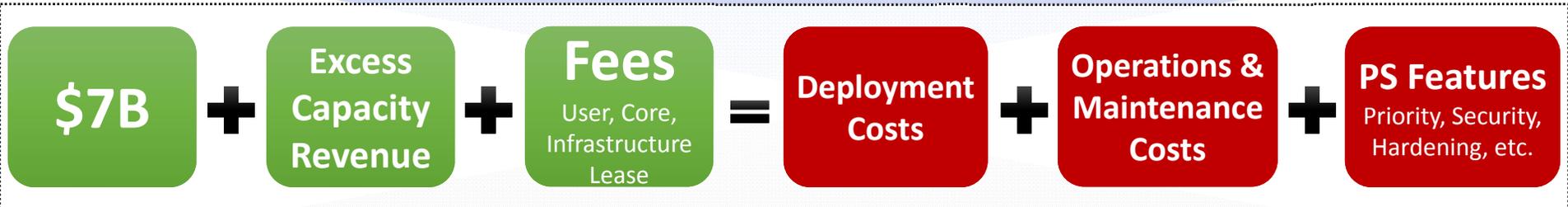


FirstNet Data Collection

Initial Consultation Meeting with California



Need State Specific Inputs



Stakeholder Inputs Critical to Inform FirstNet Planning



Coverage

Where?

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

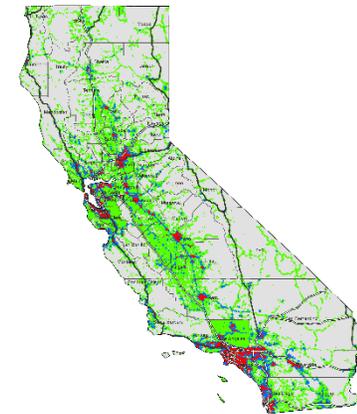
Capacity

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

Agency Data Collection Categories



Coverage

Potential Agency Role:

- Participate in State survey process
- Provide additional information on data usage if applicable/ available

Current Operations

Potential Agency Role:

- Review baseline & identify gaps in your area
- Provide CAD or other data to help inform coverage objective
- Provide input on State's phasing approach

(1) Coverage Objectives



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)*

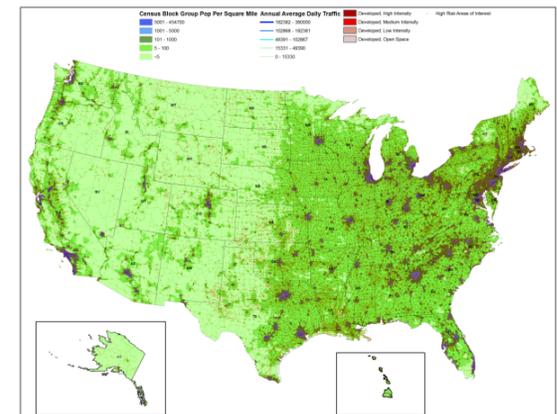
- **Population density**

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

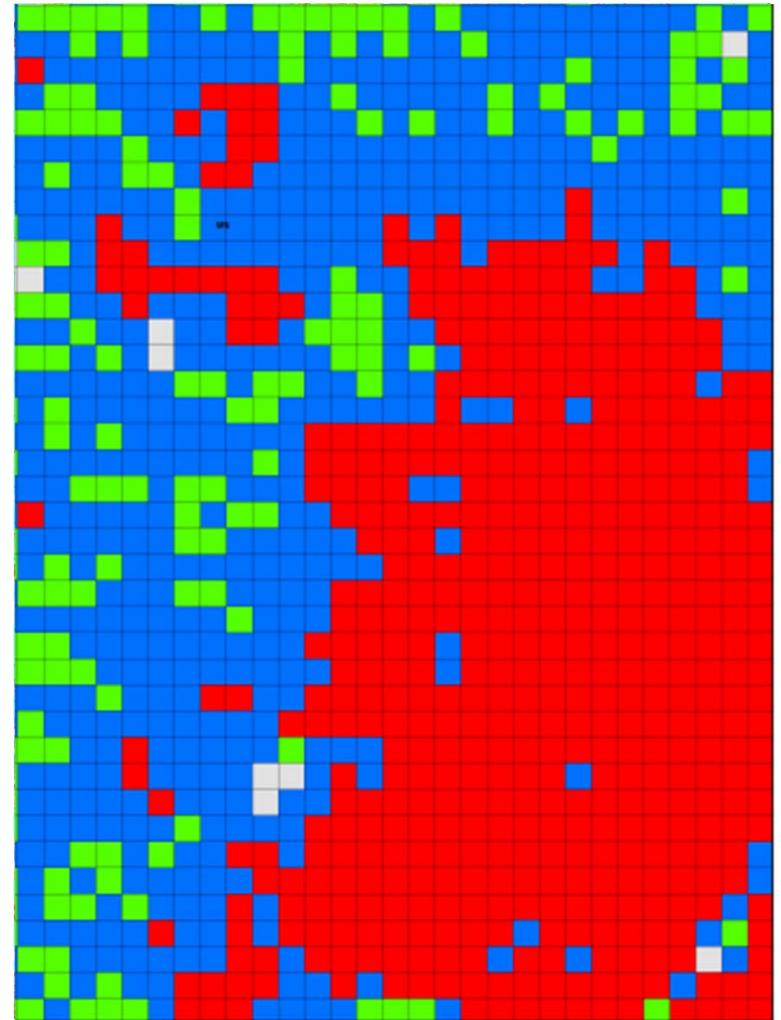


These will be incorporated with additional considerations (i.e. FirstNet Rural milestones) or via separate consultation (i.e. Federal)

