

Center for Sustainable Infrastructure Development (CSID)

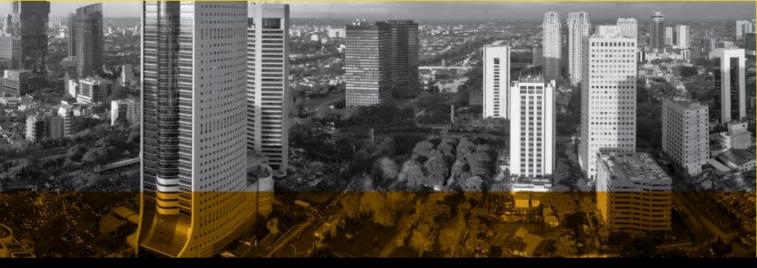
Accelerating Infrastructure Development in Indonesia



Welcome



Center for Sustainable Infrastructure Development



"Infrastructure development is vital in providing the necessary conditions to foster growth and economic development in Indonesia."

The Preface

Infrastructure covers various sectors that represent a large share of an economy and become a critical index of economic vitality. Both components of infrastructure, physical and social infrastructures, are required to provide the necessary services for public interests. Reliable public utilities (e.g. power, telecommunication, water and gas supply, and other utilities), public works (e.g. roads, dams and canals, tunnels) and public transport (urban transports, railways, ports and waterways, and airports) are basic elements of a productive economy. Therefore, provision maintenance and of adeauate infrastructure is essential for achieving rapid and sustainable economic growth. The adequacy of infrastructure helps to determine Indonesia's kev success factors in increasing productivity, expanding trade and industry, coping with population growth, reducina poverty, improving environmental sustainability and living standards of the society. The trends in infrastructure spending and the availability of infrastructure have improved significantly in Indonesia over recent years.

Responding to the need for infrastructure development in Indonesia, the Center for Sustainable Infrastructure Development (CSID) was established at the Faculty of Engineering, University of Indonesia. Having established a solid reputation and recognition of its members, CSID research focuses on infrastructure design and planning, financial and business management and innovative use of technologies, coupled with emerging best practice approaches applied to infrastructure development. By having well-planned infrastructure research, we believe that potential breakthroughs will make infrastructure project development more efficient and effective, and therefore, more beneficial for both public and private sectors. This book profile of CSID will provide you with comprehensive information on the CSID. We hope that the information will give you greater insight into the CSID background and its research activities.



The Background

Indonesia is a vast archipelago country with large and dynamic economic activities reflected by an average economic growth reaching 6% per annum. Infrastructure development plays an important role to stimulate the nation's economic growth; during the last few years, the infrastructure industry has significantly contributed to the GDP of Indonesia. Furthermore, in order to achieve acceleration of economic development, the Government of Indonesia, through the National Medium Term Development Plan (RPJMN), is targeting a gradual increase of economic growth towards two digits in the future years.





Infrastructure development plays an important role to stimulate the nation's economic growth



CSID is established at the Faculty of Engineering, University of Indonesia

Responding to the needs of infrastructure development in Indonesia, the Center for Sustainable Infrastructure Development (CSID) was established at the Faculty of Engineering, University of Indonesia. The center was initiated by scholars and professionals who were focusing on Indonesian infrastructure development in the Integrated Design and Technology (IDTech) Research Group. Since 2008, the research group has continuously received research grants from the Ministry of Education and the University of Indonesia. Additional funding sources include, but are not limited to, the Ministry of Transportation, House of Representatives, and AusAid. In the middle of 2014, the CSID was established to be the leading infrastructure research organization in Indonesia.



The Mission

"The center is an entrepreneurial environment in which researchers, skilled professionals and potential stakeholders from both academia and business can work side-by-side, ensuring that infrastructure in Indonesia can be successfully developed and accelerated to achieve the targeted national economic growth."



interdisciplinary The center conducts provides outreach research and infrastructure stakeholders. Accelerate Indonesian to the larger Its mission is to infrastructure development through an integrated approach that draws on the disciplines of planning, enaineerina, economy, business and public policy. The CSID research focuses on infrastructure design and planning, financial and business management and innovative use technologies, coupled with emerging best practice approaches applied infrastructure development. Further to the research and academic programs, the CSID is also engaged in several consultancy projects in the area of infrastructure development.

The center consists of four research clusters: Finance and Asset Management, Sustainable Mobility, Sustainable Water Management, and Sustainable Energy.

Business opportunities in infrastructure are considerable, not only for public interest but also for investors and private industries that are involved in the development of infrastructure projects.





The CSID is designed to respond directly and systematically to input received from the government and private sectors on what is required to address issues. The outputs of the center will provide the infrastructure stakeholders with means to ensure that the new performance targets and an optimum value for money for investment can be met. Furthermore, the potential breakthroughs will make more infrastructure project development

efficient, effective and, therefore, more beneficial for the public and more profitable for the private sectors.

The core activities of the CSID are underpinned by a significant number of eminent academic staff, top management in Indonesian government agencies and high profile professionals who have contributed significant research output (reference text books, published papers in refereed journals and conference proceedings) to the development of Indonesian public policy.

