

Delineating patterns of the *Spatial Crime Perception [Gaps]* in Budapest

24th Annual Conference of the European Society of Criminology

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Mirror

Ground

Contents

1. The **survey** on Spatial Crime Perception
2. The **spatial crime perception gaps** based on different types of crime
3. The **spatial diffusion effect** on crime perception
4. The **activity space effect** on crime perception
5. Work in progress: **Frequent patterns of perceptual gaps**

Hypotheses

Hypothesis 1: *Violent crime has a greater influence on people's crime perception in space than other crime types.*

Hypothesis 2: *Visible crime has a greater influence on people's crime perception in space than other crime types.*

Hypothesis 3: *Spatial diffusion effect: people mislabel areas as unsafe (or safe) when they are in close proximity to unsafe (or safe) areas.*

Hypothesis 4: *Perception of unsafety in space is heightened in areas outside one's activity space.*

Hypothesis 5: *Perceptual gaps occur when unsafe and safe areas exhibit similar physical environmental properties while crime prevalence is significantly different.*

1. Survey Crime perception | Online Survey

[Link to the Survey](#)



1. Survey Crime perception | Online Survey

The screenshot shows a web browser window with the address bar displaying 'cpg.amk.uni-obuda.hu/survey1.php'. The page header includes logos for 'universität wien' and 'Óbudai Egyetem Alba Regia Műszaki Kar Geoinformatikai Intézet', along with navigation links for 'Homepage' and 'Survey', and a 'Login' button. A central white box contains the following text and options:

Üdvözöljük! / Willkommen!

Töltse ki a kérdőívet Budapestre.


Magyar

Umfragebeantwortung Wien
Complete the survey for Vienna.


Deutsch


English

The footer contains logos for 'universität wien' and 'ÖE ÓBUDAI EGYETEM ÓBUDA UNIVERSITY', and text identifying the 'Department of Geography and Regional Research', 'University of Vienna', and 'Institute of Geoinformatics of the Alba Regia Technical Faculty Óbuda University'. A dark grey box on the right provides contact information: 'Contact us', 'Project contact: mariana.vallejo.velazquez@univie.ac.at', and 'Technical contact: gulyas.levente96@hotmail.com'.

1. Survey Crime perception | Online Survey

Mapping the Crime Perception Gap X +

cpg.amk.uni-obuda.hu/mainpage.php 80%

universität wien Öbuda Egyetem Alba Regia Műszaki Kar Geoinformatikai Intézet Homepage Survey Login

Instructions

1. Move the map to the location you want to explore. Zoom in **+** or out **-** for a better view of the map.
2. Click on **■** to draw a **polygon** on the area where you experience a sense of insecurity or feel unsafe.
3. Click on **■** to draw a **polygon** on the area where you experience a sense of security or feel safe.
 - To start drawing, click on the tool you want to use, and then click on the map.
 - To close the polygon, either double click or click the **Finish** button.
 - You can also edit **✂** or delete **🗑** the objects.
 - Please mark **at least one unsafe area and one safe area**.
4. Click on **↔** to draw a **line** of your daily activity route (optional).
5. After drawing an object you will have to answer some follow-up questions.
6. You can draw as many areas and lines as you want. After you finish, click on the **Submit map** button.

Start Survey

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University of Vienna
Institute of Geoinformatics of the Alba Regia Technical Faculty
Óbuda University

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1. Survey Crime perception | Online Survey

Mapping the Crime Perception Gap × +

← → ↻ cpg.amk.uni-obuda.hu/mainpage.php 80% ☆

universität wien Óbudai Egyetem Alba Regia Művelődési Központ és Oktatási Intézet Homepage Survey Login

Instructions

Please select the option or options that apply to you.

- **How often do you visit this area?**
 - I visit this area regularly
 - I rarely visit this area
 - I have never been to this area before
- **When do you feel fear in this area?**
 - Daytime
 - Nighttime
 - Both
- **What types of crime concern you the most in this area?**
 - Violent-related crimes (e.g., aggravated assault, robbery, harassment, hate crimes, sexual assault)
 - Property-related crimes (e.g., pickpocketing, burglary, house breaking, vehicle vandalism)
 - Both
- **Select all the features that better describe this area:**

<input type="checkbox"/> Illuminated streets	<input type="checkbox"/> Poorly illuminated streets
<input type="checkbox"/> Security personnel and/or surveillance measures (e.g., police, CCTV, and street patrols)	<input type="checkbox"/> No security personnel and/or surveillance measures
<input type="checkbox"/> Well-maintained surroundings (clean and litter-free)	<input type="checkbox"/> Inadequately maintained surroundings (e.g., litter, graffiti, and overgrown vegetation)
<input type="checkbox"/> Well-maintained infrastructure (e.g., roads, buildings, parks)	<input type="checkbox"/> Poorly maintained infrastructure (e.g., deteriorated buildings, unkempt parks)
<input type="checkbox"/> Low levels of noise pollution	<input type="checkbox"/> High levels of noise pollution
<input type="checkbox"/> It's seen as a secure area	<input type="checkbox"/> It's seen as an unsafe area
<input type="checkbox"/> Social concerns (gangs, drug dealers, people experiencing homelessness)	Other <input type="text"/>

Submit map

Save

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1. Survey Crime perception | Online Survey

Mapping the Crime Perception Gap X +

← → ↻ cpg.amk.uni-obuda.hu/mainpage.php 80% ☆

universität wien Öbudai Egyetem Alba Regia Művelődési Intézet

Homepage Survey Login

Instructions Submit map

Finish Delete last point Cancel

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1. Survey Crime perception | Online Survey

The screenshot shows a web browser window with the URL cpg.amk.uni-obuda.hu/mainpage.php. The page features a map of Vienna in the background. A central white box contains the following text and questions:

We have a few more questions to better understand your perspective. Please continue by answering the following questions:

- **How would you rate in general the level of crime severity in this city?**
 Very low Low Moderate High Very high Prefer not to say
- **How much trust do you have in the police?**
 Very low Low Moderate High Very high Prefer not to say
- **Have you ever experienced a violent crime?**
 Yes No Prefer not to say
- **Have you ever experienced a property crime?**
 Yes No Prefer not to say
- **In the past month, how often have you experienced feelings of insecurity or vulnerability?**
 Never Almost never Sometimes Fairly often Very often Prefer not to say

A "Next" button is located at the bottom of the question box. The map interface includes navigation controls (Instructions, Finish, Delete last point, Cancel) and a "Submit map" button.

