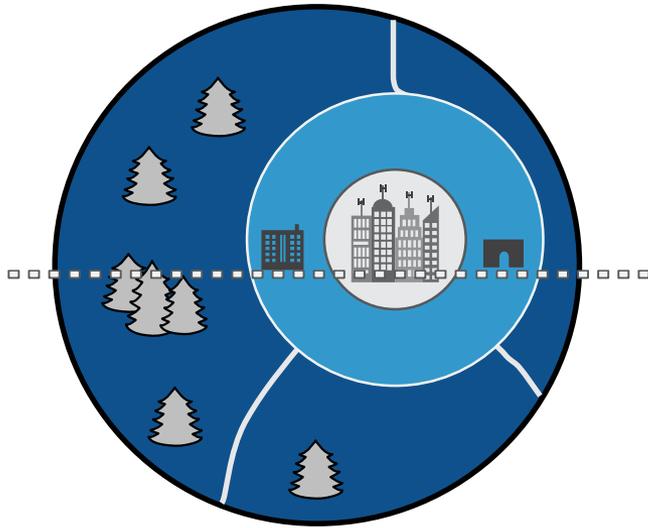


Phased Approach to Coverage



Contract Coverage	Expansion 2
	Expansion 1
	Phase 5
	Phase 3-4
	Phase 1-2



RURAL

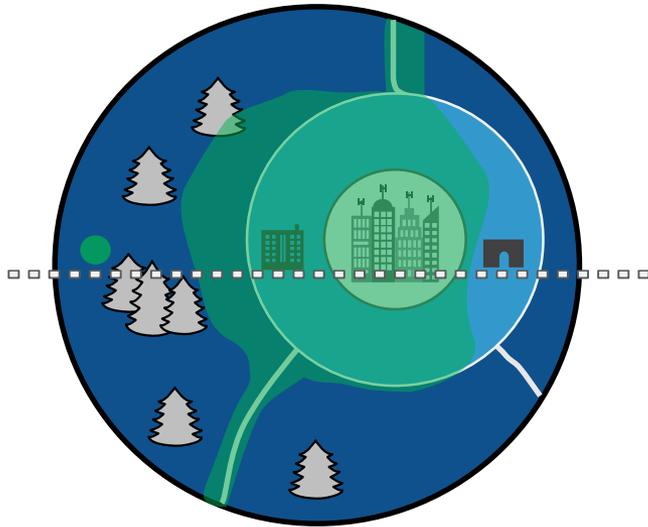
SUBURBAN

URBAN

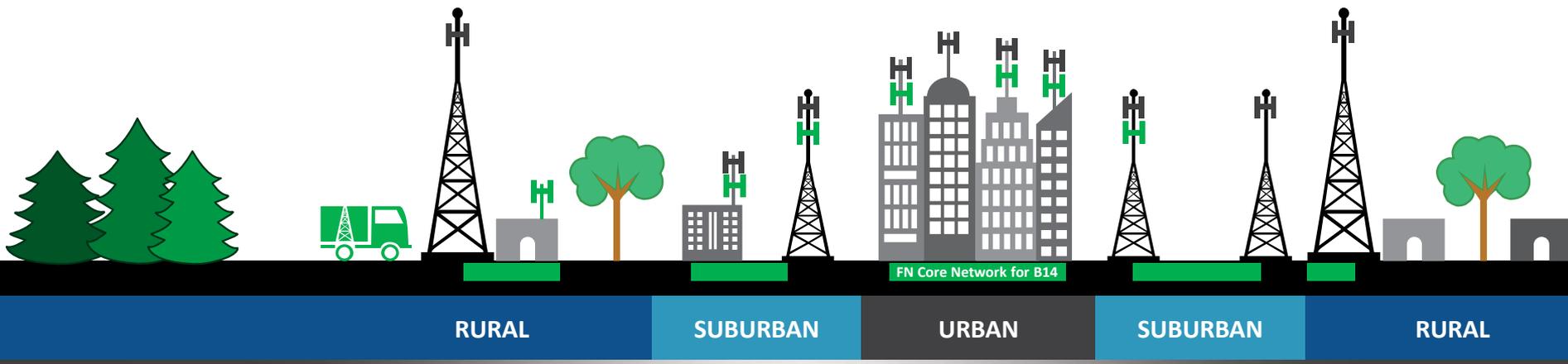
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RURAL

