

**For information
25 February 2014**

Legislative Council Panel on Development

Challenges to Delivery of the Capital Works Programme

PURPOSE

This paper outlines the major challenges we face in delivering the Capital Works Programme (CWP) in the light of recent concerns on potential bunching of infrastructure projects resulting in possibly escalating construction costs and tightening construction labour situation.

CONSTRUCTION SECTOR AND ECONOMIC GROWTH

Infrastructure Investment

2. Over the past decades, infrastructure development has contributed to different stages of the urbanisation of Hong Kong covering a wide spectrum of projects including transportation, housing, medical, education, water supply, sewerage and so on. Infrastructure investment has helped propell Hong Kong's development as one of the mature economies in the world and raised the quality of life of the general public. Historically, investment in the CWP accounts for a long-term average of about 3.4% of the real GDP. Its share reached around 6% in the days of the Airport Core Projects in the 1990s but subsequently recorded a dip to slightly more than 2% in 2005 amidst the economic downturn.

3. Since 2007, the Government has been implementing a massive infrastructure development programme, comprising the Ten Major Infrastructure Projects (TMIPs)¹

¹ TMIPs include South Island Line (East), the Sha Tin to Central Link, the Tuen Mun Western Bypass and Tuen

and other public works projects of varying scales aiming to revive Hong Kong's economy after the SARS epidemic and meeting the diverse needs of the community. The total investment on TMIPs has already exceeded \$300 billion. On a broader context, the CWP in money terms has gradually increased from \$45.3 billion in 2009-10 to about \$83 billion in 2013-14 (including the one-off grant of \$13 billion to the Hospital Authority for minor works projects for the next decade or so). As a result, we witness a gradual rise of the contribution of construction sector to GDP about 3-4% in recent years. A rough estimate of the added value to our economy brought about by the TMIPs, from commissioning to a mature stage, would be more than \$100 billion annually. The CWP investment is expected to stay at a high level exceeding \$70 billion annually for the next few years. The Government will continue the investment in worthwhile infrastructure projects to enhance Hong Kong's long-term competitiveness. At the same time, due regard to cost-effectiveness will be paid in prioritizing the projects to ensure the sustainability of our Capital Works Programme.

4. Looking forward, infrastructure developments will on one hand, sustain the growing population and help meet the rising public aspiration for a better living environment and on the other hand, reinforce Hong Kong's status as a global city and lay a solid foundation for our sustained development in the future. Despite the tremendous increase in infrastructure investment over the past five years or so, the share of the construction sector to GDP is the lowest amongst the neighbouring developed economies. To maintain the competitiveness of Hong Kong, we therefore should strive to maintain the share of the construction sector at a reasonable level. The trend of the share of the construction sector in the past 20 years is set out at **Annex 1**.

Forecast Level of Overall Construction Outputs

5. In considering the volume of the overall construction outputs, we should take account of both the public and private sectors. For the public sector, Government has all along been adopting long term and visionary planning for infrastructure development programme to enhance Hong Kong's competitiveness and to provide timely support to our development. Government also seeks to deliver infrastructure projects in an orderly manner. However, inevitably, there may be delays in some

Mun-Chap Lap Kok Link, the Guangzhou-Shenzhen-Hong Kong Express Rail Link, Hong Kong-Zhuhai-Macao Bridge, Hong Kong-Shenzhen Airport Co-operation, Hong Kong-Shenzhen Joint Development of the Lok Ma Chau Loop, West Kowloon Cultural District, Kai Tak Development Plans, and New Development Areas.

projects due to unforeseen circumstances including longer public consultation time, judicial review and legal challenges, and additional works required during the construction stage to address public needs.

6. Looking ahead, it is envisaged that there will be a consistently high demand for infrastructure to meet the diverse needs of the society. For example, Government has set a new supply target of a total of 470,000 new residential units in the coming ten years. Apart from identifying the required land, there should be adequate infrastructure development to underpin the housing development.