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



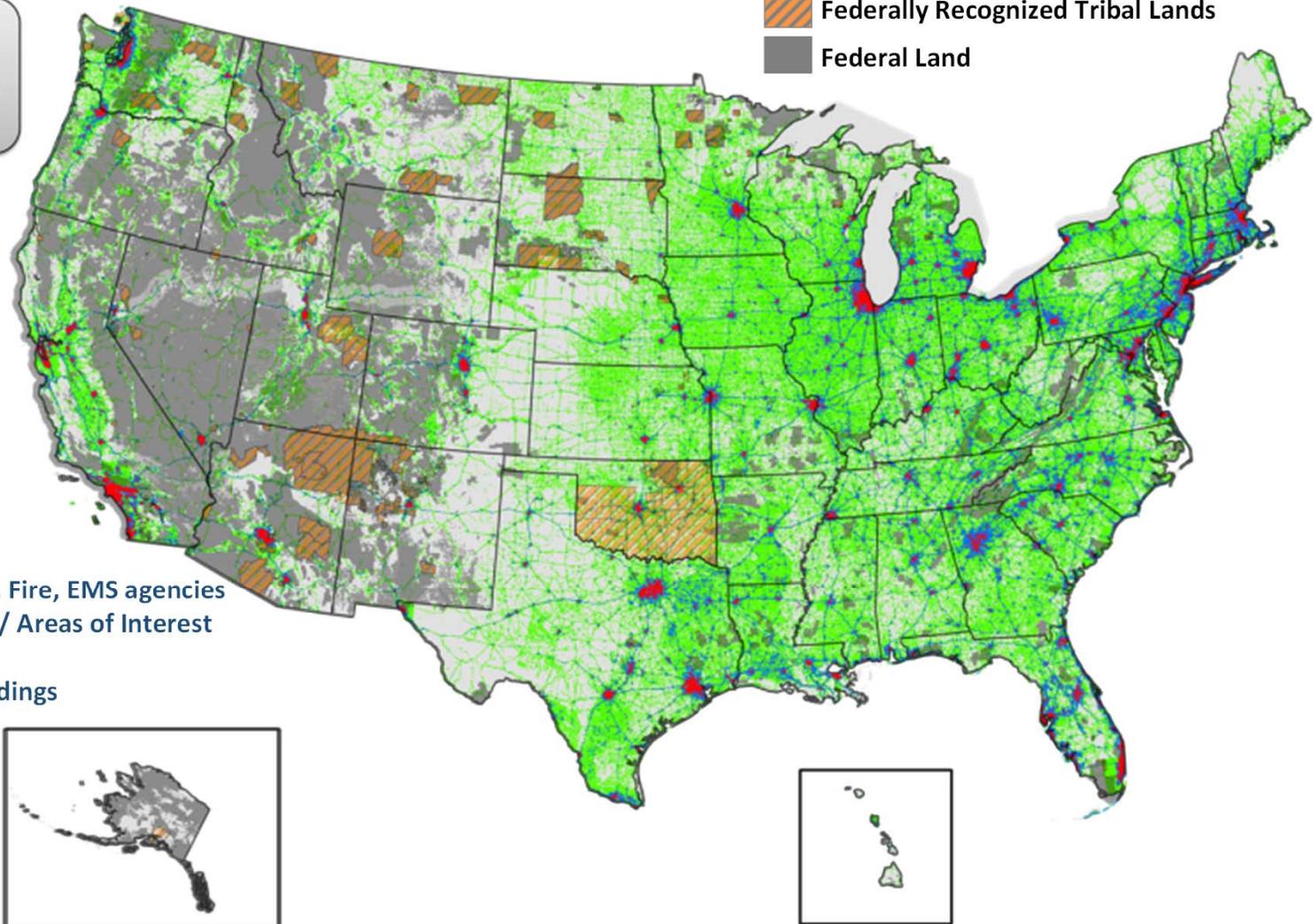
Nationwide Coverage Objective



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

California 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:

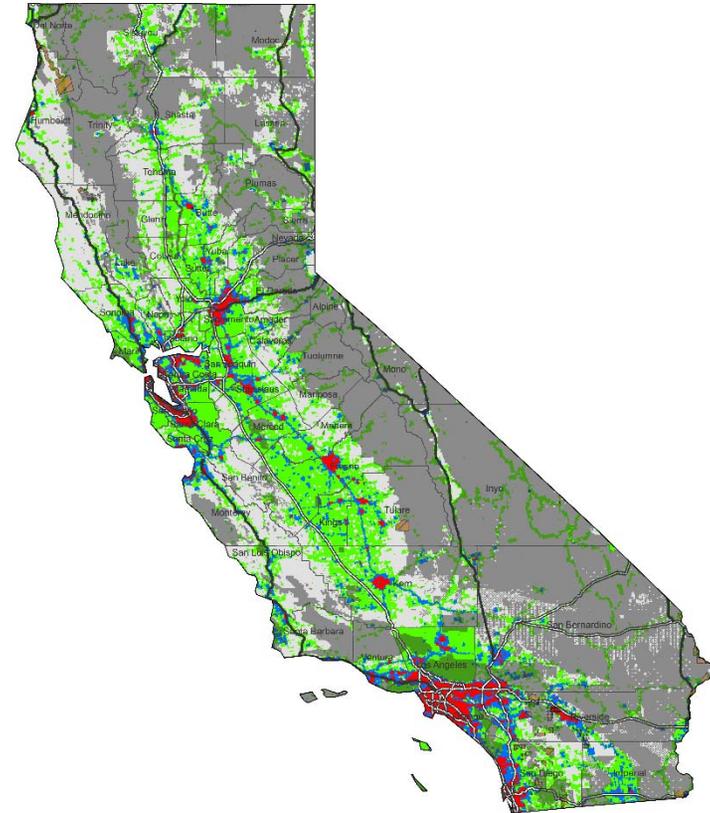
 High Concentration

 Moderate Concentration

 Low Concentration

 Federally Recognized Tribal Lands

 Federal Land

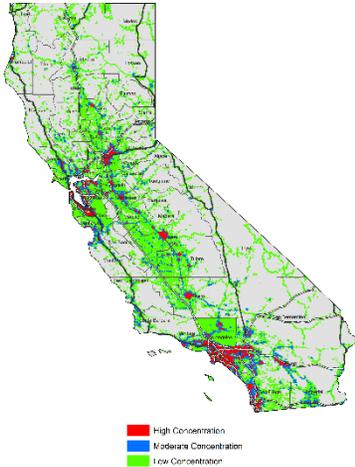


 High Concentration
 Moderate Concentration
 Low Concentration

Where are Changes Needed?



Baseline Coverage Objective



State to Modify During Consultation

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

Modified Coverage Objective



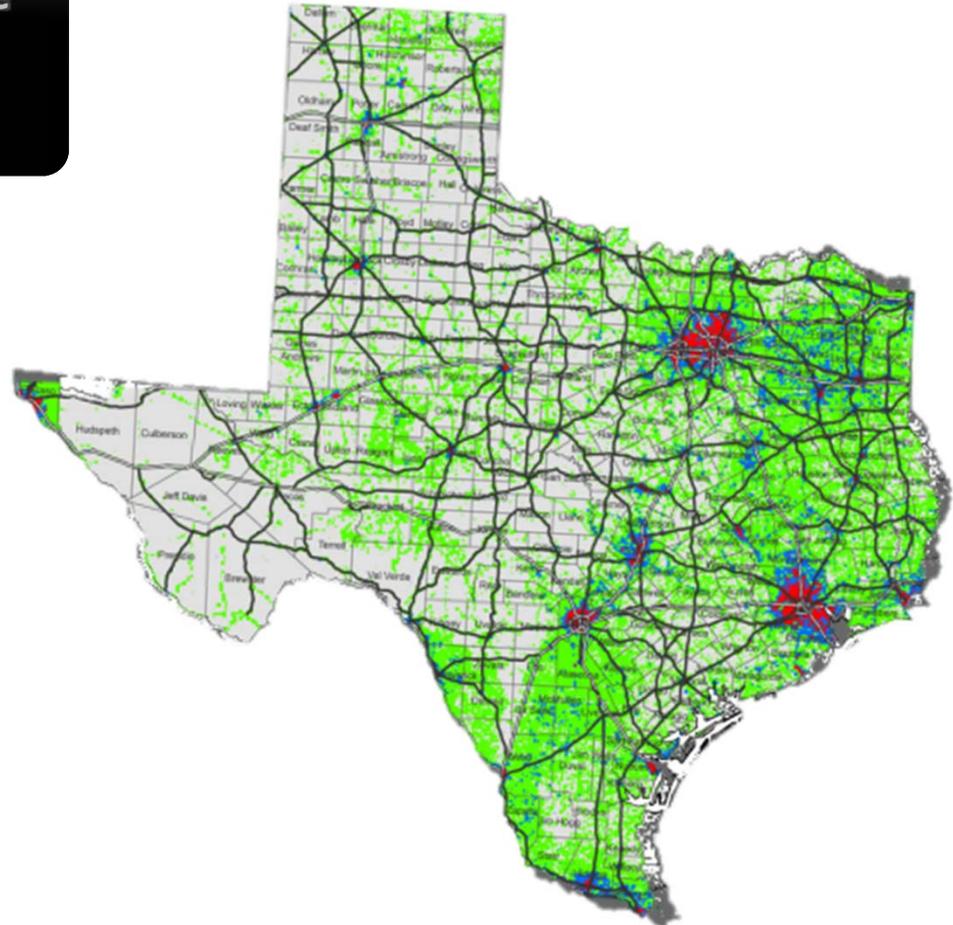
FirstNet's Coverage Objective as a Starting Point



