

Spatial Analysis of Crime

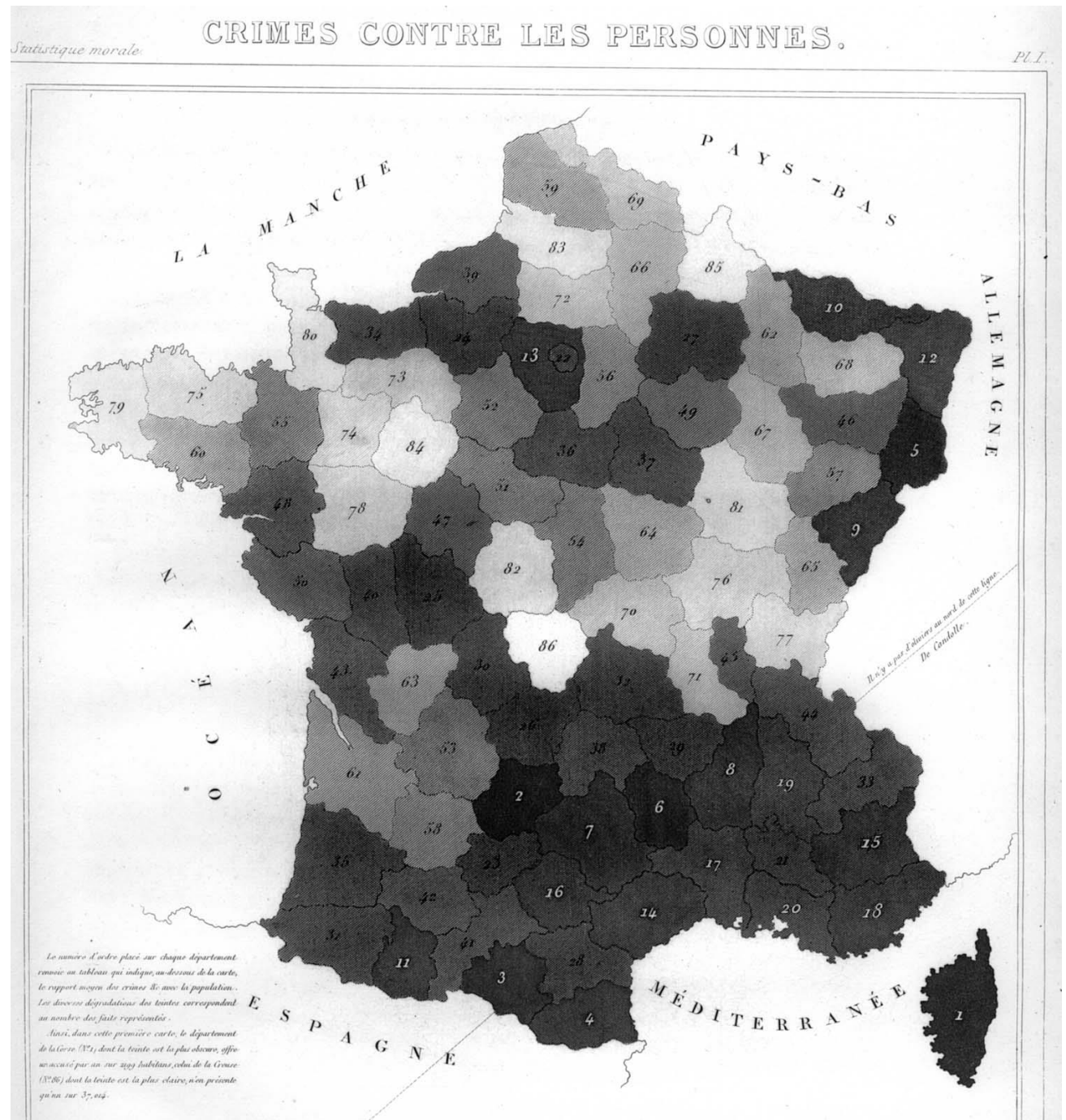
Wim Bernasco

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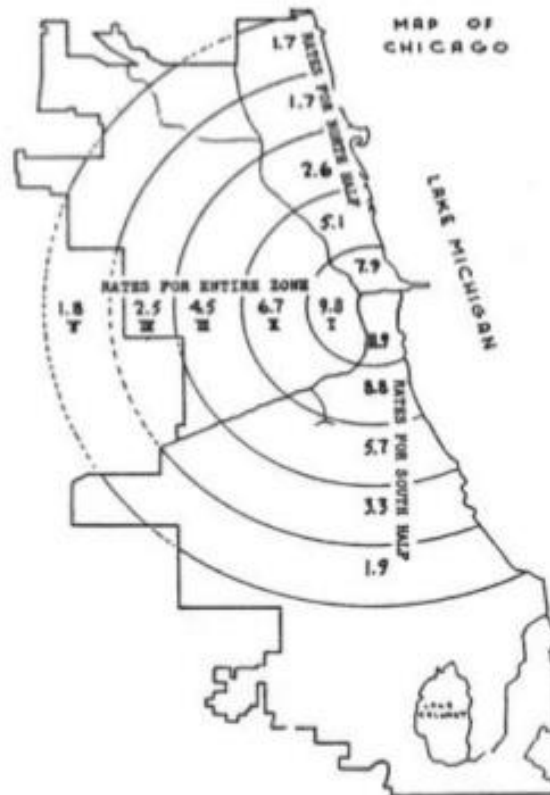
Centre for Crime, Justice and Policing, June 26th, 2017

