NCS⁴ RESEARCH SEMINAR SERIES

THURSDAY, APR. 1 • 1 P.M. CDT

THE NEED FOR EVIDENCE IN SPECTATOR SAFETY AND SECURITY

An Introduction to the National Venue Safety and Security Index

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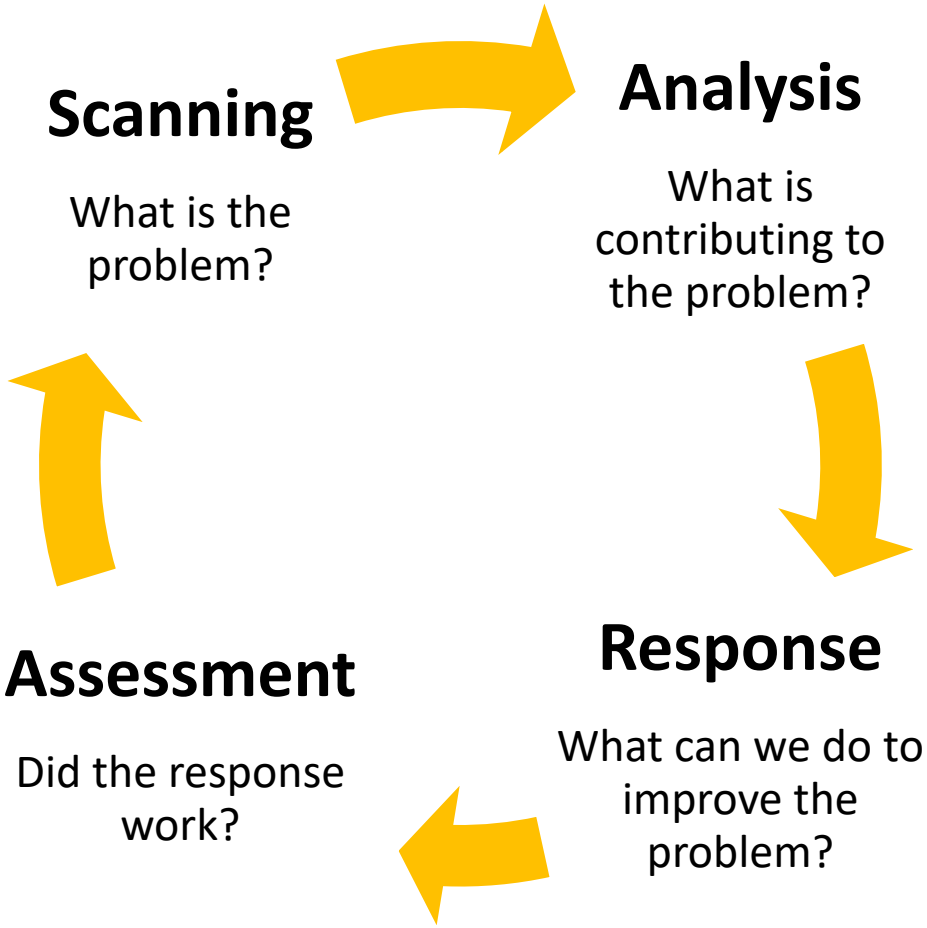
FOUNDATION OF SECURITY



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SCANNING

Systematic Reviews on Spectator Safety & Security (ongoing)

- Sports Management
- Legal

- Security Science
- Criminology
- Psychology
- Geography
- Economics
- Public Health

Aim to identify, evaluate, and summarize the findings of all relevant individual studies, thereby making the available evidence more accessible to decision makers.

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FINDINGS

In a nutshell…

- Many widespread security related problems identified
- Not specific to a particular country, state or city
- No empirical studies of security problems inside venues
- Majority of empirical studies conducted by criminologists

