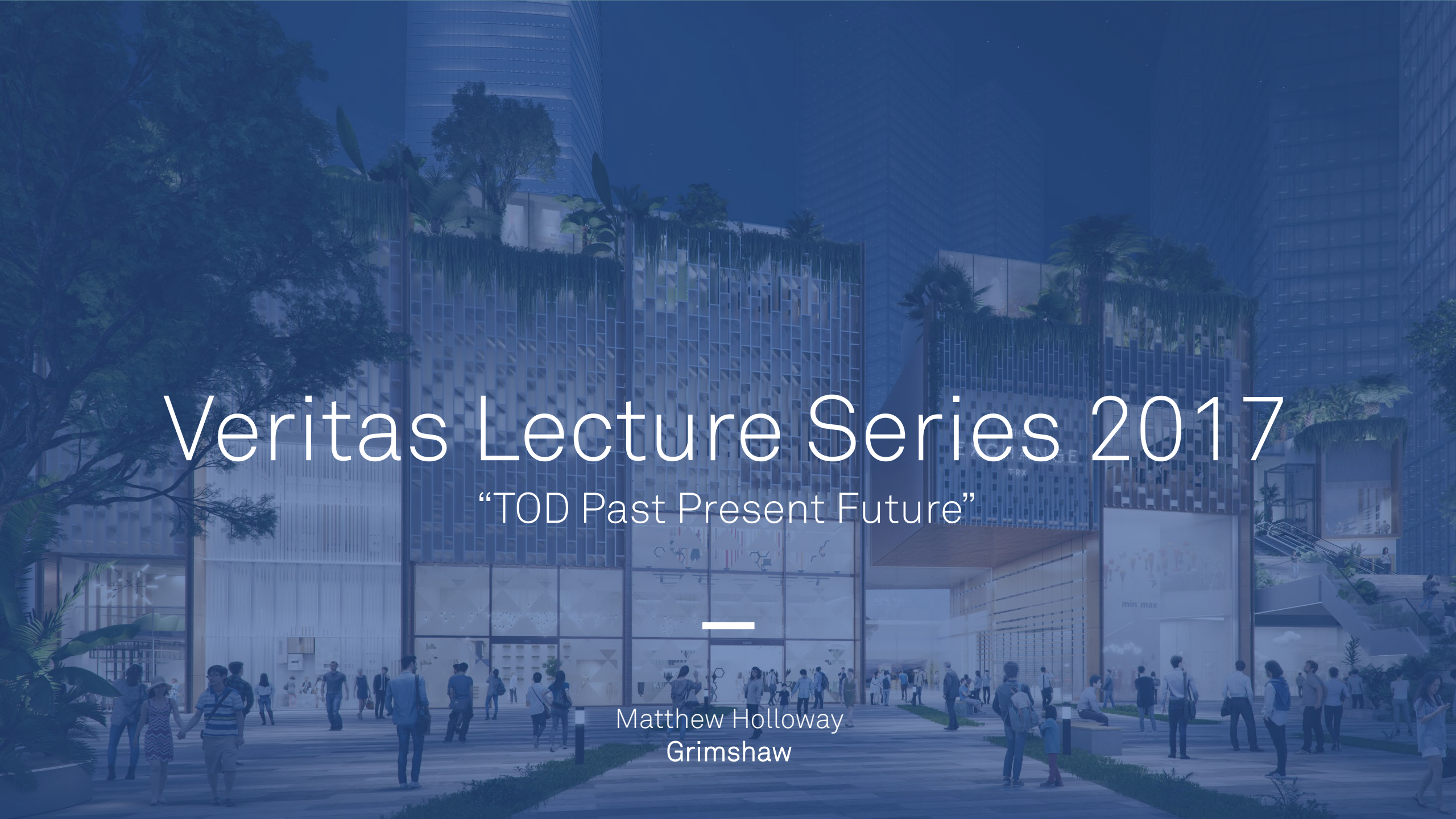


An architectural rendering of a modern building at dusk. The building features a prominent green facade with a grid of rectangular panels, some of which are illuminated from within. The ground floor has large glass windows displaying interior spaces. In the foreground, a paved plaza with a grid pattern is populated with numerous people walking and standing. To the right, a set of stairs leads up to another level of the building. The background shows other tall buildings in a city skyline.