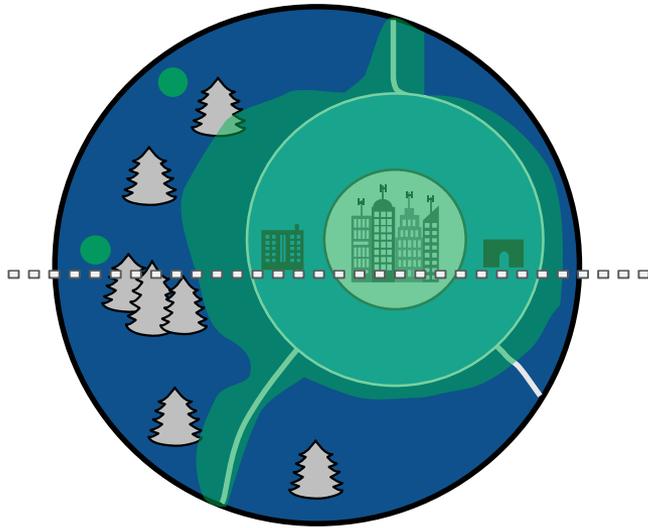
Phased Approach to Coverage



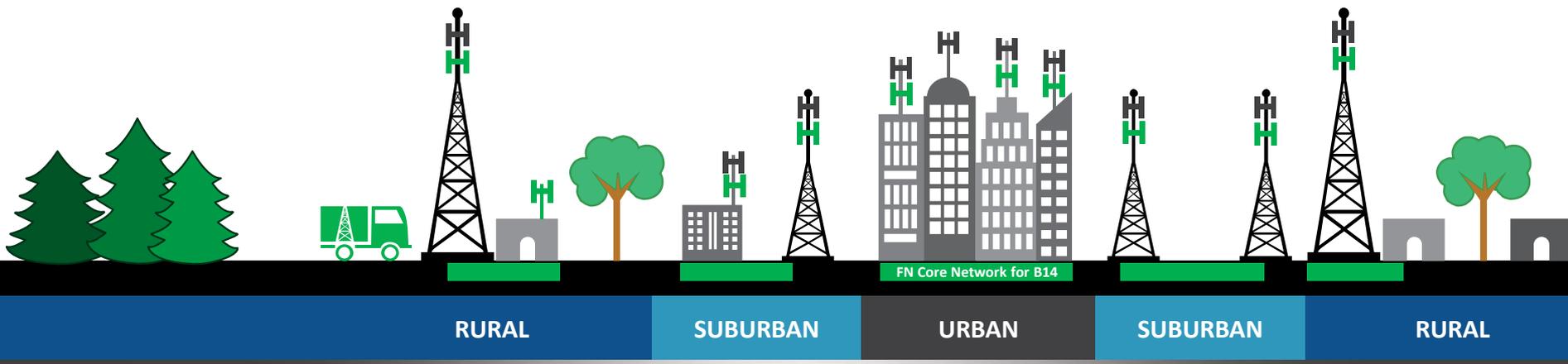
Contract Coverage	Expansion 2
	Expansion 1
	Phase 5
	Phase 3-4
	Phase 1-2



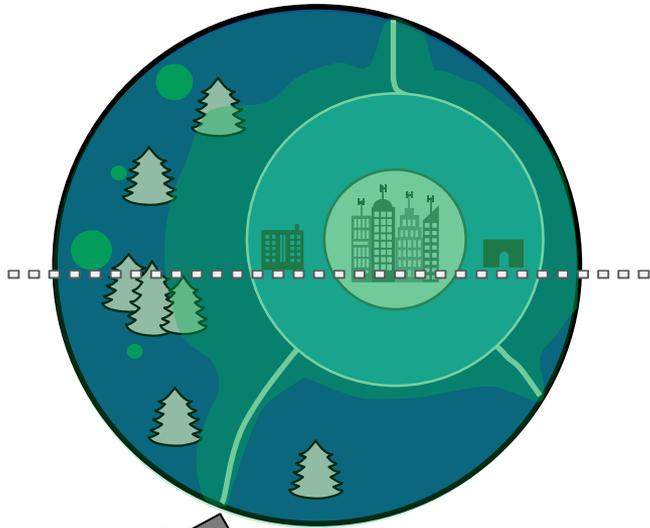
Phased Approach to Coverage



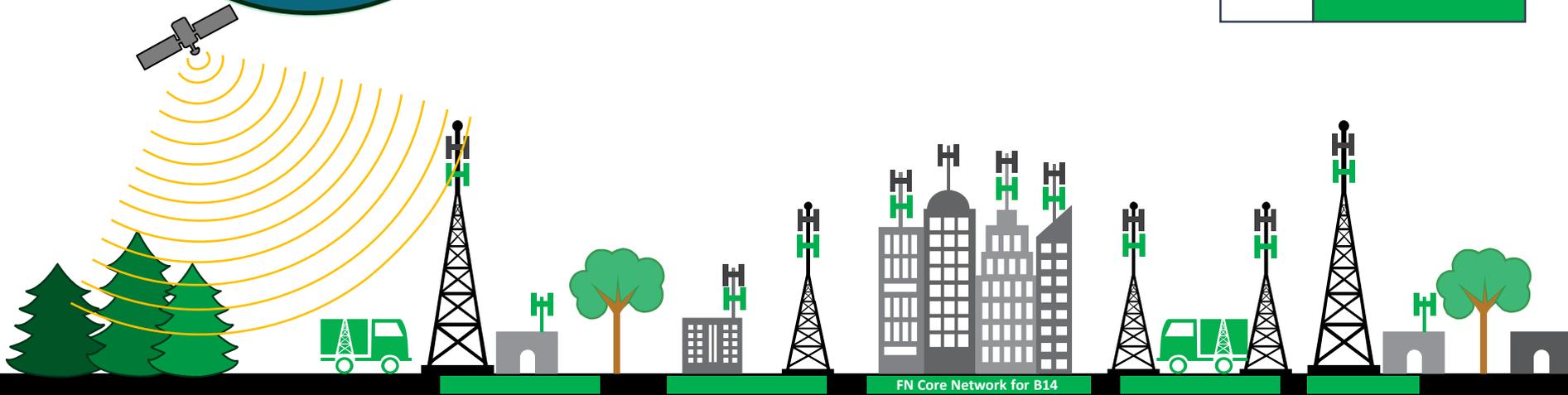
Contract Coverage	Expansion 2
	Expansion 1
	Phase 5
	Phase 3-4
	Phase 1-2