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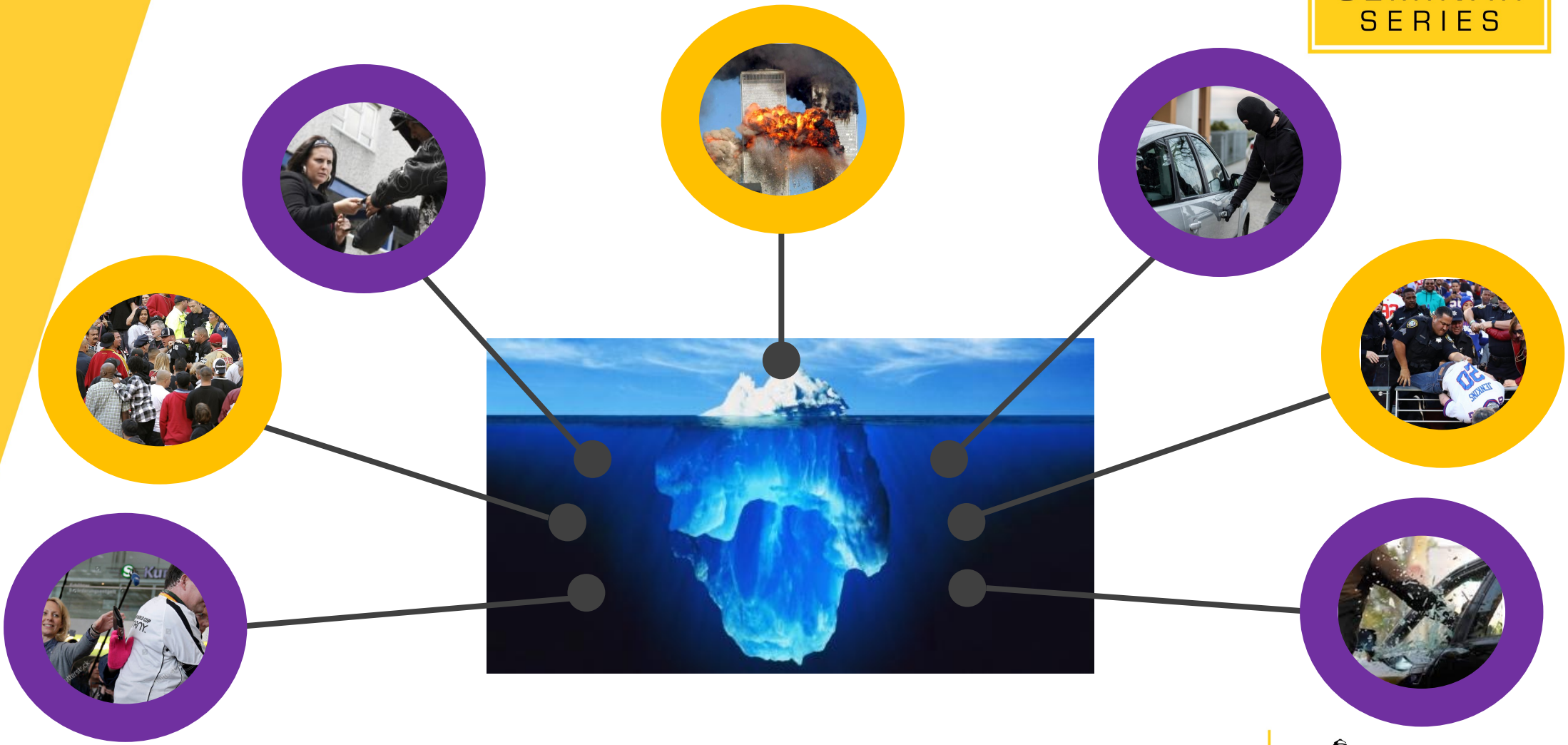
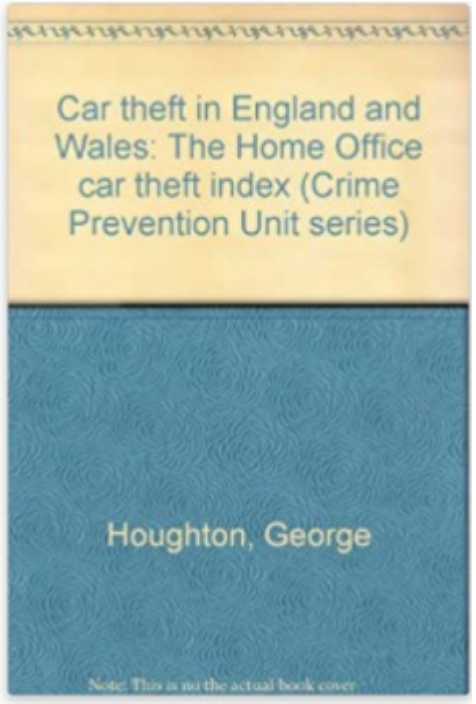


CAR THEFT INDEX

Security Hypothesis

- Crime and disorder began to decline in the mid-90s
- Not just in the U.S., but globally
- Implementation of security technology
- Empirical evidence provides support



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EVIDENCE-BASED PRACTICE

What does it mean?

