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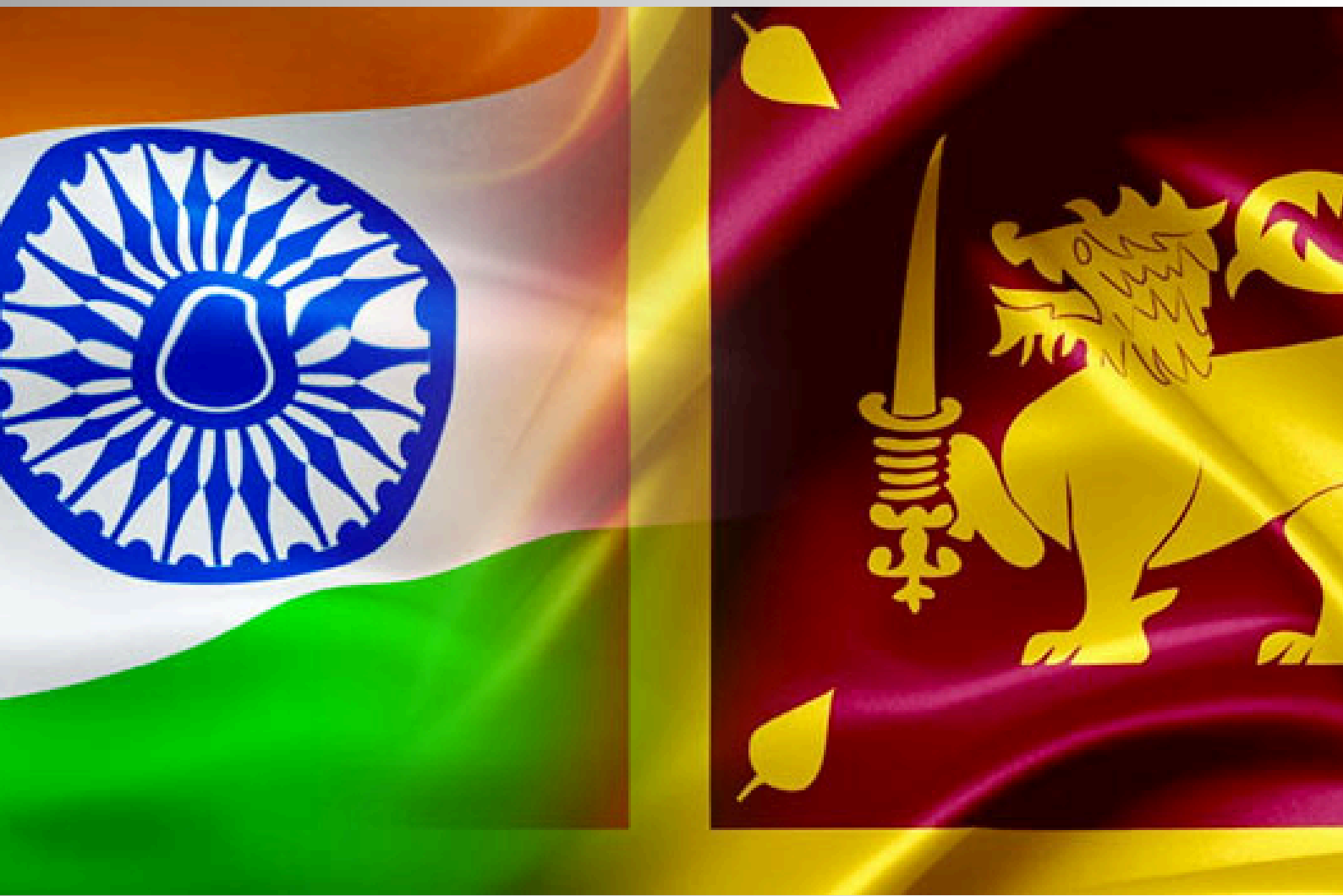
BRIDGING BORDERS: ENHANCING CONNECTIVITY BETWEEN INDIA AND SRI LANKA

AUGUST 2024



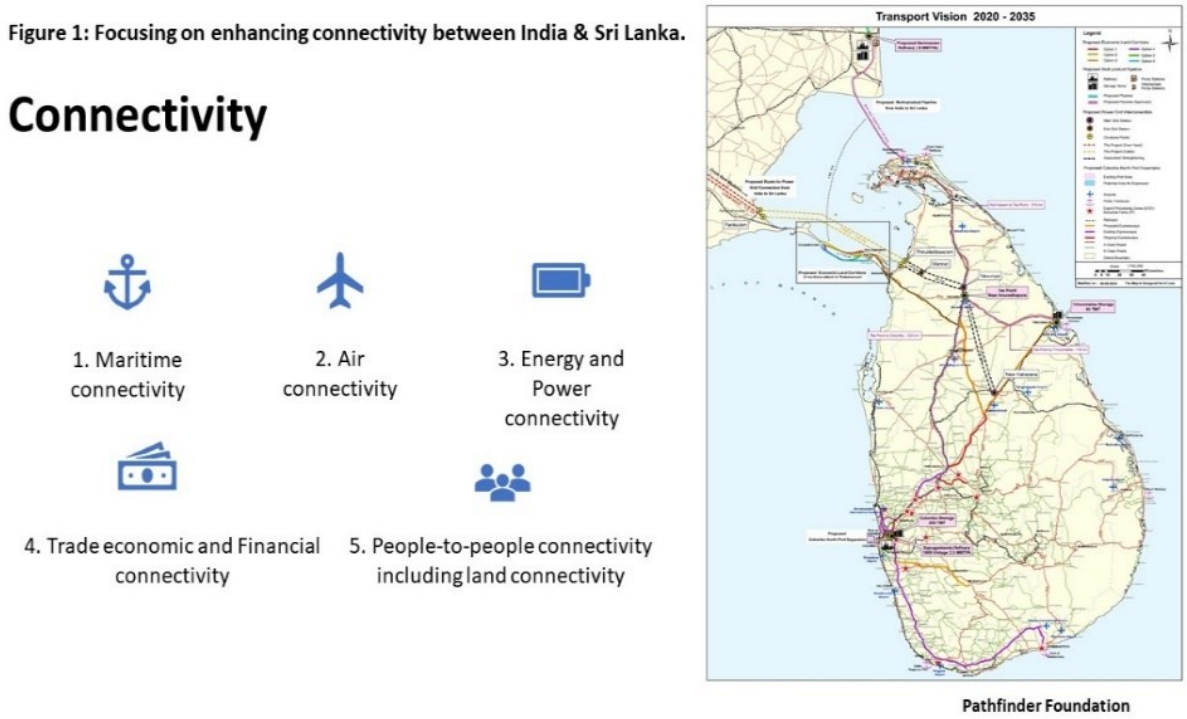
Bridging Borders: Enhancing Connectivity Between India and Sri Lanka

