



Public Safety & Security Training Series: Mitigating Crowd Safety Risks

PETER ASHWIN

LEVITT NETWORK SAFETY & SECURITY CONSULTANT

KEVIN KENNEDY

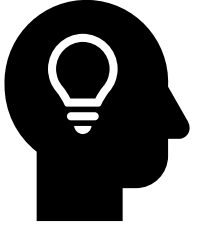
GUEST SPEAKER, KENNEDY CROWD SAFETY SOLUTIONS

October 15, 2024

Session Overview

- Introduction & welcome – Guest Speaker: Kevin Kennedy
- Recap of Session# 6: Safe and secure inclusive events
- Introduction to the fundamentals of crowd safety
- Break-out room discussion topic
- Crowd management planning tools and techniques
- Safe venue capacity planning and crowd counting
- Wrap-up Key takeaways
- Upcoming Levitt Network Trainings and Sessions

Learning Outcomes



The aim of training session # 7 is to enhance awareness and understanding of crowd safety related risks and to provide an introduction to the fundamentals of crowd safety planning for events.

At the end of the session, participants will be able to:

- 1) Demonstrate a deeper understanding of event related crowd safety related risks and mitigation measures.
- 2) Apply crowd safety and management planning principles to their concert series events.





Recap Session # 6: Safe & Inclusive Concert Series Events



What crowd safety related risks 'keep you up at night' for your concert series?

12 responses

rushing the stage
emergency crowd managemen
weather active shooter
car driving thru venue
overcrowding gun fire
getting medical staff in
violence
inebriated people



Breakout group discussion



Dagmar will allocate you to a break-out room (approx. 4 – 6 people) based on event capacity: (1) up to 500; (2) 500 – 1,000; (3) 1,000+.

- In your break-out rooms, you have 15 mins with your group to discuss:
 - What security measures and protocols you implemented for your 2024 concert series?
 - Which of these security measures & protocols most effectively contributed to delivering a safe, secure and inclusive environment?
 - Were there any constraints/ factors which impacted safety and security for your concert series?
- Designate a group spokesperson to present the summary of your group's discussion /findings



Summary of Break-out room key discussion points

The following are the key points discussed pertaining to enhancing safety and security at FOL and AMP grantee concert series in 2024:

- Pre-concert team briefings
- Use of radios to enhance communications; requirement for noise-cancelling radio 'ear buds'
- Clear C3 chain of command
- Documenting incident reports
- Volunteer training – safety and security awareness, protocols and procedures
- Understanding the 'risk profile' headliners and artists
- Advice from police during special event permit process

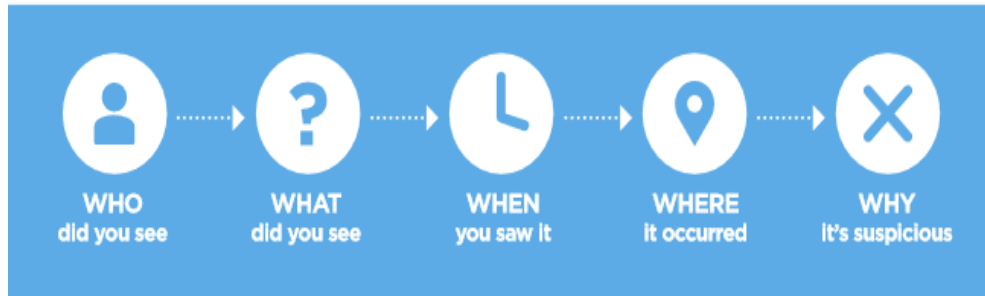


Tips for enhancing safe & inclusive event environments

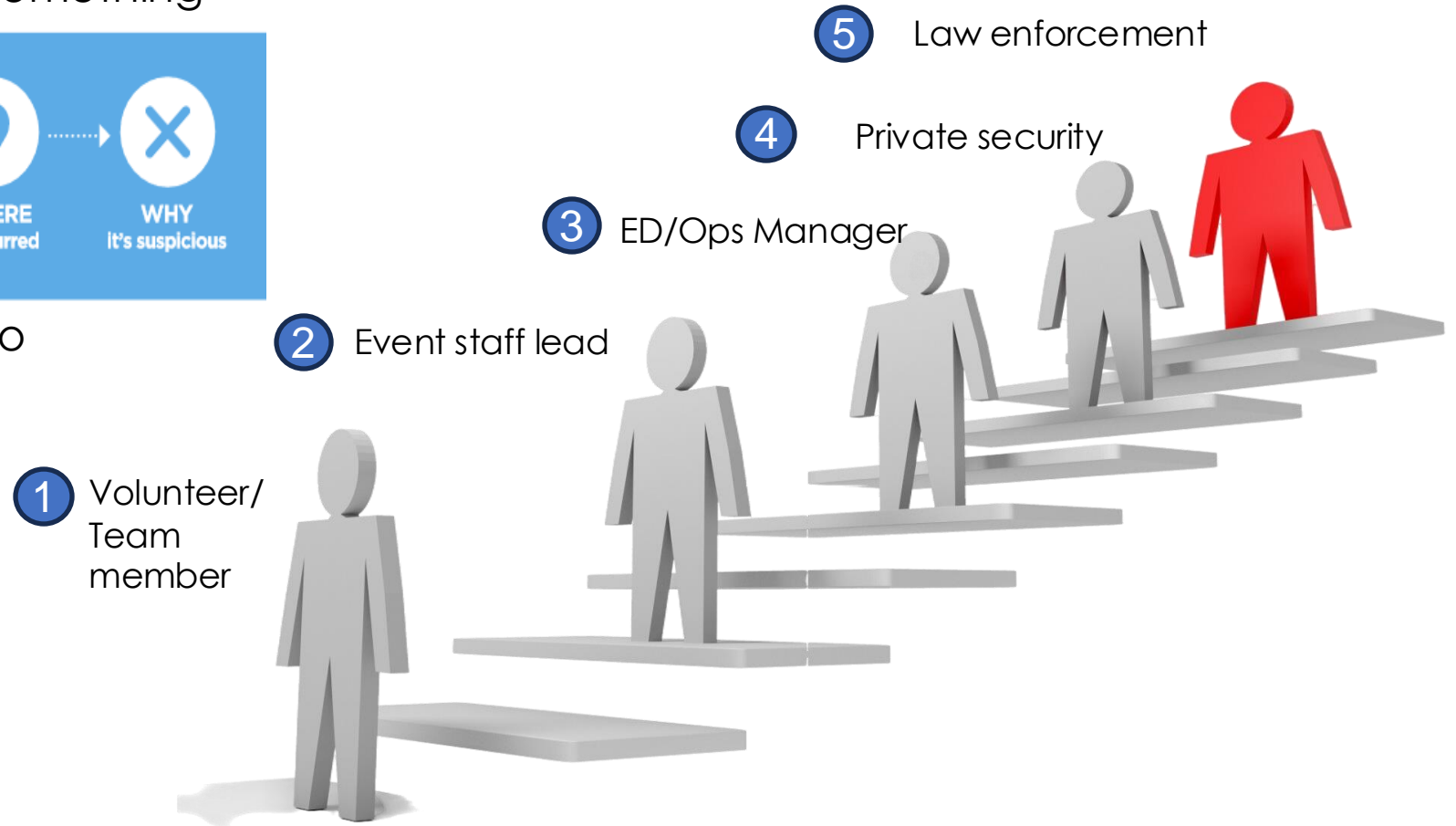
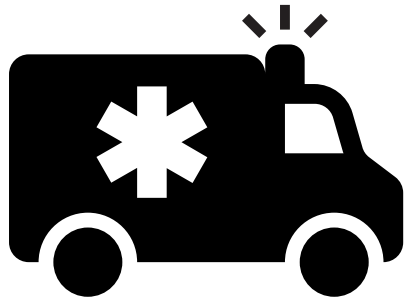
- Build and foster close relationships with local law enforcement, fire & EMS, public safety and emergency management agencies
- Build relationships with stakeholders around your venue site – whole of community approach
- Utilize the power of hello to support a safer, more welcoming and inclusive environment
- ‘Soften’ the traditional black look of security uniforms
- Team briefs and communication / escalation protocols
- Situational crime prevention techniques (next section)

Event Team C3: Comms, Reporting & Escalation

If You 'See Something, Say Something'



The Power of Hello



Key Take-aways

- Review your security related incidents for the concert series and update event risk register for 2025 – consider what maybe need to be engaged
- Implement and or/ enhance additional 'soft security measures' (as appropriate)
- Review your event team communications protocols (team briefs and escalation pathways)
- Consider how you can apply SCP techniques / tactics for your concert series



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EVENT CROWD SAFETY

Kevin Kennedy MSc

Acknowledgement:

The information in this presentation has been adopted from the crowd science theories and tools developed by Dr Keith Still during his 35 years of research, training, consultancy and expert analysis on crowd events all over the world.