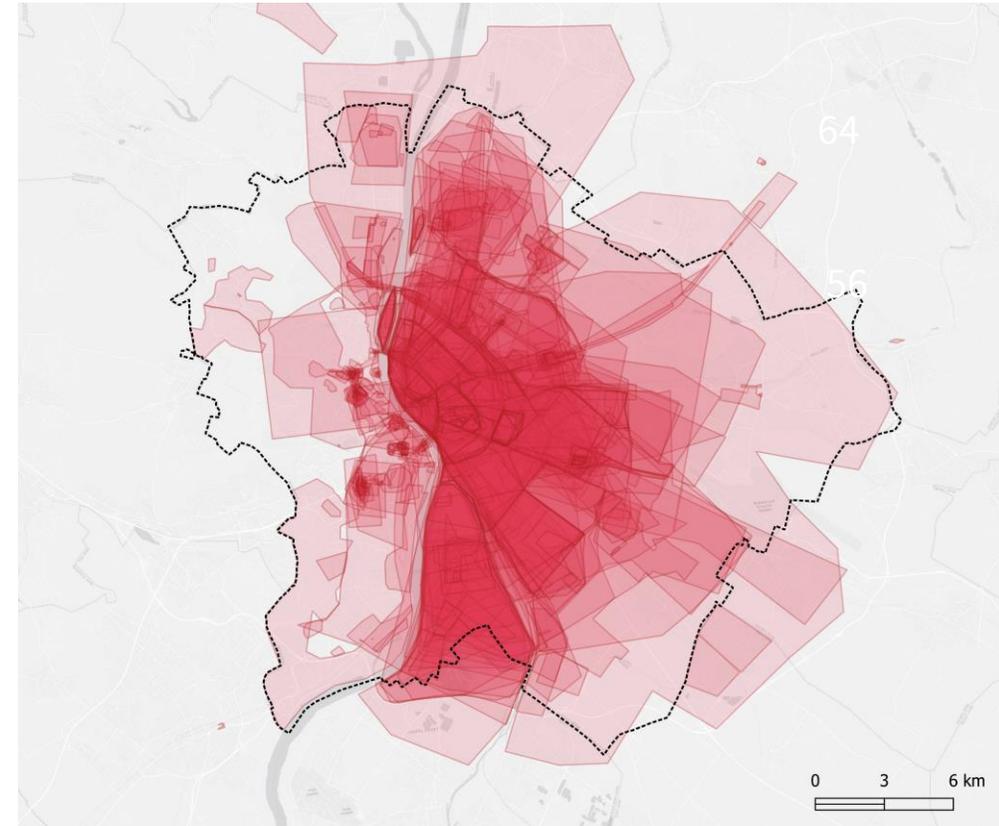
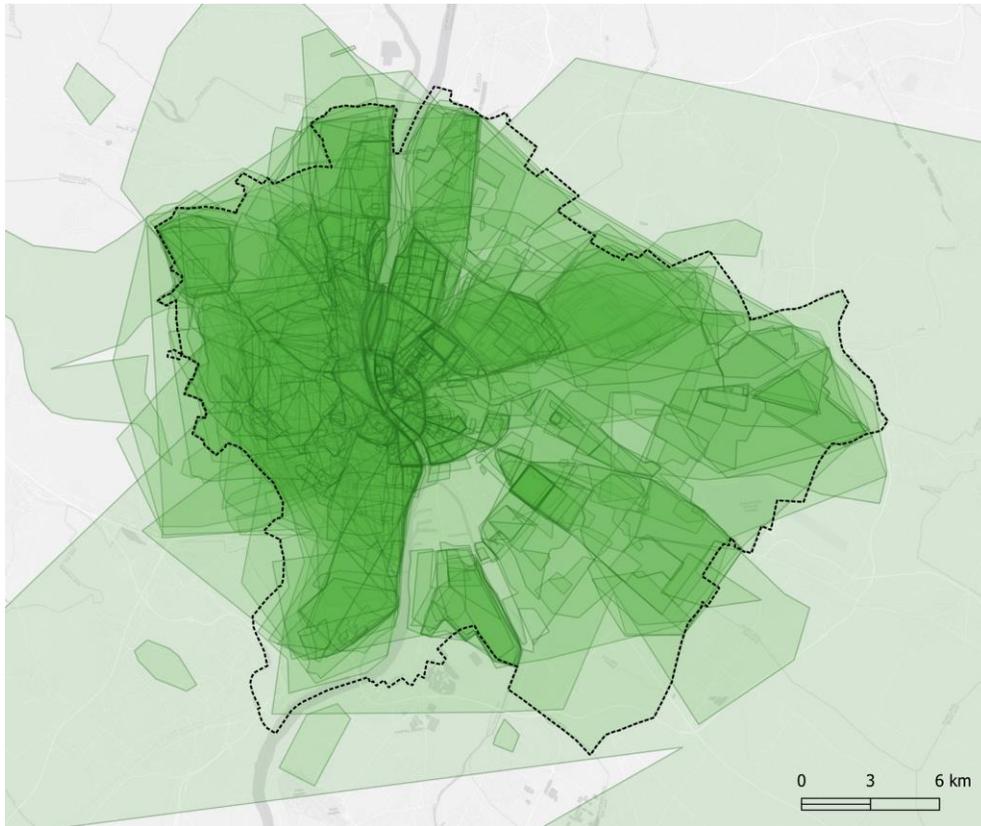
At the bottom of the page, there is a footer with the following information:

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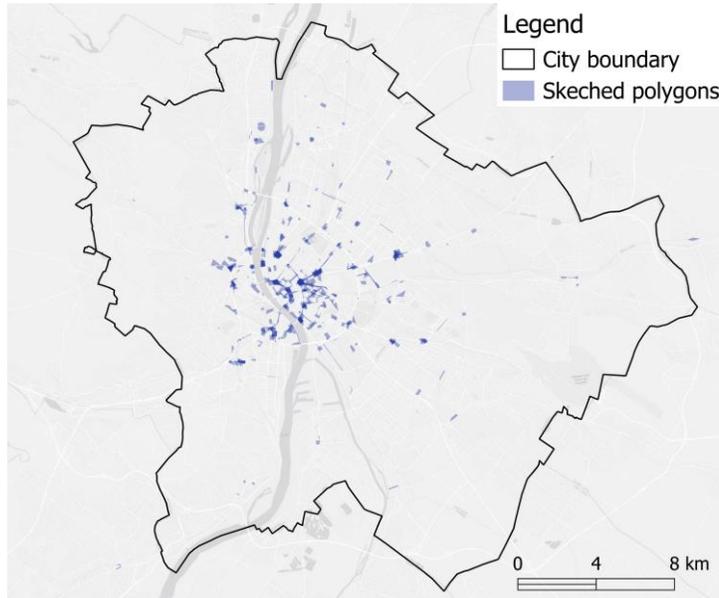
Contact us
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1. Survey Crime perception | Raw data & Geoprocessing

