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JUNE 2024

BRIDGE DESIGN TECHNOLOGIES



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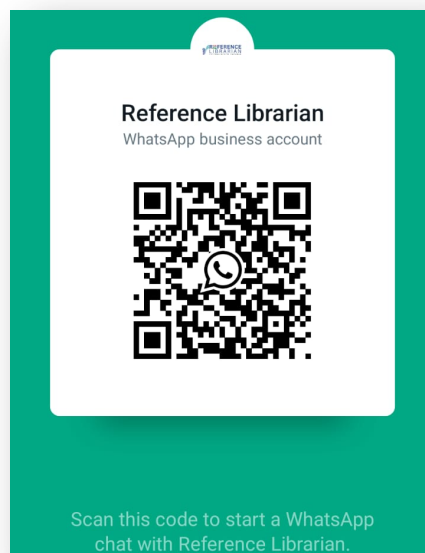
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TOPIC OF CURRENT AWARENESS SERVICES@PUSTAKA FOR JUNE:
BRIDGE DESIGN TECHNOLOGIES

Bridge design technologies have advanced significantly, integrating innovations in materials, construction methods, and computational tools. High-performance concrete and fiber-reinforced polymers are now commonly used for their strength and durability, while weathering steel reduces maintenance needs. Modern construction methods enhance efficiency and minimize disruption. Computational advancements enable precise and optimized designs. Sustainable practices are increasingly prioritized, incorporating eco-friendly materials and energy-efficient systems. Technologies such as structural health monitoring (SHM) and the use of drones for inspection improve maintenance and safety. These innovations ensure that contemporary bridges are not only robust and efficient but also sustainable and aesthetically pleasing.

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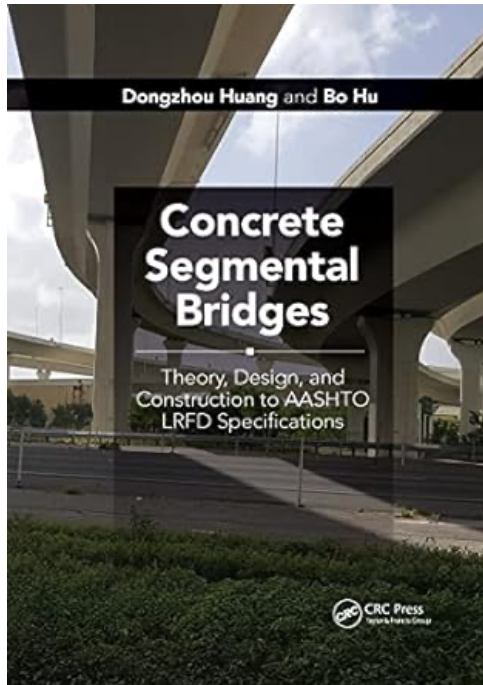
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List of Resources on Bridge Design Technologies in Pustaka's Collection

LIST OF BOOKS

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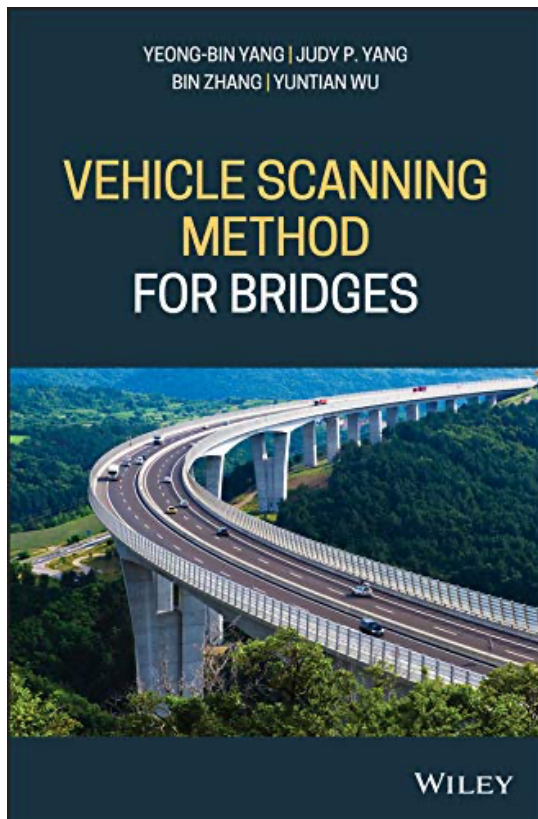
Title : Concrete Segmental Bridges: Theory, Design, and Construction to AASHTO LRFD Specifications
Author : Dongzhou Huang, and Bo Hu.
Publisher : CRC Press, 2020
Call Number : 624.37/HUA
ISBN : 9781498799003
Location : Pustaka Negeri Sarawak (Kuching)
Format : Book material