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Three basic rules of risk management



Gordon
Graham

There are no new
ways to get in trouble

There is always a
better way to stay
out of trouble.

Predictable is
Preventable



Public perception of risk – conditional bias

When we voluntarily take a risk, we usually underestimate the chances of being hurt.

To understand risk, we must understand the probability (likelihood of occurrence) and the consequences



Risk Perception

Public
(low risk, high reward)

Organizer
(potential for high risk)

People take shortcuts and willingly enter into high density situations

People take unnecessary risks

Organizers need to manage crowds, providing clear direction with the use of design, information and management



Crowd Related Risks

Be aware of...

Slips 

Trips 


Falls 

Over a third of all major injuries reported each year are caused as a result of a slip, trip or fall - this is the single most common cause of injuries at work




Slips, Trips and Falls



Vehicles and Pedestrians



High Density



Crossflow, Counterflow and Convergence

Slips, Trips and Falls

17,000 people die each year

Second most common cause of deaths (car accidents are #1)

1,000,000 people injured each year

Second most common cause of disabling injuries in the workplace

Causes

Environmental

- Housekeeping issues
- Slippery surfaces
- Uneven surfaces
- Stairs
- Poor lighting

Human Factors

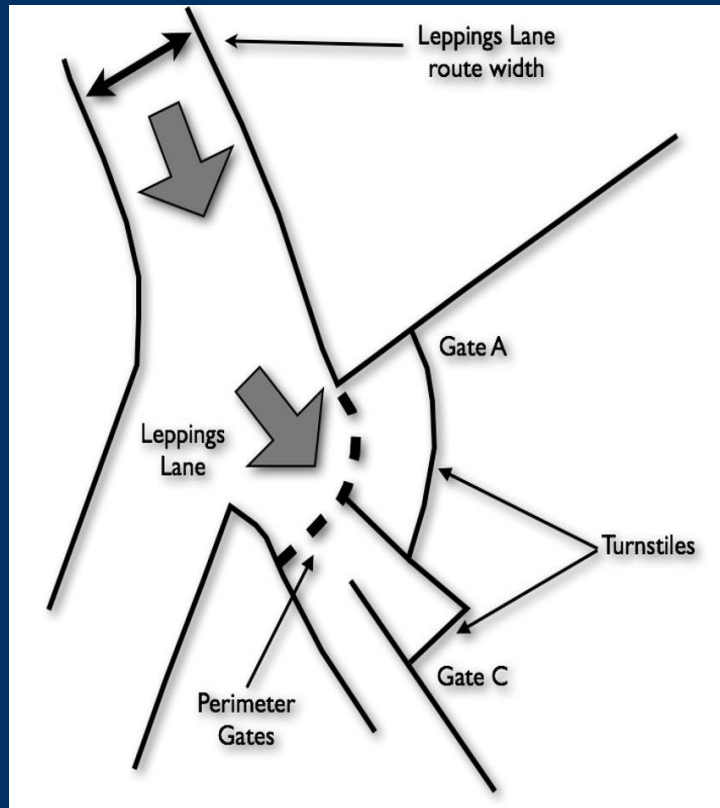
- Inattentiveness
- Shortcuts
- Risky behaviours
- Moving too quickly

What can you do...

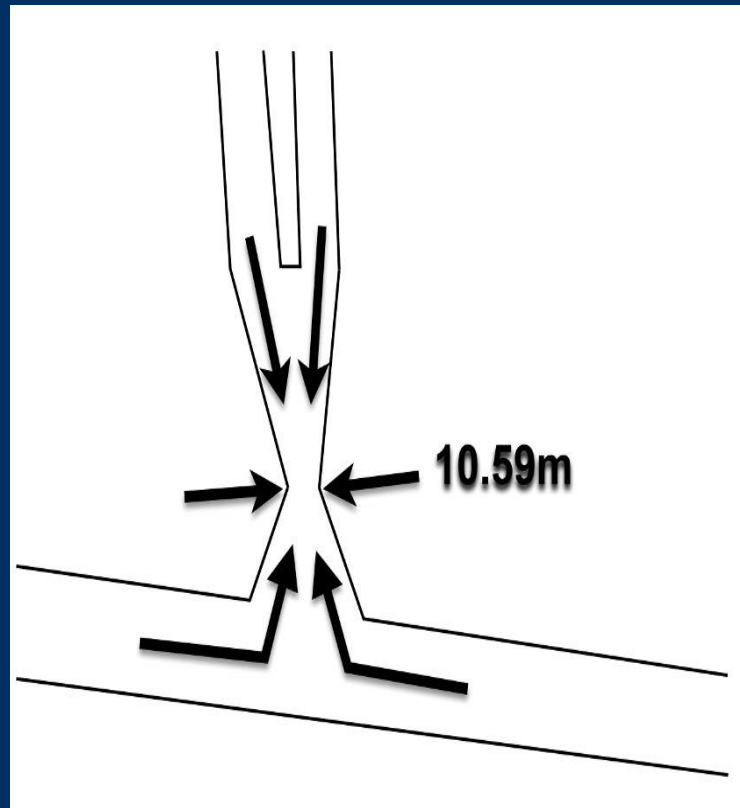
Continually scan your site

- Look for trip hazards (cables, infrastructure footings that extend outward)
- Look for areas that are wet, improper drainage
- Topography (hilly, ground ruts)
- Deal with issues and mark any hazardous areas

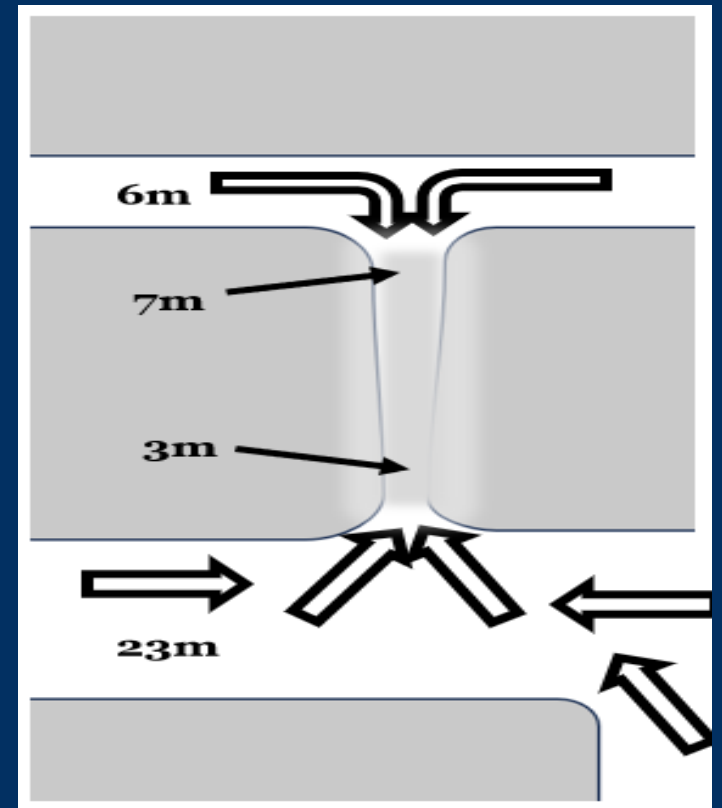
Hillsborough (1989)
97 dead
766 injured



Love Parade (2011)
21 dead
652 injured



Itaewon (2022)
159 dead
196 injured







Cookstown hotel disco 'crush': Three teens dead

17th March 2019 (St. Patrick's Day)