Guery 1833 France



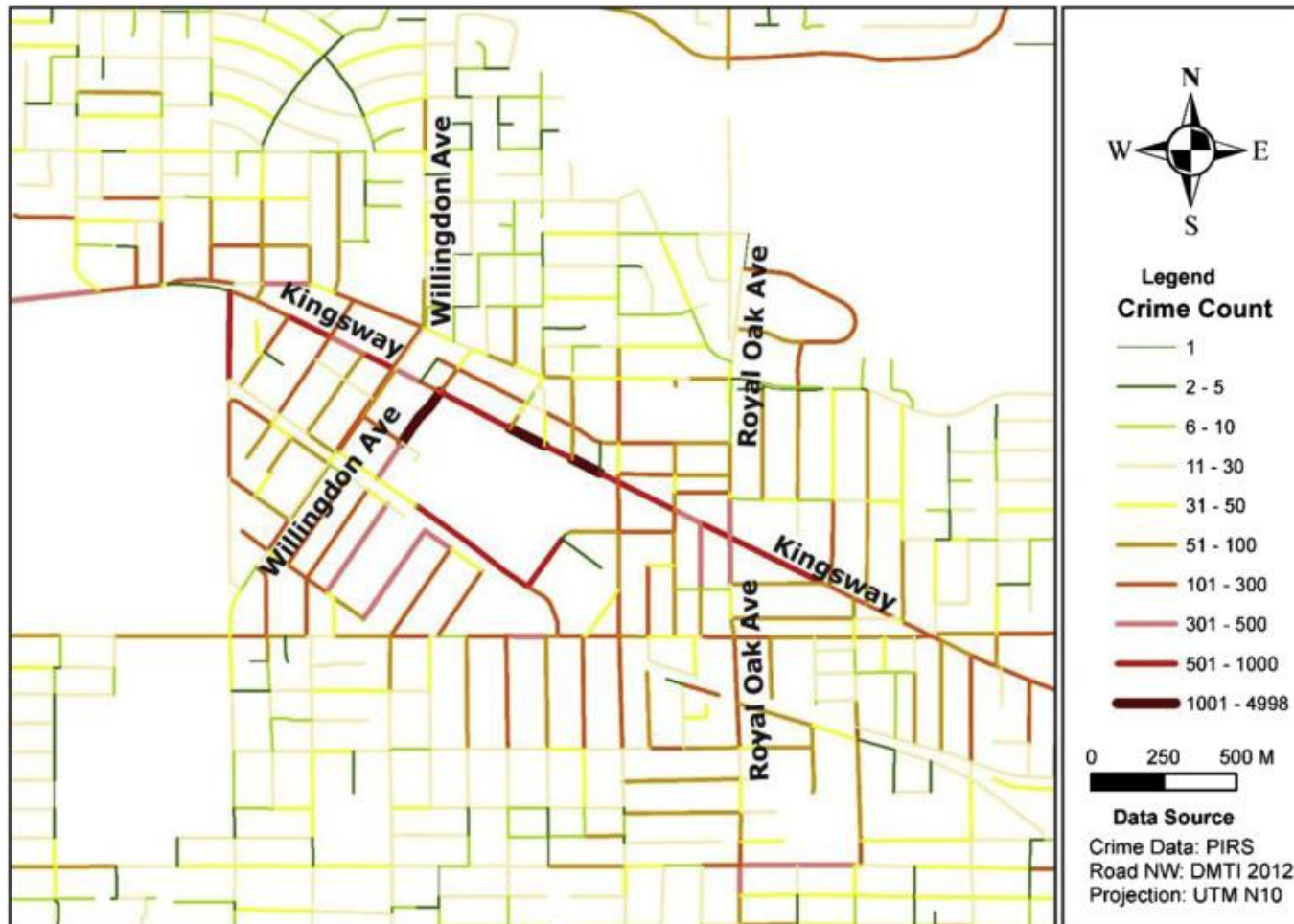
Shaw & McKay, 1942, Chicago

Figure 4.1 Zone Map of Male Delinquents in Chicago 1925-1933



Source: Shaw, C., & McKay, H. (1972). *Juvenile delinquency in urban areas* (p. 69). Chicago: University of Chicago Press. Copyright © by the University of Chicago Press. Reproduced with permission. All rights reserved.