Overview

Transportation infrastructure development and enhanced energy connectivity are crucial for improving productivity, attracting investment, and driving economic growth. Physical infrastructure projects, such as the development of roads, airports, seaports, and energy security, play a vital role in expanding production and manufacturing activities, facilitating trade, fostering industrial agglomeration and, most importantly, improving people-to-people connectivity. The development of roads, railway systems, and ports helps to lower transport costs, increase accessibility, enhance the flow of products, and create opportunities to enter new markets. Moreover, these infrastructural projects are invaluable as they improve people's quality of life. For these reasons, investment in such projects is central to economic development.

A relatively low level of infrastructure investment in Sri Lanka has been a significant barrier to driving economic development. Infrastructure projects are capital-intensive and require substantial financial resources. Given the limited resources available, self-financing massive infrastructure projects poses a formidable challenge for Sri Lanka, particularly in the current context of the country's economic crisis.

Figure 1: Focusing on enhancing connectivity between India & Sri Lanka.



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Consequently, exploring opportunities for regional and bilateral cooperation between India and Sri Lanka in such areas of core infrastructure development has received priority attention in the recent discussions between the leaders of both countries. Given this background, the

objective of this brief report is to elaborate on the recent initiatives taken between Sri Lanka and India to enhance connectivity in areas such as maritime, air, energy, and power, and to highlight their potential benefits. Additionally, it aims to explore further opportunities for bilateral cooperation in the development of transport and energy connectivity, which are crucial for strengthening the economic ties and regional integration between the two nations (Figure 1).

Bilateral Engagement

The Prime Minister of India and the President of Sri Lanka had a productive and outcome-oriented discussion during their interactions in New Delhi on 21st July 2023. They acknowledged that the India-Sri Lanka partnership has been a source of strength in overcoming the economic difficulties faced by Sri Lanka in difficult times. The two leaders agreed that India's sustained and rapid economic growth and technological advancement, coupled with the current phase of stabilization and economic recovery, reconstruction, and development in Sri Lanka, provides a unique opportunity to forge a closer and deeper bilateral economic partnership between the two countries and enhance growth in the Indian Ocean Region.

The India-Sri Lanka Economic Land Corridor aims to significantly enhance bilateral relations by developing comprehensive connectivity infrastructure, including maritime, air, power, trade, and people-to-people links. This project will create a transformative impact on economic growth, trade, investment, tourism, and cultural exchanges between the two nations, fostering regional development and economic integration.

Maritime Connectivity

Under the maritime connectivity component, the partnership focuses on developing the Colombo, Trincomalee, and Kankasanthurei ports to boost maritime trade. This includes the development of the West Terminal and North Port phases in Colombo, along with the Trincomalee tank farm projects, all aimed at enhancing port capacity and efficiency. The Kankasanthurei Port will also be developed using the Indian Line of Credit facility. The resumption of ferry services between the two countries is also expected to provide cheaper transport facilities, enhance passenger transport and trade while improving maritime trade routes, reduce shipping costs, and increase opportunities for economic integration.

Key Projects:

- **Colombo Port Development:**
  - **West Terminal Phase I**: Currently under development to increase port capacity and efficiency.
  - **West Terminal Phase II**: Currently in the planning stage. The project is aimed at further expanding port facilities.
  - **North Port Expansion**: Currently in the planning stage. This project will enhance the overall capabilities of Colombo Port.

