

Public Transport - Risky facilities & 'busyness'

Dr Andy Newton. 11th March 2020

*Presentation to International Seminar Series:
Risky Places for Crime*



Contents

1. Public Transport and its Environs
 - Spatial Interplay
 - Users and infrastructure
2. Do 'risky places' theories/concepts apply?
 - Risky Facilities
 - Generators and Attractors
 - Radiators and Absorbers
 - Space-Time Budget
3. Are transport environs unique
 - Network 'position'
 - Rhythm and 'busyness'

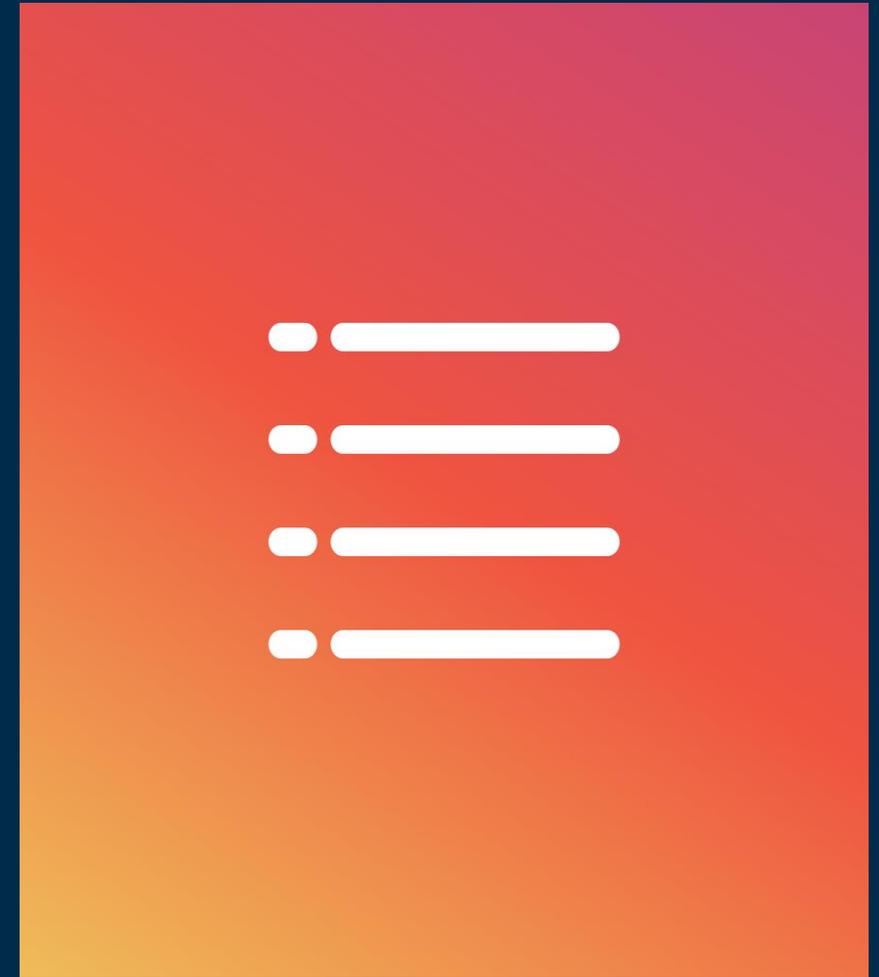


Image taken from www.pixabay.com (and used under a Creative Commons Licence)

1) Public Transport and its Environs



Image taken from www.pixabay.com (and used under a Creative Commons Licence)

1) Public Transport

- British/American English
 - *public transport, mass transit, rapid transit or public transit*
- No widely accepted definition:
- Key characteristics:
 - A system used by the **public**, often for **transporting mass numbers** of passengers
 - Generally a **for-hire system** that occurs across a **fixed route or line**
 - Range of **modes**, railway (light rail, metro/subway/ underground, high-speed rail, and intercity), buses, trolleybuses, trams; ferries; coaches; airlines; water taxis, gondolas; and pedi cabs

Newton, (2014)



David Preston @thewzrdharry



dLucas Gallone @lucasgallone

1) Public Transport

- Key characteristics (cont)
 - **Bicycle hire schemes** could be included
 - In some regions “**collective transport**” considered form of public transport, (eg minibus/fixed group taxi - South America and Russia)
 - “**Paratransit**” sometimes used in areas of low demand and for people who need a door-to-door service
 - There is a debate as to whether or not **taxis** are part of the public transport system



Linda Xu @rhindaxu



Newton, (2014)



JJ Ying @jjying

1) Public Transport and its Environs

Whole Journey Approach

'door to door'

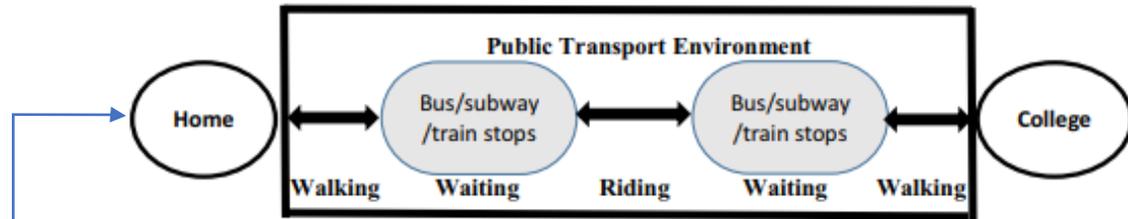


Fig. 1 The journey to and from college: crime victimization and the whole journey approach

Natarajan et al, 2017

Booking Online

Public Transport and its Environs

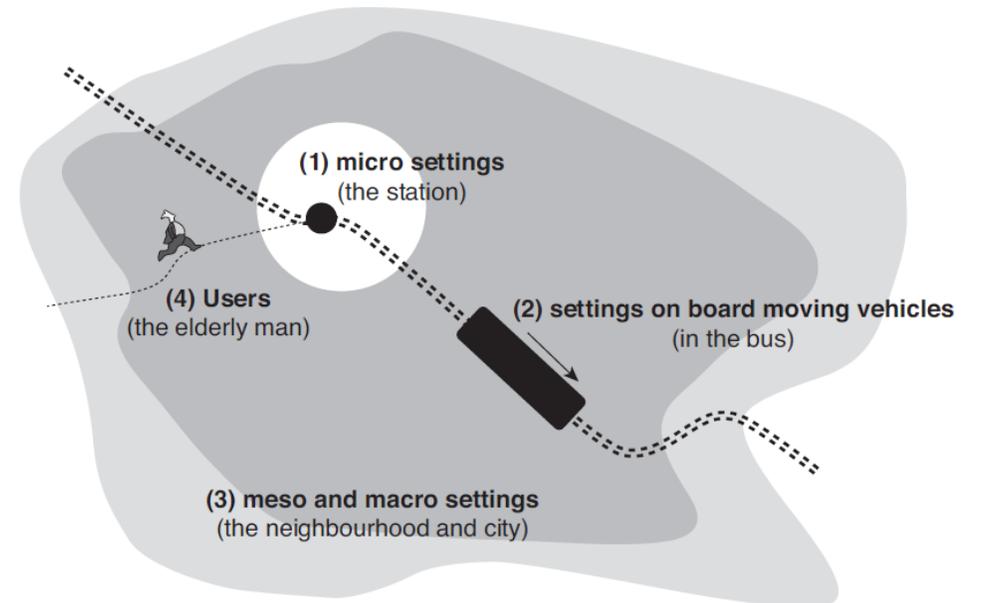


Figure 1.1 Security and safety in transit environments: the conceptual framework.

Ceccato and Newton, 2015

1) Public Transport, Crime and its Environs

What crimes might happen at stops and stations

- Waiting/connecting

What crimes might happen 'en-route'

- Inside closed/confined environment (internal)
- Travelling through changing external environment (familiarity)
- Constant boarding/alighting of passengers at each stop
- Missiles projected at moving vehicles (external to internal)

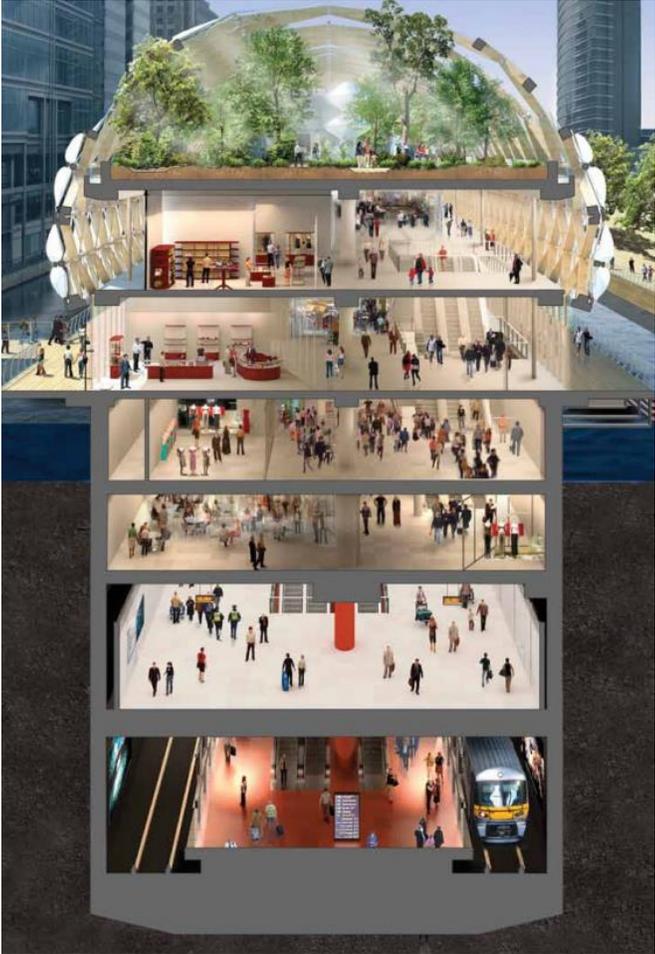
What other crimes might happen

- Line of route (trespassing)
- Metal theft
- Revenue fraud
- Damage to infrastructure
- Commercial burglary
- Shoplifting
- Who are the victims/targets and in what setting
 - Passengers: Commuters/Tourists/Social Visits/Retail/Education/Other
 - Staff: Revenue protection/engineers/cleaners/drivers/retail workers/other
 - Vehicles
 - Stations and station furniture
 - Tracks