7. In addition, there are also other major projects under different stages of planning and implementation. The key projects include the New Development Areas in the North East New Territories and Hung Shui Kiu, Tung Chung New Town Extension, Developing the New Territories North, Yuen Long South Development, and so on.

8. For the private sector, most of the construction projects will be of residential and commercial in nature. The volume of private sector investment in construction will be affected by a number of factors including economic outlook, market condition and government policies.

9. Starting in March 2013, the Construction Industry Council (CIC) provides forecasts of the overall construction expenditure, covering both public and private construction works over a 10 year horizon and on a rolling basis for the industry stakeholders' reference. While Government will regularly update information on the public capital works to CIC, CIC will also take account of the status of the submission of building plans, land sale records market intelligence, project GDP growth, etc. to forecast the construction expenditure of the private sector. According to the latest forecast at the end of October, the overall construction expenditure forecasts over the next few years will reach \$160-\$190 billion per year which is considered a high level. To facilitate appreciation of this volume against historical data, a table showing the past construction expenditure since 2003-04 is at **Annex 2**.

10. We need to continuously invest in worthwhile infrastructure in a timely manner to meet social needs and maintain Hong Kong's competitiveness. There is a suggestion for postponing projects to minimise the peak as far as practicable. However, postponing worthwhile projects may run the risk of creating a more acute construction peak several years later which may result in even higher project prices,

giving rise to more intense labour demand and at the same time, undesirably deferring the realization of the economic and social benefits of these projects. We shall continue to prioritise our Capital Works Programme with due regard to merits of individual projects and the overall affordability of Hong Kong.

CHALLENGES IN PROJECT DELIVERY

Construction Manpower

11. With the volume of construction works anticipated to be maintained at a high level in the coming year, this will be translated into a keen demand for construction personnel. In addition, the construction industry is facing an acute ageing problem, particularly for workers. According to CIC, more than 40% of the registered workers are aged 50 or above. This is compounded with the skills mismatch problem when increasing proportion of projects would be infrastructure development in the coming few years whereas building construction used to be the dominating work type. Further, according to CIC, only about 35% of the registered workers are semi-skilled or skilled workers.

12. Our construction labour market remained tight with unemployment staying low in a rate of 4.1% in the last quarter (October to December 2013). The tight manpower situation of the industry has also been reflected by wage increase of construction workers. According to the Census and Statistics Department, the median monthly employment earnings of the workers have increased from about \$9,000 in 2009 (after the financial tsunami) by about 33% to about \$12,000 in 2013. For individual trades in acute manpower shortage such as bar benders and fixers, carpenters (formwork) and concretors, the average daily wages for the skilled workers can reach the level of \$1,500 and the monthly wages can be up to \$30,000 or above.

13. Apart from wage adjustment, there have recently been three surveys² showing that construction workers for individual trades in acute manpower shortage work about 5 days per week. They are considered fully engaged taking into account the physically demanding nature of their work. The room for further tapping the pool of in-service workers will therefore be very limited.

² The three surveys include the General Household Survey conducted by the Census and Statistics Department, a survey conducted by the Construction Industry Council and a survey conducted by the Hong Kong Construction Industry Employees General Union in 2013.

Material Prices

14. Since Hong Kong has to import material, we are bound to be subject to the fluctuation of the material prices worldwide. Following the introduction of loose monetary policies by major economies after the financial tsunami to sustain their aggregate demands, there were substantial rebounds in the global commodity prices in 2010 and 2011. Locally, there is obvious increase in the prices of construction materials. Though the key material cost indices exhibit a slight decreasing trend in the past two years with year-on-year decrease of about 1.75% and 2.75% in 2011-12 and 2012-13 respectively, the prices of construction materials hinge on the global commodity prices and fluctuate from time to time. The trend on material cost indices for public sector construction projects in the past 10 years is at **Annex 3**.

Mega Projects

15. There is also added complexity in implementing mega projects. Given the massive scale and longer planning horizons and implementation timeframes for these mega infrastructure projects, they are bound to be more susceptible to the adverse effects of the fluctuation of economic cycles and therefore are more exposed to risks. Related to this, the risk premium of such projects is normally higher given their relative project complexity and longer time uncertainty, as reflected in higher tender prices. Besides, in many of the cases, there will be a limited number of market players that have the experience to take on mega contracts, thereby resulting in less competitive tender prices.

