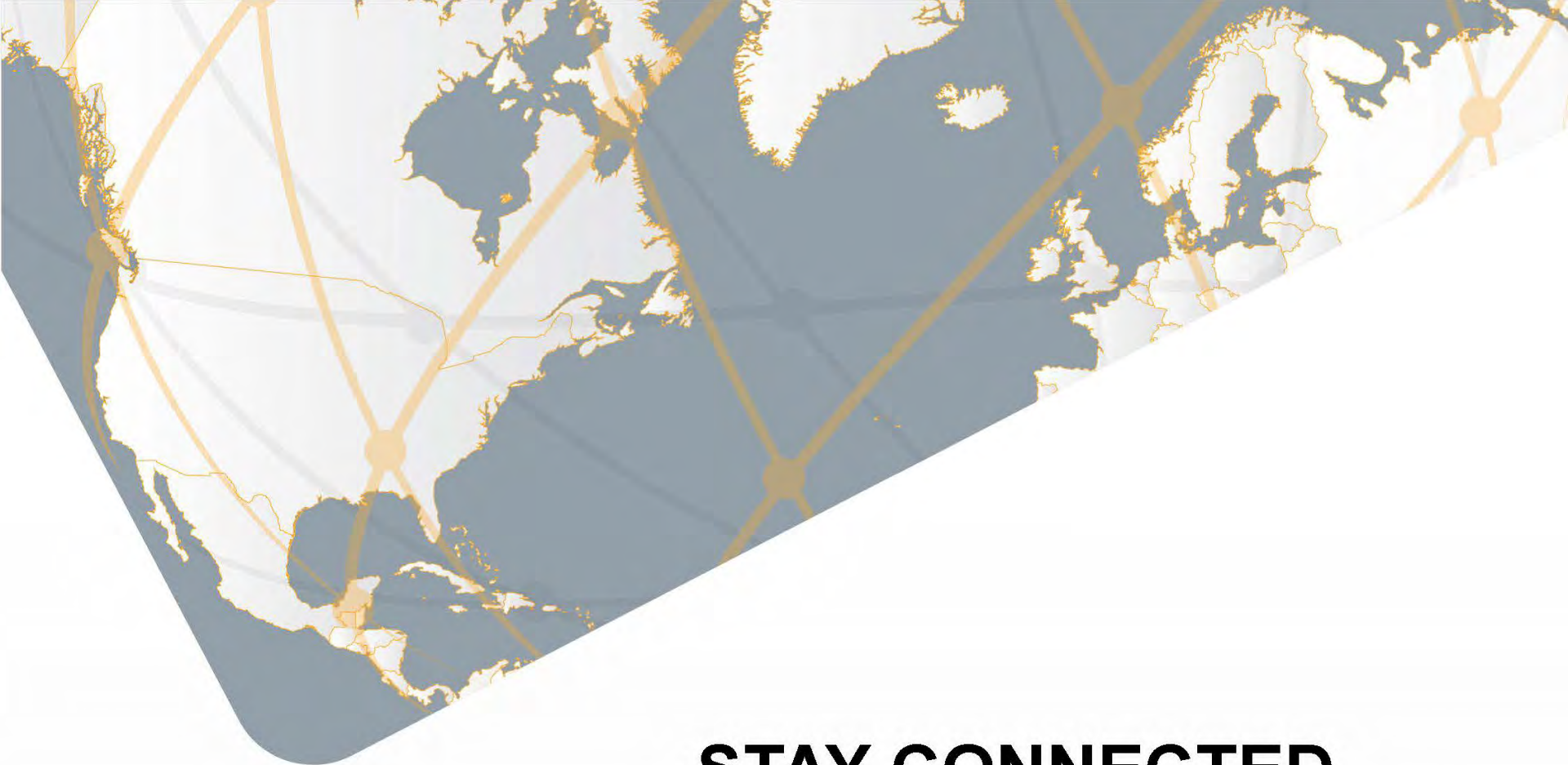




STAY CONNECTED WITH IRIDIUM & ICOM





IRIDIUM

- Enabling connections between people, organizations, and assets anywhere for over 1.6 million subscribers since 1999.



**PERSONAL
COMMUNICATIONS**



GLOBAL GOVERNMENTS



MARITIME



POLAR



**TRANSPORTATION &
DELIVERY**



U.S. GOVERNMENT



EMERGENCY



AUTONOMOUS SYSTEMS



INDUSTRIAL



AVIATION



RESEARCH



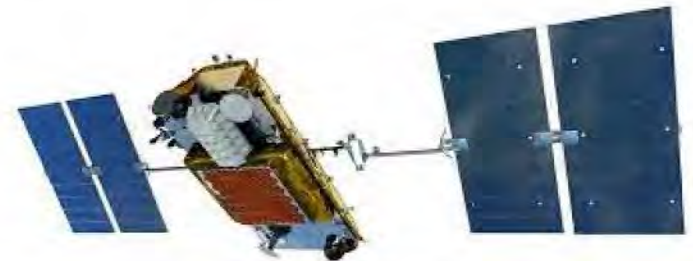
ENERGY

IRIDIUM'S NEW \$3B - 2ND GENERATION NETWORK

- 75 satellites launched over two years on with SpaceX.



- Completed January 2019.



