

# Evacuation Modelling of Stadia using MassMotion

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# Outline

- I. Project description
- II. About the location – Allianz Stadium
- III. Software
  - a) MassMotion
  - b) Modelling Results
- IV. Concert
  - a) Real-life observations
- V. Key Findings & recommendations



# Project description

## Allianz Stadium | Sia Concert | Evacuation Modelling



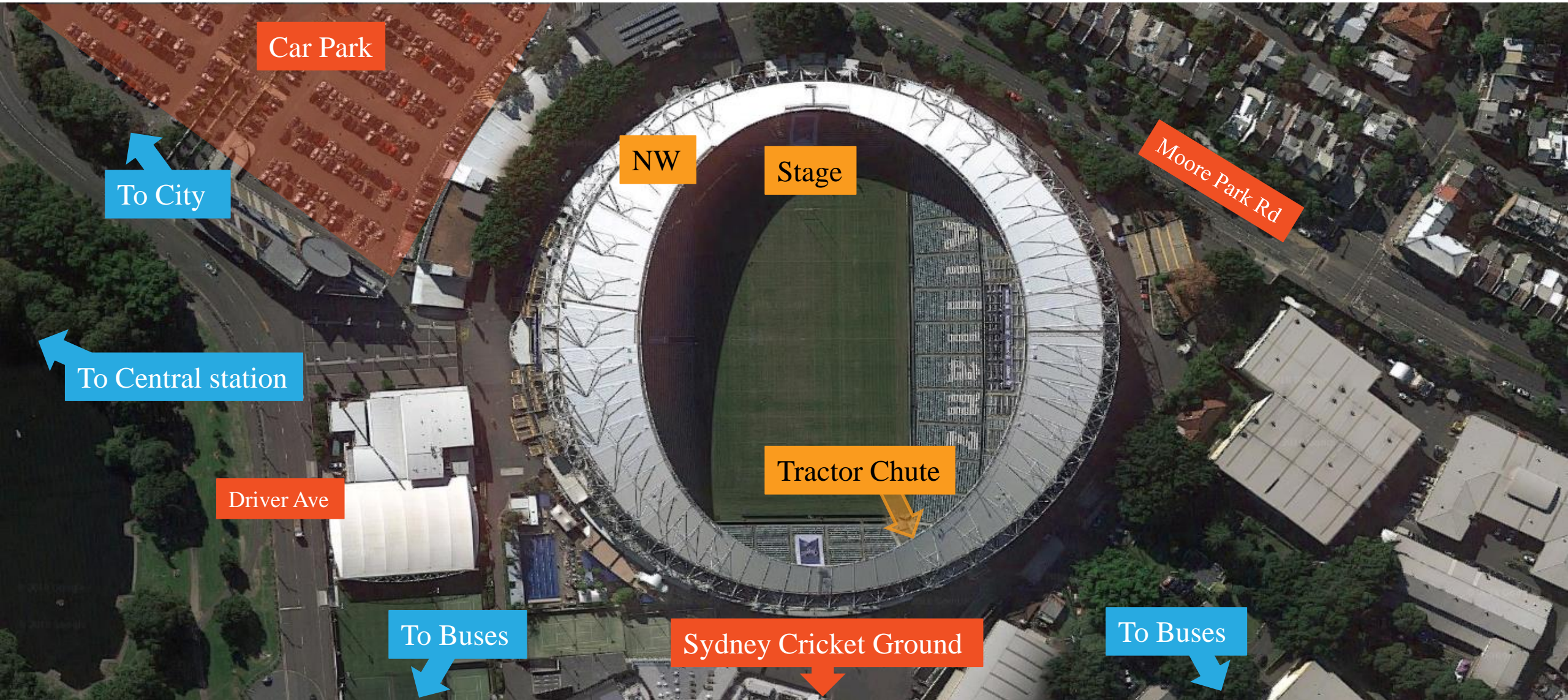


# About the location – Allianz Stadium





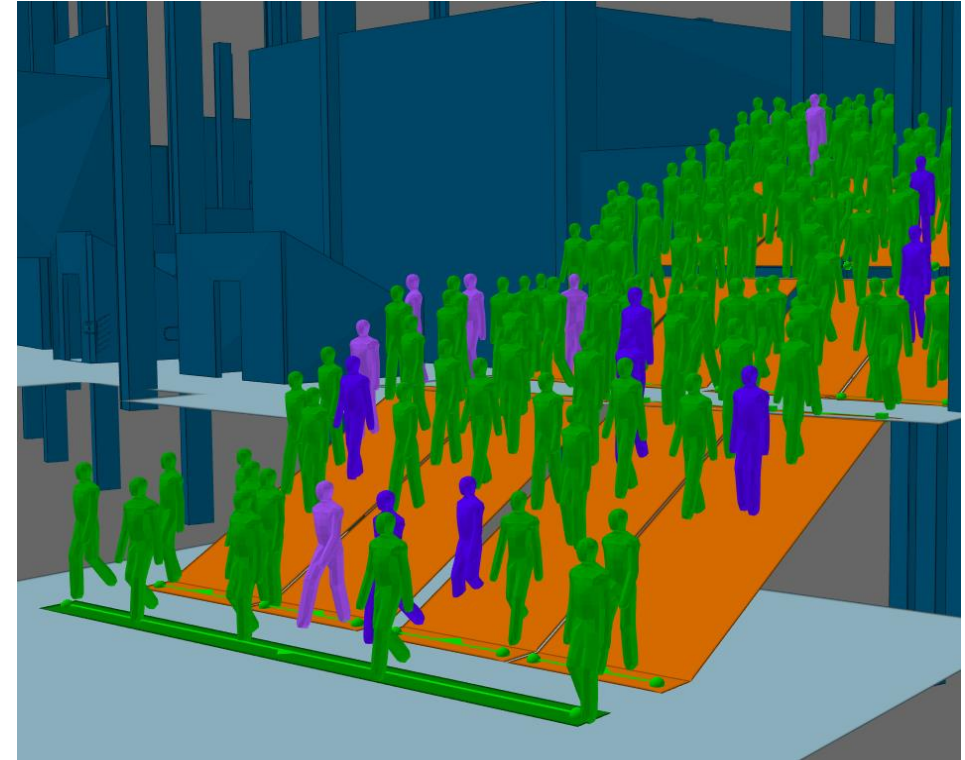
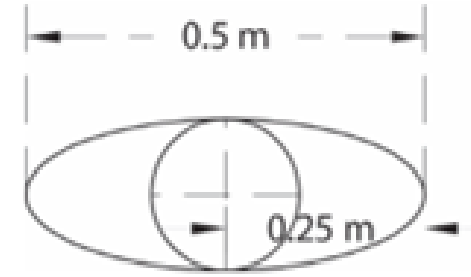
# Stadium Concert Layout





