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**Submarine Cable Deployment  
Lightning Talk @ UKNOF 9 London**

**Martin Hannigan  
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# Standard Disclaimers

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- This is a lightning talk
  - I'm representing myself
  - Not a representative of the cable operator or manufacturer

# Overview

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- Problem
- Business Case
- Vendor Engagement
- Timeline
- Summary
- Interesting Stuff...
- Questions

# Problem

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- **A place surrounded by water.**
- **1 low-cap cable @ 5 Gb/s**
- **1 hi-cap cable @ 720Gb/s**
- **Prior history of backhoe “aggression” on the hi-cap cable backhaul elements in UK**
- **EOL of the low-cap cable imminent**
- **Can’t run a high-cap business at the end of this system**

# Business Case

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- Economic benefits
- Redundancy
- Increased access and performance
- ROI
- Deploy in a year

# Project Scope

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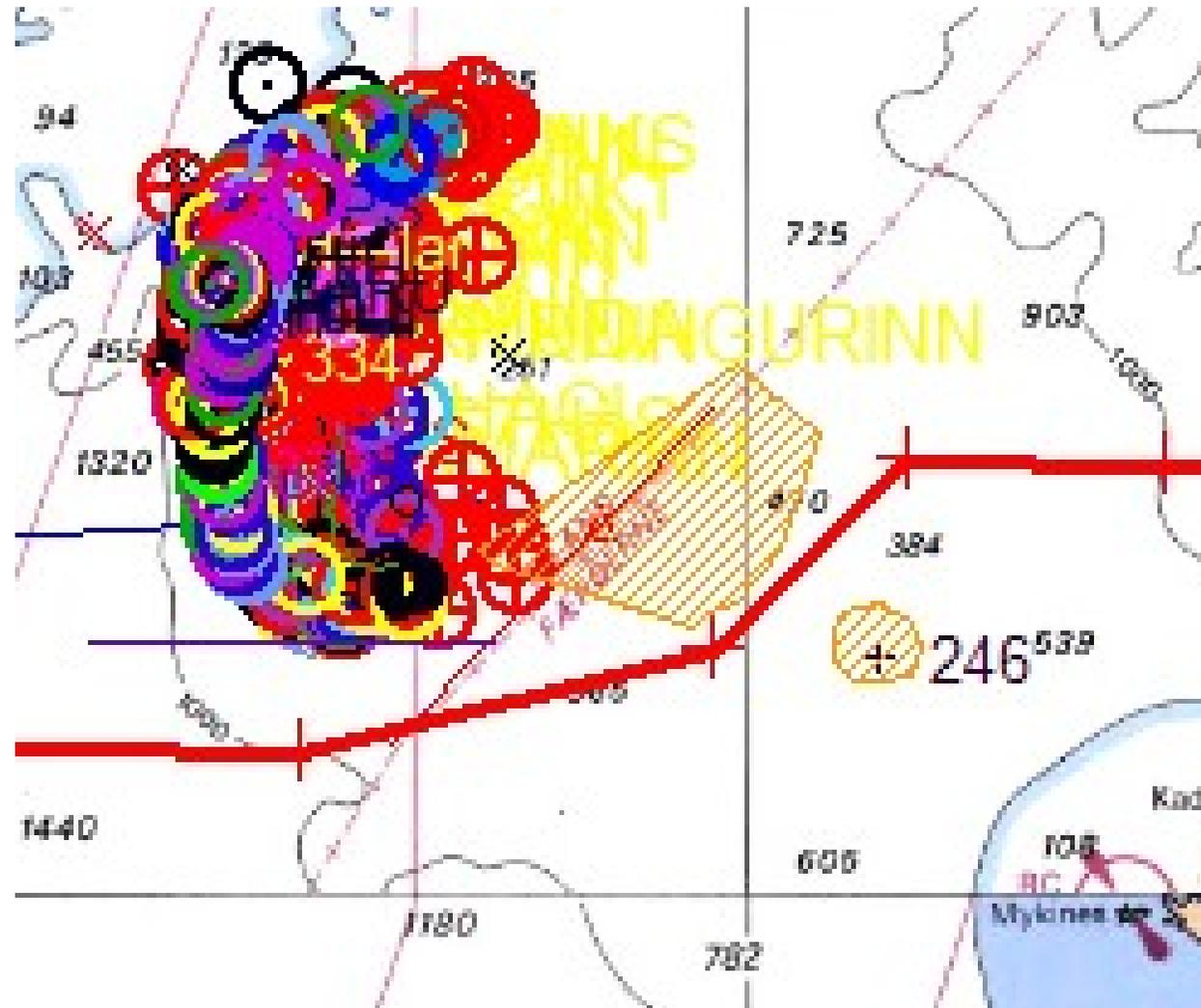
- **Define Parameters**