LEGEND

-  FirstNet Coverage Objective Baseline
-  PSAP Call Data
-  Urban Areas / Urban Clusters

**FirstNet Coverage
Objective Baseline
(Single Color)**

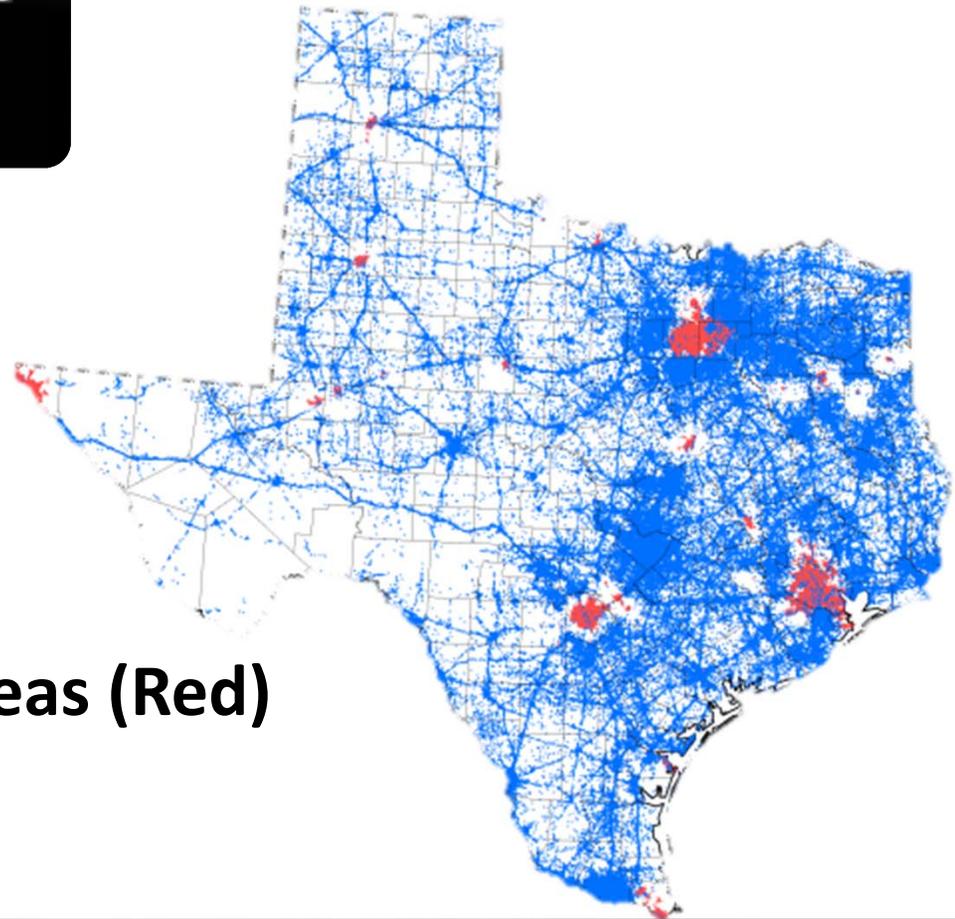


Evaluating FirstNet's Coverage Objective



LEGEND

- FirstNet Coverage Objective Baseline
- PSAP Call Data
- Urban Areas / Urban Clusters



PSAP Call Data

- 1 Year of Data
- Excludes some Urban Areas (Red)

Evaluating FirstNet's Coverage Objective

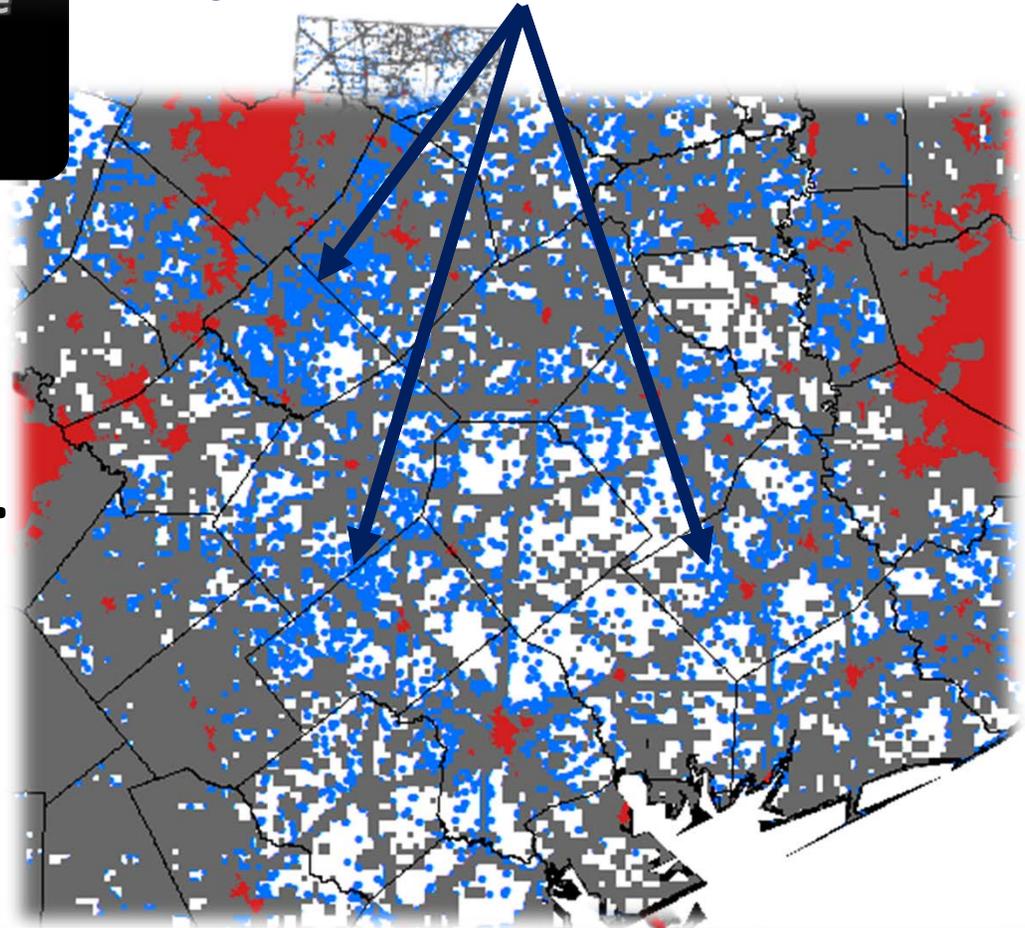


LEGEND

- FirstNet Coverage Objective Baseline
- PSAP Call Data
- Urban Areas / Urban Clusters

Question: Does the Coverage Objective cover all the call data?