16. Experience indicated that the implementation of some of these mega projects has suffered from substantial delays due to developments beyond Government's control, such as legal challenges, judicial reviews, and longer than expected consultation time. As a result, we have to deliver the projects under a compressed programme resulting in inevitable bunching of some projects over a certain period. In short, while the relative bunching is not desirable, they cannot, to a certain extent, be prevented or anticipated given the circumstances.

IMPROVEMENT MEASURES UNDERTAKEN

17. Despite the challenges set out above, Government has made its best endeavor

to strive to deliver the public works projects on time and within budget.

More Open Information

18. Bearing in mind the booms and busts of the construction industry, some industry stakeholders from the industry has appealed to Government to maintain the construction expenditure at a stable level. However, it should be noted that Government's infrastructure investment only accounts for part of the share of the total construction expenditure and experience indicates that the private sector investment has responded quickly to market situation which can be volatile. Hence, it is a fact of life that there will be ups and downs in the economic cycle and the construction industry. Nevertheless, more open information may assist relevant stakeholders in making planning. For this purpose, as set out in paragraph 9 above, CIC started to conduct the forecasts on the overall construction expenditure giving information on the various construction fields as well as the public and private sector figures.

Construction Manpower

19. In anticipation of the increased manpower demand arising from heavy infrastructure development and to address the manpower challenges of ageing and skills mismatch, we have deployed a series of measures since 2008-09, including obtaining a total of about \$320 million from the Legislative Council in 2010 and 2012 to support CIC to strengthen its role in training of local construction personnel, and to enhance promotion and publicity activities to attract more people to join the industry, especially for young people. For this purpose, we, in collaboration with CIC have implemented the "Enhanced Construction Manpower Training Scheme (ECMTS)" to attract more new entrants to the industry, targeting trades with projected manpower shortage, acute ageing or recruitment difficulties. Up to December 2013, about 4,500 trainees have joined ECMTS and about 55% of them were aged below 35 and most of the ECMTS graduates were new entrants, indicating that more young people have joined the industry. About 3,500 ECMTS trainees have graduated.

20. Further, to diversify the modes of training and provide more training places, CIC launched the "Contractor Cooperative Training Scheme", under which trainees can be hired and trained on-site to facilitate early acquisition of site experience.

21. In 2011, we collaborated with CIC to launch the "Build Up Publicity Campaign" to uplift the image of the industry. The latest image tracking survey in

mid 2013 has revealed that the percentage of young people interviewed who are willing to join the industry has been increased significantly to more than 20%, as compared with that of only 7.9% before the launch. Further, to attract more new blood to the industry, we have endeavored to improve the working conditions in construction sites. Various initiatives have been taken to enhance the caring and safety culture in the industry, including measures to improve site tidiness, provide additional welfare facilities on site, step up safety training for workers, and enhance promotion and publicity of site safety.

22. From the launch of the “Build Up Publicity Campaign” to December 2013, the number of registered construction workers has increased from about 272 000 by about 18% to about 322 000. While the average age of all registered construction workers was about 46, the newly registered construction workers in 2013 was about 38 reflecting that more young people have been attracted to join the industry.

23. With the implementation of various training initiatives, the total number of training places for CIC has been substantially increased from about 2,000 in 2009 to about a target of 7,500 to 8,500 in 2014. However, it should be acknowledged that there are limitations in training local workers, such as training capacities in the light of inadequacy in training instructors, drop-out of trainees, difficulty in retaining the new entrants to the industry, time required to nurture the semi-skilled graduates to become full-fledged skilled workers and loss of productivity for in-service skilled workers to nurture the semi-skilled graduates.

24. Having regard to the manpower forecast study recently conducted by the CIC and taking account of the forecast construction output, retirement of workers and local workers going to work outside Hong Kong, we project that the industry will need over 30 000 additional construction workers, including over 20 000 skilled workers in the next few years.