1) Public Transport Complexity



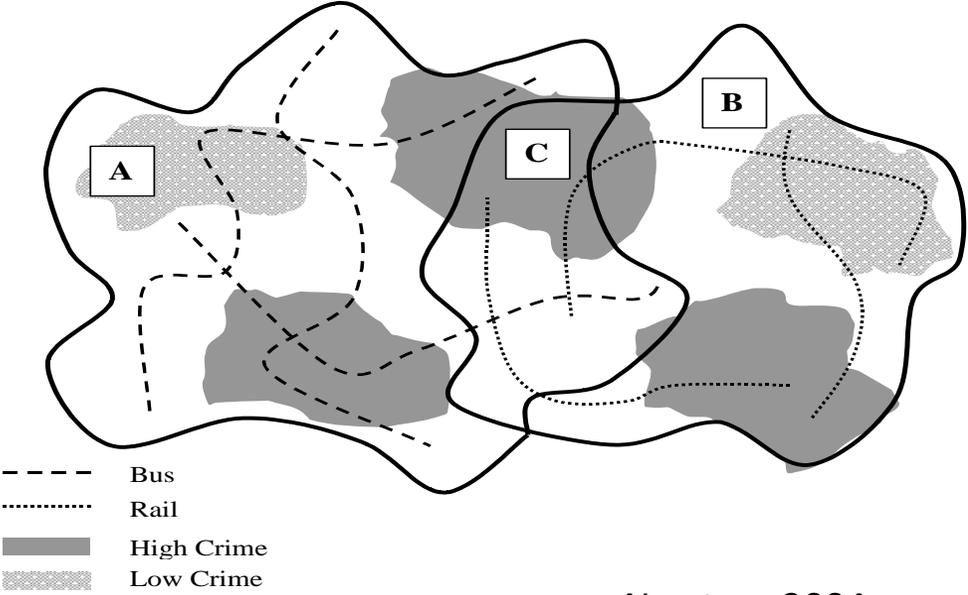
Image taken from www.pixabay.com (and used under a Creative Commons Licence)



By Rob Faulkner from Leeds, United Kingdom - Altnabreac Station Approaching Train to Wick, CC BY 2.0, <https://commons.wikimedia.org/w/index.php?curid=38403111>



1) Public Transport: static and dynamic crime events



Newton, 2004a

Static (stationary)



Eric Gilkes @Ericgilkes

Non-Static (dynamic/moving settings)



Lokesh Anand @robotchicken

Newton, 2004a

1) Public Transport – the Analytical Challenge

The Analytical Problem

Crime event occurs at time and place

‘Moving hot spots’

- VAP at bus stop
- VAP on moving bus
- Criminal damage to bus shelter
- Pick-pocketing on underground



1) Public Transport – the Analytical Challenge

The Analytical Problem

Crime event occurs at time and place

‘Moving hot spots’

- VAP at bus stop
- VAP on moving bus
- Criminal damage to bus shelter
- Pick-pocketing on underground

Crime Event	<i>Static (Stationary)</i>	<i>Non-Static (Dynamic/Transient)</i>
Example	VAP at a bus stop	VAP on a moving train
Analysis Technique	Hot spot analysis	Hot route Analysis (hot lines/segments)
Crime Event	<i>Static (stationary)</i>	<i>Non-Static (Dynamic/Transient)</i>
Example	Criminal damage to bus shelter	<u>Pick-pocketing</u> on a train
Analysis Technique	Aoristic Crime Analysis	Interstitial Crime Analysis

1) Public Transport – Environs and Spatial Interplay

2 Papers influenced my thinking

- Block and Davis (1996): The **environs** of rapid transit stations: A focus for street crime or just another risky place?
- Robinson and Goriadano: (2011) **Spatial interplay**: Interaction of land uses in relation to crime incidents around transit stations.

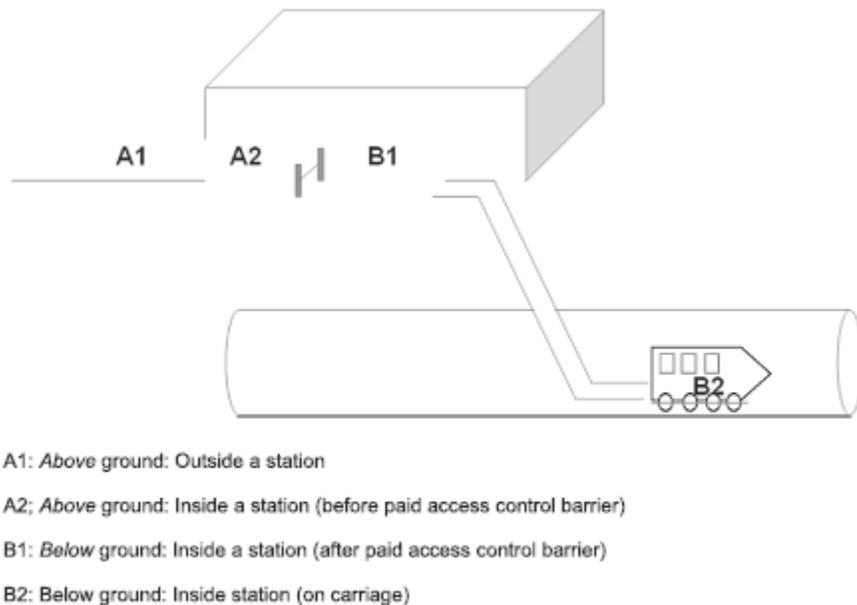


Figure 1 Potential theft settings at transit stations.

In and around: identifying predictors of theft within and near to major mass underground transit systems

Above and below: measuring crime risk in and around underground mass transit systems.

Newton et al, 2014 a,b)

2) Do 'risky places' theories/concepts apply?

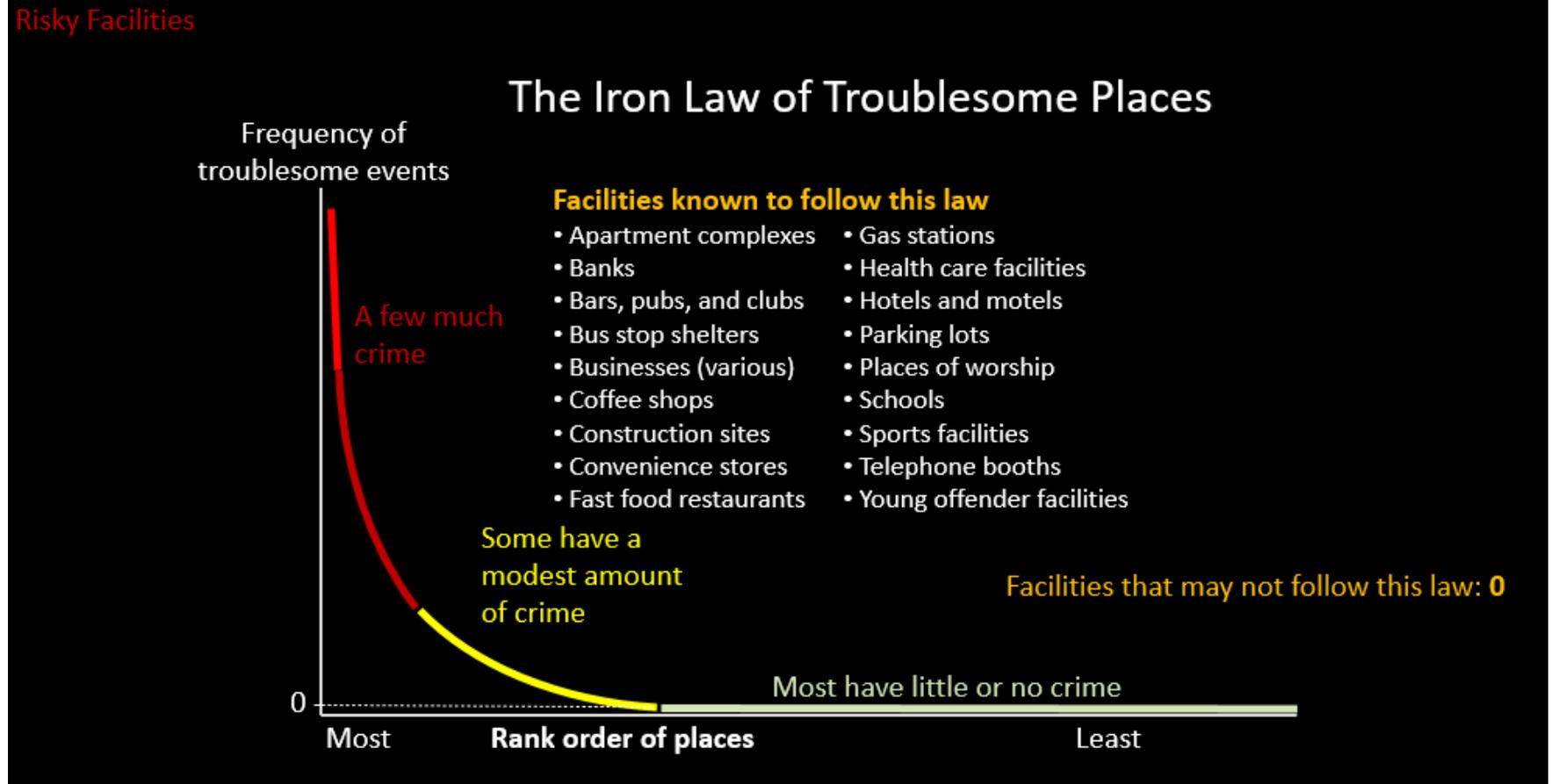


Image taken from www.pixabay.com (and used under a Creative Commons Licence)

2) Can we class PT 'risky facilities'



- Facility
- Owner
- Bounded
- Small



Eck, 2021: after Wilcox and Eck, 2011

2) Can we class PT as a risky facility

Criminal Damage to Bus Shelters



2) Can we class PT as a risky facility

Criminal Damage to Bus Shelters

Table 5. Resource Target Table for the Volume of Shelter Damage on Merseyside, Jan to Dec 2000.

