



香港大學

THE UNIVERSITY OF HONG KONG

Modular Integrated Construction Supply Chain in the Greater Bay Area for Hong Kong Development

Supply-Demand Analysis and Policy Roadmap



Modular Integrated Construction Supply Chain in the Greater Bay Area for Hong Kong Development

Supply-Demand Analysis and Policy Roadmap

Copyright © MiCLab of The University of Hong Kong, 2024

Authors:

Wei Pan, Yidan Zhang, Jiewen Wu, Chenyi Ji, Tianyao Ping, Zhiqian Zhang

Published by:

MiC Laboratory, The University of Hong Kong
<https://www.miclab.hk/>

ISBN:

978-962-8014-31-6

Contact:

MiC Laboratory (MiCLab)
Department of Civil Engineering
The University of Hong Kong
Pokfulam
Hong Kong
Tel: (+852) 2859 8024
Fax: (+852) 2559 5337
Email: wpan@hku.hk

Disclaimer:

All rights reserved. No part of this publication should be copied or redistributed in any form without prior written consent from the authors. No permission is granted for the use of any third-party information included in this publication.

Although care has been taken to ensure that all data and information contained herein are accurate to the extent that they relate to either matter of fact or accepted practice at the time of production, the publisher and the authors assume no responsibility for any errors in or misinterpretations of such data and/or information or any loss arising from or related to their use.

Foreword

Since 2017, the Government of the Hong Kong Special Administrative Region has been actively promoting and leading the adoption of modular integrated construction (MiC) in the construction industry. MiC is a new quality productive force, revolutionising the construction industry by transferring labour-intensive construction processes to off-site prefabrication, thereby enhancing quality, productivity, cost-effectiveness, safety, and sustainability.

The Government has been leading by example and mandating the use of MiC in public works projects. To facilitate the wider use of MiC in private development, the Buildings Department has introduced a pre-acceptance mechanism for granting in-principle acceptance to MiC systems. The Government also encourages MiC adoption through various incentives including granting a 10% gross floor area and site coverage concession for MiC floor area, relaxing storey height restriction for MiC floors, providing subsidies through the Construction Innovation and Technology Fund, and formulating measures to strengthen MiC supply chain eco-system. The first private residential development using MiC has been completed, with more projects to come in the future. The Housing Department has a public housing supply target of 308,000 units in the 10-year period, with no less than 50% of their projects will adopt MiC.

The Centre for Innovation in Construction and Infrastructure Development (CICID)'s dedication to research and development, as well as its knowledge transfer efforts, have been instrumental in advancing MiC development in Hong Kong. I congratulate CICID's outstanding achievement on MiC in recent years and the successful research project on addressing the MiC supply chain in the Guangdong-Hong Kong-Macao Greater Bay Area (GBA).

The findings of the research offer valuable insights into MiC supply chain and present opportunities to improve the supply chain for the long-term development in Hong Kong, the GBA, and beyond.

This booklet exemplifies effective collaboration among university, government, and industry. I am confident that this research will strengthen the leadership and competitiveness of the Hong Kong construction industry in MiC and construction innovation.

Ir LAU Chun Kit, Ricky, JP

Permanent Secretary for Development (Works)
The Government of the Hong Kong Special Administrative Region

Preface

The Government of the Hong Kong Special Administrative Region (HKSAR) has set ambitious development goals for various sectors, including public housing, private residential, elderly homes, hostels, hospitals, and hotels. Achieving these objectives will not only strengthen Hong Kong's leadership in the Greater Bay Area (GBA) but also increase the construction industry's capacity. Since 2017, modular integrated construction (MiC) has been adopted as a key policy initiative, assisting government and industry to achieve these development goals for eight consecutive years.

The GBA supply chain creates exciting synergies and opportunities for MiC development in Hong Kong. However, the limited capacity of module supply and cross-boundary logistics impose challenges to the quality delivery of millions of modules for Hong Kong development. Therefore, with funding support from the Strategic Public Policy Research Funding Scheme of the HKSAR, we have been conducting a research project to address the urgency and importance of understanding and enhancing the MiC supply chain in the GBA. This booklet reports on part of this research project, presents the findings of MiC supply–demand analysis, and provides a policy roadmap with action plans for enhancing the maturity of the MiC supply chain.

A series of GBA-wide factory visits, questionnaire surveys, interviews, and focus group meetings were conducted to gather perspectives and practices from stakeholders and MiC practitioners in the construction industry. Mathematical modelling and analysis were conducted to estimate the MiC demand and supply and map their dynamic relationship. On this basis, a policy roadmap with action plans was created for the short-, medium-, and long-term development of Hong Kong.

The first part of this booklet (Chapters 1 to 3) reviews the current and future development of MiC in Hong Kong as well as the status quo of the supply chain, and proposes a theoretical framework of MiC supply chain analysis. The second part of the booklet (Chapters 4 to 6) presents the results of MiC demand, supply, and supply–demand analysis. The third part of the booklet (Chapters 7 to 11) suggests a policy roadmap with action plans for enhancing the MiC supply chain in terms of demand, process, and supply and summarises the key findings of the research project.

A significant gap is identified between the current capacity of concrete MiC suppliers in the GBA and the anticipated future demand for concrete modules in Hong Kong. Nevertheless, the capacity of steel MiC suppliers is deemed sufficient to meet both current and projected demand for steel modules. Continuous research and development is essential to support high-quality development of MiC and address the complexity and dynamics of MiC supply chain for Hong Kong, the GBA and beyond.

I sincerely thank the funding body for providing us with this opportunity to enhance the MiC supply chain, all supporters and participants for providing insightful views and comments, and the research team for their great efforts in data collection, analysis, and reporting.

Professor PAN Wei

Director, MiCLab
Head, Department of Civil Engineering
The University of Hong Kong