Description:

Segmental concrete bridges have become a leading choice for major transportation projects globally due to their fast construction with minimal traffic disruption, lower life cycle costs, appealing aesthetics, and ability to adapt to curved roadway alignments. While most literature focuses on construction, this book addresses the need for a design-oriented resource for less experienced bridge engineers and senior university students.

The book provides comprehensive theory, design principles, and key construction methods, including a straightforward design example for each main bridge type based on the AASHTO LRFD Design Specifications. It details design techniques and the relationships between analytical methods, specifications, theory, design, construction, and practice, combining mathematical principles and engineering mechanics with the authors' extensive design and teaching experience.

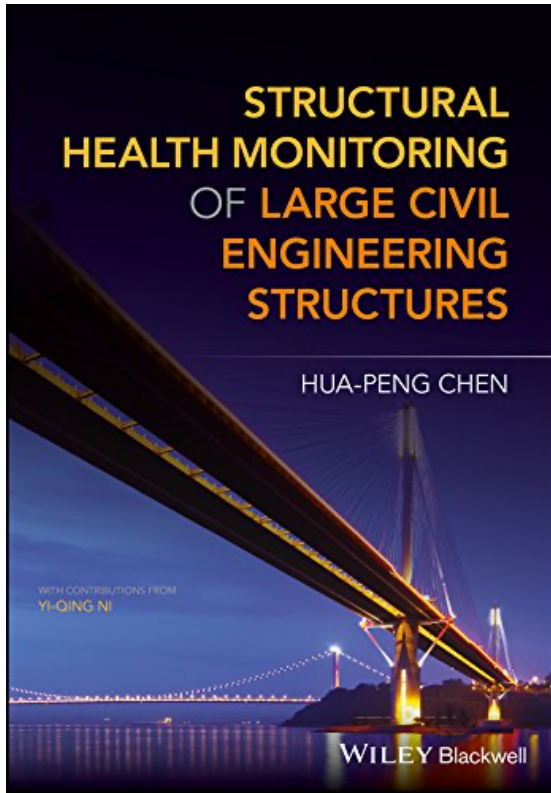


Title : Vehicle Scanning Method for Bridges
Author : Yeong-Bin Yang, Judy P. Yang, Yuntian Wu, and Bin Zhang.
Publisher : Wiley, 2019.
Call Number : 624.25/YAN
ISBN : 9781119539582
Location : Pustaka Negeri Sarawak (Sibu)
Format : Book material



Description:

Authored by a leading expert on the vehicle scanning method (VSM) for bridges, this book provides engineers with a tool to regularly monitor bridges for maintenance and damage detection. It reviews existing literature and introduces the concept of extracting bridge frequencies using a moving test vehicle equipped with vibration sensors. The book examines the impact of road surface roughness on the VSM and includes a finite element simulation to illustrate this effect. Case studies and experimental results are also presented. "Vehicle Scanning Method for Bridges" elaborates on an advanced technique for extracting higher bridge frequencies and investigates the influence of road roughness on frequency extraction. It explores a dual vehicle method to mitigate road roughness effects and describes a filtering technique to eliminate these impacts. Additionally, the book discusses the identification of bridge mode shapes, contact-point response for modal identification, and damage detection—all utilizing a moving test vehicle.