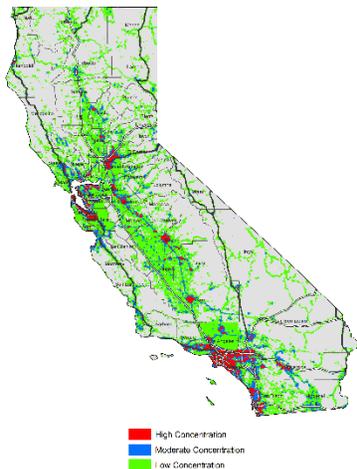
PSAP Call Data (bottom) vs. Coverage Objective (top)



Where are Changes Needed?



Baseline Coverage Objective



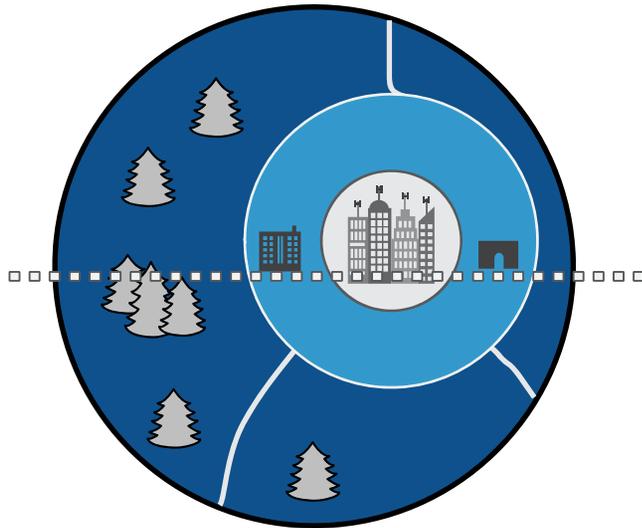
State to Modify During Consultation

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

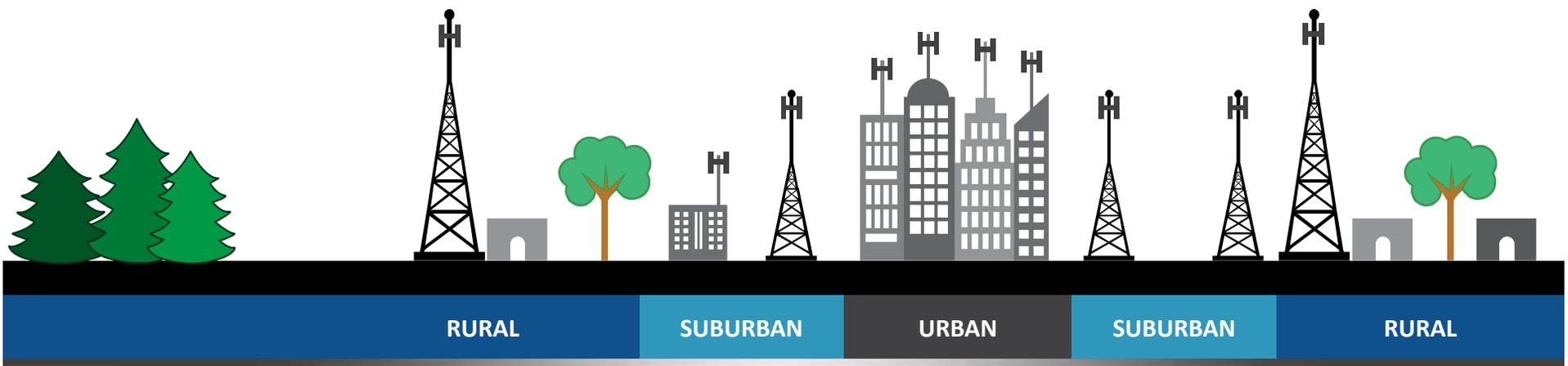
Modified Coverage Objective



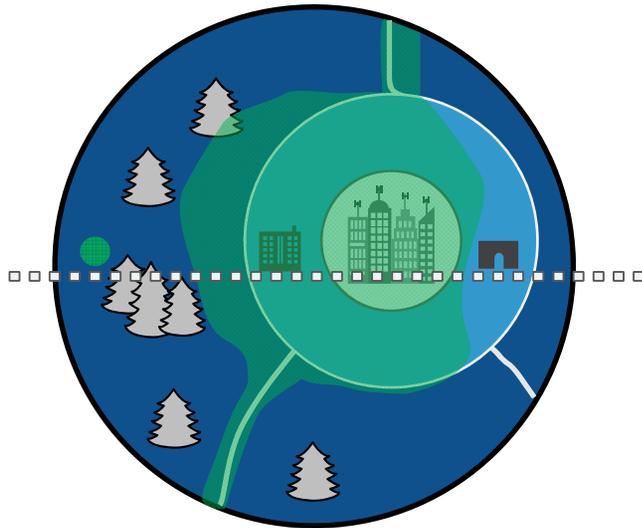
Phased Approach to Coverage



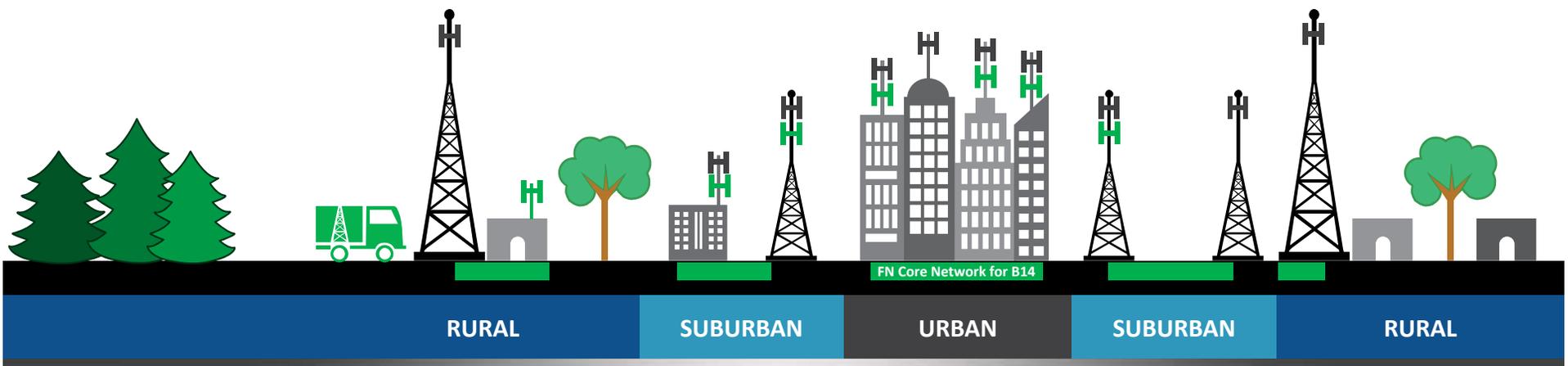
Contract Coverage	Expansion 2
	Expansion 1
	Phase 5
	Phase 3-4
	Phase 1-2