25. In the long term, we will continue to strive to meet the manpower demand by local training, re-training and attracting more new entrants to the industry. However, in view of the limitations of training as mentioned in paragraph 22 above, we see some difficulty in training up the required large number of skilled workers in the short-term.

26. Projected from current estimates, from now until end 2017, with due regard to the principle of not affecting the employment and reasonable income levels of local

construction workers, we need to make full use of the “Supplementary Labour Scheme” to import skilled labour in a timely manner. This will not only help meet the manpower demand of the construction works, but also relieve the pressure on the local in-service skilled workers so that there is room for the semi-skilled workers to enhance their skills to achieve the productivity of skilled workers through in-service training. Beyond 2017, we will adjust the training programmes as necessary to safeguard the employment of local workers.

More Mechanisation and Prefabrication

27. We are also making arrangement to let out a piece of land for setting up an automated and mechanized prefabrication yard for cutting and bending of steel reinforcement to supply prefabricated steel reinforcement to the local construction industry. The prefabrication yard will be operated in a factory-like setting with higher efficiency. It will help relieve the pressure on the demand for workforce as well as reduce the project cost

Procurement Measures

28. Recently, Government has embarked on a number of procurement related initiatives seeking to increase the capability and capacity of the industry.

Innovation in Construction

29. First, in a bid to promote innovation in construction, we have formulated the Innovation and Creativity Screening (ICS) procurement approach and completed its trial successfully on four pilot projects early this year. Riding on the success of the trial, we shall further develop the ICS approach, providing more incentives to encourage innovative solutions and trying it out on projects with more challenging engineering problems and hopefully, more satisfactory results.

Risk Management by Contractual Partnering: NEC

30. For better risk management, Government has been using the New Engineering Contract (NEC) form, which emphasizes mutual trust and co-operation between the contracting parties, in some pilot public works contracts. The NEC form allocates contractual risk to the party best able to manage it. Moreover, it provides a collaborative risk management mechanism to reduce the chance of risk

occurrence as well as mitigating the consequence when the risk is materialized. The sharing and management of risk in the NEC form could help reduce the cost to the project due to materialization of the risks.

31. Further, the payment option of target cost under the NEC form provides a pain share/gain share mechanism. The employer and the contractor share the difference between the actual construction cost and the final target cost. It drives the contracting parties to a common goal of completing the works together at reduced cost and in shorter construction period. To limit its financial liability, the employer would only share the overspending up to a certain percentage above the final target cost.

32. Currently, there are 10 public works projects with construction contracts using NEC form. We will use the NEC form more extensively in different works categories (including building works, civil engineering works etc.), contract types and contracts of different prices.

Increase the Capacity of Market Players

33. Upon a strategic review of the existing procurement system for public works projects, we have been formulating new initiatives to build up capacity and facilitate healthy growth of the construction industry. Recently, we implemented several new measures in enhancing the listing of contractors with a view to attracting more contractors and consultants, both local and overseas, into our construction market. These measures include raising the tender limits of contracts and rationalising the financial requirements for different groups of listed contractors, accepting relevant experience in non-government local works contracts to facilitate contractors to acquire confirmed status, and assessing the contractors' capability based on relevant experience without the 24-month minimum probationary period.

34. Moreover, we are actively exploring ways to achieve a more balanced workload distribution among different contractor groups by measures including splitting mega projects into appropriate contracts of manageable sizes (amid programming interfaces and other technical constraints), encouraging contractors' participation in the form of joint ventures in public works projects etc.. The above measures would help small and medium sized contractors take on more suitable public works projects, so that they can have more opportunities to gain experience and move up the ladder to tender projects of larger scale.

PROJECT COST ESTIMATION

Project Cost Control

35. We have been closely monitoring the movements of tender prices and construction costs for all public works projects. In particular, the latest construction costs indices for the key construction materials, as compared with the trough in 2009, have increased by an average of about 31%. In addition, the median monthly employment earnings of construction labours in the same period have increased by about 33%. With respective shares of 50% and 35% of construction labour costs and materials costs in total project costs, they would contribute to around 15.5% and 11.6% increase in total project costs. This is lower than the 59% increase of the Building Works Tender Price Index recorded in the same period which was possibly due to factors such as increase in risk premium.