Figure 2: Proposed Colombo North Port Expansion – Option D. 1

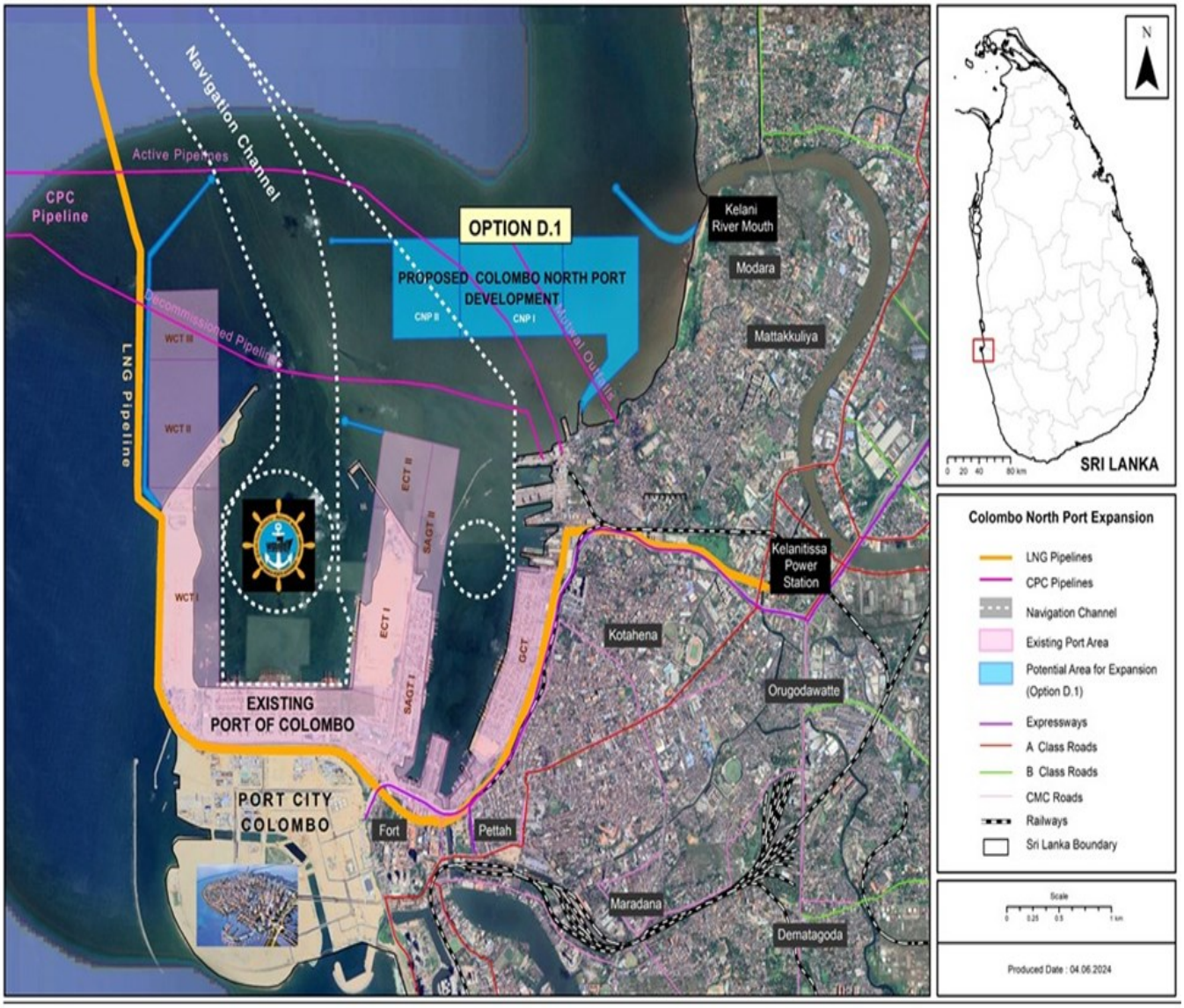
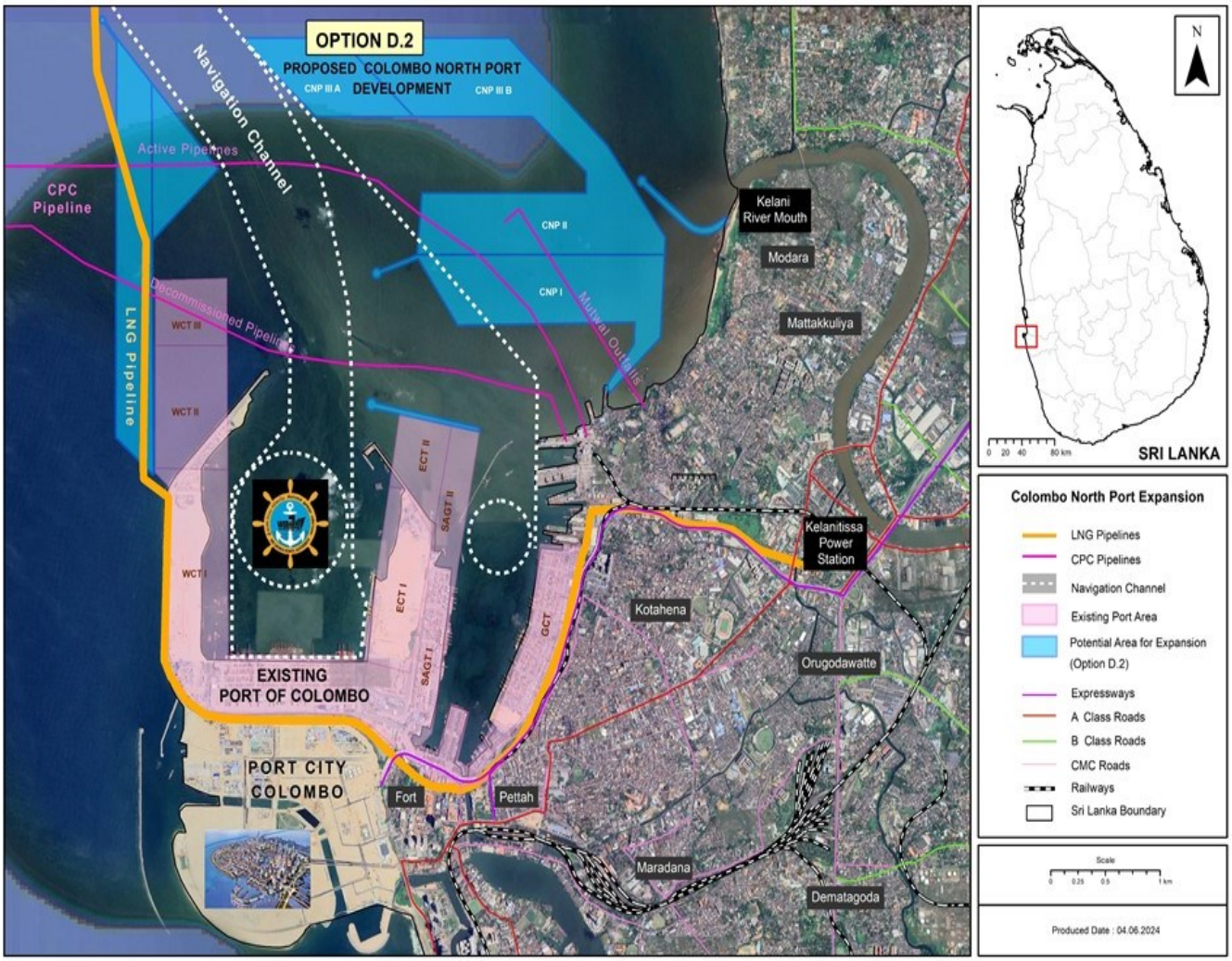


Figure 3: Proposed Colombo North Port Expansion – Option D.2



- **Kankasanthurai Port:**
    - The development will be funded under the Indian Line of Credit, focusing on improving the port infrastructure and its operational efficiency.
- **Trincomalee Port:**
    - A joint venture with India to develop the British-era tank farm cluster (61x12,100 tons), enhancing the strategic storage and logistical capability.