NEW IRIDIUM NETWORK



Significant improvement in voice quality
and data speeds with Iridium NEXT

Previous Network (1999 – 2019)

Voice: Standard Quality, Push-to-Talk

Narrowband Data (SBD, CSD)

Broadband:
Iridium OpenPort® up to 134 Kbps

Supports 1st Generation Terminals

New Network (2019+)

Voice: Standard, **High Quality**, Push-to-Talk

Narrowband Data (SBD, CSD)
Midband Data (IP up to 88kbps)

Broadband:
Iridium OpenPort: Up to 134kbps
Iridium Certus: 176kbps to 700kbps

Supports 1st Generation and **New Certus Terminals**



IRIDIUM'S LOW-EARTH ORBIT (LEO) NETWORK



IRIDIUM ADVANTAGES



GEO vs. LEO

GEO: Geosynchronous Equatorial Orbit

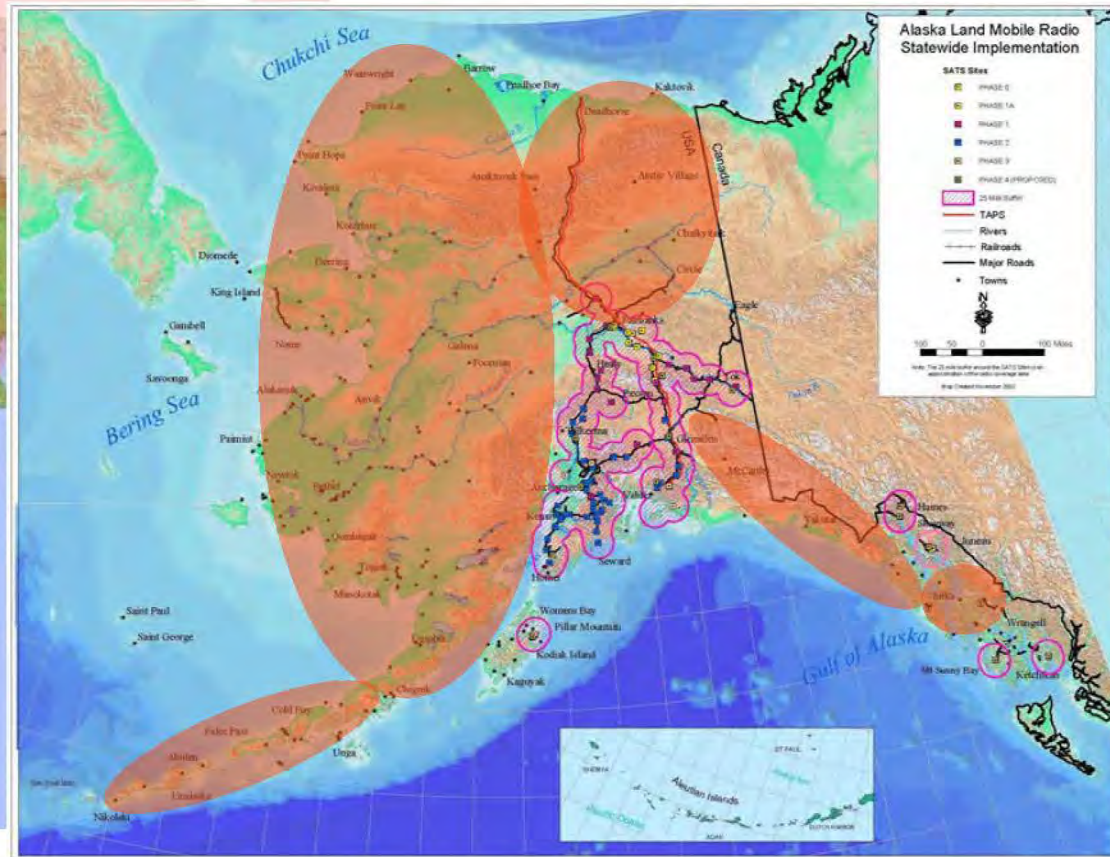
- Affected by weather, rain, snow..
- Requires large antenna
- Communication delay
- Needs to face south when communicating

LEO: Low Earth Orbit)

- Lower latencies vs. GEO
- Lower power terminals (battery powered)
- Omnidirectional, small antenna

LAND CONNECTIVITY GAPS ARE EXPANSIVE

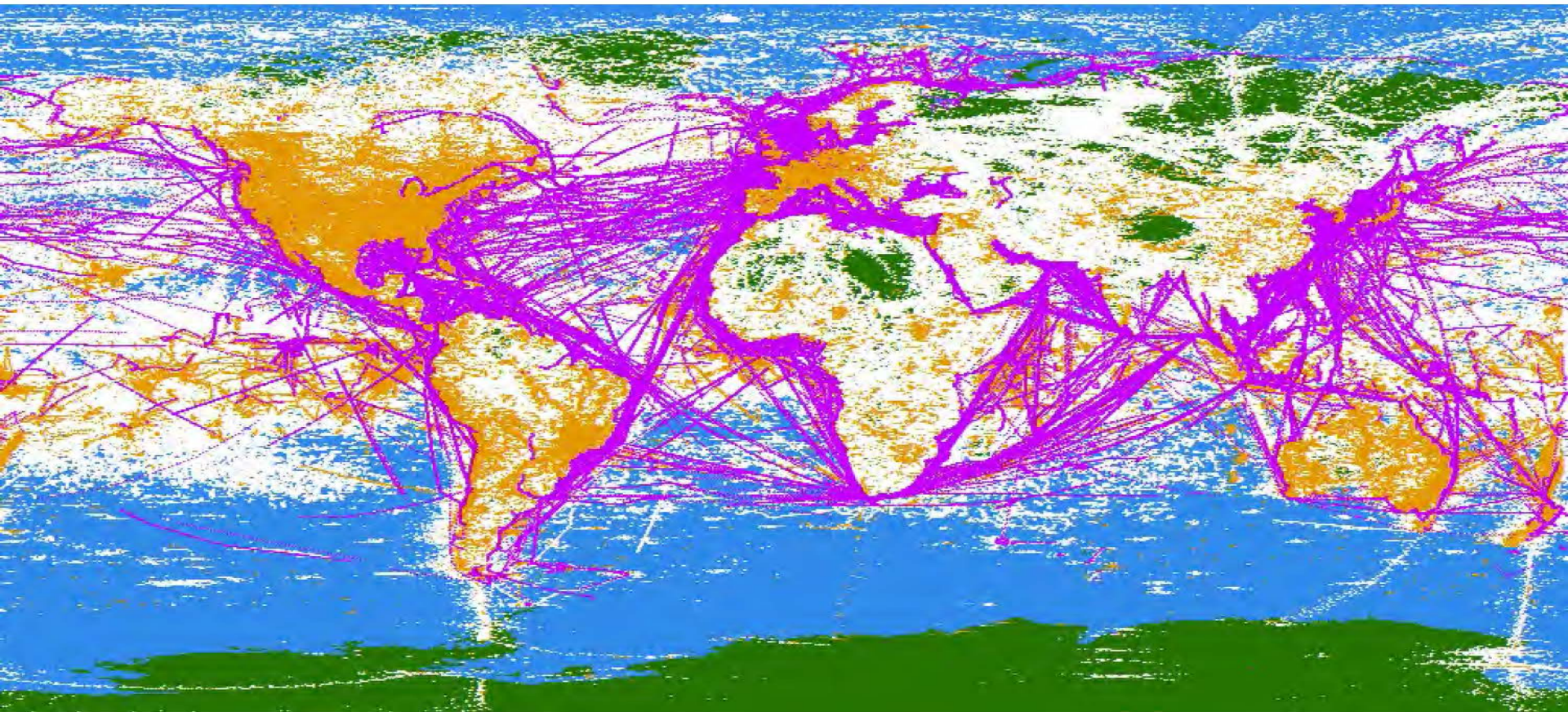
These are areas that are not cost-effective to build ground networks