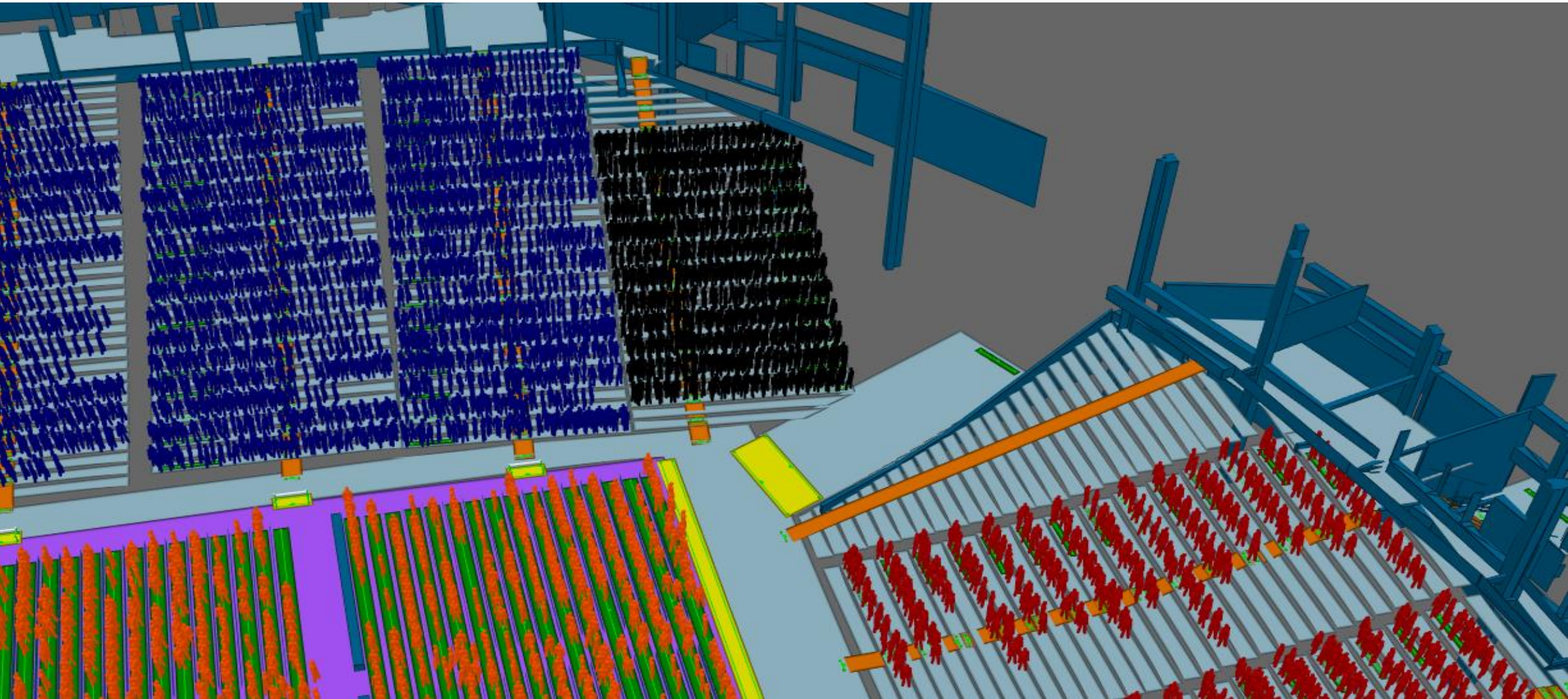
# MassMotion – Inputs and assumptions

- Simultaneous evacuation
- Agent speed
  - Normal distribution
  - Fruin's pedestrian planning & design
- Agent dimensions
- Maximum population
- Disabled access





