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# **SOUTH WEST GROUP**

## **Economic Development Tour**

**Singapore 2018**

# **Tour Report**

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## Economic Development Tour 2018: Overview

### Overview

The South West Group has undertaken a number of economic development tours since 2012 aimed at examining best practice and innovation on issues relevant to the South West Metropolitan region.

In 2018, the Board resolved to visit Singapore with a particular interest in 4 key areas:

1. Density Developments
2. Public Transport Integration
3. Port Development
4. Green Sustainability Initiatives

A detailed tour information pack was prepared ahead of the visit to Singapore and a daily fact-pack was provided to the delegates (together “**Information Report**”). The Information Report is available from the South West Group separately upon request (due to the size of the Report).

This report provides a brief overview of the “tailor-made” tour and outlines the key conclusions from the tour (“**Tour Report**”). This Tour Report is to be read in conjunction with, and as an extension of, the Information Report.

Day 1: Monday 9 April 2018	
Time	Event
8.30am	Depart Hotel
9am to 10.30am	Pasir Panjang Port, Jurong Island, Tuas MegaPort and Tuas Viaduct Tour
11am to 1pm	Jurong Lake District Township Tour
1pm	Lunch @ Westgate Mall, Jurong
2pm to 4pm	Building & Construction Authority Meeting
4.30pm	Return to Hotel
6pm to 7pm	Bumboat Tour Singapore River

<b>Day 2: Tuesday 10 April 2018</b>	
<b>Time</b>	<b>Event</b>
<b>8.30am</b>	Depart Hotel
<b>8.45am to 10am</b>	Green Building Examples: CBD
<b>10am to 12 midday</b>	Urban Redevelopment Authority City Gallery and URA Meeting
<b>12 midday</b>	Café Lunch @ PS Cafe
<b>1pm to 3.30pm</b>	Paya Lebar Quarter Tour
<b>4pm to 5.30pm</b>	Australian High Commission Meeting
<b>6pm</b>	Return to Hotel

<b>Day 3: Wednesday 11 April 2018</b>	
<b>Time</b>	<b>Event</b>
<b>8.30am</b>	Depart Hotel
<b>8.45am to 9.30am</b>	Vivo City View Point across to Sentosa
<b>9.30am to 10.30am</b>	Singapore Port Authority Meeting
<b>11am to 12.30pm</b>	Marina Bay Cruise Centre Tour
<b>1pm</b>	Singapore Satay Lunch @ Gardens By the Bay
<b>2pm to 3.30pm</b>	Public Utilities Board Meeting and Marina Barrage Tour
<b>3.30pm to 4.30pm</b>	Singapore National Stadium Tour
<b>5pm</b>	Return to Hotel



*The delegates' Four Points by Sheraton hotel looking over the Singapore River and out towards adjacent residential buildings*



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# 1. SOUTH WEST GROUP: TOUR CONTEXT

## Singapore Economic Development Tour 2018

For the 2018 economic development tour, the South West Group Board resolved to visit Singapore with a particular interest in 4 relevant areas:

1. Density Developments
2. Public Transport Integration
3. Port Development
4. Green Sustainability Initiatives

Further background for each of these 4 key areas of interest can be found in the Information Report. The tour was “tailor-made” to ensure that areas in Singapore most relevant to the South West Group were explored, given the specific and applicable local requirements in Western Australia.

The tour involved site visits and meetings with government agencies, executive staff and development managers across these 4 interest areas.

*The key to Singapore’s success – and a strong lesson for Australia – has been the “whole of Government approach”: a forward-looking and closely integrated co-ordination across the various Singapore Government agencies, industry and the community from a sustainable planning and implementation perspective.*

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## 2. TOUR CONCLUSIONS

### Applicability to South West Metropolitan Region

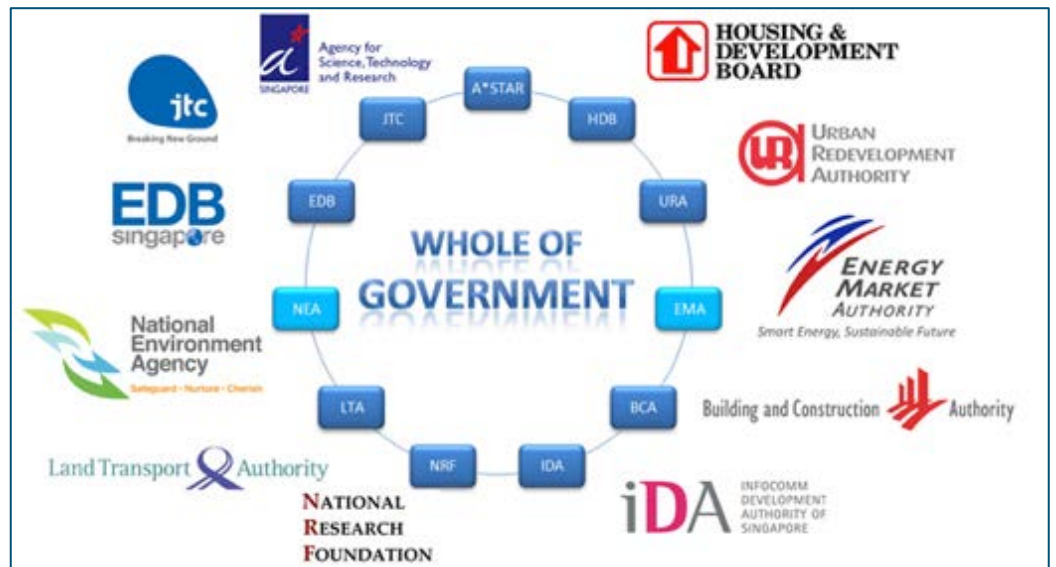
Singapore is a small republic with a big focus on bureaucratic responsiveness, education and efficient productivity allowing it to remain competitive and attract significant investment.