Land Mobile Radio Networks Are Limited By Ground-Based Towers

Natural Disasters Can Also Occur Interrupting Service With Power Outages

IRIDIUM NETWORK UTILIZATION



○ IoT (SBD) Data Transmission ● Voice Call ● Iridium Broadband Traffic

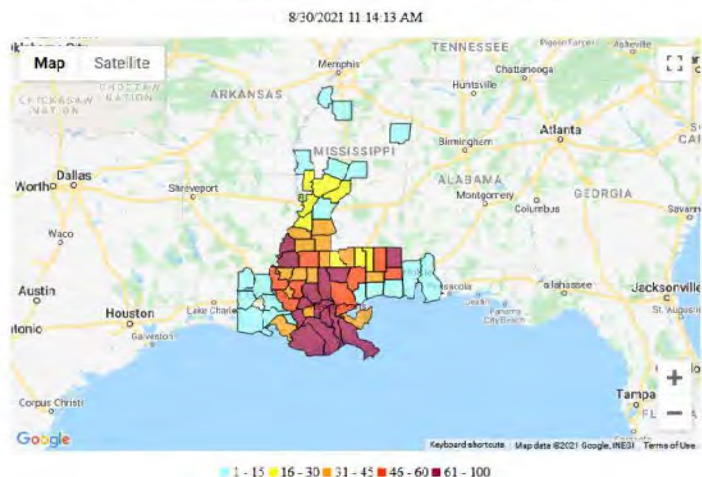
One week plot of Network Traffic

DISASTER IMPACTS ON TERRESTRIAL NETWORKS

Hurricane Ida (2021)

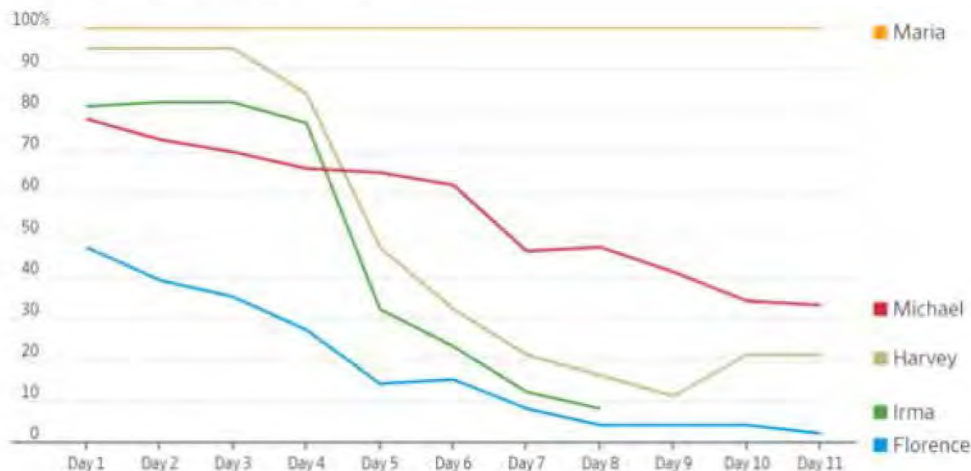


Percent Cell Sites Out-of-Service By County



Hurricane Maria, Harvey,
Michael, Irma (2017)

Percentage of total cellular sites offline



Note: Day 1 is day after storm made landfall.

Source: FCC

Negatively impacts local response and out-of-town mutual aid travelling
in to assist with response efforts,

BUILDING COMMUNICATIONS PACE PLAN

- (P)rimary, (A)lternate, (C)ontingent, and (Emergency) planning to utilize satellite communication when:
 - Incidents occur beyond the range of cellular and radio
 - OR – when networks fail due to disasters.