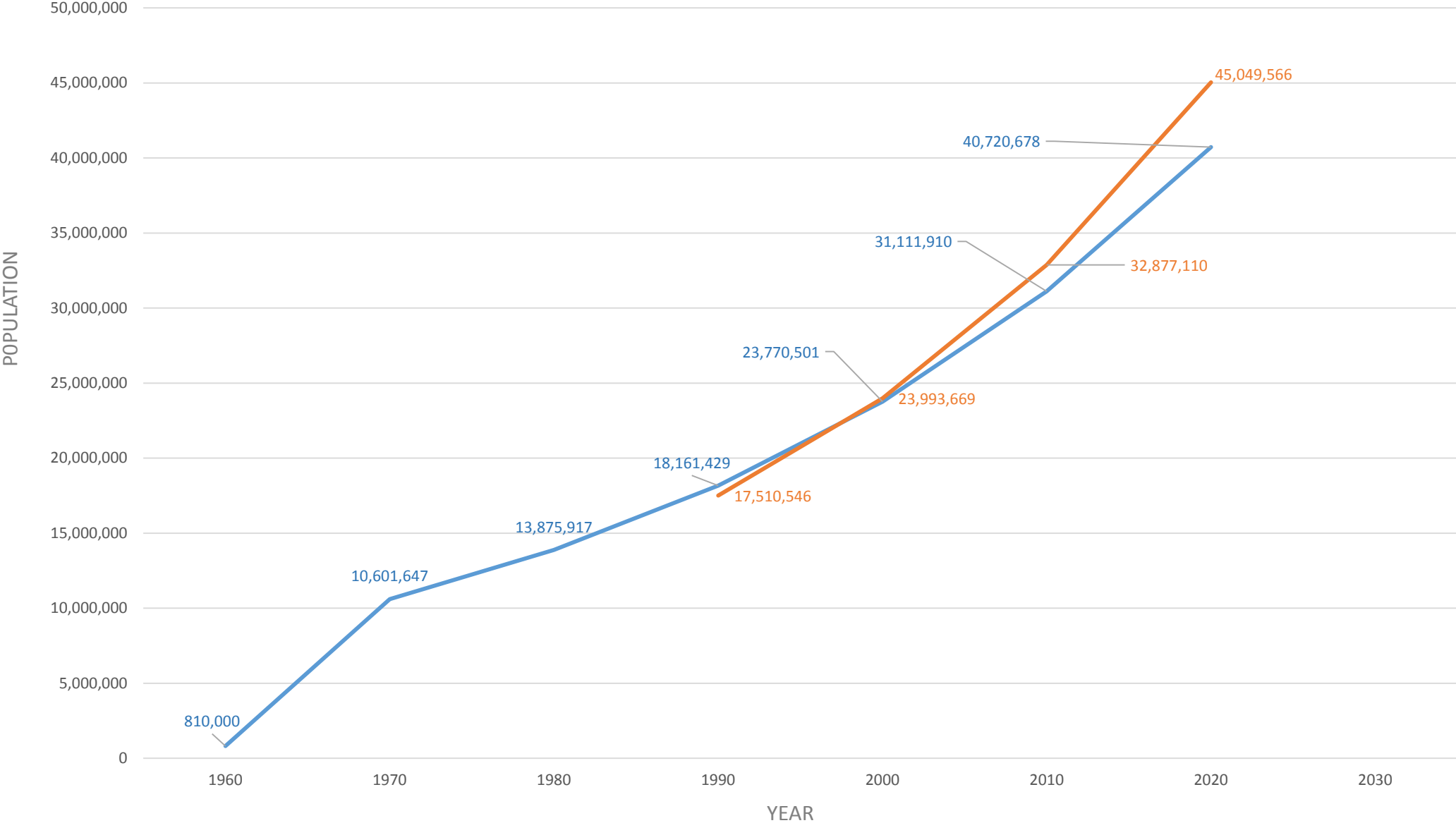
# Veritas Lecture Series 2017

“TOD Past Present Future”

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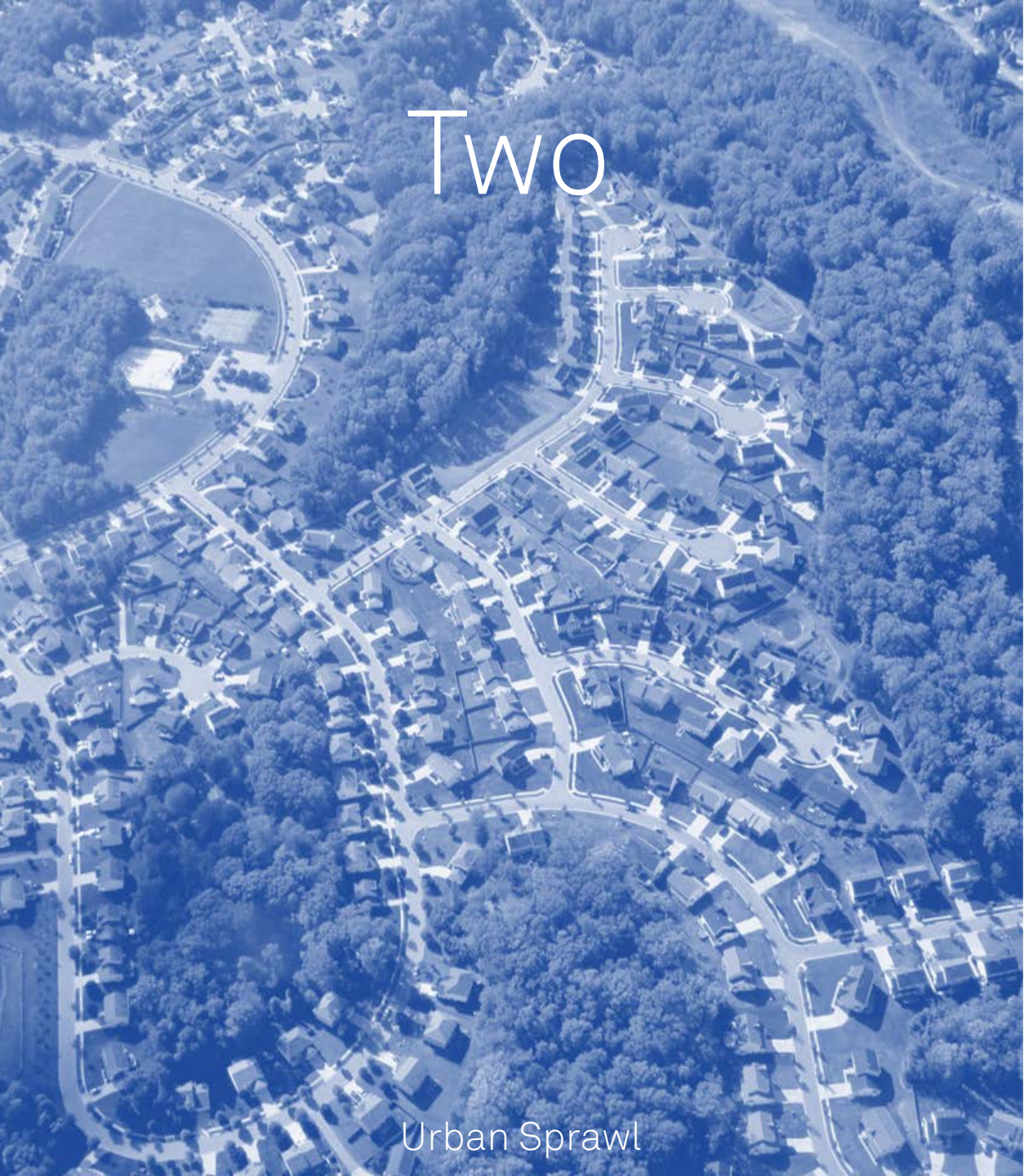
Matthew Holloway  
Grimshaw

Malaysian Population Growth 1960 - 2020



Population Growth



An aerial photograph showing a suburban residential development. The houses are arranged in a low-density, sprawling pattern with wide, winding roads. The development is surrounded by large areas of green, forested land. In the upper left, there is a large, curved body of water, possibly a lake or a large pond.

Two

Urban Sprawl

An aerial photograph of a dense urban environment. The image shows a tightly packed collection of multi-story buildings, including many high-rise apartment complexes. The buildings are closely situated, with very little open space visible between them. The overall impression is one of high land use intensity.

Choices

City Densification



**“Widening roads to solve traffic congestion is like loosening your belt to cure obesity.”**

Florida traffic engineer WALTER KULASH on induced traffic.



...both cause congestion...



Malaysia has the 3<sup>rd</sup> highest car ownership rate in the world (Nielsen 2014)

93% of households have at least one car  
/ 54 % have at least 2

KL Residents spend 250 million hours a year in traffic (World Bank)

Estimated damage of 2%+ GDP

17% of KL residents use public transport  
(69% Singapore / 82 % Hong Kong)

## Malaysian Congestion Statistics



Two

Invest in Public Transport

# Solutions



Tax Fuel

[illegible]

# Malaysian Public Transport Investment





## Rail Renaissance and Cultural Change

# TOD Drivers

Densification of cities

More walkable lifestyles away from traffic

Rapidly growing traffic congestion

Changes in family structures: more singles, empty-nesters, etc.