[f](#) [m](#) [t](#) [e](#) [Share](#)

Cookstown hotel deaths



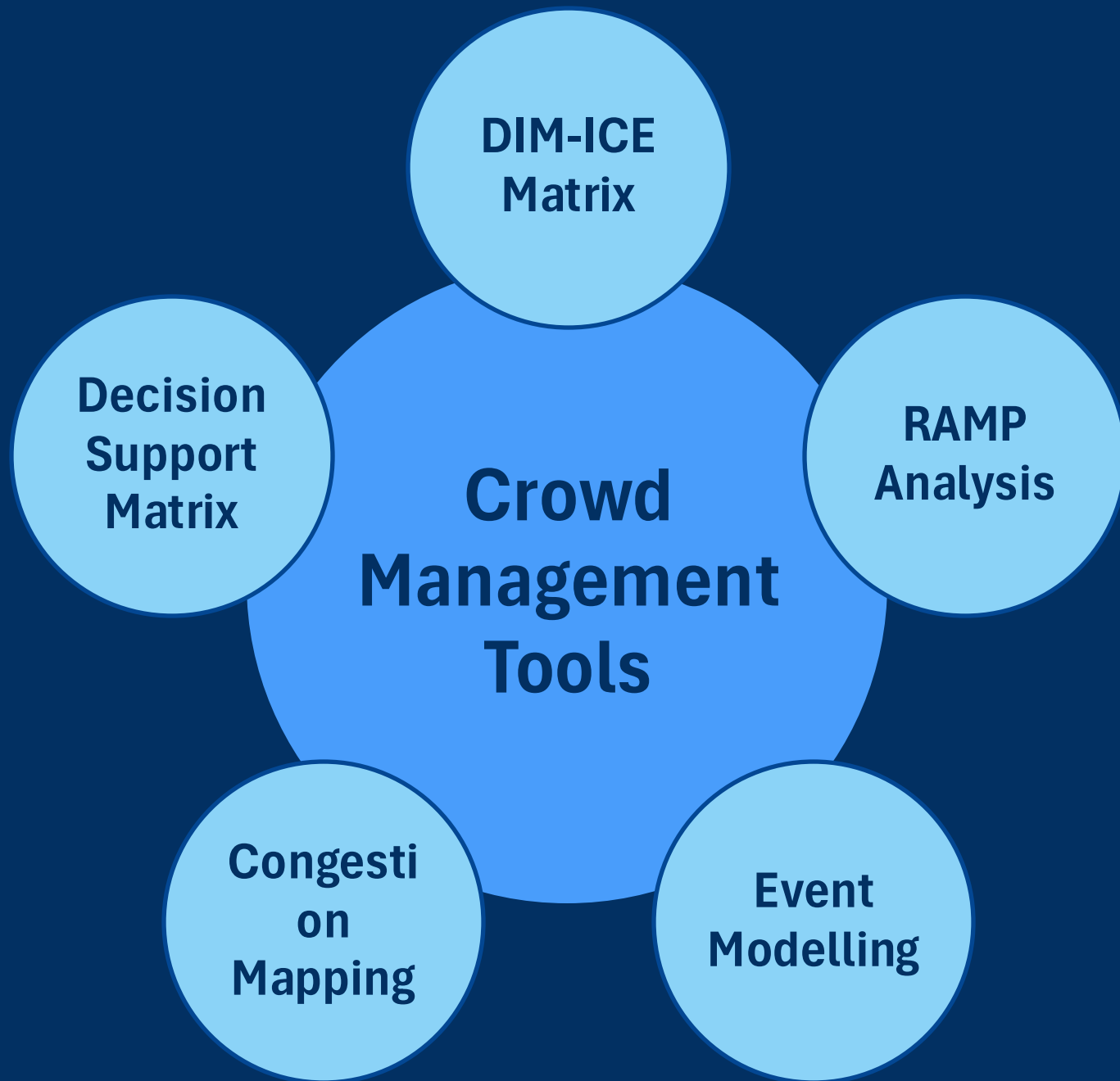
Lauren Bullock, 17, Morgan Barnard, 17, and 16-year-old Connor Currie died after the incident

High density queueing, early arrivals, no barriers, no queue management.





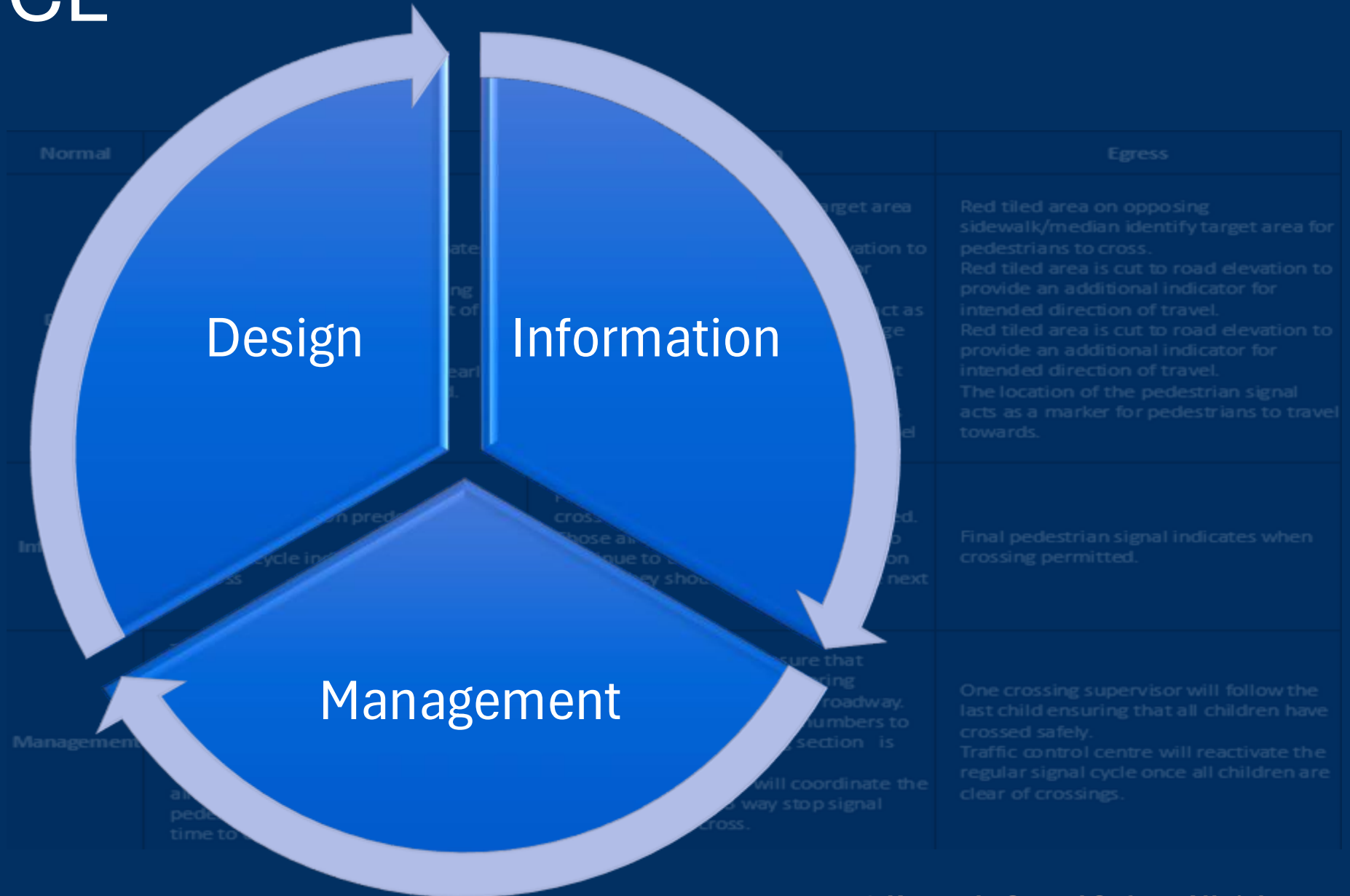
Crowd Management Planning Tools & Techniques



In addition to supporting a comprehensive crowd management plan, early use of these tools could help identify potential crowd concerns that will require attention.