Phased Approach to Coverage

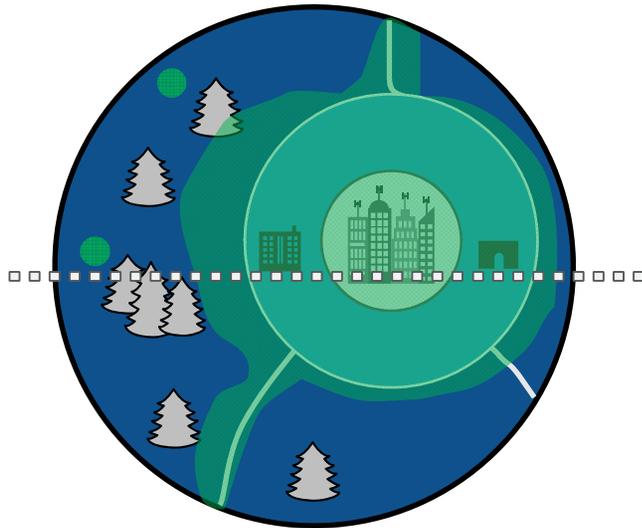


Contract Coverage	Expansion 2
	Expansion 1
	Phase 5
	Phase 3-4
	Phase 1-2

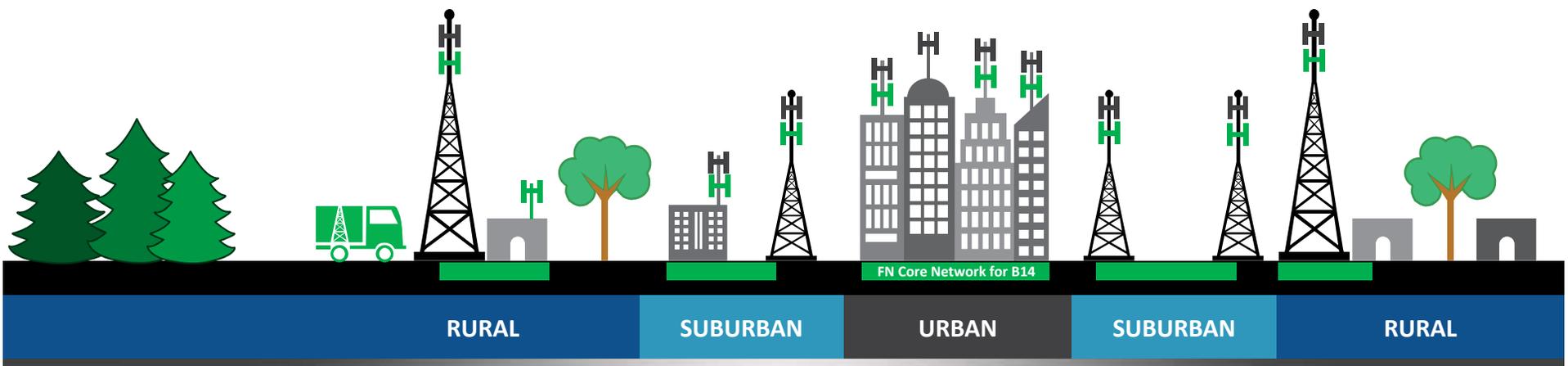


July 28-30, 2015

Phased Approach to Coverage

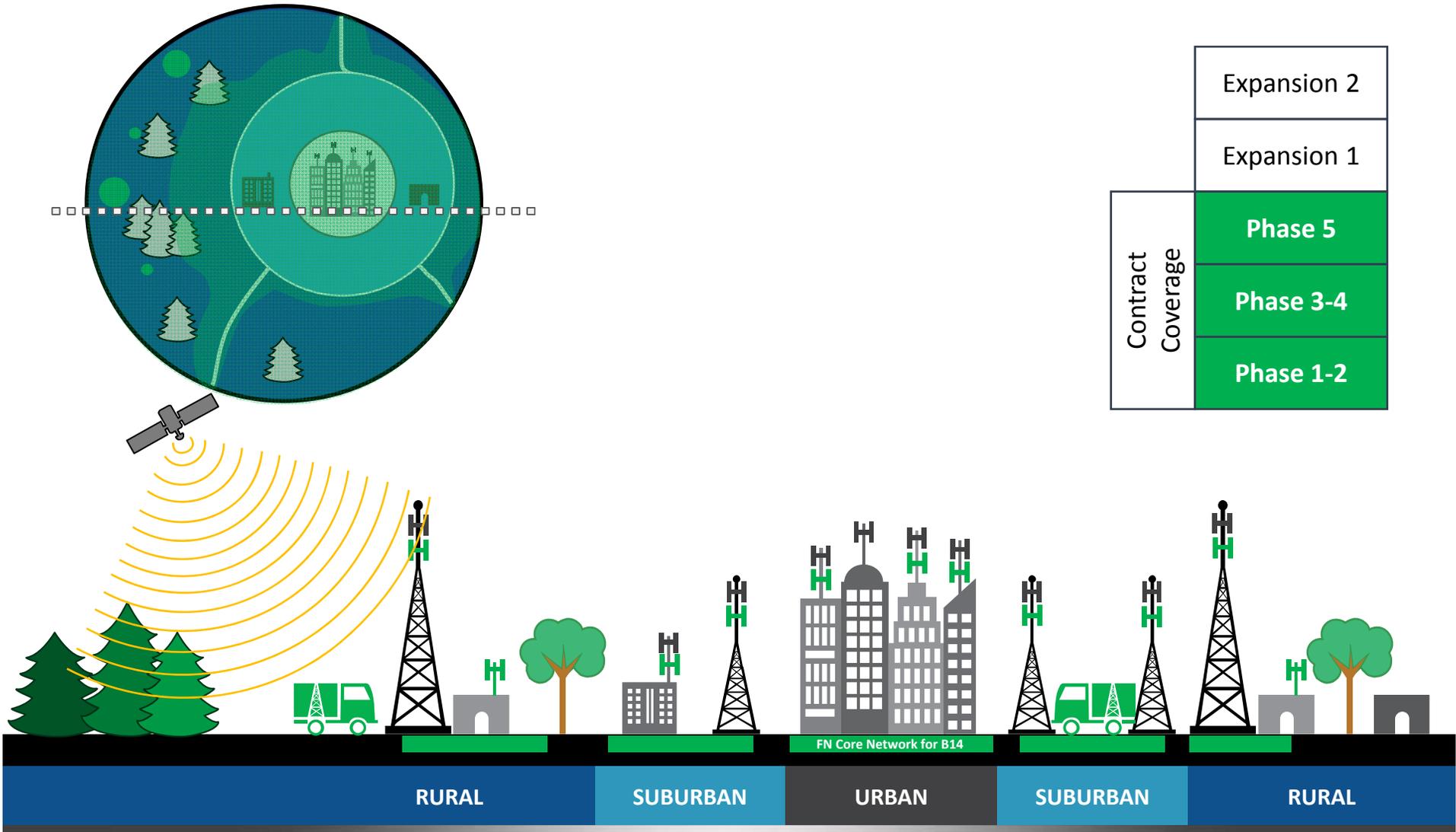