- Evidence-based practice simply means to take advantage of the *known*, available research findings to help make informed decisions
- Currently (our understanding) is that there are gaps in the evidence-base
- Consider an example

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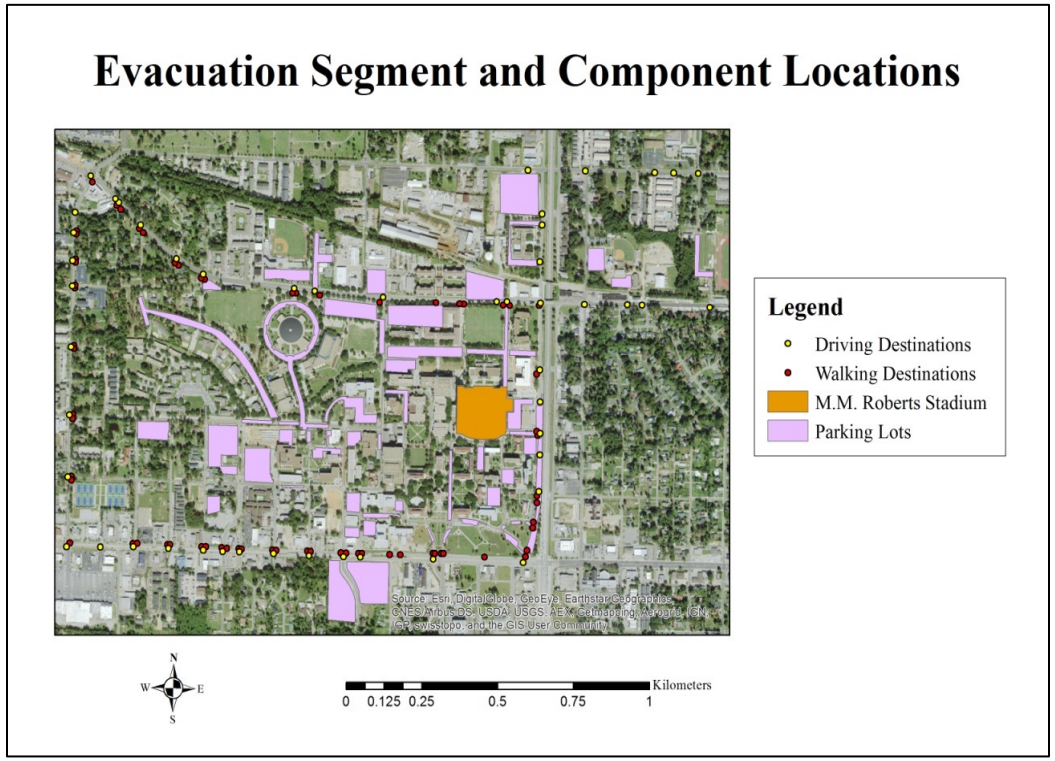
EVIDENCE-BASED RESEARCH

How is it useful?



Zale, J., B. Kar, and D. Cochran. 2018. Optimizing stadium evacuation by integrating geo-computation and affordance theory. *Journal of Emergency Management* 16(2): 81-93.

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EVIDENCE-BASED RESEARCH

How about the Venue Index?

- Where problem emerge around venues?
- When they emerge?
- Help inform the allocation of resources in game day context
- Assess the need for technologies
- Benchmarking
- Continuous improvement

