Visualizing Success in RDOF

Part 1: Where to Bid

May 12th, 2020

QUADRA PARTNERS, LLC

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Introduction

- A Once in a Decade Opportunity
- RDOF is a Race –
  Preparation Starts Now
- Visualizing Success: A Sneak Peek

LEARNING OBJECTIVES:

1. Identify immediate steps to start your auction preparation
2. Outline critical tasks to develop your strategy

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Agenda

- RDOF Tutorial
- Preparation
- Where You Start
  - Location Data
  - Business Cases
- A Mapping Platform Can Help
- Next Steps: An Outline
- Q&A

Today's Speakers

Jon Wilkins

Quadra Partners

Jim Stegeman

CostQuest Associates

Mike Wilson

CostQuest Associates

Will Mitchell

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What We're Good At

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Auction Strategy

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Financial Modeling & Location Data

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Mapping & Design Platform

RDOF Tutorial

Key Messages to Keep in Mind

1. Rural Digital Opportunity Fund (RDOF): Once-in-a-decade opportunity, but the FCC is on a VERY fast timeline in 2020

2. RDOF will be different from past FCC Universal Service auctions (e.g., CAF II) in important ways

3. Auction preparation should be happening now

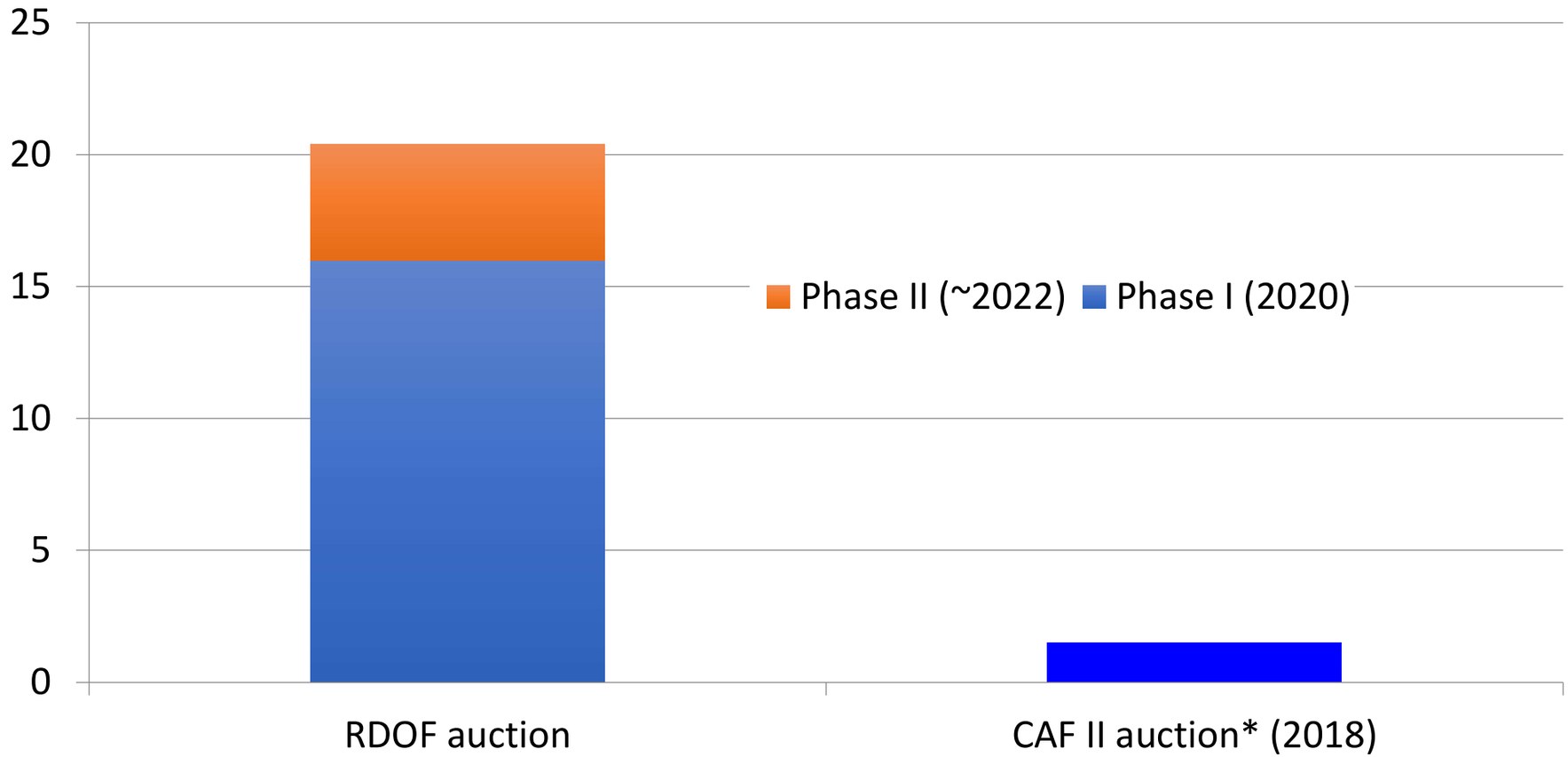
4. Participating in a bidding consortium is a key strategy to consider for accessing needed expertise, building a winning bidding approach, and managing overall complexity