Spicer, Song, Brantingham & Andresen, 2016 Vancouver



places do not commit crime



people do

Elements of choice

1. Actors

2. Alternatives

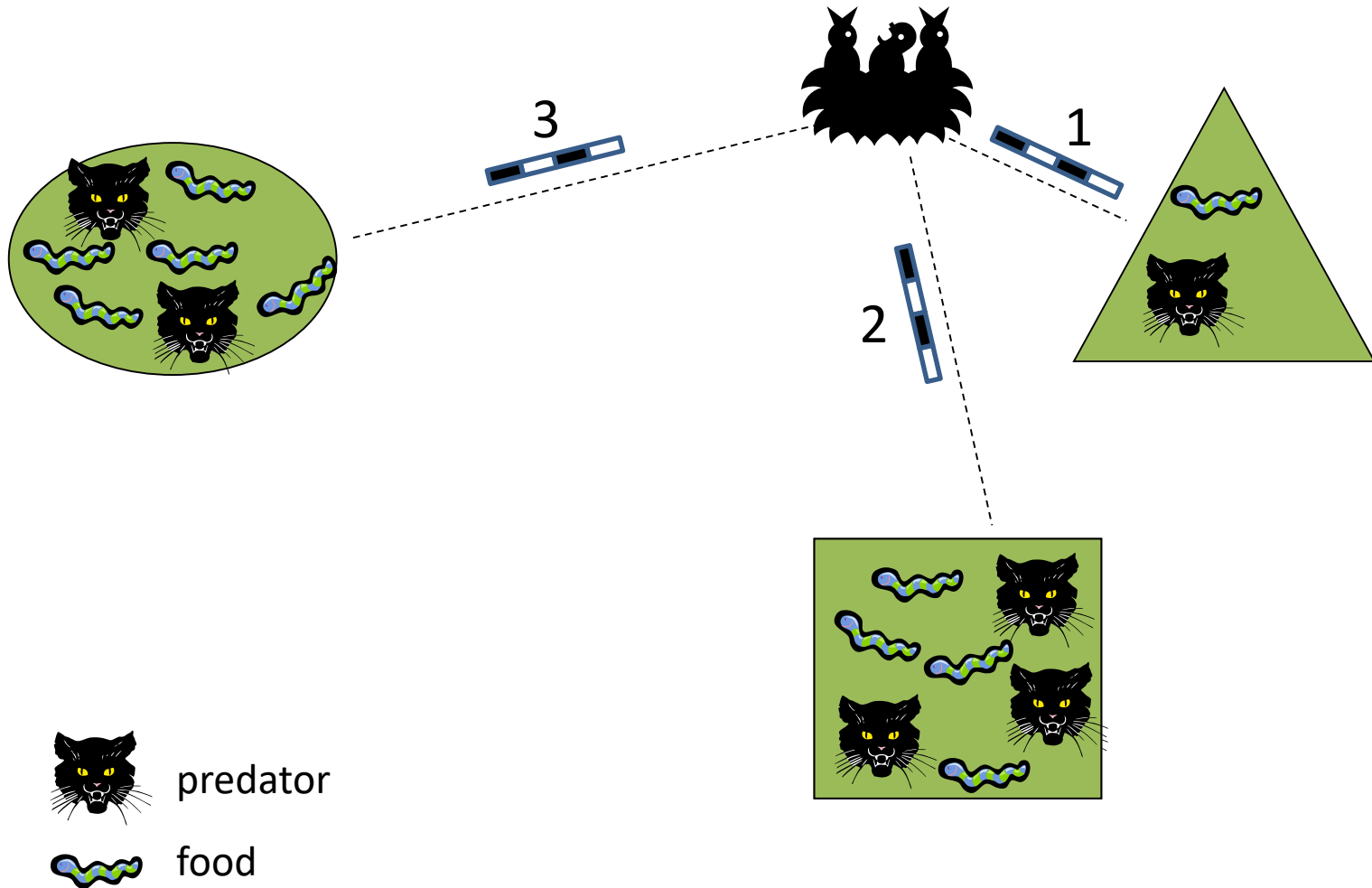
3. Attributes

4. Axiom (rule)

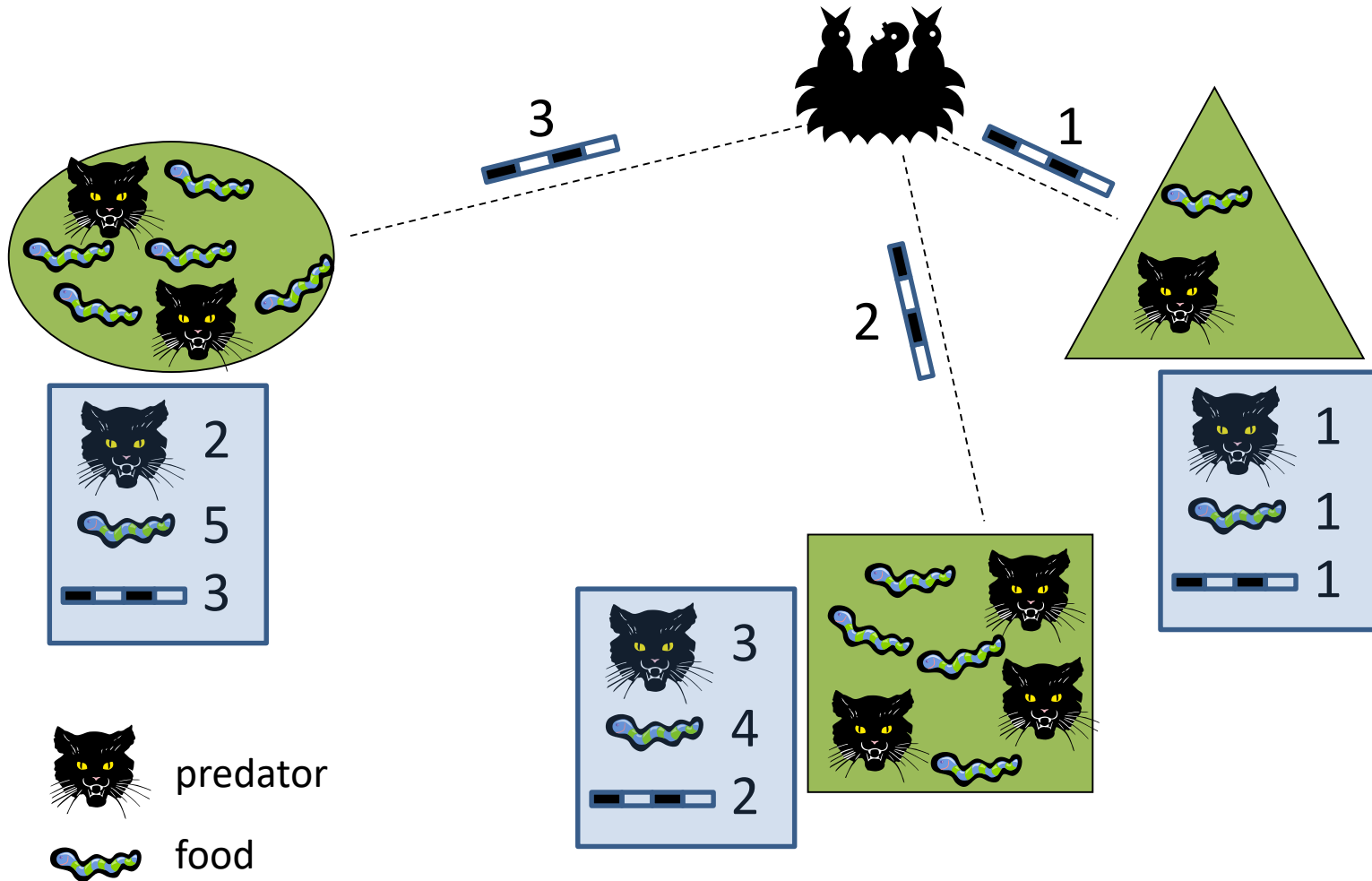
Foraging metaphor



Where to forage?



Where to forage?



Comfort zone hypothesis

- Near home
- Near former homes
- Near family members' (former) homes
- Near prior offending locations
- Near school
- Near work
- Near gym
- within activity space or **comfort zone**

Example 1: Prior Offending Locations

Offender more likely to offend near prior crime location than elsewhere.

Effect size dependent on:

- Recency (more likely if more recent)
- Frequency (more likely if more frequent)
- Proximity (more likely if closer)
- Type (more likely if same type of crime)



PredPol[®]

Predict Crime in Real Time[®]