* Not every tool is applicable to every event

DIM - ICE



<i>Normal</i>	<i>Ingress</i>	<i>Circulation</i>	<i>Egress</i>
<i>Design</i>			
<i>Information</i>			
<i>Management</i>			

<i>Emergency</i>	<i>Ingress</i>	<i>Circulation</i>	<i>Egress</i>
<i>Design</i>			
<i>Information</i>			
<i>Management</i>			

Examples of the DIM-ICE Risk Model

Normal	Ingress	Circulation	Egress
Design	Suitable width provided for ingress. Pinch point on Main Street provides potential for elevated levels of risk.	Layout designed, identifying potential hazards. Correct space for circulation at 6000 capacity. Good sightlines within most of the venue.	Main Street pinch point a high density area. Other areas have suitable exit width. Clear sightlines to plan routes. Good access to transport links.
Information	Pre event information, signage and staff in position, providing stage times and site access information.	Good signage, PA announcements and staff easily identifiable and accessible.	Transport routes could be better identified. PA announcements have limited range. Staff are easily identifiable and accessible.
Management	FREE event with varied acts allows for staggered arrival profiles. Crowd management team available in appropriate numbers to work with arriving crowds.	Good communication systems in place. Clear roles defined for crowd management and Policing roles. Specialist teams in place (e.g. Pit Team)	Management of Main street area hard to enforce due to pinch point. Good management of crowds to transport links. Response teams available to provide extra assistance where needed.

Source: Course work submissions provided by BA (Hons) students (MMU 2012 - 2013)

RAMP Analysis

Routes

What are the directions of travel (during ingress, circulation and egress).

Areas

What space is available? How is it used?

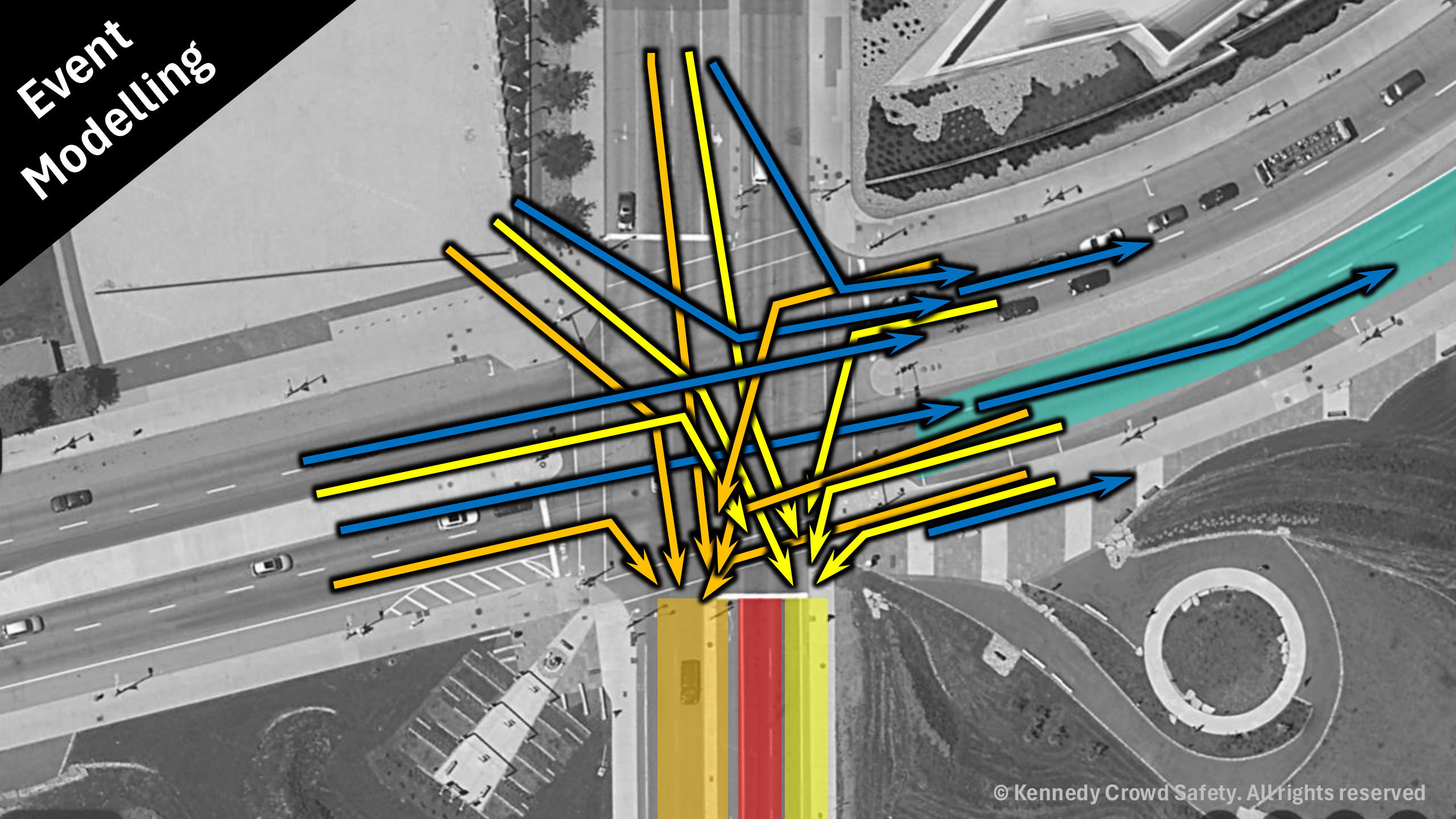
Movement

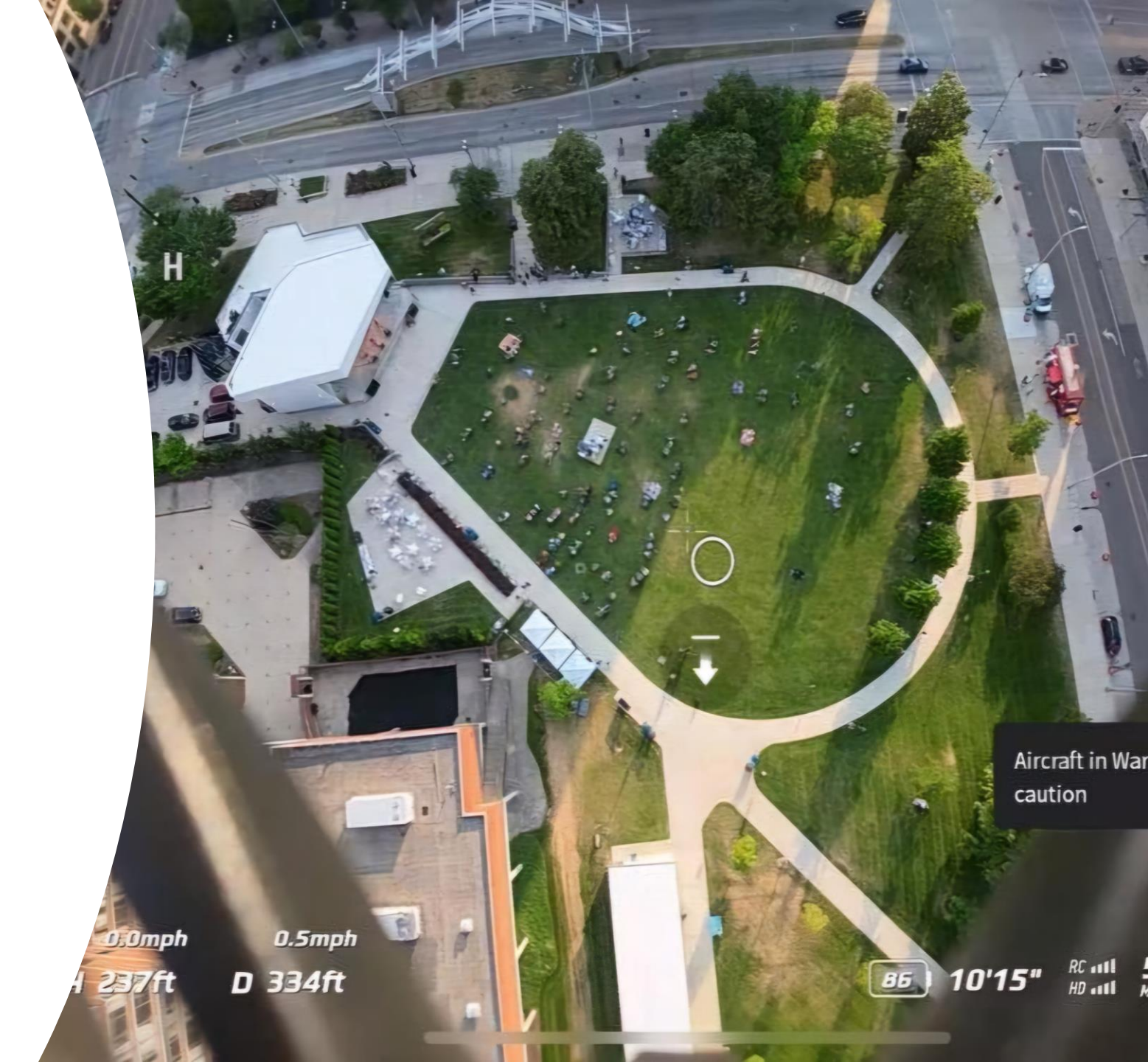
Over what time do crowds arrive/depart? How quickly do spaces fill? What elements will affect arrival/ departure?