These projects are designed to improve maritime trade routes, reduce shipping costs, and boost the economic integration of the two countries by creating a robust port and logistics network.

Air Connectivity

Enhancing air connectivity between India and Sri Lanka is pivotal for bolstering economic cooperation and facilitating the movement of people and goods. By improving air connectivity, India and Sri Lanka aim to enable convenient movement of people, promote tourism, and strengthen economic ties, contributing to both nations' overall development and prosperity.

The liberal Air Service Agreement between the two countries provides Sri Lankan designated carriers with unrestricted frequencies to most destinations in India. In addition to the national carriers of the two countries, several private airlines have also benefitted from the liberalized skies between the two countries and beyond to other SAARC countries.

Existing Flight Routes and Frequency:

The existing flight routes and frequency include 42 weekly flights from Colombo to major southern Indian cities, specifically Chennai, and 14 weekly flights to Bangalore. Additionally, there are 7 weekly flights from Chennai to Jaffna, directly connecting the northern part of Sri Lanka to southern India.

Passenger Traffic:

High occupancy rates on these routes indicate strong demand, with Colombo to Chennai having a weekly passenger capacity of 7,506 and a 65% occupancy rate. Proposed developments include expanding flight services, with plans to increase the frequency of flights and introduce new routes to enhance connectivity. Airport infrastructure development is also proposed, focusing on upgrades to efficiently handle increased passenger traffic, including expanding terminal capacities and upgrading facilities at major airports like Colombo and Jaffna.

Proposed Developments:

Moving forward, the partnership is focused on enhancing existing routes and increasing the frequency of flights between key cities in India and Sri Lanka. Additionally, the expansion of flight services and airport infrastructure is planned to accommodate the anticipated increase in passenger traffic, facilitating tourism and economic cooperation through improved air connectivity.

Energy and Power Connectivity

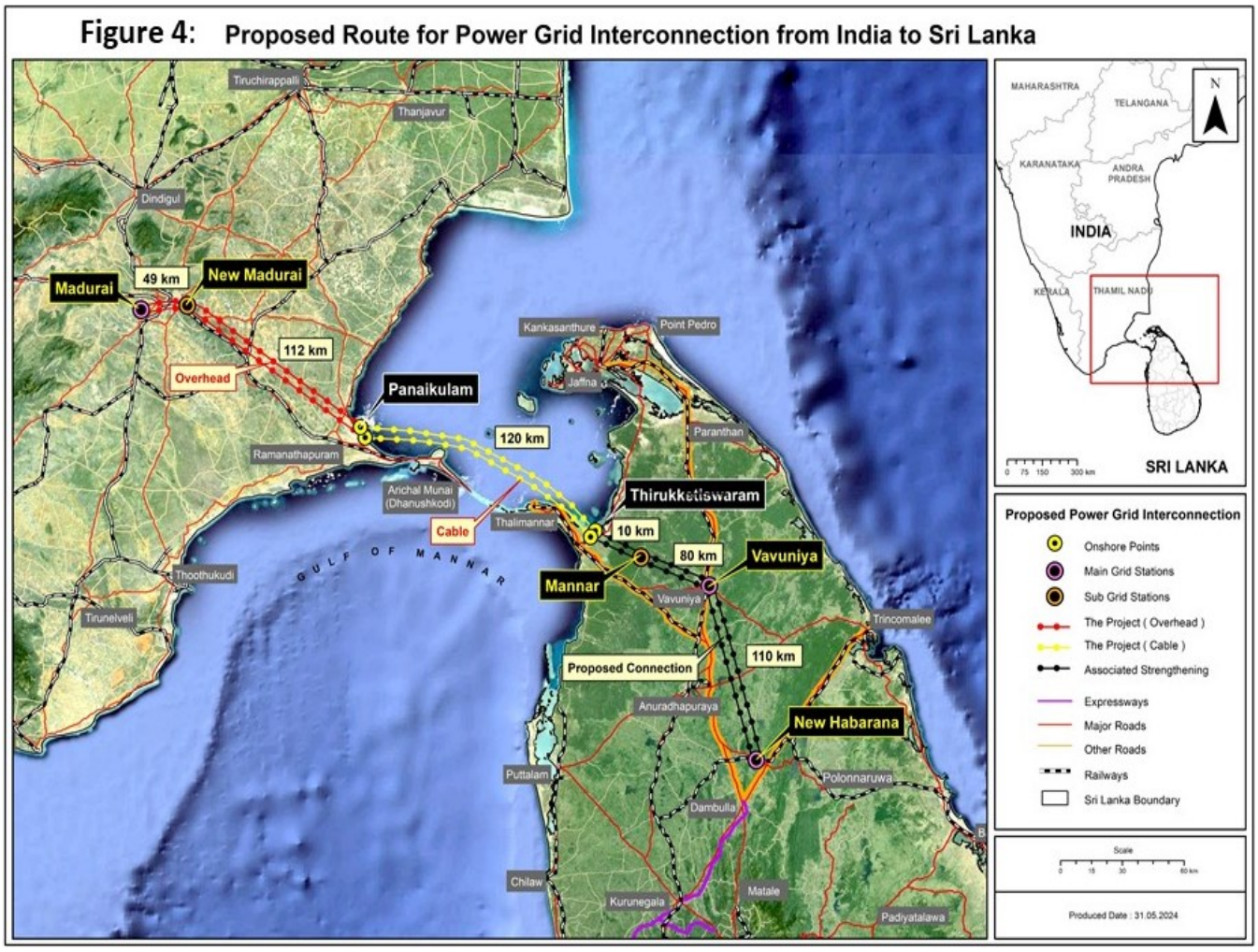
A high-capacity power grid interconnectivity between India and Sri Lanka is proposed for energy and power connectivity, enabling bidirectional electricity trade and enhancing energy security and efficiency for both countries.

Power Connectivity

The proposed power sector improvement program aims to establish a high-capacity power grid interconnection between India and Sri Lanka. This will enable bidirectional electricity trade, enhancing energy security and efficiency for both countries.