Phased Approach to Coverage



Contract Coverage	Expansion 2
	Expansion 1
	Phase 5
	Phase 3-4
	Phase 1-2



RURAL

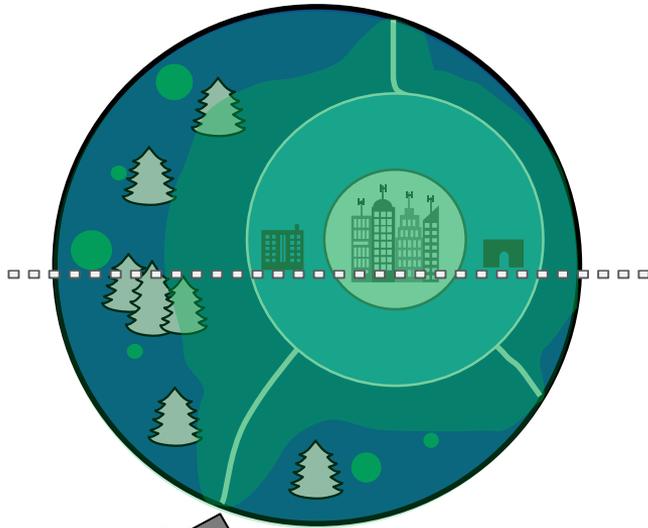
SUBURBAN

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SUBURBAN

RURAL

Phased Approach to Coverage



Contract Coverage	Expansion 2
	Expansion 1
	Phase 5
	Phase 3-4
	Phase 1-2



RURAL

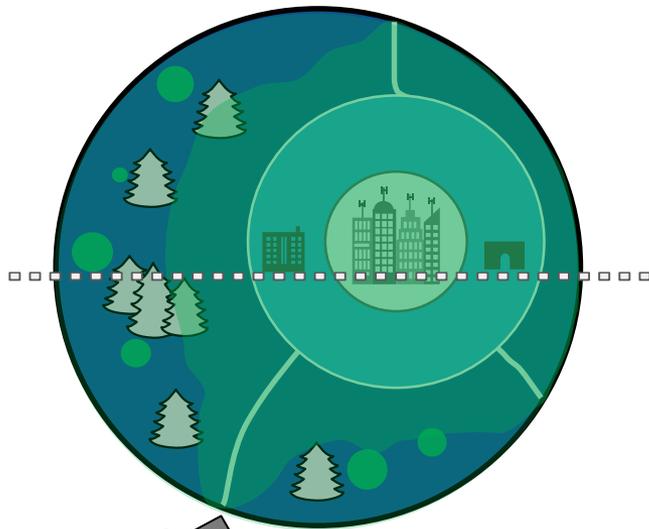
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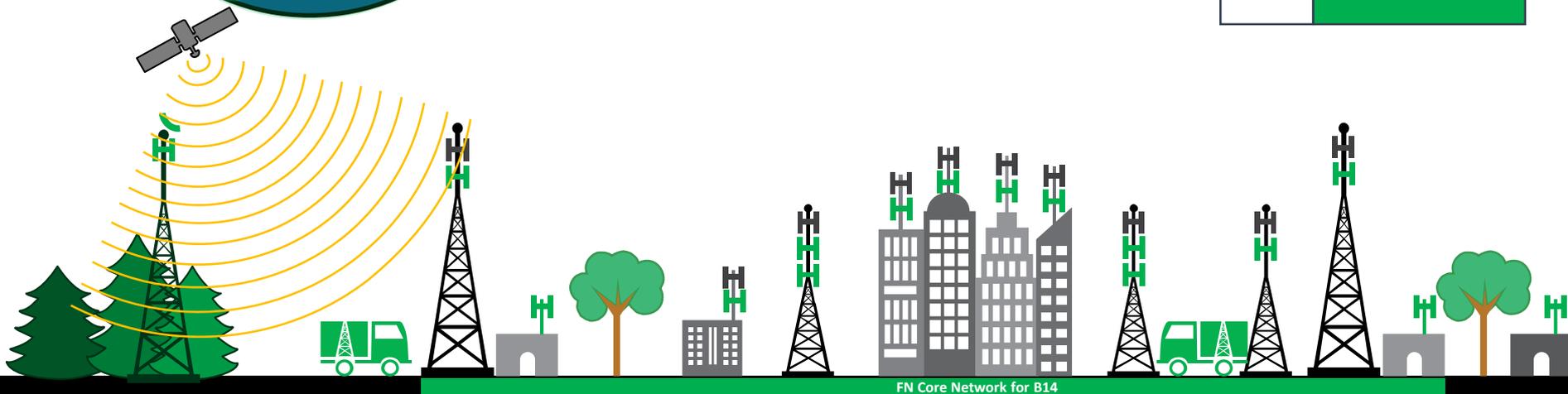
SUBURBAN