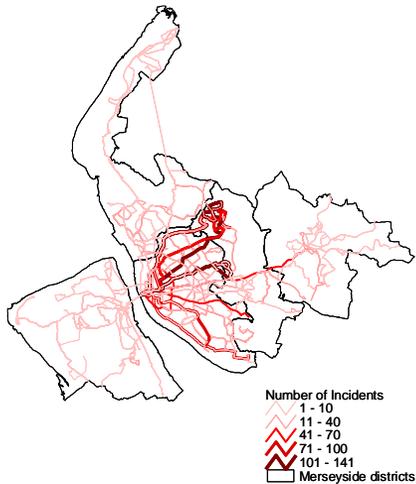
Incidents per bus shelter	Number of bus shelters affected	Cumulative number of bus shelters	Cumulative number of incidents	Cumulative percentage of bus shelters	Cumulative percentage of incidents
29	1	1	29	0.04	0.76
27	1	2	56	0.08	1.47
25	1	3	81	0.12	2.12
24	1	4	105	0.16	2.75
23	1	5	128	0.20	3.35
20	1	6	148	0.23	3.88
17	1	7	165	0.27	4.32
16	3	10	213	0.39	5.58
15	4	14	273	0.55	7.15
14	5	19	343	0.74	8.99
13	2	21	369	0.82	9.67
12	5	26	429	1.02	11.24
11	13	39	572	1.53	14.99
10	14	53	712	2.07	18.66
9	10	63	802	2.46	21.02
8	22	85	978	3.33	25.63
7	29	114	1181	4.46	30.95
6	33	147	1379	5.75	36.14
5	60	207	1679	8.10	44.00
4	89	296	2035	11.58	53.33
3	151	447	2488	17.49	65.20
2	290	737	3068	28.83	80.40
1	748	1485	3816	58.10	100.00
0	1071	2556	n/a	100.00	n/a

Resource Target Table with *Incidents Standardised per 10,000 Passengers

Incidents* per bus stop	Number of bus stop affected	Cumulative number of bus stops	Cumulative number of incidents	Cumulative percentage of bus stops	Cumulative percentage of incident
222	1	1	222	0.04	6.58
62	2	3	346	0.12	10.27
58	1	4	405	0.16	12.00
27	1	5	431	0.20	12.78
20	4	9	512	0.35	15.18
19	1	10	532	0.39	15.76
18	4	14	604	0.55	17.88
17	1	15	621	0.59	18.40
16	1	16	637	0.63	18.86
15	4	20	698	0.78	20.68
14	4	24	753	0.94	22.32
13	6	30	833	1.17	24.67
12	4	34	881	1.33	26.10
11	5	39	936	1.53	27.72
10	5	44	986	1.72	29.22
9	4	48	1022	1.88	30.27
8	7	55	1078	2.15	31.93
7	11	66	1154	2.58	34.21
6	29	95	1329	3.72	39.37
5	39	134	1526	5.24	45.23
4	42	176	1695	6.89	50.22
3	85	261	1942	10.21	57.55
2	177	438	2290	17.14	67.85
1	1047	1485	3375	58.10	100.00
0	1071	2556	n/a	100.00	n/a

2) Can we class PT as a risky facility

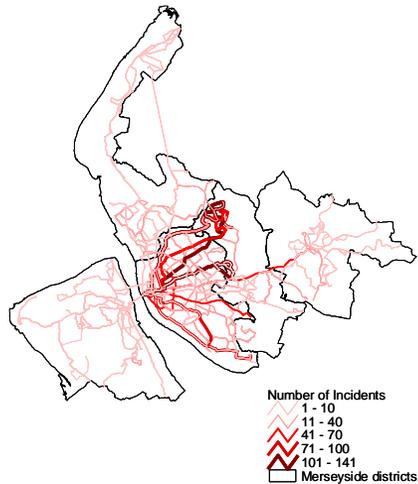
Crime on Bus Routes



Number of Incidents	Number of Routes Affected	Cumulative Number of Routes	Cumulative Number of Incidents	Cumulative Percentage of Routes	Cumulative Percentage of Incidents
272	1	1	272	0.1	4.8
270	1	2	542	0.3	9.6
269	1	3	811	0.4	14.4
255	1	4	1066	0.6	19.0
247	1	5	1313	0.7	23.4
213	1	6	1526	0.8	27.1
198	1	7	1724	1.0	30.7
167	1	8	1891	1.1	33.6
154	1	9	2045	1.3	36.4
150	1	10	2195	1.4	39.0
145	1	11	2340	1.6	41.6
143	1	12	2483	1.7	44.2
137	1	13	2620	1.8	46.6
126	1	14	2746	2.0	48.9
101	1	15	2847	2.1	50.6
90 to 100	2	17	3029	2.4	53.9
80 to 89	6	23	3525	3.3	62.7
70 to 79	2	25	3674	3.5	65.4
60 to 69	3	28	3861	4.0	68.7
50 to 59	4	32	4082	4.5	72.6
40 to 49	6	38	4341	5.4	77.2
30 to 39	7	45	4579	6.4	81.5
20 to 29	6	51	4719	7.2	84.0
10 to 19	33	84	5155	11.9	91.7
1 to 9	149	233	5621	33.0	100.0
0	474	707	n/a	100.00	n/a

2) Can we class PT as a risky facility

Crime on Bus Routes

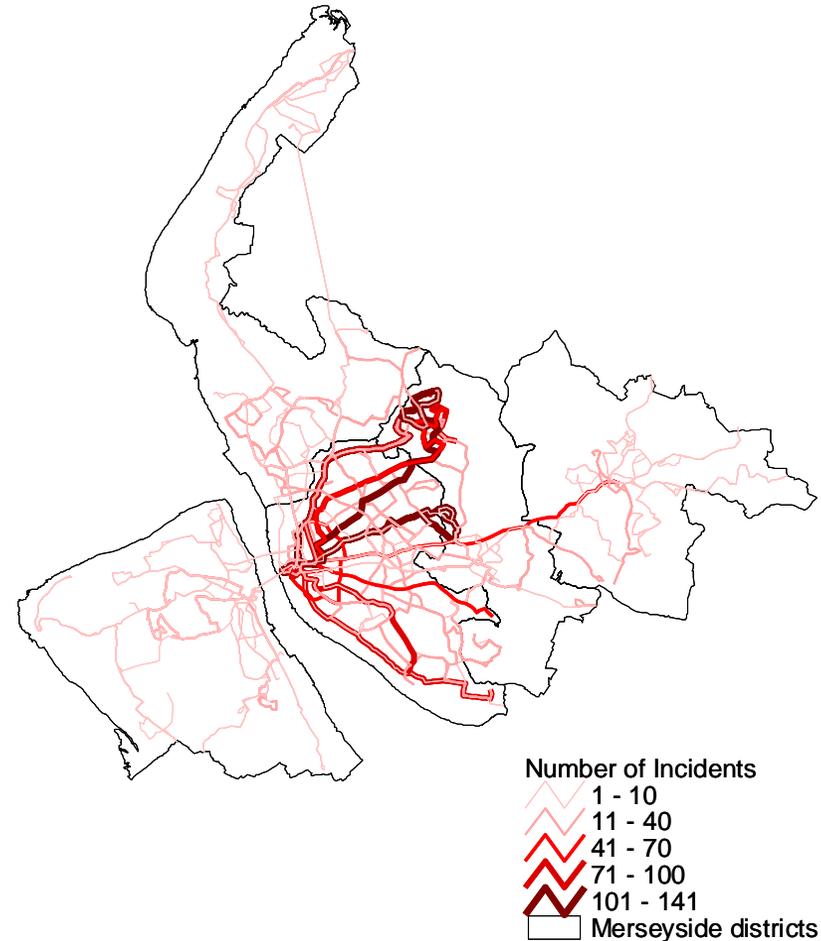


Crime Type	Time of Day							Total %	Total Number	
	Not Recorded	0600-0959	1000-1359	1400-1759	1800-2159	2200-0159	0200-0559			
Top 15 ranked routes for incidents of crime (out of 707 routes)										
1	Assault / VAP / Offensive Weap	0.08	0.12	0.30	0.67	0.99	0.38	0.18	2.73	179
2	Theft	0.02	0.05	0.27	0.55	0.82	0.20	0.00	1.90	125
3	Criminal Damage	0.06	0.12	0.15	0.91	1.39	0.53	0.21	3.38	222
4	Missile Projected	0.06	0.20	1.20	4.60	11.38	2.86	0.11	20.42	1340
5	Drugs/Alcohol	0.02	0.08	0.27	0.72	0.78	0.66	0.17	2.68	176
6	Disorder (all)	0.00	0.15	0.21	0.47	0.32	0.53	0.64	2.33	153
7	Disorder (youth)	0.00	0.11	0.41	1.69	3.29	1.17	0.12	6.80	446
8	Fraud / Forgery	0.05	0.26	0.49	1.30	1.49	0.56	0.72	4.86	319
9	Other	0.00	0.03	0.02	0.03	0.17	0.03	0.03	0.30	20
Total %		0.27	1.11	3.34	10.94	20.63	6.93	2.18	45.41	
Total Number		18	73	219	718	1354	455	143		2980

2) Can we class PT as a risky facility

Crime on Bus Routes

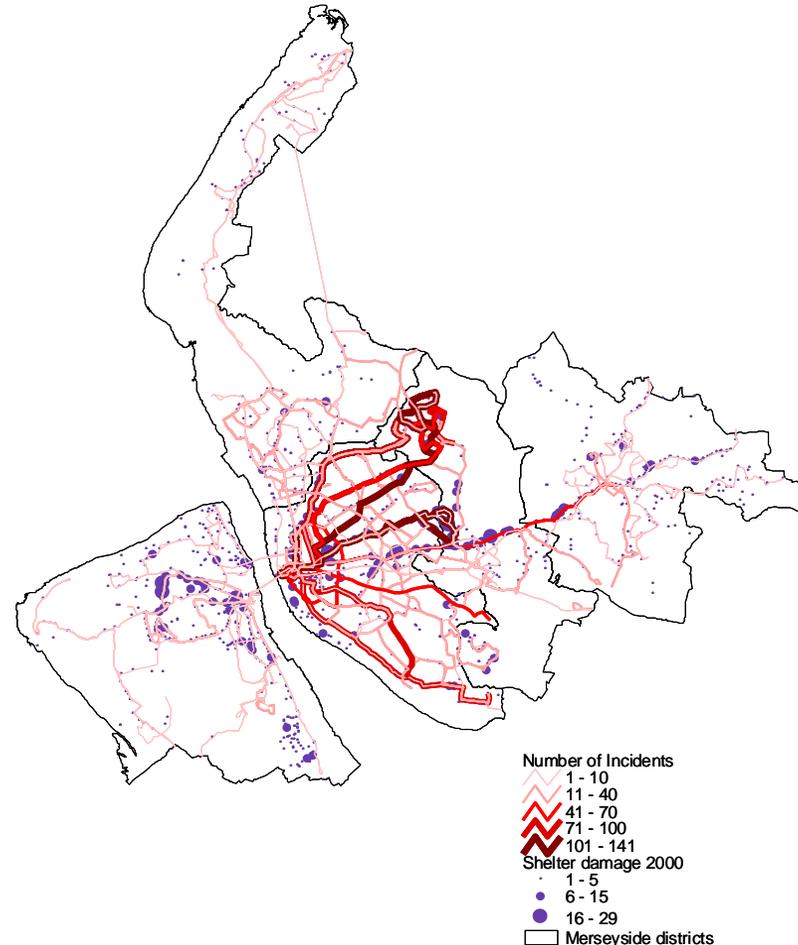
- Bus route crime
 - positively correlated with levels of crime in environs (places it traverses)
 - crime those routes that traverse high crime areas is greater than on other routes
 - The risk propensity is heightened in high crime areas
- Routes that have more stops in high crime areas have greatest risk
 - multiple entry and exit points