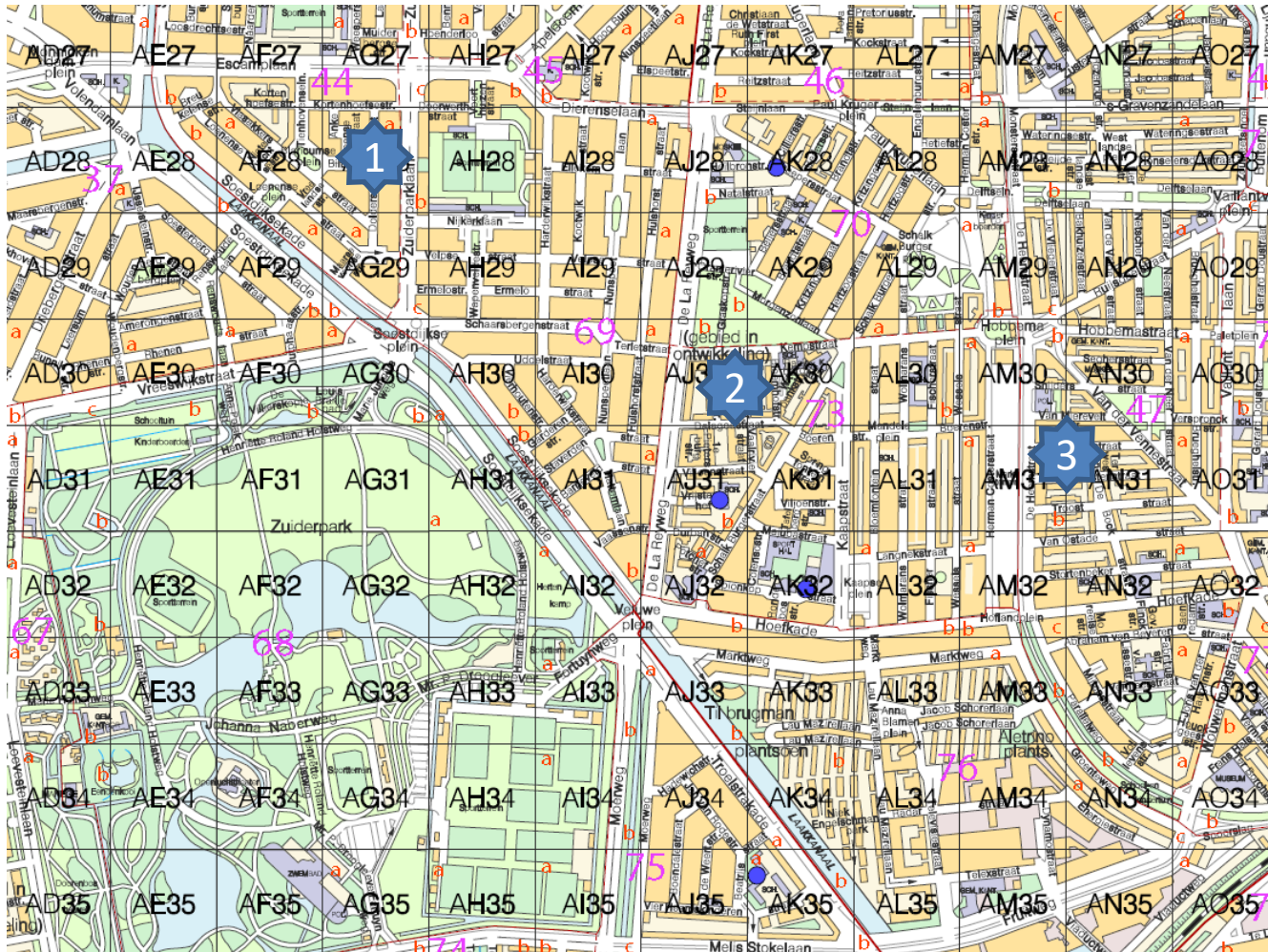
PredPol provides targeted, real-time crime prediction designed for and successfully tested by officers in the field.

- close in time and space
- same offender
- conditioned by prior offenses?



**Real Future:
Predictive Policing**

Prior 3 offense locations



Crime activity space at offense #4



Example 2: Former residence

Offender more likely to offend near former residence than elsewhere.