# Construction of Model





# Acceptance Criteria

## Queuing Times | Densities | Green Guide



Max time queuing  
➡ 8 mins



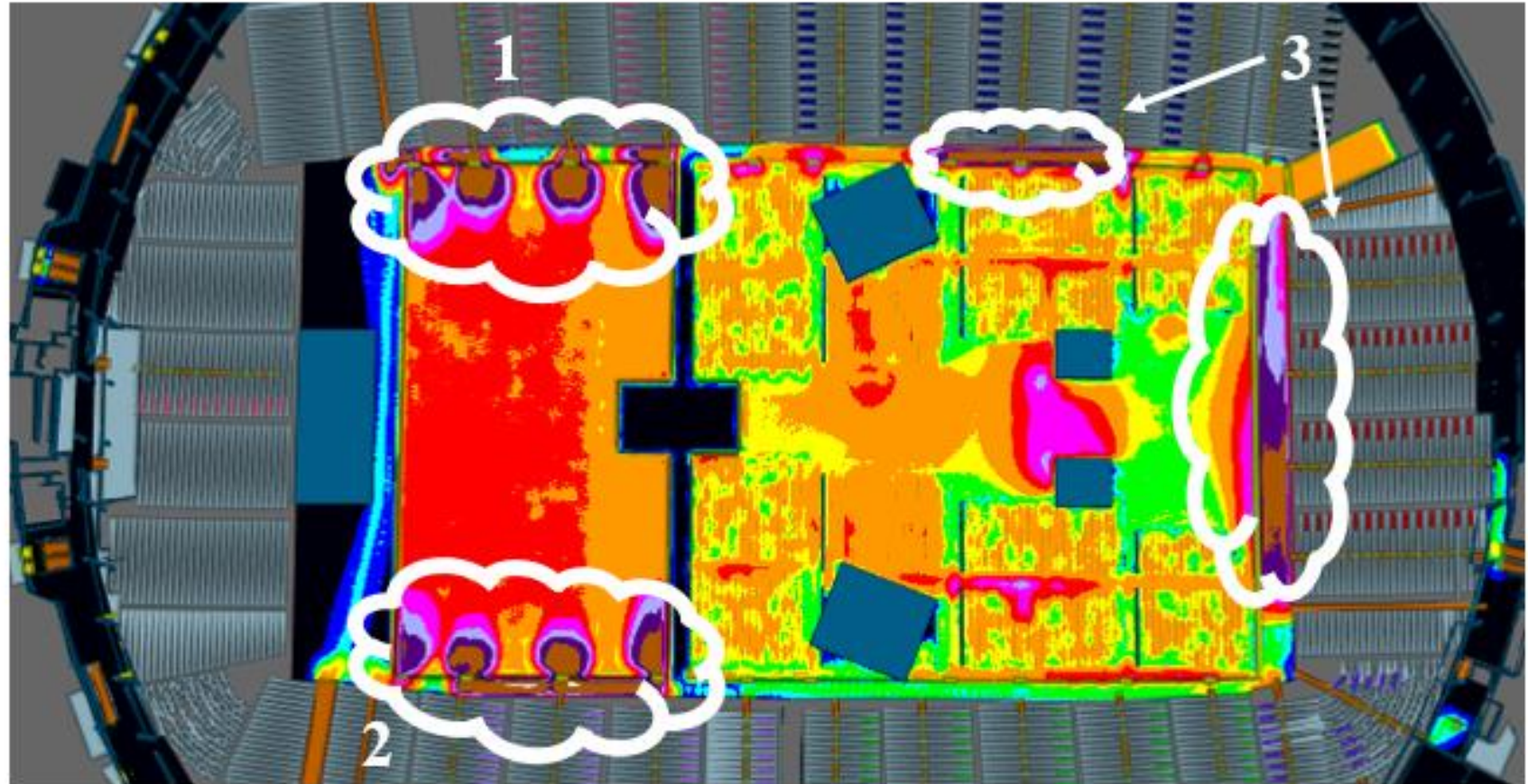
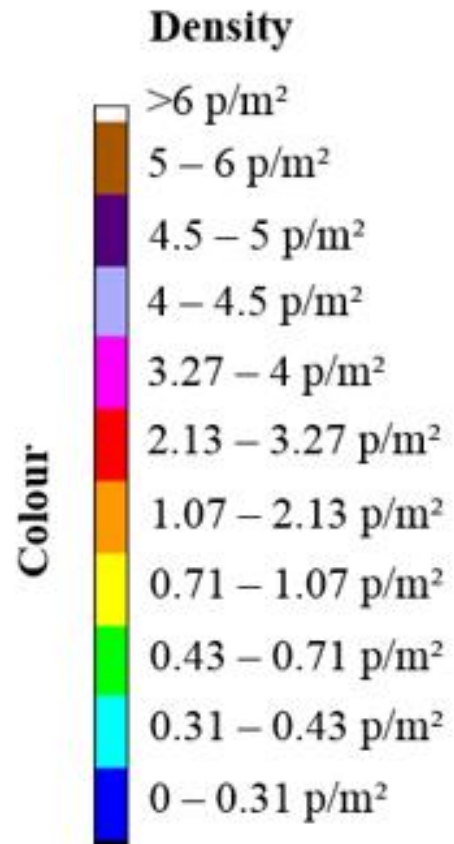
Density limit ➡ 4 people/m<sup>2</sup>



