

**SPEECH BY MR HUGH LIM, CHIEF EXECUTIVE OFFICER  
OF BUILDING AND CONSTRUCTION AUTHORITY AT THE  
BOA-ACES CONFERENCE 2018 ON TUESDAY 22 MAY,  
9:30AM AT SANDS EXPO & CONVENTION CENTRE,  
MARINA BAY SANDS**

Mr Heng Swee Keat  
Minister for Finance

Mr Tan Shao Yen  
President of the Board of Architects, Singapore

Engineer Chua Tong Seng  
President of the Association of Consulting Engineers  
Singapore

Distinguished Guests,

Ladies and Gentlemen;

1 Good morning. It is my pleasure to join you today at the second joint BOA-ACES Conference. Happy to hear it will transit to a wider forum in the coming year.

2 The Construction Industry Transformation Map (ITM) was launched in October last year, a result of months of hard work by industry firms, trade associations and chambers (TACs), institutes of higher learning, and the unions, all in

partnership with government. That was but the first step of our Built Environment (BE) sector's transformation journey.

3 This morning, I will share with you what comes next, as well as speak on the key ingredient for a successful transformation of our sector -- which is deeper collaboration among all stakeholders.

### **Our industry needs to deepen collaboration to build capacity for growth**

4 Our built environment sector is very complex, with multiple processes and multiple stakeholders. Different parties work in your respective segments of the value chain, and there is a tendency to function in silos, leading often to unproductive work – like recreating BIM models - and wastage of resources – correcting mistakes or making changes after works have already been done. We can do better in this regard and the vision expressed in our ITM of an advanced and integrated sector gives us a focal point to rally our sector together. In our transformation journey, trade associations and chambers such as SIA, IES and ACES have key roles to play.

5 Let me share my thoughts and observations on why collaboration is so important for us, and how we must work together to successfully transform the sector.

6 The first point really is that the majority of our firms, whether consultants, builders, suppliers, are SMEs, and lack scale in their capacity and operations. 99% of our industry are considered SMEs. Amongst consultants, medium-sized firms (with annual turnover of between \$10mil and \$100mil) make up about 3% (about 50 firms) and small firms (with annual turnover of less than \$10mil) comprise 96% (about 1,750 firms) of the industry.

7 For contractors, the medium-sized firms (with annual turnover of between \$10mil and \$100mil) and small firms (with annual turnover of \$10mil and below) made up about 6% (about 800 firms) and 93% (12,800 firms) of the industry structure respectively. We recognize that it can be a challenge for smaller firms to upgrade and build capacity whilst bidding and working on projects, let alone go overseas to compete for projects.

8 A small number of consultant firms – generally the larger ones - have been more successful in this regard; but for our builders, we observe that even our largest Singapore builder is many times smaller than the international firms who are

often active in other markets, including Singapore. Talent, in-house capability and financial size can all pose limits to the type and scale of jobs which our firms can compete for.

9 Nonetheless, we see a small but growing number of success stories as firms identify their core strengths, match these against market opportunities here and abroad, and invest in capability-building. Singapore architects, like DP Architects and Ong & Ong, have gained footholds in overseas markets with 17 and 12 international offices respectively. We also see local SMEs like WOHA Architects venturing out to Taiwan, Thailand, Hong Kong, China and India and working on two huge housing projects in Mumbai. With its area of expertise in Earth Retaining Stabilising Structures, LSW Consulting Engineers have gained entry to markets in Hong Kong and China. Tham & Wong has also explored markets in Thailand and Vietnam undertaking civil and structural design works for residential, office and mixed-development projects.

10 Some of our builders, too, have found their respective niches in Singapore and regional markets. For example, Utracon, an SME builder specialising in construction of flyovers, highways and bridges, has successfully expanded its business into neighbouring countries in Southeast Asia, Indian, Sri Lanka, and further into Africa, Middle East and Guam. In Singapore, Santarli, which was an SME builder just three years ago, has deepened its core capability in land

reclamation works, securing a \$1bil contract on its own here in 2015.

11 These examples give us reason to cheer and are an inspiration for firms who wish to grow even as we work with industry to transform for the future.

**There are opportunities at home and overseas for firms which are ready**

12 The key thrusts of the ITM – Green Building; DfMA and IDD – represent areas which BCA has been promoting for several years to address our need for sustainability, productivity and to capitalise on the opportunities afforded by digitalisation using BIM. Indeed, professionals and firms have had to learn many new things as BCA introduced and mandated these onto the sector here. But they have yielded a dividend for the early movers who have not only adopted but embraced them and blossomed in these practice areas.