Title : Structural Health Monitoring of Large Civil Engineering Structures
Author : Chen Hua-Peng
Publisher : John Wiley & Sons, 2018.
Call : 624.171/CHU
Number
ISBN : 9781119166436
Location : Pustaka Negeri Sarawak (Kuching)
Format : Book material



Description:

Structural Health Monitoring (SHM) enables the ongoing evaluation of structural integrity and damage assessment, playing a crucial role in condition-based maintenance and damage forecasting. This extensive book informs readers about the latest developments and innovations in SHM technologies for civil engineering structures. It addresses all necessary components for effective field monitoring, including sensors and networks, data collection and processing, as well as damage detection and prognostic techniques. Additionally, the book presents numerous case studies demonstrating the application of these techniques in creating sustainable and resilient civil infrastructure systems.

LIST OF ARTICLES

Note: Kindly scan the QR Code for full text online.

Title : The level of Building Information Modelling (BIM) implementation in Malaysia.
Authors : Idris Othman, Yasser Yahya Al-Ashmori, Yani Rahmawati, Y.H. Mughahed Amran, and Mohammed Ali Mohammed Al-Bared.
Online Database : Mandeley (ASEJ)
Format : e-Article
DOI : <https://doi.org/10.1016/j.asej.2020.04.007>

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Civil Engineering

The level of Building Information Modelling (BIM) Implementation in Malaysia



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BIM usage
BIM benefits
Malaysia

ABSTRACT

Building Information Modelling is one of the crucial topics in the construction industry. The construction industry has played an important role to assist stakeholders to successfully transfer construction practices to BIM-based technology. Currently, no systematic research that has been carried out to determine the level of BIM implementation in Malaysia. Therefore, this paper aims to evaluate the diffusion of BIM among Malaysian companies. The results of the 268 responses received revealed that only 13% of the participants from both public and private sectors are using BIM in their organization and this is a negative sign that Malaysia is still far away from the position it supposed to be in BIM implementation. Lack of awareness, costs, slow adaptation, unavailability of a clear guideline to assist organizations and policy-makers toward BIM implementation transforming and that BIM was not mandated in sufficient time were observed to be responsible for the slow implementation.

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Title : Building information modelling, artificial intelligence and construction tech.
Authors : Rafael Sacks, Mark Girolami, and Ioannis Brilakis
Online Database : Mandelley (Elsevier)
Format : e-Article
DOI : <https://doi.org/10.1016/j.dibe.2020.100011>

Developments in the Built Environment 4 (2020) 100011



Building Information Modelling, Artificial Intelligence and Construction Tech



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ARTICLE INFO

Keywords:

Artificial intelligence
Building information modelling
Construction technology
Digital construction
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Innovation

ABSTRACT

Adoption of digital information tools in the construction sector provides fertile ground for the birth and growth of companies that specialize in applications of technologies to design and construction. While some of the technologies are new, many implement ideas proposed in construction research decades ago that were impractical without a sound digital building information foundation. Building Information Modelling (BIM) itself can be traced to a landmark paper from 1975; ideas for artificially intelligent design and code checking tools date from the mid-1980s; and construction robots have laboured in research labs for decades. Yet only within the past five years has venture capital actively sought startup companies in the 'Construction Tech' sector. Following a set of digital construction innovations through their known past and their uncertain present, we review their increasingly optimistic future, all through the lens of their dependence on digital information. The review identifies new challenges, yielding a set of research topics with the potential to unlock a range of future applications that apply artificial intelligence.

1. Introduction

Researchers in architecture, engineering and construction have long dreamed of applying information technology, robotics and other new technologies to design and construction. Yet invariably, their conceptual understandings of what could be done, and hence their visionary views of the future of construction, far outstripped the practical, technical, commercial, cultural and/or organizational constraints that had to be overcome for their fulfilment.