Prevent Suburban Sprawl

Smart Growth

Desire for quality urban lifestyle

Vibrance and Activity



Liveable



Amenable



Connected



Diverse



# Case Studies









KINGS CROSS ST PANCRAS  
LONDON, UK





ST PANCRAS STATION  
LONDON, UK





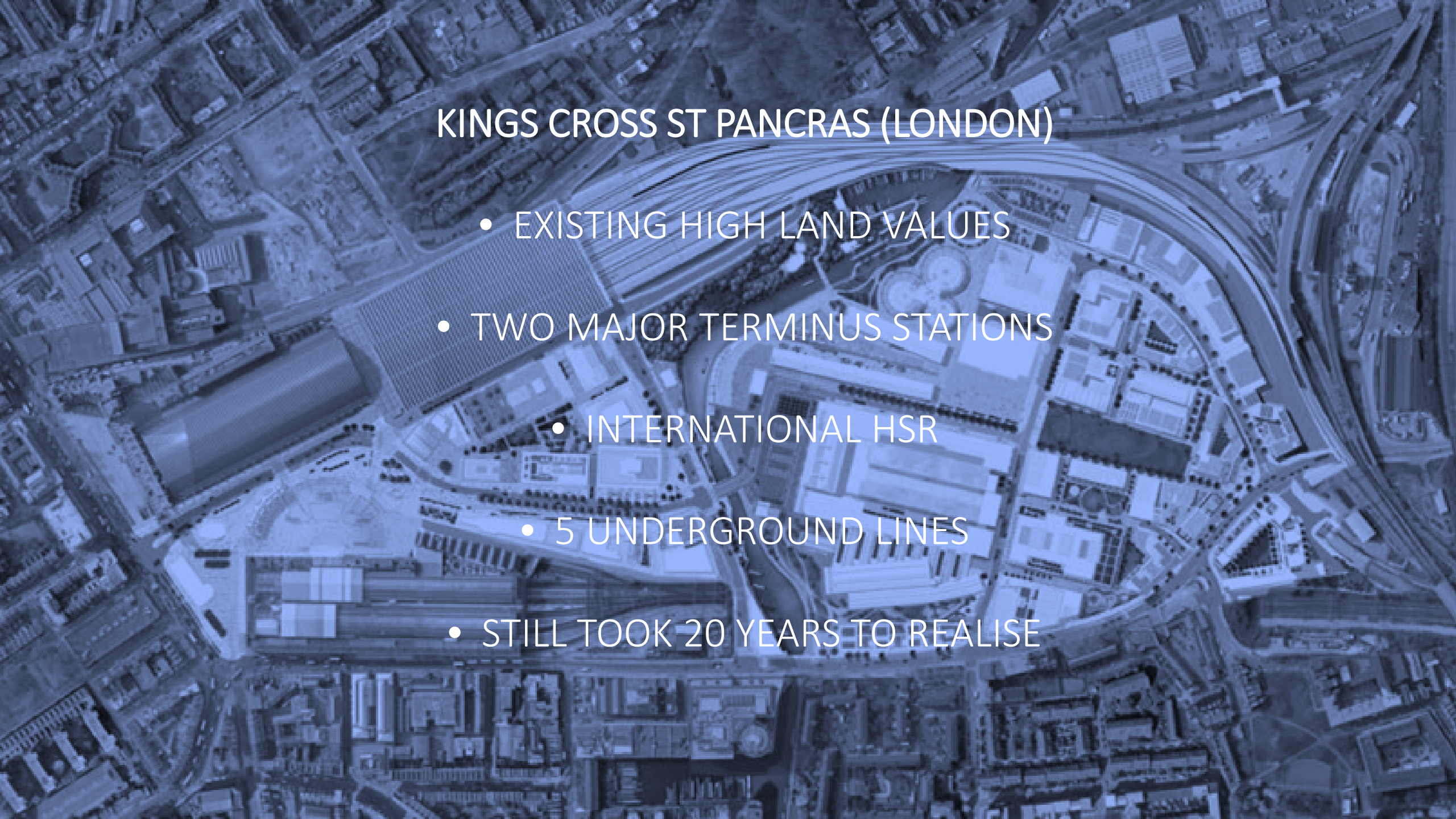
KINGS CROSS STATION  
LONDON, UK





KINGS CROSS by ARGENT  
LONDON, UK





## KINGS CROSS ST PANCRAS (LONDON)

- EXISTING HIGH LAND VALUES
- TWO MAJOR TERMINUS STATIONS
- INTERNATIONAL HSR
- 5 UNDERGROUND LINES
- STILL TOOK 20 YEARS TO REALISE