Key Initiatives (Figure 4):

1. **High-Capacity Power Grid Interconnection:**
    I. A strategic initiative is planned to facilitate the exchange of electricity between India and Sri Lanka, ensuring a reliable and sustainable power supply.
2. **New Overhead High Voltage Power Line:**
    I. **Route:** From New Madurai in India to Panaikulam (India).
    II. **Distance:** 112 kilometers.
    III. This line will enhance the power transmission capacity and improve the reliability of the power grid in the region.
3. **Undersea High Voltage Power Cable:**
    I. **Route:** From Panaikulam (India) to Thirukeshvaram (Sri Lanka).
    II. **Distance:** 120 kilometers.
    III. This undersea cable will connect the power grids of India and Sri Lanka, enabling seamless electricity trade and enhancing energy security.
4. **Strengthening Existing High Voltage Power Lines:**
    I. **Thirukeshvaram to Vavuniya:**
        1. **Distance:** 90 kilometres.
        2. Upgrading the existing power line to increase capacity and reliability.
    II. **Vavuniya to New Habarana Grid Station:**
        1. Strengthening the transmission line to support the increased load and ensure a stable power supply.

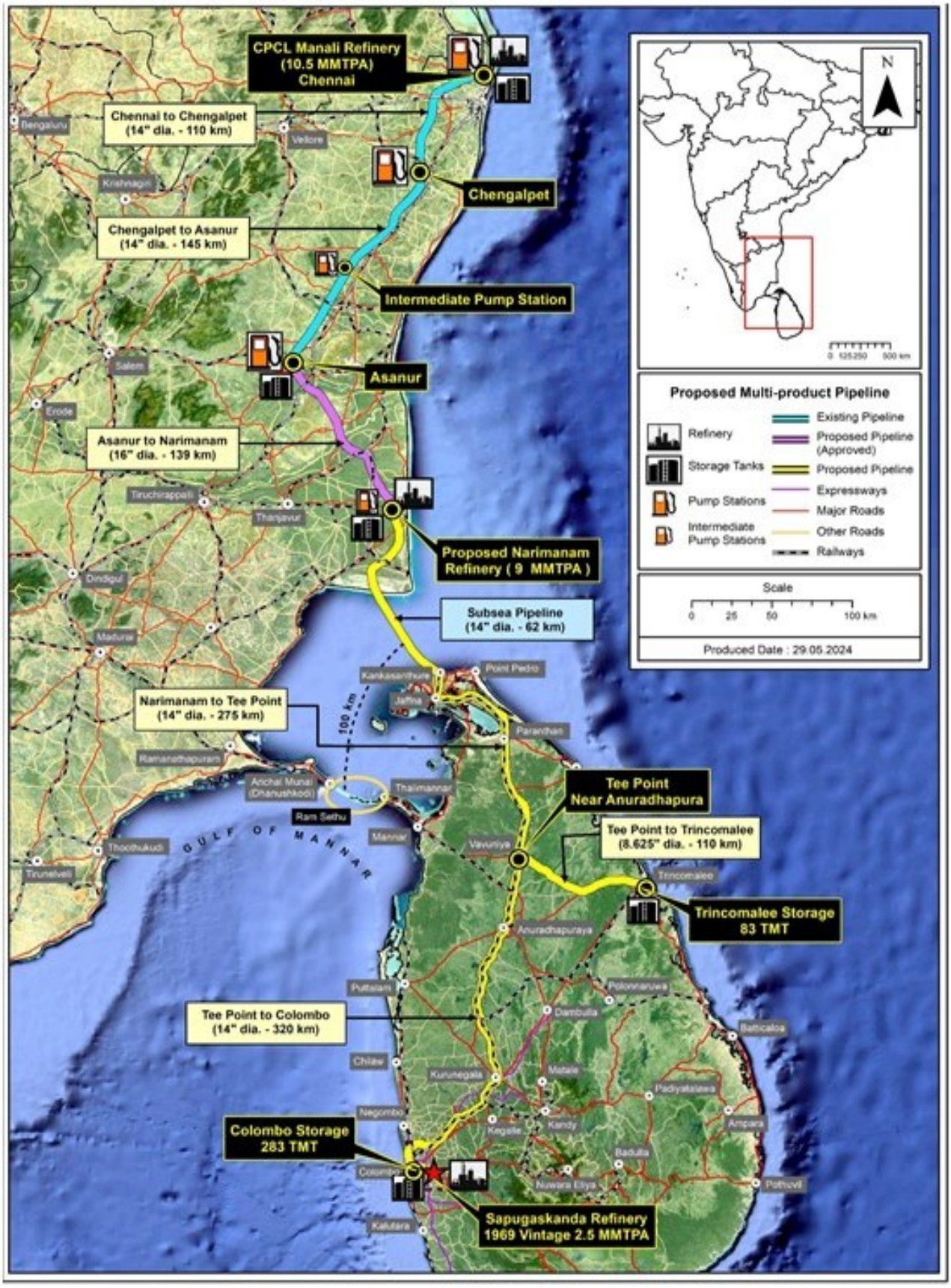


Energy Security

Energy is an essential input required for the smooth operation of many production and consumption activities, and ensuring energy security is vital to achieving sustained economic growth. From a physical viewpoint, using energy that drives economic productivity and industrial growth is central to the operation of any modern economy.

Constructing a multi-product pipeline is a crucial step toward enhancing energy security (Figure 5). Accordingly, energy security will be further supported by laying a 14-inch diameter, 275 km long multi-product pipeline from Narimanam in Tamil Nadu, India, to Anuradhapura in Sri Lanka, along with a 320 km pipeline from Anuradhapura to Muthurajawela. An 8-inch pipeline will also link the Trincomalee tank farm to Anuradhapura. These pipelines will ensure the transport of crude oil, natural gas, and refined petroleum products, enhancing energy security. Furthermore, they will provide a stable and efficient route for transporting crude oil, natural gas, and refined petroleum products, significantly reducing dependency on single-source suppliers. Additionally, it will mitigate supply chain disruptions, ensuring a consistent and reliable energy supply.