Bi-lateral trade between Singapore and Australia currently stands at \$20 billion a year, with Singapore being the fifth-largest investor in Australia. Recently upgraded Free Trade Agreements provide an opportunity for both countries, and especially for Western Australia.

While the single Republic of Singapore government system differs markedly from the three-tiered system in Australia, there are conclusions from the Singapore Tour which can be applied in the WA and South West Metropolitan Region context.

#### 1. **Integrated Planning and Development Approach**

The consideration of holistic factors early in the planning process enables Singapore to design, plan and implement integrated precincts and outcomes that bring together optimum land uses. This integration is supported by sound decision making on infrastructure provision that is able to align agencies and leverage private sector investment toward common objectives. Firm direction from Government and the use of collaborative structures (eg. multi-agency working groups) operating at a precinct-level enables obstacles to be overcome and facilitates whole of government decision making and implementation effectiveness.



*Singapore's "whole of Government" approach*

Although the WA State Government is currently committing significant resources to the METRONET and Westport taskforces, there are opportunities in the future for improved collaborative structures to be implemented for key activity centres in the region.

Focused planning and development will unlock maximum potential for local employment, community-centric development and housing and attract investment into the South West Metropolitan region. A beneficiary of such an approach could be around the Murdoch hospital precinct, given the lessons learnt from Singapore's integrated development at Jurong, centred around its public hospital, Ng Teng Fong Hospital.



*Fiona Stanley Hospital, Murdoch (L) and Ng Teng Fong Hospital, Jurong (R)*



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Singapore’s collaborative approach – coupled with accountability to Government and the community – has resulted in successful development outcomes that can provide useful insights and structures to support successful integration across Western Australia and the South West Metropolitan region in particular.

## 2. Long-Term Investment

Singapore has a stable Government that has been in power for over 50 years following independence in 1965. This stability and certainty in policy and strategic direction enables Singapore to take a long-term view on future development and infrastructure needs to support its key economic drivers (ports, airport, tourism, business, oil and gas).

As a nation with sound financial fundamentals, coupled with highly competitive but lucrative revenue streams, an environment has been created where the risks and rewards associated with significant capital investment (eg. Tuas MegaPort, damming rivers, land reclamation) are understood and supported. These decisions have shaped Singapore into a major global destination and trading-hub.



*Singapore CBD image in year 2000 (L) and CBD image in year 2010 (R)*

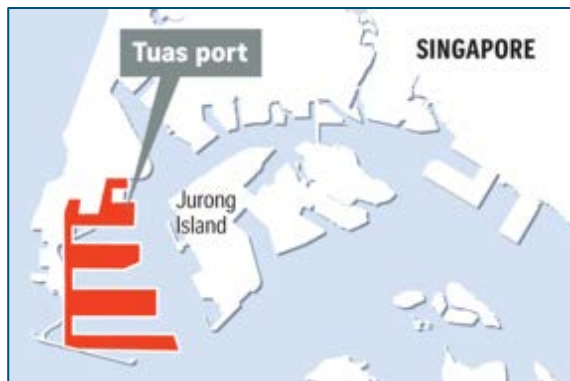
WA has made similar long-term planning and development decisions on some issues of state economic significance in the past (eg. Pilbara iron ore mining and infrastructure development, Norwest Shelf oil and gas exploration and infrastructure development) and more recently with the Perth Airport Expansion.

However, there is now a need for more long-term planning for economic infrastructure provisions within the metropolitan area.

Activity centres and industrial areas targeting employment and economic development outcomes should be the focus for future infrastructure provision. This could be undertaken as part of the implementation phase of METRONET and include other centres requiring enhanced public transport and utilities investment.



Westport presents a key opportunity for the region to provide a long-term plan for the port of Fremantle and the Outer Harbour in Kwinana. This would provide a clear direction to investors under a focused and executable government policy, with many lessons and potential for input from Singapore's Port Authority (given Singapore's Tuas MegaPort centralisation development project, currently underway).



