



The Need for Physical Diversity for Submarine Cable Routing

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SUBMARINE CABLE MAP 2007

TeleGeography

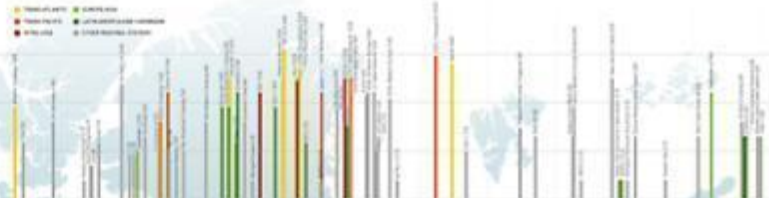
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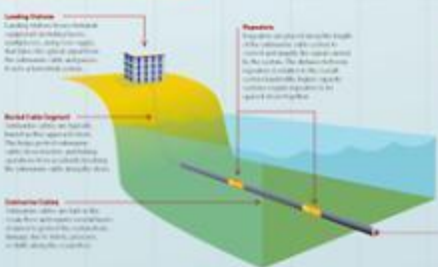
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SUBMARINE CABLE SYSTEM TIMELINE

Timeline of the world's submarine cable systems from 1900 to 2007. The chart shows the number of cable systems in operation at the end of each year, categorized by type: Fiber optic, Copper, and Hybrid. The total number of systems grows from approximately 10 in 1900 to over 100 by 2007.



COMPONENTS OF A SUBMARINE CABLE SYSTEM



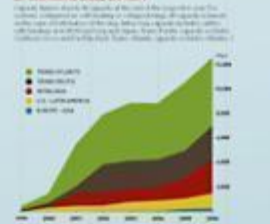
CROSS-SECTION OF A SUBMARINE CABLE



ROUTE PRICE TRENDS



LIT SUBMARINE CABLE CAPACITY



GLOBAL LIT SUBMARINE CABLE CAPACITY



Private Vs. Consortium

- Consortium (club) cables have been viewed as inefficient
 - Takes a majority vote to implement an overall design
 - Too many *different* company contacts involved to complete a single transaction
- Private cables (single point of contact)
- Consortium cables (club cables) and early private submarine cables terminate at cable landing stations on shore often hundreds of miles from these key city centers
- The backhaul routes from these cable landing stations were traditionally handled by one company often along a single fiber route causing congestion and diversity concerns
- ***Break the “bottleneck”***

The Cost of Connectivity

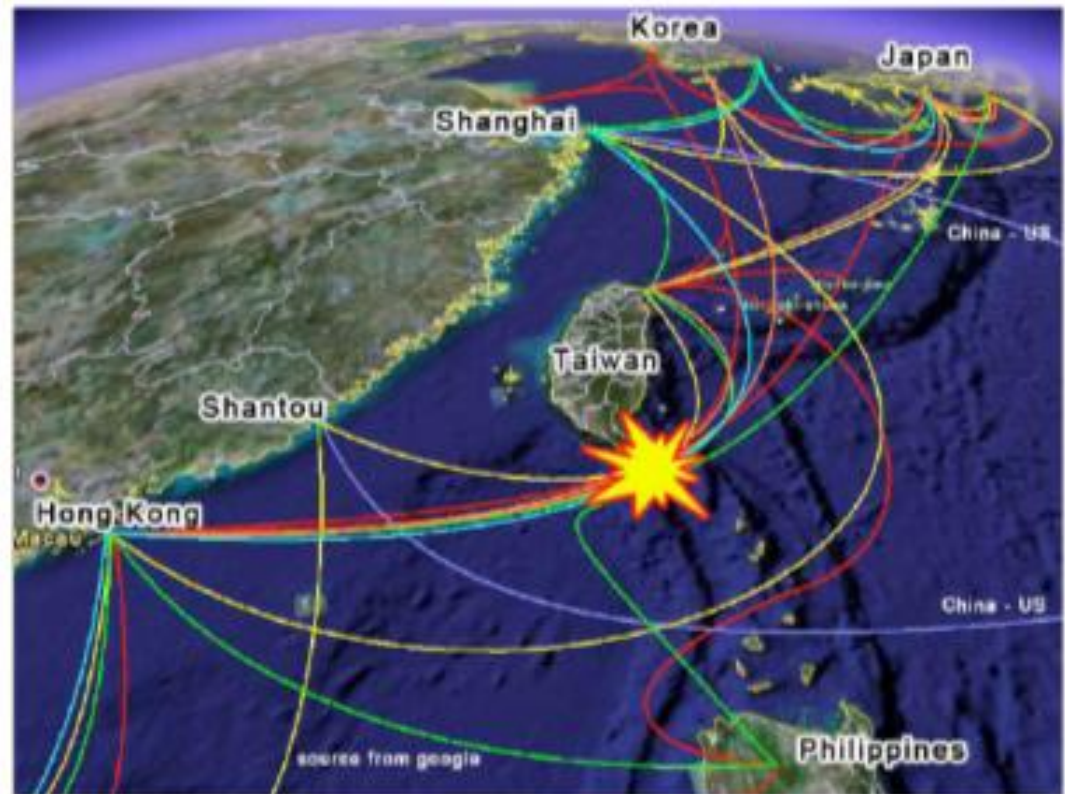
The Design, Implementation and Operation of a Submarine Cable and Terrestrial Network