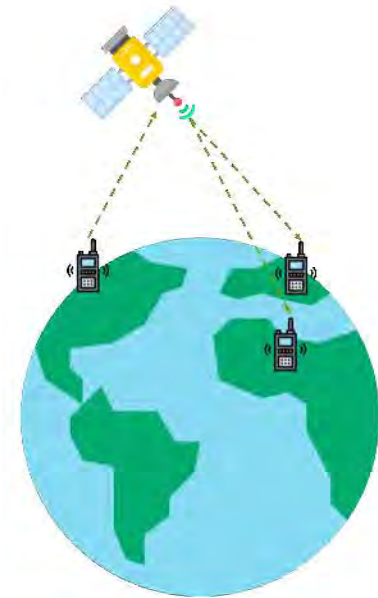
General PACE Plan

Pre-Deployment / Deployment	Full Spectrum Operations	Transfer of Authority / Recover in Place
Phase 1 - Higher	Phase 2 - Higher	Phase 3 - Higher
P BFT	P NIPR/SIPR VOIP	P BFT
A TACSAT	A NIPR/SIPR E-MAIL	A FM
C IRIIDIUM	C BFT	C TACSAT
E CELL PHONES	E TACSAT	E CELL PHONES
Phase 1 - Lower	Phase 2 - Lower	Phase 3 - Lower
P BFT	P FM	P FM
A FM	A BFT	A BFT
C IRIIDIUM	C IRIIDIUM	C IRIIDIUM
E CELL PHONES	E CELL PHONES	E CELL PHONES

U.S. Military Example

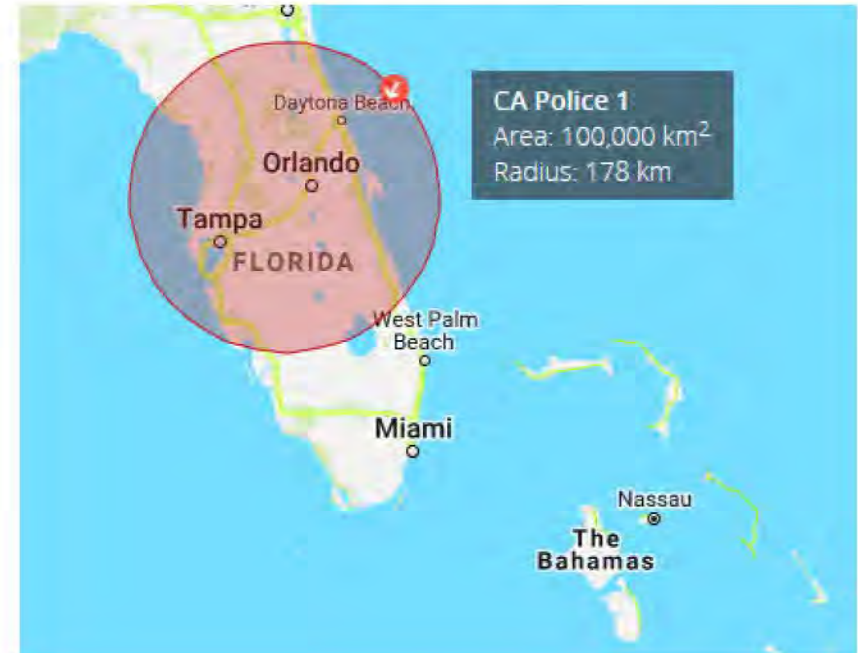
IRIDIUM PUSH TO TALK (PTT)

- The service enables users with:
 - Unlimited one-to-many comms
 - AES-256 encryption
 - Low latency (500ms)
 - Large talkgroups (Multi-State)
 - Secure, web-based device and talkgroup management (OTA)
 - Flat-rate service pricing



YOU DETERMINE THE COVERAGE

- Regions are drawn with the rectangular or circular region tools
- Clicking on the tool will drop a shape on the map that can be repositioned, resized, and rotated to cover the desired areas
- Each defined geographic region can be named
- Talkgroup name changes will be updated on devices accordingly



SERVICE PRICING – DEVICES & TALKGROUPS

- Iridium PTT has flat monthly rates and unlimited device and talkgroup usage – no bill shock at the end of the month

- Talkgroup Sizing (max area):
 - Small: 100,000 km² (63,000 mi.)
 - Medium: 300,000 km² (190,000 mi.)
 - Large: 750,000 km² (470,000 mi.)
 - X-Large: 1,500,000 km² (940,000 mi.)
 - Jumbo: 2,250,000 km² (1,400,000 mi.)

Talkgroup size	Small	Medium	Large	X-Large	Jumbo
Coverage area	Up to 100,000 km ²	Up to 300,000 km ²	Up to 750,000 km ²	Up to 1,500,000 km ²	Up to 2,250,000 km ²
Approximate Equivalent Coverage Area	Indiana	Arizona	Texas	Texas + New Mexico + Arizona + Oklahoma	Washington + Oregon + California + Idaho + Nevada + Arizona + Utah + Montana
					
Number of Service Areas Per Talkgroup	Up to 5	Up to 10	Up to 10	Up to 10	Up to 10

ICOM + IRIDIUM SATELLITE PTT

- Combines Land Mobile Radio style design with Iridium satellite PTT
- Key features:
 - Powerful audio
 - Radio controls (knobs)
 - Durable antenna
 - Waterproof design (IP67)
 - Ease-to-use interface
 - Attractive price point
 - Radio accessories
- Products:
 - Handheld
 - In-Vehicle
 - In-Building
 - Interoperability