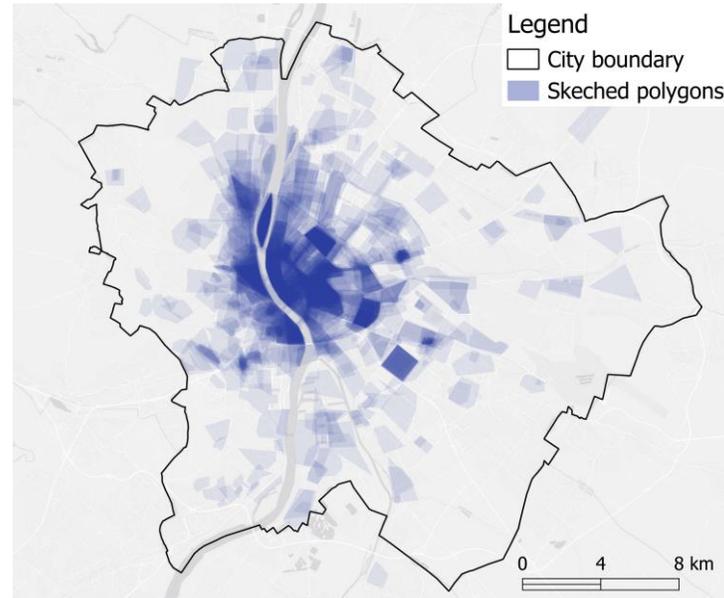
Budapest



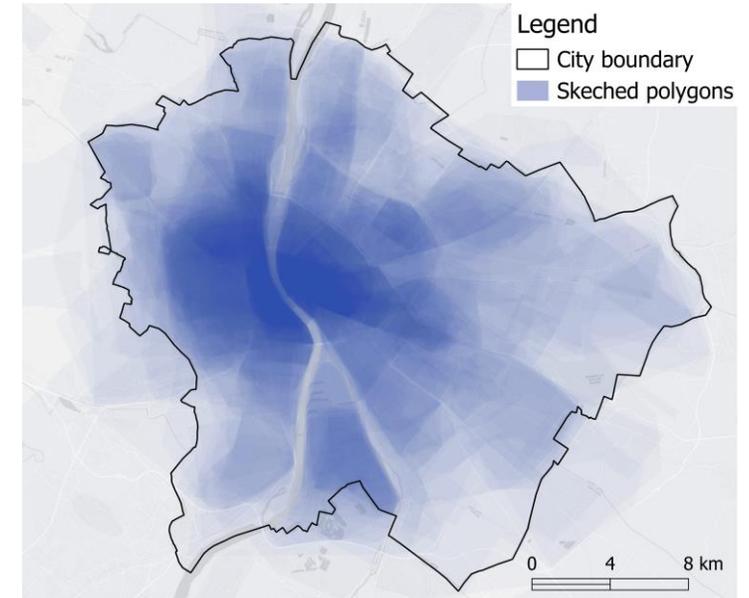
1. Survey Crime perception | Raw data & Geoprocessing



Area ≤ 0.071 km²



0.071 km² < Area ≤ 2.5 km²

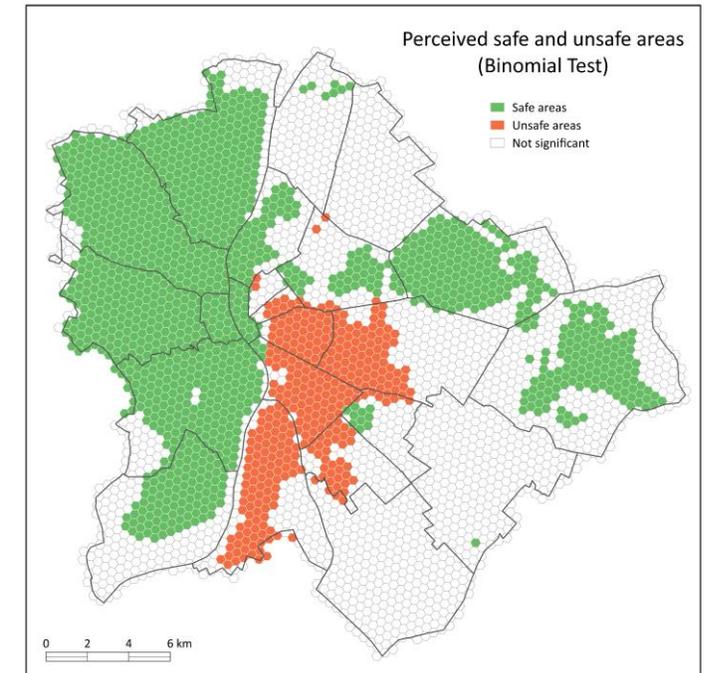
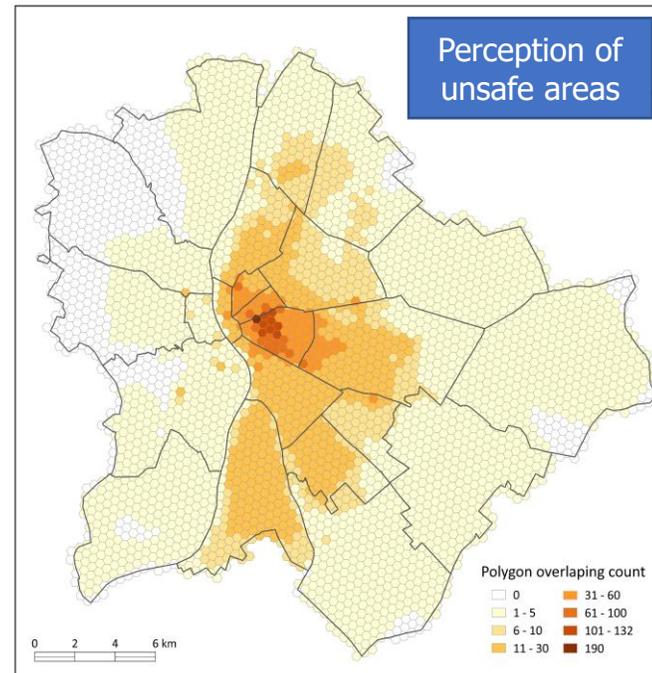
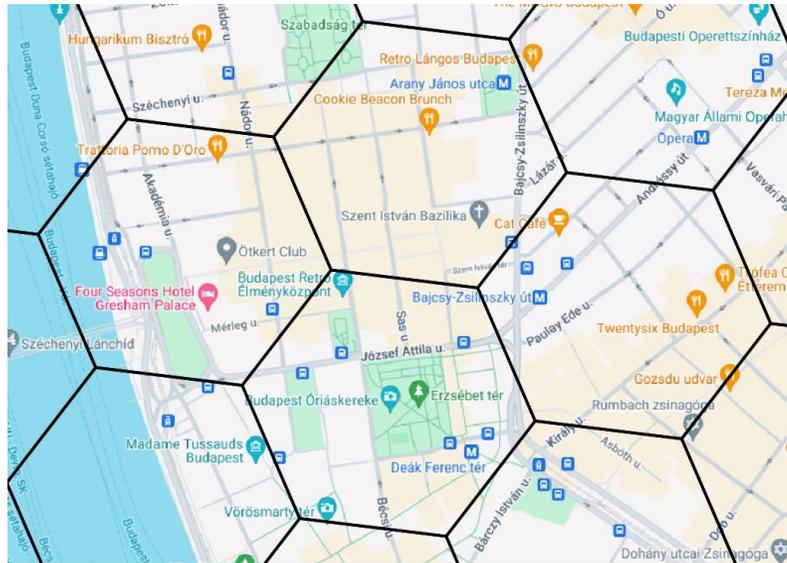


Area > 2.5 km²

The size of polygons / km ²	Number of safe polygons	Number of unsafe polygons
≤ 0.071	190	585
> 0.071 & ≤ 2.5	868	848
> 2.5	406	265
Total	1464	1698

1. Survey Crime perception | Final Perception Map

Hexagon unit of analysis



2. Spatial Crime Perception Gap | Definition

Perception data \neq Real/Reference data \rightarrow **Crime perception gap**

This can have repercussion on:

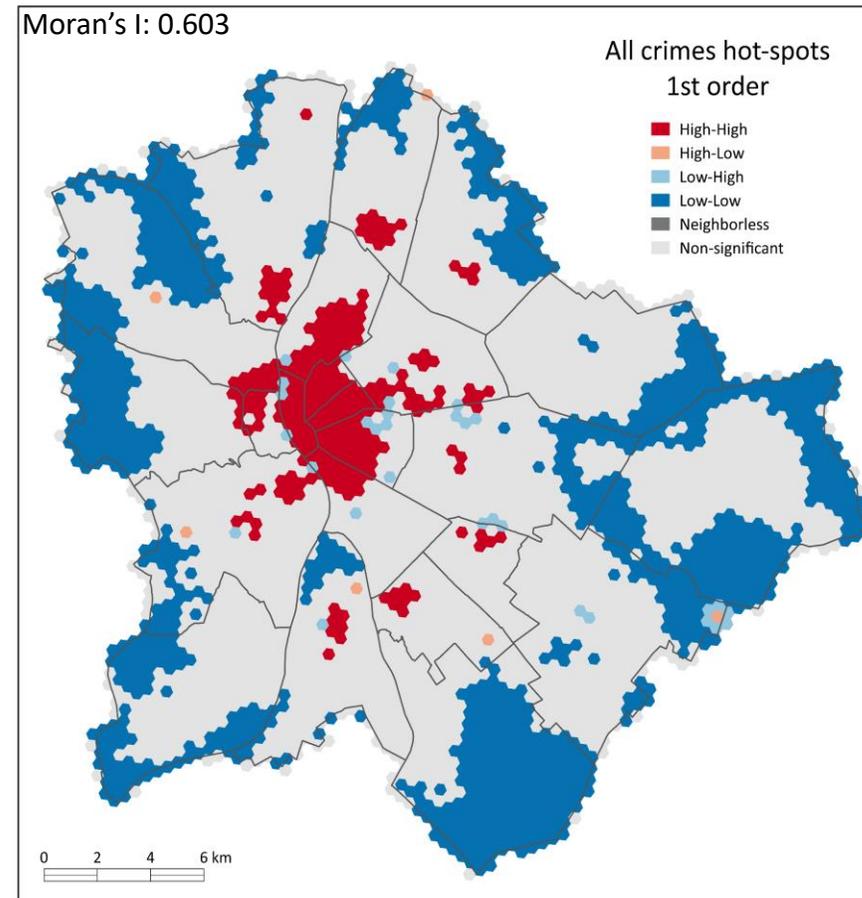
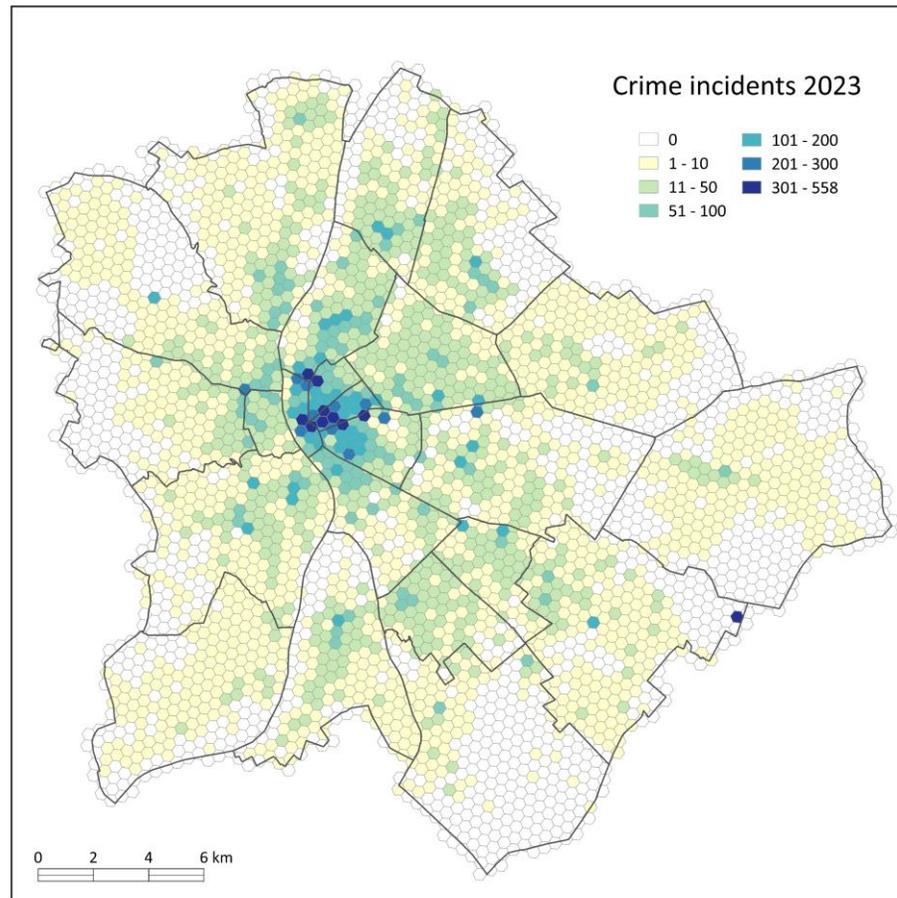
- people's lifestyle
- affect social behaviour
- spatial and economic dynamics



It is relevant that police agencies develop strategies directed to narrow the perception gap