2) Can we class PT as a risky facility

Crime on Bus Routes

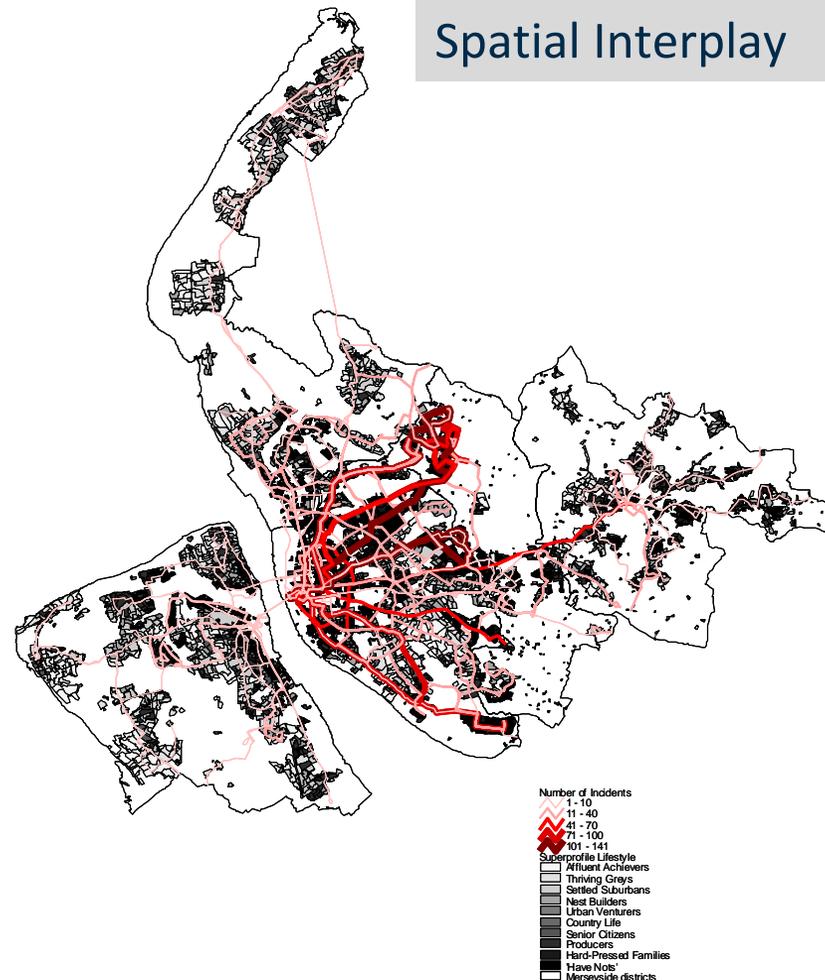
- Bus route crime
 - positively correlated with levels of crime in environs (places it traverses)
 - crime those routes that traverse high crime areas is greater than on other routes
 - The risk propensity is heightened in high crime areas
- Routes that have more stops in high crime areas have greatest risk
 - multiple entry and exit points



2) Can we class PT as a risky facility

Crime on Bus Routes

- Bus route crime
 - positively correlated with levels of crime in environs (places it traverses)
 - crime those routes that traverse high crime areas is greater than on other routes
 - The risk propensity is heightened in high crime areas
- Routes that have more stops in high crime areas have greatest risk
 - multiple entry and exit points



2) Can we class PT as a risky facility

Shoplifting at Rail Stations

Table 11.2 Station classification (England and Wales)

Station type	Number of stations	Type of station	Trips per annum
A	28	National hub	Over 2 million
B	62	Regional interchange	Over 2 million
C	236	Important feeder	0.5–2 million
D	262	Medium, staffed	0.25–0.5 million
E	591	Small, staffed	Under 0.25 million
F	996	Small, unstaffed	Under 0.25 million

Table 11.3 Shoplifting offences at rail stations by station type (2011/2012)

Station type	A	B	C	D	Sub total 1 (stations A to D)	E	F	Sub total 2 (stations A to F)
Number of stations	28	62	236	262	588	591	996	2282
Number of stations with at least one shoplifting offence	24	30	29	13	96	4	5	105
Percentage of stations with at least one shoplifting offences	85.7	48.4	12.3	5.0	16.3	0.7	0.5	4.6
Number of shoplifting offences	1259	206	114	91	1670	6	6	1682
Percentage of all shoplifting offences	74.9	12.2	6.8	5.4	99.3	0.4	0.4	100.0



Newton, 2018

2) Can we class PT as a risky facility

Shoplifting at Rail Stations

Table 11.4 Concentrations of shoplifting at rail stations (2011/2012)

Anonymised station number	Station category	Number of shoplifting offences	Number of stations	Cumulative frequency shoplifting offences	Cumulative frequency of stations	% of shoplifting offences	% of stations	Cumulative % of shoplifting offences	Cumulative % of stations
1	A	297	1	297	1	17.8	0.2	17.8	0.2
2	A	146	1	443	2	8.7	0.2	26.5	0.4
3	A	134	1	577	3	8.0	0.2	34.6	0.5
4	A	120	1	697	4	7.2	0.2	41.7	0.7
5	A	96	1	793	5	5.7	0.2	47.5	0.9
6	A	70	1	863	6	4.2	0.2	51.7	1.1
7	A	66	1	929	7	4.0	0.2	55.6	1.2
8	B	65	1	994	8	3.9	0.2	59.5	1.4
9	A	63	1	1057	9	3.8	0.2	63.3	1.6
10	A	52	1	1109	10	3.1	0.2	66.4	1.7
		20 to 50	10	1413	20	18.2	1.7	84.6	3.4
		10 to 19	8	1430	21	6.3	1.4	85.6	4.8
		5 to 9	7	1519	28	3.1	1.2	91.0	6.0
		2 to 4	24	1633	59	3.8	4.1	97.8	10.1
		1	37	1670	96	2.2	6.3	100.0	16.4
		0	492	1670	588	0.0	83.7	100.0	100.0
Total		1670	588	na	na	100.0	15.0	na	na

Crime at the Intersection of Rail and Retail

283

Newton, 2018

2) Can we class PT as a risky facility

- *Risky facilities can show up as hot spots on a city's crime map.*
- *Indeed, specific hospitals, schools, and train stations are often well-known examples.*
- *But simply treating these facilities as hot spots misses an important analytical opportunity: **comparing the risky facilities with other like facilities.***

U.S. Department of Justice
Office of Community Oriented Policing Services



COPS
COMMUNITY ORIENTED POLICING SERVICES
U.S. DEPARTMENT OF JUSTICE

Problem-Oriented Guides for Police
Problem-Solving Tools Series
No. 6

Understanding Risky Facilities

by
Ronald V. Clarke and John E. Eck

Clarke and Eck, 2007

2) Can we class PT as a risky facility

Why Do Facilities Vary in Risk?

- Variations in size
- Hot products
- Location
- Repeat victimization
- Crime attractors
- Poor design and layout
- Poor management
- Network Position
- Rhythm/'Busyness

U.S. Department of Justice
Office of Community Oriented Policing Services



COPS
COMMUNITY ORIENTED POLICING SERVICES
U.S. DEPARTMENT OF JUSTICE

Problem-Oriented Guides for Police
Problem-Solving Tools Series
No. 6

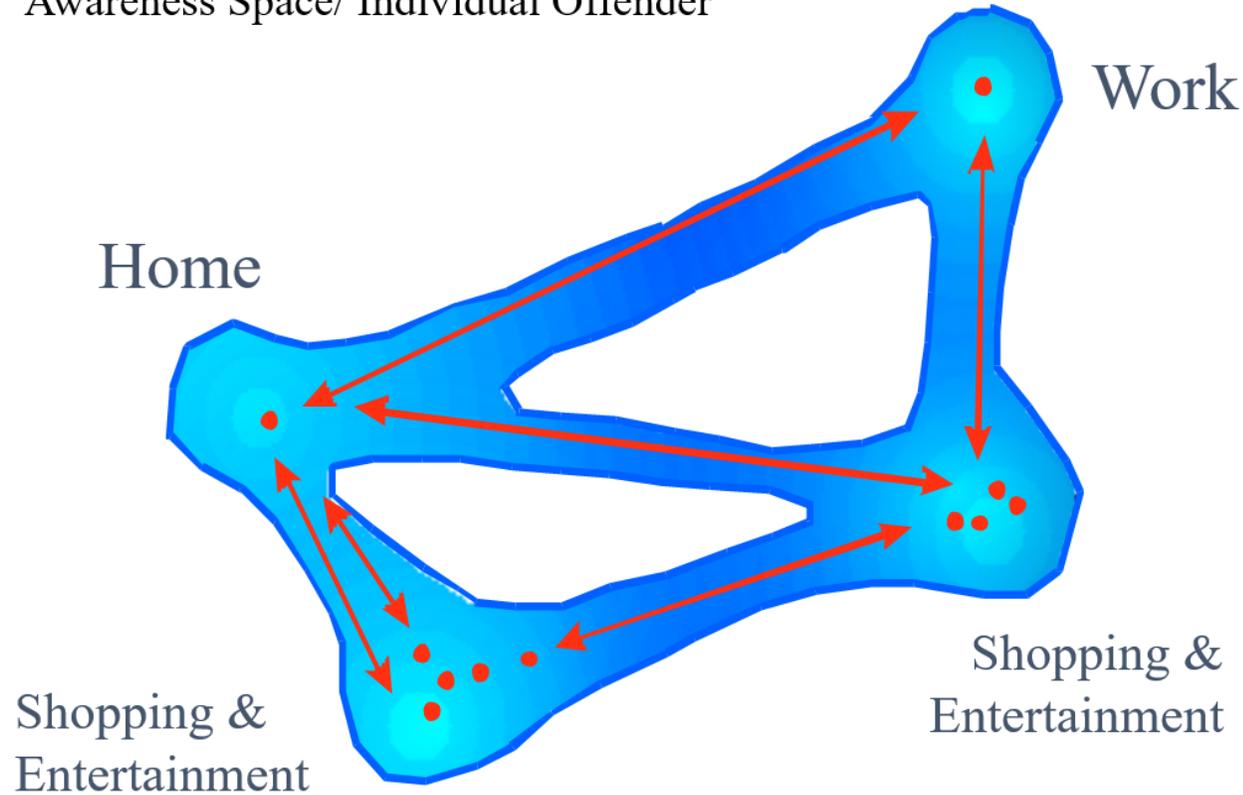
Understanding Risky Facilities

by
Ronald V. Clarke and John E. Eck

Clarke and Eck, 2007

2) Are PT places crime attractors/generators

Awareness Space/ Individual Offender



Public Transport
Nodes – stations/stops
Paths – 'en route' journeys
Edges – PT infrastructure

Brantingham, 2021 (see Seminar series Presentation 2)