The South West region is well placed to capitalise on activity centre development and has prepared action plans for key activity centres requiring State Government investment and active involvement in their development as priorities. The infrastructure investment opportunities and benefits have been communicated to the State Government as part of the South West Group's submission on the State Infrastructure Plan and planned formation of Infrastructure WA.

### **3. Policy and Execution Certainty**

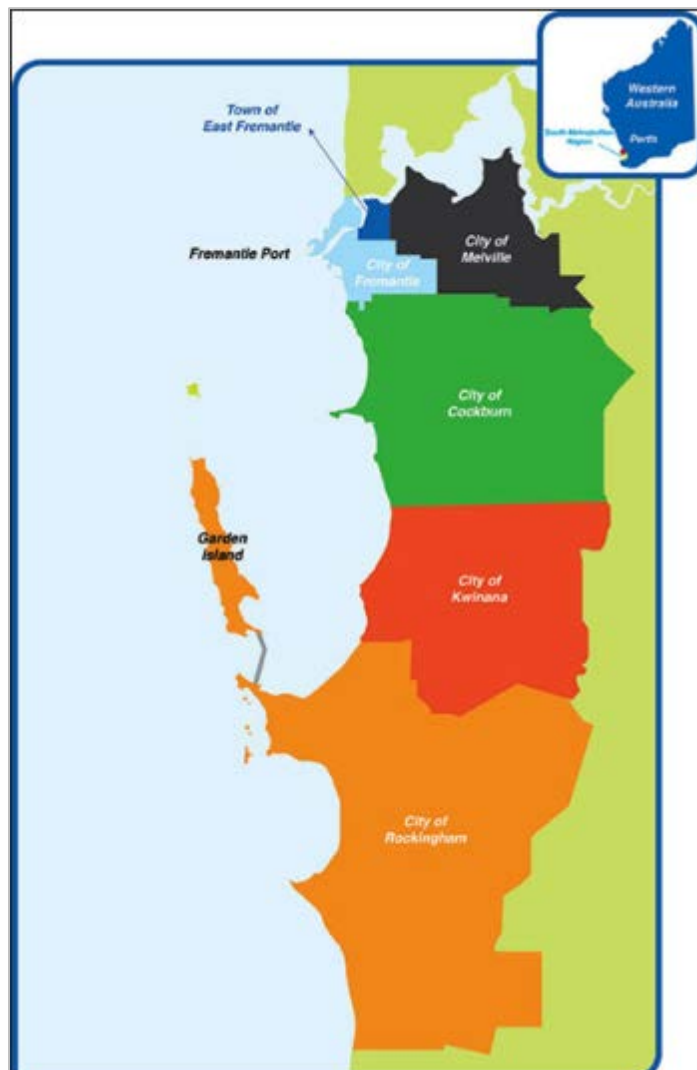
The combination of certainty in policy and decision making and a long-term time horizon for investment in infrastructure by Singapore creates favourable conditions for investment attraction and execution across major projects, precinct development, infrastructure and service provision.

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The demand for office space and vibrancy in the CBD and across key decentralised areas, together with the fact that a large number of global companies have headquarters in Singapore, is testament to these conditions.

Although the financial environment at the State Government level may not currently be conducive to infrastructure investment in areas such as metropolitan activity centres, the planned formation of Infrastructure WA and the development of the State Infrastructure Plan are positive steps towards attracting greater private sector investment in infrastructure planning, design and construction to support major projects and the development of activity centres.

The South West area is well placed to do business with Singapore-based industry particularly in bio tech, security, maritime and defense. Most Singapore companies have a connection with WA and the time zone makes it very attractive for established businesses to push offshore.