# Results – MassMotion



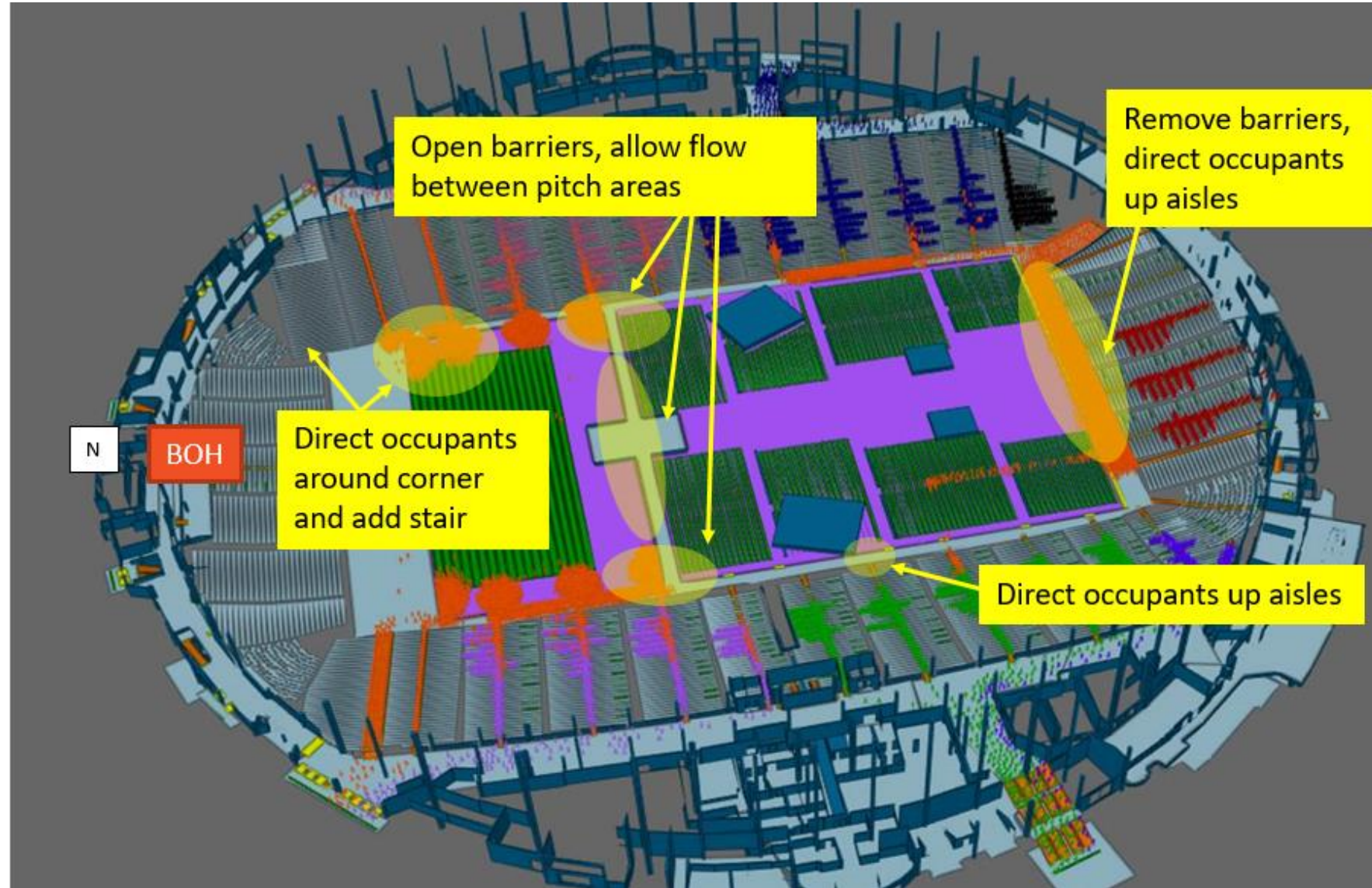
# Results





# Recommendations