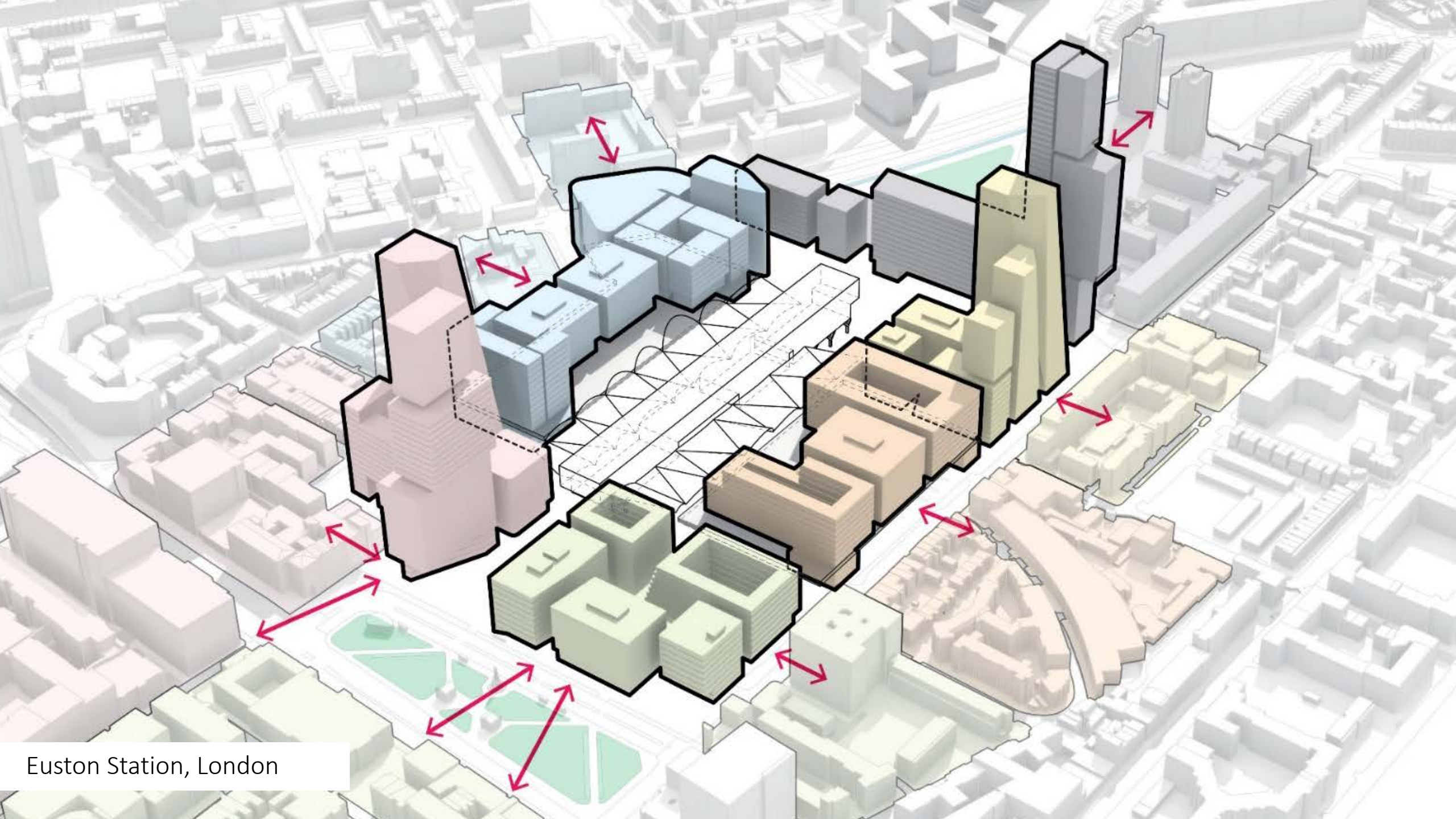
EUSTON STATION  
LONDON, UK





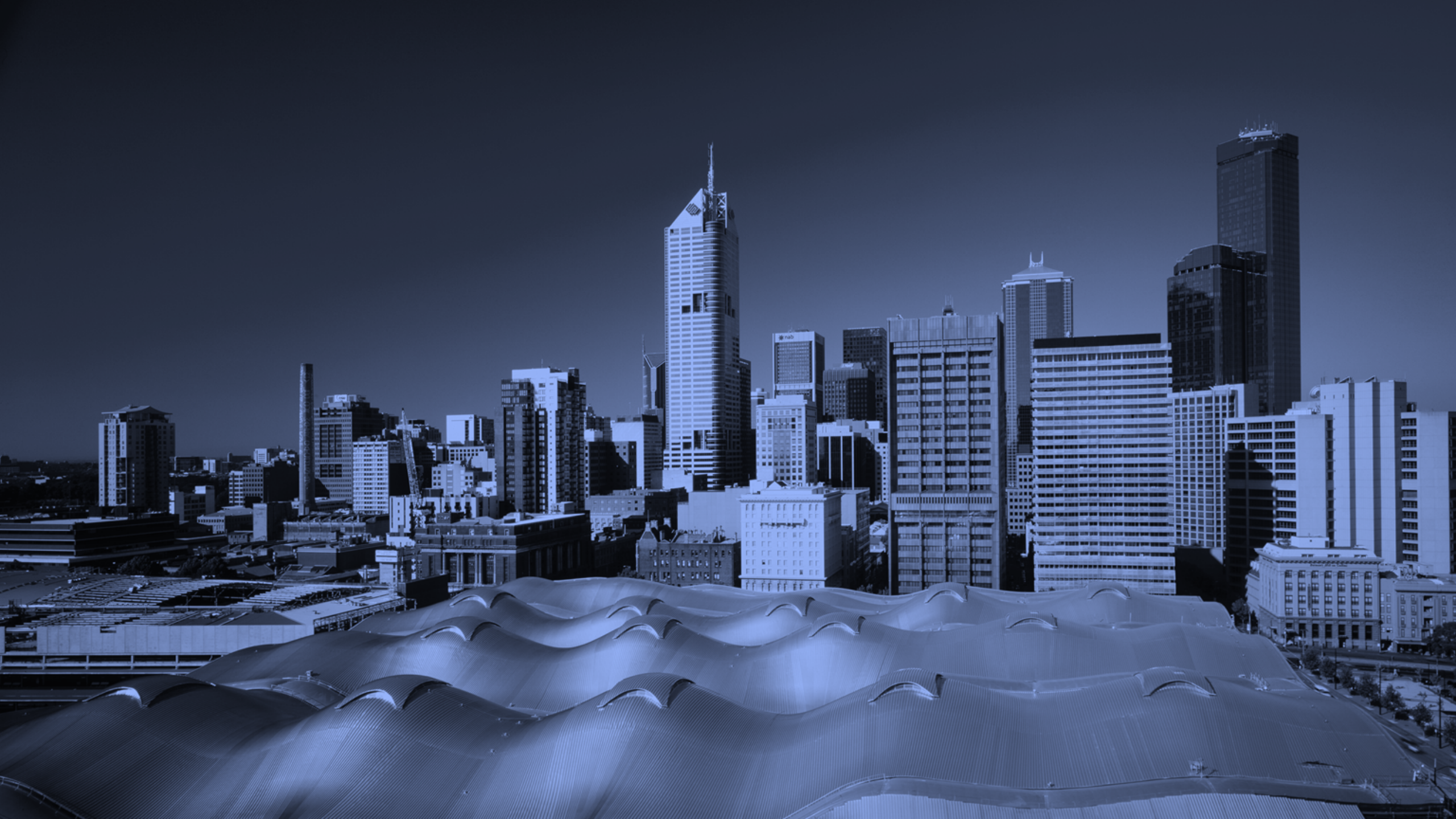
NEXT PHASE - EUSTON STATION  
LONDON, UK





Euston Station, London









SOUTHERN CROSS STATION  
MELBOURNE, AUSTRALIA















699 Bourke Street  
MELBOURNE





699 Bourke Street  
MELBOURNE





664 Collins Street  
MELBOURNE





## SOUTHERN CROSS (MELBOURNE)

- EXISTING HIGH LAND VALUES
- NEW TERMINUS STATION
- SIMPLE OVER RAIL DEVELOPMENT
- TOOK 10 YEARS AFTER THE STATION
- WRITTEN OFF LAND VALUE



# What have we observed?

Grimshaw



An aerial photograph of a city street grid. A prominent diagonal road cuts through the grid from the top-left towards the bottom-right. The grid consists of many small, rectangular blocks. The colors are muted, with various shades of brown, tan, and grey, suggesting a mix of urban development and possibly some vegetation or older buildings.

# Planned vs Organic Growth of Cities





Densification without Amenity





City's Serve People



A photograph of a park area with a large, multi-story white building in the background. The building has many windows and a classic architectural style. In the foreground, there are several large, leafless trees with intricate branch structures. A paved walkway with a pattern of light and dark stones leads through the park. A black metal fence separates the walkway from a grassy area. Several people are walking in the park, and a group of pigeons is gathered on the pavement in the lower foreground. The sky is clear and blue.