Effect size dependent on:

- Recency (more likely if more recent residence)
- Duration (more likely if longer resident)
- Proximity (more likely if closer)

Example 3: Family member

Offender more likely to offend near family member's (former) residence than elsewhere.

Effect size dependent on:

- Recency (current residence more than former)

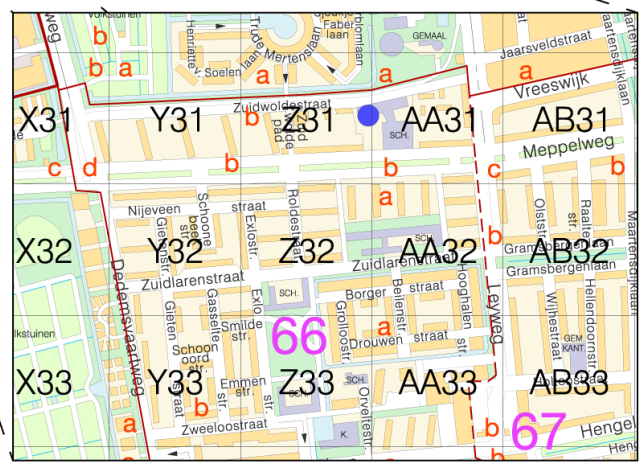
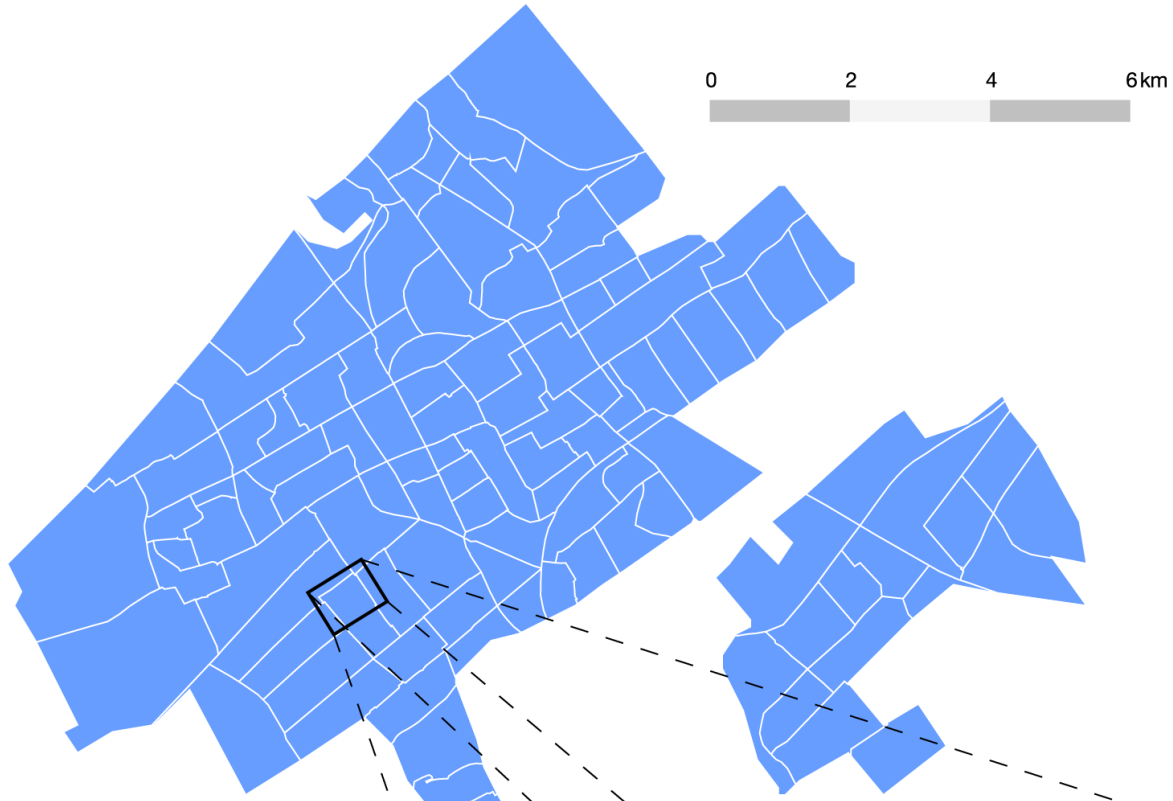
Situational causes of crime



