

HAMCATION 2019

The Florida Statewide Amateur Radio Network “SARnet” Forum

February 8, 2019

Presented by

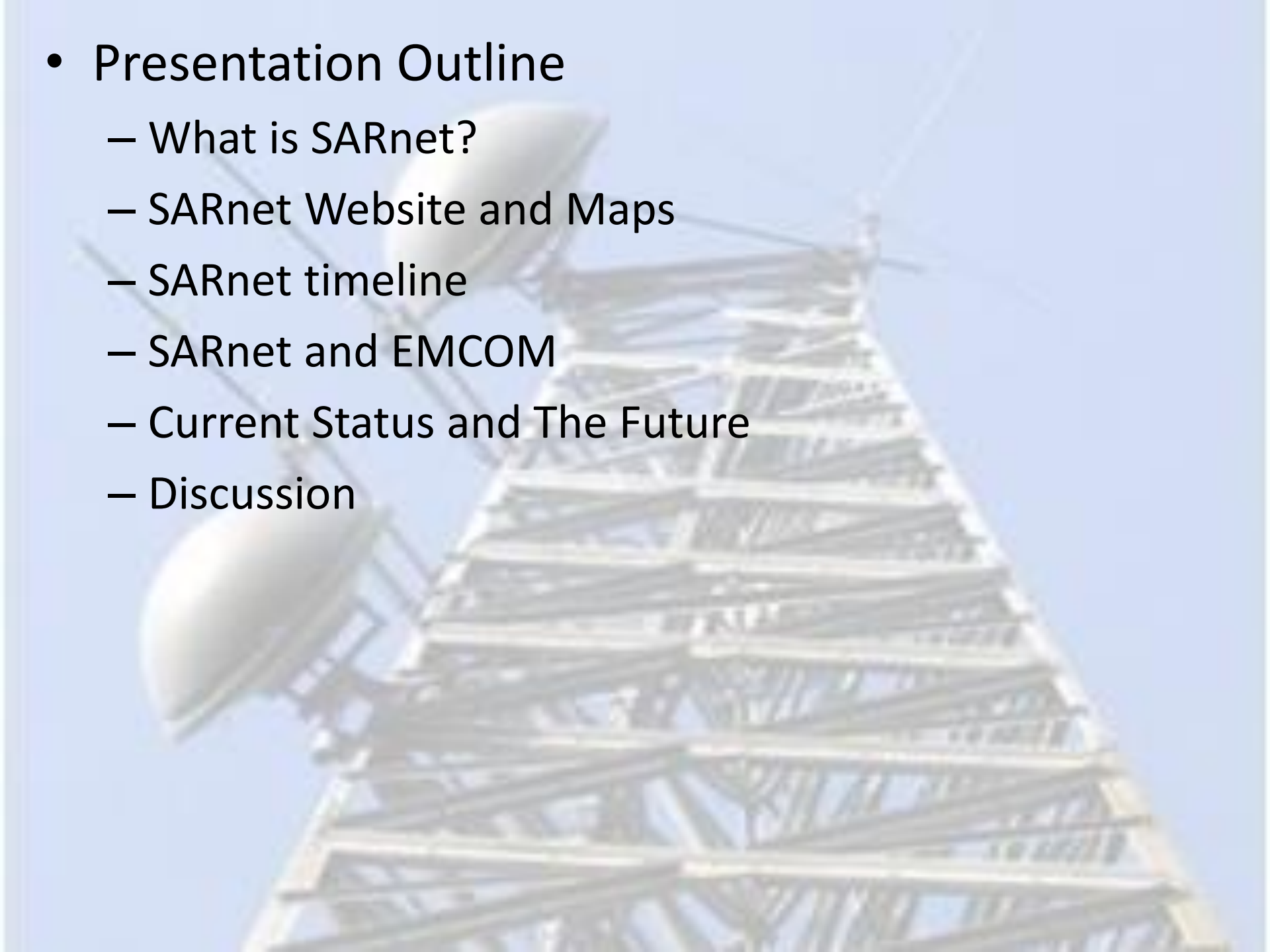
Randy Pierce (AG4UU),

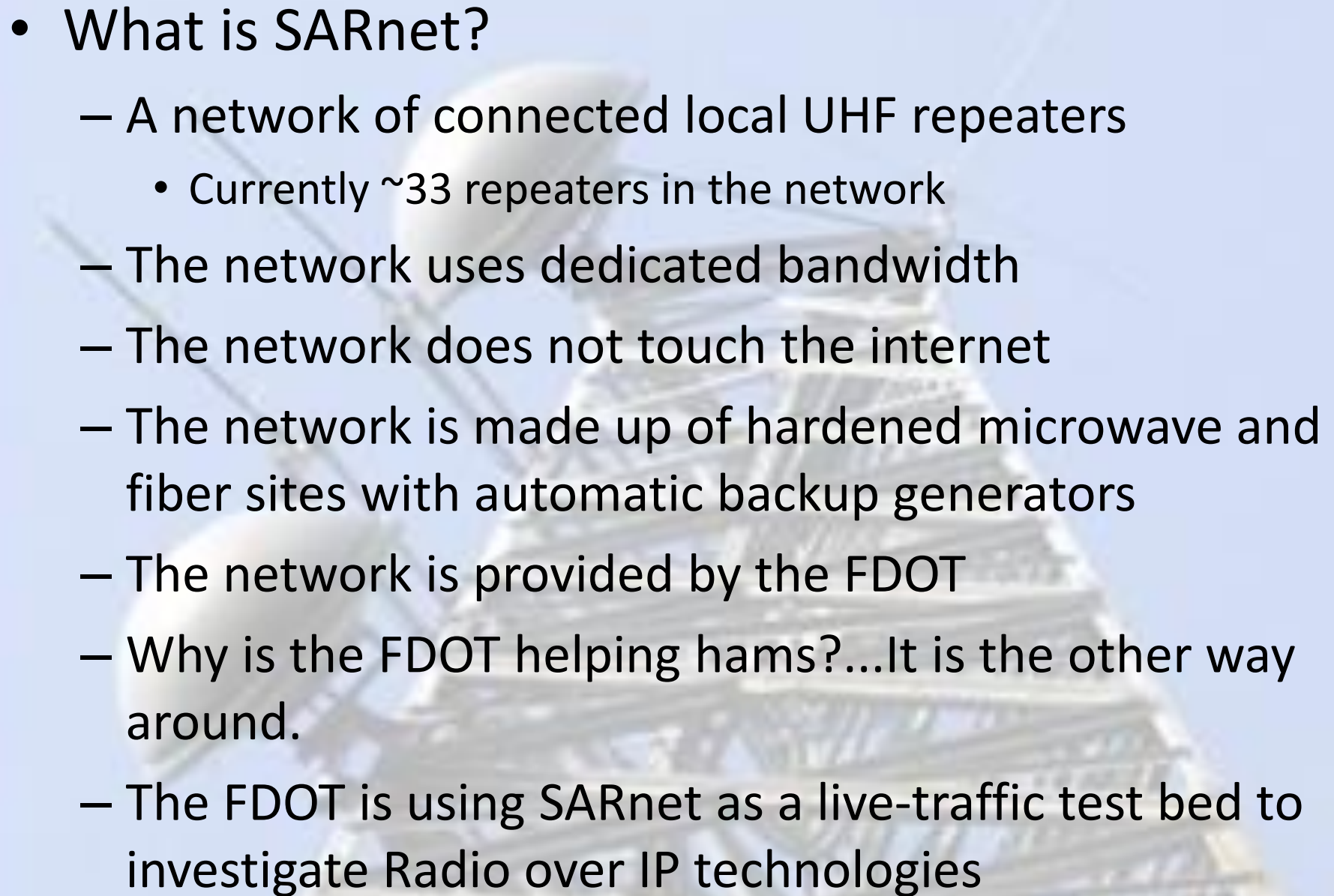
Brian Kopp (KC5LPA),

Joe Poerschke (WB4HIS),

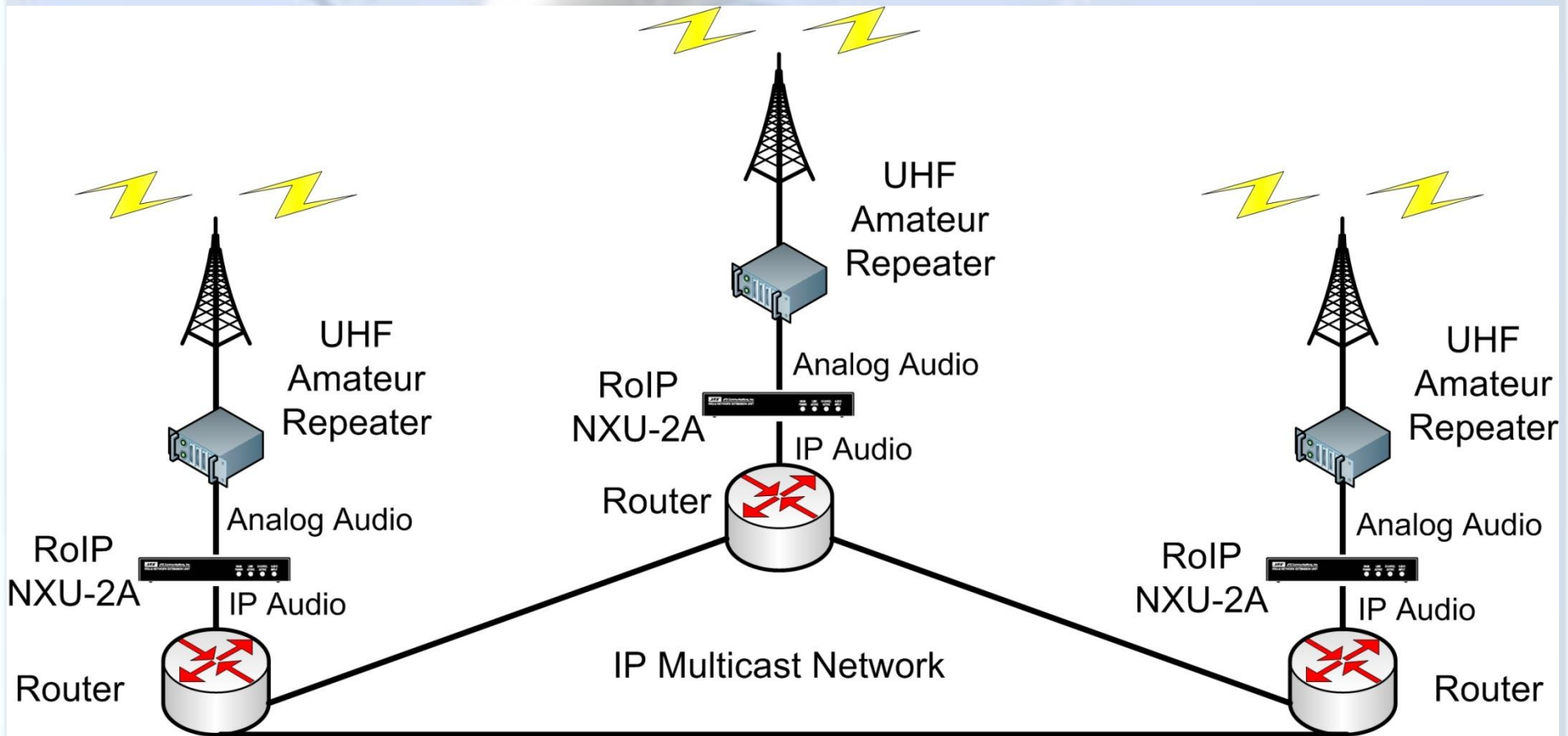
David Krauss (NX4Y),

Miller Norton (W4EMN)

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- Presentation Outline
 - What is SARnet?
 - SARnet Website and Maps
 - SARnet timeline
 - SARnet and EMCOM
 - Current Status and The Future
 - Discussion

- 
- What is SARnet?
 - A network of connected local UHF repeaters
 - Currently ~33 repeaters in the network
 - The network uses dedicated bandwidth
 - The network does not touch the internet
 - The network is made up of hardened microwave and fiber sites with automatic backup generators
 - The network is provided by the FDOT
 - Why is the FDOT helping hams?...It is the other way around.
 - The FDOT is using SARnet as a live-traffic test bed to investigate Radio over IP technologies

- SARnet Network Simplified Diagram



- Website: www.sarnetfl.com

SARnet - Home - Mozilla Firefox
File Edit View History Bookmarks Title Tools Help
Inbox - brian@thesemaph... x SARnet - Home x +
www.sarnetfl.com
BMW CBS All access DCS ebay FB FCC filings FCC General Report FCC ULS Fidelity Google IEEE Lib IB Interactive Brokers Jax Weather Lat and Long m-w MATLAB Tutorial Morningstar Mutual Funds | Interac... MyWings NHC NI Solar SpaceWeather

SARNET

HOME HOW IT WORKS SYSTEM MAPS SYSTEM STATUS FAQ CONTACT US

SARnet: Statewide Amateur Radio Networking in Florida

PLEASE BE ADVISED:
Unauthorized use of SARnet by persons who are not licensed by the United States (US) federal government to operate amateur radio equipment is a direct violation of US federal law under Title 47, Part 97, of the US Code of Federal Regulations.

IN ADDITION, under Florida Statute 877.27, unauthorized use of SARnet resulting in interference to authorized users is illegal and considered a third degree felony, punishable by up to 5 years in jail and up to a \$5,000 fine. If found guilty of a felony in the state of Florida you will lose your right to vote, sit on a jury, hold public office, and own a gun.