RDOF Capsule Summary: Key Topics

- Funding amounts and timing
- Obligations of funding recipients
- Eligible areas
- Reverse auction approach to awarding funds
- Bidding consortia

RDOF Funding: $20+b over 10 years

$ billions (10 year total)



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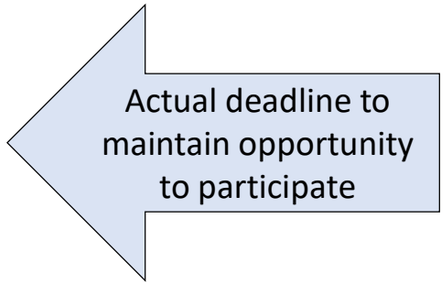
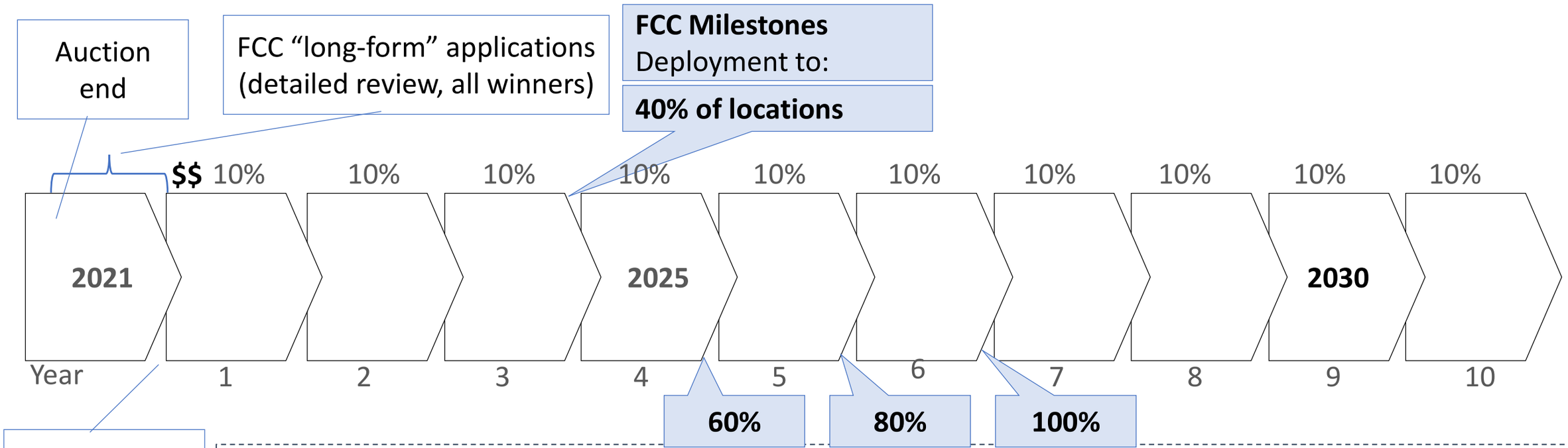
*Note: In-going CAF II budget = $2b

RDOF Timing Is on a Very Fast Track

- Key FCC dates (estimates of likely timeline)
  - Jan 30, 2020: Final rules formally adopted
  - Feb 28, 2020: Proposed auction procedures
  - March 2020: Proposed eligible areas list released
  - May 2020 (est.): Final auction procedures
  - May 2020 (est.): Final eligible areas list
  - July 2020 (est.): Short-form application deadline
  - October 22, 2020: Auction start