36. Adhering to the overriding principles of prudent management of public money and close monitoring of project expenditure, we have been making use of the available information and base on the latest situations to prepare the most accurate project estimate. We do not earmark excessive funding so as not to unnecessarily freeze internal resources and affect the implementation of other worthwhile projects.

37. We have asked all Works Departments to set up committees to vet the estimates of all public works projects under their purview. They are also required to maintain an updated unit cost database taking into account the latest trend of labour cost, materials costs, etc. While works departments have been exercising their best endeavour in producing project estimates, which comprises in essence the base estimate, contingencies and price adjustment, there may still be a need to increase the estimates of individual projects due to unforeseen circumstances. Generally, we can classify increases in approved project estimate into two main categories -

- (a) additional expenditure for an ongoing project due to increase in price adjustments provisions and/or additional works; and
- (b) tender prices returned in tendering exceeding sum allowed in the approved project estimates.

38. While we have set out the detailed justifications in the relevant PWSC papers for the increases, owing to the special circumstances of individual projects, such

increases are necessary and could not have been fully anticipated and hence are well justified.

Project Cost Estimate Performance

39. According to past records, Government has the proven ability to provide realistic project estimates for the Legislative Council's close scrutiny in considering funding application for infrastructure development. We are also performing satisfactorily in controlling expenditure for our public works projects. Our record in this respect shows that in the past ten LegCo sessions which experienced several economic cycles, of the some 600 capital works projects with funding approved by the Finance Committee, only 10% of the projects required increases in approved project estimate. The amount of increase accounted for 3.4% of the \$620 billion total project cost. We have also bench-marked the performance of our highway projects with that of over 800 road projects from over 30 countries and found that the frequency and average cost overrun is lower in Hong Kong. Taking into account the fast changing external environment, this demonstrated a satisfactory track record of the capability of works departments in producing project cost estimates and controlling project expenditure.

CONCLUSION

40. Promoting economic growth remains a top government priority. We have embarked on the preparation for development for more land to meet our housing and commercial needs and to create a land bank. There are already high public aspiration for transportation infrastructure to solve our traffic problems, border facilities to strengthen our external connectivity, hospital and health care facilities for our ageing population, waste handling facilities and sewerage projects to enhance our quality of living, etc. All these require our continuing investment in capital works projects. We have to enhance the delivery capacity of our construction industry and to invest substantially in manpower resources now to plan and prepare for the construction work to come in five to ten years down the road. Success in the delivery of the Capital Works Programme is crucial to sustaining our economic growth and to maintaining Hong Kong as Asia's World City.

41. Postponement of worthwhile projects will upset the overall Capital Works Programme which could bring adverse consequences, e.g. increased ultimate spending,

delay in project delivery to meet public aspirations and hampering in our economic growth. In this connection, the Government will continue to prioritise our Capital Works Programme with due regard to merits of individual projects and fiscal sustainability of our programme.

42. We seek to continue to improve the situation by, for instance, also exploring more measures to improve the cost-effectiveness for the delivery of the Capital Works Programme. We are conducting study on the cost components of construction works and carrying out survey on contractor's tendering consideration in order to help formulating appropriate policies to bring down tender prices and construction costs. We are also preparing for legislation on security of payment to reduce contractor's financing costs resulting from improved cashflow.