Eastman, for example, conceived of a computerised Building Design System (BDS) with all the functionality of what we now know as Building Information Modelling (BIM) (Eastman, 1975). The basic BIM functions took 25 years to reach the market, and some – such as Eastman's prediction that "Later, one can conceive of a BDS supporting automated building code checking in city hall or the architect's office" – have yet to be realized in full. Indeed, Gholizadeh et al. (2018) found that, as late as 2017, of the 14 BIM functions whose adoption they investigated, only three were in widespread use. Similarly, Warszawski and Sangrey (1985) wrote that "Implementing robotics in construction may follow several paths. One approach will involve an evolution of robotic and computer technology into existing procedures. The second approach will be more dramatic with the

combination of robotics and CAD-CAM providing the basis for entirely new building systems—the construction of the future." Construction robotic machines of the first type are only now beginning to become practical and economical, and none have achieved the revolutionary change they contemplated in their second mode. For many researchers with foresight and a good conceptual grasp of potential implementations, automation in construction has at times proved to be a frustratingly difficult goal from the point of view of implementation in industry.

Within the last five years, however, there has been a steady influx of new, innovative companies specializing in application of a variety of information and automation technologies, developed in other industries, to construction. These startup companies are supported by venture capitalists, academic research and public and private incubator programs, together with which they form an ecosystem commonly called 'Construction Tech' (echoing the name 'High Tech' used for the information and automation technology industry). In the US, the amount of venture capital invested in Construction Tech annually is reported to have grown from circa \$250 m in 2013 to well over \$1,000 m in 2018 (Andersen and Forr, 2018). Most of the new companies owe their newfound practicality not only to the maturation of their core technologies, but equally to the comprehensive building information available in BIM environments. In

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Title : Computer vision-based real-time monitoring for swivel construction of bridges: from laboratory study to a pilot application.
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Computer vision-based real-time monitoring for swivel construction of bridges: from laboratory study to a pilot application

Bridge swivel construction monitoring

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Abstract

Purpose – The swivel construction method is a specially designed process used to build bridges that cross rivers, valleys, railroads and other obstacles. To carry out this construction method safely, real-time monitoring of the bridge rotation process is required to ensure a smooth swivel operation without collisions. However, the traditional means of monitoring using Electronic Total Station tools cannot realize real-time monitoring, and monitoring using motion sensors or GPS is cumbersome to use.

Design/methodology/approach – This study proposes a monitoring method based on a series of computer vision (CV) technologies, which can monitor the rotation angle, velocity and inclination angle of the swivel construction in real-time. First, three proposed CV algorithms were developed in a laboratory environment. The experimental tests were carried out on a bridge scale model to select the outperformed algorithms for rotation, velocity and inclination monitor, respectively, as the final monitoring method in proposed method. Then, the selected method was implemented to monitor an actual bridge during its swivel construction to verify the applicability.

Findings – In the laboratory study, the monitoring data measured with the selected monitoring algorithms was compared with those measured by an Electronic Total Station and the errors in terms of rotation angle, velocity and inclination angle, were 0.040%, 0.040%, and -0.454%, respectively, thus validating the accuracy of the proposed method. In the pilot actual application, the method was shown to be feasible in a real construction application.

Originality/value – In a well-controlled laboratory the optimal algorithms for bridge swivel construction are identified and in an actual project the proposed method is verified. The proposed CV method is complementary to the use of Electronic Total Station tools, motion sensors, and GPS for safety monitoring of swivel construction of bridges. It also contributes to being a possible approach without data-driven model training. Its principal advantages are that it both provides real-time monitoring and is easy to deploy in real construction applications.

Keywords Bridge swivel construction, Computer vision, Laboratory study, Pilot application

Paper type Research paper

1. Introduction

Swivel construction is a special bridge construction method, usually used where the bridge has to cross rivers, valleys, railroads and other obstacles (Su *et al.*, 2021). With the rapid development of transportation in developing countries, a large number of passenger lines,

This project was funded by the National Natural Science Foundation of China (grant no. 52108279), the China Postdoctoral Science Foundation (grant no. 2020M670918), the Research on The Improvement of High-Level Service Ability of Whole-Process Engineering Consulting (grant no. R20210505, China Ministry of Housing and Urban-Rural Development), Liaoning Research Project, China (grant no. lnjc202007), and by Shenyang Science and Technology Project, China (grant no. RC200143).