13 For example, the BCA Green Mark introduced in 2005 to promote more sustainable design and construction practices in Singapore, has now been adopted in close to 300 projects across the region, most of whom have engaged Singapore SME firms such as Building System and Diagnostics (BSD) and G-Energy Global Pte Ltd to work on them.

14 The authorities from other countries also approach BCA to share our practices, and as they adopt them, this will undoubtedly open up new opportunities for firms who are experienced in designing for sustainability.

15 Recently, I spoke at a Modular Integrated Construction conference in Hong Kong. The Hong Kong Development Bureau requested us to share what we have been doing for PPVC in Singapore. Singapore now has 42 PPVC projects running. When completed, the 40-storey Clement Canopy would be the world's highest concrete PPVC building, and just last month, the final PPVC module was lifted into place. Hong Kong is still contemplating their very first PPVC project. Perhaps, there are opportunities in Hong Kong for consultant firms who have experience in PPVC!

16 In an earlier visit to Japan, I also observed that BIM is not widespread adopted in Japan. In fact, they are contemplating the wider use of BIM in order to enable robotics and automation based on digital technologies to offset their lack of manpower in the industry. Yet, the Japanese builders whom we met acknowledge that they are far behind in BIM adoption compared to Singapore, though their working culture and industry structure enables them still to achieve high standards of workmanship, productivity and quality.

17 I attribute this to a very high level of collaboration between firms. I share these observations not because I think that we can replicate the conditions overseas in Singapore, but because we need to recognize our conditions here, and find a Singapore way to work around them.

18 The three key thrusts for the ITM represent opportunities for our firms if they are able to harness the demands placed on you to also build a competitive edge. They represent areas in which Singapore firms, having had to deal with the high bar set in Singapore, can deepen capabilities with which they can gain an advantage when competing for similar projects overseas. And, by combining capability and expertise in all three areas – Green; DfMA and IDD – our firms can build a sustainable competitive edge in competing for future projects, both at home and abroad.

19 At the same time, because many of our firms are small, there is an important role played by Government, the IHLs, the TACs and the Unions to pool our resources together to share knowledge and information, chart out the way ahead, and build capacity through technology and training, and research and innovation. Let me elaborate on these areas.

**Adoption of advanced technologies to better integrate our industry sector**

20 First, we will continue to push for wider adoption of Design for Manufacturing and Assembly (DfMA) and Integrated Digital Delivery (IDD). DfMA brings the construction considerations upfront and incorporates manufacturing concepts to maximize productivity. Collaboration between different project parties is critical in order to reap the full benefits of DfMA. Complementing DfMA, there is IDD that offers to connect all project parties, through advanced digital information and technology. This is why DfMA and IDD have been identified under the Construction ITM as two of the key growth areas for the BE sector.

21 We are making good headway in the area of DfMA. The government has committed to increase the use of DfMA in public sector projects. The industry now has more than 120 projects, including those already completed, ongoing and in the pipeline, developed using DfMA. At the industry adoption level, we are halfway to meeting our target of 40% by 2020. BCA alone cannot make this happen. We need industry to champion this initiative together with us, and a number of leading firms have done so.

22 To this effect, we have launched resources for industry practitioners, such as the Prefabricated Prefinished Volumetric Construction (PPVC) guidebook and the DfMA

guidebook on Prefabricated Mechanical, Electrical and Plumbing (MEP) Systems. Co-developed with the industry involving ACES, IES, REDAS, SIA, for the industry, these are examples of our sector's commitment to ride the transformation wave in collaboration.

23 We are also seeing good progress in the adoption of IDD amongst both large and small consultancy and construction firms. Enabled by Building Information Modelling (BIM), IDD represents the next step in our commitment to fully integrate processes and stakeholders across the value chain through advanced info-communications technology (ICT).

24 When I met RSP Architects and Engineers earlier this year, they demonstrated their extensive experience in using IDD in various projects such as the Jewel at Changi Airport and the ongoing redevelopment of Funan Mall. At the same time, they also shared how they have brought other firms involved along with them, as not every firm had the requisite skills or experience in BIM when they came on board.