- **Wet Plant**
- **Dry Plant**
- **DTS**
- **Pair count**
- **Route (undersea and terrestrial)**
- **RFS Date**

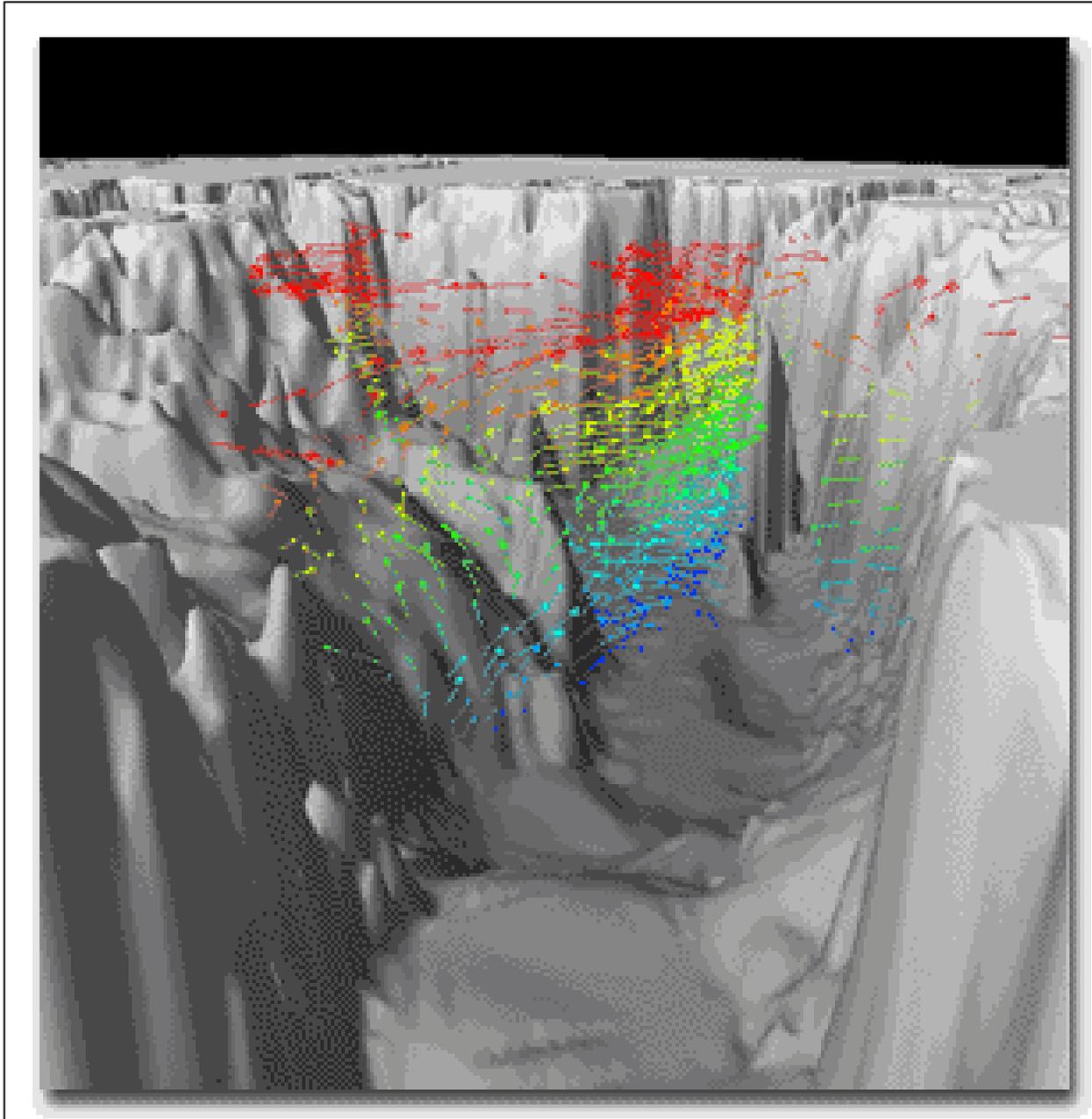
- **Risks**

- **Length**
- **Repeater count, distance, and sparing**
- **Fishing**
- **Aggression**
- **Routing**
- **Approvals**

