

**PP2 Cà Foscari – Dept. Of Management**

[WP 3.1 – ATT5]

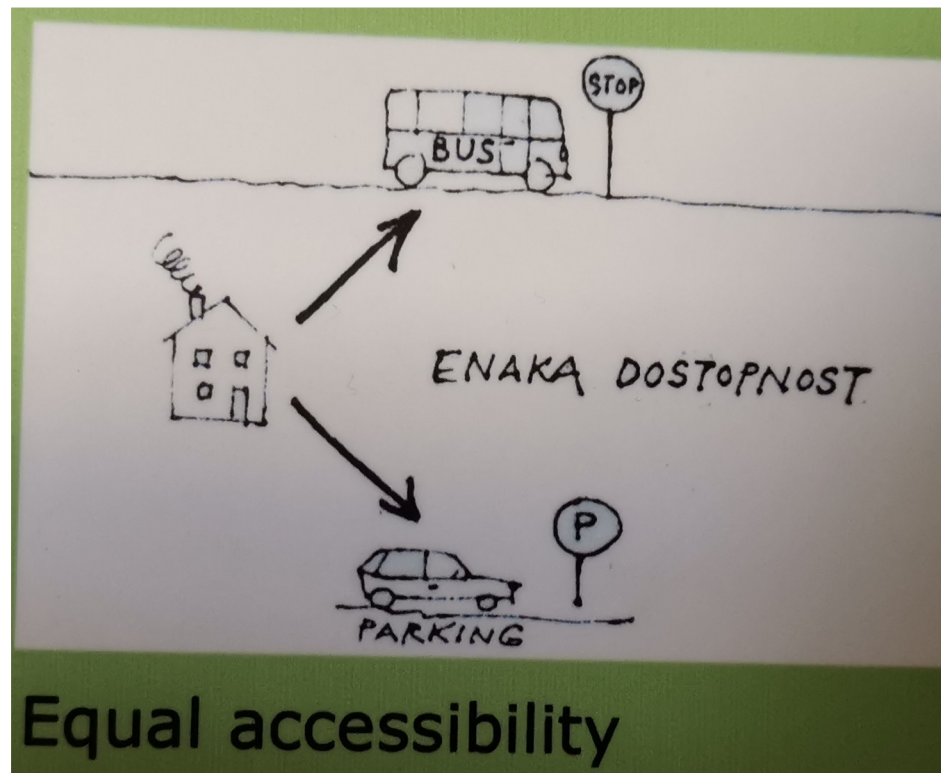


# **ACCESSIBILITY Index Methodology and results**

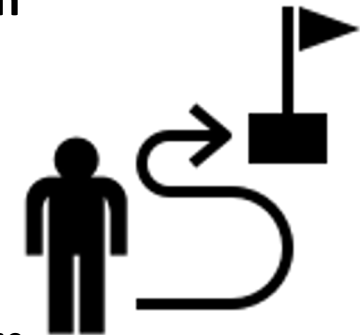
**Jessica Labriola**

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# Working on Accessibility Index.....