ICOM – IC-SAT100M

ICOM Equipment

Mobile

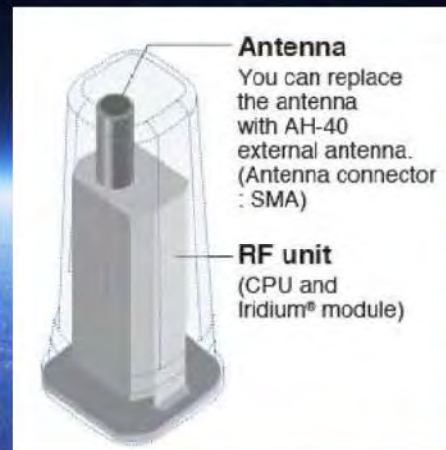
Handmic



Outside Antenna



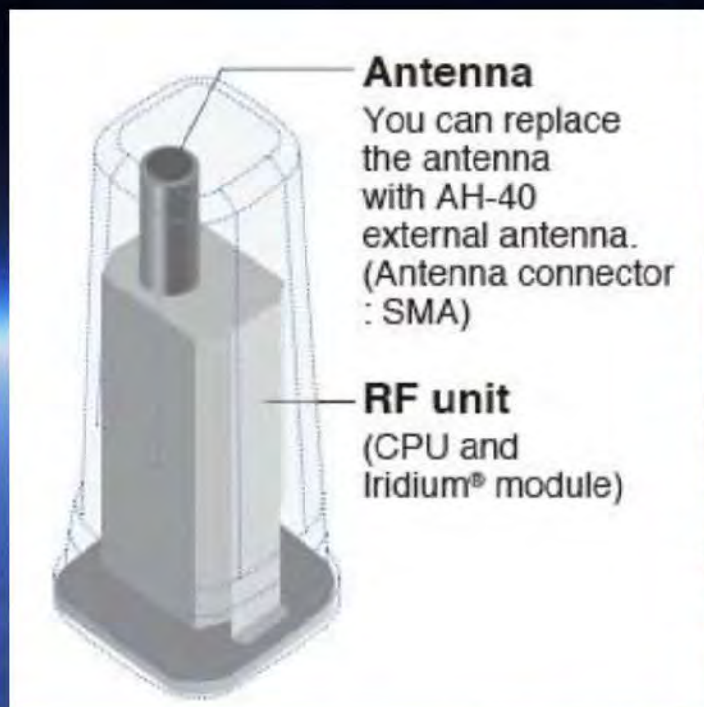
RF Unit Inside



COST-EFFECTIVE AND LOSSLESS CONNECTIVITY



RF Unit in Outside Antenna



<CPU and Iridium Module inside of antenna>
If you place main unit inside of vehicle or building, coaxial cable is required..

Since unit is inside of antenna,,

- **No coaxial cable required**
- **Extending with just LAN cable**
- **Less sensitivity loss**
ex) **No need to worry less sensitivity of wiring in a vehicle.**

VE-PG4: ROBUST INTEROPERABILITY SIMPLIFIED

- Types of Connections
 - 4 EXT Ports, (Physical connections)
 - Network Connections,(Virtual Connections)
 - LAN
 - WLAN
 - LTE Connections
 - IP501 H or M
 - GPS Information for RDT, and OzieTracker
 - USB Ports
 - Recording of 4 Audio Paths
 - Input of new Firmware



SEAMLESS BRIDGING ACROSS ANY SYSTEM

- Types of Connections

- 4 EXT Ports, (Physical connections)

- Use OPC cables or fabricate a custom cable to connect the radio
 - The VE-PG comes with several Blue connectors to fabricate your own cables



Cables
OPC-2273
Connects to M605



OPC-2275
Connects to F5061D or A120



OPC-2276
Connects external microphone/speaker



OPC-2389
Connects serial device with RS-232



OPC-2390
Connects to FRS000



OPC-2412
Connection cable for VE-PG4.
5 m, 16.4 ft length.