- In the design phase of a submarine cable, most organizations did not take into account the proximity of multiple terrestrial fiber networks when terminating the subsea cable
- Often these terrestrial cable routes were built after the fact to link several submarine cable stations on a cost effective linear route
 - Route is primarily a mixture of aerial and buried fiber assets
 - Fiber assets range in age from 1988 to present

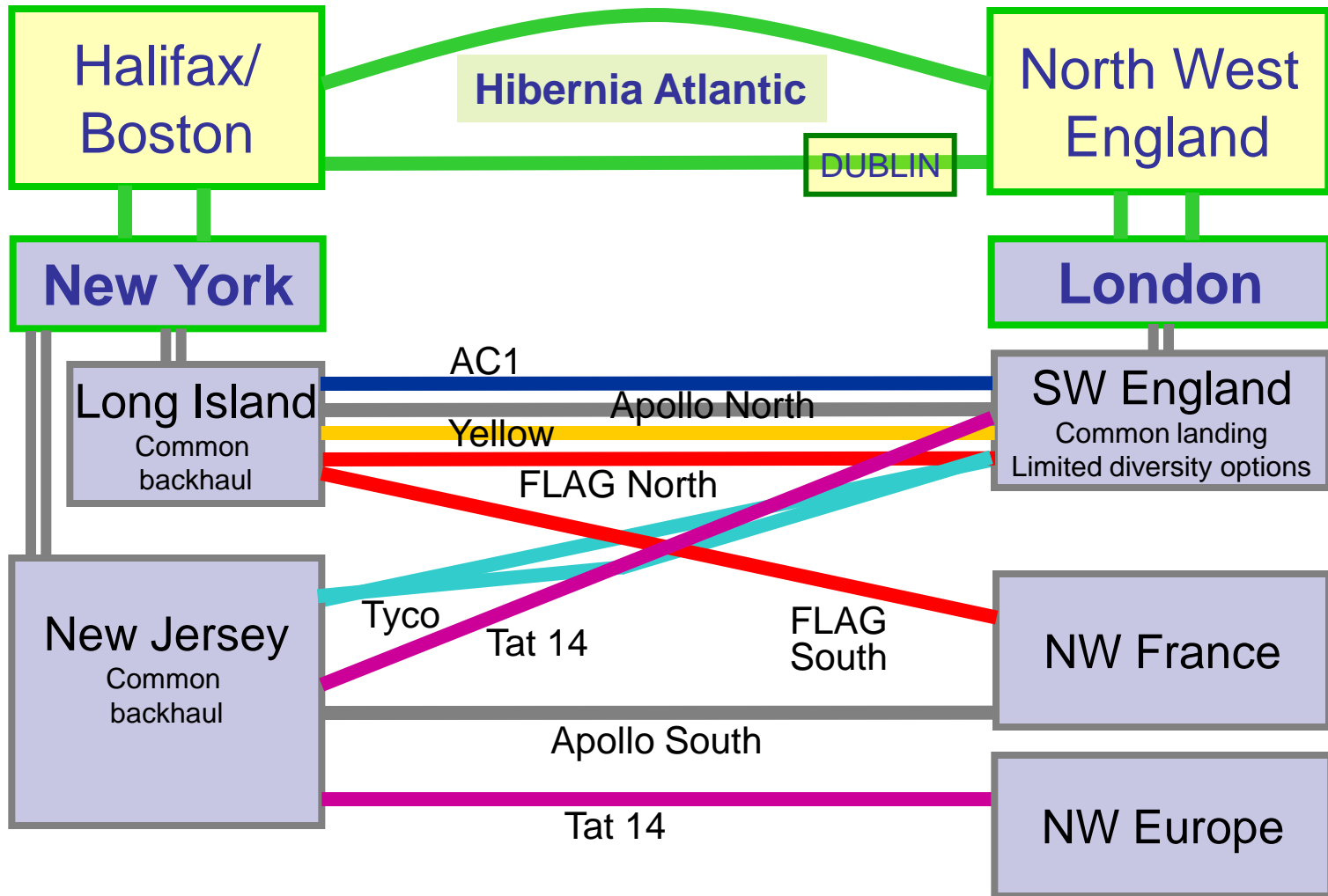
The focus on cost control and efficient design has left customers with little to no alternatives

