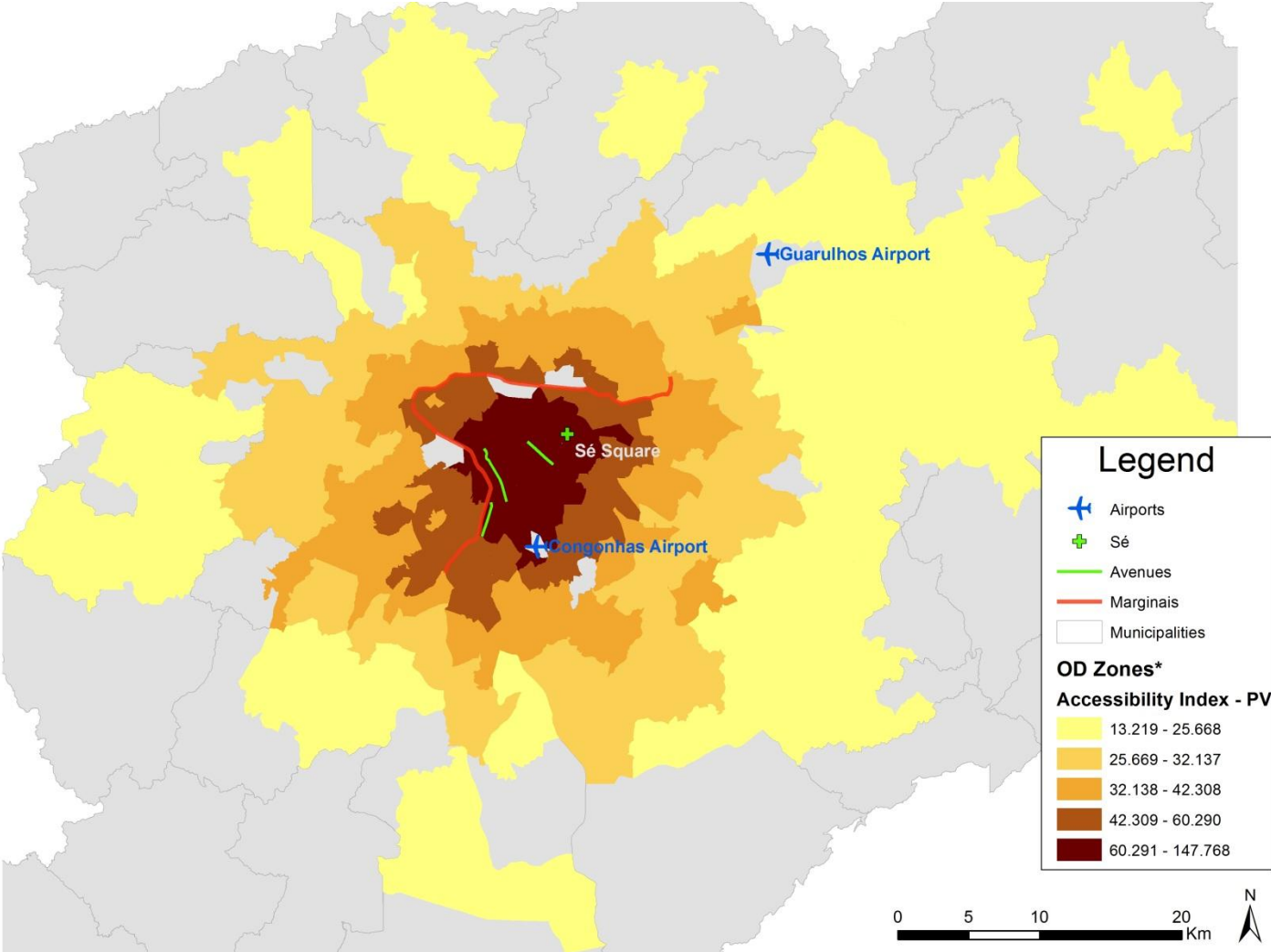
SPMR overview

Building the index

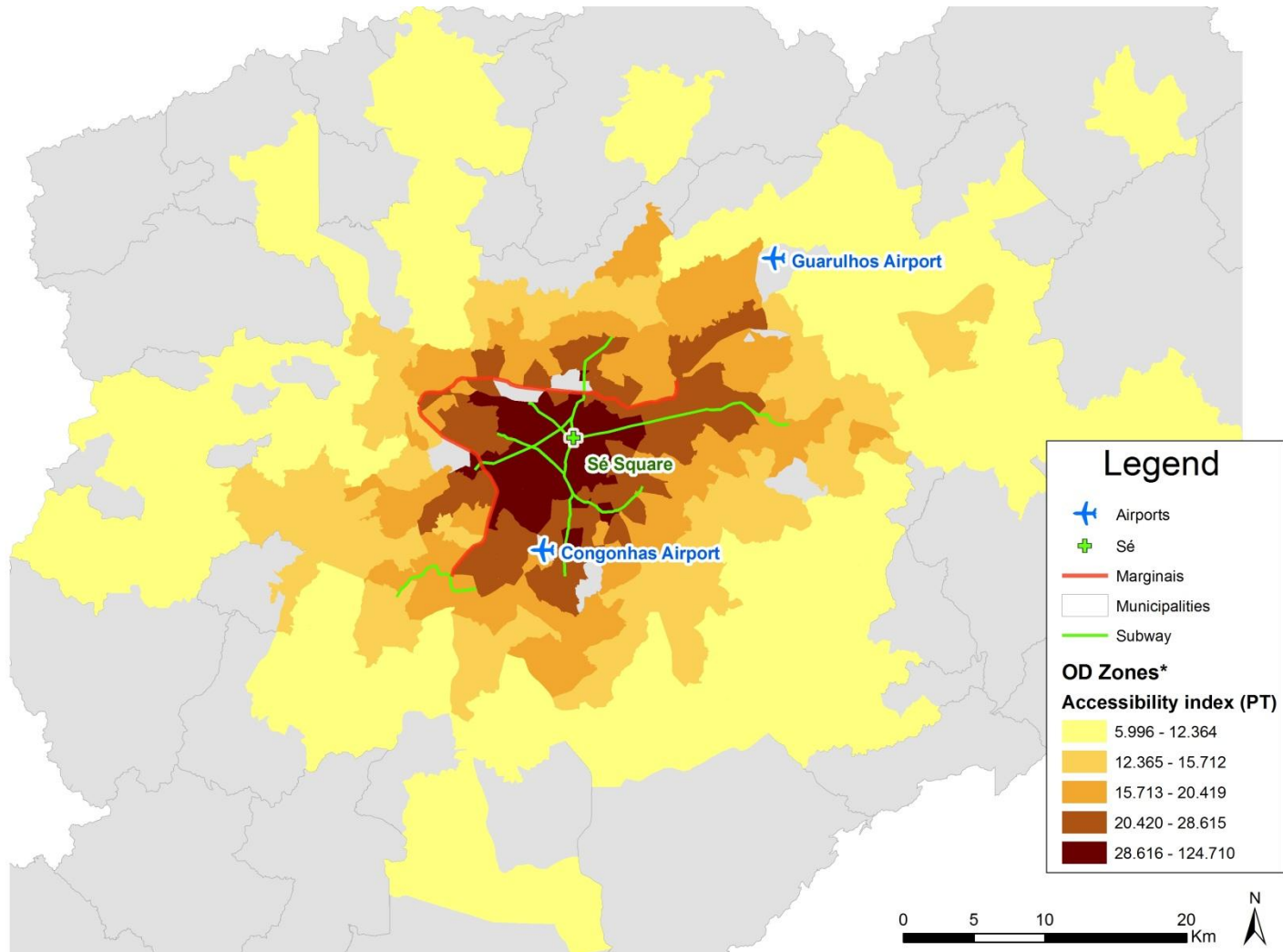
✓ **Results**

Final remarks