25 At the beginning of this year, when I met with ID Architects, they shared how they had benefited by not just adopting BIM to meet BCA's submission requirements, but also embracing and now advocating its use for fully integrated construction management. Indeed, so much so that they have

set up their own subsidiary, IDA Technology Pte Ltd, a Technology Solutions Provider to assist industry's adoption of technologies such as Virtual Reality (VR) to digitalise the Design and Construction Ecosystem.

26 Just yesterday, they signed a Memorandum of Intent with their technology partners, at SG Digital Industry Day to collaborate and work on projects together using an integrated digital sharing platform. This aims to assist SMEs to adopt technology under a project team. Industry initiatives such as this promote knowledge transfer and sharing, which is a great boost to building and enhancing technology capabilities of our sector.

27 I would also like to take the opportunity to commend ACES for taking the lead in forming a group of BIM specialists to promote BIM adoption. We hope to see more of such initiatives by the TACs and unions, to help our SMEs embark on the IDD journey.

28 During one of our learning trips with industry delegates to the Netherlands last year, we saw how the Dutch managed to promote the widespread adoption of BIM. A group of top Netherlands contractors jointly developed a BIM Information Delivery Manual (IDM) for the industry to ensure the effective and efficient use of the open BIM standards. The manual is

key to BIM information sharing across the entire construction value chain.

29 I strongly believe we too can achieve this in Singapore as well. Widespread adoption of IDD would bring about greater integration among different stakeholders, bringing about time savings and efficiencies in seeking timely decisions and resolving issues before they can impact the cost or schedule of the project. We are working closely with the TACs and unions to develop a comprehensive IDD plan targeted for launch in the second half of 2018.

30 Under the ITM, we aim to raise DfMA adoption to 40% over the next 3 years, and we will engage suitable DfMA project teams to adopt IDD, as part of the IDD plan. Each project will enable project parties comprising developers, consultants, builders and FM operators to collaborate through shared platforms, and processes. SMEs could tap on the availability of various shared services and platforms to jumpstart their entry into IDD.

31 Today, only about 3% of the local SMEs in the construction sector are investing in R&D. I would like to invite more firms to work with us in seeking out and adopting innovative solutions. For example, under BCA's 2-stage Innovation Grant Programme, United Project Consultants Pte

Ltd was able to develop a BIM-based software known as greenCollab to compute Greenmark scores for their projects. This improves accuracy and efficiency of their Greenmark submissions. Besides providing funding to develop good solutions, we will also be seeking out partner companies in the Built Environment who are keen to sponsor proposals by enabling them to be piloted in your projects. In this way, we aim to accelerate the introduction and adoption of innovative solutions into the industry. We will work with the respective TACs to make known these grant calls when they are issued. This would be another way even SMEs can participate in building up capability for transformation.

### **Fostering greater collaboration among firms to build capabilities**

32 Besides changing the way we build, we will also need to look at the way we work, deepen collaboration among the various industry stakeholders in order to achieve better construction outcomes.

33 Last month, BCA organized an inaugural seminar on Collaborative Contracting in partnership with ACES, IES, SIA, SCAL, SIBL, SISV and SPM. At this session, we heard the story behind the success of Changi Terminal 4 (T4). The T4 team comprising Changi Airport Group (CAG), SAA Architects

and Takenaka Corporation and other project parties, was able to complete this complex project on a tight timeline of just 24 months. How did they do that?

34 Firstly, a collaborative mindset was adopted right at the top. At the project's onset, CAG's senior management had committed to a number of regular meetings for T4. This allowed the top management across different stakeholders to gather feedback from the ground, identify and resolve issues expediently and amicably.

35 Secondly, there were deliberate efforts to enhance collaboration among the different project stakeholders. The project teams were co-located at the same office which facilitated open communication for speedy problem solving. It did not end there. Teambuilding activities and celebration of project milestones were organised for everyone involved in the T4 project, not just for the individual stakeholder. The spirit of collaboration was truly exemplified by the T4 team.

36 To encourage such a positive mindset on more projects here, we have been looking into the adoption of collaborative contracting to enhance integration among project stakeholders by working for the common goals of a project, through mutual trust and collaboration.

37 We have set up a working committee involving representatives from government agencies and industry practitioners from ACES, IES, REDAS, SCAL, SIA and SISV to look at the adoption of collaborative contracting for public sector projects in Singapore. Through this committee, we hope the TACs can contribute more ideas to help promote the adoption of collaborative contracting, which is particularly useful for complex projects. We will also be looking into piloting the adoption of such collaborative contracting principles in public sector projects.