Figure 5: Proposed Multi-proposed Pipeline from India to Sri Lanka



Overall Benefits:

The benefits of these energy and power security projects include ensuring reliability and stability in power and energy supplies for Sri Lanka and India, attracting foreign investments to Sri Lanka, promoting sustainable energy practices through the introduction of renewable energy sources, and strengthening the economic and strategic partnership between the two countries. It not only creates jobs and stimulates industrial growth but also attracts investments in related sectors. By improving energy accessibility and lowering energy costs, such infrastructure enhances connectivity and opens new economic corridors. This, in turn, contributes to the region's overall development, fostering a more integrated and prosperous economy.

Energy connectivity projects, such as those between India and Sri Lanka, exemplify effective international cooperation and regional energy distribution. These initiatives enhance energy trade between the two nations and strengthen regional energy security and economic collaboration. By carefully considering engineering and environmental factors, these projects ensure both feasibility and sustainability, contributing to long-term regional stability and growth.

Trade, Economic, and Financial Connectivity

In terms of trade, economic, and financial connectivity, the partnership aims to;

- Strengthen bilateral trade between the two countries with policy consistency, promoting ease of doing business and fair treatment of each other’s investors.
- Expedite the conclusion of the Economic and Technological Cooperation Agreement (ETCA) to enhance bilateral trade and investment.
- Promote investments from India in the divestments of Sri Lankan State-Owned Enterprises and manufacturing/economic zones in various sectors. Boost economic cooperation through the digitalization of transactions and the use of INR for trade settlement.

People-to-People Connectivity – Land Connectivity

Land connectivity projects will be developed to facilitate the movement of goods and people, reducing transportation costs and transit time and enhancing opportunities for people-to-people connectivity (Figure 6). Creating dual tourist destinations will promote cultural exchanges and tourism, while infrastructure development and tourism sector growth are expected to create jobs.

Figure 6: Land Connectivity

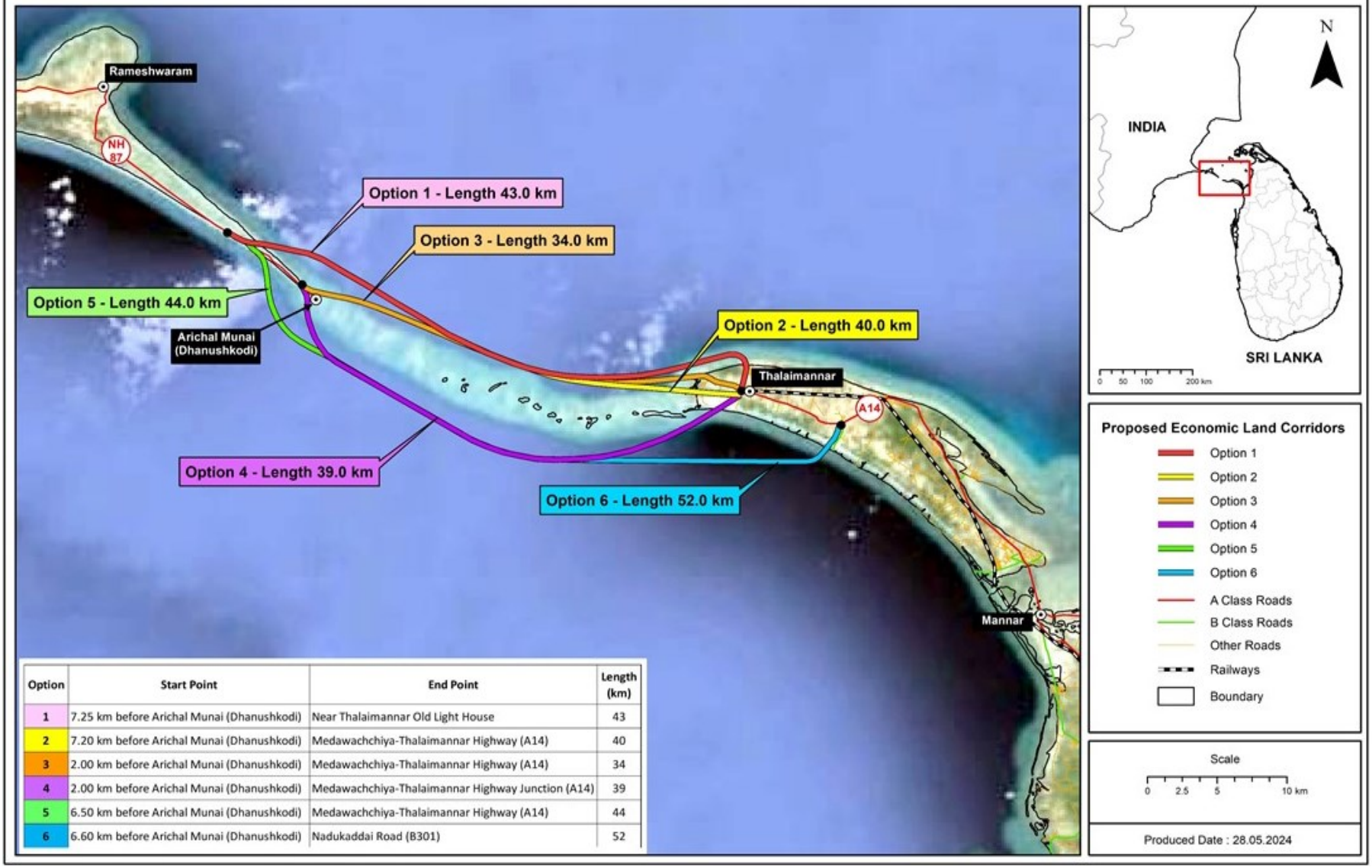
Objectives of the Land Connectivity Project

The land connectivity project is strategically important, with a pre-feasibility study identifying a suitable alignment between Dhanushkodi in India and Mannar Island in Sri Lanka. The proposed construction of a 4-lane, 40 km sea bridge, estimated to cost around USD 4.9 billion, is expected to benefit both countries. These objectives aim to strengthen economic ties between India and Sri Lanka, enhance regional connectivity, and unlock new opportunities for both countries. These include:

- **Economic Integration:**
    - Facilitate the movement of goods and people between the two countries, reducing transportation costs and transit time.
    - Boost bilateral trade and promote economic integration by improving accessibility.
- **Investment Attraction:**
    - Attract foreign and domestic investment in manufacturing, logistics, and services sectors.
    - Significant freight and transaction cost savings are expected, reducing transportation expenses and enhancing trade volumes.