Check the system status page for system updates!! Last update: January 27, 2017

WHAT IS SARNET?

The Statewide Amateur Radio Network (SARnet) is a network of linked UHF voice repeaters that serves the State of Florida. The repeaters are operated by their local trustees and the network that connects them together does not interfere with the local use of the repeaters. These UHF repeaters were specifically chosen in part because the voice traffic on them is light. This helps ensure that long conversations and rag-chews are rare on SARnet since any SARnet traffic brings up ALL of the repeaters on the network.

The key to what makes SARnet work so well is that this network uses dedicated bandwidth that is separate from the internet. Statewide connectivity is achieved without the use of any commercial telecommunications services. SARnet does not use the Internet, cellular telephones, or land lines.

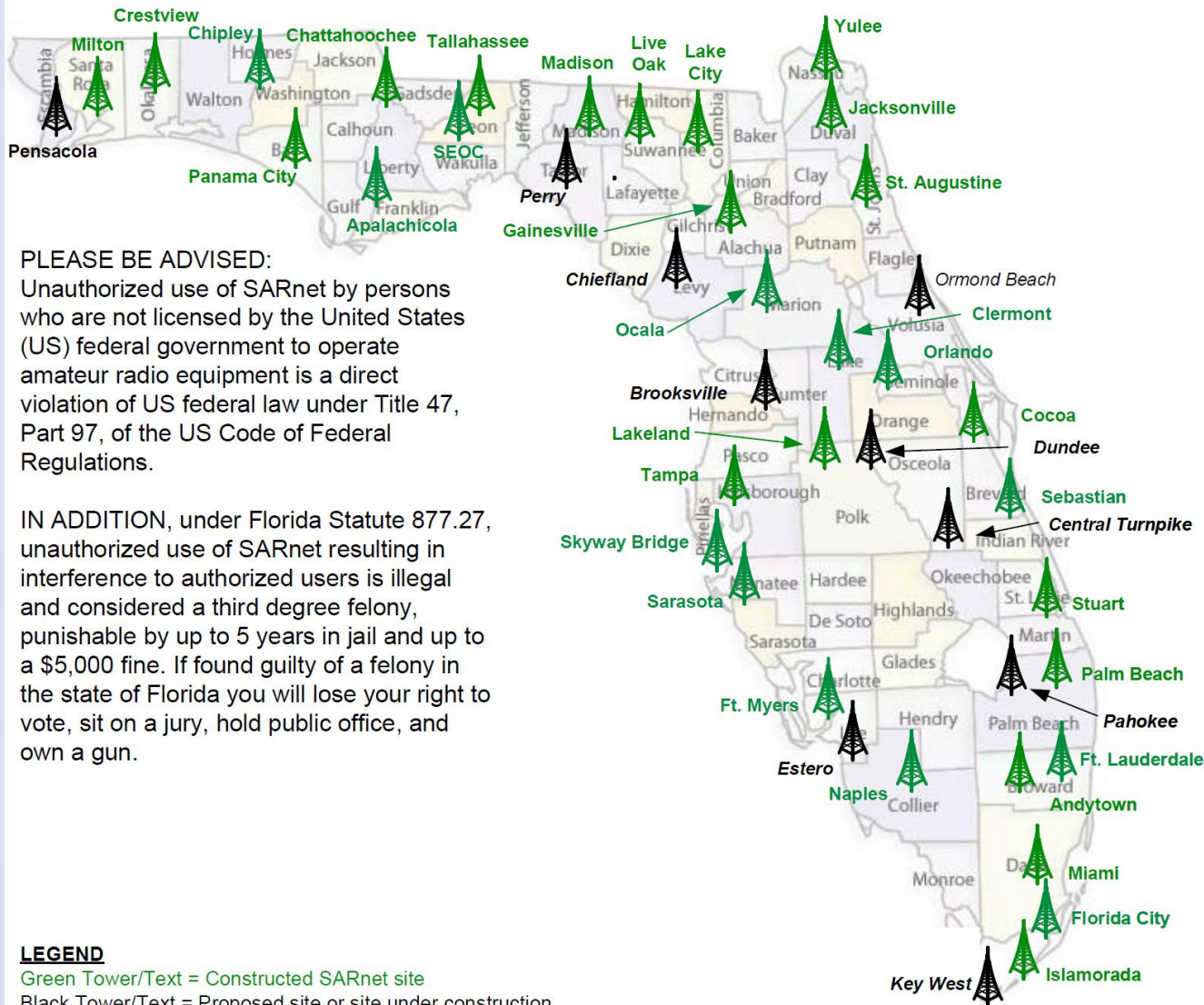
WHY WAS SARNET STARTED?

The state of Florida Department of Transportation is continually investigating new IP technologies for use in improving its own voice radio network and to meet its mandate to provide interoperable communications with other state agencies and public safety entities. Instead of using their live voice radio network as an ongoing test bed for these new IP technologies, the FDOT has partnered with the amateur radio community to use their radio systems throughout the state as part of a test bed to support the FDOT's research. The benefit for the FDOT is that they gain valuable knowledge about how to install, operate,

Statewide Amateur Radio Network "SARnet"