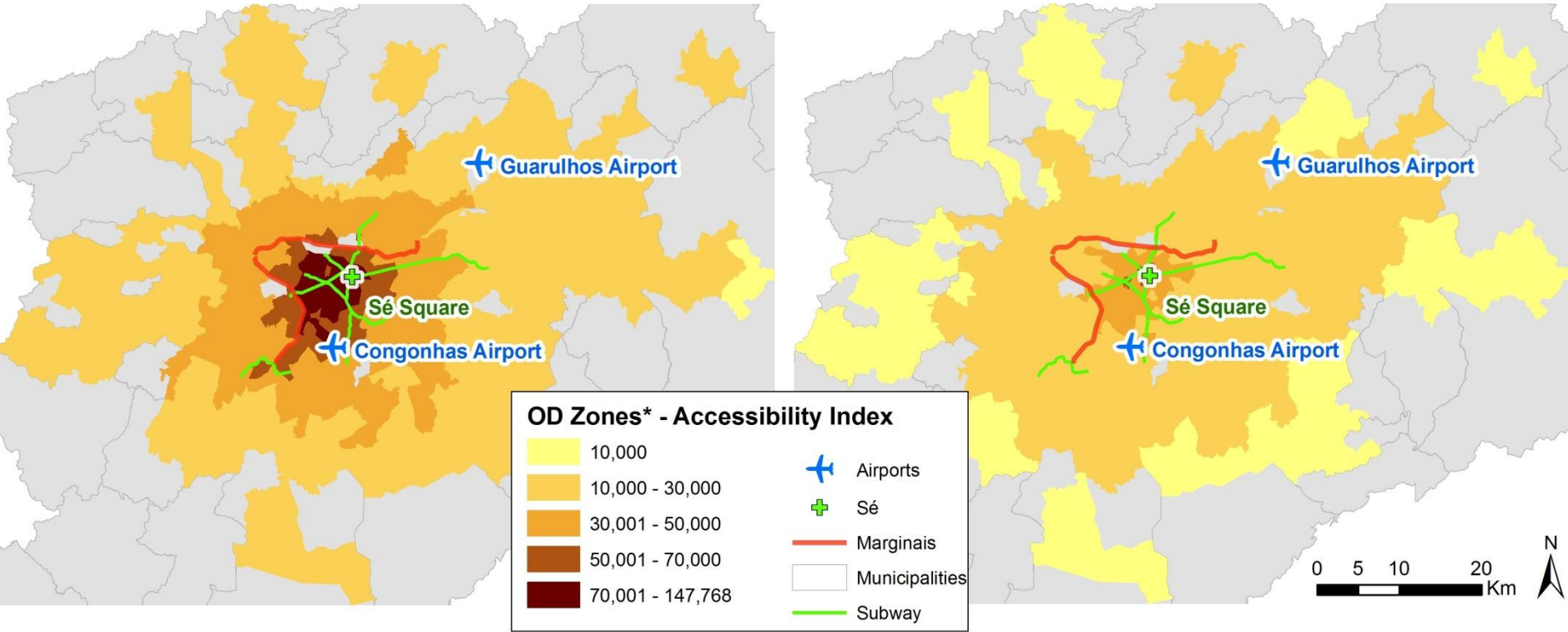
Car



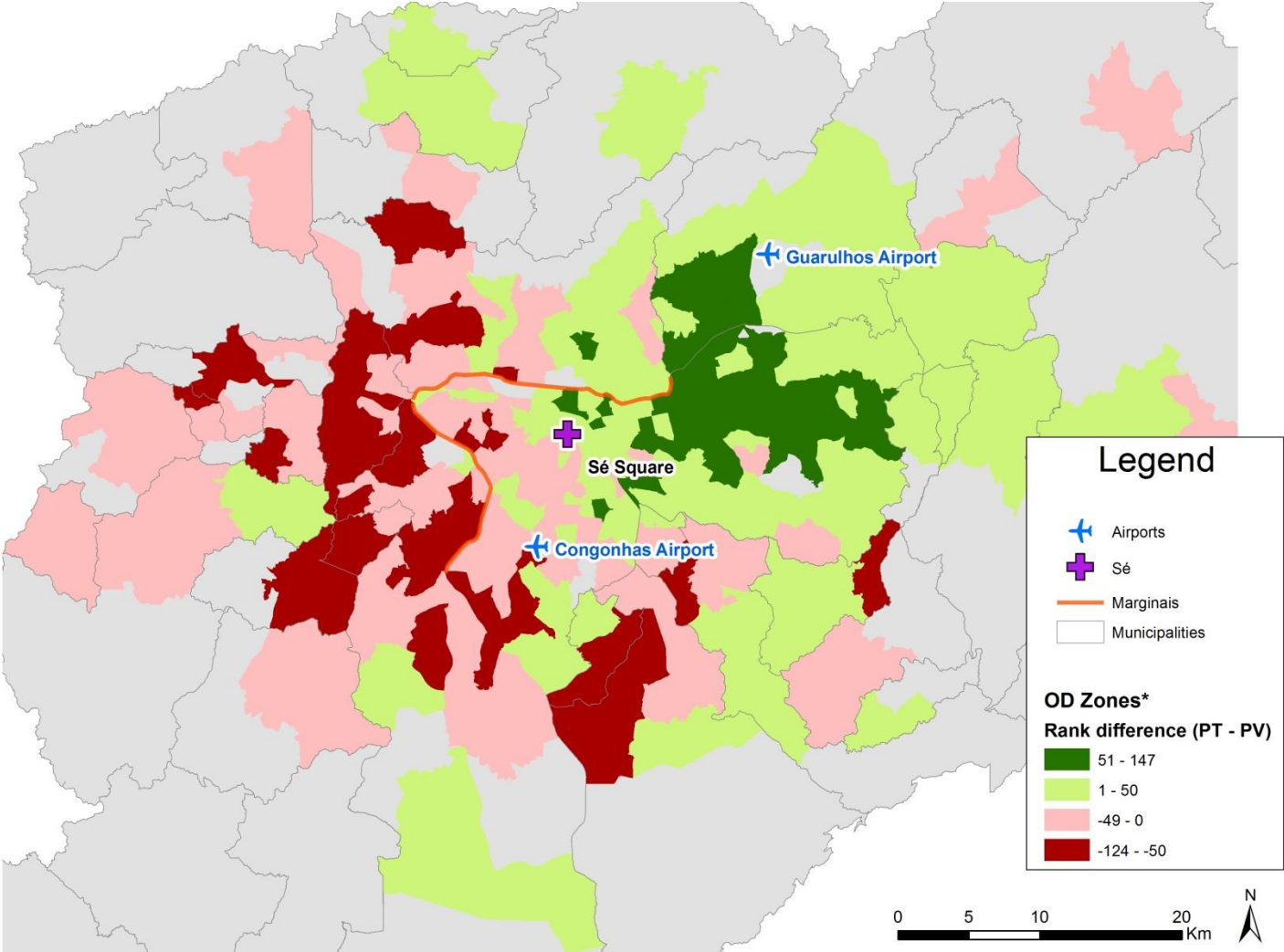
Public Transportation



Same scale

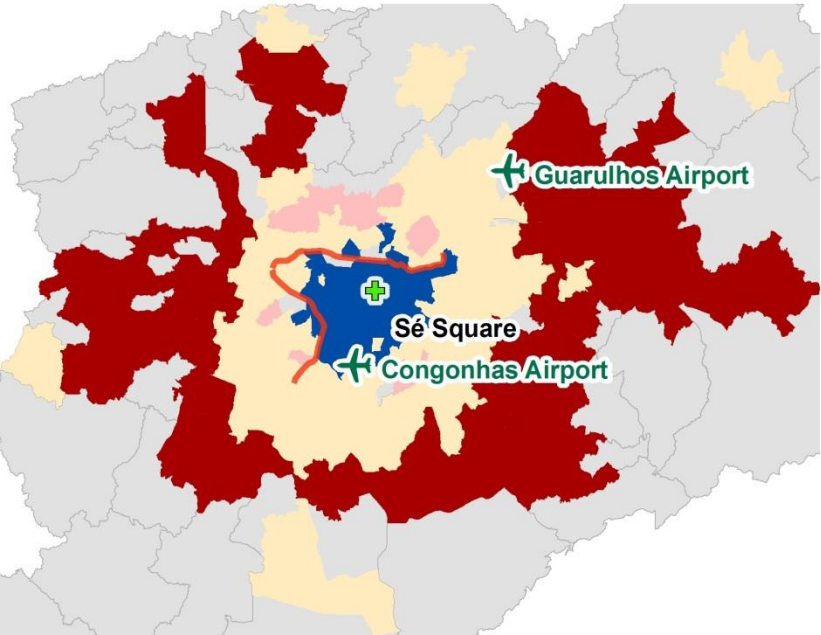