Density is not Height



[illegible]





#### Diversity & Adaptability

Create a highly adaptable and flexible master plan that can evolve



#### Community

Embrace a diverse and inclusive heartland for all



#### Water

Understanding the flow throughout the entire master plan



#### Catalytic

Bring a new burst of life with creativity and innovation



#### Transport

A car-lite city established on high performance & expandable network



#### Ecosystem

Establish an expansive and thriving setting



#### Infrastructure

Forward thinking and viable for everyday life



#### Heritage

Cherishing history while adapting to the future



#### Destination

Bringing Singapore's new west to the forefront



TOD in Asean

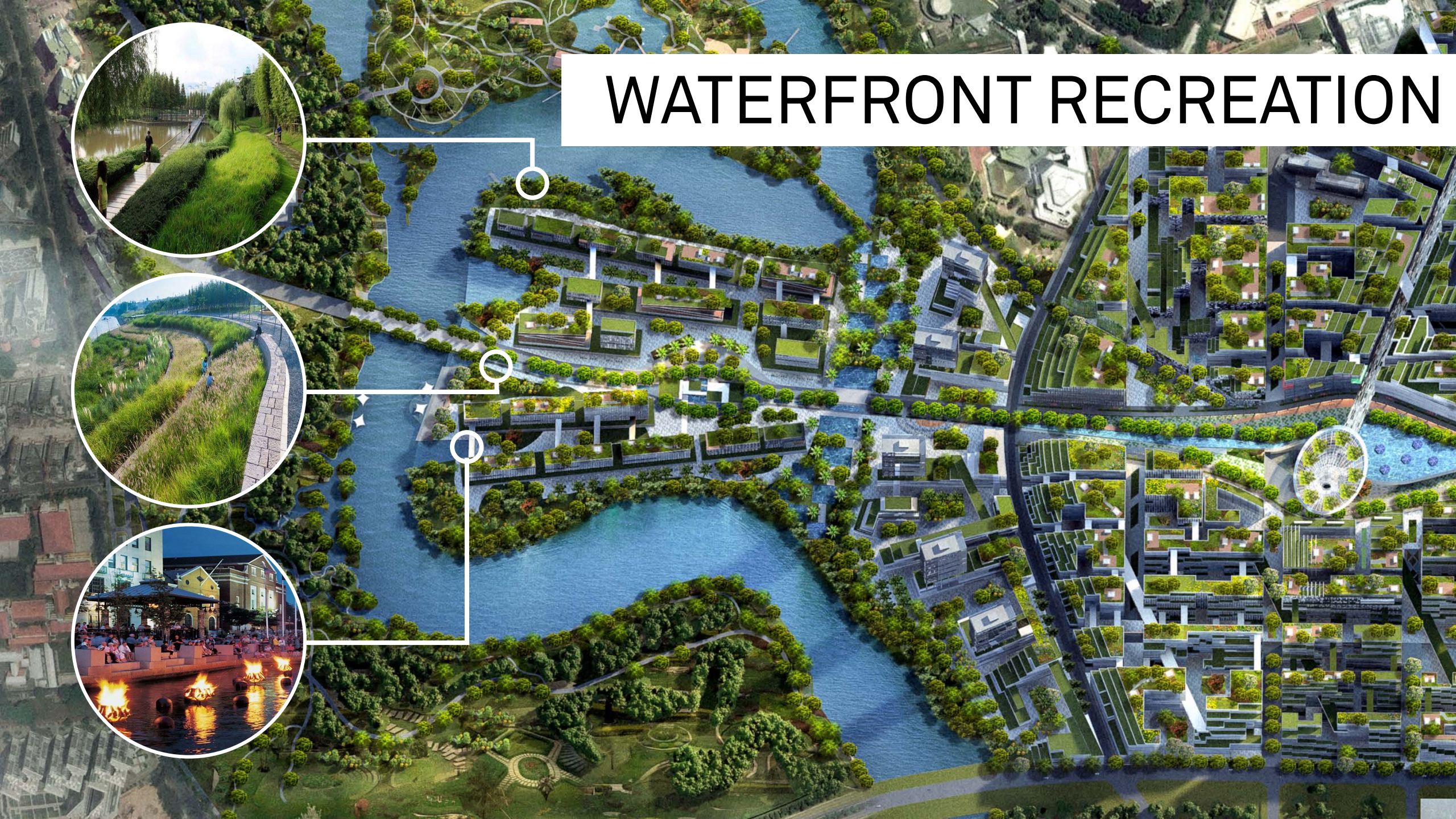




Jurong Lake District Masterplan - Shortlist  
SINGAPORE



# WATERFRONT RECREATION





ISLAND





CENTRAL

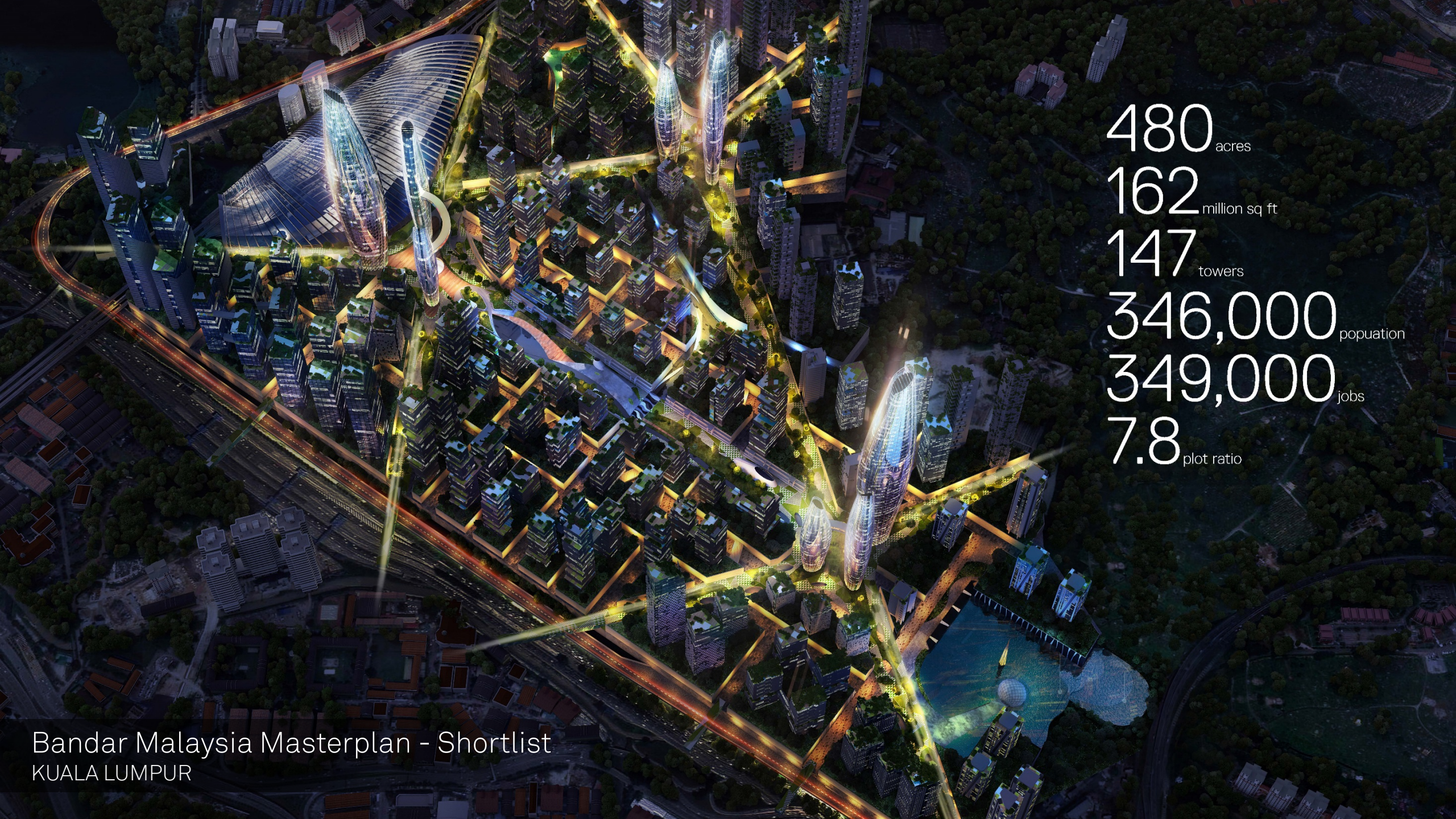




CREATIVE







480 acres

162 million sq ft

147 towers

346,000 population

349,000 jobs

7.8 plot ratio

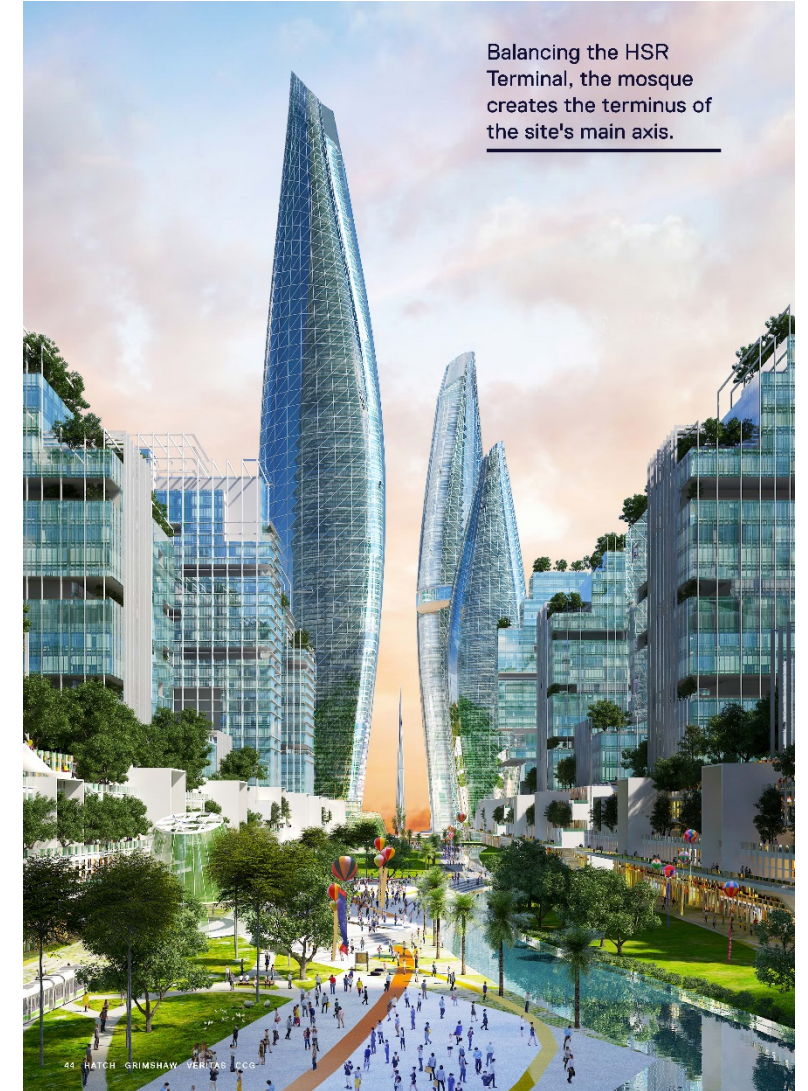
Bandar Malaysia Masterplan - Shortlist  
KUALA LUMPUR