Constructed Sites as of January 3, 2019

**YOU MUST BE A FEDERALLY LICENSED AMATEUR
RADIO OPERATOR WITH A CALLSIGN TO USE SARnet**



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LEGEND

Green Tower/Text = Constructed SARnet site

Black Tower/Text = Proposed site or site under construction

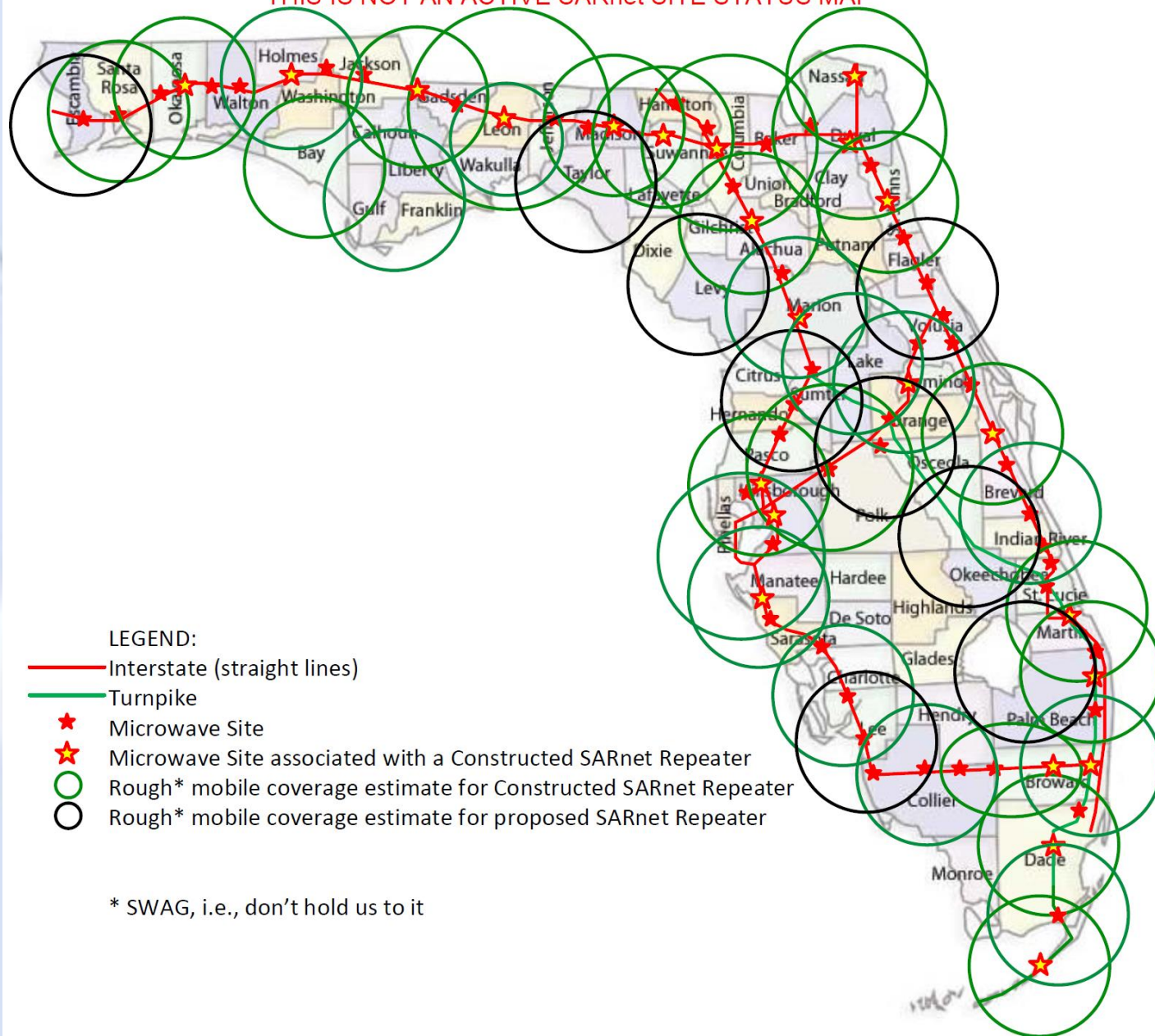
TX frequency is repeater talk-out. All UHF repeaters have a +5MHz offset for the talk-in repeater receiver

<u>SARnet SITE</u>	<u>TX (MHz)</u>	<u>Tone (Hz)</u>
Andytown	442.825	110.9
Apalachicola	444.400	94.8
Brooksville	444.825	146.2
Central Turnpike	444.975	107.2
Chattahoochee	444.975	94.8
Chiefland	TBD	TBD
Chipley	444.750	100.0
Clermont	444.975	103.5
Cocoa	444.650	107.2
Crestview	444.900	100.0
Dundee	444.350	103.5
Estero	TBD	TBD
Ft. Lauderdale	442.850	110.9
Florida City	442.050	114.8
Ft. Meyers	444.225	136.5
Gainesville	444.925	123.0
Islamorada	442.850	114.8
Jacksonville	444.700	127.3
Key West	444.400	114.8
Lake City	444.900	110.9
Lakeland	442.275	82.5
Live Oak	443.700	110.9
Madison	444.300	94.8
Miami	444.600	167.9
Milton	444.725	100.0
Naples	444.950	103.5
Ocala	444.025	123.0
Orlando	444.075	103.5
Ormond Beach	TBD	TBD
Pahokee	TBD	TBD
Palm Beach	443.975	110.9
Panama City	444.175	100.0
Pensacola	444.875	100.0
Perry	443.100	94.8
Sarasota	444.800	100.0
Sebastian	444.375	107.2
SEOC	443.500	94.8
Skyway Bridge	442.250	146.2
St. Augustine	442.800	127.3
Stuart	444.150	107.2
Tallahassee	442.100	94.8
Tampa	442.850	146.2
Yulee	442.900	127.3