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LIST OF CASE STUDY

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Title : Self-healing characteristics of cement concrete containing expansive agent
Authors : Sungil Jeon, Mohammad Shakhawat Hossain, Seungyeon Han, Pangil Choi, and Kyong-Ku Yun
Online Database : Mendeley (Elsevier)
Format : e-Article
DOI : <https://doi.org/10.1016/j.cscm.2022.e01609>



Case study

Self-healing characteristics of cement concrete containing expansive agent

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ARTICLE INFO

Keywords:
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Microscopic image analysis
Concrete overlay for bridge deck

ABSTRACT

Many studies have been conducted to identify the self-healing effect in cementitious materials. However, the knowledge regarding the self-healing effect is insufficient to utilize this effect for design purposes. This study examined the influence of numerous admixtures such as expansive agents (EA), ultra-fine fly ash (UFFA), finely ground granulated blast furnace slag (FGGBS), and silica fume (SF) on the self-healing capacity of Portland cement concrete. Here, focused on investigating the effect of the expansive agent (EA) used in concrete mixtures to identify whether the EA could act as a self-healing trigger in concrete materials that are frequently used in a bridge deck overlay. Ordinary Portland cement concrete (OPC), latex-modified concrete (LMC), and silica fume concrete (SFC) was used to compare the effect of the EA (0, 4, 8%, and 12%) in the ternary blended cement concrete on each material for bridge deck overlay concrete. In this study, the crack width was examined at 0, 7, 14 and 28 days respectively which were induction at 3 and 7 days age of concrete specimens by the microscopic image analysis system. Samples with healed cracks with a width range of 100–200 μm and EA \geq 8% on day 28 exhibited faster self-healing performance. Additionally, we calculated the self-cracking closing ratio and performed a microstructure analysis by SEM/EDS. Moreover, the compressive strength was examined at 7, 28, 56, and 90 days for understanding the improved performance of all concrete mixtures.

1. Introduction

Concrete is a significant material that has been used extensively in construction and infrastructure technology. Portland cement (PC) concrete is a structured, quasi-brittle, and heterogeneous material that can resist high compressive strength [1]. Concrete cracks because of mechanical activities, physicochemical conditions, and environmental weathering, and their brittleness can considerably influence the service life of structure elements [2]. Consequently, the cracks drastically decrease the concrete's load-bearing capability and increase the porosity inside the concrete [3]. To overcome this problem, self-healing plays an important role it can be a promising solution to mitigate the cracks [4–6]. Over the last two decades, the self-healing concept of cement-based materials has gained

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LIST OF NEWSPAPER ARTICLE

Note: Kindly scan the QR Code for full text online.

Article Name : A buoyant solution
Authors : -
Newspaper : The Star Malaysia
Date of Published : 23 June 2024
Online Database : PressReader



WORLDWIDE, rising sea levels and increasing urbanisation represent a formula for disaster, with more and more people seeking to live on land that will, at some point, be swallowed up by the sea.

But a futuristic-sounding solution – the construction of full cities on top of the water – is poised to become a reality. One project in particular, off Busan, South Korea, is roping in a combination of high and low technology to create a large-scale, on-water town, which will be able to house more than 10,000 people.

Strictly defined, floating communities already exist in the Netherlands, Thailand and elsewhere in South-East Asia. But these are typically clusters of houseboats moored close to one another. What sets the new concepts apart is a matter of scale. Rather than comprising an agglomeration of smaller vessels, each of these cities is designed to be built on enormous concrete platforms suspended on the water.

How does such a large form float?

"The physics is very easy," said Koen Olthuis, the founder of the Dutch architectural firm Waterstudio, who designed a floating development in the Maldives that has received a great deal of attention.

"A block of concrete will sink," Olthuis added, speaking on the phone from the Netherlands. "But if you shape it into a box, then it floats. It's Archimedes. The amount of volume you push away is equal to the weight of the displaced water."

Think of aircraft carriers. The floating city in development off Busan is coming together through the collaborative efforts of the United Nations Human Settlements Program, known as UN-Habitat; the architecture firm BIG (Bjarke Ingels Group); and technology company

A buoyant solution

Floating developments, including the Oceanix Busan in South Korea, suggest that building floating cities as an answer to rising seas isn't a pipe dream.

