Critical Internet Infrastructure Submarine Cable Resilience

Presented by

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Introduction & Importance of Submarine Cables

Geographic Diversity in Routes and Landing Stations

Investment Models for Submarine Cables in the Caribbean

International Bodies and Best Practices

Role of Policy & Regulation in Promoting Submarine Cable Resilience

Workshop Wrap-Up & Next Steps

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The Digital Backbone of the Caribbean

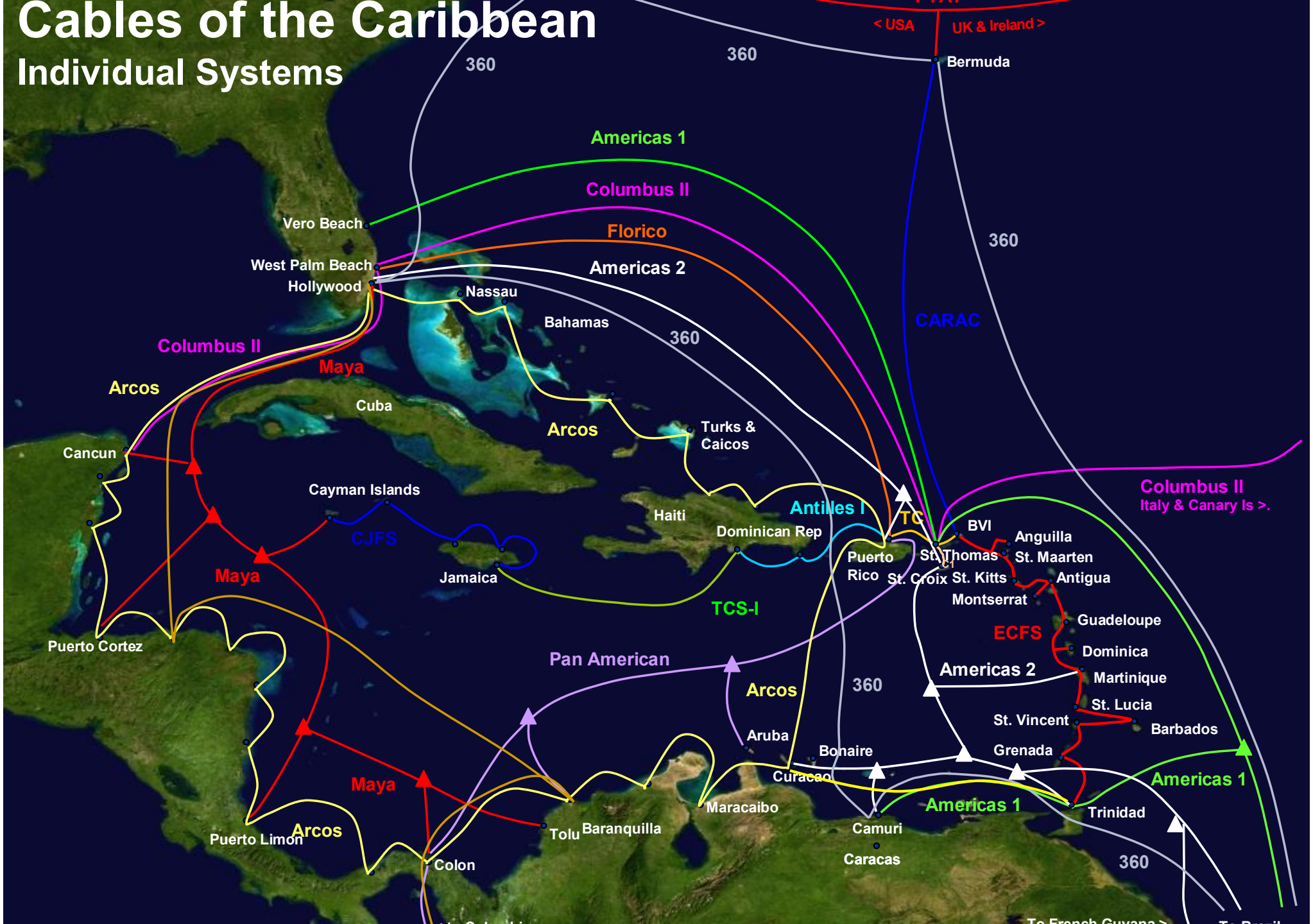
Submarine cables facilitate **99%** of international data transmissions. critical for:

- Economic Development
- Social Connectivity
- Disaster Response
- Tourism
- Finance
- Education
- Healthcare

Critical Communications Infrastructure

- **Data Centres** – Provide secure cloud services
- **Internet Exchange Points (IXPs)** – Reduce international bandwidth costs and improve latency by localising traffic
- Together submarine cables, data centres and IXPs provide robust connectivity

Vulnerabilities to disruption still exist despite recent investments.


Cables of the Caribbean
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Americas 2
CARAC
Vero Beach
West Palm Beach
Hollywood
Nassau
Bahamas
Columbus II
Maya
Arcos
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Turks &
Caicos
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Cayman Islands
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Haiti
Antilles I
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Dominican Rep
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BVI
Anguilla
St. Maarten
Puerto
Rico
St. Thomas
St. Croix
St. Kitts
Antigua
Montserrat
Maya
Jamaica
TCS-I
ECFS
Guadeloupe
Dominica
Puerto Cortez
Pan American
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360
To French Guyana >
To Brazil

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Principles of Geographic Diversity

Diversification reduces **single points of failure** from

- Natural Disasters
- Human Activities e.g. anchoring, fishing

Caribbean Case Study

- **Curaçao:** Proactive measures in replacing ageing Americas Two cable and ensuring capacity redundancy.
- BlueNAP-T&T: such a connection can build regional capacity

Challenges

- Island geography limits routing options
- High costs for deploying and maintaining landing points.
- Human activity accounts for **70%** of cable damage incidents.

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Traditional Models

- Telecom operator consortia and private sector initiatives remain dominant

Emerging Models

- Content Providers actively invest in cable infrastructure
- Public-Private Partnerships (PPP)
- Support from development institutions like the World Bank, which funded the Caribbean Submarine Cable System (CSCS)

Attracting Investment

- Need for **policy certainty, regulatory transparency and mitigation of perceived risks**
- **Modular data centres** can be a cost-effective infrastructure for investment

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International Cable Protection Committee (ICPC)

- Promotes marine protection standards, cable safety best practices and legal frameworks
- Has 3 specialised workings groups to enhance resilience and protection of submarine fibre optic cables:
  - **Connectivity and Geographic Diversity**
    - Supports national and regional strategies for route diversification by addressing the regional vulnerability posed by island geography and concentration of cables in limited area,.
  - **Risk Monitoring and Mitigation**
    - Informs regulatory frameworks and operational policies in Caribbean coastal and marine management while building understanding of human's role in cable damage.
  - **Timely Deployment and Repair**
    - Supports the development of disaster preparedness protocols and contingency measures, which are critical to the regional where delayed repairs can severely impact internet access, financial services and emergency communications

ITU Advisory Body on Submarine Cables

- Established to support global resilience strategies with Caribbean participation.
- Emphasises standardisation, policy coordination and capacity building.

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National Frameworks

- Stronger regulation is needed for
  - Licensing of cable operators and landing station,
  - Promoting competition and diversity
  - Integrating disaster preparedness and recovery protocols.

Regional Cooperation and Harmonisation

- CTU-led Regulators Forum promotes cross-border agreements which can include cable protection and restoration.
- Sharing information and best practices for cohesive policy approaches
- Developing regional resilience strategies, utilising shared regional infrastructure and mutual support mechanisms will strengthen the Caribbean's digital ecosystem

Incentives and Disincentives

- Tax incentives or subsidies, co-financing models and regional grants for investment in diverse routes.
- Regulations on minimum resilience standards
- Consequences for non-compliance