2) Are PT places crime attractors/generators

Crime generators are particular areas to which large numbers of people are attracted for reasons unrelated to any particular level of criminal motivation they might have or to any particular crime they might end up committing. Typical examples might include... Crime generators produce crime by creating particular times and places that provide appropriate concentrations of people and other targets . . . Mixed into the people gathered at generator locations are some potential offenders with sufficient general levels of criminal motivation that although they did not come to the area with the explicit intent of doing a crime, they notice and exploit criminal opportunities. (Brantingham and Brantingham, 1995, p. 7)

Crime attractors are particular places, areas, neighbourhoods, districts which create well-known criminal opportunities to which strongly motivated, intending criminal offenders are attracted because of the known opportunities for particular types of crime. Examples might include. . . Crimes in such locations are often committed by outsiders to the area . . . Strongly motivated offenders will travel relatively long distances in search of a target.. The attraction is created by an ecological label . . . , often supplemented by the intending offender's personal past history, establishing that location as a known place to go for that kind of crime. (Brantingham and Brantingham, 1995, p. 8)

2) Are PT places crime attractors/generators

Crime generators are particular areas to which large numbers of people are attracted for reasons unrelated to any particular level of criminal motivation they might have or to any particular crime they might end up committing. Typical examples might include... Crime generators produce crime by creating particular times and places that provide appropriate concentrations of people and other targets . . . Mixed into the people gathered at generator locations are some potential offenders with sufficient general levels of criminal motivation **that although they did not come to the area with the explicit intent of doing a crime,** they notice and exploit criminal opportunities. (Brantingham and Brantingham, 1995, p. 7)

Crime attractors are particular places, areas, neighbourhoods, districts which create well-known criminal opportunities to which strongly motivated, intending criminal offenders are **attracted because of the known opportunities** for particular types of crime. Examples might include. . . Crimes in such locations are often committed by outsiders to the area . . . Strongly motivated offenders will travel relatively long distances in search of a target.. The attraction is created by an ecological label . . . , often supplemented by the intending offender's personal past history, establishing that location as a known place to go for that kind of crime. (Brantingham and Brantingham, 1995, p. 8)

2) Are PT places crime attractors/generators

Why was an offender there at that place and time

For most offences we don't know this

Crime attractors and generators difficult to measure

Table 22.3 Comparing Crime Numbers and Rates at Attractors and Generators

	Number	Rate
Crime generator	High	Low
Crime attractor	High	High

Newton, 2018 – developed from Clarke and Eck (2005)

Boggs (1965) states: as “...the number of events, or the numerator, varies with the type of crime, the denominator should likewise vary so that the whole number of exposures to the risk of that specific event is incorporated as the base ” Boggs, 1965, p. 900

2) Are PT places crime attractors/generators

Table 22.2 Facilities, Densities of Persons, and Attractor/Generator Properties of Place

Crime type	Facility	Level of crowd density	Attractor or generator
Disorder	Park at quiet time	Low	Attractor
Disorder	Sports event or shopping mall	High	Generator
Sexual assault (rape)	Park at quiet time	Low	Attractor
Sexual assault (groping)	Station at peak time	High	Generator
Criminal damage and arson	Park at quiet time	Low	Attractor
Theft of/from car	Unsecured car park outside rail station	Low	Attractor

Table 22.2 Facilities, Densities of Persons, and Attractor/Generator Properties of Place

Crime type	Facility	Level of crowd density	Attractor or generator
Assault	Train station late at night	Low	Generator
Assault	Nightclub	High	Generator or attractor
Robbery	Shopping center	Intermediate	Attractor
Theft from person	Bag snatch at shopping mall	Intermediate	Attractor or generator
Drug dealing	Park or open market	Intermediate	Attractor
Pickpocketing and petty theft	Train station	High	Generator

2) Are PT places crime attractors/generators

Routine Activities

Hawley identified three important temporal components of community structure:

*(1) rhythm, the **regular periodicity** with which events occur, as with the **rhythm of travel activity**;*

*(2) **tempo**, the number of events per unit of time, such as the number of criminal violations per day on a given street; and*

*(3) **timing**, the coordination among different activities which are more or less interdependent, such as the coordination of an offender's rhythms with those of a victim (Hawley, 1950:289)*

Cohen and Felson 1979.



Image taken from www.pixabay.com (and used under a Creative Commons Licence)

2) Are PT places crime attractors/generators

Routine Activities

Hawley identified three important temporal components of community structure:

*(1) rhythm, the **regular periodicity** with which events occur, as with the **rhythm of travel activity**;*

(2) tempo, the number of events per unit of time, such as the number of criminal violations per day on a given street; and

(3) timing, the coordination among different activities which are more or less interdependent, such as the coordination of an offender's rhythms with those of a victim (Hawley, 1950:289)

Cohen and Felson 1979.



Image taken from www.pixabay.com (and used under a Creative Commons Licence)

2) Are PT places crime attractors/generators

Density Hypothesis

Street robbery (Angel. 1968)

- more likely intermediate levels of pedestrian traffic
- Less likely low or high crowds densities
- Suggested “**critical intensity zone**” for robbery to occur

Second critical zone (Loukaitou-Sideris,1999)

- as places get busier, serious robbery and violence offenses less likely
- as crowd density increases further, a new critical zone reached
- other offenses emerge, such as minor theft and pickpocketing

Routine Activities Theory

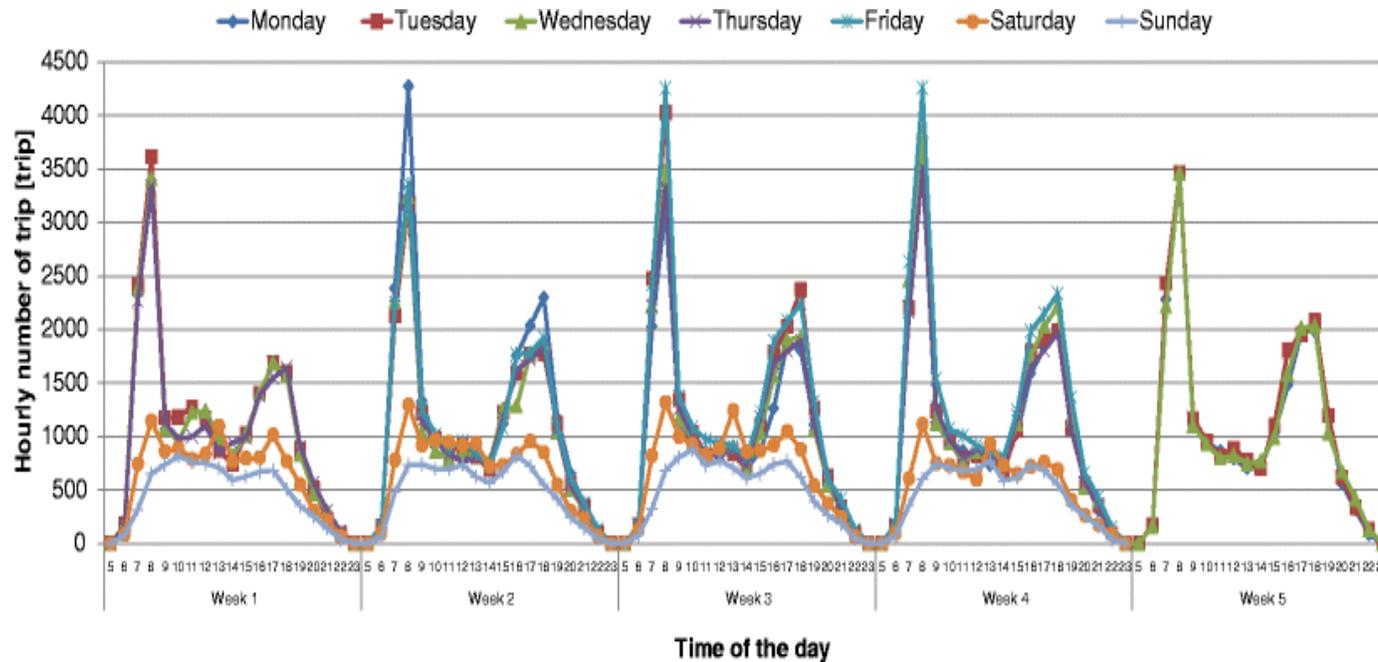
- Pedestrian traffic sparse = too few targets for offenders
- Pedestrian traffic high = many guardians present to intervene

Routine Activities Theory

- In high-density crowds
- Presence of more people does not increase capable guardianship
- Acts as barrier to detection, giving anonymity to offenders, reducing visibility, limiting likelihood of offenders being spotted or identified

2) Are PT places crime attractors/generators

The temporal nature of generators/attractors



Well defined temporal rhythm
Regular Periodicity
Known peak hours and off peak travel
Switch between 'busy' and 'quiet'

Nishiuchi et al, 2013

2) Are PT places crime attractors/generators

Density, Proximity, and 'Busyness'

Do we have an 'optimal level of busyness/quietness for:

- 1) *Criminal Damage*
- 2) *Robbery*
- 3) *Pickpocketing*
- 4) *Sexual Assault*
- 5) *Drug Dealing*

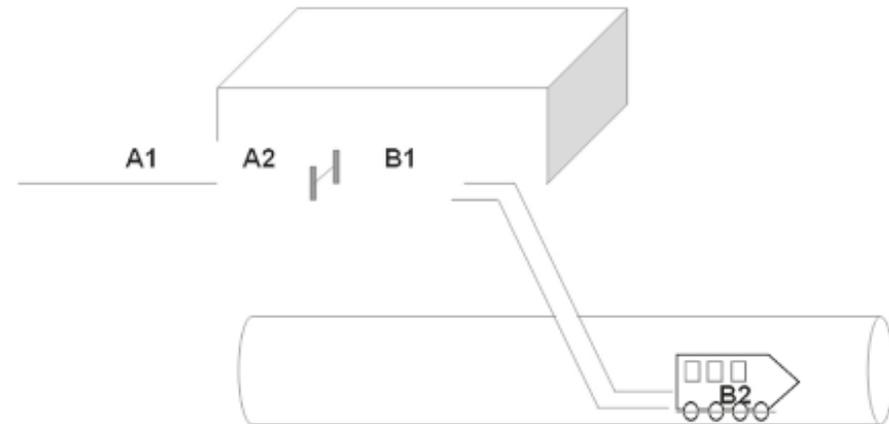
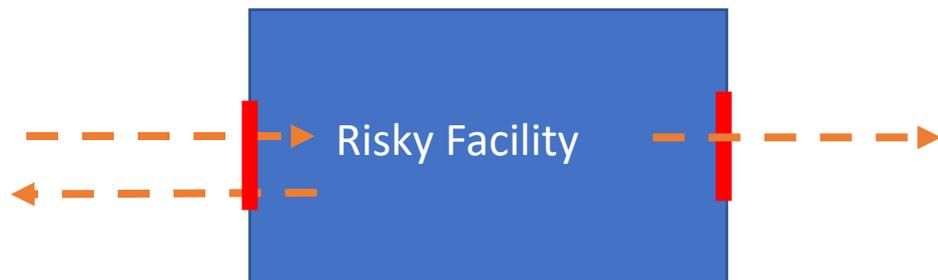
A range of factors need to be considered including:

- how many people are present: **volume**
- the number of people relative to the size of the space: **density**
- how close together these people are: **proximity**
- for how long they are in close proximity: **proximate interaction**
- All are related to 'flow' and **rhythm** of passengers

3) Does PT act as a crime radiator/absorber

‘True radiator’

- You can actually arrive at the station from inside and move out
- Underground system connected by ‘pipes’
- Overground system separated by internal/external environment of a vehicle
- You don’t have to enter and exit via a boundary entrance
- Enter station at B2



A1: Above ground: Outside a station

A2: Above ground: Inside a station (before paid access control barrier)

B1: Below ground: Inside a station (after paid access control barrier)

B2: Below ground: Inside station (on carriage)

Figure 1 Potential theft settings at transit stations.