LIMITLESS POSSIBILITIES

Possible connections to EXT Ports



IDAS Repeater utilizing
Accessory Port



ICOM Land mobile Radios



Other Manufacturers Radios



Microphone



Remote Gates



Other Manufacturers Repeater



Marine Radios



SAT100



Speakers



Warning Lights



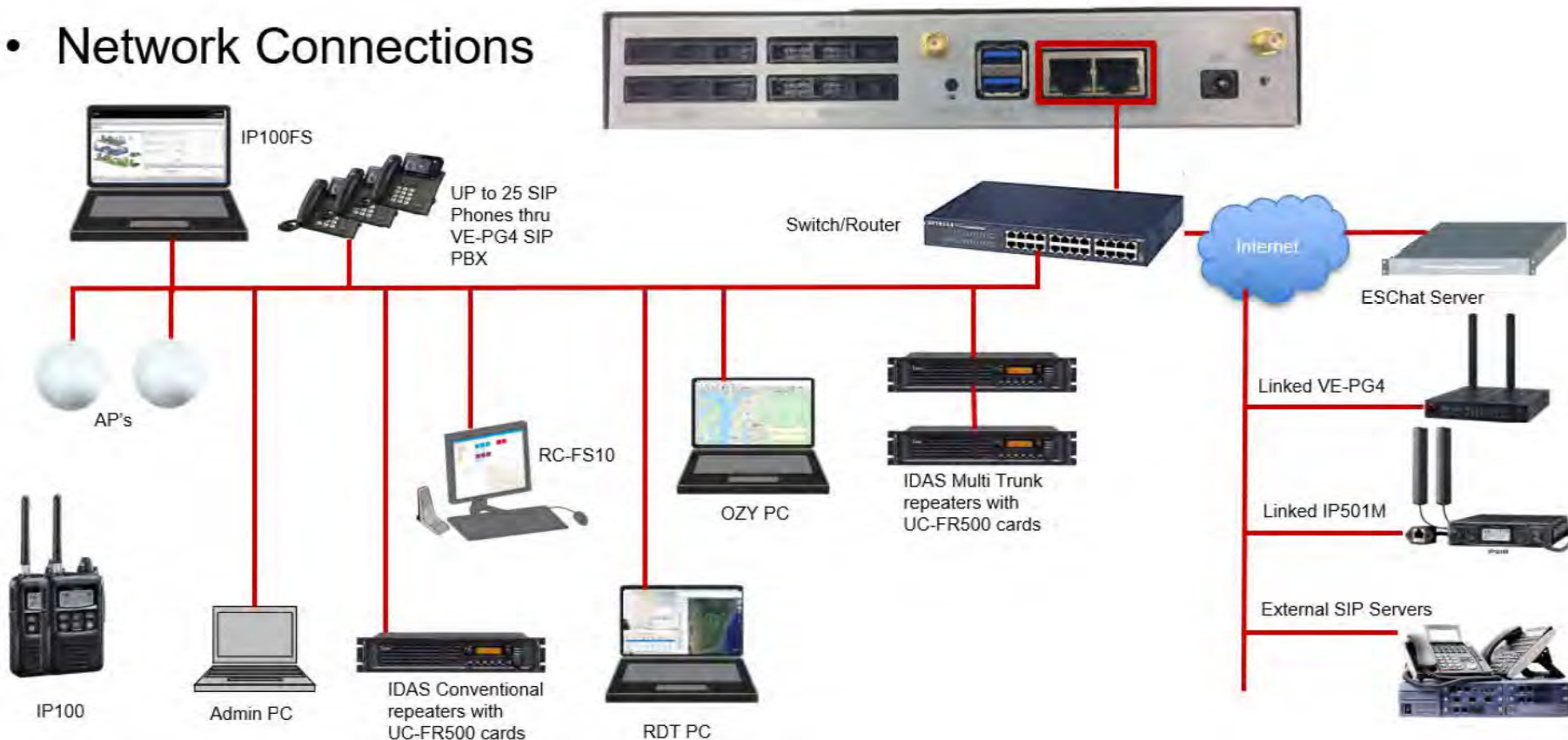
Aviation Radios



PA Systems

LIMITLESS POSSIBILITIES

- Network Connections



STATEWIDE ALMR INTEROPERABILITY

Outside Antenna



RF Unit Inside



Antenna
You can replace the antenna with AH-40 external antenna (Antenna connector: SMA)

RF unit
(CPU and Iridium® module)