# Fishing Conflicts Avoidance



# Bathymetry, Ocean Floor



# Route (Existing)

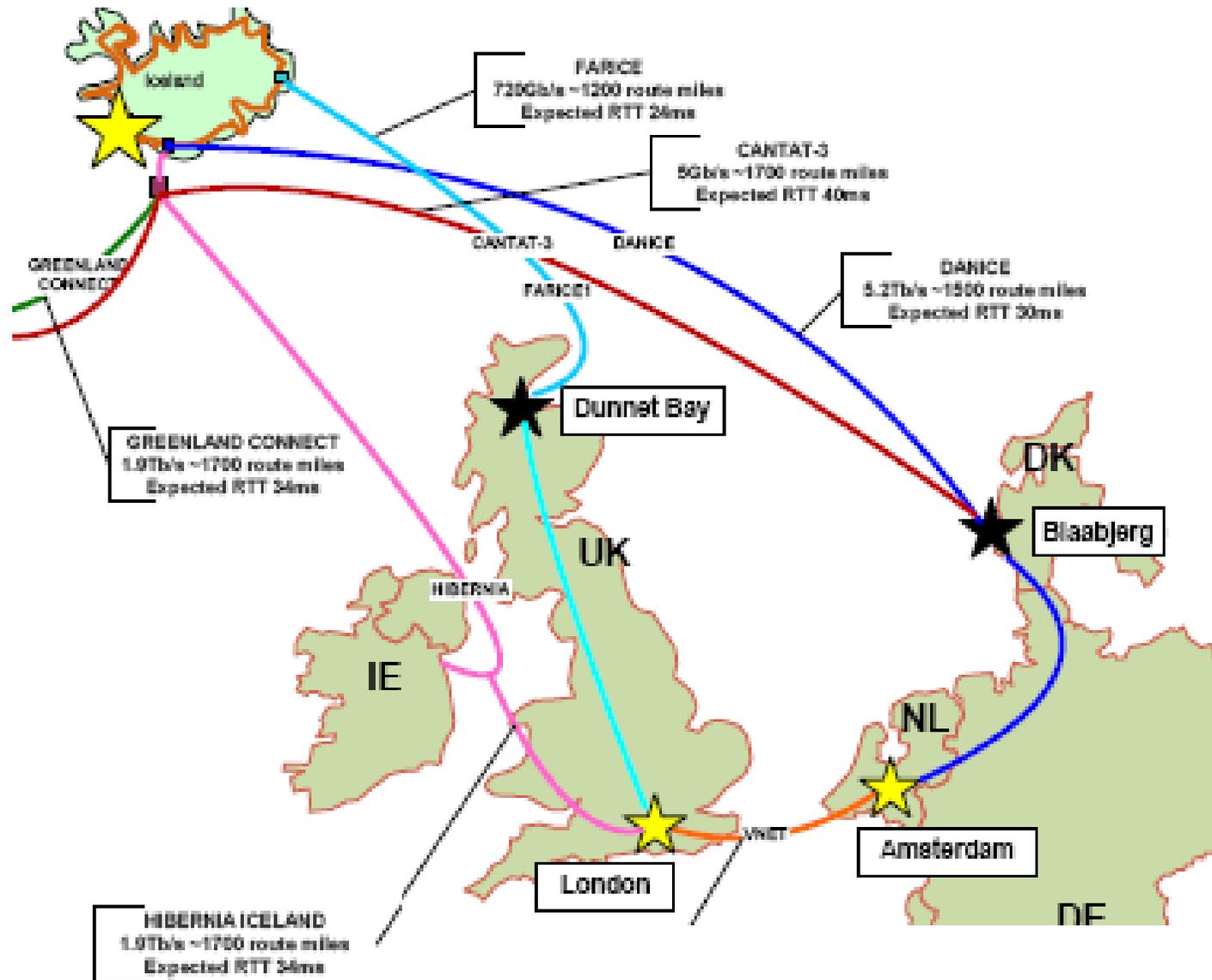


# Route (New)

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# Results



# Planning

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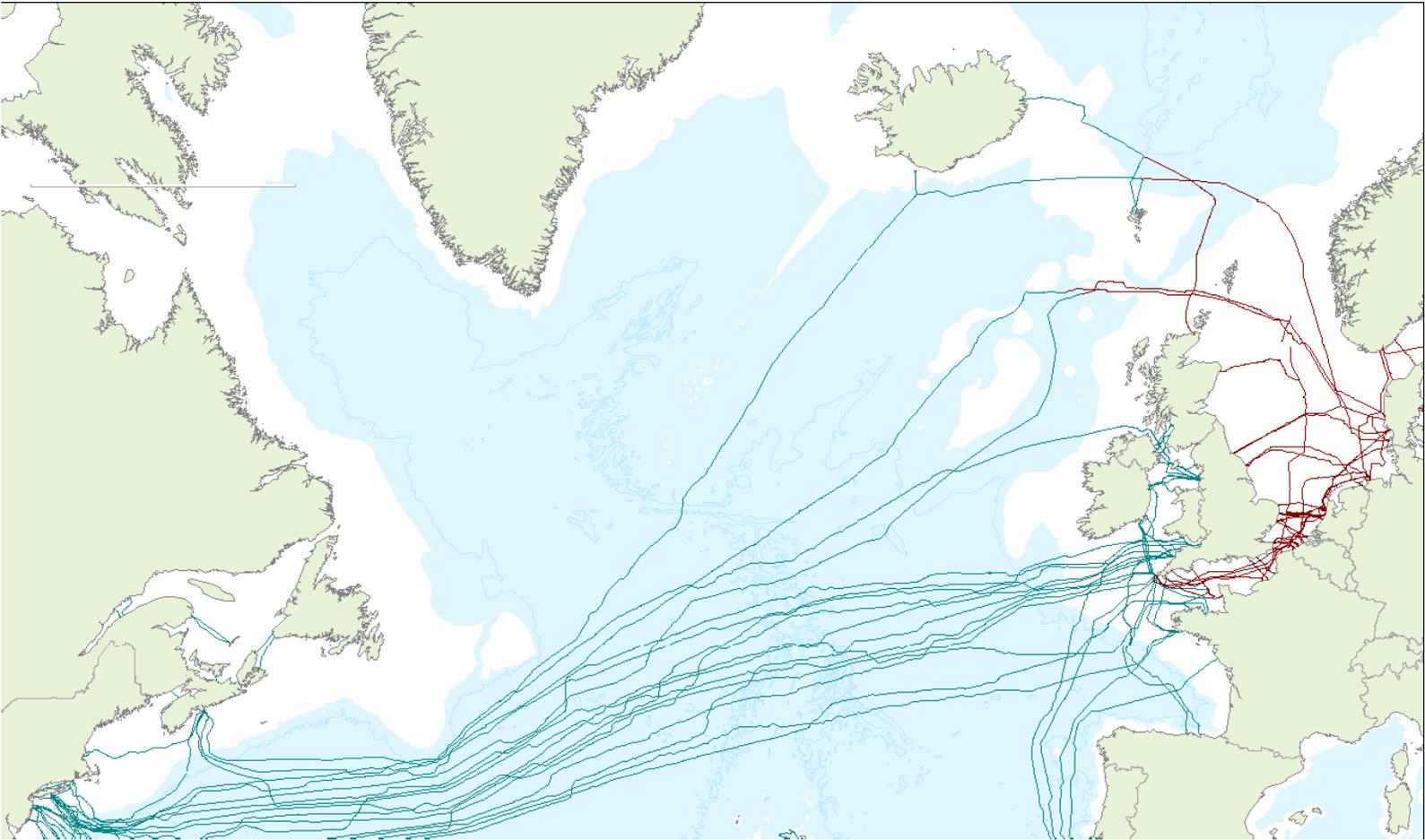
- Sign an Intent To Proceed “ITP”
- Commission preliminary marine desk top study “DTS”
- Vendor begins provisioning materials and acquiring landing sites
- Complete engineering, sign final agreement
- Finish backhaul, PoP, and full DTS
- Final plan adjustments
- Manufacture of cable and build out of stations begin
- Ship sets to sea for deployment
- Alpha end dropped to the beach
- PoP’s, backhaul, ready - cross connects ordered
- Complete acceptance testing and RFS