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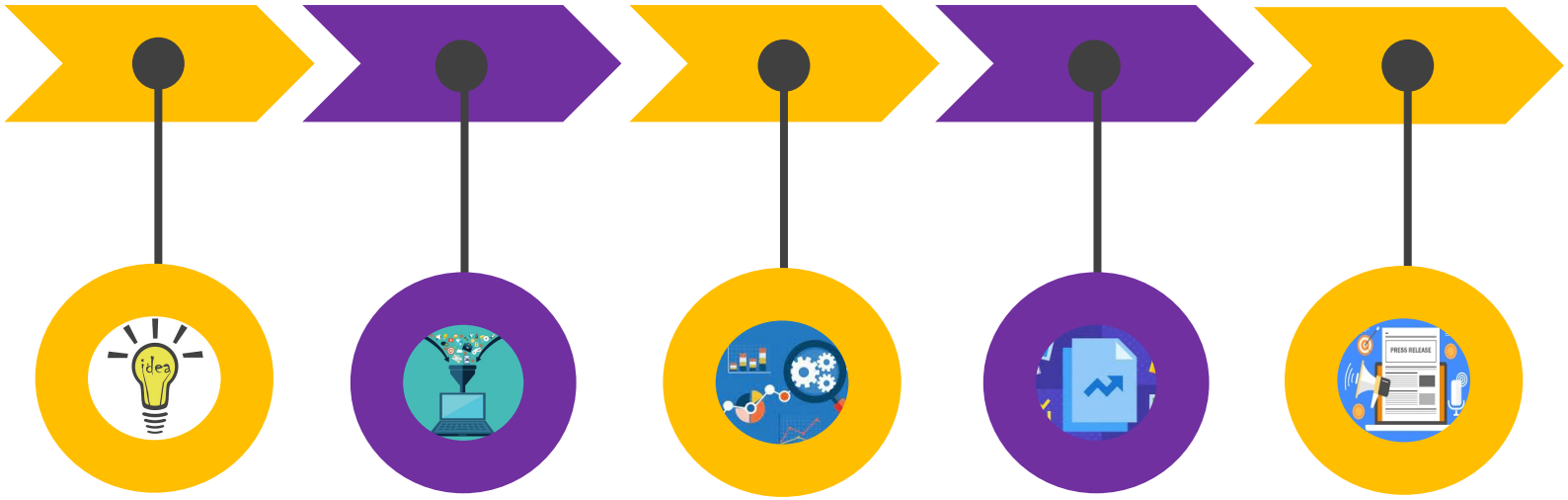
VENUE INDEX ROADMAP

What is the plan?



January 2020

June 2021

September 2021

December 2021

January 2022

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DATA SOURCES

Where did we find the data?

- ESPN, NFL, Team Websites, Wikipedia, NOAA (NCDC), NOAA (ESRL), EPA
- Crime data from Open Source Government/Police Department Websites
- Issues we ran into
  - No standardized format for reporting
  - No standardized format for file sharing
  - Not every City had the required information, which meant we had to utilize FOIA Requests

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CRIME DATA - FROM THIS

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
1	Report Nu	Report Da	Occur Dat	Occur Tim	Possible D	Possible T	Beat	Apartmen	Apartmen	Location	Shift Occu	Location T	UCR Lit	UCR #	IBR Code	Neighborh	NPU	Latitude	Longitude
2	90010930	1/1/2009	1/1/2009	1145	1/1/2009	1148	411			2841 GREE	Day Watch	8	LARCENY-	630	2303	Greenbria	R	33.68845	-84.4933
3	90011083	1/1/2009	1/1/2009	1330	1/1/2009	1330	511			12 BROAD	Day Watch	9	LARCENY-	630	2303	Downtow	M	33.7532	-84.392
4	90011208	1/1/2009	1/1/2009	1500	1/1/2009	1520	407			3500 MAR	Unknown	8	LARCENY-	630	2303	Adamsvill	H	33.75735	-84.5028
5	90011218	1/1/2009	1/1/2009	1450	1/1/2009	1510	210			3393 PEAC	Evening W	8	LARCENY-	630	2303	Lenox	B	33.84676	-84.3621
6	90011289	1/1/2009	1/1/2009	1600	1/1/2009	1700	411			2841 GREE	Unknown	8	LARCENY-	630	2303	Greenbria	R	33.68677	-84.4977
7	90011327	1/1/2009	1/1/2009	1645	1/1/2009	1645	609			1217 CARC	Evening W	24	LARCENY-	630	2303	Edgewooc	O	33.75786	-84.3487
8	90011450	1/1/2009	1/1/2009	1740	1/1/2009	1815	408			2685 METI	Evening W	12	LARCENY-	630	2303	Venetian	S	33.70827	-84.4539
9	90011608	1/1/2009	1/1/2009	1627	1/1/2009	2110	210			3393 PEAC	Evening W	8	LARCENY-	630	2303	Lenox	B	33.84676	-84.3621
10	90010721	1/1/2009	1/1/2009	815	1/1/2009	820	411			3030 HEAI	Day Watch	12	LARCENY-	630	2303	Greenbria	R	33.68841	-84.4874
11	90010108	1/1/2009	########	2000	1/1/2009	100	507			360 MARIE	Morning V	18	LARCENY-	640	2305	Downtow	M	33.76269	-84.397
12	90010247	1/1/2009	########	2300	1/1/2009	135	609			195 ARIZO	Morning V	13	LARCENY-	640	2305	Edgewooc	O	33.75902	-84.3312
13	90010267	1/1/2009	########	2230	1/1/2009	130	610			58 SAUND	Morning V	20	LARCENY-	640	2305	Kirkwood	O	33.75441	-84.3247
14	90010730	1/1/2009	1/1/2009	100	1/1/2009	900	403			1457 VENI	Day Watch	20	LARCENY-	640	2305	Venetian	S	33.71464	-84.4361
15	90010745	1/1/2009	########	2030	1/1/2009	800	208		313	3558 PIEDI	Day Watch	18	LARCENY-	640	2305	Buckhead	B	33.85115	-84.3794
16	90010774	1/1/2009	1/1/2009	130	1/1/2009	923	608			456 CAND	Day Watch	13	LARCENY-	640	2305	Candler P	N	33.76675	-84.346
17	90010805	1/1/2009	1/1/2009	900	1/1/2009	945	604		1305	626 DEKAI	Day Watch	18	LARCENY-	640	2305	Old Fourth	M	33.75283	-84.3669
18	90010917	1/1/2009	########	1915	1/1/2009	1137	503			422 9TH ST	Day Watch	13	LARCENY-	640	2305	Midtown	E	33.7808	-84.3733
19	90011020	1/1/2009	########	1900	1/1/2009	1230	509			590 W PEA	Day Watch	18	LARCENY-	640	2305	Downtow	M	33.77023	-84.3881
20	90011049	1/1/2009	########	1700	########	2200	502			188 14TH S	Day Watch	18	LARCENY-	640	2305	Midtown	E	33.78663	-84.3814