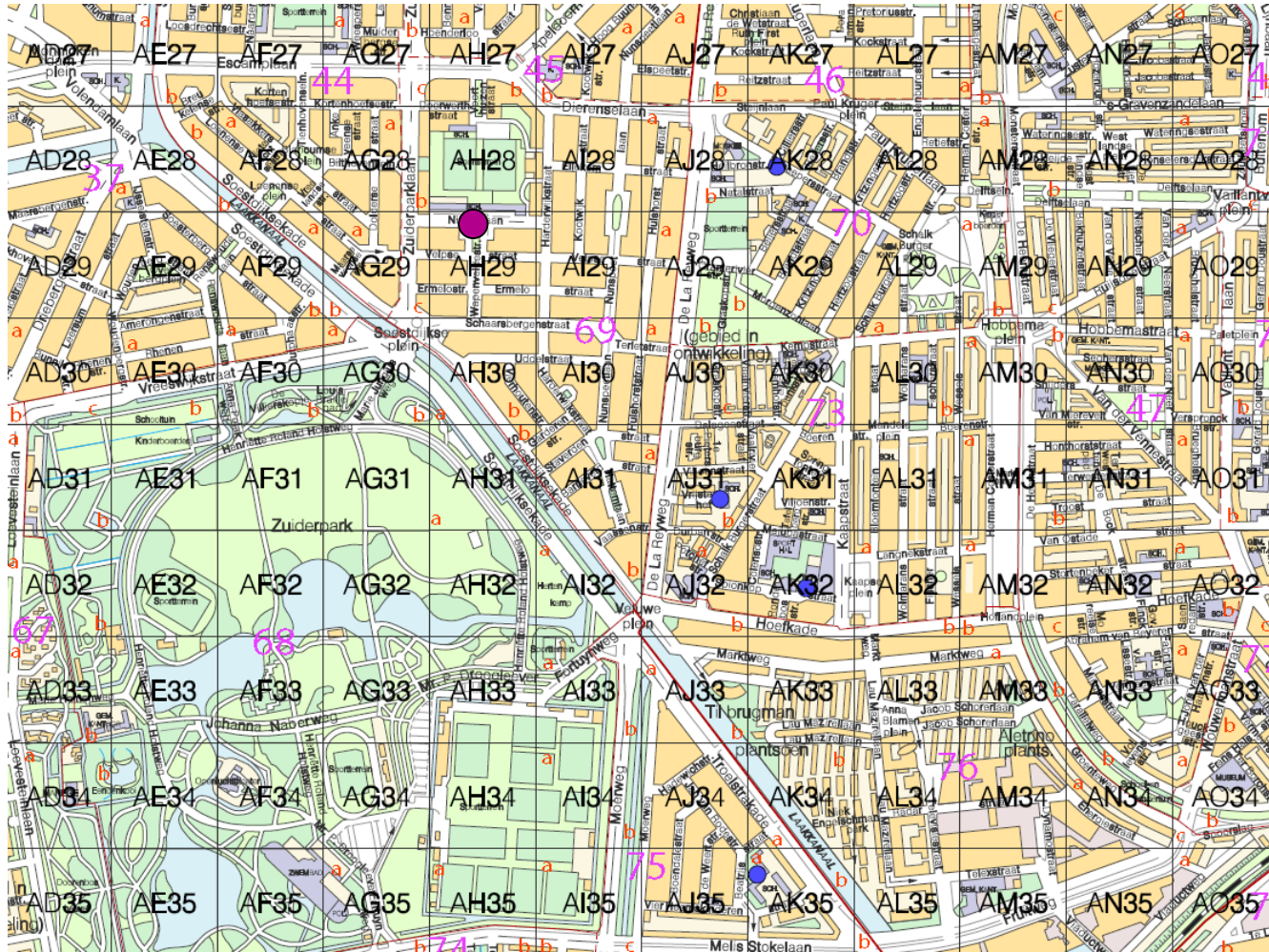
Systematic diary

- personal interview
- retrospective
- 4 dagen (Friday, Saturday, 2 weekdays)
- open style, free sequence
- per hour (24 hours per day)
- where, what, with whom?
- + criminology topics: offender, victim, alcohol, drugs, weapons

hour	location	function	social	activity	Off	Vict	Alc
6am	AG28	home	alone	sleep	No	No	No
7am	AG28	home	mom	breakfast	No	No	No
8am	AJ31	supermarket	coworkers	work	No	No	No
9am	AK30	classroom	teacher+peers	learn	No	No	No
10am	AK30	classroom	teacher+peers	learn	No	No	No
11am	AK30	classroom	teacher+peers	learn	No	No	No
12am	AK30	schoolyard	peers	socialize	Yes	No	Yes
1pm	AG28	home	sibling	watch TV	No	No	Yes
2pm	AG28	home	mom + sibling	homework	No	No	No
...			