Profile

Crowd demographics/ Head Liner & acts
How will the characteristics affect crowd behaviour?

Event Modelling





Safe venue
capacity
planning & crowd
counting

Aircraft in War
caution

0.0mph
H 237ft
0.5mph
D 334ft

86 10'15"

RC HD





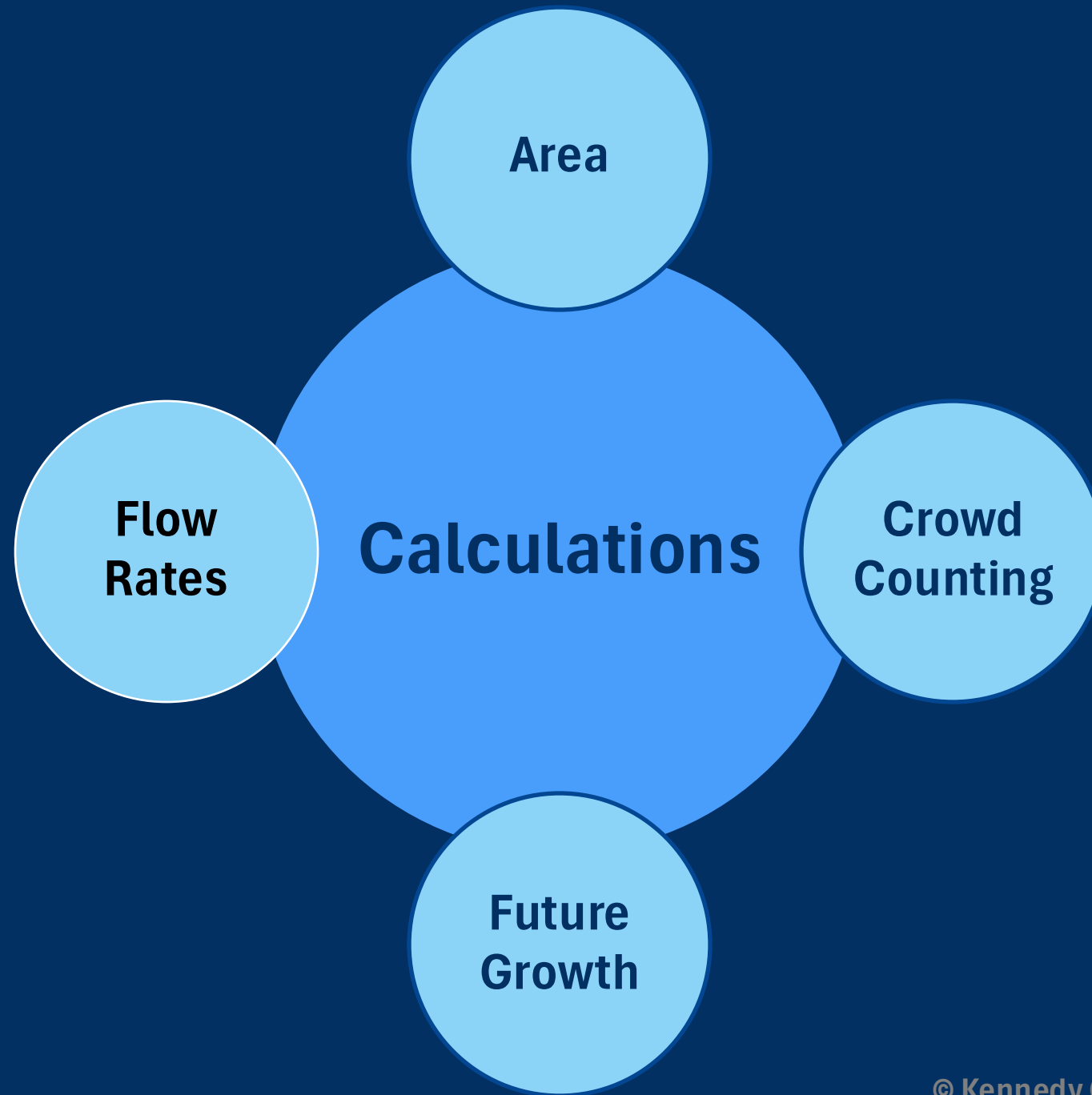
Breakout group discussion

Dagmar will now allocate you to a break-out room (approx. 4 – 6 people)

In your break-out rooms, you have 10 mins with your group to discuss:

How do you plan for and mitigate the risk of overcrowding at your concert series?

Designate a group spokesperson to present the summary of your group's discussion /findings.



USA - NFPA 101 - Life Safety Code

- 12.1.7.1* General. The occupant load, in number of persons for whom means of egress and other provisions are required, shall be determined on the basis of the occupant load factors of Table 7.3.1.2 that are characteristic of the use of the space or shall be determined as the maximum probable population of the space under consideration, whichever is greater.
- 12.1.7.1.2 In areas in excess of 10,000 ft² (930 m²), the occupant load shall not exceed one person in 7 ft² (0.65 m²).
- 12.1.7.4 Outdoor Facilities. In outdoor facilities, where approved by the authority having jurisdiction, the number of occupants who are each provided with not less than 15 ft² (1.4 m²)