## Interesting stuff..

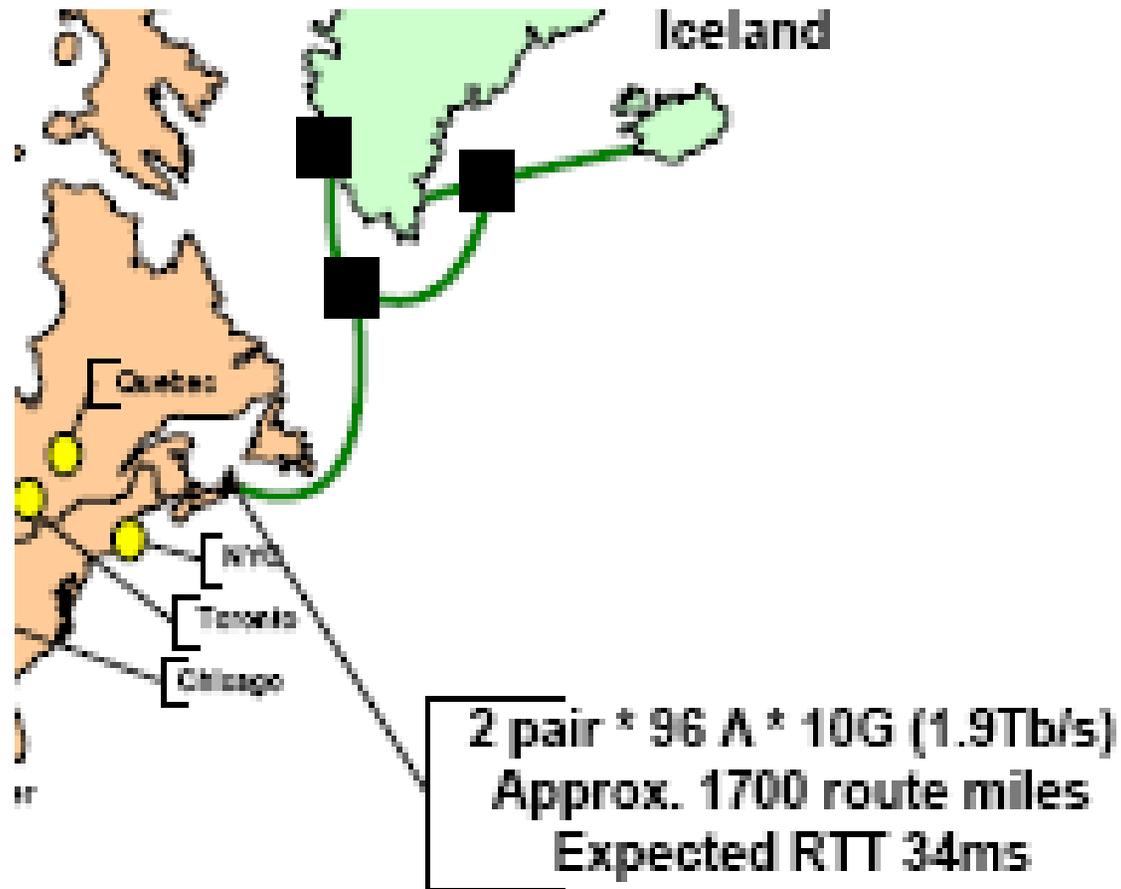
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- There are ~42 active u/nets in the UK and North Sea
- There are ~36 active u/nets in the Baltic and Skagerrak
- There are ~75 active u/nets in the Med, Red Sea, and Black Sea
- Many are redundant due to branching
- There are ~50 active cable ships (lay, repair, or both)
- Cables are powered from the landing stations @ -48VDC
- Turn key systems average \$35K per route mile
- I didn't estimate maintenance so the above is not a good number to reverse engineer the costs 😊

# Crossings Map



# Imminent US Route



## Summary

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- Undersea cables are expensive, but not terribly difficult to deploy incorrectly
- The physical layer architecture is critical
- Redundancy and proximity to other routes is obviously key
- Foresight in routing enables later potential branches for performance and revenue
- Vendor experience, plant reliability, and vendor reputation matters

## Credits

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- Tyco Marine, Virginia and New Hampshire, USA
- Tyco Electronics, Moorestown, NJ USA
- Invest Iceland, Iceland
- Cable operator, information regarding cable system, Iceland
- USGS, ocean bathymetry and geology
- Google Earth, route tracing and rudimentary measurements for speed of light/latency calcs
- ICPC, cable maps and cable directories
- Google News Keywords “submarine cable” for providing me with cable deals and route mile costing data