Contract Coverage	Expansion 2
	Expansion 1
	Phase 5
	Phase 3-4
	Phase 1-2



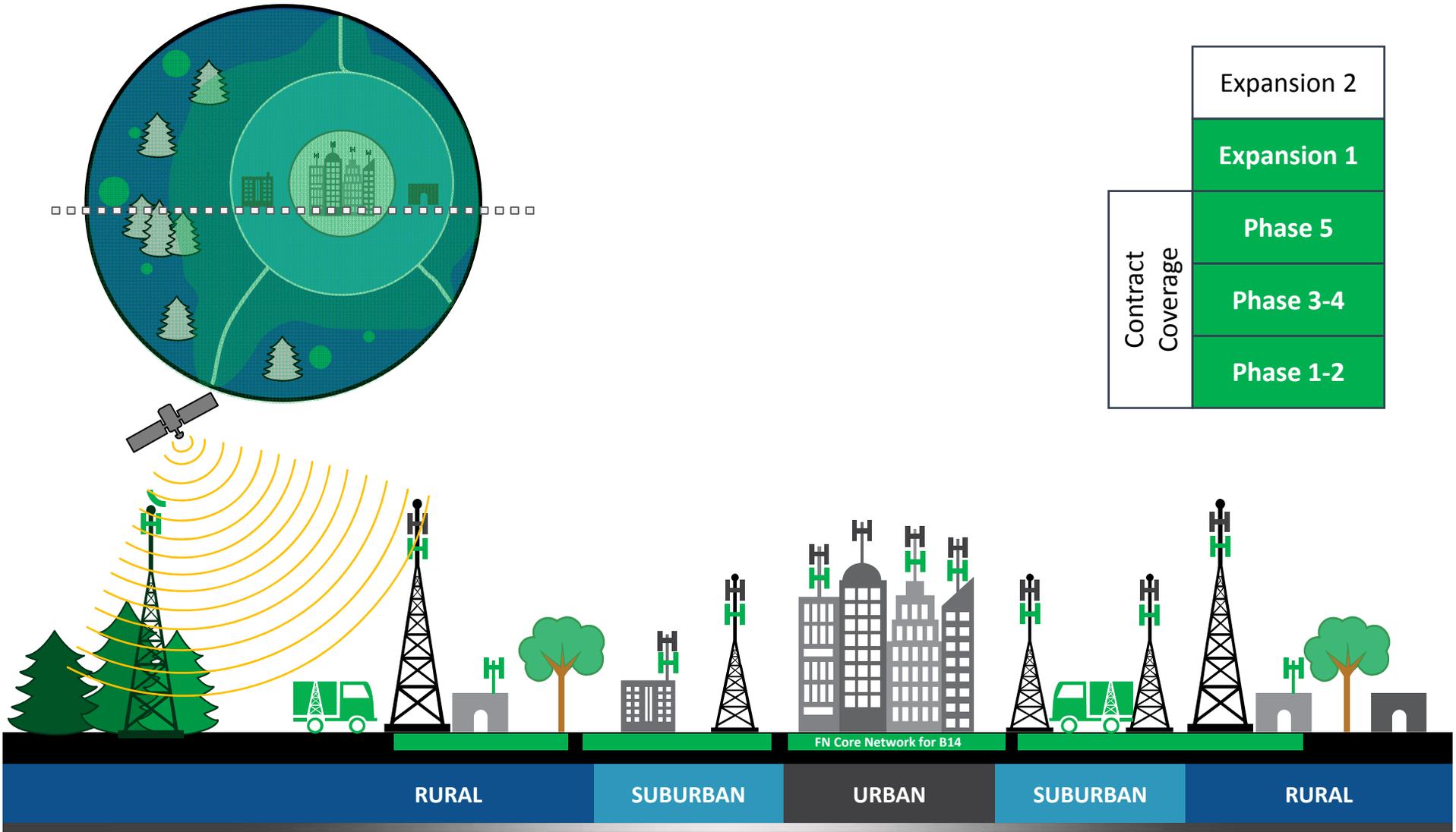
July 28-30, 2015

Phased Approach to Coverage



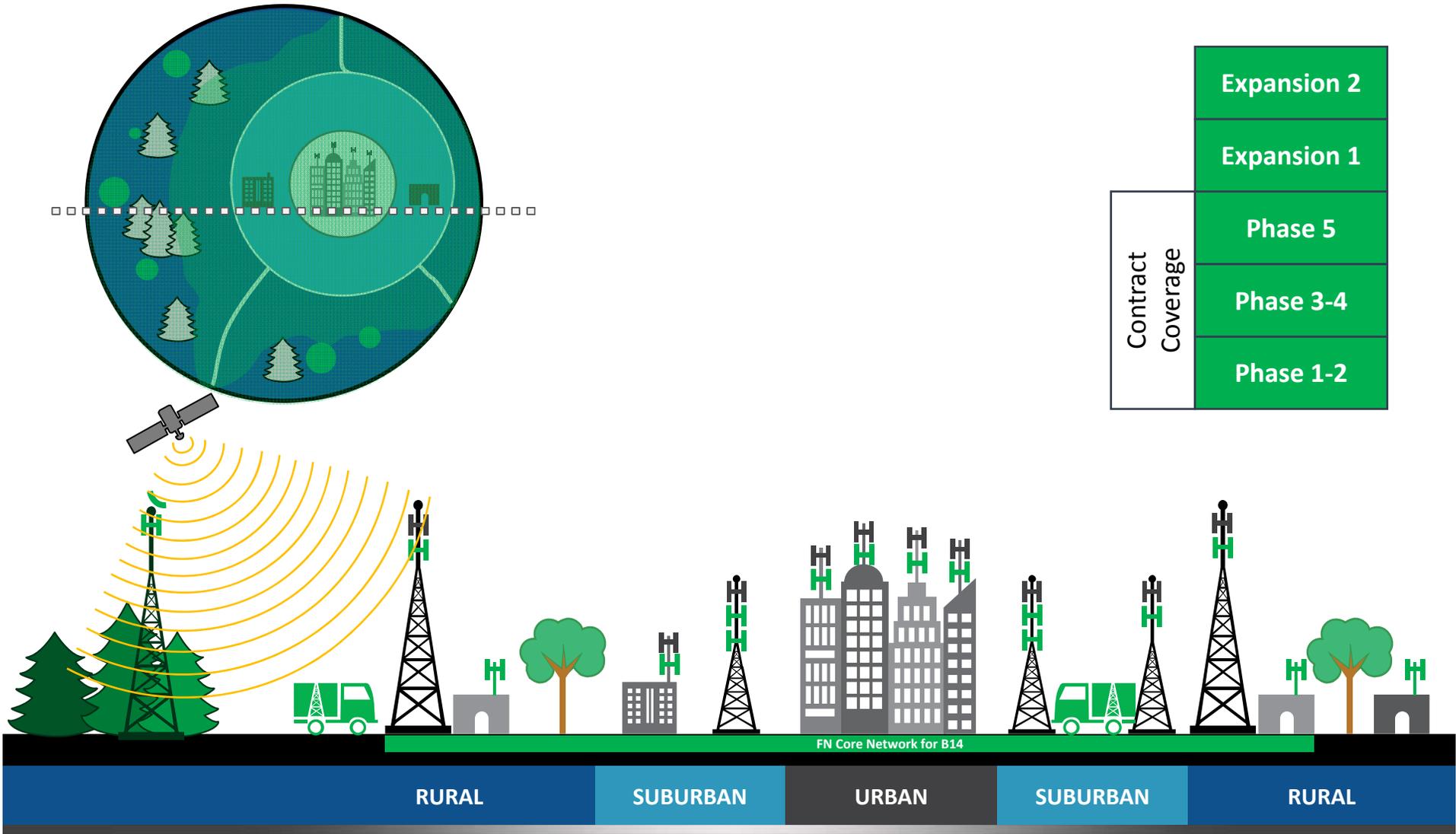
July 28-30, 2015

Phased Approach to Coverage