38 Another area that we can work together is on the public sector procurement framework. As part of industry transformation, BCA will continue to enhance our public sector procurement framework to better support quality, capability building and collaboration within firms.

39 With the valuable inputs from the TACs and industry stakeholders, we implemented the revised Quality-Fee Method (QFM) and Price-Quality Method (PQM) on 31 Jan 2018, with the aim of shifting the emphasis away from just price, toward quality and investment in capability. We will continue to monitor the outcomes of these changes – for example, how consultants size and price their manpower commitments for each project. Where needed, we will improve further. I would like thank all for giving us valuable feedback

during the reviews and showing support for our QFM and PQM enhancements by reaching out to your members through your respective publication channels.

### **TACs to take the lead to transform respective sectors**

40 So, what else can TACs do to work with us to transform the sector? Firstly, we are calling on TACs to take charge of transforming your respective specialisations and professions, for example, by helping to define the capabilities and technologies with firms would need to succeed in the future. Several of the TACs in the BE sector are now working on their respective ITMs.

41 To support TACs' transformation journey, we have set up BuildSG to partner the industry more closely to co-implement the Construction ITM. Since its inception on 1 Apr this year, BuildSG is now laying the foundation for closer tie-ups with TACs, to raise awareness of the ITM and translating it into action plans for member firms and individual PMETs in the construction industry.

42 One example of a TAC taking an active role in transformation is the Singapore Chinese Chamber of Commerce and Industry (SCCCI). It has launched its own ITM and initiated a Trade Association (TA) Hub in an effort to drive

cross-sectoral collaboration for industry development. Today, the TA Hub houses multiple TACs in the same location, offering shared resources with the aim of promoting innovation and productivity development and fostering greater cross-TAC collaboration. We see potential for similar cross-TAC collaboration for the TACs in our BE sector, e.g. forming joint taskforces, pooling training resources and facilities, and coming together to raise the profile of BE sector in conferences such as this.

43 Secondly, TACs and the professional boards have critical roles in (i) ensuring the sector has a sustained pool of talents and (ii) facilitating the right skills to drive the transformation of the built environment sector.

44 On building a sustained talent pool, many of the TACs' members have been joining hands with BCA in offering scholarships and sponsorships to young Singaporean talents at all levels. The industry and BCA have been successful in awarding more than 2,700 scholarships and sponsorships since 2010. Going forward, we need to do even more in our quest for talent as well as grooming them to take on future leadership roles.

45 In the area of facilitating the right skills to drive the transformation of the sector, we formed the Built Environment

SkillsFuture Tripartite (BEST) taskforce late last year. The TACs, professional boards, IHLs and BCA have worked closely together in establishing the needs of the industry and how each stakeholder can play its part in equipping our workforce with the necessary skills and competencies across pre-employment education and training (PET), structured internship and early job training, and continuous education and training (CET).

46 Thirdly, TACs could work closely with BuildSG in exploring overseas opportunities such as Amaravati, India and Tianjin Eco-City, China. We hope to work closely with TACs to identify firms which are ready to venture overseas or to facilitate formation of consortiums to provide integrated solutions for higher value-add and better competitive advantage for internationalisation. This is where a strong Singapore brand of innovation and a collaborative and integrated team will help set ourselves apart from our competitors. Collaboration will be key for us to work together to build up this Singapore brand.

47 A very good example is how the Singapore Manufacturing Federation (SMF) has been instrumental in helping our home-grown food manufacturers gain access to overseas markets and expand businesses. Under its Working In Partnership (WIP) programme, Singapore food

manufacturers are able to enjoy the benefits of economies of scale from shared resources thus lowering their risks in overseas ventures.

48 By partnering Enterprise Singapore, and working in close collaboration with the Restaurant Association of Singapore and the Singapore Food Manufacturers Association, SMF is key to the success of Tasty Singapore, a Singapore food industry brand which today, is a world-renowned quality mark, as shared by Minister Heng. With close collaboration and partnership, we could emulate the efforts of the Food and Beverages (F&B) sector.

## **Conclusion**

49 The Construction ITM has charted a course for where we jointly want to go. I seek the continued support from BOA, ACES and other TACs to heed the rally call, for the industry to move as a whole. Let us ride on this wave of industry transformation and work collectively to Build Singapore and the industry it needs to do so.

50 Thank you and I wish everyone here a fruitful session today.