RURAL

Phased Approach to Coverage



Contract Coverage	Expansion 2
	Expansion 1
	Phase 5
	Phase 3-4
	Phase 1-2



RURAL

SUBURBAN

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SUBURBAN

RURAL

Defining Key Terms



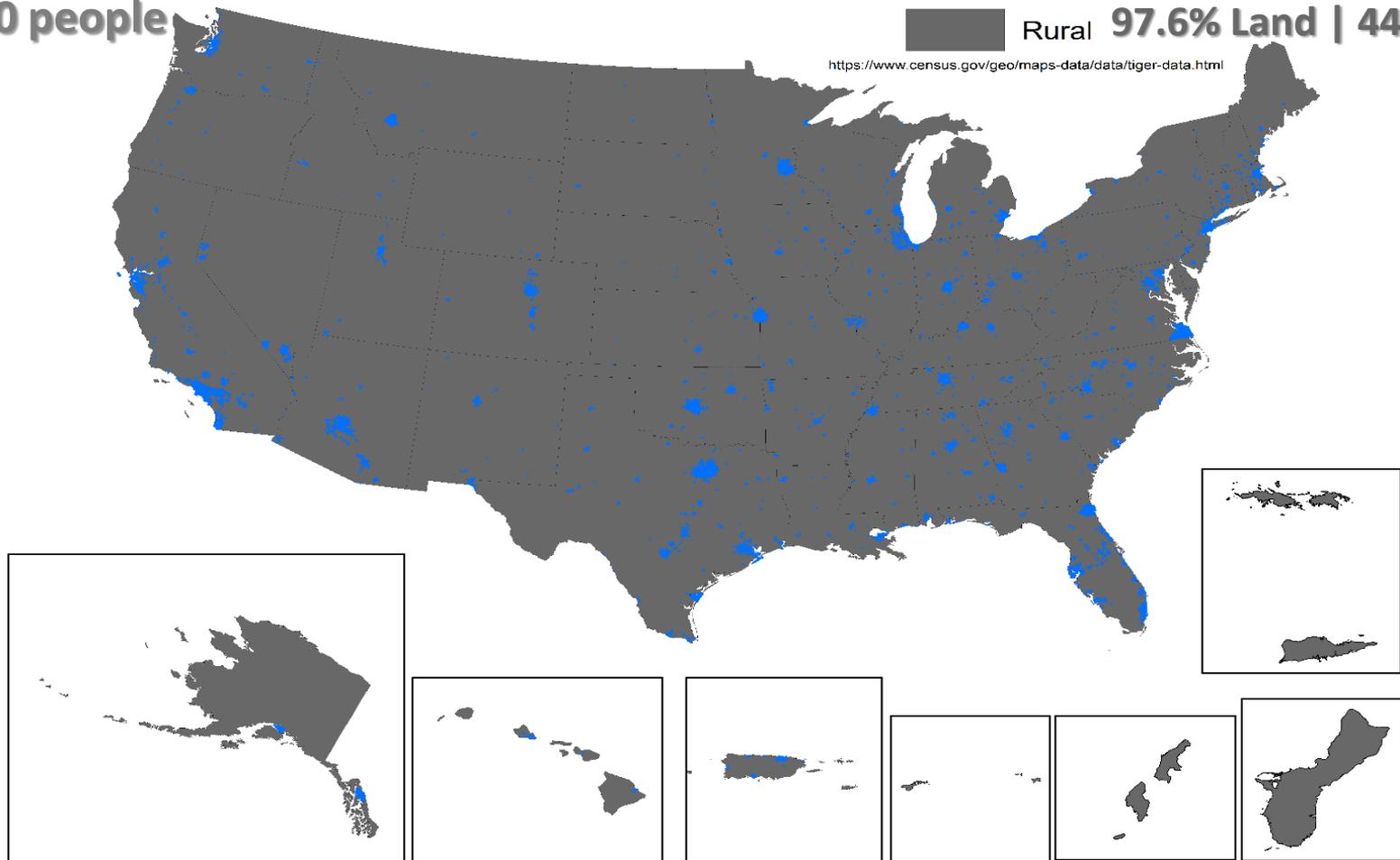
- Rural areas are ***any area other than:***
 - A city, town or incorporated area that has a population of greater than 20,000
 - Any urbanized area contiguous and adjacent to a city or town with greater than 50,000 inhabitants
- Need to define ***city, town or incorporated area and urbanized area***
 - US Census defines “places” as an incorporated place established to provide governmental functions for a concentration of people.
 - Usually a city, town, village, or borough but can have other legal descriptions
 - Also includes Census Designated Places (CDPs)
 - Source: http://www.census.gov/geo/reference/gtc/gtc_place.html#cdp
- US Census “Place” provided appropriate areas representing population centers with associated population counts in which to apply the above rules

Mapping the Results

All US Census Places >20,000 & adjacent to
>50,000 people

Urban 2.4% Land | 55.8% Pops
Rural 97.6% Land | 44.2% Pops

<https://www.census.gov/geo/maps-data/data/tiger-data.html>



(1) Coverage Objectives



Stakeholder Inputs Critical to Inform FirstNet Planning



Coverage

Where?

- Where Needed (Objectives)
- Different Device Types
- Throughput levels

Capacity

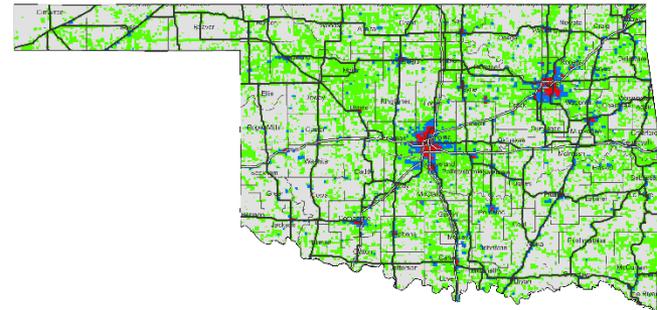
How Much?