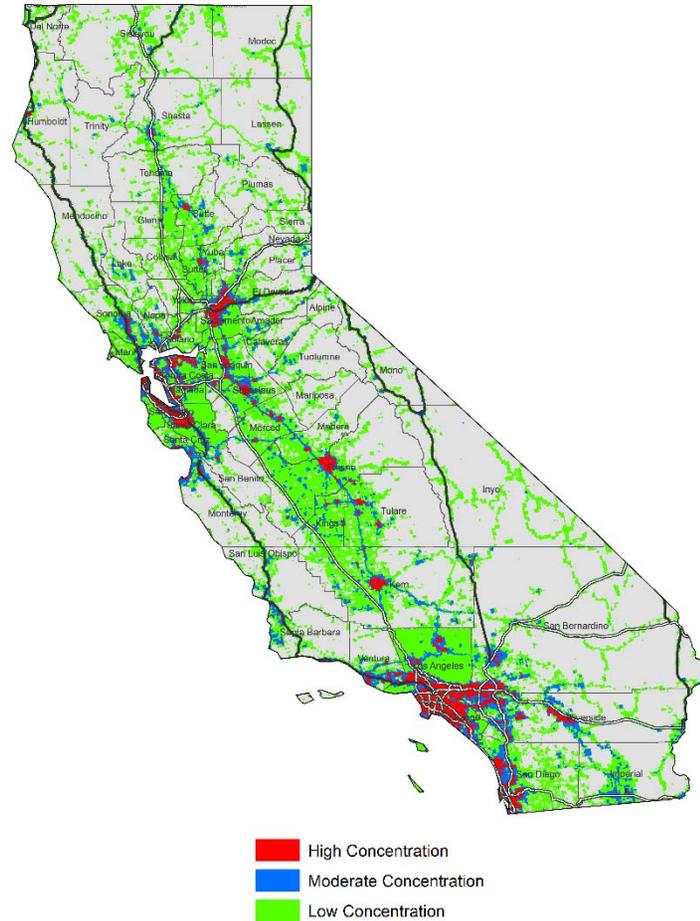
July 28-30, 2015

Phased Approach to Coverage



July 28-30, 2015

Coverage Baseline Discussion / Questions



(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



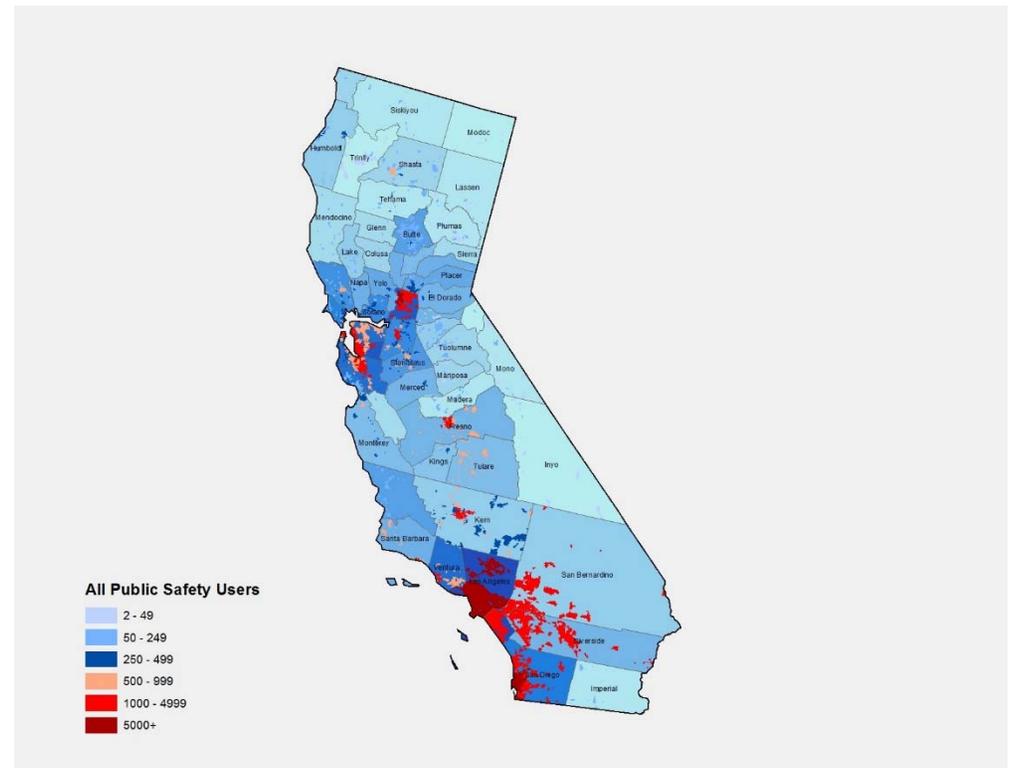
Totals (Estimated)