## Bandar Malaysia Masterplan - Shortlist KUALA LUMPUR





## Bandar Malaysia Masterplan - Shortlist

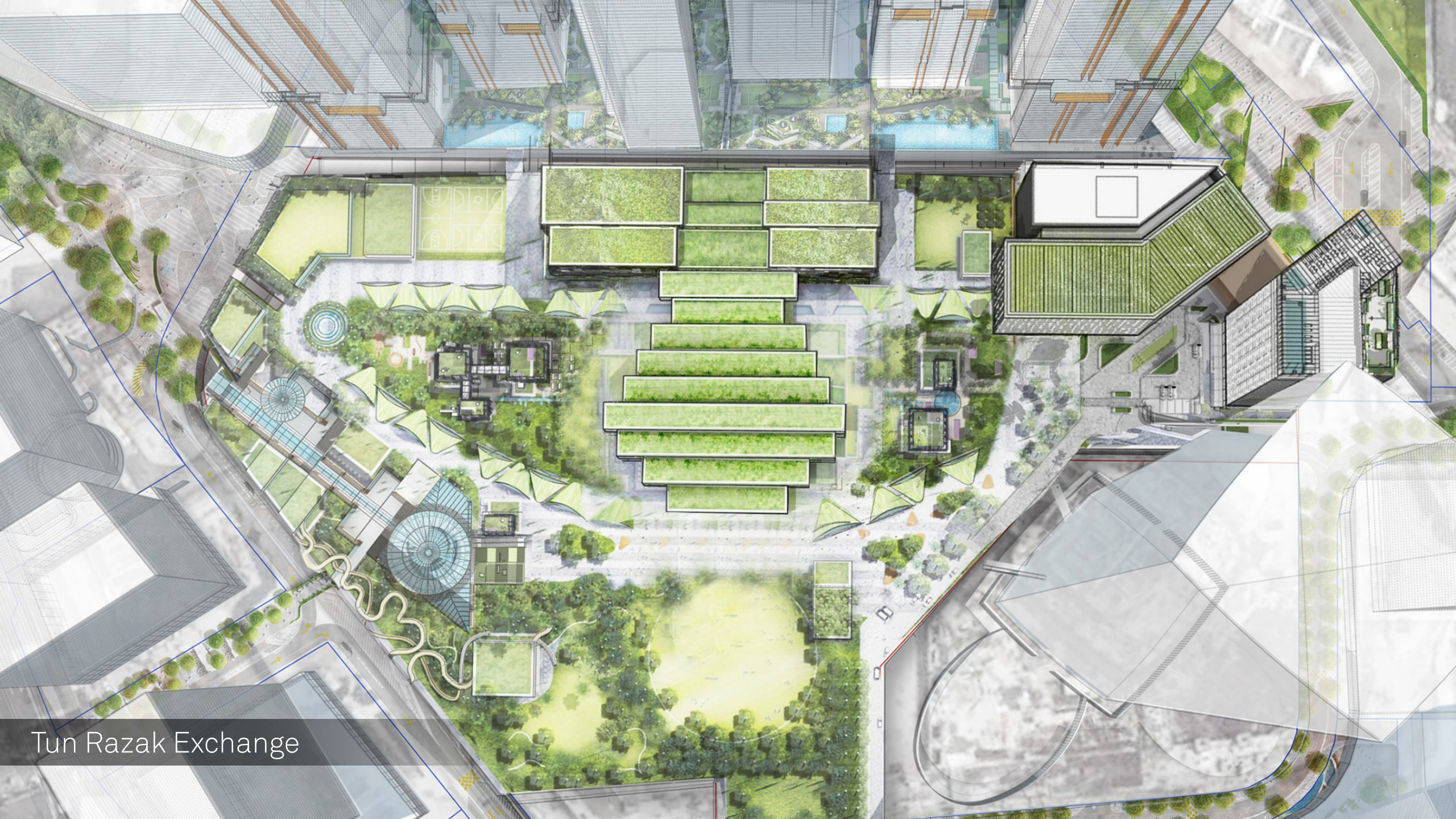
### KUALA LUMPUR





Tun Razak Exchange





Tun Razak Exchange





Tun Razak Exchange, Lifestyle Quarter  
RETAIL





Tun Razak Exchange, Lifestyle Quarter  
RETAIL









Tun Razak Exchange, Lifestyle Quarter  
RETAIL





Tun Razak Exchange, Lifestyle Quarter  
CITY PARK



# Tun Razak Exchange

UP TO 26 MILLION SQFT GFA

COHESIVE INTEGRATED DESIGN PRINCIPALS

but

MRT ONLY UNDERPINS 20% OF POPULATION FLOWS

STILL OVER 5,000 CARS

PRESSURE ON THE ALREADY STRESSED ROAD NETWORK

CAR PARKING CHALLENGES QUALITY DESIGN





# THE FUTURE?

## Connected & Autonomous Vehicles + Public Transport Combined



BUROHAPPOLD  
ENGINEERING



# SOME TERMINOLOGY

## Autonomous vehicles



- Driverless or self-driving cars
- Uses cameras, LIDAR, radar, GPS
- Computer vision is the most prominent emerging technology

*(Chris Urmson TedTalk: How a driverless car sees the road)*

## Connected vehicles



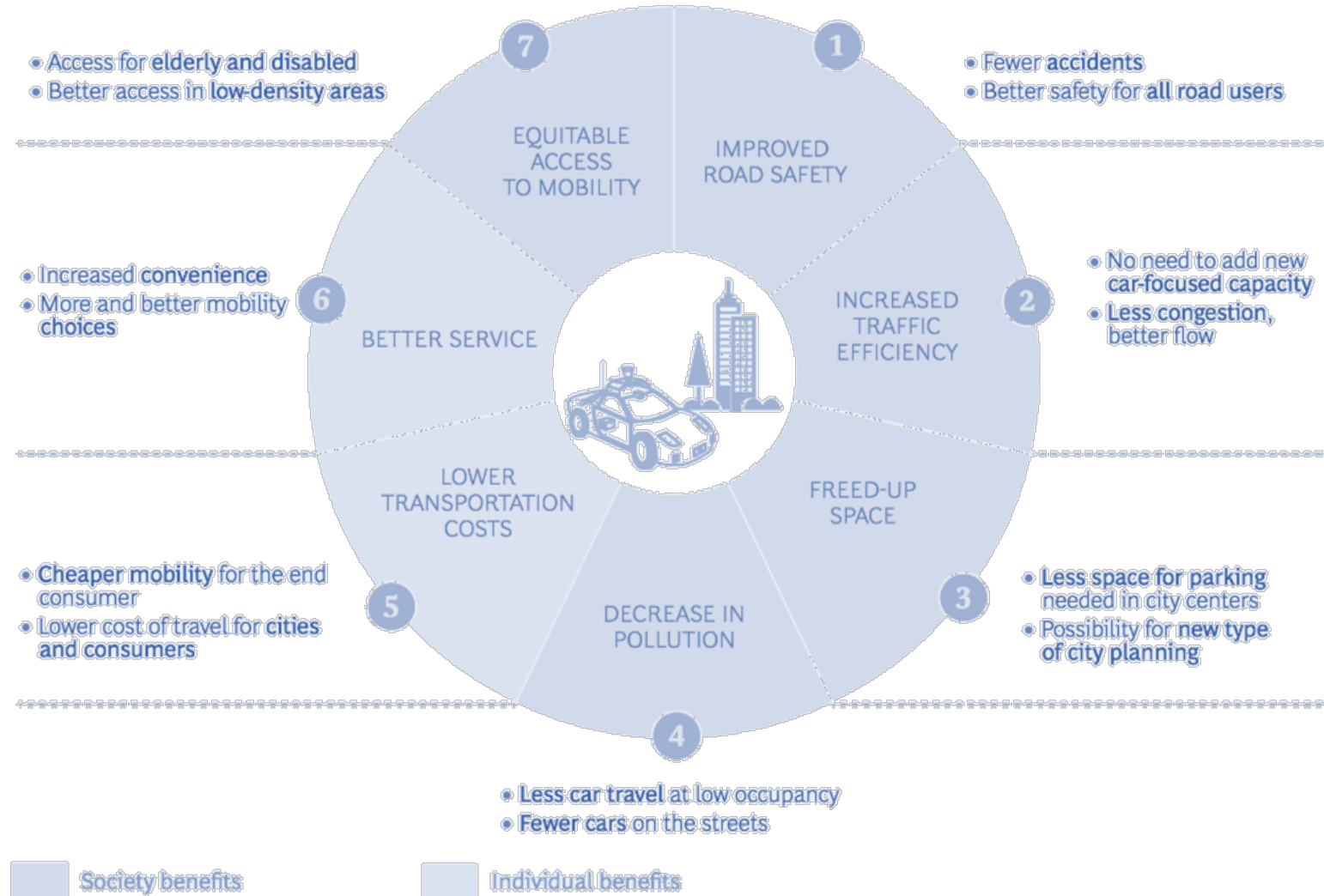
- Road users communicate with each other, sharing location, speed, direction, road conditions
- Communication can happen with surrounding infrastructure (e.g., toll road infrastructure)



Imagine a time where you can send your  
car out to work for you?



# POTENTIAL BENEFITS



Sources: City interviews, Q3 2015; World Economic Forum; BCG analysis.