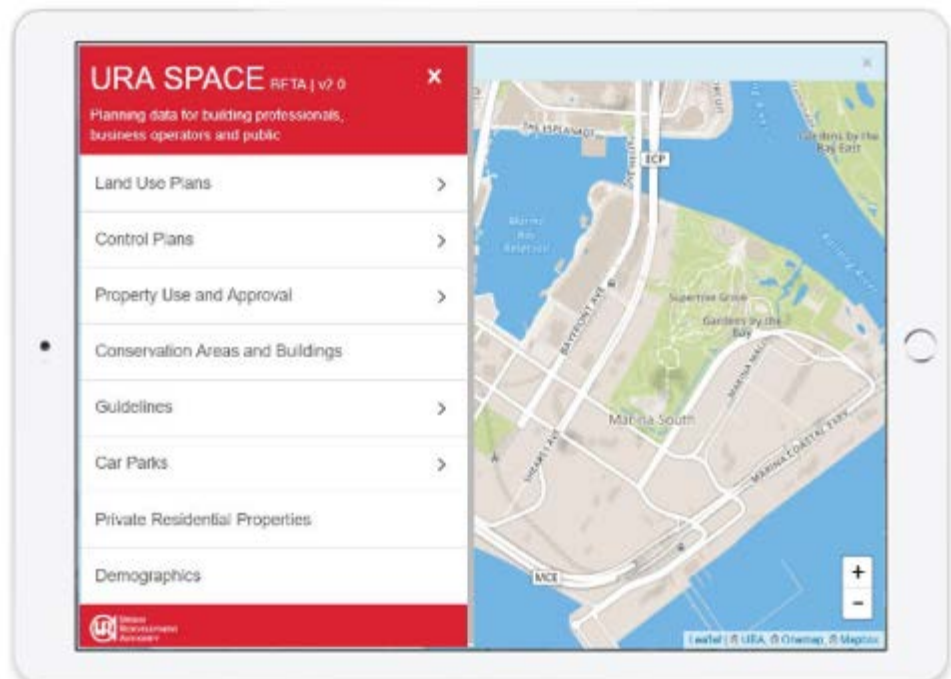
Working together to support business opportunities, being clear on what companies are looking for and actively promoting the region’s attributes and opportunities requires a single coordinated focus.

Specificity of the “WA offer” is needed, coupled with local relationship management and support-links to foreign investor delegates and representatives.

## 4. Streamlined and Efficient Approvals

The Singapore Government, and in particular agencies such as the Urban Redevelopment Authority (URA), are truly a one-stop-shop for planning and development approvals and permits. This is evidenced in Singapore by the rapid approval timelines for development proposals that meet planning and zoning requirements compared to the extended timeframes experienced in WA.

By way of example, URA manages agency referrals with remarkably quick turnaround times (days, rather than months as experienced in WA). The Singapore Government has established detailed planning provisions and design requirements for buildings, including specified plot ratios, for most of Singapore, given that it owns 80% of the land.



*Example of one of URA’s information digitisation and streamlined on-line lodgement systems*

There are many lessons that WA could learn from Singapore, particularly in approvals for developments that are deemed to comply. Efficiencies and streamlining could be achieved in WA, however this would require better integration between Activity Centre plans and policies, Structure Plans and Local Planning Schemes and more detailed provisions (design/technical guidelines) specified upfront. These efficiencies would most likely require a review of how the Development Assessment Panels (DAPs) operate here in WA and the balance between State and Local government approvals and delegations.

Clarity around responsibility and accountability to achieve an outcome will assist in reducing timeframes and providing certainty to the development industry .

## 5. Clean and Green

Singapore is recognised as a leader in sustainability and for the ways it is greening the city. There are a range of programs that mandate or support increased consideration of environmental and social factors including Green Mark, Zero Energy, Active Beautiful Clean (ABC) water design and WELL building standard features (Building and Construction Authority). These programs set requirements that ensure high quality built design standard and sustainability targets are achieved for new buildings and redevelopments.



*Green space features are common in Singapore's CBD and contribute to public amenity*

Although some aspects may be discretionary for private sector developments, most Singapore Government projects mandate or demand strong adherence to standards and targets set in these programs.

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The lack of available land and the need to construct efficient buildings are key drivers in the application of these clean and green specifications.



There is minimal mandatory greening, energy efficiency or sustainability targets required for developments and buildings in WA, with the exception of those specified in selected activity centre plans. For most other developments, these clean and green requirements are discretionary, and their implementation largely rely upon local government negotiations with the development industry and proponents.

The South West Group member Councils already undertake a leadership role in regard to encouraging clean and green buildings, however this is not always supported by the DAPs who may be unduly influenced by proponents and their consultants seeking to maximise yields whilst minimising costs.

The South West Group Technical Directors Committee are well placed to investigate ways to improve the application of clean and green standards in building design and construction in the region on behalf of the South West Group, including recommendations to the State Government for regulatory and/or policy reform.

Opportunity exists to establish a development bonus approach for development that provide for environmental sustainability outcomes.

# 3. KEY FINDINGS AND LESSONS LEARNT

## Day 1



### 1. Building and Construction Authority

- The Building and Construction Authority (BCA) operates under the Ministry for National Development, with sister agencies including the Urban Redevelopment Authority (URA) and Housing and Development Board (HDB), National Parks (NParks) and Agri-Food and Veterinary Authority (AVA)
- The BCA's activities are guided by the URA Concept Plan and Masterplan
- The BCA administers the CoreNet electronic development application lodgement system which coordinates input from the 15 other agencies involved in development control and approvals
- Development approvals are usually achieved within 7 days, providing the application complies with requirements and contains all of the necessary information



*The use of models in Singapore forms an important part of project management and stakeholder engagement*

- The BCA has developed a “Green Mark” system which sets out building design and performance standards to achieve sustainable build form outcomes
- The BCA has a target of having 80% of all buildings in Singapore to be green buildings by 2050. They are also working toward Zero Energy builds
- BCA also has a system for quality control