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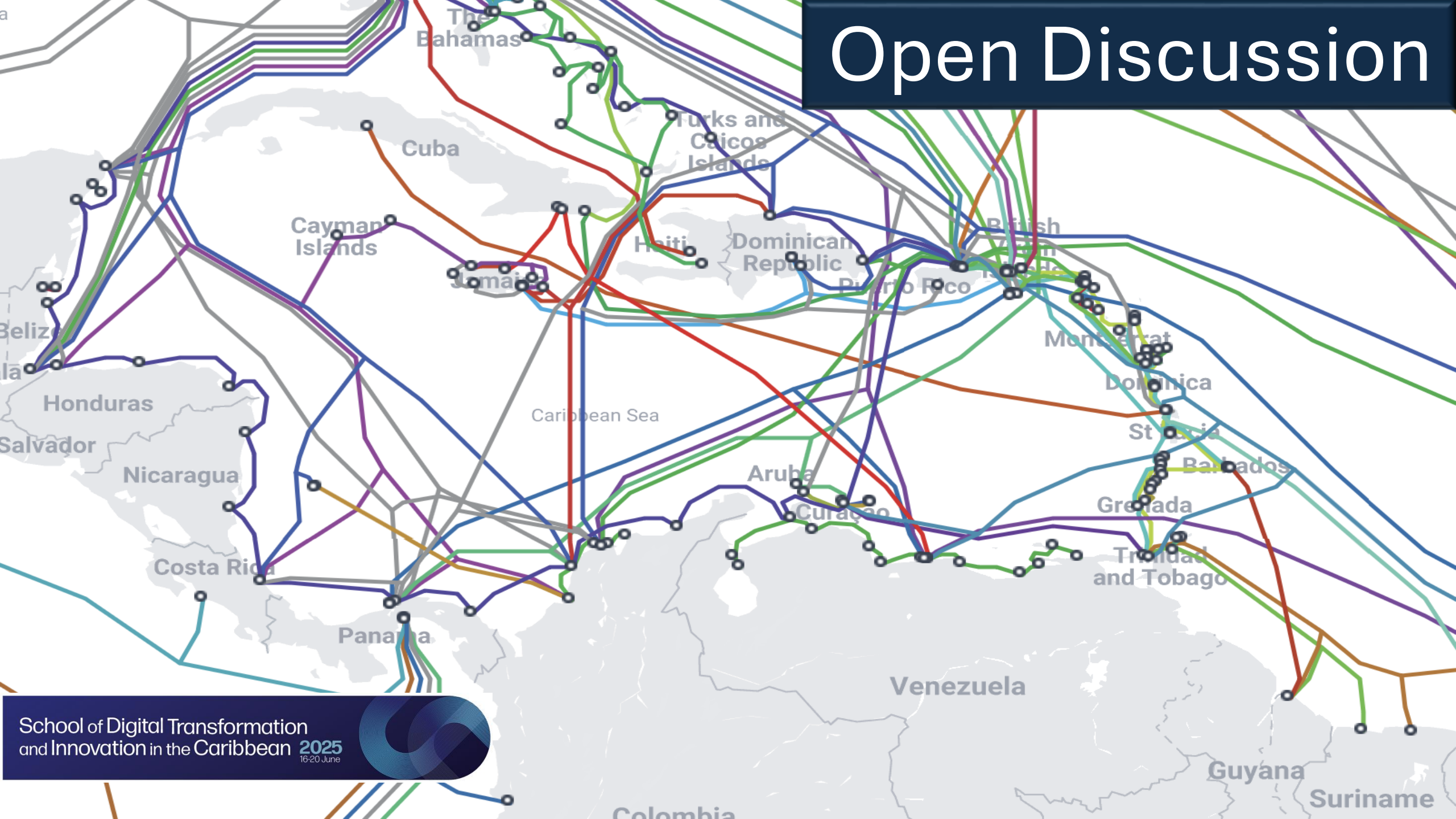
Key Takeaways

- Need for a Caribbean resilience strategy which includes subsea and terrestrial infrastructure.

Actionable Recommended Next Steps

- Improve regional participation in ITU and ICPC forums
- Facilitate partnerships through the Caribbean Data Centre Association
- Continue stakeholder engagement
- Follow-up post meeting/fora to translate recommendations into regional policies.

Open Discussion



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