Icom VEP-G4





VEP-G4 → APX Radio
cabling created by





Icom VEP-G4 Interfaces

Handmic

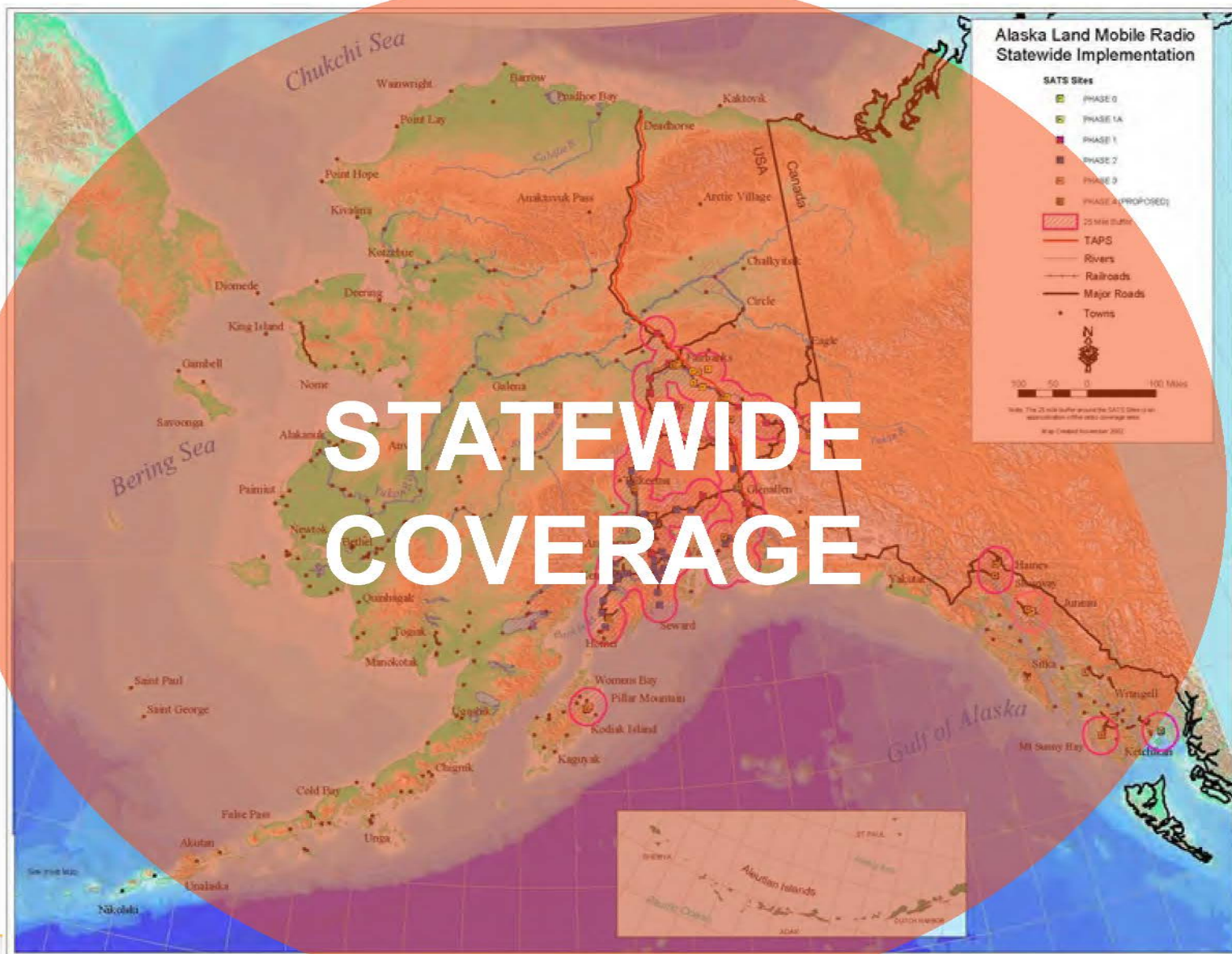


Mobile

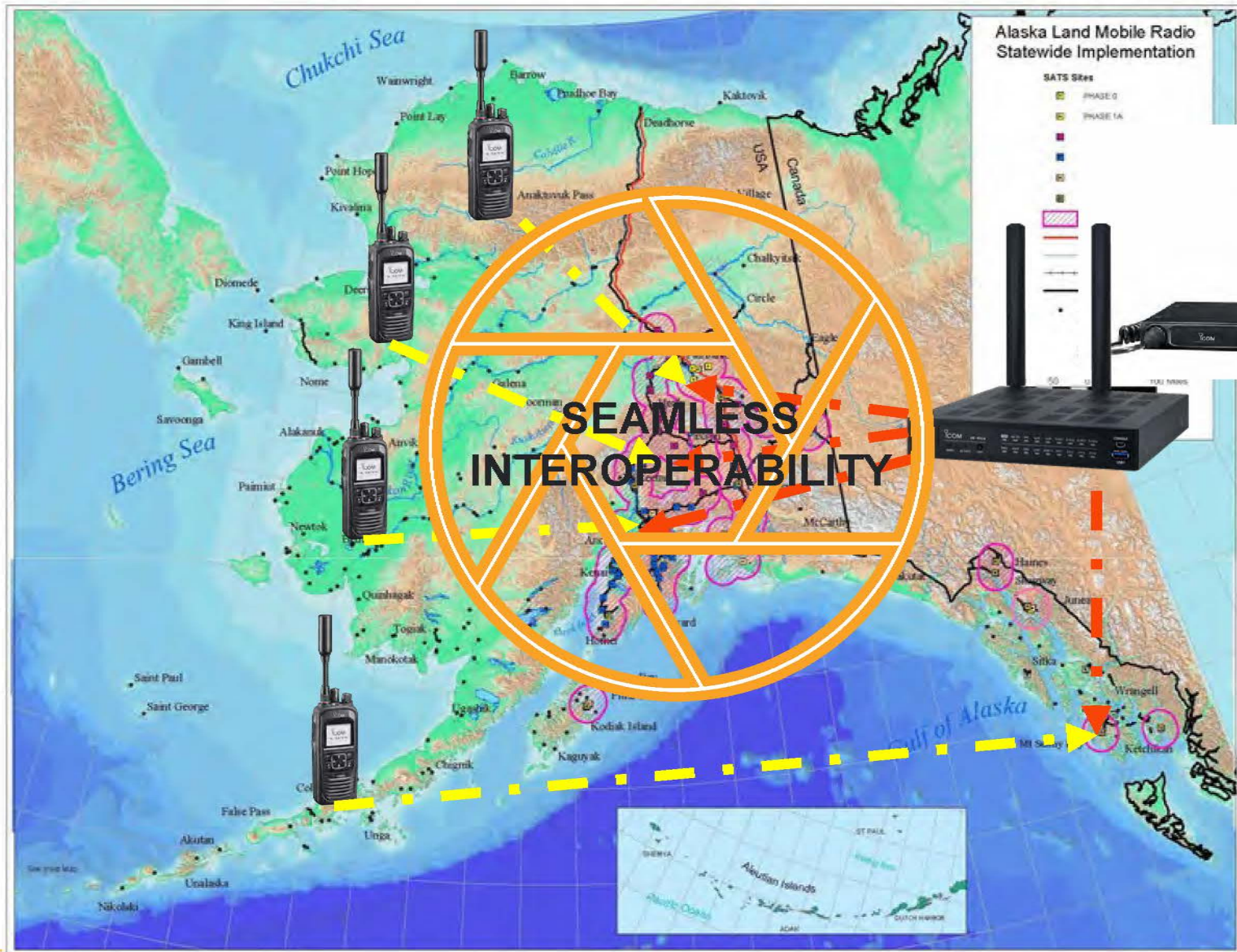


D-Sub LAN VE-PG4

STATEWIDE ALMR INTEROPERABILITY



OPERATIONALIZING INTEROPERABILITY



USE CASE 1 – ON FOOT / SNOW MACHINE



IC-SAT100



Shoulder Harness



HM-222



VS3

USE CASE 2 – IN-VEHICLE



Docking Station for In-Vehicle Use

FA-S103U

AH-40



DOCKING STATION

BC-247

Charger cradle for in-vehicle and in-building use. 12/24 V battery compatible.

ONE-TOUCH ANTENNA CONNECTOR

FA-S103U

Easily replace the antenna tip to an external antenna. (SMA to BNC)

EXTERNAL ANTENNA

AH-40

Magnet mount antenna with 1.5 m, 4.9 ft coaxial cable.

SPEAKER-MICROPHONE

HM-222H

Use the HM-222H (or an external headset) to transmit, while the radio is attached to the BC-247.

USE CASE 3 – IN-BUILDING

Easy Installation

- Connecting LAN cable
- Power through POE
- 100m extension → 400m w/ hub

-Flexible wiring work without any sensitivity loss

-Power can be supplied through POE, LAN cable from main unit to antenna (with RF unit)

-Extending cable maximum 100m
Allowing to lead cable from floor to rooftop. PoE Hub allows maximum 400m extension.