- **Economic Benefits:**
    - Lower prices of goods and services, making products more competitive globally.
    - Reduced cost of living in local markets due to decreased transport costs.
- **Job Creation:**
    - Generate thousands of direct and indirect jobs, potentially reducing unemployment rates.
    - Foster inclusive economic growth in both nations.
- **Tourism Development:**
    - Develop dual tourist destinations in Southern India and Northern Sri Lanka.
    - Attract more international and domestic tourists, boosting the local hospitality industry and creating jobs.
- **Infrastructure Investment:**
    - Create jobs and stimulate economic growth during the construction of the sea bridge.
    - Maintenance and operation of the bridge will also generate employment and economic activity.
- **Disaster Response:**
    - Enhance the ability to respond to natural disasters such as cyclones, tsunamis, and earthquake

Figure 7: Proposed Economic Land Corridors (From Dhanushkodi-India to Thalaimannar-Sri Lanka)

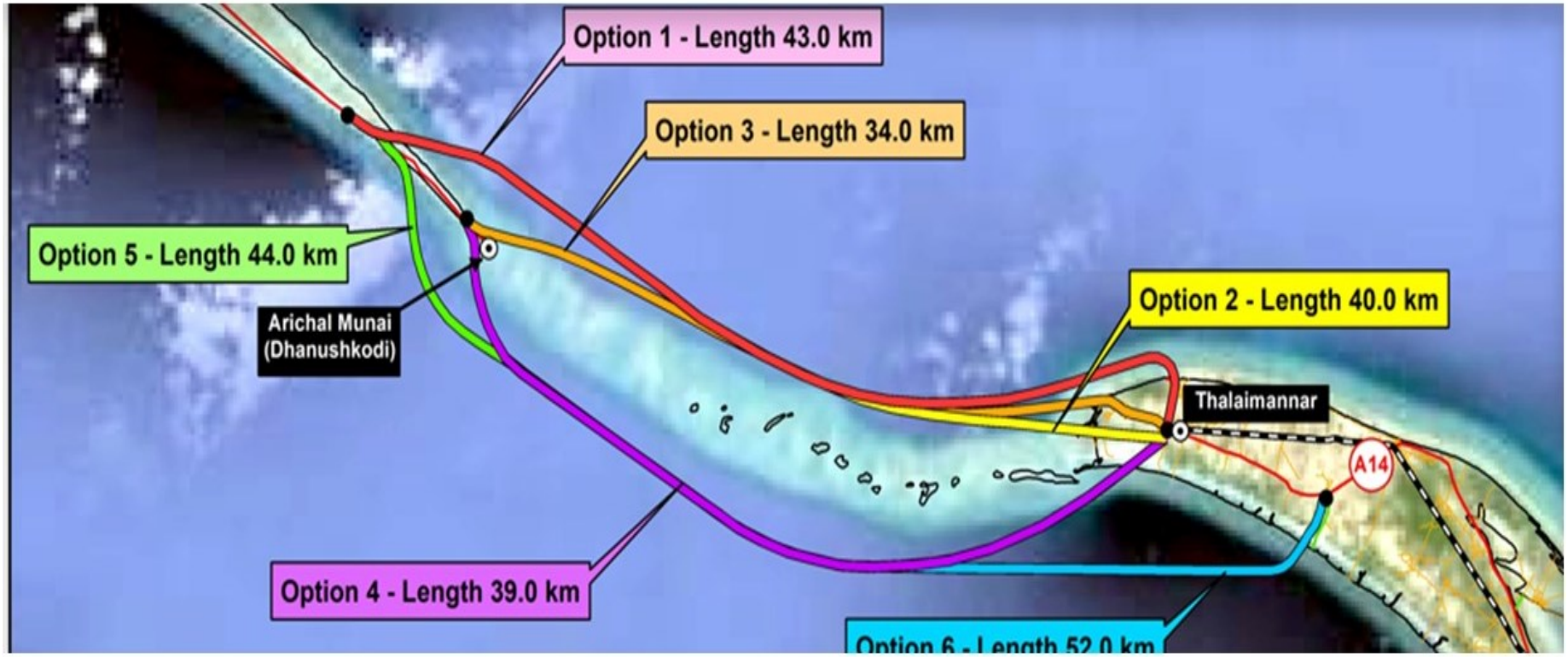


Option	Start Point	End Point	Length (km)
1	7.25 km before Arichal Munai (Dhanushkodi)	Near Thalaimannar Old Light House	43
2	7.20 km before Arichal Munai (Dhanushkodi)	Medawachchiya-Thalaimannar Highway (A14)	40
3	2.00 km before Arichal Munai (Dhanushkodi)	Medawachchiya-Thalaimannar Highway (A14)	34
4	2.00 km before Arichal Munai (Dhanushkodi)	Medawachchiya-Thalaimannar Highway Junction (A14)	39
5	6.50 km before Arichal Munai (Dhanushkodi)	Medawachchiya-Thalaimannar Highway (A14)	44
6	6.60 km before Arichal Munai (Dhanushkodi)	Nadukaddai Road (B301)	52

Construct a bridge linking southern India (Dhanushkodi) to Mannar Island, Sri Lanka. The connection will be made through a land and sea bridge.

- **Pre-Feasibility Study** - Conducted to assess the feasibility of connecting the two countries through this bridge. Six alignments were considered
- **Route Details (Figure 8)**
    - **Option 1, 2, 3:** Alignments north of Adam's Bridge.
    - **Option 4, 5, 6:** Alignments south of Adam's Bridge.

Figure 8: Route Details



Approximate Length of the Proposed Alignments (Figure 9)

Figure 9: Approximate Length of the Proposed Alignments

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1	7.25 km before Arichal Munai (Dhanushkodi)	Near Thalaimannar Old Light House	43
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Options 2 and 3 have been selected as most feasible,

Route Description: Option 02

- The alignment takes off 6.50 km before Arichal Munai (Dhanushkodi) in India and reaches the land side at the existing beach road in Talaimannar, Sri Lanka.
- This alignment is marked in green and is approximately **40 km long.**

Geometric Details:

- Designed to accommodate a speed of 100 km/h.
- In India, the alignment overlaps with NH87 for 1.2 km, requiring widening and strengthening.
- In Sri Lanka, the alignment overlaps with the existing beach road for 1.5 km, necessitating road widening, strengthening, and resettlement of some settlements.