Projected RDOF Awards: Timing and Key Milestones



- FCC reporting and certification requirements throughout
- Must register as an Eligible Telecommunications Carrier (ETC) to receive funds
- "10 business days" provisioning time standard for "providing service"
- Funding holds for missing by more than 15%, $$ payback for repeated misses
- Letter of Credit required of all winners to secure potential payback scenario

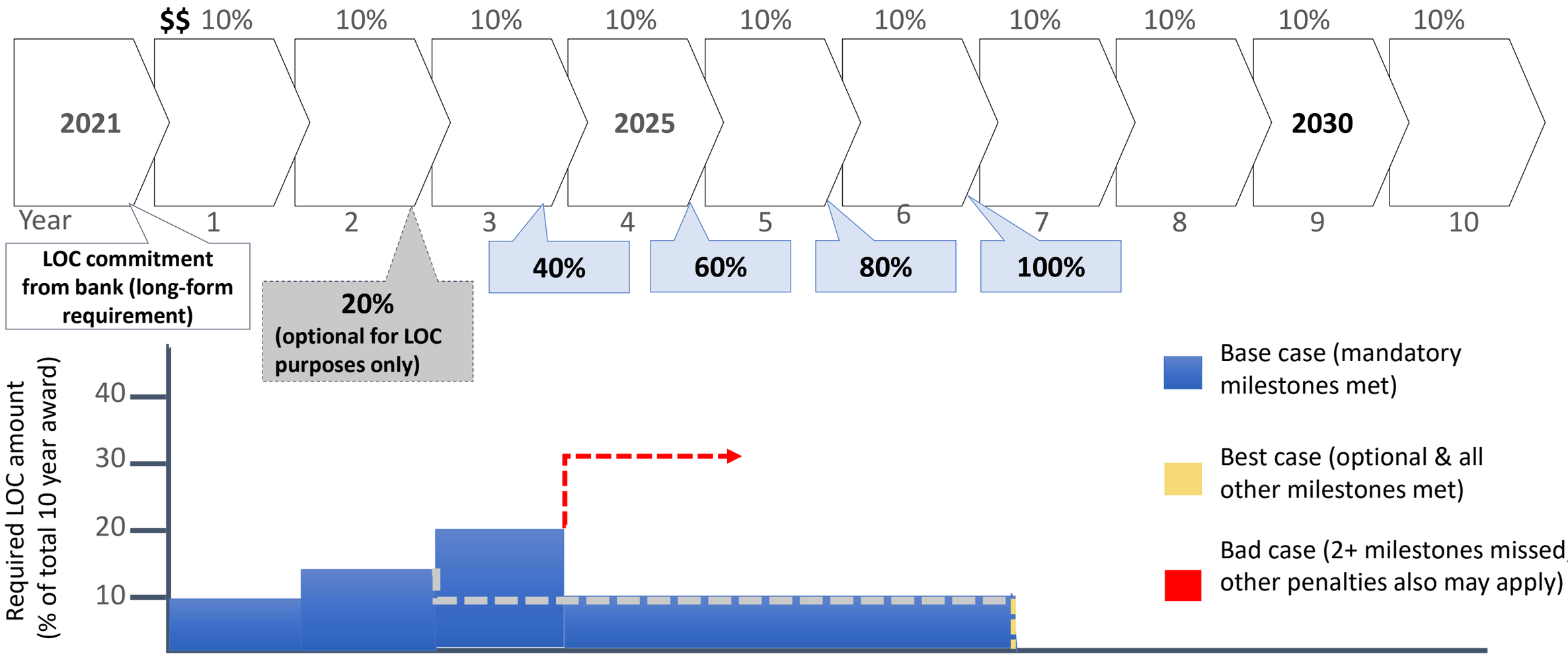
ETC Requirement for RDOF Winners

- Winning recipients of RDOF funds must be designated as an "Eligible Telecommunications Carrier" (ETC) – required under federal law
  - Default requirement: state designation (state PUC or PSC)
  - Federal designation process (FCC) also available in some circumstances

- Obligations of ETCs have been reduced significantly at the FCC and in most states compared to historical practice, and many are basic