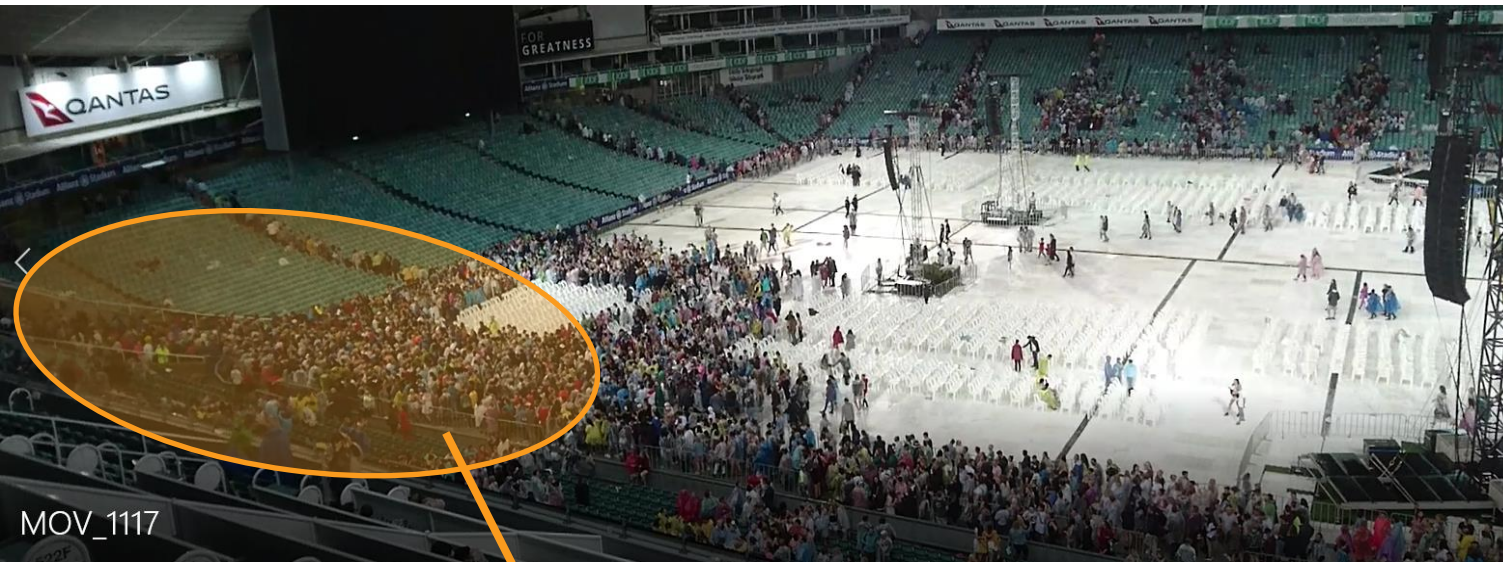
1. More exit width
  - i. Additional stair
2. Use aisles
3. Open up barriers