Feasibility:

- Utilizes the existing beach road on the Sri Lankan side, minimizing new land acquisition.
- Requires detailed topographical and bathymetric surveys during the Detailed Project Report (DPR) stage.

Route Description: Option 3 (Single Deck with Future Railway Provision):

- The alignment takes off 2.00 km before Arichal Munai (Dhanuskodi) in India and reaches the land side at the existing beach road of 5.5m wide in Talaimannar, Sri Lanka.
- This alignment is marked in yellow and is approximately 34 km long.
- This option proposes a single-deck structure that incorporates two lanes in each direction with emergency lanes and provisions for future railway integration

- **Geometric Details:**
  - Designed to accommodate a speed of 100 km/h.
  - In India, the alignment overlaps with NH87 for 400m before take-off, requiring widening and strengthening.
  - In Sri Lanka, the alignment overlaps with the existing beach road for 2.90 km, necessitating road widening, strengthening, and resetting of some settlements.
- **Feasibility:**
  - Requires minimal land acquisition on both sides, with significant use of existing infrastructure.
  - Requires detailed studies on road widening feasibility and environmental impacts.

Proposed Highway Bridge Specifications:

- **Length:** Approximately 40 km and 34 km for Option 2 and 3.
- **Carriageway:**
  - Two lanes in each direction.
  - Additional two emergency lanes on either side.
- **Bridge Design:**
  - **Marine Viaduct:** Typically 5-span continuous modules with a 60m span prestressed post-tensioned box girder supported by monopiles, pile-bent, or group pile systems.
  - **Functional Requirements:**
    - Minimum clearance of 6m from High Tide Level (HTL) to the soffit of the girder.
    - Designed for phased traffic capacity augmentation with a vision for the next 100-120 years.

- **Additional Features:**
    - Options include iconic structures and navigational spans up to 400m for future development.

These specifications provide a comprehensive overview of the proposed bridge's functionality, structural integrity, and capacity to accommodate future traffic demands.

Estimated Cost is approximately US$ 4.9 billion:

The estimated cost of the project is around US$ 4.9 billion. This figure includes the total Engineering, Procurement, and Construction (EPC) cost, project management consultant charges, supervision and administrative expenses, physical contingencies, and price escalation based on the Wholesale Price Index (WPI)

Parallel Dual Railway Bridge:

There is a provision for constructing a parallel dual railway bridge. This would be integrated with the road bridge or built separately. The parallel railway bridge aims to accommodate future increases in goods and passenger services between the two countries.

- Integrating a parallel dual railway bridge with the highway bridge:
  Increases the cost by US $1 billion – 1.2 billion.
- Constructing a separate dual rail bridge parallel to the highway bridge:
  Increases the cost by US $2.64 to US $3 billion.

Road Connectivity Improvements (Figure 10)

- **A14 Road:**
    - On the Sri Lankan side, the alignment overlaps with the existing A14 road for a section. Upgrades to this road will be necessary to handle the increased traffic.
- **A9 and A6 Roads:**
    - Widening of A 9 road up to 4 lane width up to Dambulla.

Option 1 –

(i) A6 road widening to 4 lanes up to Kurunegala.
(ii) Link Colombo through Kurunegala-Kadawatha Expressway

These roads are crucial for connecting to the broader highway network in Sri Lanka and need to be improved to ensure seamless traffic flow.

- **Central Expressway:**

The Central Expressway in Sri Lanka is also a key connection that will require enhancements to support the increased vehicular load resulting from the new bridge

Option 2–

(i) Extend Central Expressway up to Dambulla. (proposed)

(ii) Link Colombo through Kurunegala- Kadawatha Expressway

Figure 10: Transport Vision 2020 - 2035

Railway Connectivity Improvements:

- Upgrade the Madawachchiya - Thalaimannar railway line to a double-track railway.
- Upgrade the existing railway line from Medawachchiya to Maho to accommodate double tracks.
- Enhance the current railway line connecting the Colombo port to enable efficient and improved rail services by converting it into a double-track railway.

Both the road and railway options for the Economic Land Corridor involve significant overlaps with existing infrastructure, requiring careful consideration of widening, strengthening, and potential resettlement. While each option offers unique advantages in terms of integration with current roads and railways, they also present challenges, particularly in areas needing further study and potential resettlement efforts. Overall, the Economic Land Corridor is set to be a transformative project, enhancing trade, economic, and financial connectivity between India and Sri Lanka, thereby supporting both nations' economic goals and fostering regional integration.

Environmental Considerations and Financial Feasibility for Proposed Projects

Environmental considerations for the project include comprehensive environmental impact assessments to minimize ecological damage. Measures will be taken to ensure that the construction and operation of the proposed infrastructure projects adhere to environmental standards and safety protocols.

The financial feasibility of the India-Sri Lanka Economic Land Corridor Project is supported by the estimated cost of USD 4.9 billion for the construction of bridges, highways, and other infrastructure. Integrating a parallel dual railway bridge could increase the cost by USD 1-3 billion. However, the anticipated economic benefits, including increased trade, job creation, and regional development, justify the investment.

Conclusion

In conclusion, the India-Sri Lanka partnership in developing maritime, air, power, energy, and land connectivity provides a strategic opportunity to strengthen the bilateral partnership between the two countries and enhance the economic growth of Sri Lanka.

Pathfinder Foundation is a premier think tank that has played a catalytic role in research and analysis aimed at contributing to economic policy reforms in Sri Lanka. Over the years, it has established a wide network of partner organizations worldwide, thereby enhancing bilateral and multilateral partnerships to promote economic, social, and political development, in addition to its security and strategic focus. Serving as a platform to engage in critical thinking and cross-disciplinary analysis, the Pathfinder Foundation aims to increase knowledge and raise awareness of salient issues with relevant stakeholders locally and internationally.