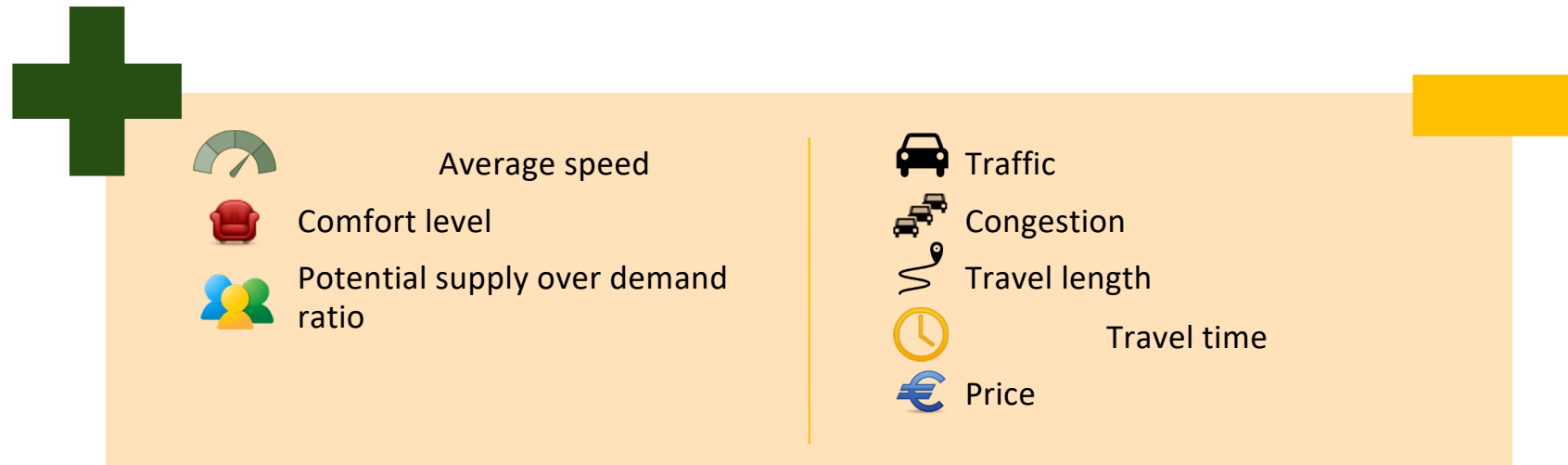


**Accessibility is the extent to which individuals can have access to a destination or an activity using different transport modes.**



**OBJECTIVE:** develop an analytical tool to support the decision-making process.

We identified an **Accessibility Index** suitable for measuring Accessibility in different environments. We analysed different variable and evaluated whether they increase or decrease the total Accessibility level.




By using the specified variables, we derived the following **Accessibility Index**:


$$A_{ij}(t, s) = \frac{\mu_1 AV_{ij} \times CL \times \sum_{j=1}^n \mu_{2,j} \frac{O_j}{D_j} e^{-\beta c_{ij}}}{\mu_3 TVC \times \mu_4 \frac{V}{C} \times \mu_5 T_{ij} \times \mu_6 L_{ij}}$$

where


$A_{ij}$  = Total Accessibility


$AV_{ij}$  = average speed 

$CL$  = comfort level 


$O_j/D_j$  = potential supply over demand ratio 


$\beta$  = cost elasticity parameter

$c_{ij}$  = travel cost 

























$TVC$  = traffic volume count 

$V/C$  = congestion level 

$T_{ij}$  = travel time 

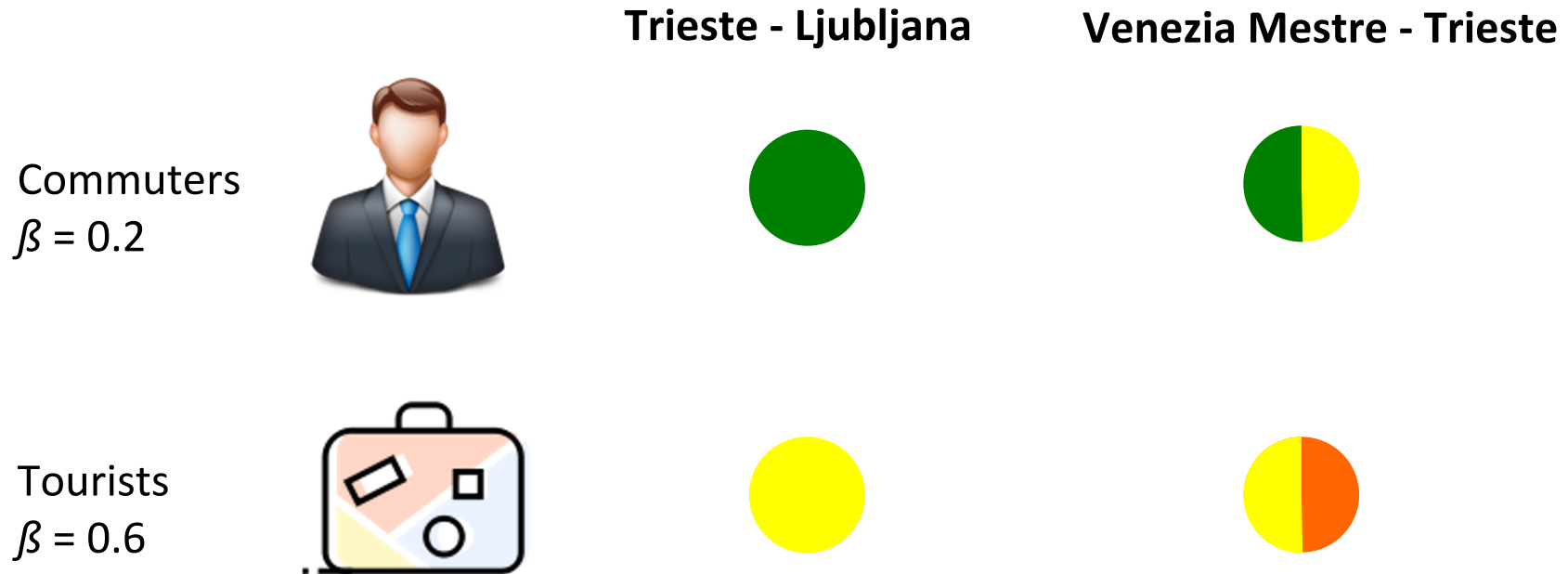
$L_{ij}$  = travel length 

Applying the Accessibility Index, we evaluated the point-to-point Accessibility for the rail line Trieste - Ljubljana by using different transport systems.