COBRA-2009-2019

Ready

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CRIME DATA - TO THIS

	A	B	C	D	E	F	G	H	I	J	
1	Date	Hour	Hourly_AGG	Hourly_AutoThef	Hourly_Burglary-NonRe	Hourly_Burglary-Resident	Hourly_Homicid	Hourly_Larceny-From Vehic	Hourly_Larceny-Non Vehic	Hourly_Robbery-Commerci	Hourly_Rob
2	1/1/2009	0	1	2	0	0	0	7	4	0	
3	1/1/2009	1	0	0	0	3	0	1	1	0	
4	1/1/2009	2	2	1	0	0	0	1	0	0	
5	1/1/2009	3	0	0	0	0	0	2	0	0	
6	1/1/2009	4	0	0	0	0	0	2	0	0	
7	1/1/2009	5	0	1	0	0	0	0	0	0	
8	1/1/2009	6	0	1	0	0	1	2	0	0	
9	1/1/2009	7	0	1	0	0	0	3	1	0	
10	1/1/2009	8	0	2	0	1	0	2	2	0	
11	1/1/2009	9	0	0	0	1	0	3	0	0	
12	1/1/2009	10	0	0	0	0	0	2	0	0	
13	1/1/2009	11	0	0	0	1	0	0	0	0	
14	1/1/2009	12	1	0	0	1	0	12	3	0	
15	1/1/2009	13	0	0	0	1	0	0	0	0	
16	1/1/2009	14	1	0	0	2	0	4	1	0	
17	1/1/2009	15	0	0	0	1	0	3	0	0	
18	1/1/2009	16	1	0	0	4	0	0	1	0	
19	1/1/2009	17	1	0	0	1	0	3	0	0	
20	1/1/2009	18	0	0	0	0	0	2	2	0	
21	1/1/2009	19	1	0	0	1	0	1	1	0	

Sheet1

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VENUE SECURITY INDEX

Gathering venue data

- Team is compiling short descriptions of each venue.
- Examples of venue information:
  - Location and surrounding environment (e.g., city center, more rural, etc.)
  - Capacity
  - Types of events
  - Transportation and parking
  - Construction history

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VENUE SECURITY INDEX

Approach to Analysis

- Bespoke Statistical Programs
  - Non-parametric permutation tests
  - Where
  - When