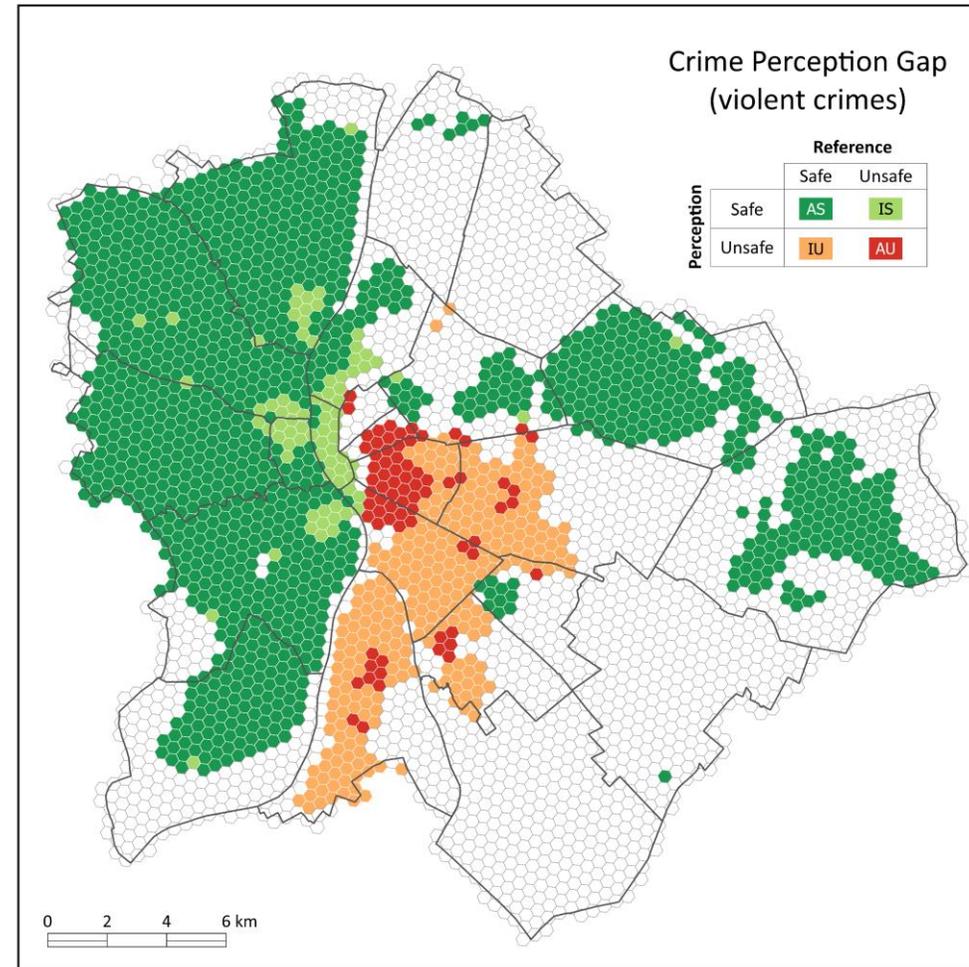
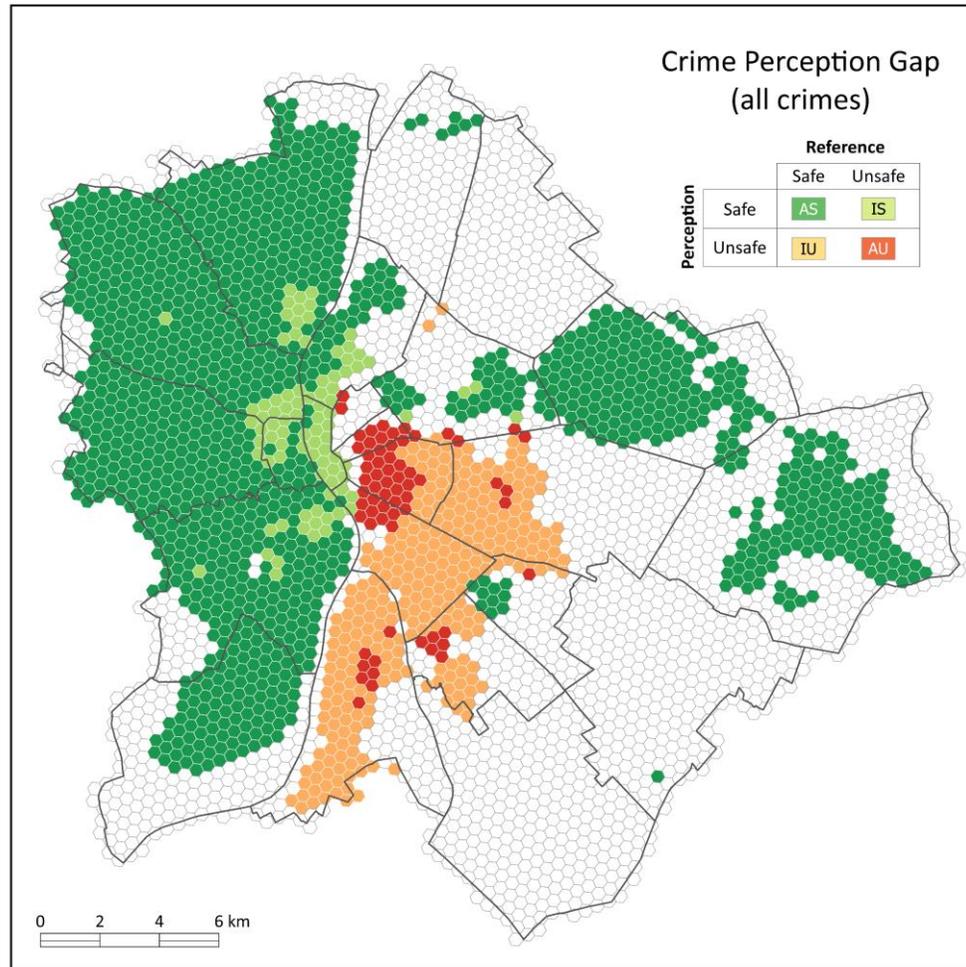
		REFERENCE	
		SAFE	UNSAFE
PERCEPTION	SAFE	Accurate perception of safe area (AS)	Inaccurate perception as safe area (IS)
	UNSAFE	Inaccurate perception as unsafe area (IU)	Accurate perception of unsafe area (AU)