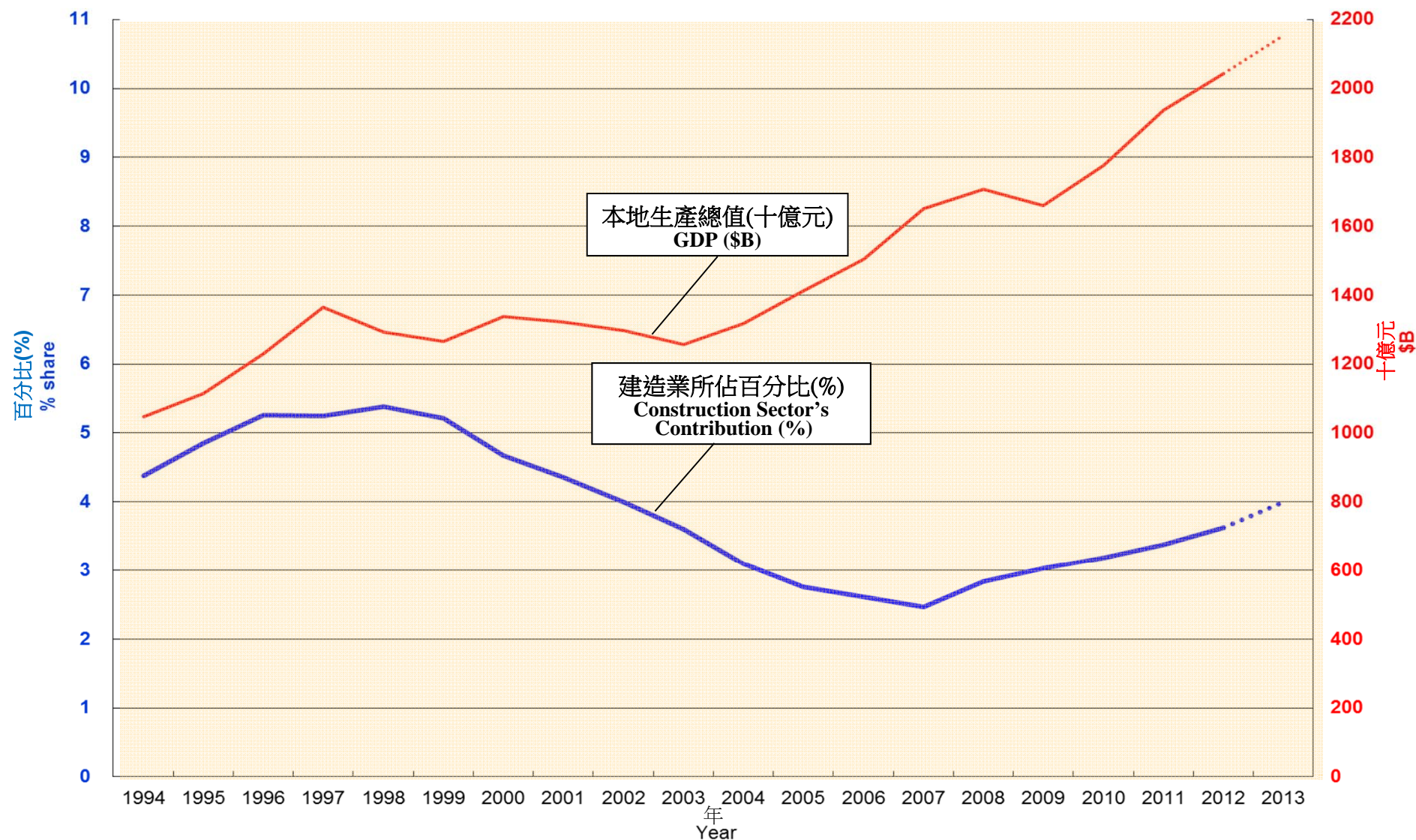
43. Over the past years, we have been closely monitoring and reviewing the progress of various government infrastructure projects and our capability of taking forward the infrastructure projects. We have been vigilant to the market trend of the construction industry, and will continue to explore and formulate effective measures to control infrastructure project cost. We will work closely with the relevant Bureaux and Departments to take forward infrastructure projects in an orderly and effective manner, ensuring the community aspirations will be met and Hong Kong will reap the economic benefits from our Capital Works Programme.