- BCA manages the building development process from application approvals through to the granting of occupation permits, giving it the control over the whole process
- The BCA operates under legislation that covers new buildings (2008) and existing buildings (2012)
- BCA has a green procurement policy for building construction that also extends to other activities such as events
- 6 growth areas have been identified in Singapore; with Jurong and Paya Lebar being visited by the Group
- The BCA operates under a “three-pillars” policy that integrates (1) green buildings, (2) design for manufacture and assembly (DFMA) and (3) integrated beam design considerations into future developments
- BCA has set up a transformation office to facilitate progress in these areas



*The BCA Head Office in Jurong is an innovative building that was constructed in accordance with Green Mark requirements*



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## Key Findings and Lessons Learnt

1. The standards, quality controls and compliance requirements for building and construction in Singapore are clearly articulated and understood by Government and industry
2. Sustainability and resource efficiency targets are set high and enforced through programs such as the Green Mark and Zero Energy programs
3. The BCA has highly automated and online development and building approval systems
4. Compliant Development Approvals are processed within 7 days and Building Permits within a similar timeframe, thereby accelerating the approvals process and enhancing investment certainty

### Contractor Briefings

BCA arranged for 2 contractors to attend the BCA briefing and they discussed the modular design and construction industry and its applicability to Australia

#### Team Build Group



- Currently undertaking a PBCC project
  - Site in Malaysia for manufacture
  - Has developed over 4,500 Brown stone modules at a rate of 100 modules per day, with a large project recently completed involving 6,600 modules

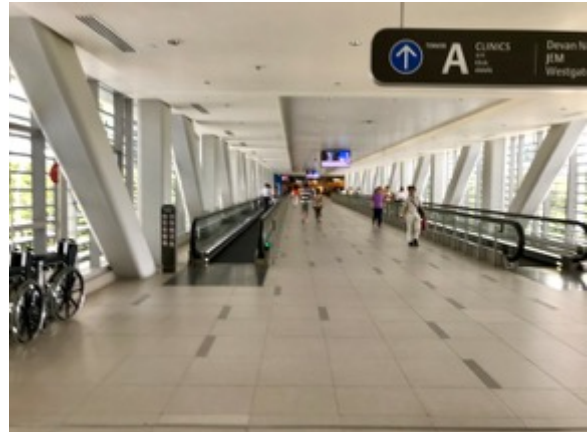
#### Venturer



- Current rates of development relate to 4-6 sqm per man day, with modular able to achieve 10 sqm per man day
- Have completed KL Edge UK
  - Prefab done in Europe
  - 4 storey office and 3 storey JTC offices completed in Singapore
  - Capable of up to 30 storeys

## 2. Jurong: Integrated Development + Tuas MegaPort

- Planned as Singapore's second CBD, Jurong is a thriving activity centre with an integrated hospital, commercial, residential and retail heart around the rail station
- Built over four years, the hospital and surrounding development is testament to the high quality and rapid construction techniques used in Singapore for major projects



*Jurong's integrated hospital facility is connected to the adjacent precinct buildings and train station by an above street walkway ("J-Walk")*



*The main street through the Jurong precinct includes high density commercial and residential developments*

- Jurong is located in close proximity to the planned Tuas MegaPort and industrial development areas, which will be a key economic driver to support the area



*The Jurong industrial area includes large scale container storage parks and major heavy oil and gas industries that will benefit from the new Tuas MegaPort*



*The Tuas Viaduct is the first integrated road and rail connection between the future Tuas MegaPort and Singapore's existing transport network*

- The industrial area around Jurong and extending out to the Tuas MegaPort project is a major employment district in Singapore, particularly for semi-skilled and unskilled workers largely sourced from India, Bangladesh and Malaysia
- To accommodate the workers for the Tuas MegaPort project, a migrant workers village has been established and is capable of housing up to 16,000 workers



*The workers dormitory village in Tuas is capable of housing up to 16,000 people*

- Transport to and from work sites are provided by the contractor, with the workers village including dormitory style shared kitchen facilities and independently operated convenience stores to purchase daily items

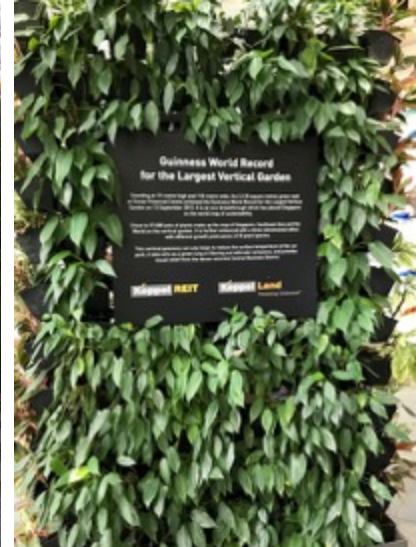
## Key Findings and Lessons Learnt

1. Major infrastructure projects such as the Tuas MegaPort development require skills and workers that are not available domestically and therefore need to be brought into Singapore
2. The industrial areas around the port project have been well established by the Singapore Government and are capable of expansion to meet future needs
3. The Jurong CBD is a remarkable example of a rapid built and highly integrated city centre development which already supports a thriving economy and demonstrates high levels of activation
4. There is a high level of diversity in land uses in and around the Jurong CBD, with plans to expand further green field and infill development in the short term to cater for future growth