2. Spatial Crime Perception Gap | Detection of Hotspots



- All crimes
- Property crimes
- Violent crimes
- Visible crimes

2. Spatial Crime Perception Gap | Delineation of the Gap

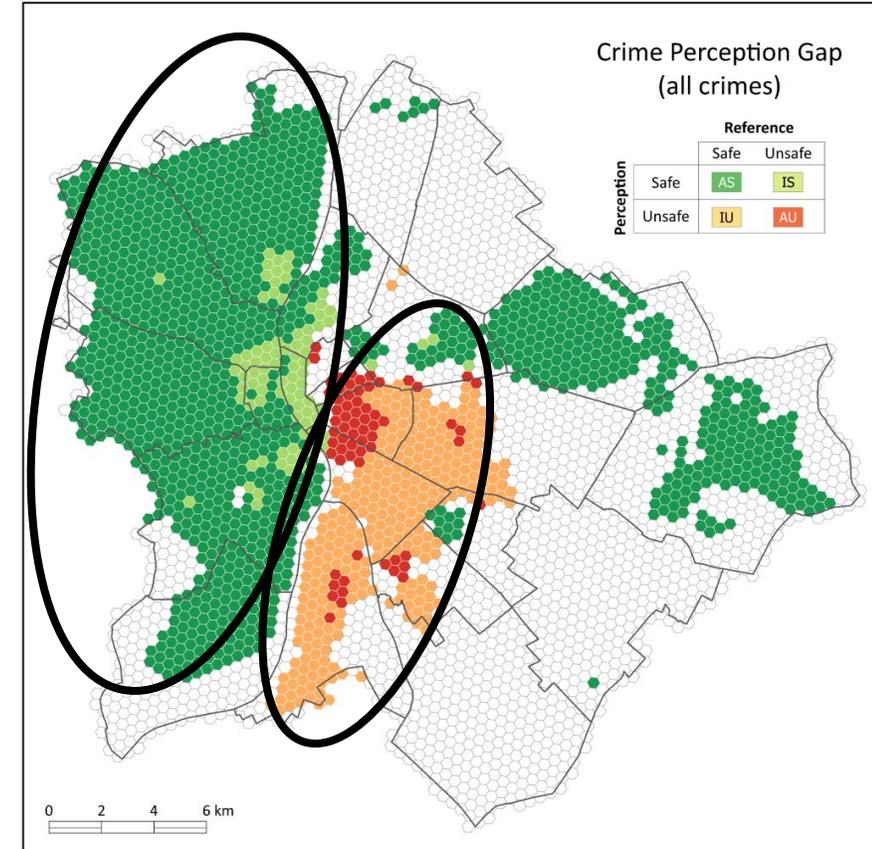


2. Spatial Crime Perception Gap | Evaluation Metrics

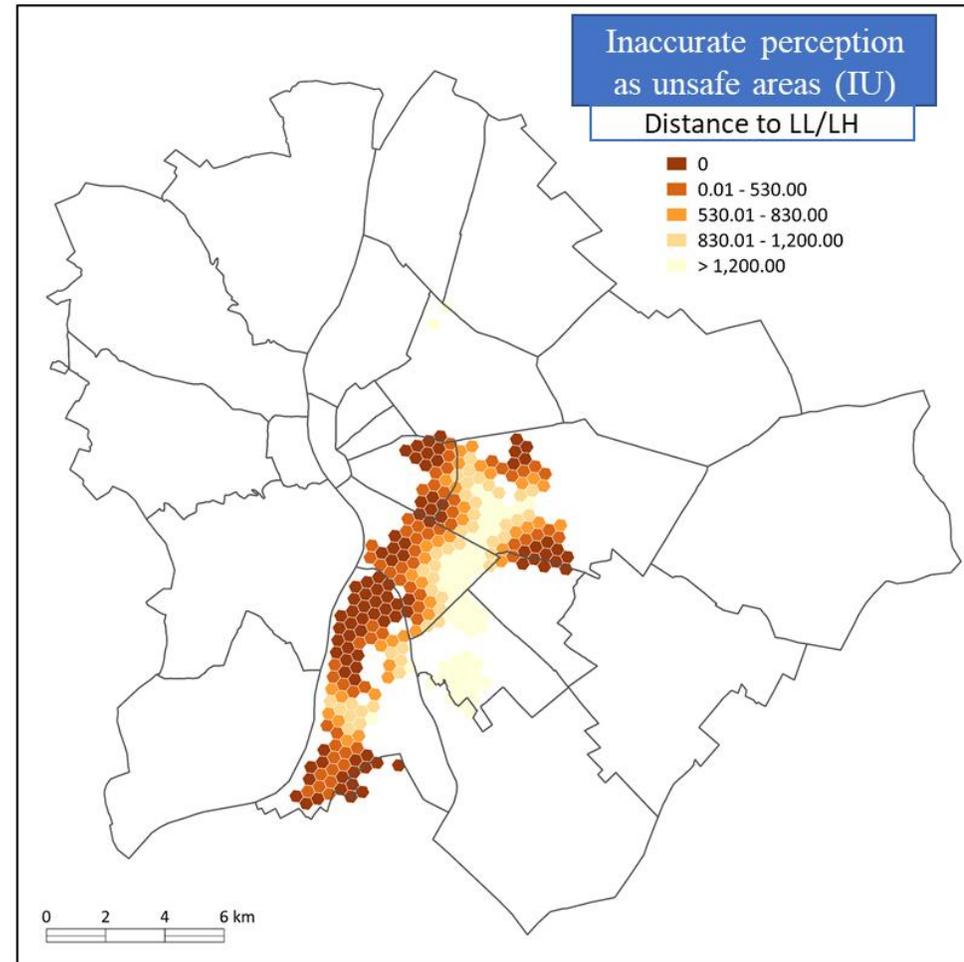
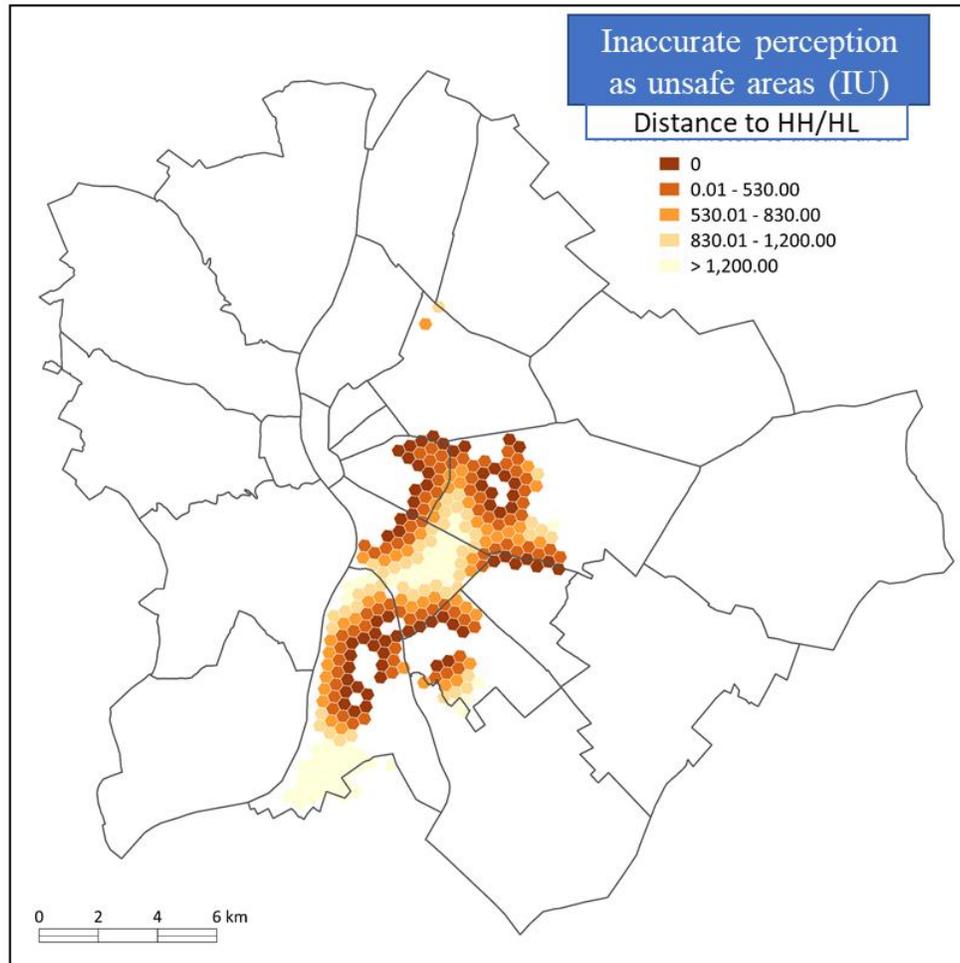
	Cohen's Kappa Statistic	Precision (U)	Accuracy
All Crime	0.149	0.183	0.779
Property	0.165	0.174	0.790
Visible	0.174	0.188	0.789
Violent	0.186	0.205	0.789

Precision: the proportion of the perceived unsafe areas that are correctly identified