- RDOF winners also have broad flexibility to work with third party providers, including to "outsource" certain retail obligations

RDOF Irrevocable Standby Letter Of Credit Requirements (Alternate scenarios)



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RDOF Eligible Areas (Proposed*)

- Geographic unit of bidding: census block groups ("CBG", multiple per service territory for many bidders)
- Geographic unit for funding (Phase 1): census block (multiple per CBG) *wholly unserved by 25/3 Mbps*
- FCC to release full list of proposed eligible areas and reserve prices, based on reported data from existing providers
- *Package bidding rules* likely will be available for multiple bidding units; final auction procedures still pending at FCC
- Challenge process will be available

*** Note: Based on final RDOF rules only; final RDOF auction procedures still pending at FCC and could change**

Illustration: RDOF Eligible Areas, Funding Amounts, and Bidding Units (Proposed*)

Census Block Group 123 (Bidding Unit)
RDOF Phase I opening support offer: **$550** (A + D)

Unserved locations (less than 25/3)
Served locations (25/3 or greater)

Census Block A

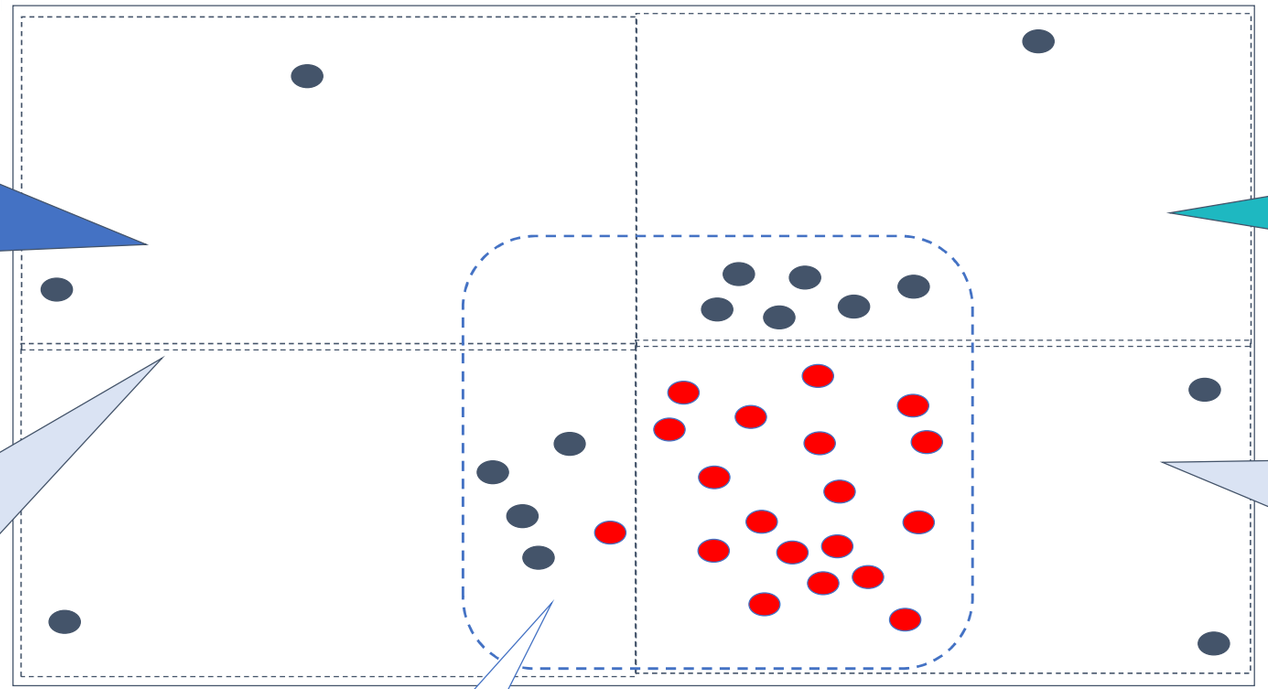
Eligible for Phase I

FCC model support for
2 unserved loc: **$250**

Census Block D

Eligible for Phase I

FCC model support for
7 unserved loc: **$300**



Census Block B

Ineligible for Phase I
(*but eligible for Ph II*)