Statewide Microwave Network

Constructed "SARnet" sites shown as of December 20, 2018

THIS IS NOT AN ACTIVE SARnet SITE STATUS MAP

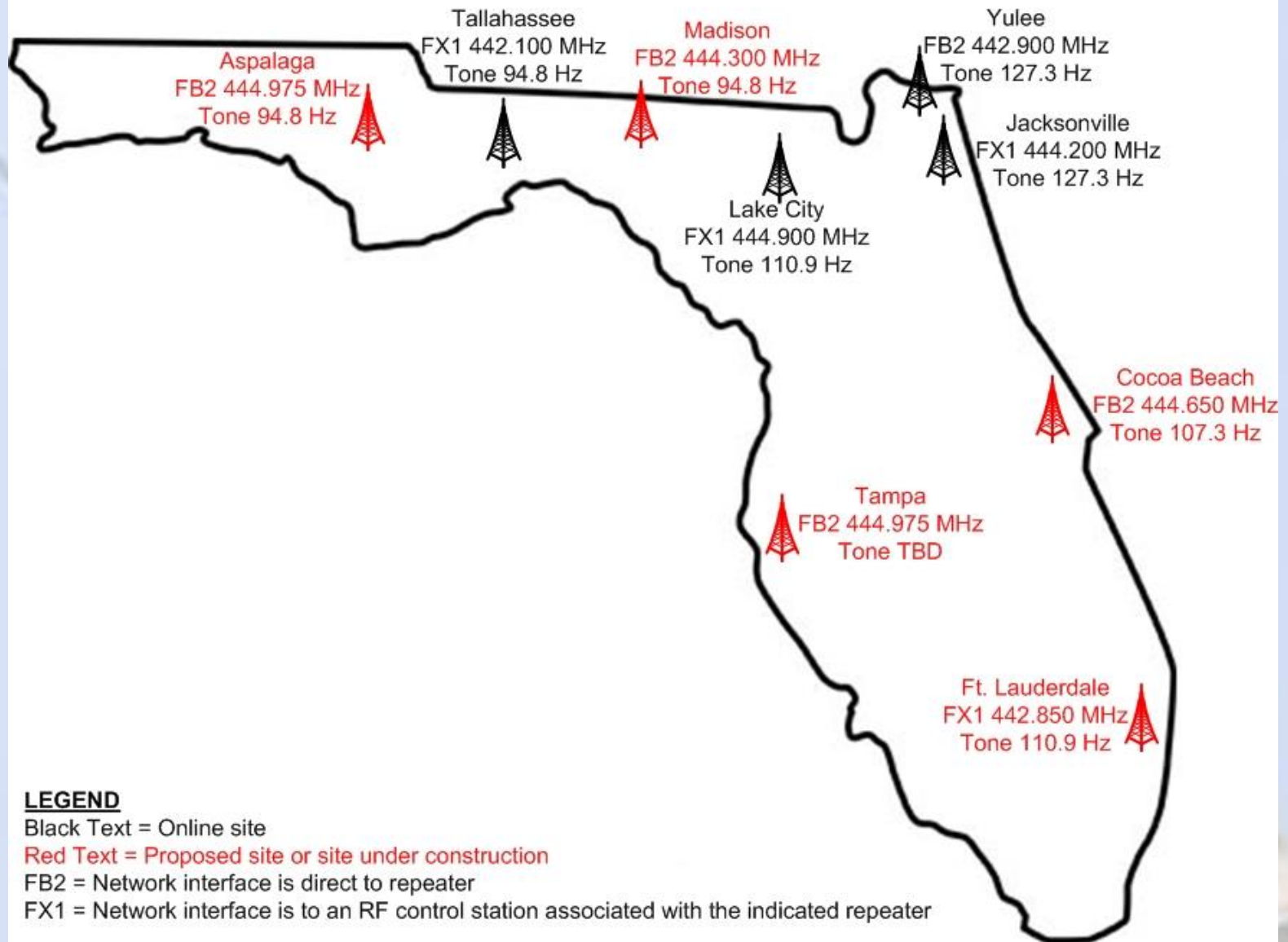


- SARnet timeline

- June 2011: network concept discussions are underway at FDOT and the Raytheon JPS NXU-2A is selected
- February 2012 First site install at Tallahassee
 - Lake City comes online immediate afterwards
 - Randy Pierce (AG4UU), Theo Titus (K4MVL), and Colin Brackney (KR4HO) develop first two NXU - GE MDX control station radio interfaces
 - Both Tallahassee and Lake City are FX1 connections to SARnet using existing local repeaters
- September 2012 Yulee comes online as 3rd site
 - First direct connection of a repeater to SARnet
 - Brian Kopp (KC5LPA) interfaces an NXU with a Hamtronics repeater
- October 2012 The K4QHR repeater on the Dames Point bridge in Jacksonville becomes the 4th SARnet site and third FX1 connection (uses the proven GE MDX control station interface)
- Late 2012 David Krauss (NX4Y), Joe Poerschke (WB4HIS), and Ralph Tullo (N0LO) begin work on network buildout in central and southern Florida

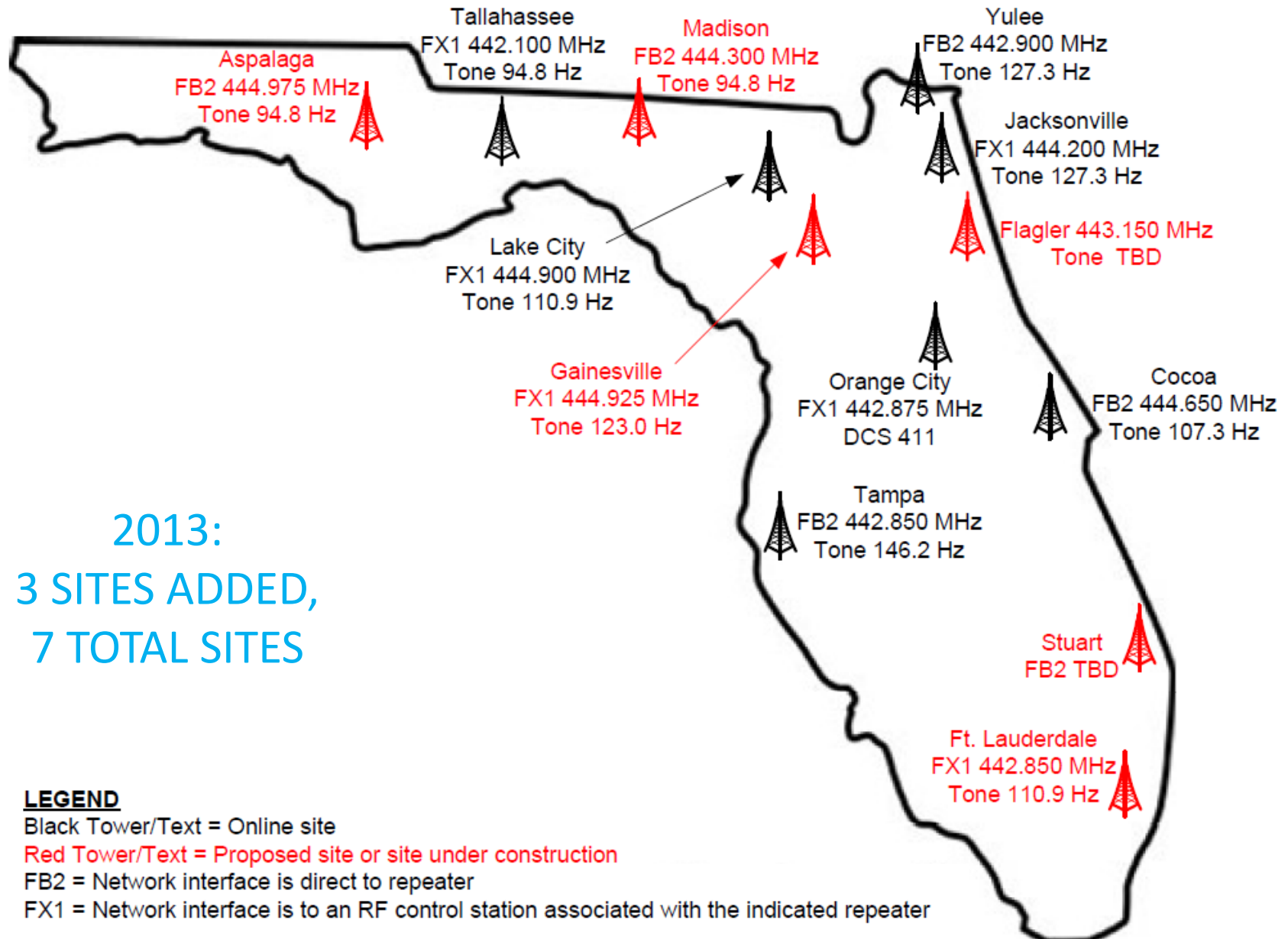
Statewide Amateur Radio Network "SARNet"

Status as of December 21, 2012



Statewide Amateur Radio Network "SARNet"

Status as of December 20, 2013



2013:

3 SITES ADDED,
7 TOTAL SITES

LEGEND

Black Tower/Text = Online site

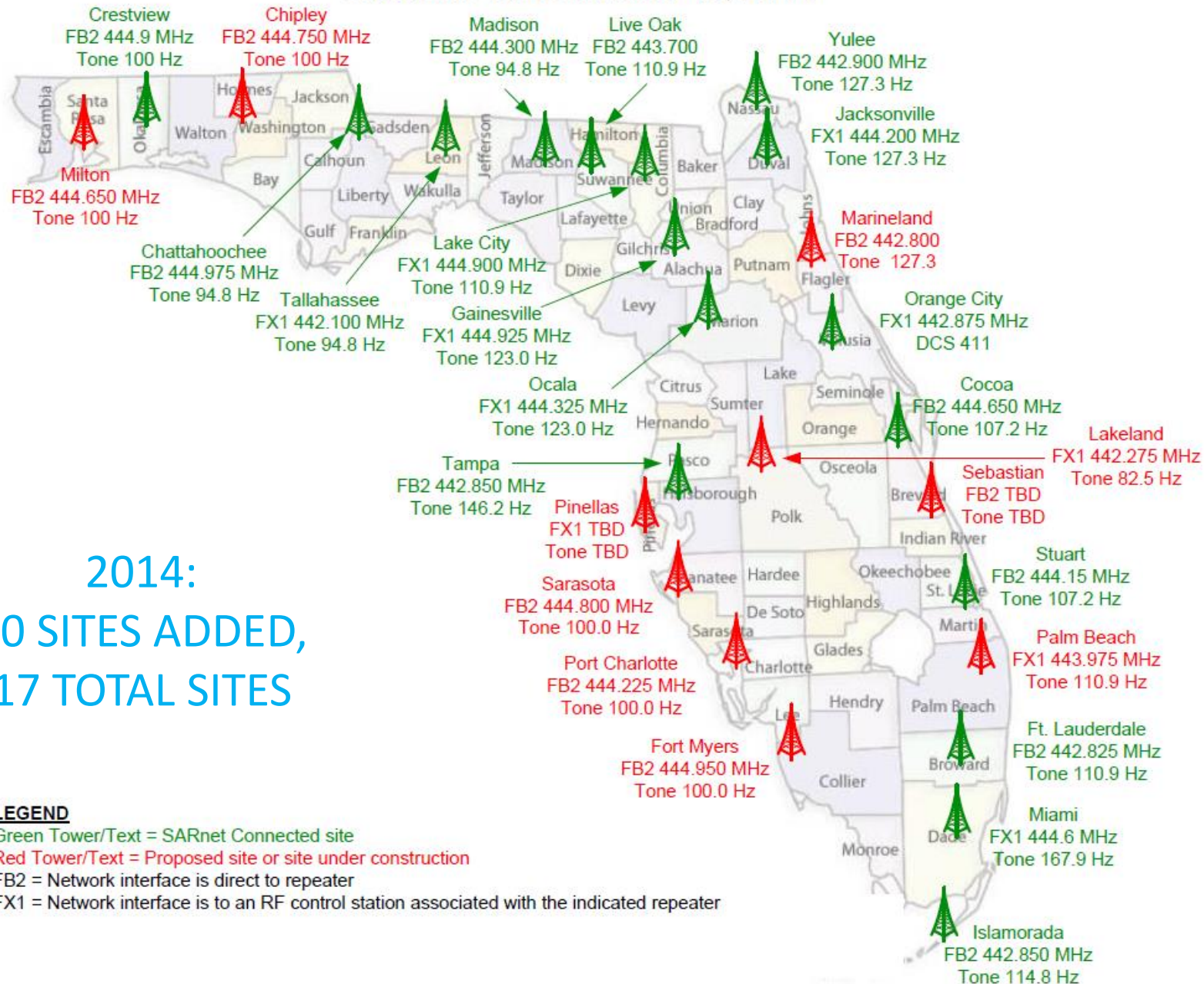
Red Tower/Text = Proposed site or site under construction

FB2 = Network interface is direct to repeater

FX1 = Network interface is to an RF control station associated with the indicated repeater

Statewide Amateur Radio Network "SARNet"

Status as of December 18, 2014



THIS IS NOT AN ACTIVE SARnet SITE STATUS MAP



LEGEND

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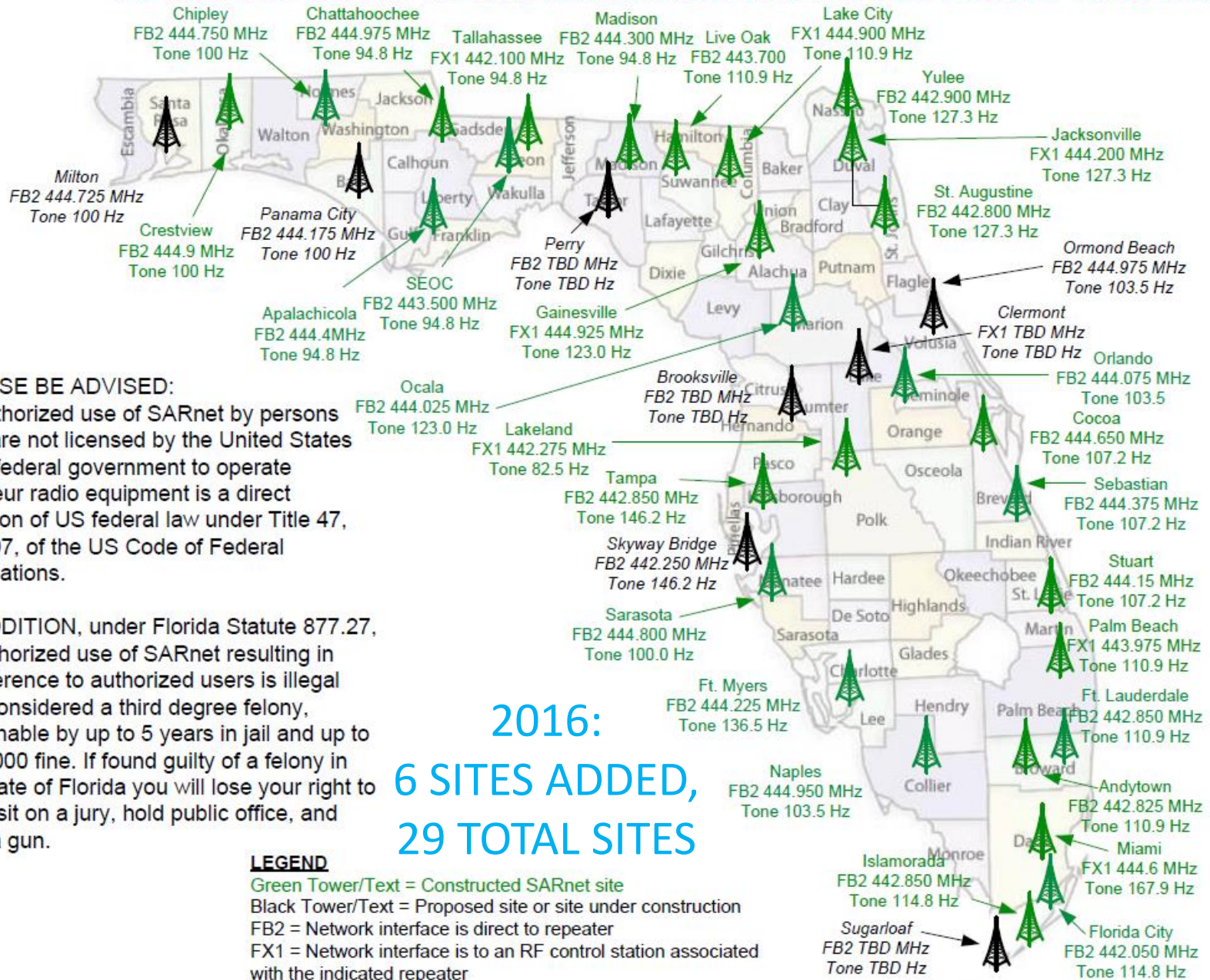
FB2 = Network interface is direct to repeater