Zone's rank difference

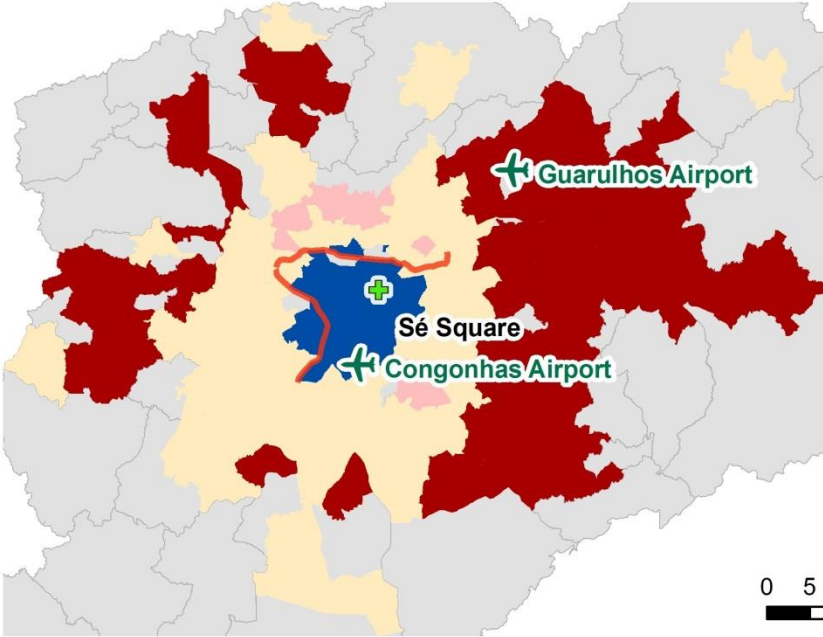


Spatial autocorrelation

Public System



Private Vehicle

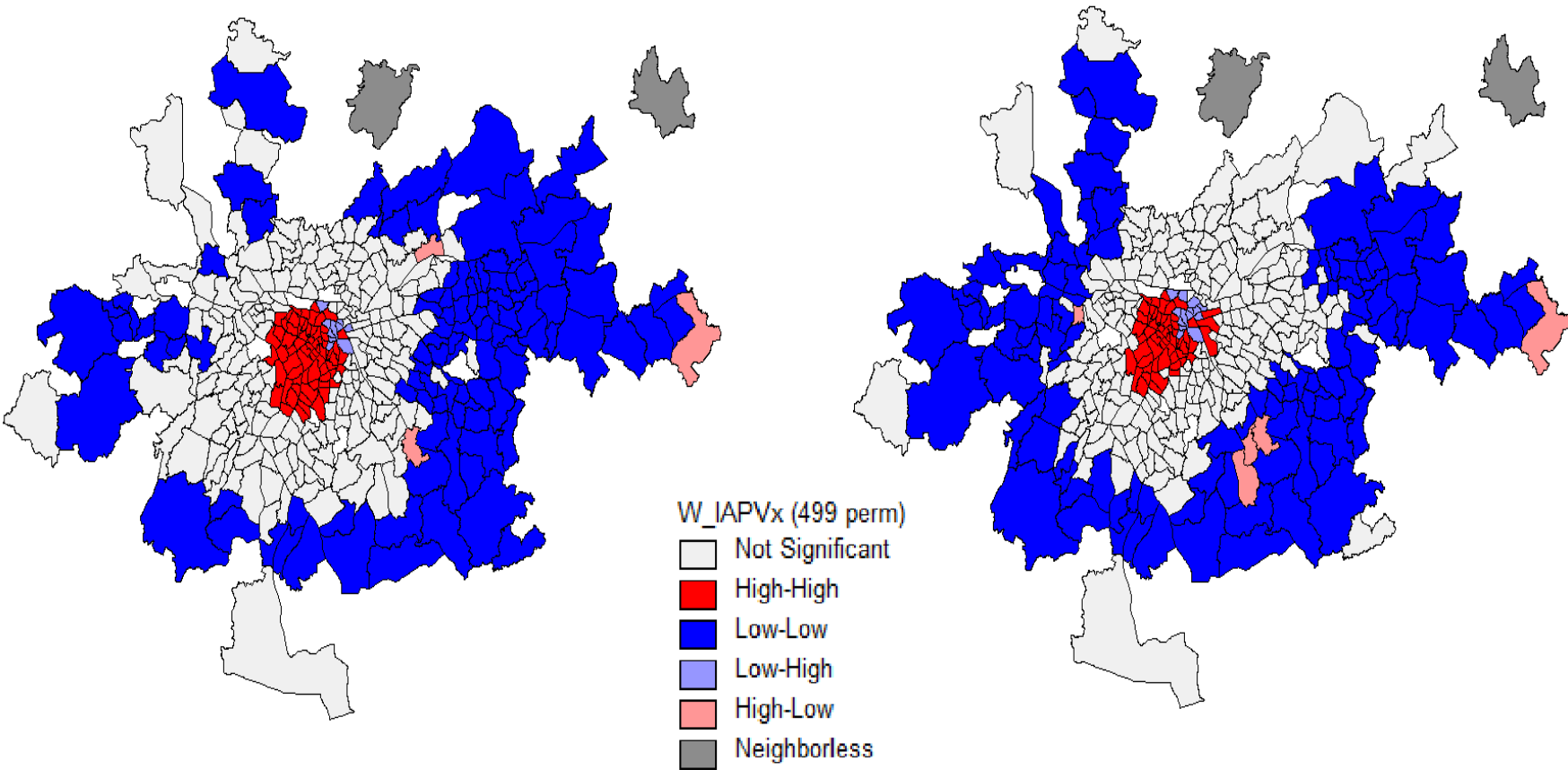


Legend

- Not Significant
- HH
- HL
- LH
- LL
- Airports
- Sé
- Marginais
- Municipalities



Spatial correlation (Income x Accessibility)



Outline

Accessibility

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Conclusions

- Center x Periphery pattern
- Richer x poorer pattern
- Historical city Center as an exception
- Much higher accessibility by car mode.
- Subway seems to have a major impact over public transportation accessibility