6u - home



9u - school



14u – friend's school

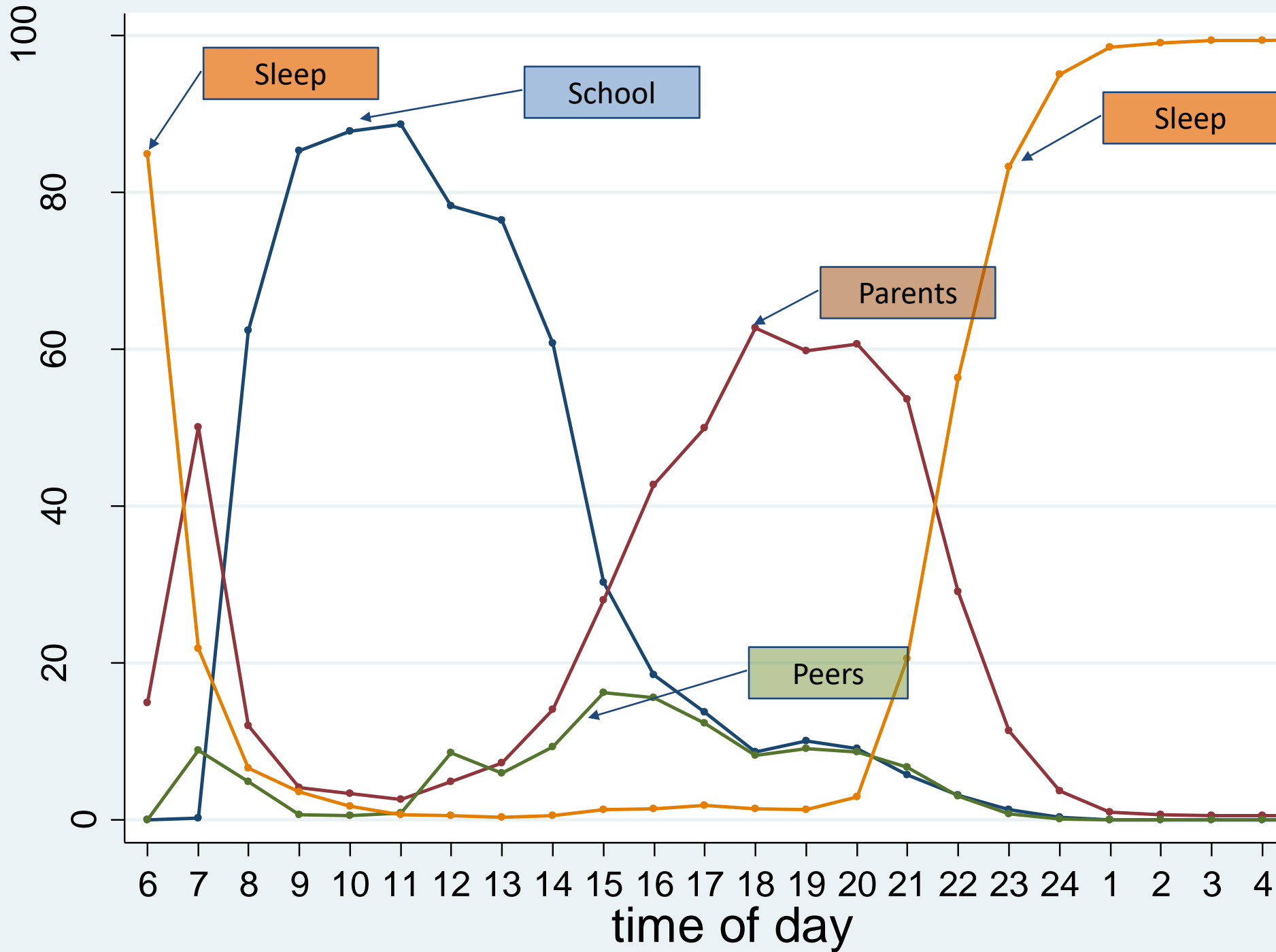


15u – friend's home

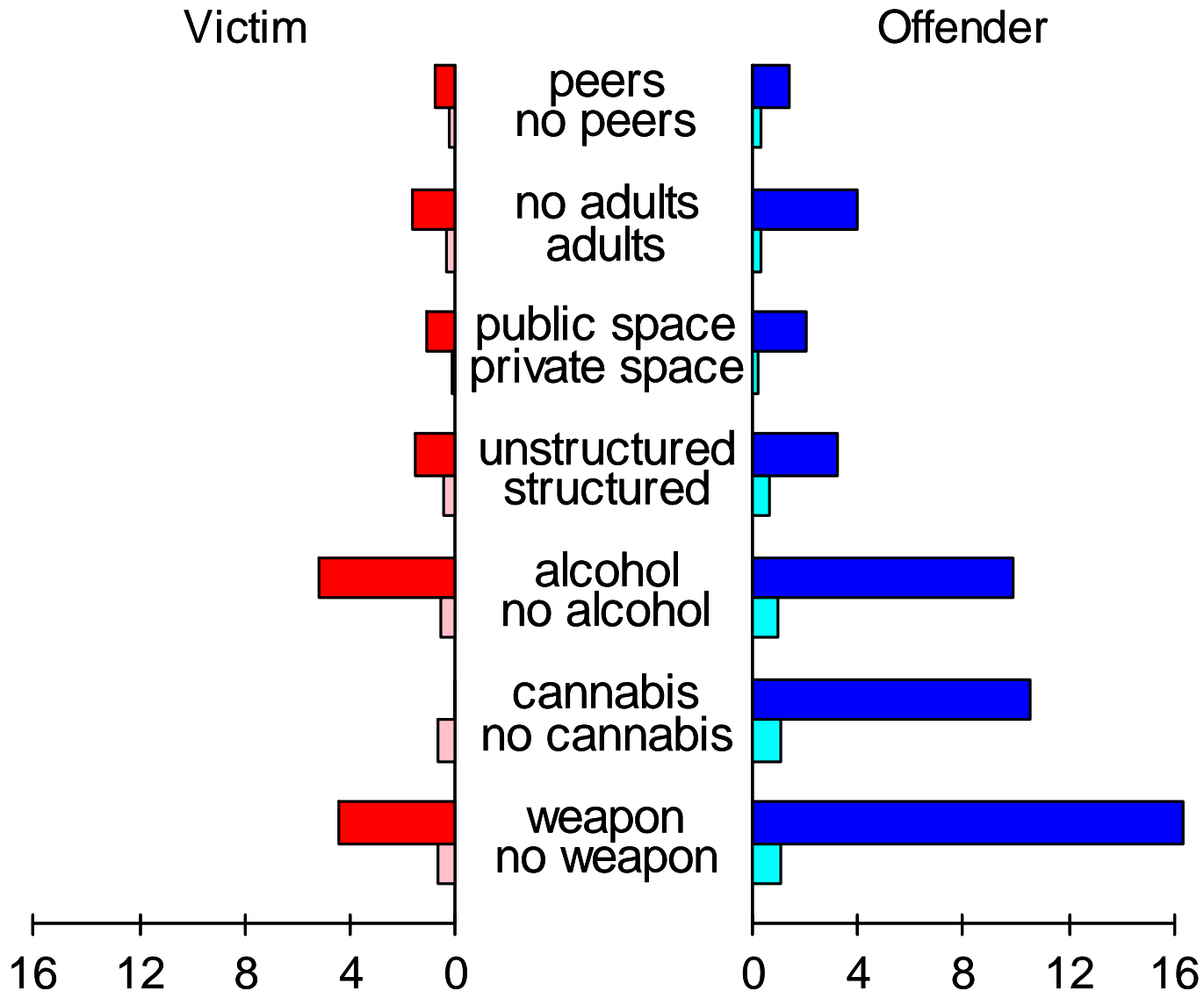


16u – football field





Crimes per 10k hours in specific activities



Take home messages

0. Spatial resolution

Macro (regions) to micro (street segments)

1. Location choice theory

Actors, Alternatives, Attributes & Axiom

2. Comfort zone

Preference for familiar places, including prior crimes

3. Situational causes (youth)

Peers, no adults, public space, no structure, alcohol

Thanks

More materials, contact: www.wimbernasco.nl