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Statewide Amateur Radio Network "SARNet"

Constructed Sites as of November 28, 2016

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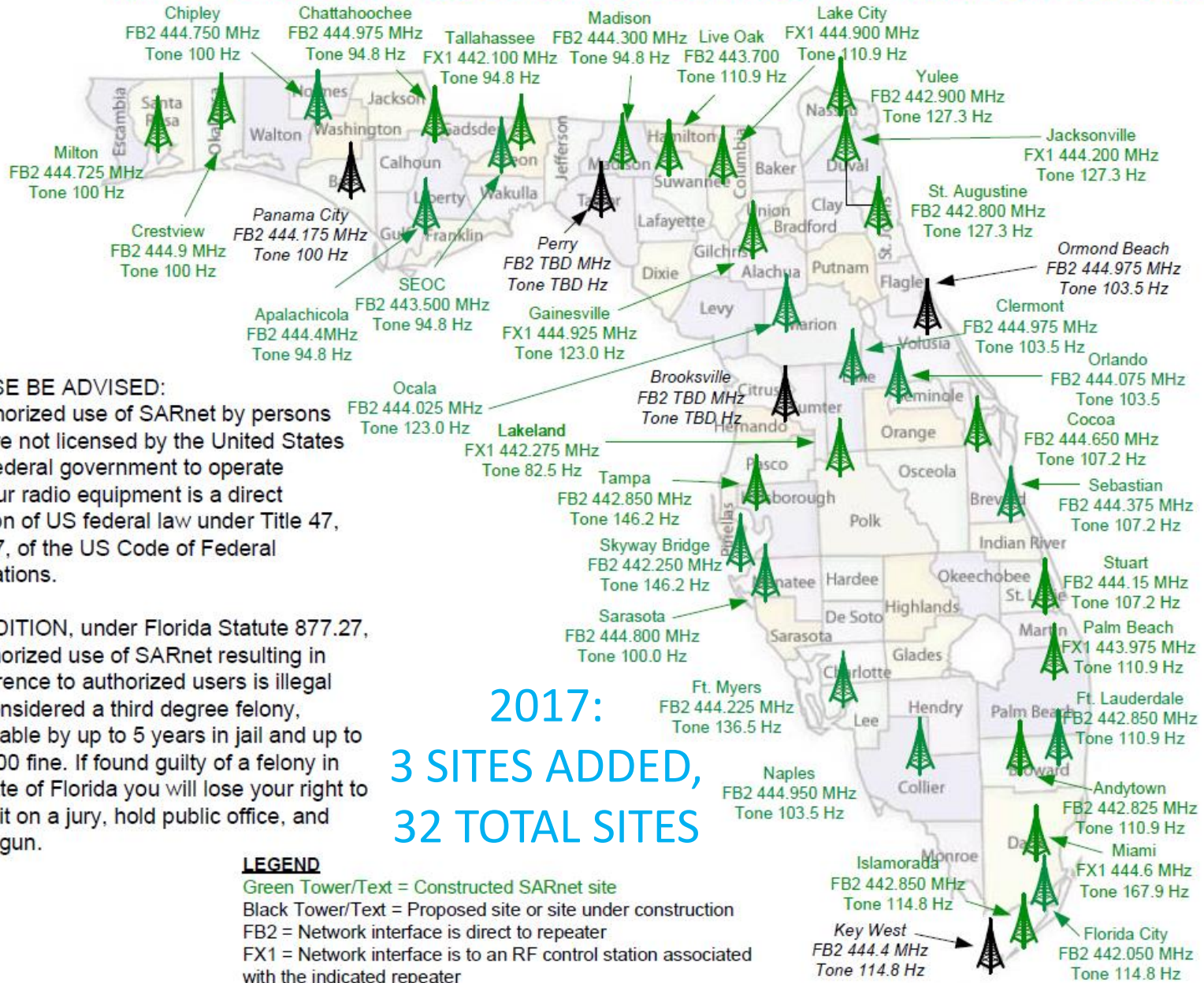
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Constructed Sites as of October 14, 2017