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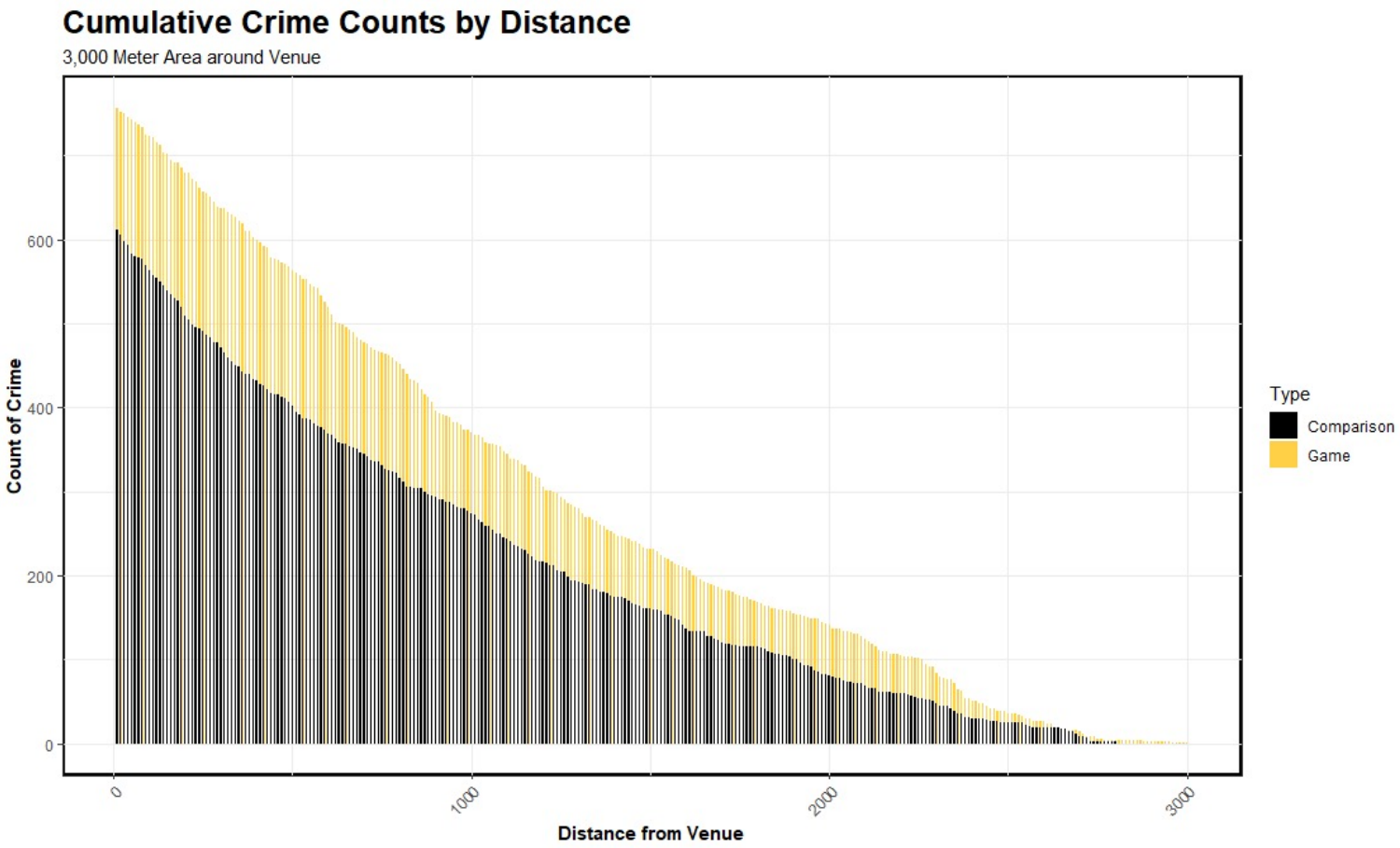
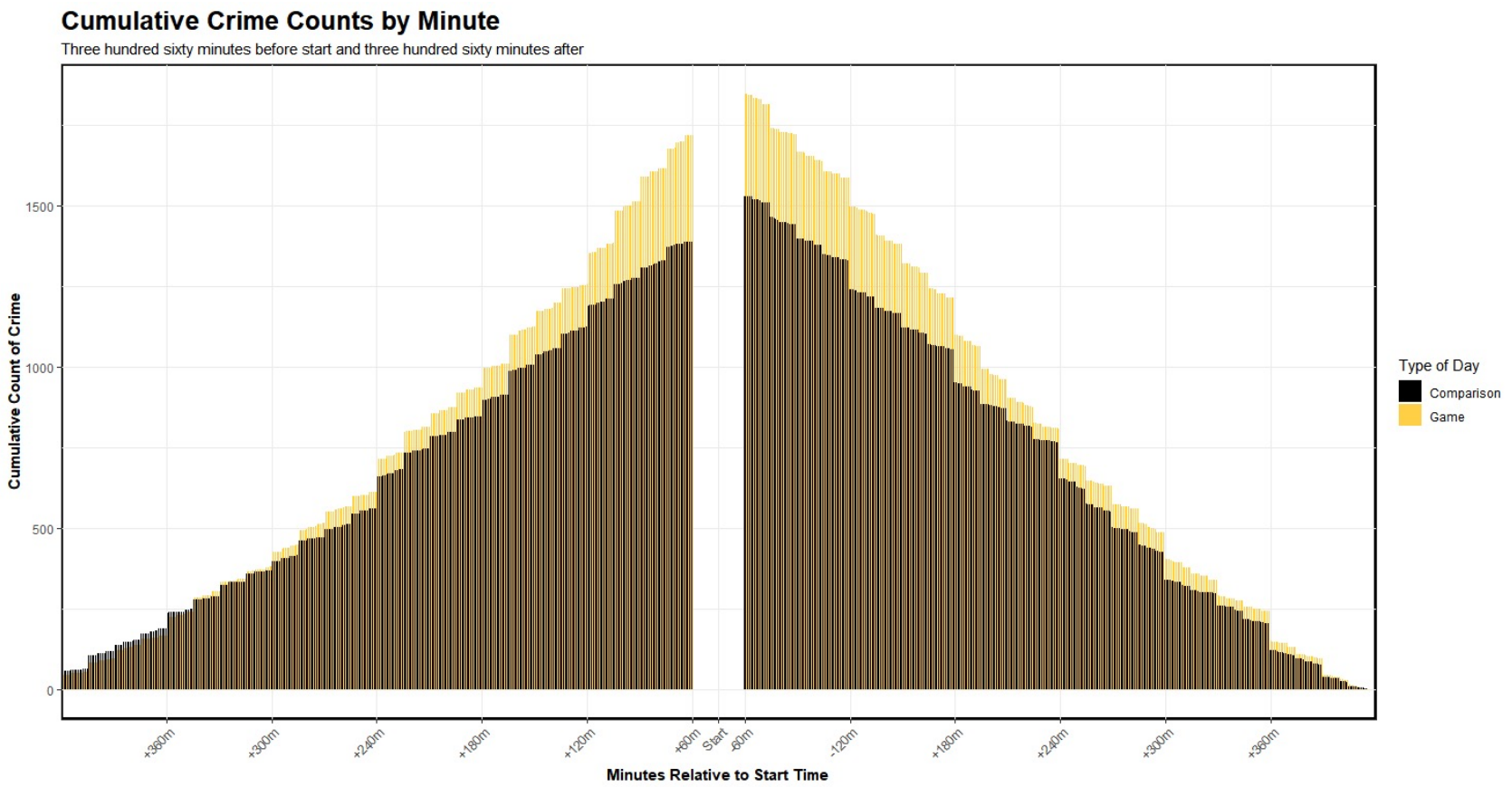
WHERE?