- # of Users and Devices
- Application Usage
- Data Consumption

FirstNet Financial Team

- Request for Proposals (RFP) Development/Evaluation
- Economic Modeling

FirstNet
Baseline



FirstNet Engineering Team

- RFP Development/Evaluation
- Core, radio access network (RAN) and Devices

FirstNet's Coverage Objective Goals



- **GOAL:** *Come up with a consistent, nationwide starting point to objectively identify Public Safety's coverage desires -- update through Consultation*

- 1. Set a FirstNet Nationwide Coverage Objective Baseline as a starting point
 - ❑ Identify initial coverage objectives relevant to Public Safety's desires
 - ❑ Develop a systematic, consistent and objective approach applied nationwide
 - ❑ Leverage feedback from the Office of Emergency Communications' (OEC's) Coverage Workshops
 - ❑ Generate maps to document the starting point

- 2. Facilitate coverage discussion for a phased build out
 - ❑ Include additional data to tailor needs for each state
 - ❑ Modify based on stakeholder input and feedback

FirstNet Envisions Continued Discussion and Revisions on Coverage Beyond Delivery of a State Plan

Starting Coverage Objectives Data



1. Public Safety User Population *(Source: HSIP, OEC provided)*

- **Public Safety User Density** based on jurisdiction (OEC data to start)

2. Public Safety High Risk / Areas of Interest *(Source: HSIP)*

- **Key facilities** – PS agencies, corrections, airports, EOCs, hospitals, PSAPs, schools, etc.
- **Critical infrastructure** – manufacturing, energy, dams, etc.
- **Large Public Venues** – stadiums, theme parks, malls
- **Other major event locations** – if provided with initial consultation submission
- ***Area for feedback** – tourist/recreational destinations (parks, hiking, waterways, etc.)

3. US Population *(Source: 2010 US Census)*

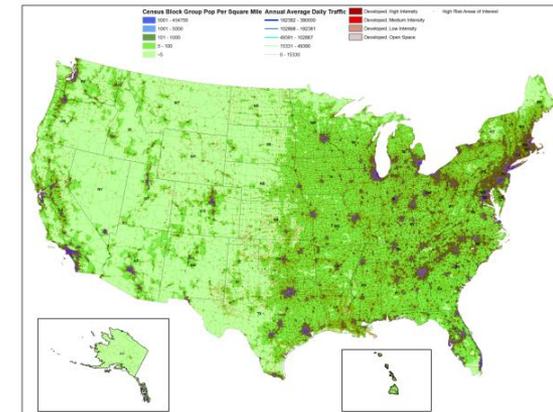
- **Population density**

4. Developed Areas / Buildings *(Source: 2011 National Land Cover Database)*

- **Dense / Medium / Light / Open / None**

5. Roadways *(Source: Federal Highway Administration)*

- **National Highway System**
- **Average Daily Traffic Counts** to identify significant secondary roadways



6. Tribal Land

7. Rural Metrics

8. Federal Land

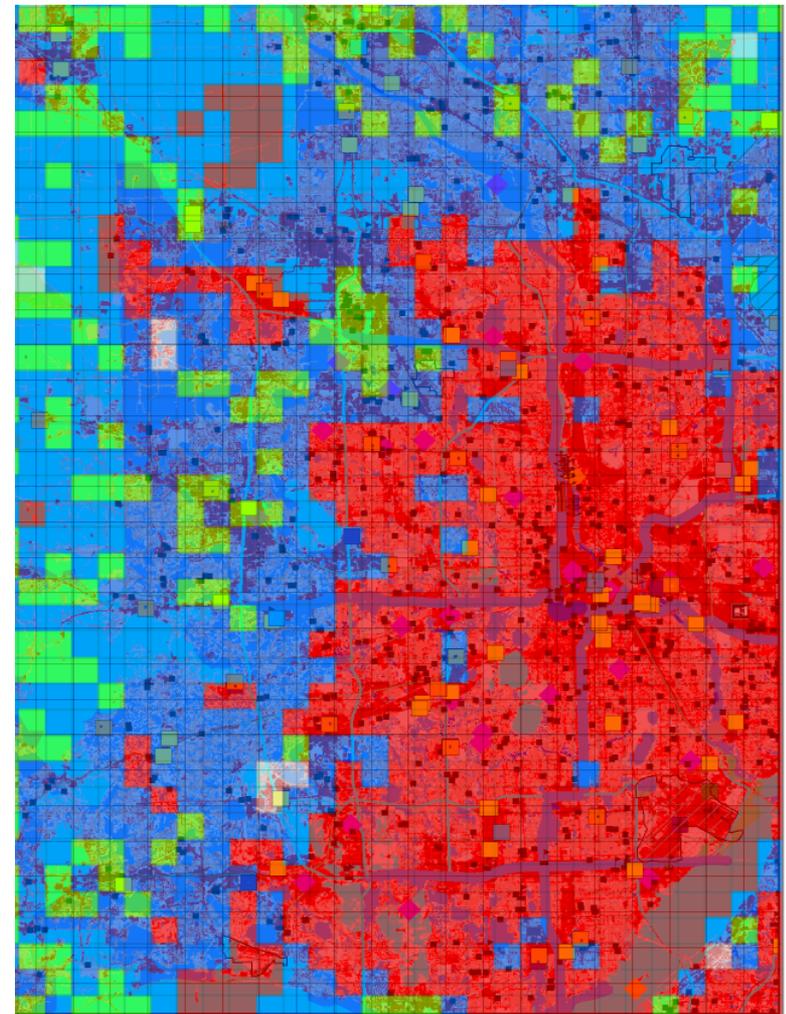


These will be incorporated with additional considerations (i.e. FirstNet Rural milestones) or via separate consultation (i.e. Federal)