Can what happened in the Pacific happen in the Atlantic?

- Multiple subsea cables out of service due to one single incident
- Refocused attention to the need for clear physical diversity in network planning



TransAtlantic Cables



Natural Catastrophes?

Contingency Plan?



What About Backhaul?

- Cables landing on the beaches of New York and New Jersey follow the same cable route. 3 different TransAtlantic Cable Stations use the same common backhaul route in New Jersey and 4 stations on Long Island.
- Conversely in the UK, most traffic coming in and out of London use the same common backhaul routes connecting White Sands, Porthcurno, Bude and Bristol cable stations. Some terrestrial runs carry 8 of the world's largest carriers within a 23-manhole stretch.



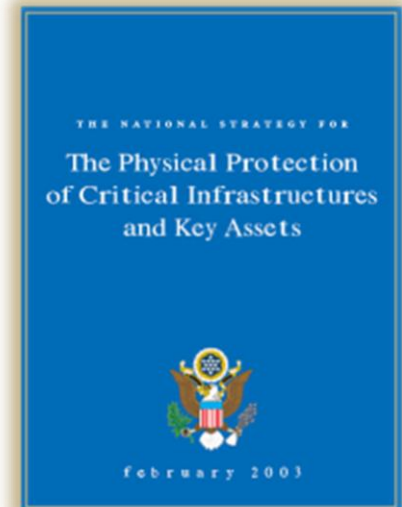
UK Backhaul Map



Diversification for TransAtlantic traffic requires careful selection and the appropriate analysis of *both submarine routes and backhaul.*