Oceanix. Founded in 2018 by Itai Madamombe and Marc Collins Chen, Oceanix, which is based in New York City, the United States, designs and builds floating infrastructure for people to live and work sustainably on the ocean. (Some 90% of cities are coastal and hence can be vulnerable to sea level rise, according to UN-Habitat.)

When cities need to expand to accommodate more people, many resort to land reclamation, using large amounts of rock or cement, then filling in with clay and dirt until the ground is sufficiently high to build on.

According to Madamombe, this is not sustainable.

"They are essentially dumping debris and other things into the ocean to create new land, which has a lot of problems," she said.

The floating city in the works off the coast of South Korea, Oceanix Busan, is relying on a

series of connected floating platforms that are designed to initially cover 6.3ha and house about 12,000 people. The community will be linked to the land by a bridge, and each platform will be anchored to the seabed. The infrastructure will handle power, water, waste and some food.

Madamombe said the goal is not only self-sufficiency, but also, if possible, the ability to produce enough energy to give back to the nearby community.

"This is an extension of a city," she said.

Construction of the modular platforms is currently scheduled to begin in South Korea by the end of the year. The platforms will then be towed to the site and assembled.

"This allows us to build as many of these as quickly as possible," Madamombe said.

She added that the structure is infinitely expandable, and the city could eventually house 150,000. The project is scheduled to be completed by 2028.

"We are also pursuing other diverse floating infrastructure projects that we will be announcing in the near future," Madamombe said.

Busan's floating city is centred on the feat of building on water, with less attention paid to the design of individual buildings.

"We were more making sure that the concepts that we developed for the city infrastructure could house a great degree of variation of different kinds of architecture," said Daniel Sundlin, a partner at BIG.

(The firm also developed a community of 72 floating apartments in Copenhagen,



Oceanix Busan relies on a series of connected floating platforms that are designed to initially cover 6.3ha and house about 12,000 people.

Denmark, near a deserted island that had served as a shipyard, as part of a project called Urban Rigger.)

The shape of the Busan platforms, basically rounded hexagons, keeps them stable; they won't rock with every wave, as a houseboat would. BIG also worked with the Massachusetts Institute of Technology and marine engineering firms to make sure the platforms can withstand the waves and winds associated with hurricanes.

"We have been conscious about the scale of the buildings, and also the materials we use to keep the weight as light as possible," Sundlin said.

"Treated wood is a great material in that it is very lightweight. Steel is lightweight," he added, as compared with concrete or masonry.

These structures are also unique in their ability to increase biodiversity and the ecological health of the harbours in which they are anchored, by providing places for oysters and mussels, for example, to grow.

"This kind of floating structure attracts life in the ocean and essentially helps to restore ecology," Sundlin said.

Floating cities are the Wild

West in terms of international regulations and standards. So projects like Busan are setting those standards, with the help of the United Nations.

Naomi Hoogervorst, the programme management officer of the Planning, Finance and Economy Section of UN-Habitat, said it is the organisation's role to make sure sustainable development goals are implemented at all levels.

Hoogervorst said Busan was chosen because it strongly embraces technological innovations, especially in marine engineering, and because South Korea is promoting smart marine cities in general.

Madamombe added, "The mayor is dedicated to making Busan the No. 1 smart marine city," so they are able to move more quickly than people working on similar projects in other parts of the world.

"I think people see it as this far-fetched, futuristic thing," Sundlin said.

But, he added, floating markets, houseboats and houses on stilts have been around "since the beginning of civilisation".

He noted that these forms of architecture are still "a very common way of living next to or on top of water". – The New York Times



An undated rendering of Oceanix Busan, a floating city in development off the coast of South Korea for which designers envisioned the city as sitting upon enormous concrete platforms floating on the water. – Photos: BIG/The New York Times

Article Name : The Key Bridge disaster is a wake-up call for US infrastructure.
Authors : R. Richard Geddes
Newspaper : The Sunday Capital
Date of Published : 15 April 2024
Online Database : PressReader

The Key Bridge disaster is a wake-up call for US infrastructure

By R. Richard Geddes

President Biden visited the site of the collapsed Francis Scott Key Bridge in Baltimore, which has been called a "mangled mess," on Friday, mourning the loss of the six workers killed in the accident. The economic impact of this accident is significant and goes far beyond the bridge itself. The disaster should serve as a wake-up call to ensure that all bridges, as well as all marine infrastructure in general, can withstand such a collision. Rebuilding the Key Bridge offers the chance to bring American infrastructure delivery up to rest-of-world standards through better cooperation between the public and private sectors.