Cumulative Crime Counts by Distance
3,000 Meter Area around Venue
Count of Crime
600
400
200
0
0
1000
2000
3000
Distance from Venue
Type
Comparison
Game

WHEN?



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VENUE SECURITY INDEX

Approach to Analysis

- **Econometric Models**
  - **CRIME = HOUR + DOW + WOY + MONTH + WEATHER + AQI + ERROR**

APPLIED ECONOMICS, 2016
VOL. 48, NO. 8, 723–730
http://dx.doi.org/10.1080/00036846.2015.1085645

Routledge Taylor & Francis Group

Athletic contests and individual robberies: an analysis based on hourly crime data

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[a]Deloitte, Chicago, IL, USA; [b]Owen Graduate School of Management, Vanderbilt University, Nashville, TN, USA; [c]Department of Economics, Rhodes College, Memphis, TN, USA; [d]Department of Economics, Florida Atlantic University, Boca Raton, FL, USA; [e]Center for Economic Education, Columbus State University, Columbus, GA, USA

ABSTRACT
Using *hourly* data on individual robberies, this article employs a novel approach to investigate the relationship between athletic contests and individual robberies in Memphis, Tennessee, a well-known entertainment destination, with its iconic Beale Street locale, in the US. Empirical results indicate that home basketball games hosted by the NBA's Memphis Grizzlies and those hosted by the University of Memphis Tigers are associated with increases in individual robberies, while away games are not associated with such an increase. This finding is consistent with the *hot spot theory* of crime, as large numbers of individuals travel to the games, thus providing additional opportunities for crime.