Converting Data into Coverage Objectives



1. Employee count of Law Enforcement, Fire, EMS agencies
 2. Public Safety High Risk / Areas of Interest
 3. US Population
 4. Developed Areas / Buildings
 5. Roadways
- A lot of data in different formats
 - Points, lines, polygons, etc.
 - To evaluate these broad datasets, applied a 1x1 mile grid for uniformity
 - Evaluated all data by grid to:
 - 1) Identify areas that had data of interest to Public Safety
 - 2) Show concentration areas



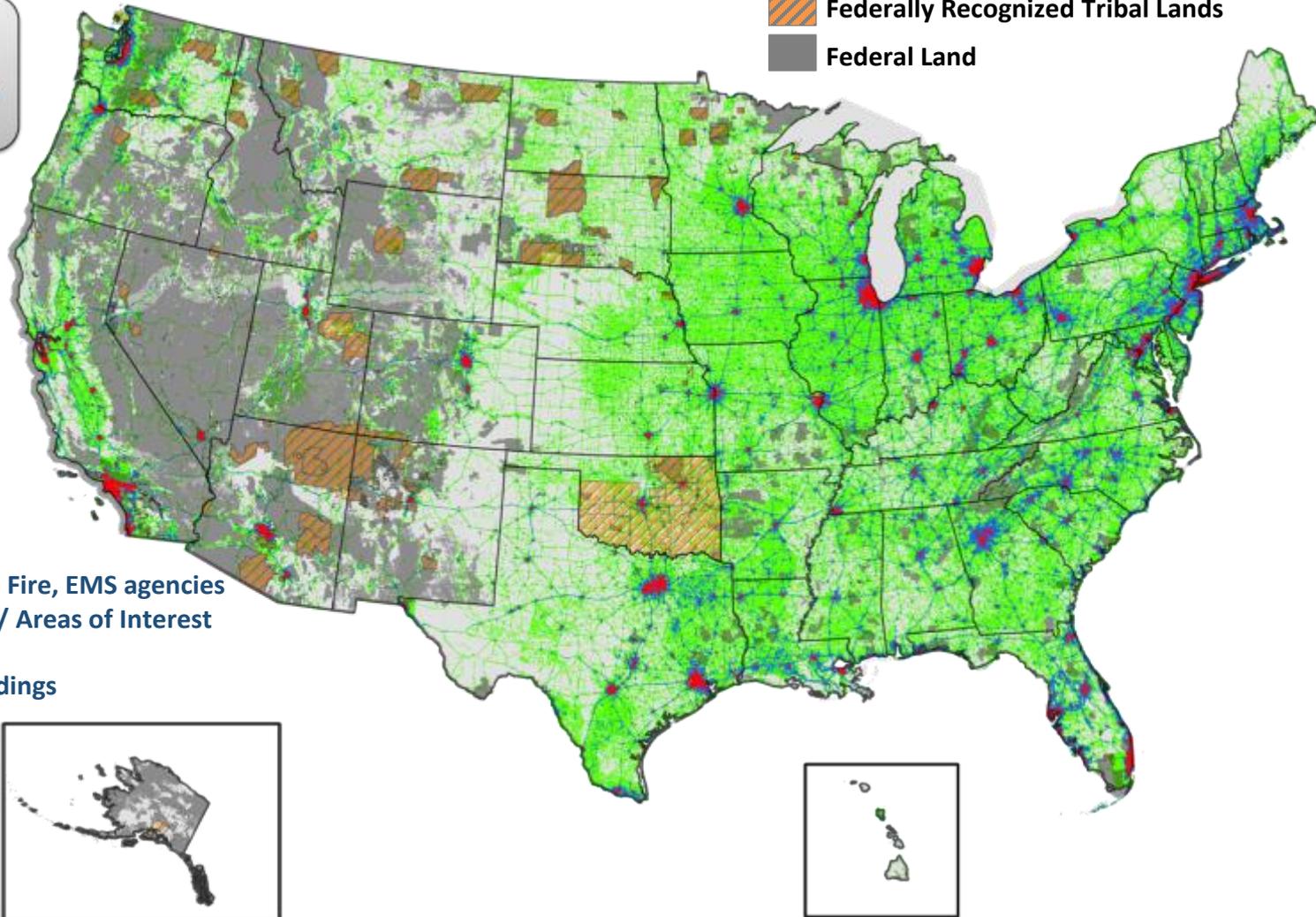
Nationwide Coverage Objective



Legend:

- High Concentration
- Moderate Concentration
- Low Concentration

- Federally Recognized Tribal Lands
- Federal Land



1. Employee count of L.E., Fire, EMS agencies
2. Public Safety High Risk / Areas of Interest
3. US Population
4. Developed Areas / Buildings
5. Roadways