FCC model support for
5 unserved loc: $300

Census Block C

Ineligible for Phase I
(*but eligible for Ph II*)

FCC model support for
2 unserved loc: $200

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*** Note: Based on final RDOF rules only; final RDOF auction procedures still pending at FCC and could alter**

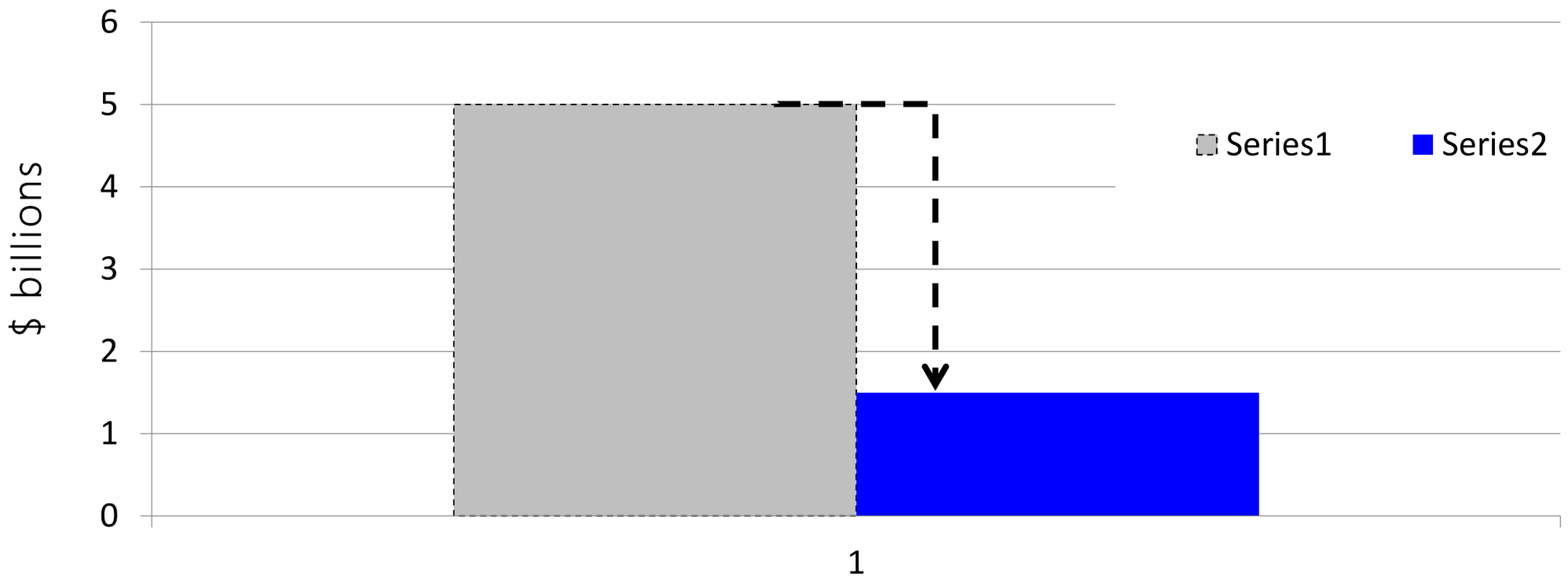
RDOF Reverse Auctions (101 level)

- FCC starts by offering a maximum subsidy in each bidding geo ("reserve price"), but initial nationwide total will exceed available budget

- Auction therefore will be a competition:
  - Between geographies (not all eligible areas will receive funds)
  - Within geographies (only one provider per area will win)