1 person / 10 ft²



2 people / 10 ft²



3 people / 10 ft²



4 people / 10 ft²



5 people / 10 ft²



Low Risk

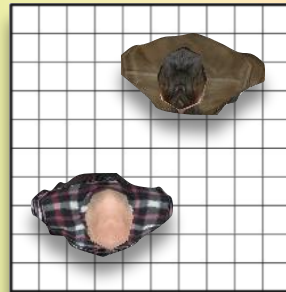


High Risk

1



2



3



4



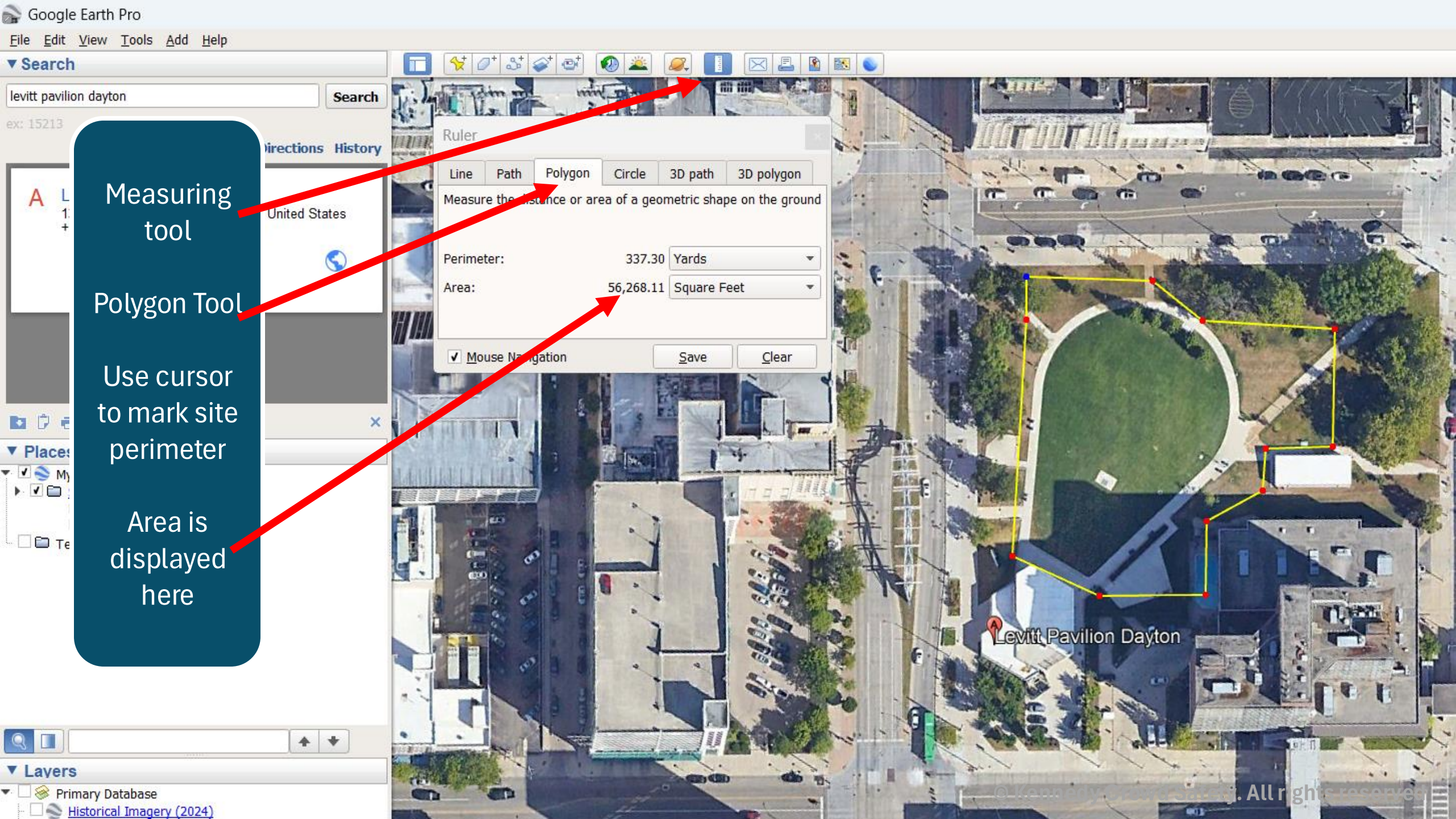
5



Static
Standing



Venue Capacity Calculation



Measuring tool

Polygon Tool

Use cursor to mark site perimeter

Area is displayed here

Ruler

Line Path Polygon Circle 3D path 3D polygon

Measure the distance or area of a geometric shape on the ground

Perimeter: 337.30 Yards

Area: 56,268.11 Square Feet

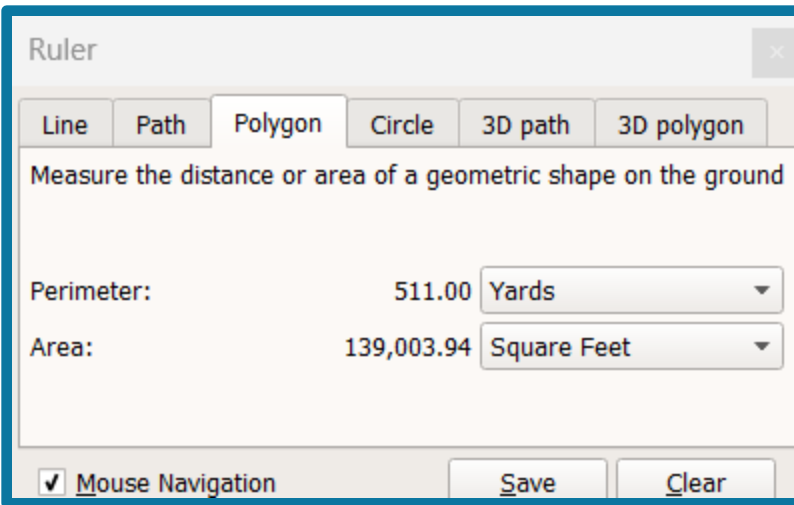
Mouse Navigation

Save

Clear

Levitt Pavilion Dayton

Venue Capacity Calculations



The event area is ~56,000 ft²

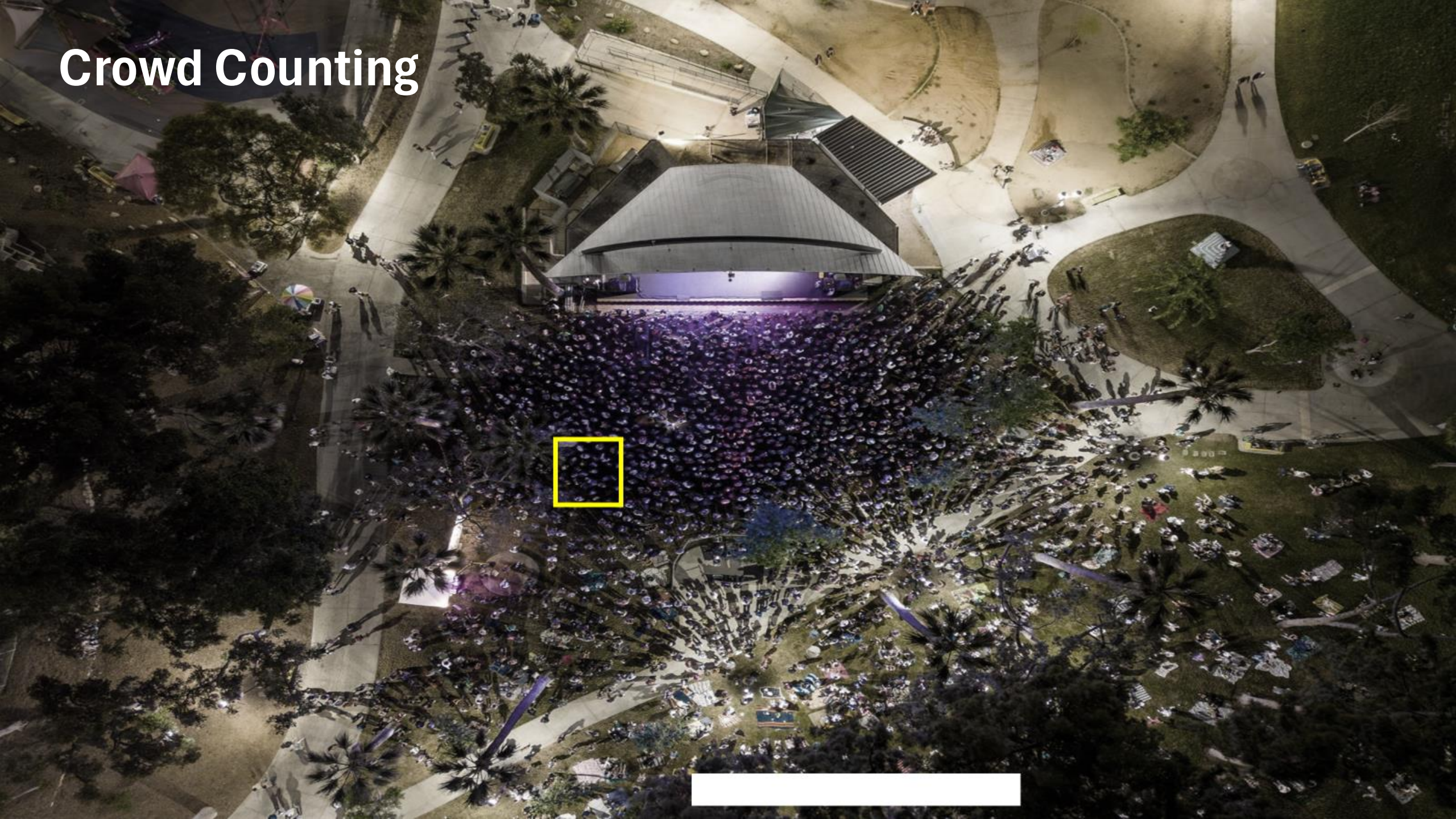
As per Section 12.1.7.1.2 of the *USA - NFPA 101 - Life Safety Code*, the occupant load shall not exceed one person in 7 ft².