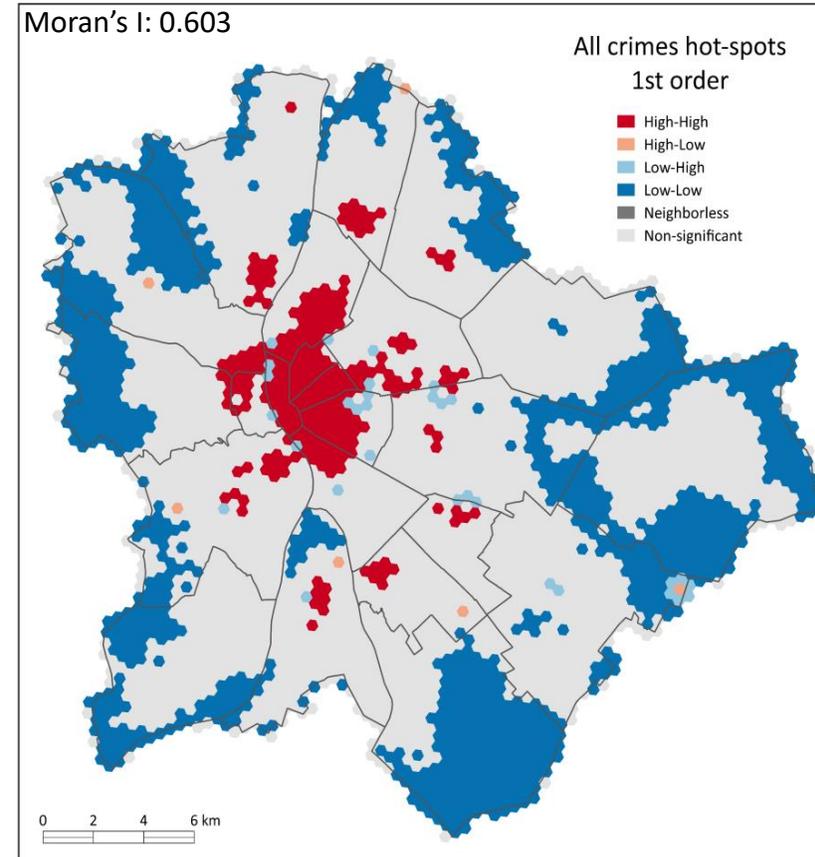
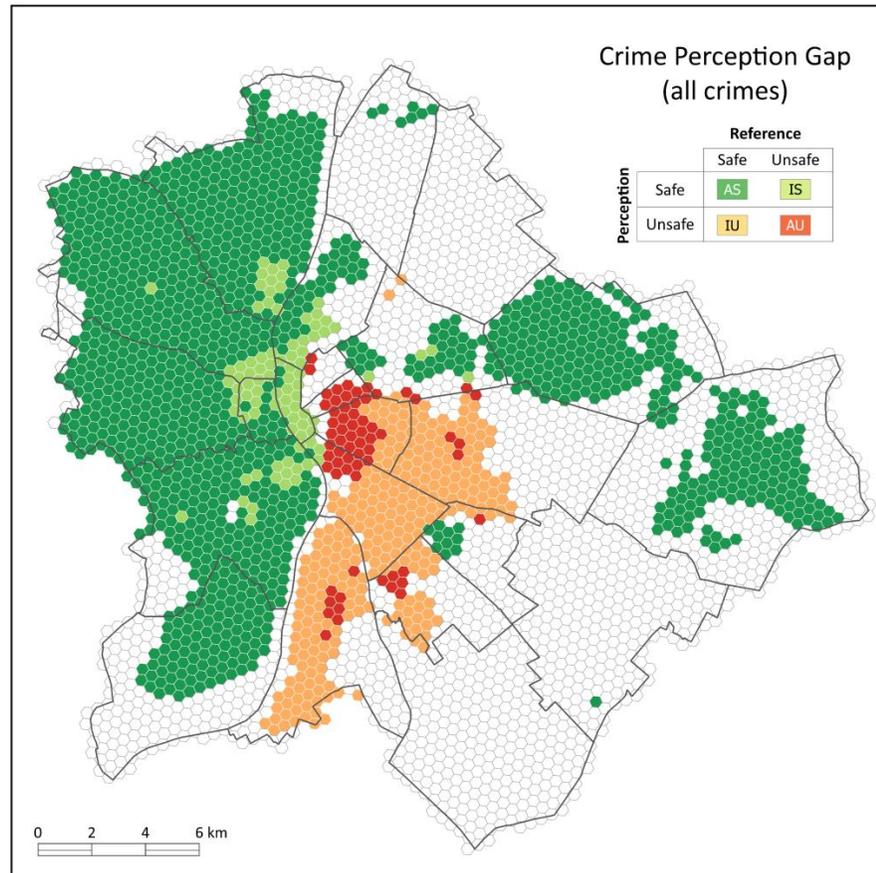
Crime Types	Perception	Reference	
		Safe	Unsafe
<i>All Crime</i>	Safe	1269	88
	Unsafe	291	65
<i>Property</i>	Safe	1292	65
	Unsafe	294	62
<i>Visible</i>	Safe	1285	72
	Unsafe	289	67
<i>Violent</i>	Safe	1278	79
	Unsafe	283	73



3. Spatial Diffusion Effect| IU - Distance to crime spatial groupings



3. Spatial Diffusion Effect| Inaccurate perception & spatial outliers



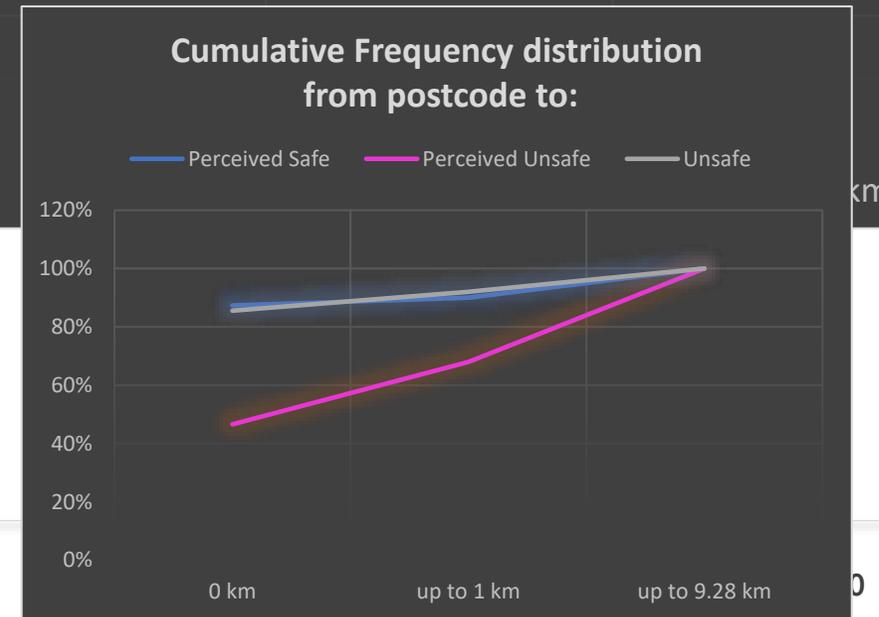
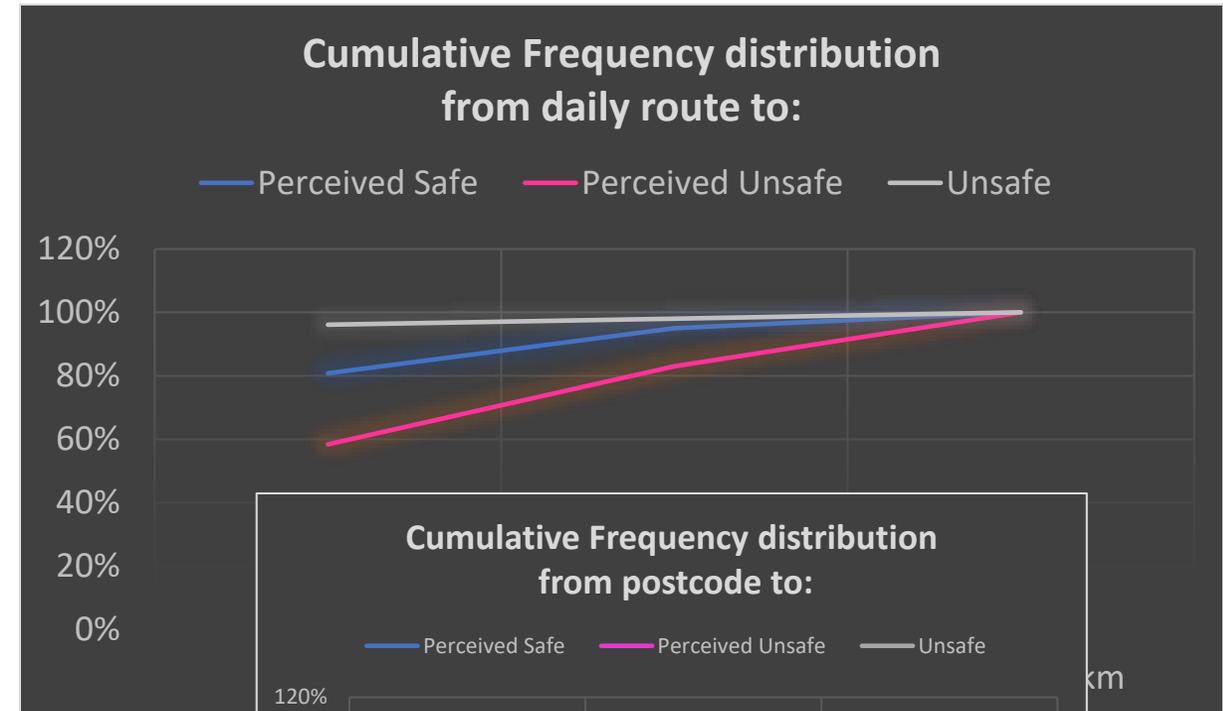
Spatial Grouping Accuracy	
LL	0,933
Non significant	0,795
HH	0,427
HL/LH (outliers)	0,333
All	0,779