The core of such cooperation is a long-term contract between the public and private sectors known broadly as a "public-private partnership" or PPP. The success of public-private partnerships in building, operating and maintaining all areas of infrastructure can be seen all over the country; and the future of PPP starts with improving public policy, including assessing standards.

The central aspect of a PPP is that it bundles or "wraps" the design and construction of a piece of infrastructure together with its operation and maintenance over the long term, such as 25 or 30 years. A PPP might also include private-sector financing to cover the new bridge's substantial design and construction costs. Because the Key Bridge featured all-electronic tolling, a user-fee funding source already exists to help pay for the new bridge over time. This means that the new bridge can be delivered quickly under a "toll concession" agreement.

The federal government already committed some funding to reconstruct the Key Bridge. However, a new bridge will be expensive and will cost more than this initial commitment. A PPP for the Key Bridge would combine design and construction with operation and maintenance — and include provisions to ensure that the infrastructure is properly maintained. This would reduce the likelihood of deferred maintenance, one of the main problems plaguing U.S. infrastructure today.

Rather than simply bouncing back from this disaster, a long-term PPP provides the opportunity to "bounce forward." Since the Key Bridge first entered into service in 1977, a quiet, but vast, technological revolution has occurred in infrastructure. Improvements in materials (such as concrete and asphalt), sensors, designs and much more are readily available. These improvements can be incorporated into the new bridge's design and construction, as well as its operation and maintenance by "future-proofing" PPP contracts with the private sector.

PPP contracts include operation and maintenance over the long term, which



The wreckage of the Francis Scott Key Bridge and the container ship Dali rest against each other in the Patapsco River after the ship struck the bridge on March 26, causing its collapse. AMY DAVIS/STAFF

risks locking in outdated technologies. Future-proofing refers to the risk of not adopting available innovative technology and design standards well into the future. A future-proofed contract thus ensures that private capital, incentives and expertise are deployed to make U.S. infrastructure as resilient as possible for decades to come.

Moreover, many U.S. infrastructure projects notoriously run over both time and budget. When completed, Phase 1 of New York's Second Avenue Subway, for example, cost about \$2.5 billion per mile. That is 8 to 12 times more expensive than similar subway projects in Sweden, Italy, Paris, Berlin and Istanbul. There is no need for the new Key Bridge to suffer the same

fate. A PPP contract puts the risk of time and cost overruns on the private partner rather than the taxpayer. The private partner can be incentivized to deliver the project on time via financial penalties for late delivery and rewards for delivery ahead of schedule. A PPP would deliver the new bridge faster.

PPPs also allow projects to cut through much of the bureaucracy that often slows U.S. projects. America has typically used a design-bid-build (DBB) approach, where a government entity first bids out the bridge's design and then bids out the chosen design separately. Combining and integrating the design and construction into a single project allows for quicker delivery and more synergies between

design and construction firms. New York's widely acclaimed new Tappan Zee Bridge was built using such a contract.

The United States is decades behind many other countries where the use of PPPs is standard. Despite the suffering caused by this tragic accident, it provides an opportunity for Maryland to "bounce forward" and prevent future degradation of current infrastructure systems.

R. Richard Geddes (rgeddes@cornell.edu) is a nonresident senior fellow at the American Enterprise Institute, a professor in Cornell's Jeb E. Brooks School of Public Policy and the founding director of the Cornell Program in Infrastructure Policy. He is a 1984 graduate of Towson State University.



SCHOOL REFERENCE POINT

Are you looking for extra reference materials related to your school curriculum?