Security in Diversity

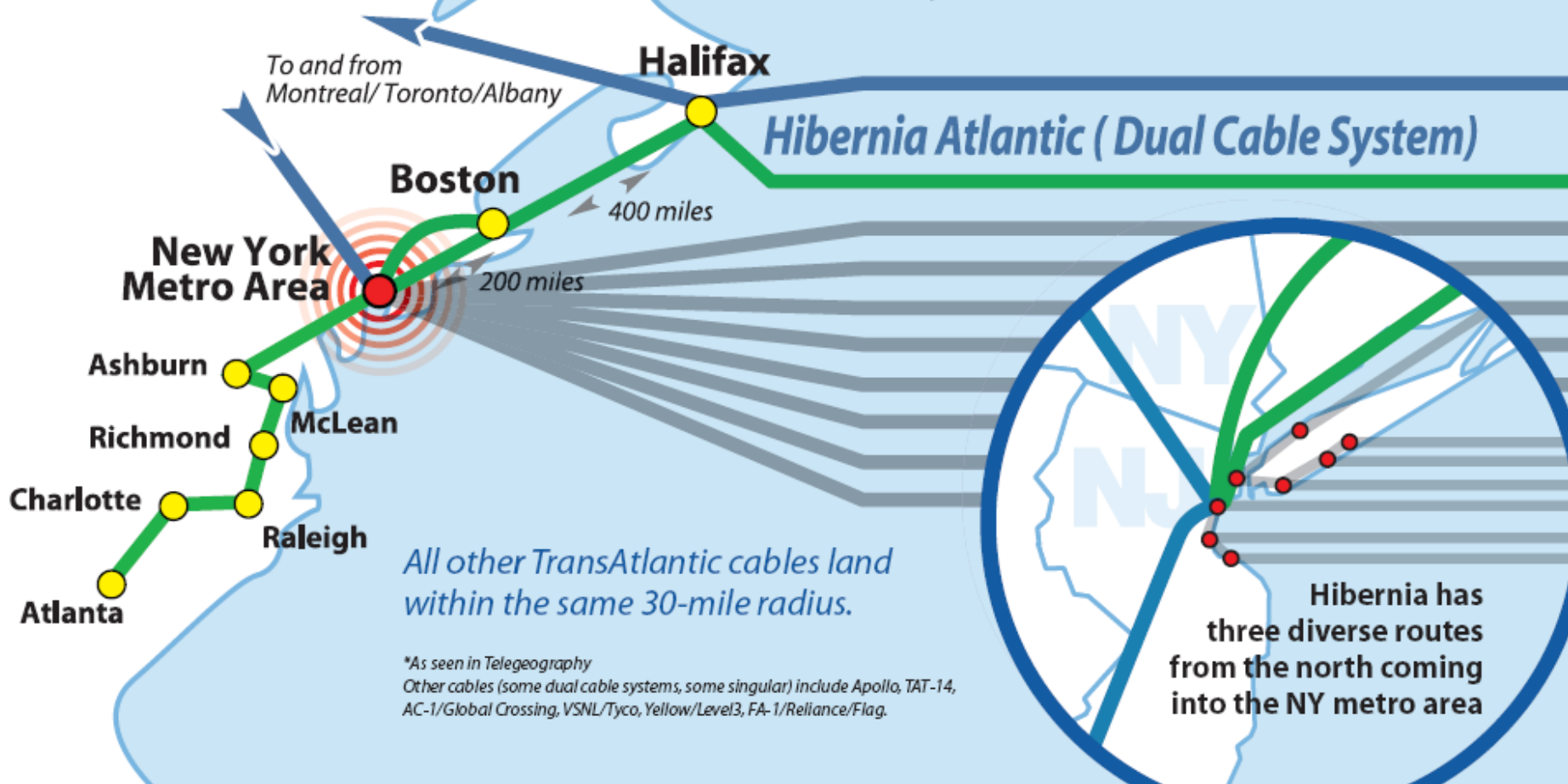
- Information and critical business is at risk. Worldwide Financial Infrastructure, Medical Institutions, Government Agencies and Global Business.
- 9/11 and the London bombings have made terrorism and International Security all too real causing virtual communication devastation.
- Little effort has been made for a global call to action to safeguard International communications.
- In 2003 The White House released The National Strategy for The Physical Protection of Critical Infrastructures and Key Assets.





FACT: Most TransAtlantic Traffic Shares the Same Congested Waterways, Entry Points and Backhaul Connecting NYC Metro Area.

QUESTION: How Secure is your Network?



All other TransAtlantic cables land within the same 30-mile radius.