3) Does PT act as a crime radiator/absorber

- Several studies test for correlations between PT and surrounding environs (rail and bus)
 - Block and Davis (1996)
 - Levine et al (1986)
 - Newton, 2008
 - Bernasco and Block, 2011
 - Ceccato et al, 2013
 - Newton et al (2014 a,b)
 - Stucky and Smith (2017)
 - Gerell (2018)
 - Zahnow and Corcoran (2019)
 - Ceccato & Gustavo, 2020

All demonstrate a spatial relationship between crime at transit settings and crime in transit environs

What is nature of spatial interplay/transmission/interaction between transit and environs?

Included Generators and Attractors (Newton, 2014b)

- Theft - high theft counts and high theft rates (attractor)

Included Radiators and Absorbers (Ceccato & Gustavo, 2020)

- Robbery – radiator
- Theft – radiator/absorber effect

3) Does PT act as a crime radiator/absorber

What are the mechanisms for this spatial interaction

Three Hypotheses

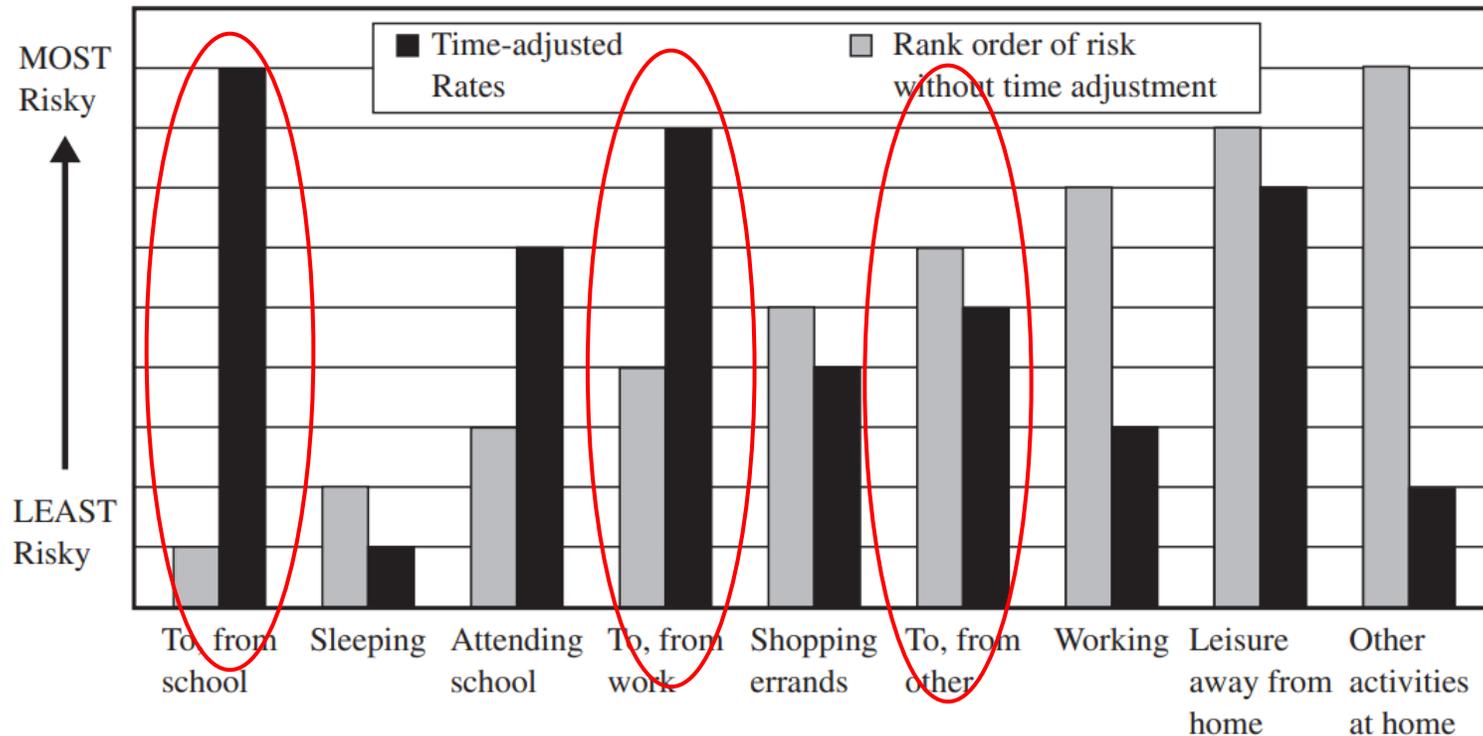
1. High crime public transport settings are a receptor of being located in a high crime area – situated in high crime areas (absorber)
2. Public transport settings act as an input to the area, and criminogenic public transport facilities radiate crime out to surrounding area (radiator)
3. Public transport settings act as both an absorber of crime and a radiator of crime – with a two way interplay/interaction between the transport facility and the features/facilities of its nearby environs.

Move from thinking about **spatial interplay of PT with land use**

Thinking about **spatial interplay of PT and ‘Use of land’ or ‘use of facilities’**

4) Are Space-Time/Activity Budgets Useful

Probably



Lemieux and Felson (2012)

3) Are PT systems and their environs unique as risky places for crime



Image taken from www.pixabay.com (and used under a Creative Commons Licence)

3) Public Transport as a uniquely risky setting

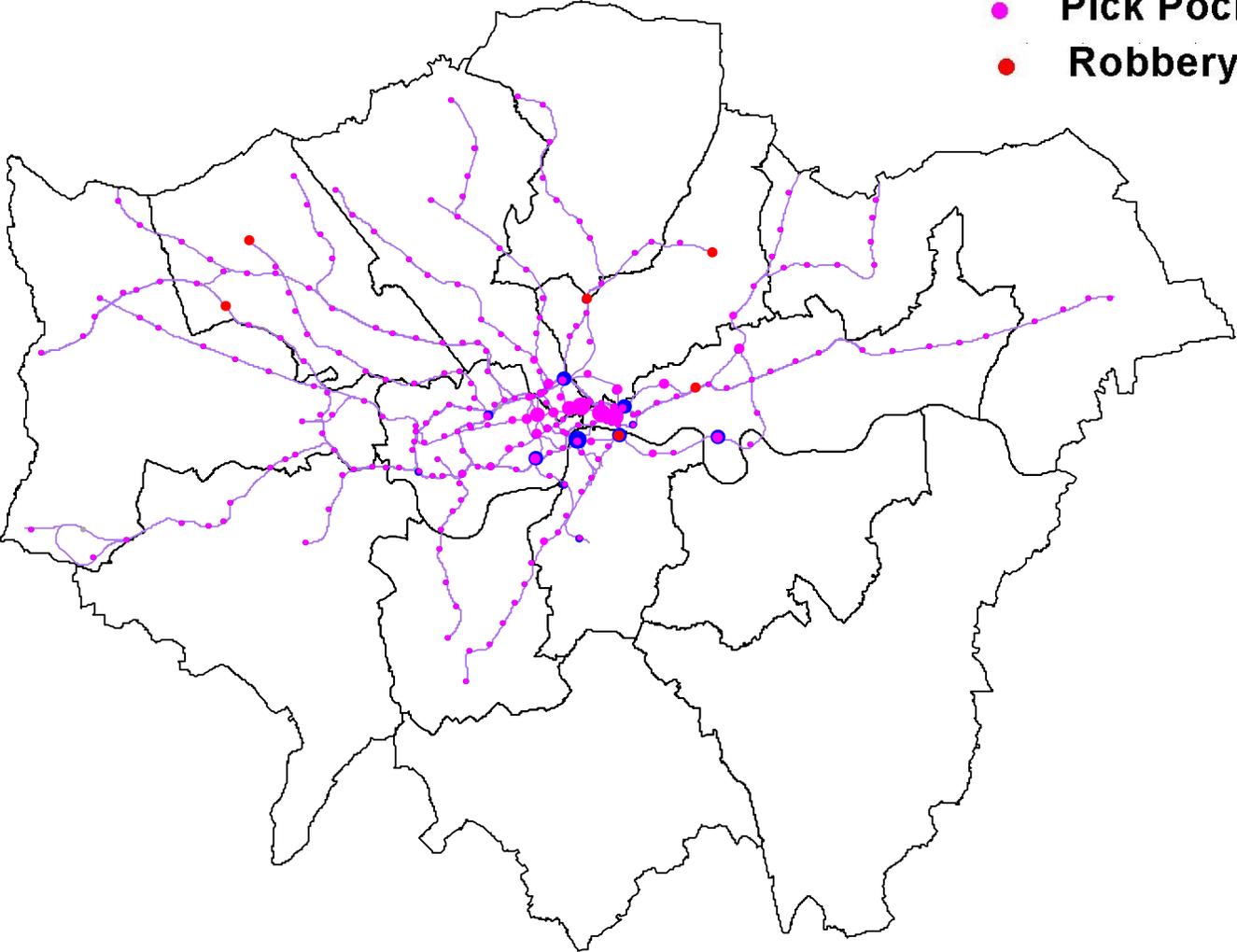
- Do other risky facilities have same regular rhythm/periodicity of travel
 - Daily basis throughout year
- Public Transport also has directionality of travel
 - Journey from 'activity node 1' to 'activity node 2'
 - Return journey 'activity node 2' to 'activity node 1'
 - Multiple Trips
- What is the importance of a stations position on the network
 - Newton, 2014 a,b
- End station/Transit station/Central Station
 - Ceccato & Gustavo, 2020