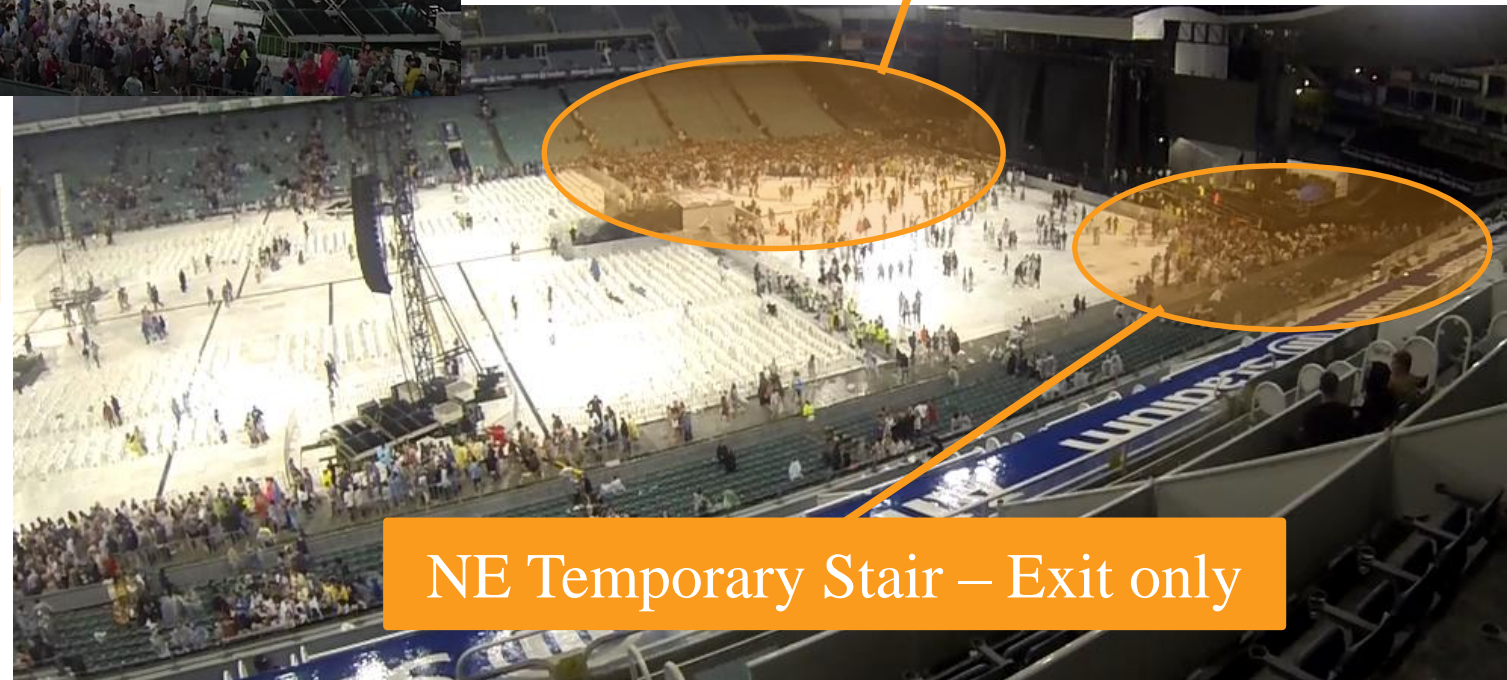
# End of Concert Egress

# Observations - Human Behaviour



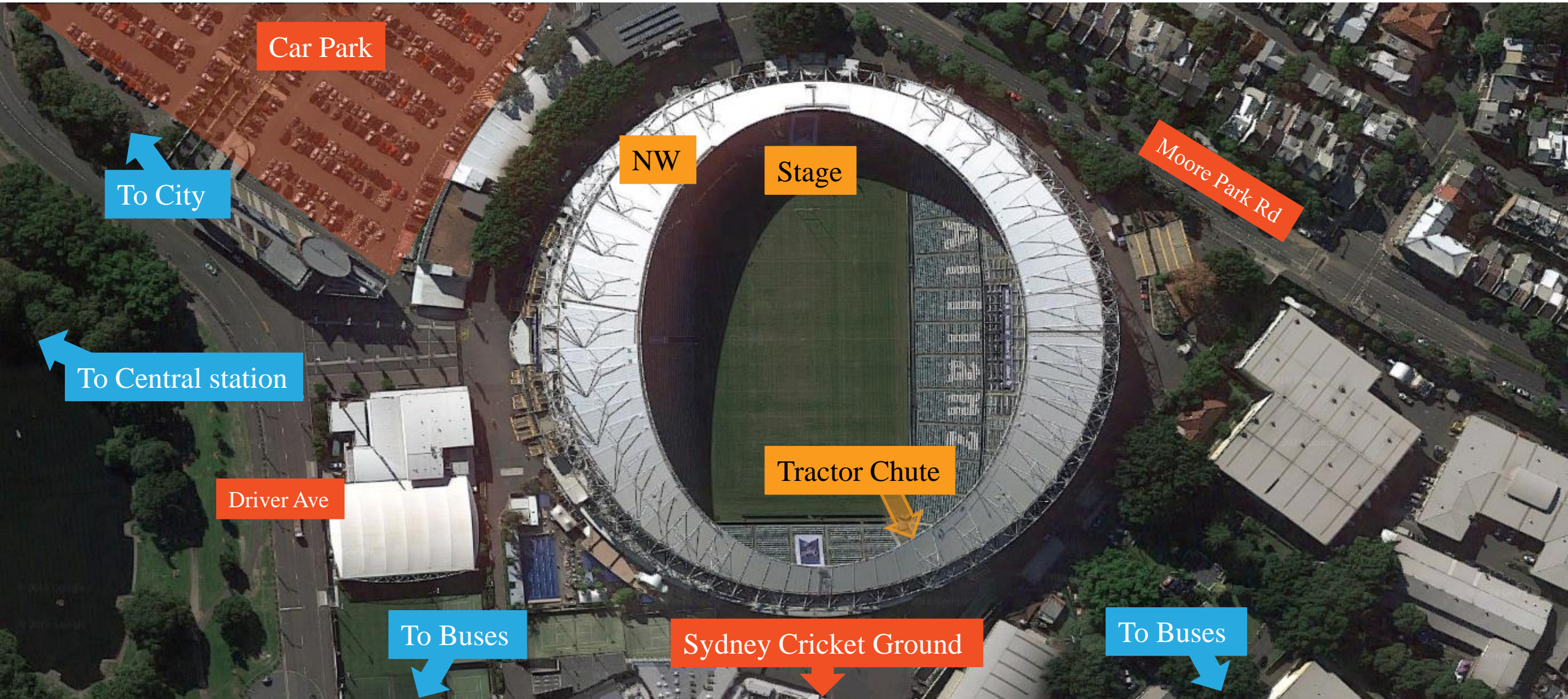
Tractor Chute – Toilets / Bar/ Food

NW Temporary Stair – Entry point





# Precinct Movement



# Key Learnings and Recommendations

Why did people move away from less congested exits routes?

- Exit familiarity (fire engineering)
- Stadium layout (pedestrian planning)

Differences in occupant behaviour between model and real-life

Client was highly responsive to recommendations → valuable exercise

Design the stadium layout and exit capacity for evacuation and egress at initial stages of design so that there will be less congestion and queuing due to human behaviour to manage.