	Car and bus		Car, bus and train	
<i>Average speed</i>				
<i>Comfort level</i>				
<i>Potential supply over demand</i>				
<i>Travel cost</i>				
<i>Traffic volume</i>				
<i>Congestion</i>				
<i>Travel time</i>				
<i>Travel length</i>				
$\beta$	 <b>0.2</b>	 <b>0.6</b>	 <b>0.2</b>	 <b>0.6</b>
$A_{ij}$				

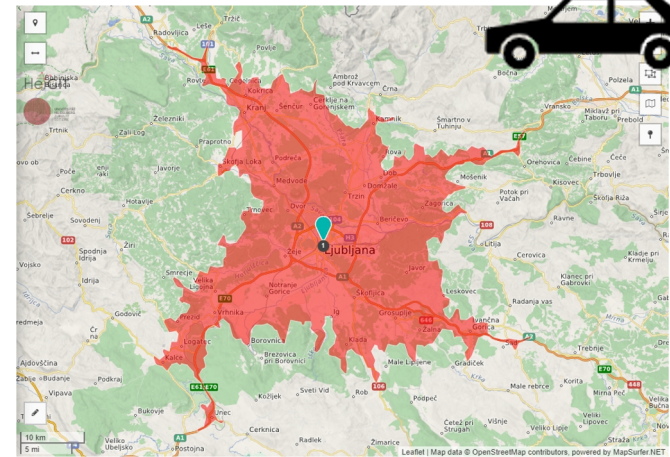
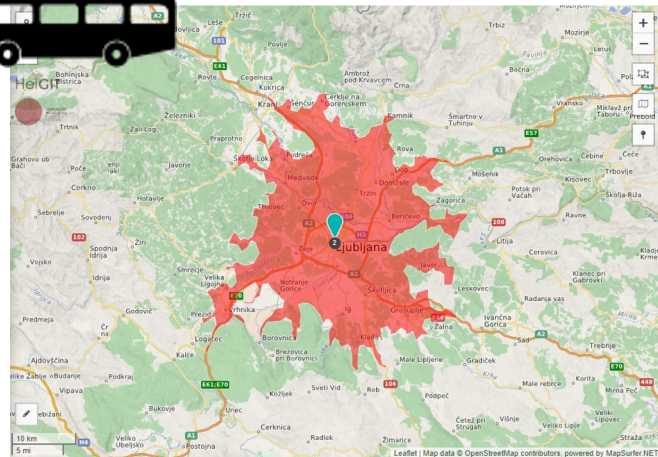
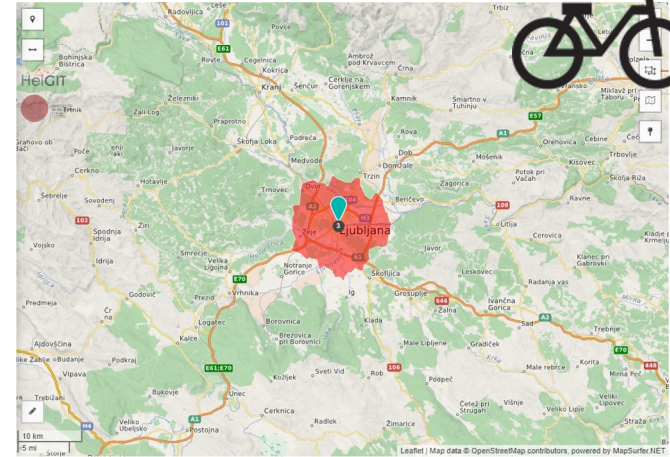
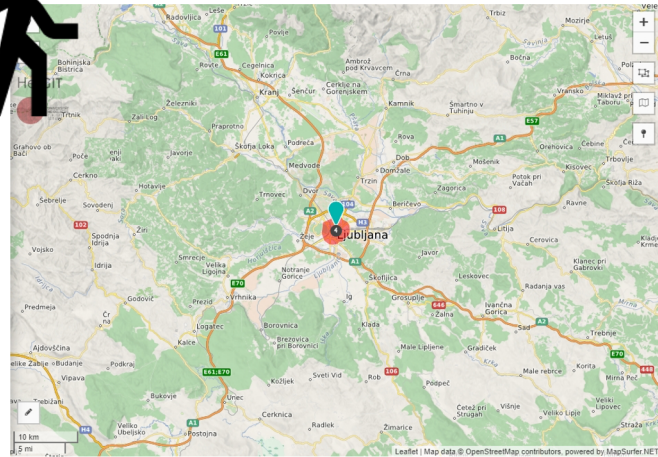
Then, we calculated point-to-point Accessibility by using the train for the rail line **Trieste - Ljubljana**. Then, we evaluate the point-to-point Accessibility for the rail line **Venezia Mestre - Trieste**.