KEYWORDS
Economics of crime; sports economics; regional economics

JEL CLASSIFICATION
J01; J20; R0

APPLIED ECONOMICS
https://doi.org/10.1080/00036846.2019.1587590

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Check for updates

Arena-based events and crime: an analysis of hourly robbery data

Justin Kurland [a,b]

[a]Computing and Mathematical Sciences – Institute for Security and Crime Science, University of Waikato, Hamilton, New Zealand; [b]The National Center for Spectator Sports Safety and Security, University of Southern Mississippi, Hattiesburg, MS

ABSTRACT
This article makes use of hourly crime counts to model the relationship between events that take place at the Prudential Center in Newark, NJ and robberies, an arena that has caused local controversy regarding the costs and benefits of hosting such an entertainment venue. Results from the econometric model suggest that the NHL's New Jersey Devils ice hockey games, concerts, and Disney-themed events are all associated with increases in robbery, while various other event categories such as the NBA basketball games played by the Nets and boxing, and mixed martial arts (MMA) matches are not associated with an increase. These findings support two complementary ecological theories of crime that focus on how events provide additional opportunities for crime by increasing the associated benefits while simultaneously decreasing the cost for economically motivated offenders to take advantage of.

KEYWORDS
Economics of crime; entertainment economics; sports economics; crime pattern; rational choice

JEL CLASSIFICATION
C12; H89; L82; L83

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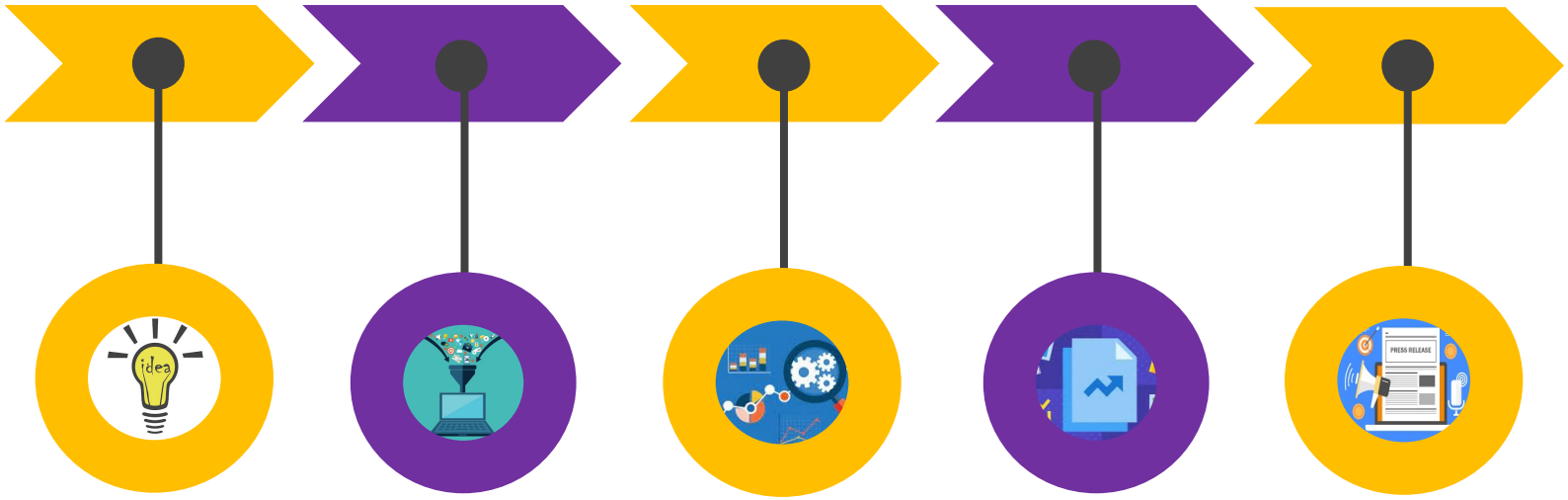
VENUE INDEX ROADMAP

Next Steps….



January 2020

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VENUE INDEX ROADMAP

Conclusion

- Huge research project
- Annual benchmarks
- Continuous process
- Improved fan experience
- Better, safer, security for spectators driven by evidence

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