Network Position



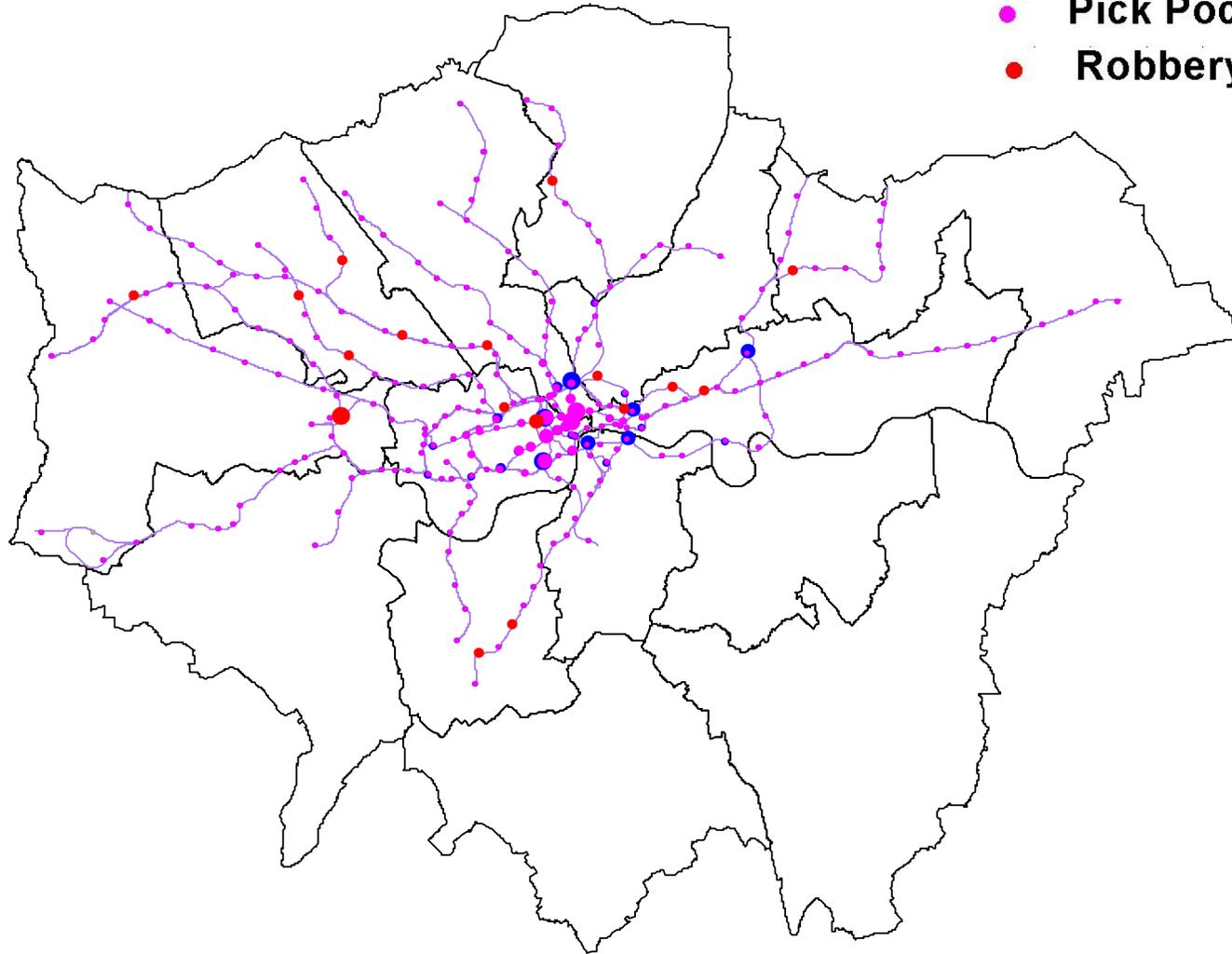
Am peak (0700-0959)

- Passengers
- Pick Pocketing
- Robbery



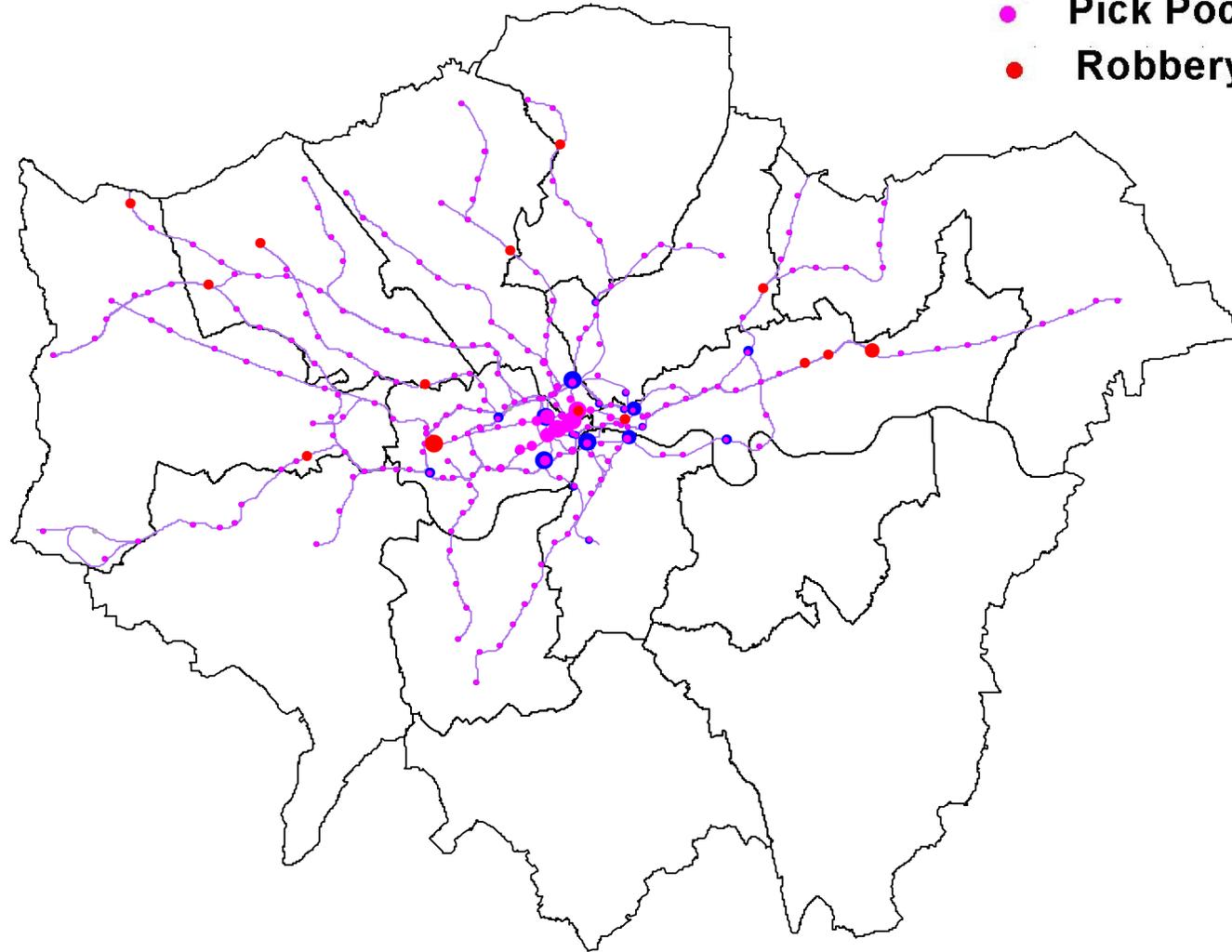
Inter-peak (1000-1559)

- Passengers
- Pick Pocketing
- Robbery



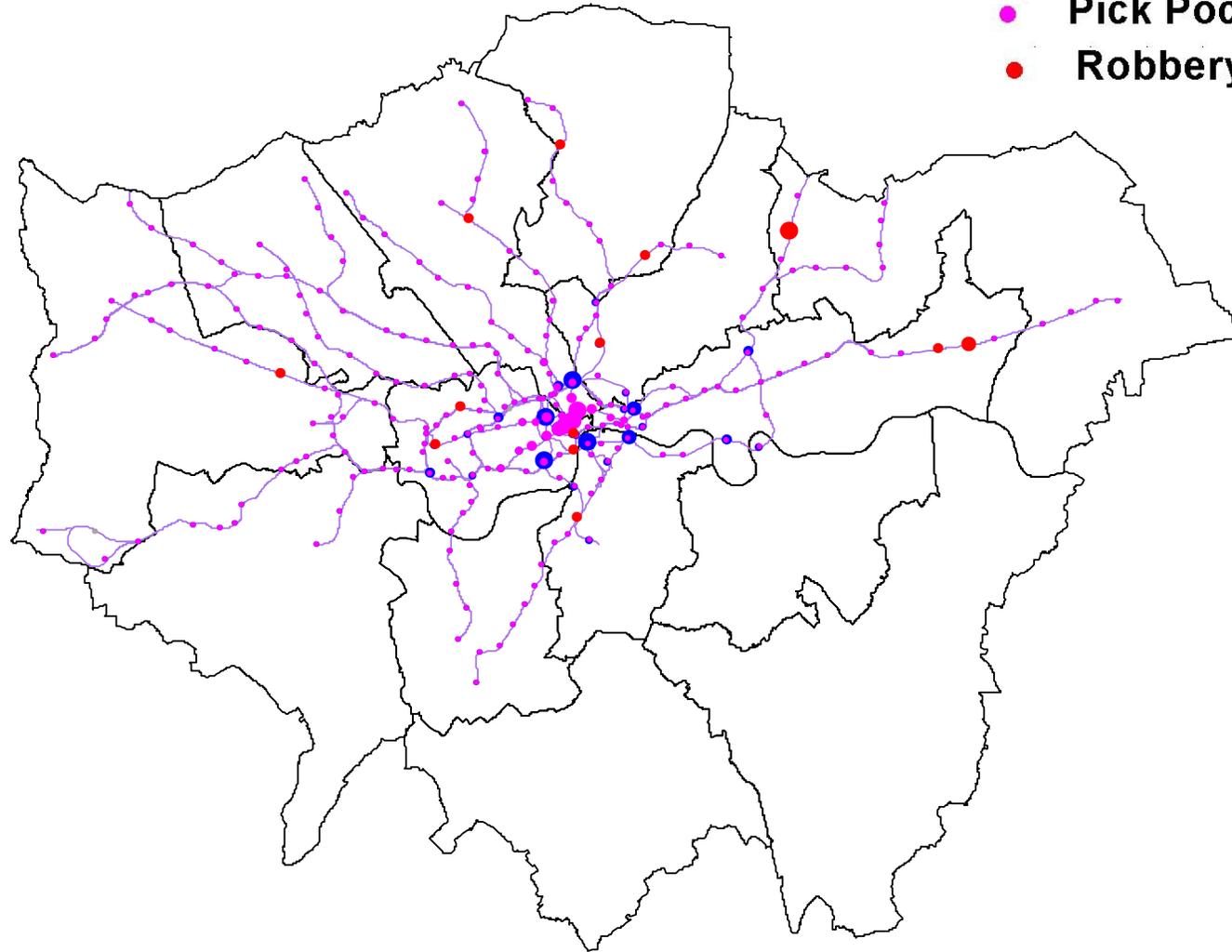
Pm peak (1600-1859)