CENTER FOR
SUSTAINABLE
INFRASTRUCTURE
DEVELOPMENT
(CSID)
RESEARCH
CLUSTER

Sustainable Infrastructure Development

Sustainable Mobility Finance and Asset Management **Sustainable Energy**



The Four Clusters:

Finance and Asset Management Cluster

This cluster conducts research activities that focus on engineering (design), infrastructure financing management and asset management. Multi-disciplinary research developed in this cluster include: concept design and planning based on value creation, cost effectiveness and economic feasibility; operational management and asset management; the role and impact of government policies and regulations; as well as the development of project financing based on public private partnership schemes. The research has the objective to accelerate infrastructure development in the fields of transportation, water, and energy resources.

Sustainable Energy Cluster

The Sustainable energy research cluster focuses on the infrastructure of energy management and development . This cluster conducts activities to improve the sustainability of energy supply, reduce energy subsidies and greenhouse gases emissions, and increase the use of renewable energy as an alternative energy by means of sustainable infrastructure projects.

Sustainable Mobility Cluster

The Sustainable mobility research cluster is a multidisciplinary field of research involving expertise in transportation, architecture, and urban planning. The research activities focus on the development and sustainability of urban planning, the development of rail-based public transport infrastructure along with airports and seaports in order to improve accessibility and logistics efficiency.

Sustainable Water Management Cluster

The Sustainable water management research cluster is a field of research that is concerned with the development of water infrastructure and water resources management. The research activities focus on the development of water infrastructure and other infrastructure projects to produce clean water supply as well as projects to secure the infrastructures required to support food security, controlling flooding and treating waste as an effort to improve quality of life.

SELECTED PUBLICATION

BOOKS

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PROJECT **HIGHLIGHT**

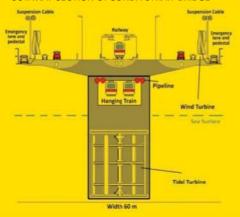
INNOVATIVE DESIGN OF

SUNDA STRAIT BRIDGE

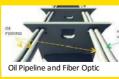
Indonesia is a vast archipelago country with large and dynamic economic activities reflected by an average economic growth reaching 6% per annum and has varied potential that can be developed. Sunda Strait Bridge is one of the mega projects offered by the Indonesian government that plans to spend about \pm US\$ 25 billion .

The use of value engineering (VE) in the project design is expected to increase and to improve the project's feasibility. A Research team in Center of Sustainable Infrastructure Development (CSID), Faculty of Engineering, University of Indonesia produced an alternative design of SSB to attract private investment. The proposed design creates more benefits that include additional functions of SSB: 1) Renewable kinetic energy generated by tidal current; 2) Integration of oil, gas and utility pipelines; 3) Tourism industrial development in Sangiang Island which can be accessed by road or hanging train; 4) Development of an industrial area in Banten and Lampung. These functions were then developed into a design visualization of Sunda Strait Bridge.

CUTAWAY SECTION OF SUNDA STRAIT BRIDGE



Tidal Power Plants







The estimated construction cost for Sunda Strait Bridge is about US\$ 18.8 billion and overall result showed that the SSB investment indicated a prospective financial feasibility and a positive NPV.

INNOVATIVE DESIGN OF

PRASTI TUNNEL-RAILWAY LINK AIRPORT

Various problems that have occurred in Jakarta and the potency of development are catalysts for innovative ideas for the design of Public RAilways and STormwater Infrastructure (PRASTI) Tunnel. Underground infrastructure was proposed as a solution for the limited land in Jakarta by integrating public transport and flood tunnels that would be used to solve Jakarta's traffic congestion and annual flood problems.

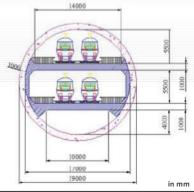
The multi-function tunnel provides an innovative solution through additional functions: 1) A Transportation function consisting of MRT and Airport Rail, 2) A Flood Control function, 3) A Commercial Area function and 4) A Utility (e.g., telecommunication) function. Value for money for the proposed

project development is achieved by conducting Life Cycle Cost analysis.

Total initial cost for the integrated function will cost about US\$ 2.2 billion and produces a positive NPV and significant Internal Rate of Return (IRR).

CROSS SECTION AND DIAMETER ANALYSIS OF PRASTI TUNNEL





PROJECT **HIGHLIGHT**



FINANCE AND ASSET MANAGEMENT CLUSTER

- Infrastructure project finance: Bonds, Insurance Fund Investment, Municipal bond, Sukuk
- Value for Money and Life cycle analysis of Infrastructure
- Strategic Alliance Public Private Partnership (SA-PPP) for infrastructure project development

SUSTAINABLE WATER MANAGEMENT CLUSTER

 Water infrastructure development: dam, tunnel, water and wastewater treatment plans



SUSTAINABLE MOBILITY CLUSTER

- Urban planning development: Sustainable City, Green Building Design, Net Zero Energy Building, Smart Building
- Urban Mobility: Logistic Service improvement, Land, Seaports, and Airports Infrastructure Development
- Railway Project Development: Track Access Charge, Double Track, High Speed Train, Railway's Vertical Separation System



SUSTAINABLE ENERGY CLUSTER

- Renewable energy infrastructure development: Tidal energy, Wind energy, Photovoltaic Energy
- Oil and gas infrastructure development

RESEARCH NETWORK















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Research Interest: Transportation, Infrastructure, Spatial Planning and Regional Development



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Research Interest: Materials Forming, Mechanical Metallurgy



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