Oklahoma Coverage Baseline



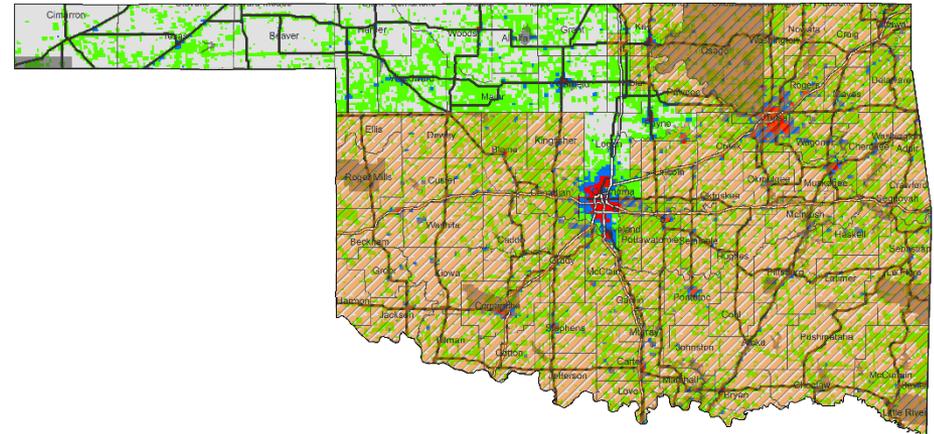
1. Employee count of L.E., Fire, EMS agencies
2. Public Safety High Risk / Areas of Interest
3. US Population
4. Developed Areas / Buildings
5. Roadways

Legend:

-  High Concentration
-  Moderate Concentration
-  Low Concentration

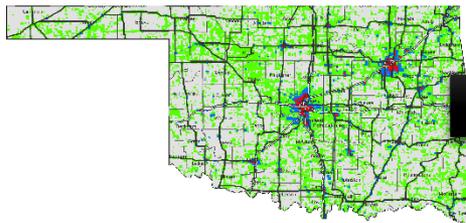
-  Federally Recognized Tribal Lands
-  Federal Land

-  High Concentration
-  Moderate Concentration
-  Low Concentration



Where are Changes Needed?

Baseline Coverage Objective



High Concentration
Moderate Concentration
Low Concentration

State to Modify During Consultation

- ✓ Calls for Service Data
- End User Local knowledge
- Tourist/Recreational Areas
- Evacuation Routes
- Large Temporary Venues
- Mass Transit Routes
- Highly Navigable Waterways
- Etc.

Modified Coverage Objective



(2) Users and Operations



Estimate Total Eligible Users



Totals (*Estimated*)

Discipline	# Agencies	# Users	Adoption	# Devices	Ave. Usage
LE	250	15,000	90%	22,500	4 GB/mo
Fire	300	20,000	80%	20,000	2 GB/mo
EMS	125	5,000	95%	7,500	3 GB/mo
Emergency Mgmt	50	2,000	80%	4,000	1 GB/mo
Transportation	25	3,500	70%	3,500	1 GB/mo
Other	450	25,000	60%	12,500	2 GB/mo

Estimate from User Surveys

* Sample data only

Estimate Operational Areas



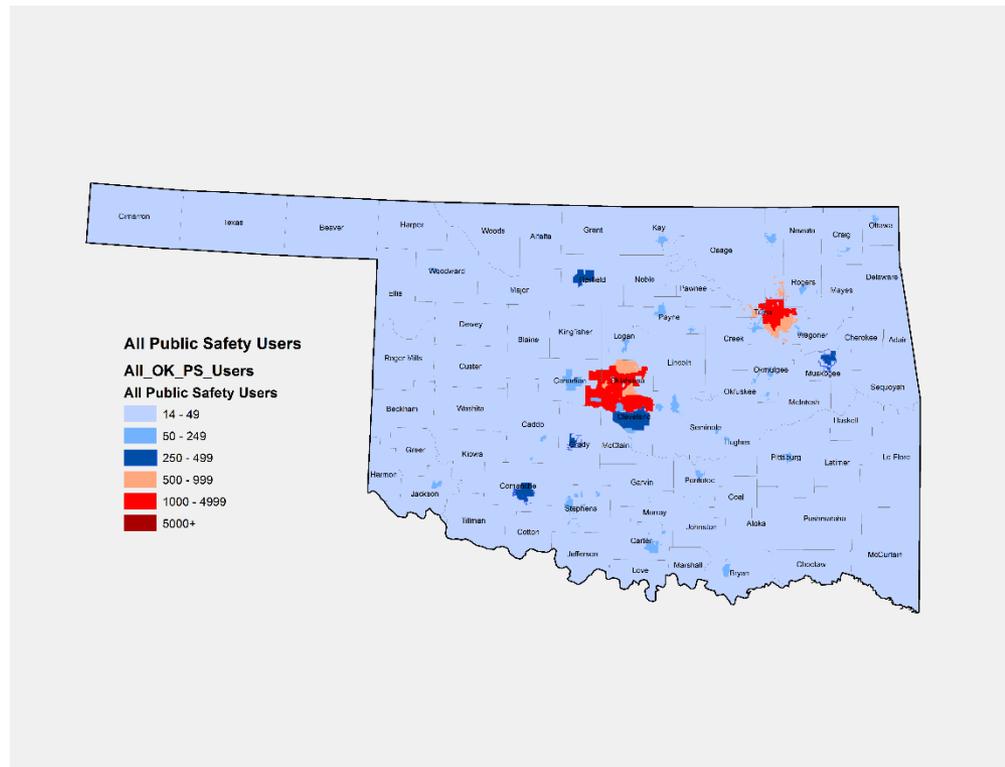
Totals (Estimated)

Discipline	# Agencies	# Users	# Devices
LE	250	15,000	22,500
Fire	300	20,000	20,000
EMS	125	5,000	7,500
Emergency Mgmt	50	2,000	4,000
Transportation	25	3,500	3,500
Other	450	25,000	12,500

