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The Nusantara Tunnel™ development of an integrated linkage system between Java and Sumatra islands in Indonesia

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ABSTRACT

The idea of constructing a link between Java and Sumatra Islands across Sunda Strait was proposed in 1958 by the First Indonesian President, Soekarno, and was developed during 1960-1965 in the form of bridge linkage. The construction of the linkage is urgent, since the existing ferry system will become unmanageable to transport passengers, cargo, and goods in the coming years. The paper proposes a sub-sea tunnel for the linkage infrastructure along with regional development in order to ease the financial burden and at the same time raise the relevance of the project.

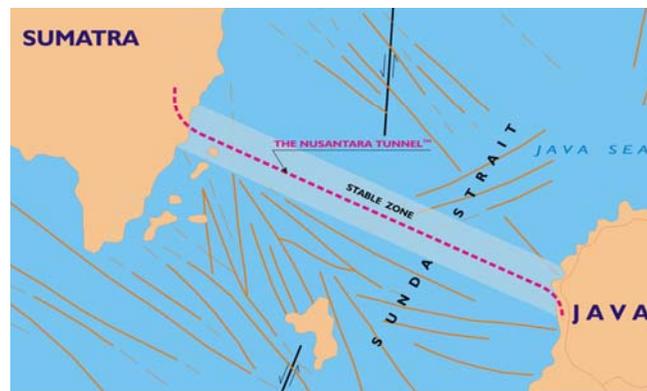
In the paper, an underground tunnel constructed at least 40 meter under the seabed is proposed to link Java and Sumatra Islands and is referred herein as the Nusantara Tunnel™. The tunnel is designed to carry electric car trains that move passengers, cars, buses, trucks, and trailers. The lower capital investment and better system of safety both for passengers and cargo, as well as having virtually no need for a ventilation system when compared to a highway tunnel, are among the reasons for the underground tunnel selection. In addition to the electric car train, Nusantara Tunnel™ will be used to accommodate oil and gas, coal slurry, extra high power transmission, and telecommunication lines so as to make the tunnel multipurpose.

The Nusantara Tunnel™ as proposed in the paper constitutes an interconnected twin tunnel of 33 km long that will be constructed in two phases. Each tunnel is of double elliptical shape with an 8.5-m flat side and a 6.6-m vertical height carrying two-way single-track electric car train with maximum traffic capacity of 15,500 passenger-car-units (pcu) per day. The first phase of the tunnel will cost approximately US\$ 1.5-2 billion to construct and US\$ 4 million per annum for maintenance, operation, and repair. This will require a toll fee of as much as US\$ 20 per pcu to travel one-way. The travel time required in making a one-way trip would be approximately an hour. © 2005 Published by Elsevier Ltd.

Keywords: Nusantara Tunnel™, underground tunnel, electric car train, Java and Sumatra linkage system.



Concept of Nusantara Tunnel.



Nusantara Tunnel rests in 5-km wide stable zone.

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