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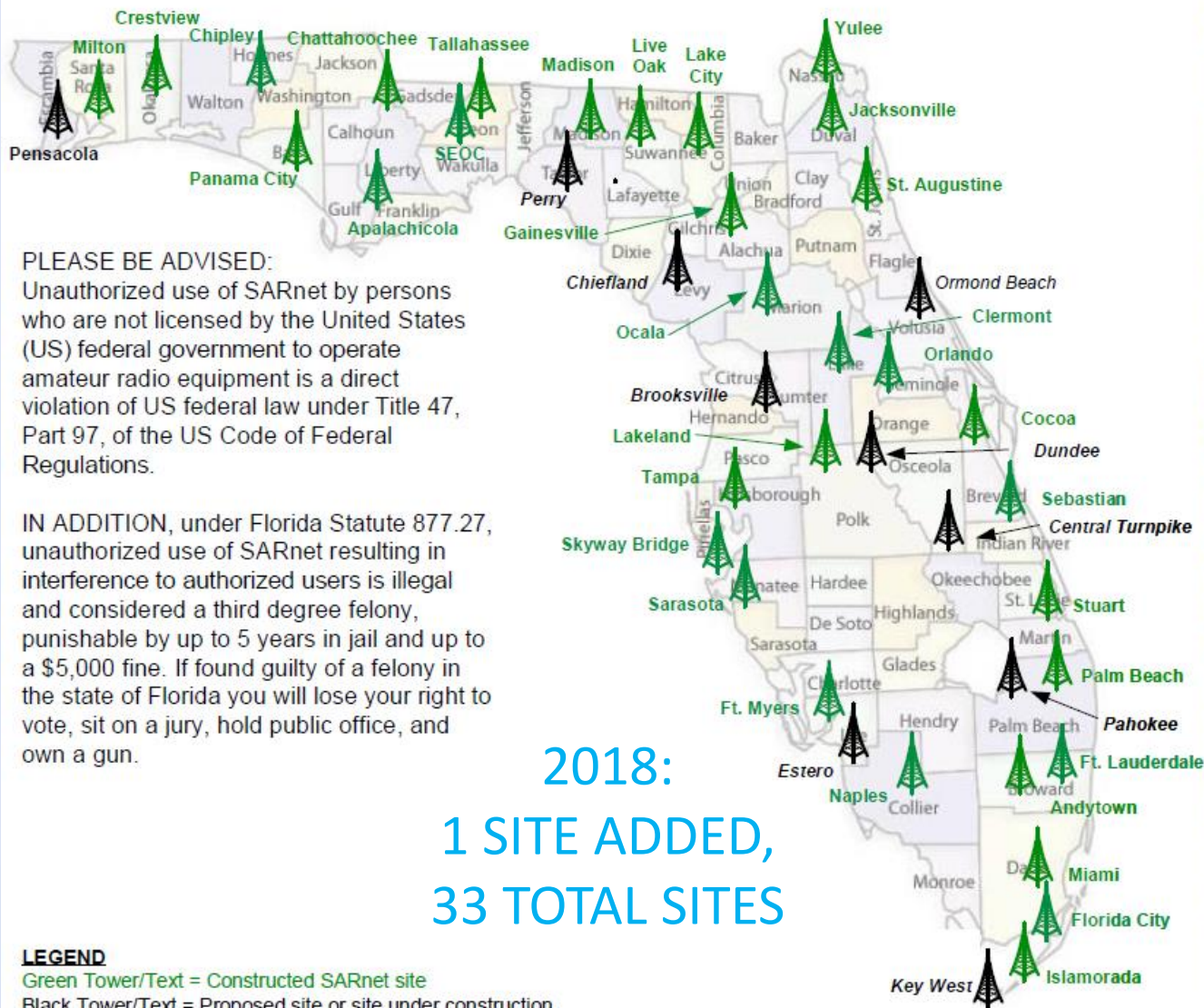
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2017: **FB24 Ton**
TES ADDED,
TOTAL SITES

Statewide Amateur Radio Network "SARnet"

Constructed Sites as of December 20, 2018

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**2018:
1 SITE ADDED,
33 TOTAL SITES**

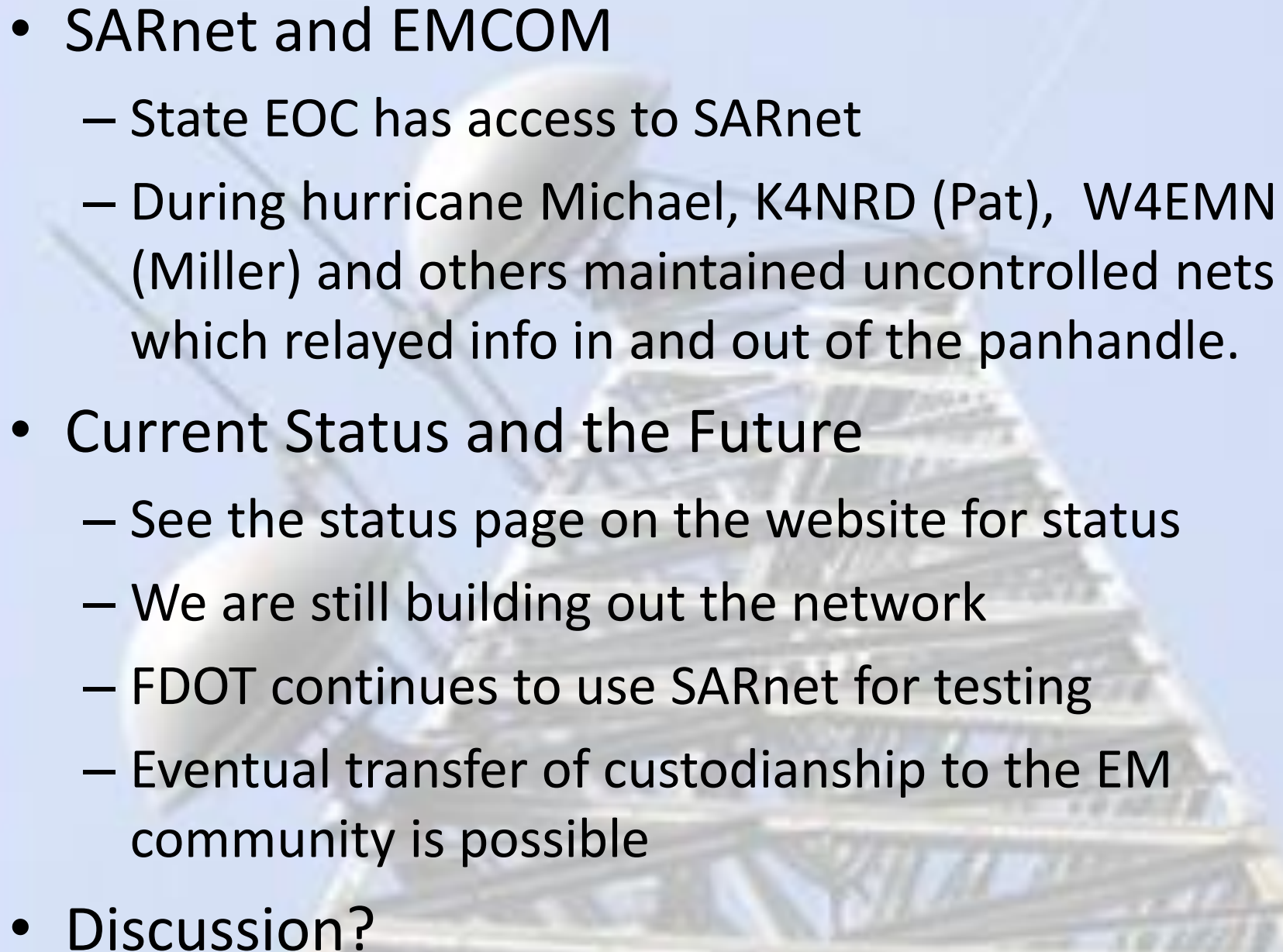
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- SARnet and EMCOM
 - State EOC has access to SARnet
 - During hurricane Michael, K4NRD (Pat), W4EMN (Miller) and others maintained uncontrolled nets which relayed info in and out of the panhandle.
 - Current Status and the Future
 - See the status page on the website for status
 - We are still building out the network
 - FDOT continues to use SARnet for testing
 - Eventual transfer of custodianship to the EM community is possible
 - Discussion?