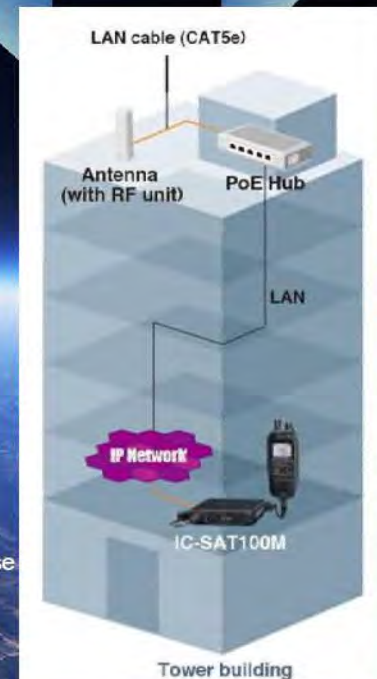
Much Lighter and reasonable than coaxial cable



Coaxial Cable F-8D-LCX
100m @\$3,400



CAT5e LAN Cable for outside use
100M @\$140



Guaranteed In-Building Redundancy Ensures Operational Continuity

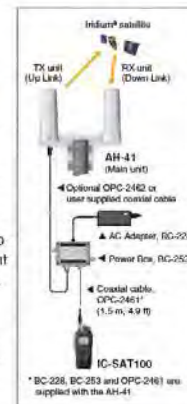
Active Antenna for In-Building Use



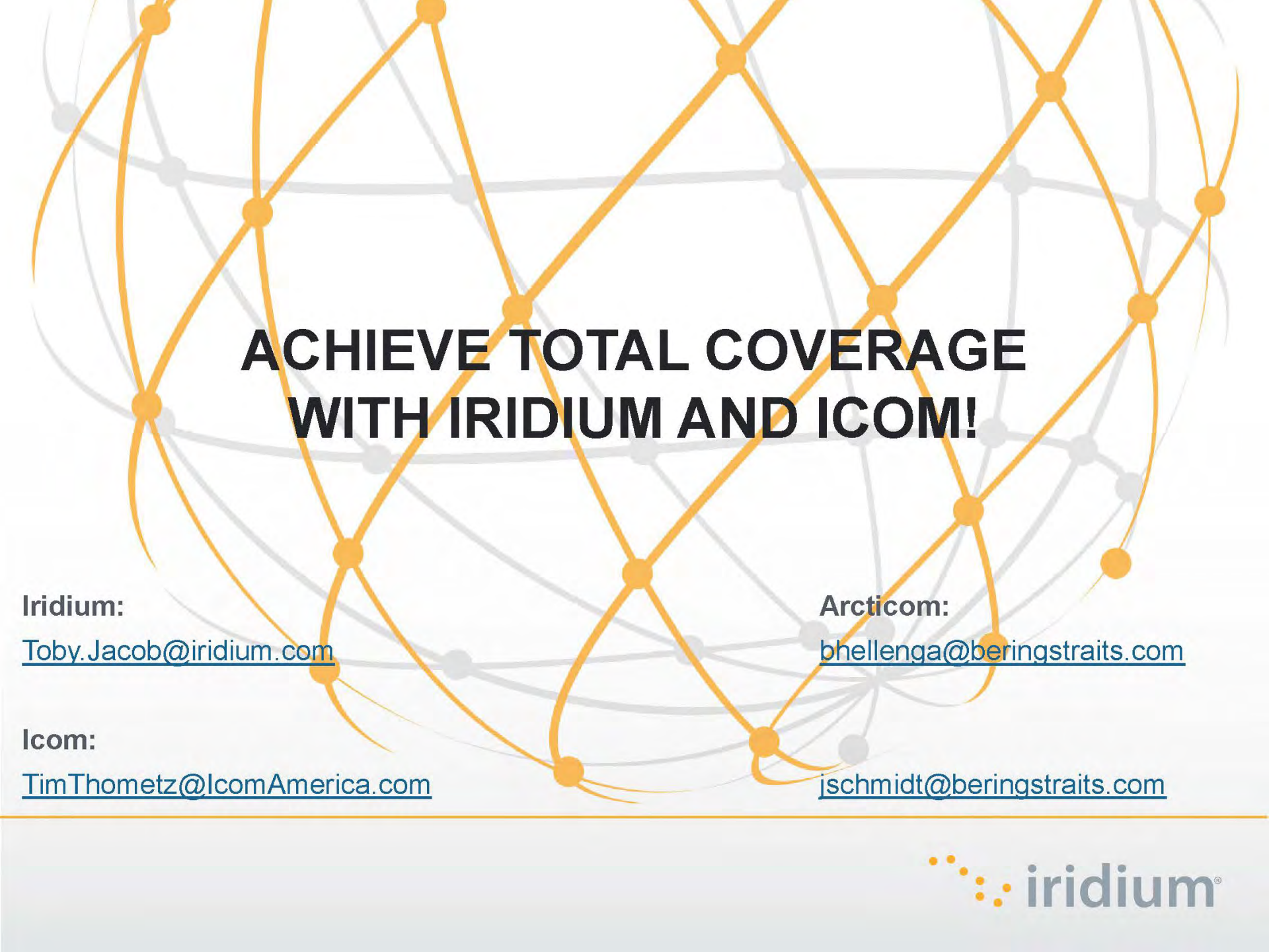
EXTERNAL ANTENNA AH-41

Maximum 169 m;
554.5 ft* coaxial cable for installing in a clear location to obtain a line-of-sight path to the satellite.

* Use optional OPC-2462 (59 m; 193.5 ft) or user supplied coaxial cable (Max. 169 m; 554.5 ft) to meet Iridium® performance requirements, and comply with FCC regulations.



* BC-226, BC-252 and OPC-2461 are supplied with the AH-41



ACHIEVE TOTAL COVERAGE WITH IRIDIUM AND ICOM!

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