Development Bureau
February 2014

建造業所佔本地生產總值

Construction Sector's Contribution to GDP

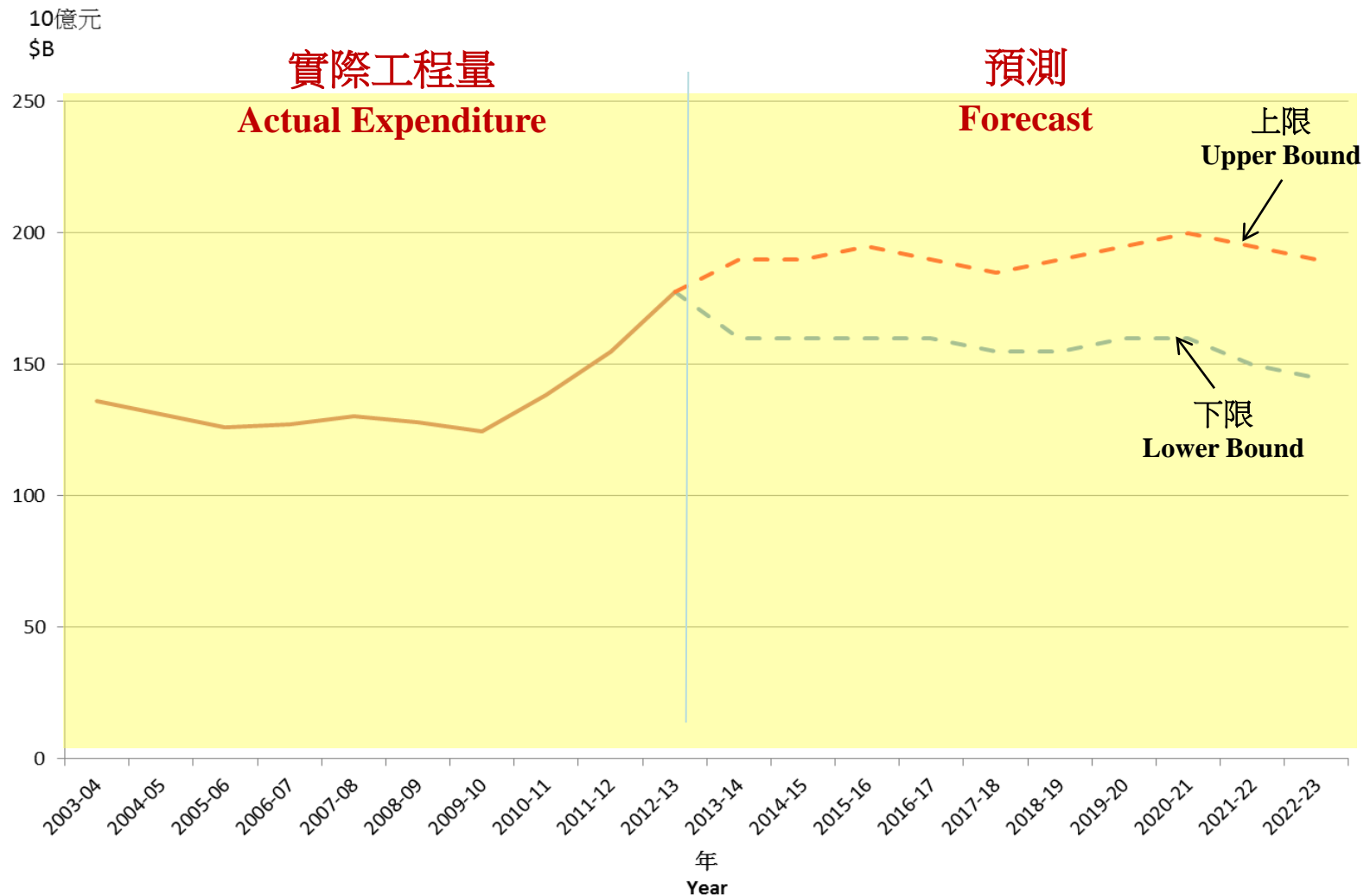
附件一
Annex 1



整體建造工程量的預測

Overall Construction Expenditure Forecast

附件二
Annex 2



統計處公營建築工程的材料成本指數
C&SD Index Numbers of Costs of Materials used in Public Sector Construction Projects