## Day 2

### 1. Greening Singapore

- The CBD has a number of excellent examples of green infrastructure being applied to buildings and major projects



- The greening of Singapore is mandated through programs such as the BCA's Green Mark that requires buildings and developments to incorporate environmental and sustainability aspects into the built form
- Green walls, green roofs, landscaping and the integration of green spaces into infrastructure and building construction is applied to developments as measures to achieve Green Mark accreditation



- The greening of Singapore is recognised globally for its achievements during a period when the city was also going through major redevelopment and growth in the number and scale of buildings and the "greening" approach has helped to soften built form, improves physical well-being and reduces heat emission

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## Key Findings and Lessons Learnt

1. The tropical climate of Singapore is highly conducive to the establishment of green infrastructure; however, many examples could be replicated in Australia under the right conditions and correct orientation of buildings to maximise green spaces
2. Incentives at WA State and Local Government levels would be necessary to encourage the establishment of green infrastructure as part of the planning, development and building approval process
3. Greening of cities should be recognised in planning provisions and eligible to the development industry as a “community benefit”, with incentives commensurate with the scale of greening
4. The ongoing survival, management and maintenance of green walls and roofs are key issues for Singapore and are also likely to be more important factors if applied in Australia, particularly taking into account safety requirements and climatic conditions

## 2. Urban Redevelopment Authority

- URA is one of the 37 agencies under 16 Ministries in Singapore and one of 6 under the Ministry for National Development
- URA has over 1,000 staff, with 40% graduates across a range of disciplines
- URA covers the full range of planning in Singapore including strategic, master planning, development control, land sales, conservation of heritage and place management in key locations such as Marina Bay



- URA works closely with the Ministry of Transport who are responsible for maritime and ports, aviation and public transport
- Concept plans provide the long-term framework for planning, which is projecting a population of 6.5 – 6.9 million by 2050 (currently 3.5 million)

- About 80% of the 35 million TEUs managed at the port are trans-shipment, with 20% domestic
- The URA Master Plan sets out plot ratios for development in zones, although there is a process for re-zoning and seeking variations to plot ratios



*The URA 's head office contains a range of models and interactive displays outlining the history and future of Singapore's development*

- URA aims for granting planning approvals in 4 weeks, including 3 weeks of advertising
- Electronic lodgement of planning applications is managed through the BEAM portal
- The Planning Act requires the URA Master Plan to be reviewed every 5 years
- The level of community consultation in the planning process has increased and there are a range of consultation activities such as use of focus groups
- Public transport patronage is currently 65%, with 35% car and a small percentage walking and cycling
- 70% to 80% of land is owned by the Singapore government and is sold or leased under government tender (which makes controlling development easier)





*Scale models of the central Singapore CBD show existing and proposed development and are effective tools in engaging the public on the development of Singapore and how things might look in the future*

- There is an emergence of digital districts being developed such as Punggol as well as satellite cities such as Toa Payoh and New Towns like Tengah Forest Town
- JTC is the master industrial development agency for Singapore's industrial land
- Singapore has constructed 1.3 million public housing units, with 300,000 private housing units developed
- Aged-care is currently managed through studio units which are integrated into all housing developments
- URA has a number of online tools to assist with the planning and development approvals process including GEMMA and QUEST (3D GIS) as well as the URA self-help space within the URA head office



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## Key Findings and Lessons Learnt

1. The URA is in a unique position as the sole strategic and statutory planning agency and regulator in Singapore
2. The high proportion (80%) of land owned by the Singapore Government is a significant advantage for development and investment as it:
  - Simplifies and accelerates zoning, planning and development approval processes
  - Facilitates master planning and design principles for sites under government ownership
  - Enables the implementation of development outcomes that are close to the agreed vision, design philosophies and quality standards
  - Provides certainty of execution for developers and construction companies
  - Attracts investment by minimising land-holding costs and approval delays

### 3. Paya Lebar Quarter: Integrated Development

- The Paya Lebar Quarter is a 4.4 ha green-field development site purchased by Lendlease from the Singaporean Government under an open tender



- The development includes a retail building (30,000m<sup>2</sup>), two commercial buildings (combined 90,000 m<sup>2</sup>) and a residential tower (429 units comprising 1, 2 and 3-bedroom units)
- The buildings are certified to achieve Green Mark 3 requirements, incorporates Active Beautiful Clean (ABC) water design and WELL building standard features
- The site was planned through a master-plan and place-making approach which involved active community consultation and engagement