$56,000 \text{ ft}^2 / 7 \text{ ft}^2 \text{ (per person)} = \text{a crowd capacity of } \mathbf{8,000 \text{ people}}$

Note: The above answer is the maximum capacity given an open site.

Before making the calculation, you must also consider removing any areas that are used for stage, backstage zones, refreshments, merchandising kiosks, portable sanitation areas, etc.

Crowd Counting



Crowd Counting

Ticket count/scan

People count as crowds pass through an entrance

Estimations

- Calculate crowd flow through a given area and multiply by length of time
- Identify the square feet and multiply by the estimate crowd density of the identified area

Open events in which people flow in and out of the site through multiple points (very rough calculation)

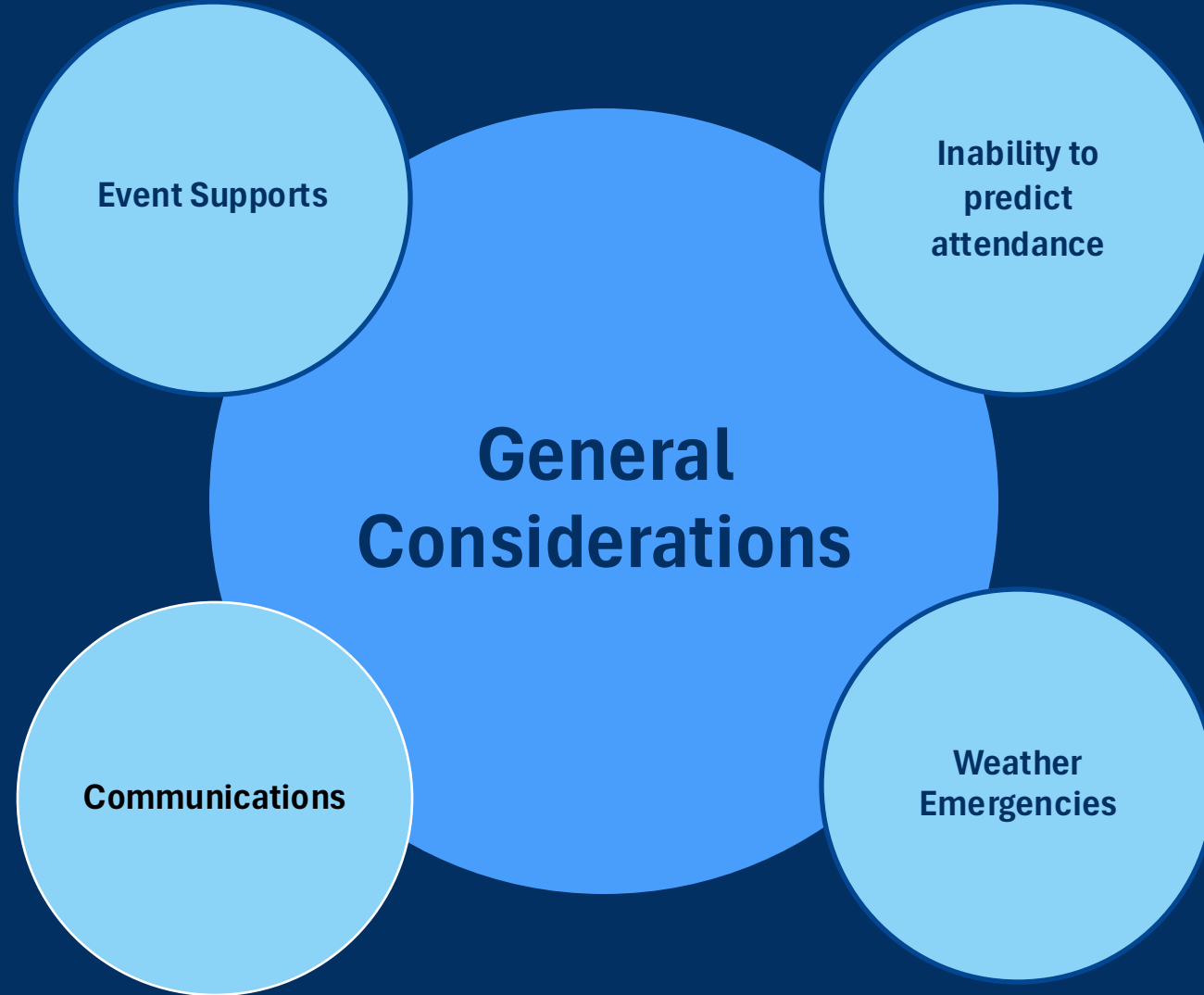
- Technological solutions (electronic device monitoring)
- Clickers
- F & B sales
- *Predicted estimate – scheduled spot checks

Planning for Concert Series Growth: Venue Site Selection Considerations



General considerations for crowd management





Event Supports



Messaging and placement



Sightlines



Emergency communications

In an emergency, communicating with the public presents particular problems:

Should information be given?

If so, how much should be given?

By what means will it be given?

How is it best expressed?

How can we monitor whether it is understood?

Consider your event and how the various strategies for communication are implemented

Messaging should be clear, concise, consistent and repetitive.

Where will the crowd move and is there sufficient space?

Free events, unrestricted entry events

Event success is usually measured on attendance

This statement holds true for most events.

However, is it a successful event if your venue is overcapacity & crowded ?

Keep in mind that attendee experience has a direct impact on crowd behaviour

- Is there adequate space for crowds around the stage and attractions e.g. sponsor activations?
- Do you have enough sanitation facilities?
- Do you have adequate food & beverage points of sale and supplies?
- Will queue lines (wait times) be unreasonably long/delayed?