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



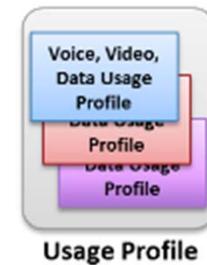
Application Survey

- 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

Voice, Video, Data Usage Profile

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

Usage Profile

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

(4) Current Service / Procurement



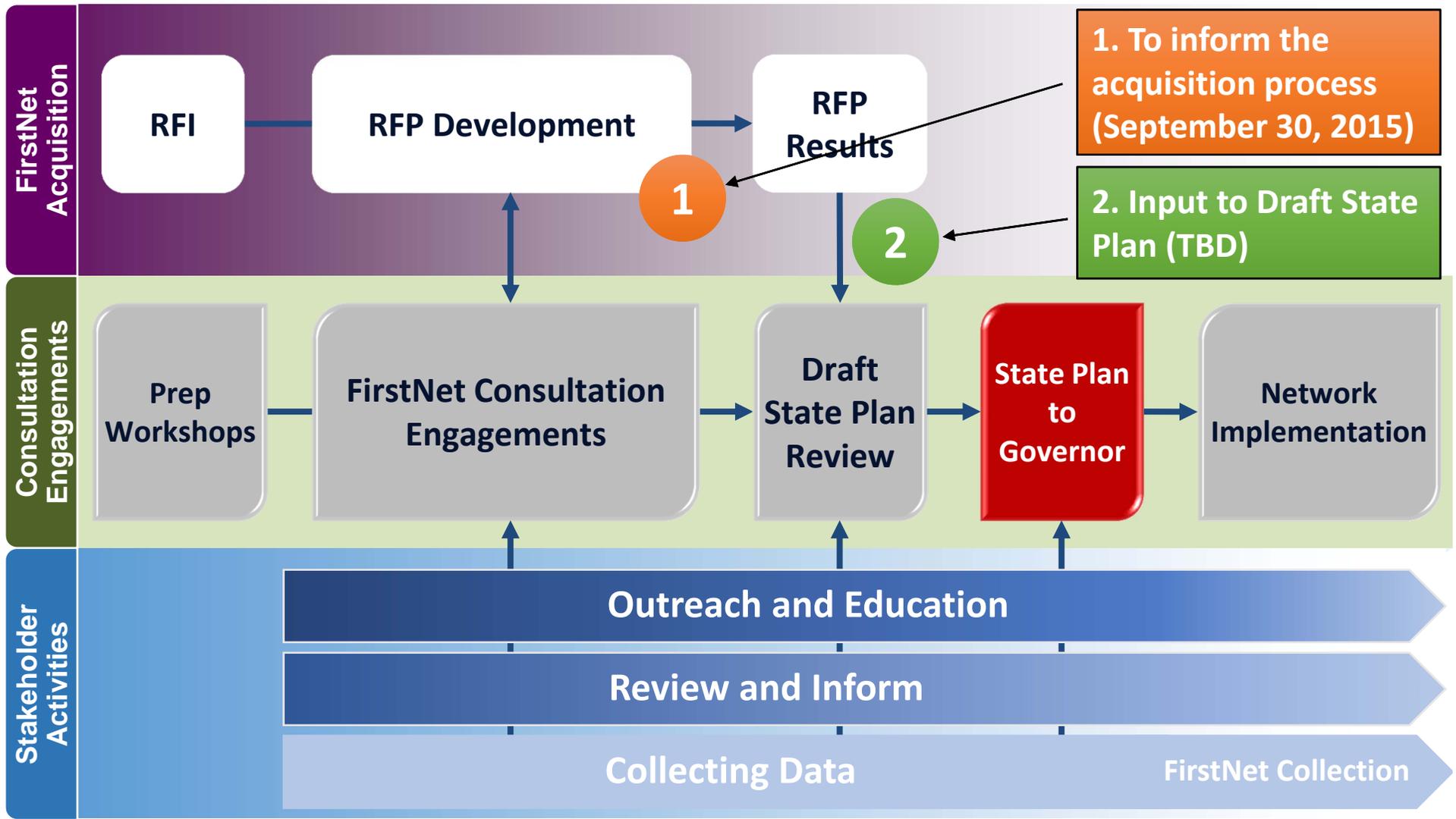
How do Agencies do Business Today?



- 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



Data Collection Milestones



Need State Specific Inputs



Data Collection Wrap-up



Data Collection Elements Summary



Data Categories		Description	Survey	Other Method
1. Coverage		Identify desired coverage and proposed deployment phases within the State/Territory		
1a.	Coverage Objectives	Identify State/Territory coverage by developing a baseline or providing feedback and changes to the FirstNet baseline		X
1b.	Phased Deployment Approach	Provide recommendations on targeted areas or objectives for each deployment phase (suggest a minimum of 5 phases)		X
2. Users and their Operational Areas		Gather information on the eligible user base and their respective operational areas		
2a.	Public Safety Entity ("PSE") ¹ Info, Personnel Counts	Basic PSE demographics: entity name, discipline, location, POC, total personnel. Please provide the same information for those entities that qualifying PSEs wish to designate as PSEs within the State/Territory (including Tribal lands) under the terms of the Act ² .	X	
2b.	Devices - Counts and Types	Number and type of agency issued voice/data wireless devices used by PSE personnel, estimates of usage growth and use of personally owned devices	X	
2c.	Users and Devices Summary	Estimate the total eligible user base within the State/Territory (including Tribal lands). Use the device/user ratio from surveyed data to estimate the total number of currently deployed devices.		X
2d.	Operational Areas	Provide geographic areas of responsibility as well as common response areas for each PSE (as available)		X
2d-i.	i. User maps based on jurisdiction	Baseline maps of user counts distributed across their respective areas of responsibilities		X
2d-ii.	ii. Common response areas (Calls for Service data)	As available, provide calls for service response data from eligible PSEs, analyzing and mapping the results to show common and critical response areas		X
3. Capacity Planning		Estimate current application and data usage		
3a.	Application Usage	Data gathering on basic application usage to identify what PSEs are currently using, frequency of use, and projected growth. This information may also be used to estimate network capacity.	X	
3b.	Data Usage (Traffic Profiles)	Targeting a small subset of PSEs representing the different demographics of the State/Territory, capture data and conduct analyses to quantify how much data is used by different PSEs. This sampling of data could be gathered and analyzed, for example, by different size and scope of incident responses or planned events, by discipline types, by urban vs. rural, comparing uplink vs. downlink, etc. Supplemental information on planned growth, launch of new applications, limitations of current usage, etc. are all important to note while developing representative traffic profiles.		X
4. Current Providers / Procurement		Information on current service provider's plans, procurement vehicles, and barriers to adoption		
4a.	Procurement vehicles / restrictions	Provide how mobile services are procured today, contract duration, and what restrictions may exist with leveraging different procurement options	X	
4a.	Plan types / costs	Identify different plan types, periodicity, and their associated costs	X	
4a.	Any specialized services provided?	Provide additional services supplied (e.g., network/system interfaces, SLAs, unique APNs, separate VLANs, COLTs/COWs)	X	
4b.	Barriers	Identify current barriers that have limited or prevented fully operationalizing mobile data	X	
5. State Plan Decision		Document the process and potential barriers for State Plan decision-making		
5a.	Document State Plan Review Process	Document the State Plan review decision-making process, associated timelines, responsibilities, and windows of availability for delivering a state plan for proper FirstNet planning when scheduling the delivery of the final state plan to the Governor.		X

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Thank You