CAF II Illustrates Impact of Reverse Auction Bidding

CAF II Auction : Final Awards Well Below Opening Offers



Bidding Weights: Speed and Latency Tiers

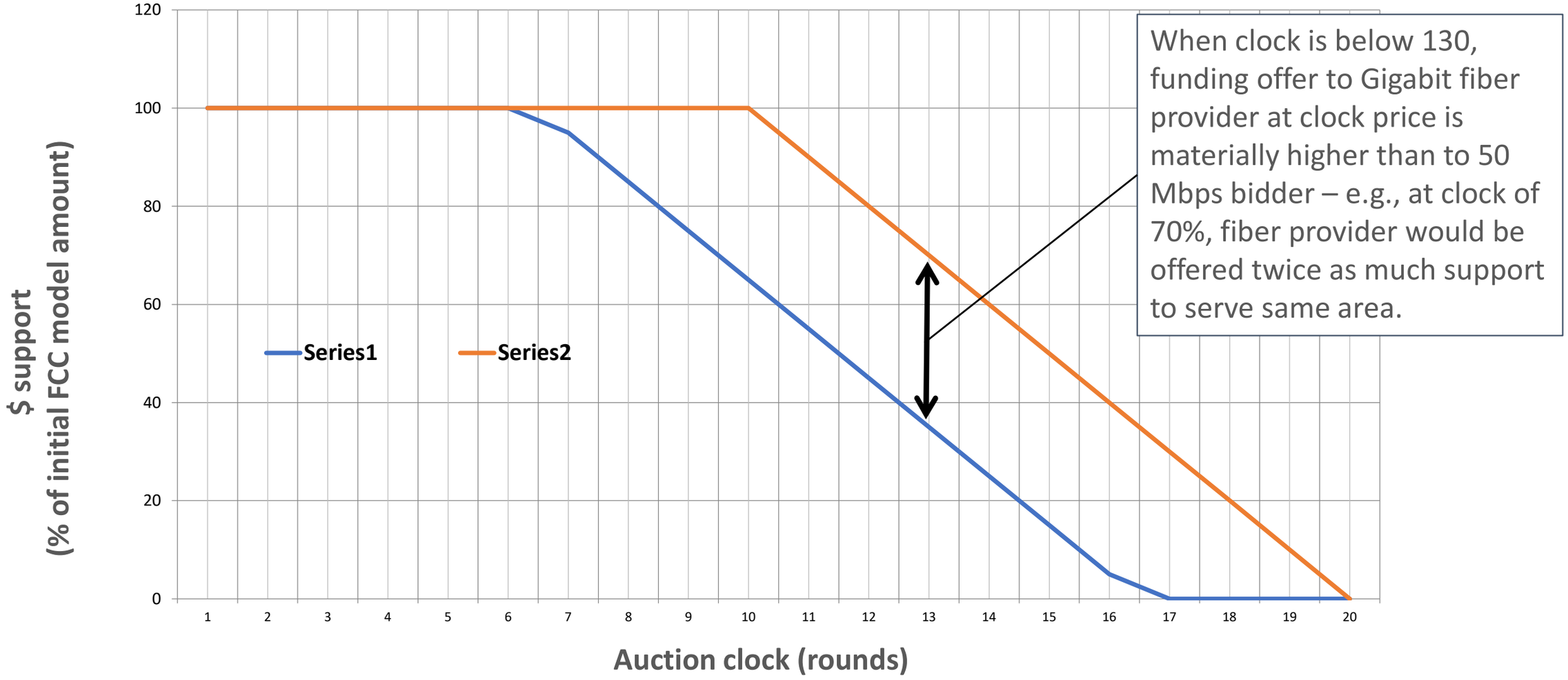
Speed (Down/Up, Mbps)	Weight
25/3	50 (worst)
50/5	35
100/20	20
1000/500	0 (best)

+

Latency (ms, 95% of peak demand)	Weight
<750 (high latency)	40 (worst)
<100 (low latency)	0 (best)

= Utility Grade Broadband (fiber)