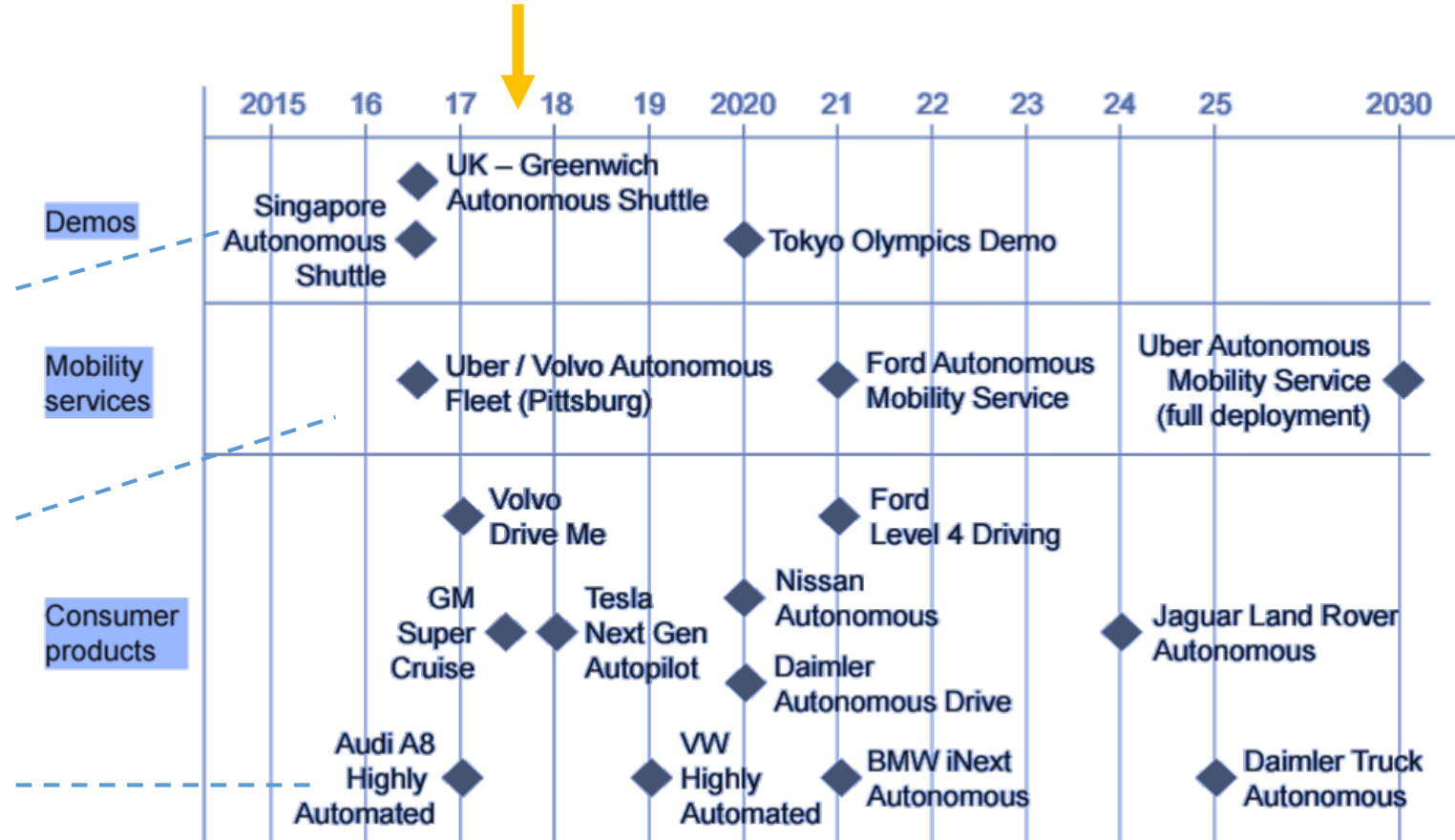
# TIMELINE

## EXHIBIT 5

### AUTONOMOUS DRIVE LAUNCHES



#### Timeline of events

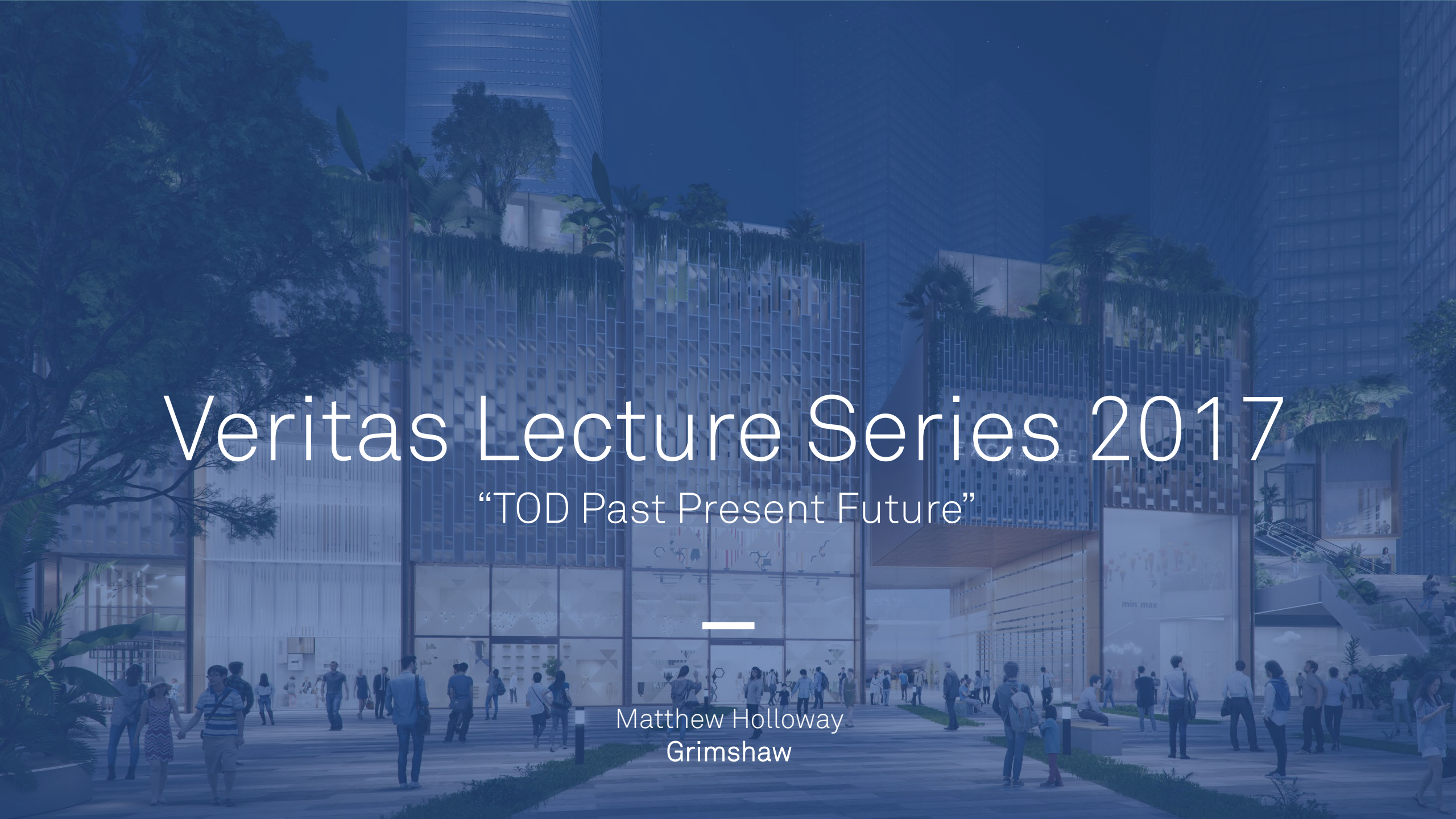






GRIMSHAW



An architectural rendering of a modern building with a green facade and people walking in front. The building features a large, textured facade with a grid of small, square openings. The ground floor has large glass windows. People are walking on a paved plaza in front of the building. The scene is set at dusk or night, with a blue sky and some trees visible in the background.

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Matthew Holloway  
Grimshaw