- Lendlease examined the possible installation of solar panels to generate energy for the development, however the flight path restrictions meant that this could not be achieved based on the approved design and height limitations



*Lendlease's Paya Lebar Quarter project models provide an excellent perspective on the scale and design of the development*





*Close up of retail mall building (above left) and open space area adjacent to residential building (above right).*

*The viewing area of the Paya Lebar Quarter development site from inside Lendlease's office (below)*



## Key Findings and Lessons Learnt

1. The ability for Lendlease to raise funding (\$1.3 billion) to purchase the Paya Lebar Quarter green-field site ahead of securing planning permission and approvals was a key success factor in its selection as the preferred developer
2. The open plan design and high roof breezeway structures for the retail areas help to cool the outdoor spaces and provide an enticing place for people to meet, entertain, exercise and enjoy events

3. The integration of retail, commercial and residential buildings across the site is a key success factor, particularly given that separate lots were established for each building in order to manage the uses as separate assets
4. Understanding that the central green space linking and activating the uses on the site and its role in connecting to nearby public transport infrastructure (in this case rail stations) is a design requirement that should be applied to all major developments across WA
5. The South West Group would be well placed to learn from the experiences gained by Lendlease in the Paya Lebar Quarter and its application to the South West Metropolitan Region

## 4. Australian High Commission



- High Commission representatives confirmed that Singapore were strong on ideas, innovation and collaboration and this provided opportunities for Australian companies to actively engage across a range of priority areas such as:
  - Food production
  - Aged-care development
  - Student housing
  - Medical/bio technology
  - Health
  - Cybersecurity
  - Defence
  - Fintech
- The Singapore Government has established a Centre for Liveable Cities and a Comprehensive Strategic Partnership to facilitate this, including partnering with China on their Belt and Road initiative
- Advanced manufacturing is an area where there appears to be significant potential for WA companies and technology providers (eg remote automation, modular assembly etc.)
- The excess of land for development is a key advantage of WA and the State Government could look to partner with Singapore for activities suited to offshoring

- Singapore continues to expand its influence across Asia and is keen to strengthen ties and economic development opportunities. WA's close proximity and trade arrangements with Asia places it in an advantageous position



*The South West Group delegation at the Australian High Commission*

## Key Findings and Lessons Learnt

1. The Australian High Commission and WA High Commission representatives are keen to engage with local governments and industry in Australia to explore mutually beneficial trade, business and investment opportunities with Singapore
2. There are a number of Singapore's priority industries that are relevant to the South West Metropolitan Region such as aged-care development, medical/biotechnical, health and defense
3. The South West Group should consider how to engage with and attract to WA commercial and property development groups from Singapore to help broaden WA's investment sources, including hosting delegations from the Singaporean private sector for specific opportunities

## Day 3



### 1. Singapore Port Authority

- Representatives from the Maritime and Port Authority (MPA) met with the delegation at their head office
- The ports are managed by the Port of Singapore Authority (PSA), which was recently separated and corporatised
- Singapore ports are connected to 200 shipping lines, 600 ports and 120 countries and is one of the largest ports globally
- MPA is the regulator and promoter of port trade in Singapore
- Pasir Panjang Port is Singapore's current operational port and manages approximately 35 million TEUs each year, with 80% being trans-shipment containers



*Pasir Panjang Port is Singapore's main port and handles around 35 million TEU annually*

- Jurong Port is an emerging port that manages RORO, industrial and bulk trade
- There are around 1,000 ships in Singapore's ports at any one time
- MPA has embarked on a \$100 million green initiative and is contributing \$200 million towards a maritime industry business and industry cluster development project aimed at innovation, talent retention and job redesign
- The plan is to continue to grow Singapore into a global trade hub and safeguard its future through strategic planning and efficiency measures linked to automation

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- Challenges for the future include:
    - Ability to accommodate larger vessels
    - Technology and driverless ships
    - Upskilling workers and job creation (Skills Future Program)
  
  - The Singapore Government has developed a Committee for Future Economy which has identified Ports as one of the 23 sectors needed to innovate and drive Singapore’s future economy. This has included the preparation of the Sea Transport Transformational Map
  
  - Key themes that are emerging and a focus for MPA include:
    - Living lab – testing and learning from automation systems at the existing port with a view of applying the latest technology and systems to the Tuas MegaPort
    - Encouraging Start-Ups – harnessing talent and establishing clusters of companies/specialists related to ports, logistics and freight transport
    - Proof of Concept – developing proposals and ideas for future investment, feasibility and application
  
  - The expansion of the existing port and the construction of the new port will be based on achieving Green Mark accreditation and the MPA Academy is planning to establish Centres of Excellence around the port as part of the supply chain
  