4. Activity Space Effect | Distance to safety perception & unsafe areas

Distance from daily route to			
Statistics	Perceived Safe	Perceived Unsafe	Unsafe
Mean	190.49	643.70	67.93
SD	797.41	1544.64	440.40
Range	0-5840	0-9150	0-3615

Distance	Perceived Safe	Perceived Unsafe	Unsafe
0 km	81%	58%	96%
up to 1 km	14%	24%	2%
1-2 km	1%	7%	0%
2-3 km	1%	3%	1%
3-4 km	1%	2%	1%
4-5 km	0%	3%	0%
5-10 km	1%	3%	0%

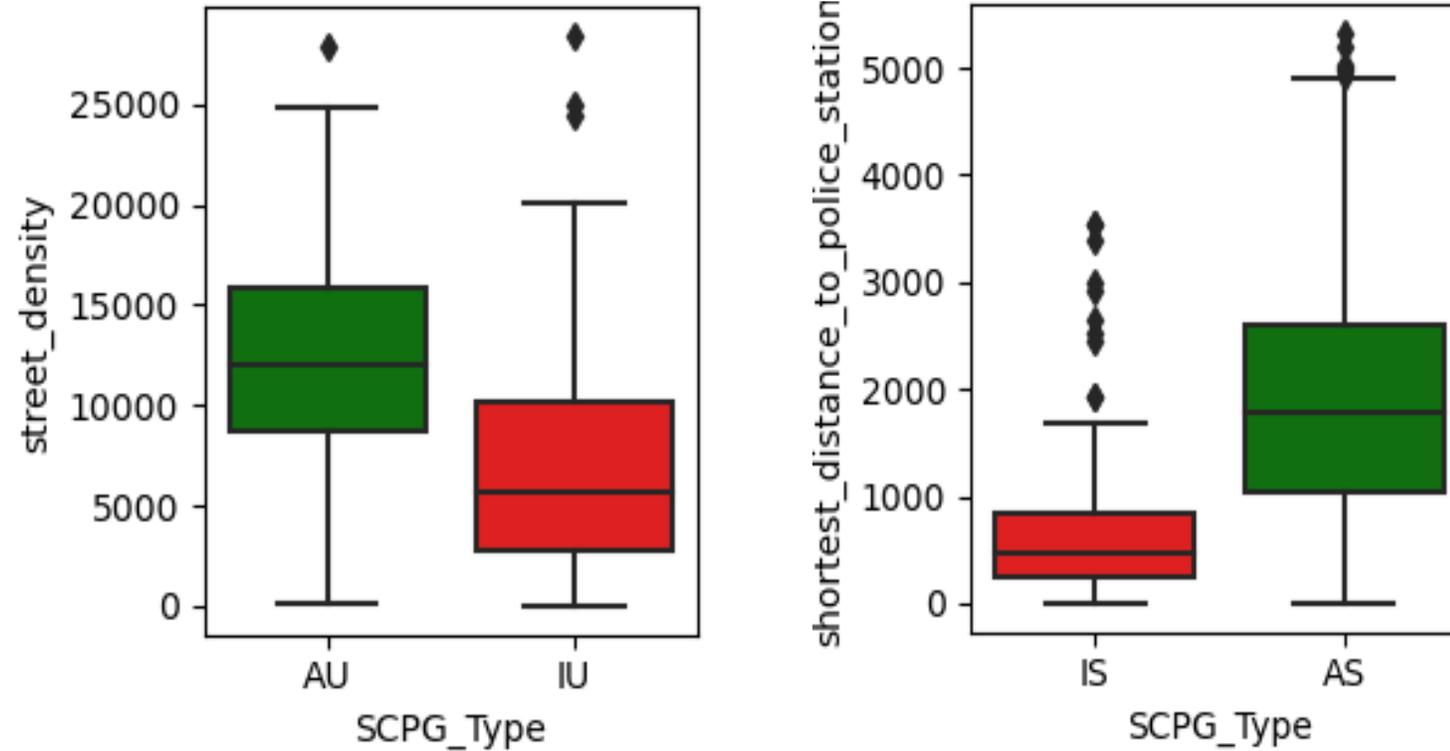
Distance from postcode to			
Statistics	Perceived Safe	Perceived Unsafe	Unsafe
Mean	386,68	1183,25	131,30
SD	1433,90	1781,24	364,02
Range	0-9280	0-6775	0-1313



5. Frequent patterns of perceptual gaps| Work in Progress

- *Q1: Is the IU associated with more night or day visitation times?*
 - *Q2: What social, economic, and demographic features tend to be more associated to perceptual gaps?*
 - *Q3: What kinds of physical and social environment features tend to be more associated to perceptual gaps?*
- About 90 variables to be examined in relation to SCPG
- Point Biserial Correlation Coefficient & Apriori Algorithm

5. Frequent patterns of perceptual gaps| Examples



Examples with significant Point Biserial Correlation Coefficient

Conclusions

- ✓ **The spatial crime perception gap is extensive and more prominent for areas that are mislabeled as unsafe.**
- ✓ **Although violent crimes and visible crimes are closer to subjective crime perception than all crimes or property crimes, still the agreement between perception and reference data is rather poor.**
- ✓ **Safety perception seems to be linked to (or affected by) the safety perception of neighboring areas.**
- ✓ **Perception of unsafety in space is heightened in areas outside one's activity space.**
- ✓ ***There is still a lot to learn (and plenty of material to analyze) regarding crime perceptual gaps!***

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Thank you for your attention !