Do you know that Pustaka Negeri Sarawak is part of the u-Pustaka Consortium members. u-Pustaka is an innovation that manifests a collaborative synergy from the Ministry of Information Communications and Culture (KPKK) through Malaysian Communications and Multimedia Commission (MCMC), with the support of the National Library of Malaysia (PNM). The u-Pustaka Portal provides u-Pustaka Members with rich e-resources that can be access by members 24/7.

Interested to get access to u-Pustaka e-resources? Head over to u-Pustaka Portal here (<https://www.u-library.gov.my/portal/web/guest/home>) to register as a member.



#SarawakReads
Read. Immerse. Excel

SARAWAK NEGERI PUSTAKA

TUTOR INFINITI

PORTAL PEMBELAJARAN

Semua dalam talian untuk membantu pelajar membuat ulangkaji dan latihan pengukuhan

68,785 soalan tahap peperiksaan UPSR, PT3 dan SPM

100% KSSR/KSSM/KBSM KBAT + HOTS

Imbas sini!

Maklumat lanjut, sila hubungi:
Pustakawan Rujukan
Pustaka Negeri Sarawak Jalan Pustaka,
Off Jalan Stadium Petra Jaya, 93050,
Kuching Sarawak, Malaysia

www.pustaka-sarawak.com | pustaka.sarawak | pustakarawak | pustakanegerisarawak | PustakaSarawak

MyGuru

Pustaka Negeri Sarawak subscribes to a MyGuru database which is related to school curriculum. MyGuru, previously known as Learning Port Interactive, is a set of highly effective online revision resources that assists with learning and prepares students for their exams. This database provides lesson component which features hundreds of lessons for each school subject. To achieve the best learning outcome, each lesson is presented with full interaction and animation and scores of interactive activities. The Question Bank component features many thousands of sample questions and answers. Each question comes with a detailed answer and a full explanation. MyGuru is 100% aligned with the latest curriculum for primary and secondary school.



The image shows a screenshot of the MyGuru website interface. At the top, the MyGuru logo is displayed. Below it, a large orange banner contains the text: "MyGuru previously known as Learning Port Interactive is a set of highly effective online revision resources that assists with learning and prepares students for their exams." The website interface includes a navigation bar with "LESSONS" and "QUESTION BANK" buttons, and a section for "Lower Primary Level I" with subject options: Science, Maths, Bahasa Melayu, English, and English. A "Support Desk" section is also visible. A promotional overlay in the bottom left corner features a QR code and text: "Interested to get access to our subscribed online resources? Please proceed to Pustaka Negeri Sarawak or conveniently scan the QR code to register as a member." To the right of the QR code is a video player showing a teacher at a desk with a globe, with contact information: "Reach us at 082-442000 or via email at librarian@sarawak.gov.my." The video player shows a duration of 12:34. At the bottom, social media links for Pustaka Sarawak are provided.

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Dashboard

WHAT DO YOU WANT TO DO TODAY? LESSONS QUESTION BANK

Lower Primary Level I

Science Maths Bahasa Melayu

English

English

Support Desk
My Submitted Questions

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Reach us at
082-442000 or via email at
librarian@sarawak.gov.my.

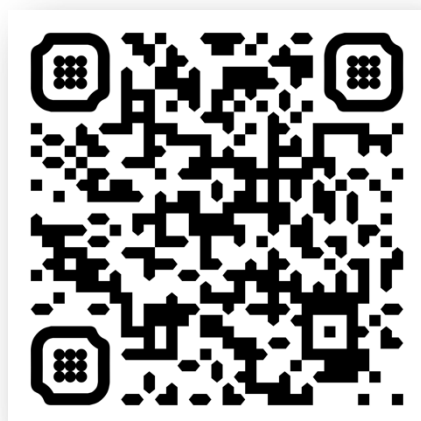
12:34

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SUBSCRIPTION AND DELIVERY METHOD

By sharing your information here, you will be receiving updates (if any) on the latest collection related to your interest subject area.

Please help us to save earth by go paperless. One (1) ream of paper already used up 60% of a tree.

Kindly scan the QR Code below to choose the delivery method.