  - Some challenges were identified by Port Management:
    - Whilst valuable having the Jurong Town Corporation (JTC) actively involved in the industrial development around the Port area, it needs a close working relationship to support the existing and new port
    - Applying the “Just in Time” concept to future shipping is a key challenge, but provides significant growth opportunities
    - Ensuring the port “eco-system” operates as a comprehensive and integrated operation in partnership with industry, supply chains and the wider-community
    - Keeping up with the greater use of technology and automation of port operations



*Ms Tee Tan (Assistant Chief Executive of MPA) addresses the delegation on port operations, challenges and expansion plans*

## Key Findings and Lessons Learnt

1. The current Singapore port is a large scale, globally connected and high technology port operation
2. Port operations are one of the most important economic drivers for Singapore and requires continued expansion and investment to retain its prominent global position
3. The MPA is using the port as a living lab to test more advanced technology and automation innovations that could be applied to the future Tuas MegaPort
4. The MPA has a long-term planning horizon for the port operations (50 years+) and continual investment in future port infrastructure is critical to maintain Singapore as a global trade and shipping hub
5. MPA has established very close working relationships with PSA and the freight and logistics industries which enables them to take a holistic view when planning for future port needs





## 2. Marina Bay Cruise Centre

- The relocation and construction of the cruise terminal at Marina Bay has enabled the facility to be located very close to the Singapore CBD and popular tourist locations
- The cruise centre is one of largest and most efficient cruise terminals operating in Asia and can service up to three cruise liners (depending upon their size), with the ability to process up to 6,000 passengers at one time and 30-minute turnaround
- The cruise centre can accommodate the largest cruise liners in the world and is home port to iconic ships from several cruise companies include Carnival
- The terminal has the ability to process baggage from passengers transferring to the airport through an arrangement with the airport terminal provider



*Cruise Services CEO Lionel Wong showcases the benefits of the Marina Bay cruise terminal*

### Key Findings and Lessons Learnt

1. The relocation of the port terminal to Marina Bay provided Singapore with the opportunity to establish a bespoke facility capable of handling the largest cruise ships in the world
2. The terminal is technologically advanced and integrated with airport operations in terms of baggage handling and customs controls

3. Greater involvement on terminal operators in the design and function of the facility may have enabled more efficient operations and better use of terminal floor space
4. The baggage is arranged manually within the terminal structure as investigations into the use of conveyor systems to automate the process was logistically prohibitive due to the large space required to handle the volume of baggage from disembarking ships
5. The experience gained from the design and operation of Singapore's cruise terminal is directly relevant to any relocated or upgraded cruise terminal for Fremantle and other locations in WA

### 3. Marina Barrage



- The barrage is a major engineering project that involved damming the Singapore River to create a freshwater environment
- The dammed water is treated to a very high standard and is a key component of Singapore's public water supply



*The Marina Barrage is a significant infrastructure project aimed at securing water supplies to support Singapore's current and future needs*

- The other main sources of water supply in Singapore come from freshwater dams in the higher forested areas, recycled wastewater and water supplied by Malaysia through a long-term agreement that is due to expire in the next 10 years
- The reliance on water from Malaysia has been identified as a key risk and potential constraint to Singapore's economic growth, prompting plans to secure other forms of water supply domestically

- Most of the major rivers discharging out to the ocean in Singapore have been dammed and are used for water supply
- Since damming the Singapore River, the water quality has improved significantly, with otters and freshwater fish species (eg. mullet) re-establishing in record numbers
- The barrage site also houses Singapore's largest solar photovoltaic system



*The South West Group delegation on top of the Marina Barrage building with Geof Stephens (Head – Marina Barrage)*

## Key Findings and Lessons Learnt

1. The Marina Barrage is an amazing infrastructure project that has helped Singapore to collect and harvest freshwater for its public water supply, whilst improving water quality in the river
2. The water produced from harvested freshwater is treated to a high standard, with treated wastewater packaged and sold in bottles as drinking water

## 4. Singapore National Stadium

- The Singapore National Stadium precinct includes an Olympic size athletics track and football stadium/event space with 55,000 seating facility and one of the largest retractable roofs in Asia, a competition-grade swimming pool with technologically advanced time recording system, a basketball stadium and rowing facility as well as community facilities and a retail mall



- The stadium and associated facilities are directly-served by an underground MRT station, which has been integral in managing large crowds attending sporting events



*The Singapore National Stadium is an integrated precinct that includes a retail mall and recreational facilities. The climbing wall inside the shopping centre complex is a major attraction in the precinct.*

## Key Findings and Lessons Learnt

1. The co-location of sporting facilities into an integrated precinct has enabled multiple codes to be undertaken at the same site and provides year-round visitation
2. The diversification of uses to include a shopping centre, event space, commercial, recreational and civic uses (eg. library) within the precinct provides greater choices of experiences and activation
3. The diversity of uses in turn supports the investment in infrastructure such as the MRT station and additional community facilities