**As seen in Telegeography
Other cables (some dual cable systems, some singular) include Apollo, TAT-14, AC-1/Global Crossing, VSNL/Tyco, Yellow/Level3, FA-1/Reliance/Flag.*

Hibernia has three diverse routes from the north coming into the NY metro area

Diverse Continental European Terrestrial Routes Built for Security

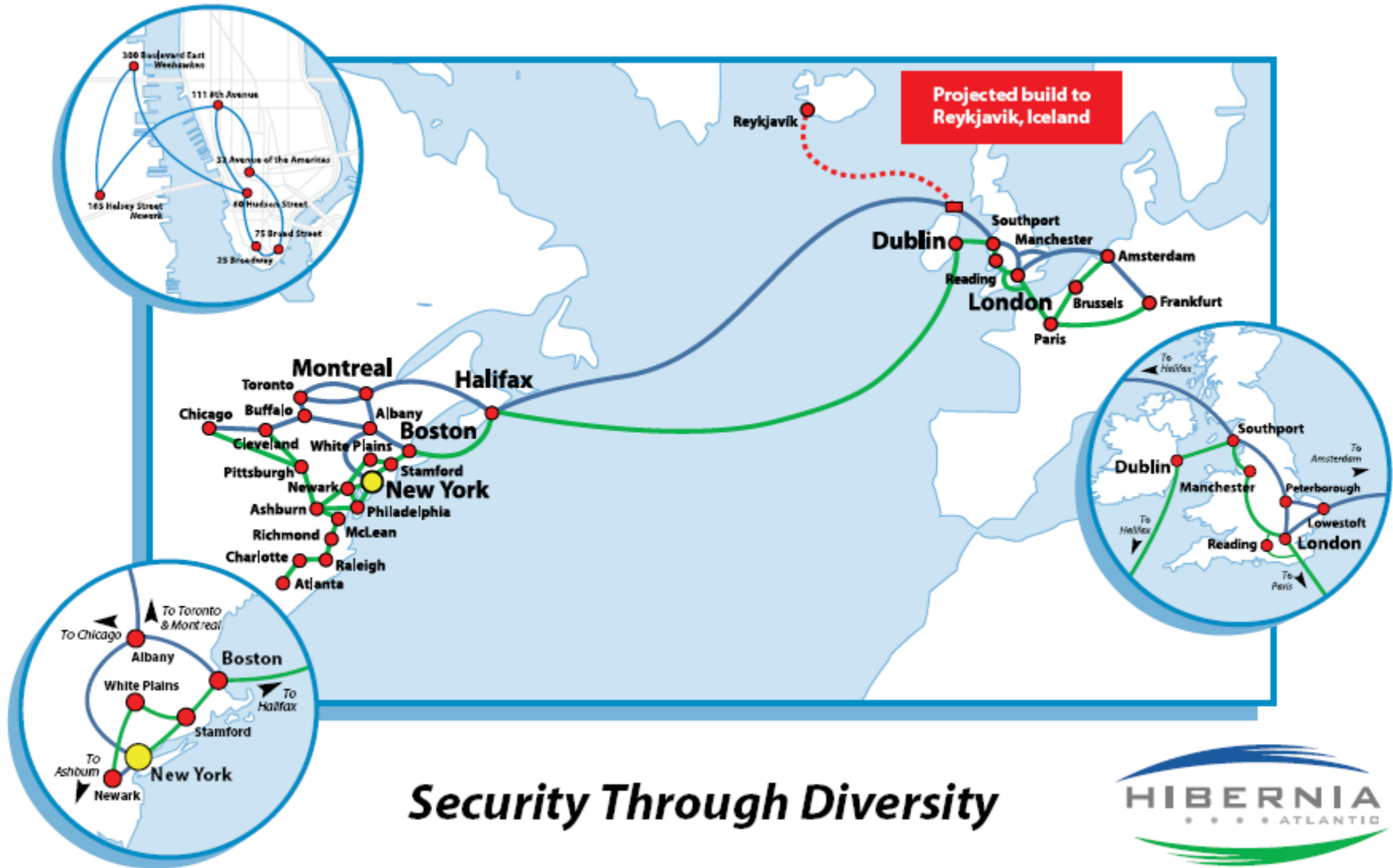


Ireland



UK

Hibernia Network Map



Security Through Diversity