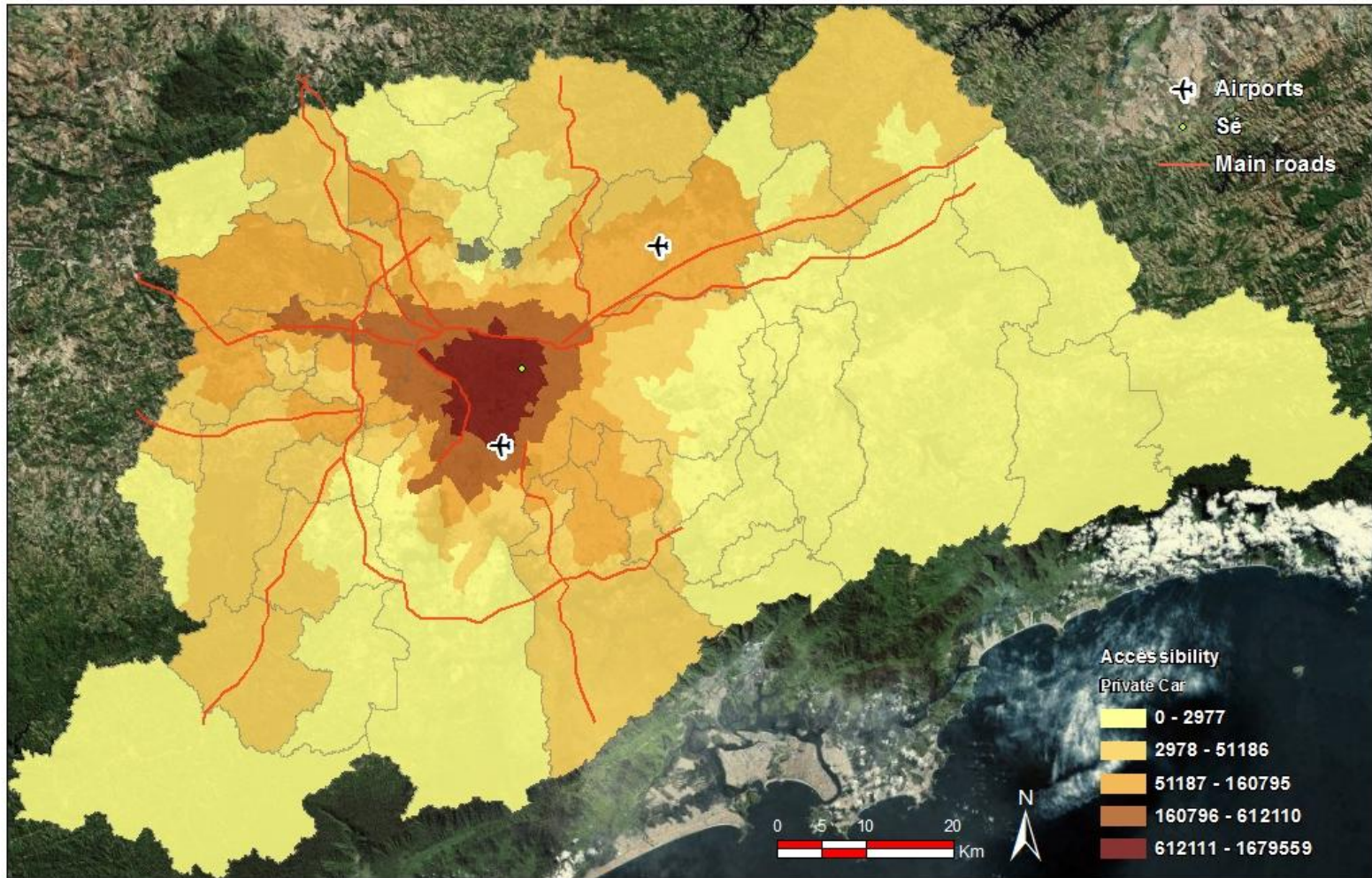
Remarks

- Travel time data
- Impedance function
- Accessibility to jobs only
- Accessibility under competition