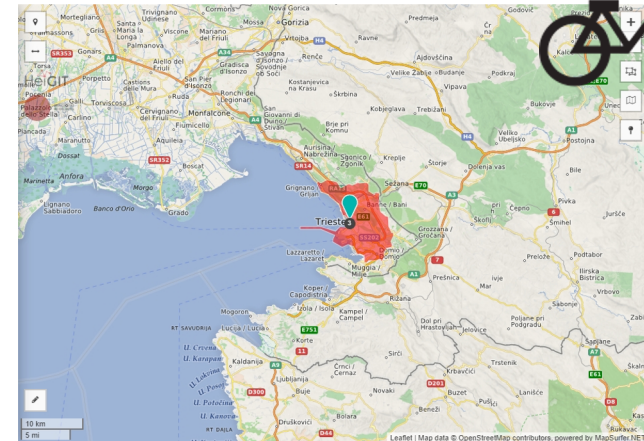
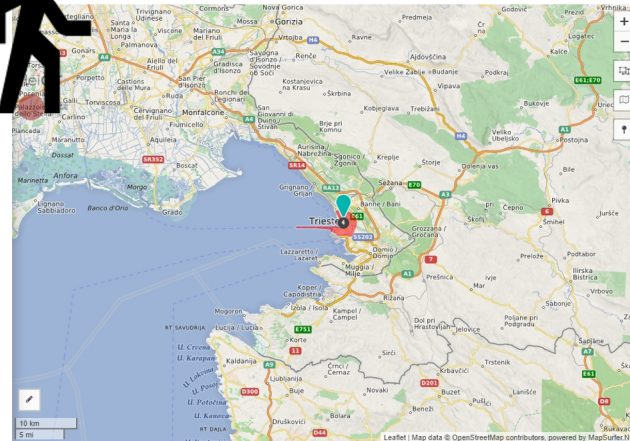
In both cases, we distinguished between commuters and tourists thanks to the parameter  $\beta$ .



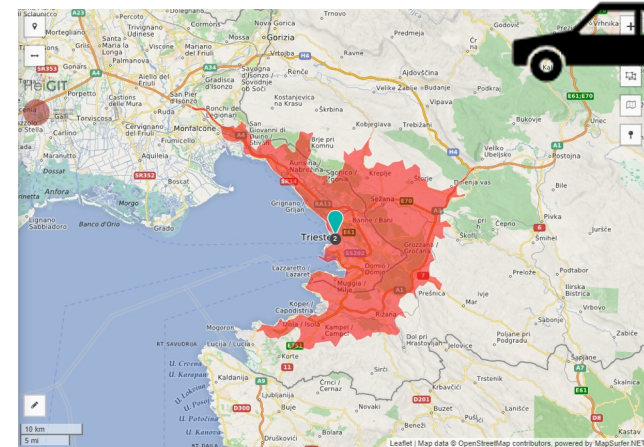
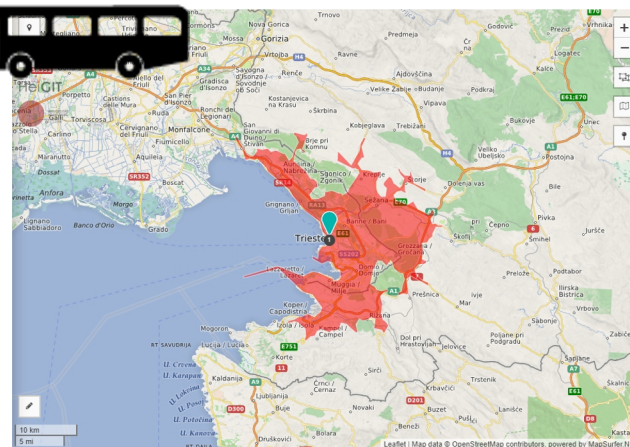
The Accessibility Index is versatile and allows to measure both point-to-point Accessibility and area Accessibility.

In order to evaluate the potential of the destination, we calculated **Ljubljana's area Accessibility** for different transport modes. The starting point of the isochrone is at the central train station.





Then, we calculated the **area Accessibility of Trieste** for different transport modes, too. The starting point of the isochrone is always at the central train station.



The objective was to evaluate how far you can go within a 30-minutes time span starting from the train stations considered, comparing the results obtained for the two cities.



The comparison between Ljubljana and Trieste is straightforward. Within the same time, it is possible to cover a larger territory starting from Ljubljana than from Trieste.

### Why?

- Public transport system more developed;
- Much more cycling routes;
- Less traffic and congestion;
- Well connected train station in a central position.