- Passengers
- Pick Pocketing
- Robbery



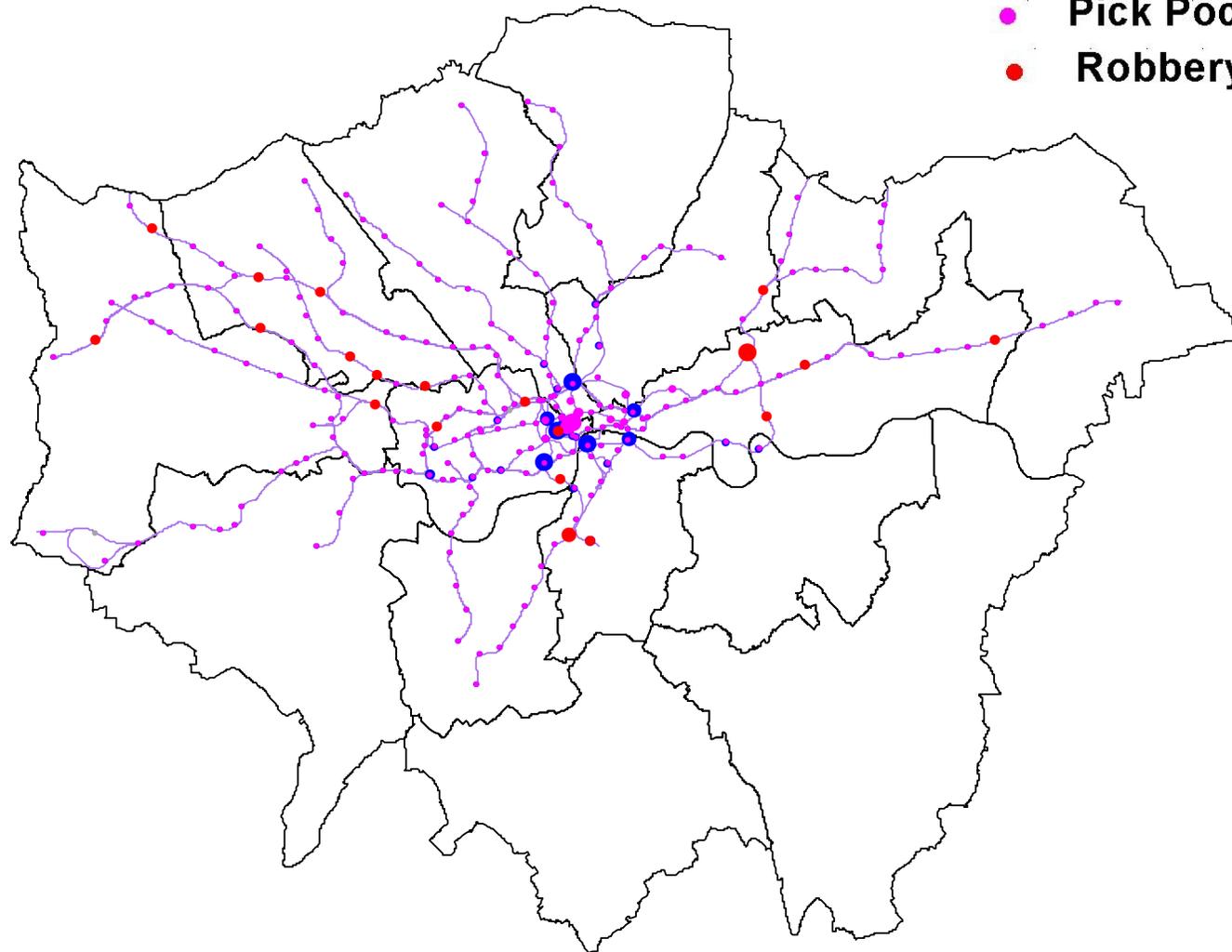
Evening (1900-2159)

- Passengers
- Pick Pocketing
- Robbery



Late (2200-0159)

- Passengers
- Pick Pocketing
- Robbery



4) Closing thoughts



Image taken from www.pixabay.com (and used under a Creative Commons Licence)

Final Reflections

Explanations of Public Transport as Risky Places for Crime?

Variations in size

Location

Repeat victimization

Hot products

Crime attractors /generators/radiators/absorbers

Poor design and layout

Poor management

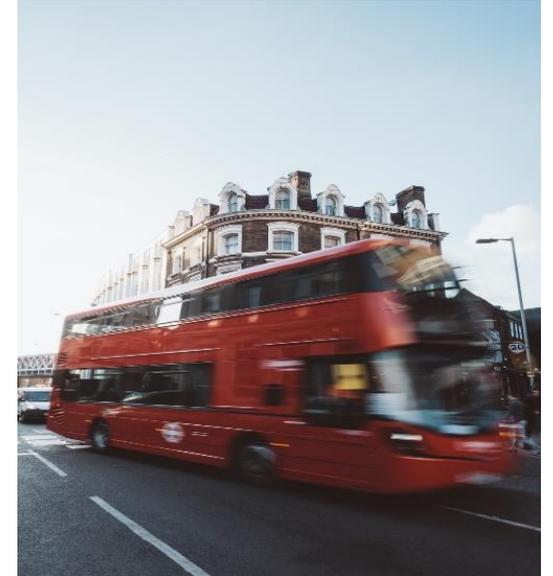
Network Position + Direction of Travel

Rhythm/ *Busyness (passenger flow/Periodicity)*

Users at different times of day

(commuters/tourists/children/elderly)

What are implications of this for crime prevention
different presentation for another day



David Preston @thewzrdharry



dLucas Gallone @lucascallone

References

- Bernasco W, Block R. Robberies in Chicago: A Block-Level Analysis of the Influence of Crime Generators, Crime Attractors, and Offender Anchor Points. *Journal of Research in Crime and Delinquency*. 2011;48(1):33-57. doi:[10.1177/0022427810384135](https://doi.org/10.1177/0022427810384135)
- Block, R, Davis, S (1996) The environs of rapid transit stations: A focus for street crime or just another risky place. *Crime Prevention Studies* 6: 237–257.
- Brantingham, P. and Brantingham, P. (1995) Criminality of place: Crime generators and crime attractors. *European Journal on Criminal Policy and Research* 3 (3): 5–26.
- Ceccato, V., Uittenbogaard, A. & Bamzar, R. Security in Stockholm's underground stations: The importance of environmental attributes and context. *Secur J* **26**, 33–59 (2013). <https://doi.org/10.1057/sj.2011.32>
- Ceccato, V. and Newton, A., (2015). Aim, scope, conceptual framework and definitions. In: V. Ceccato, and A. Newton, eds., *Safety and security in transit environments. Crime prevention and security management* . London: Palgrave Macmillan, pp. 3-22. ISBN 9781349571796
- Ceccato, V., Moreira, G. The Dynamics of Thefts and Robberies in São Paulo's Metro, Brazil. *Eur J Crim Policy Res* (2020). <https://doi.org/10.1007/s10610-020-09462-3>
- Clarke, R.V.G., and J.E. Eck. 2007. *Understanding risky facilities*. Washington, DC: US Department of Justice, Office of Community Oriented Policing Services.
- Cohen, L.E. and Felson, M. (1979) Social Change and Crime Rate Trends: A Routine Activity Approach. *American Sociological Review*. Vol. 44, No. 4, pp 588–608.
- Gerell, M (2018) Bus stops and violence, are risky places really risky? *European Journal on Criminal Policy and Research* 24: 351–371.
- Lemieux, A. M., and Felson, M., (2012). Risk of Violent Crime Victimization During Major Daily Activities. *Violence and Victims*. Vol. 27, n.5 635-655.
- Levine, N. , M. Wachs , and E. Shirazi . 1986. Crime at bus stops: A study of environmental factors. *Journal of Architectural and Planning Research* 3 (4): 339-61.

References

- Natarajan, M., Schmuhl, M., Sudula, S. et al. Sexual victimization of college students in public transport environments: a whole journey approach. *Crime Prev Community Saf* 19, 168–182 (2017). <https://doi.org/10.1057/s41300-017-0025-4>
- Nishiuchi, H., King, J. & Todoroki, T. Spatial-Temporal Daily Frequent Trip Pattern of Public Transport Passengers Using Smart Card Data. *Int. J. ITS Res.* 11, 1–10 (2013). <https://doi.org/10.1007/s13177-012-0051-7>
- Newton, A (2004a) Crime and Disorder on Buses: Towards an Evidence Base for Effective Crime Prevention. Unpublished Ph.D. Thesis, University of Liverpool. Liverpool, UK
- Newton, A., (2004b). Crime on public transport: 'static' and 'non-static' (moving) crime events. *Western Criminology Review*, 5 (3), pp. 25-42. ISSN 1096-4886
- Newton, A (2008) A study of bus route crime risk in urban areas: The changing environs of a bus journey. *Built Environment* 34(1): 88–103. <https://doi.org/10.1186/2193-7680-3-1>
- Newton, A (2014) Crime on public transport. In: Bruinsma G and Weisburd D (eds) *Encyclopedia of Criminology and Criminal Justice*. New York, NY: Springer, pp.709–720. <http://doi.org/10.1007/978-1-4614-5690-2>
- Newton, A, Partridge, H, Gill, A (2014a) Above and below: Measuring crime risk in and around underground mass transit systems. *Crime Science* 3: 1. <https://doi.org/10.1186/2193-7680-3-1>
- Newton, A., Partridge, H. & Gill, A. (2014b) In and around: Identifying predictors of theft within and near to major mass underground transit systems. *Secur J* 27, 132–146. <https://doi.org/10.1057/sj.2014.2>
- Newton, A (2018) Crime at the intersection of rail and retail. In: Ceccato, V, Armitage, R (eds) *Retail Crime: International Evidence and Prevention*. London: Palgrave MacMillan, pp. 271-29
- Robinson, J, and Goridano, L (2011) Spatial interplay: Interaction of land uses in relation to crime incidents around transit stations. In: Andresen, M, Kinney, B (eds) *Patterns, Prevention, and Geometry of Crime*. London: Routledge, pp.175–199.
- Wilcox, P., & Eck, J. E. (2011). Criminology of the unpopular. *Criminology and Public Policy*, 10(2), 473–482.
- Zahnow R, Corcoran J. Crime and bus stops: An examination using transit smart card and crime data. *Environment and Planning B: Urban Analytics and City Science*. November 2019. doi:[10.1177/2399808319890614](https://doi.org/10.1177/2399808319890614)