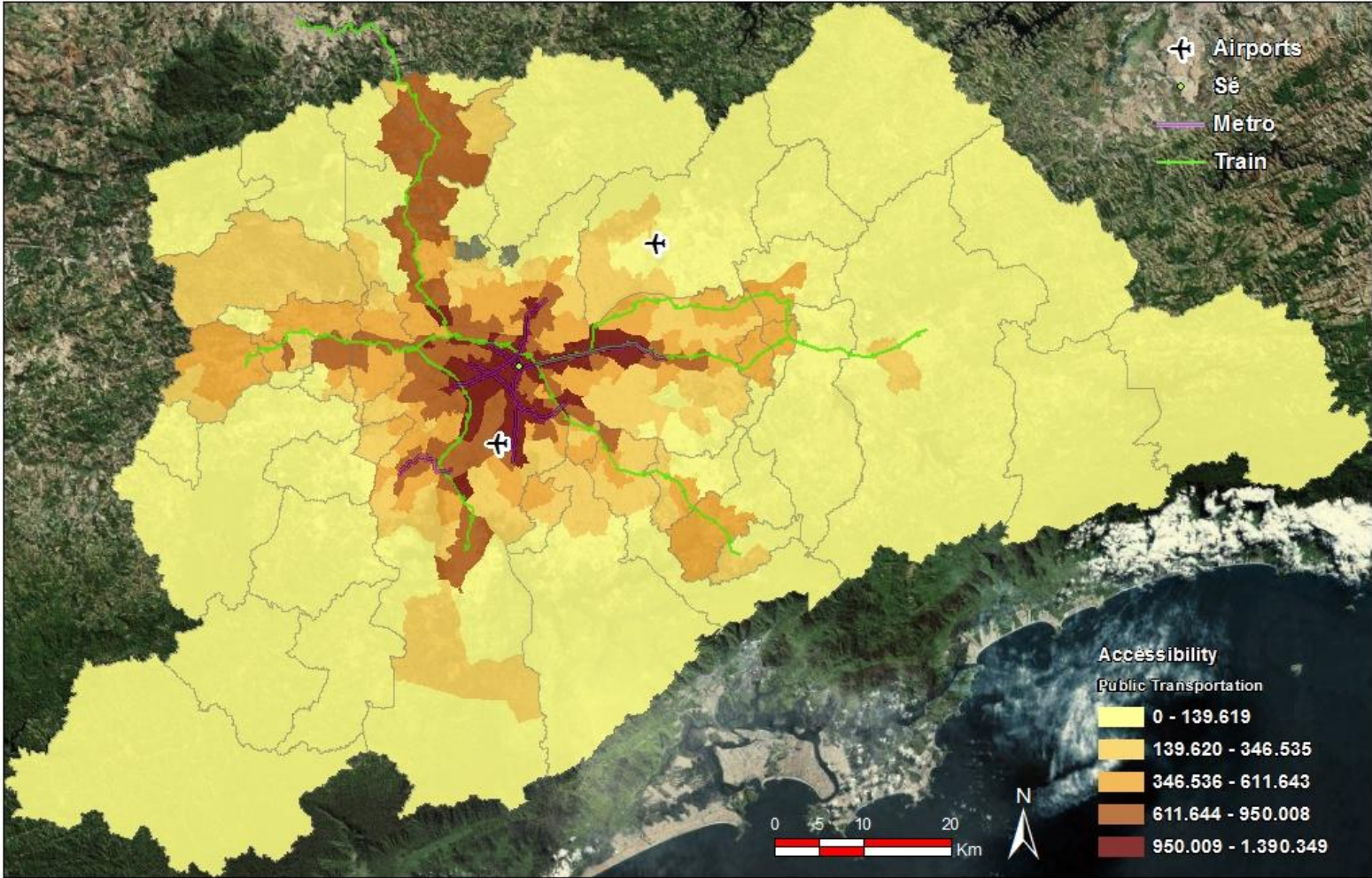
Next steps

- Find more data
- Improve impedance function
- Calculate accessibility to other kinds of opportunities
- Compare accessibility between similar cities
- Observe the impact of accessibility into other urban issues

Recent achievements



Recent achievements



Recent achievements