* Sample data only



User Density by Operational Area



(3) Capacity Planning



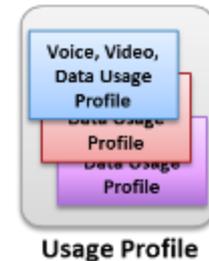
Application Survey

- Current application usage
- Frequency of use
- Desired applications
- Estimate of data consumption



Traffic Profiles (Case Studies)

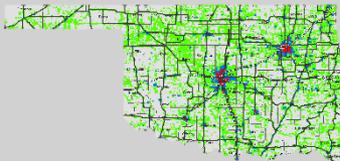
- Quantify usage for specific use cases
- Vary by
 - Incident Types
 - Discipline
 - Area
- Important Metrics
 - Number of responders and devices
 - Type of responders (discipline)
 - Location of responders
 - Variability by incident types and scale
 - Upload vs. Download
 - Data usage by application
 - Time data sent



Law Enforcement User
xxx kbps voice calls
xxx kbps video
xxx kbps other data
xxx kbps total usage

Combining All the Inputs

(1) Coverage Objectives



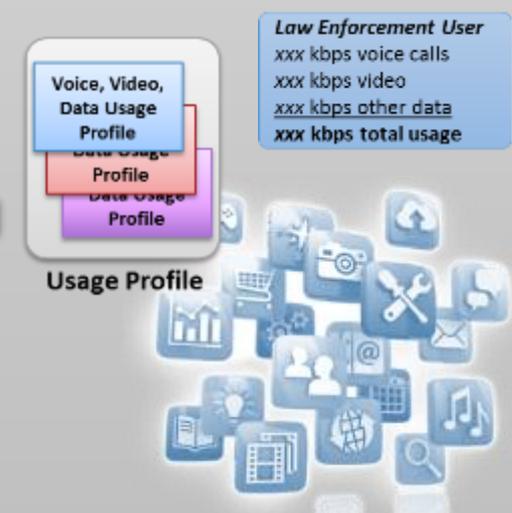
(2) Users & Operations

Totals (Estimated)

Discipline	# Agencies	# Users	# Devices
LE	250	15,000	22,500
Fire	300	20,000	20,000
EMS	125	5,000	7,500
Emergency Mgmt	50	2,000	4,000
Transportation	25	3,500	3,500
Other	450	25,000	12,500



(3) Capacity Planning



==> Inputs to RAN Design and State Plan
Representative of State's Needs

(4) Current Service / Procurement



How do Agencies do Business Today?



- Identify major procurement vehicles / options
- Identify different service plan types and costs
- Capture any specialized services
 - Cells on Light Trucks (COLTs)/Cells on Wheels (COWs), network interfaces/customization, etc.
- Identify current barriers

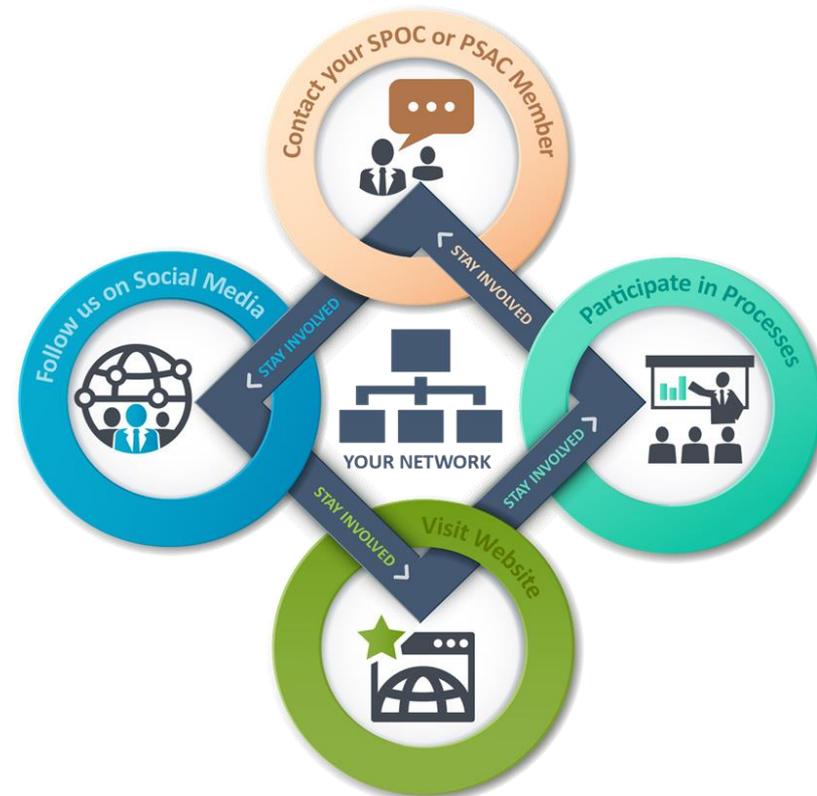


Stay Connected with FirstNet



- The FirstNet **website** (www.firstnet.gov) provides valuable information, including:
 - Program background and procurement information
 - Fact sheets, Presentations
 - Blogs
 - SPOC and PSAC information
 - FirstNet Board meeting materials.
- FirstNet's **social media** accounts are key resources for keeping stakeholders informed on the latest FirstNet news.

-  Twitter (@FirstNetGov)
-  Google+ (+FirstNetGov)
-  YouTube (FirstNetGov)
-  Flickr (FirstNetGov)
-  LinkedIn (First Responder Network Authority)





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Thank You