Prepare plans and contingencies for when attendance exceeds safe capacity

Case Study: Toronto International Film Festival 2023

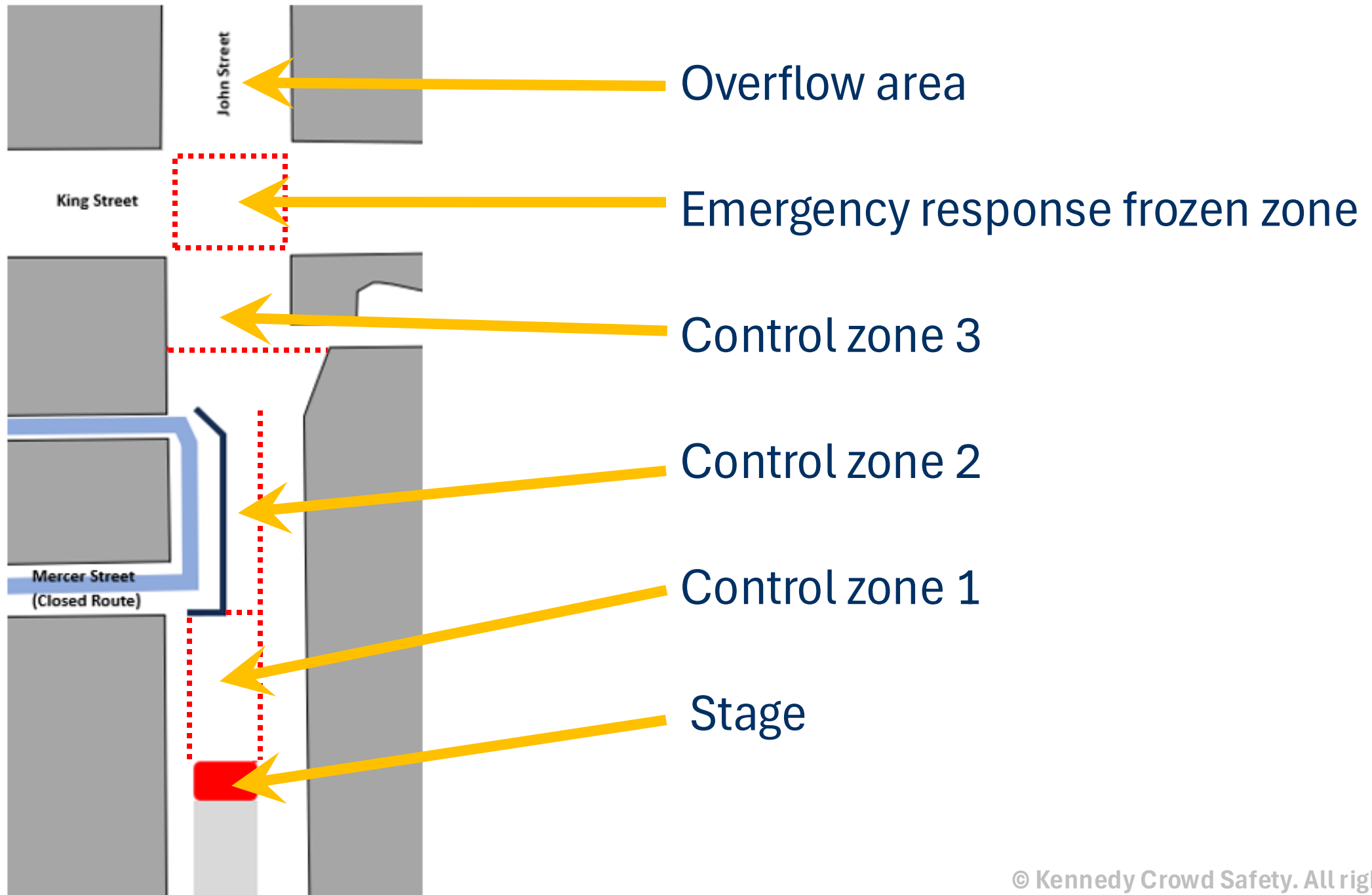


Nickelback concert

Free outdoor concert

Stage located on roadway within a confined space (lined by city scape buildings on either side)

Organizers wanted it announced in advance



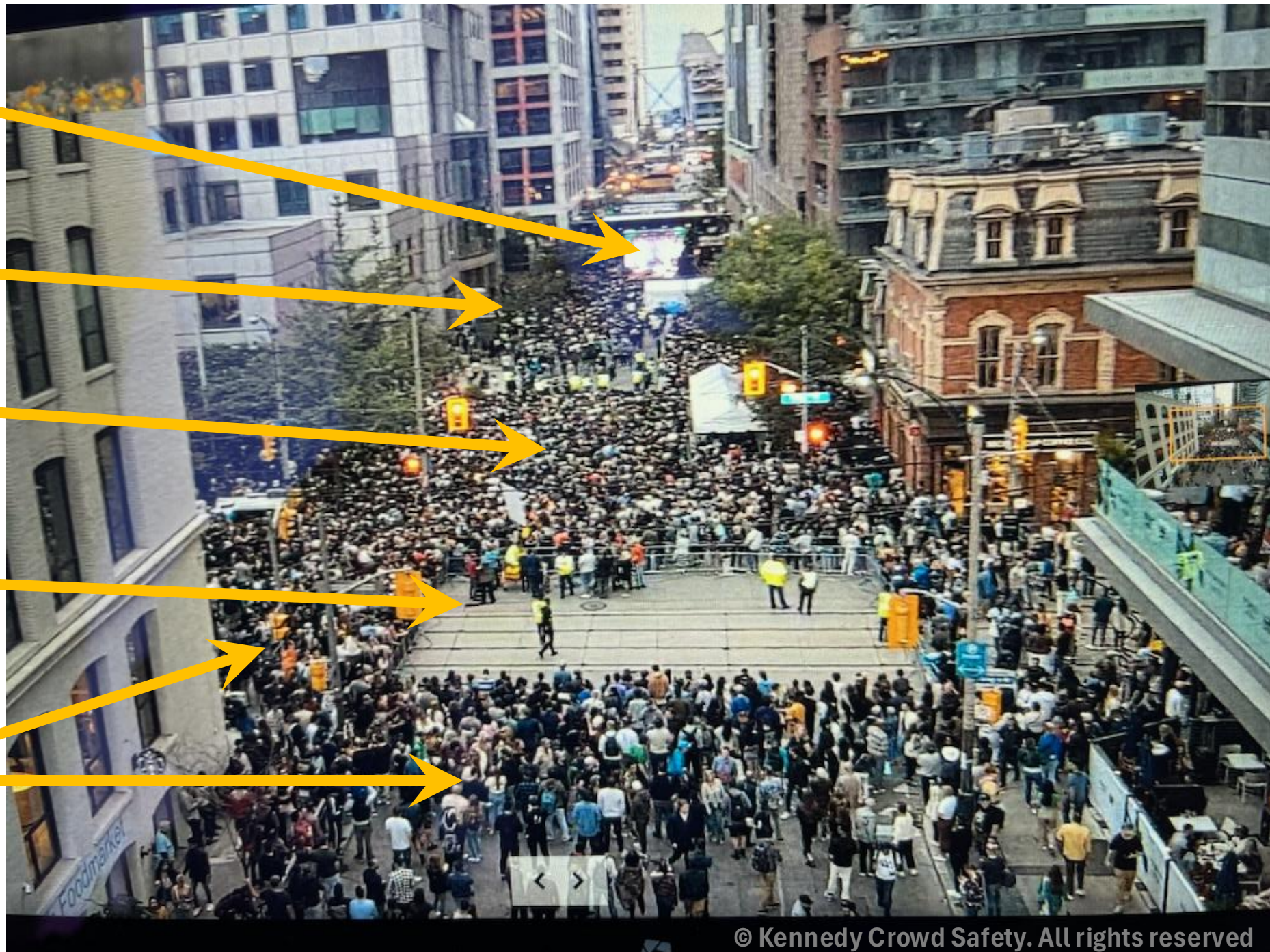
Stage and first coral

Second coral

Third coral

Emergency response frozen zone

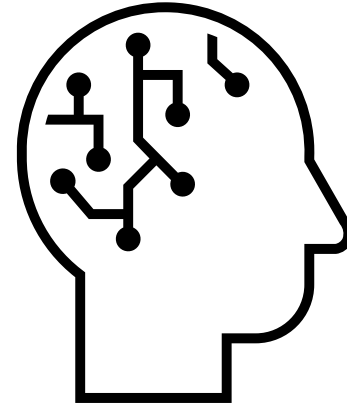
Overflow – restricted site lines





Key Take-aways

- Adhere to local, state and national regulations
- Have a contingency plan for excess crowds/venue overcapacity for both normal and emergency situations
- Consider routes, areas, movement and crowd profile
- Influence crowd behaviour through design, information and management (DIM)
- Train your staff



Questions ?

If you have any follow-up questions, please reach out to safetysecurity@levitt.org





Resources & References

If you would like to delve deeper into the practice & science of crowd safety for events, the following are a list of resources and references (by no means meant to be an exhaustive list):

- Dr Keith Skill (UK) - provides links to courses and other online resources <https://www.crowdrisks.com/> & <https://gksed.com/>
- The Event Safety Guide (2014), Ch 9. Crowd Management, pp. 103-188. Access & download via this link (free) [Standards and Guidance — Life Safety First : Event Safety Alliance](#)
- Safe and Healthy Crowded Places (2018); Ch 6. Crowd Management & Security Measures; pp. 49-57. Access & download via this link (free) [crowded-places-handbook.pdf \(aidr.org.au\)](#)
- [Professor Chris Kemp | Mind Over Matter \(momconsultancy.com\)](#)



Upcoming Levitt Network Trainings and Sessions

PUBLIC SAFETY & SECURITY TRAINING

TUESDAY, OCTOBER 29 | 1PM ET / 10AM PT

Event Readiness

TUESDAY, November 12 | 1PM ET / 10AM PT

Levitt Safety & Security Forum

IN CONVERSATION: ARTIST ROSTERS AND BOOKING Q&A

TUESDAY, OCTOBER 22 | 1PM ET / 10AM PT

Marking Up an Artist Contract with Anne Sturm

EDI SPEAKER SERIES

TUESDAY, NOVEMBER 19 | 1PM ET / 10AM PT

Spinning Straw into Gold, Part II: Responding to Microaggressions

Visit www.levitt.org/training for more information.



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