Illustration: Impact of Bidding Weights for Gigabit vs 50 Mbps Tiers



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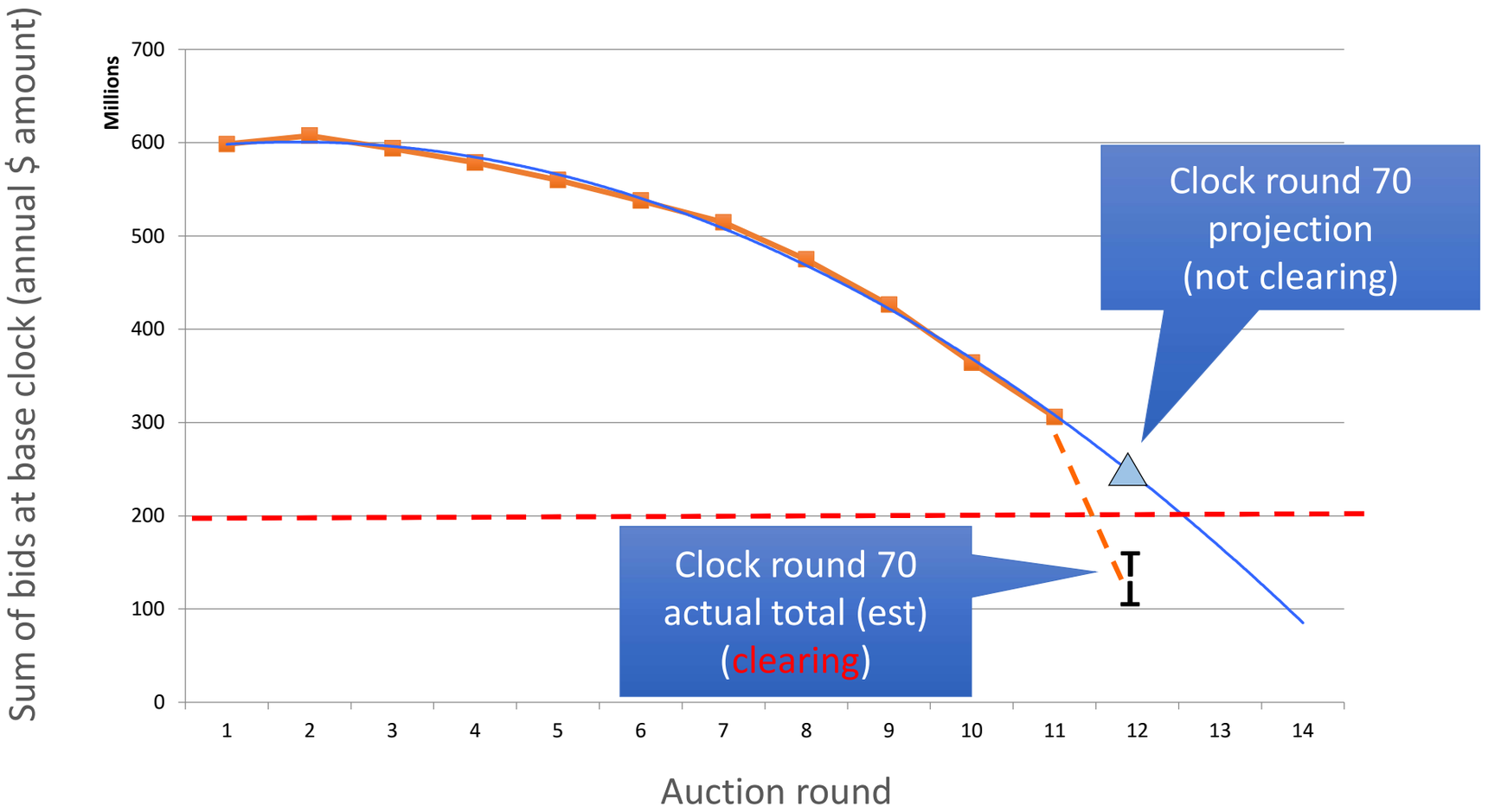
Clearing Round Timing Is Hard to Predict: CAF II Example*

CAF II: Actual vs. projected base clock total bids by round



- FCC releases round-by-round totals (until clearing)
- But predicting the clearing round is unlikely to be possible

Auction budget = $200m/yr

Clearing total by round (most expensive bids at base clock)

Forward projection (polynomial curve fit)

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Three Examples: Who Actually Wins When Clearing Round Is Reached?*

Scenario 1	Scenario 2	Scenario 3
CBG 123	**CBG 123**	**CBG 123**
Auction Clock: 70	**Auction Clock: 70**	**Auction Clock: 70**
Clearing at: 72	**Clearing at: 78**	**Clearing at: 75**
Active bids	Active bids	Active bids
50/5 tier: 70	50/5 tier: 70.01	50/5 tier: 76
100/20: 70	100/20: 70.02	100/20: 77
1000/500: 70	1000/500: 70.02	1000/500: 79
Winner: 1000/500 (base clock tie goes to the lowest weight)	**Winner: 50/5 (lowest bid wins)**	**Winner: NONE in this CBG (no bids at or below clearing price)**

*** Note: Based on final RDOF rules only; final RDOF auction procedures still pending at FCC and could change**

Key Expertise Needed to Succeed

Engineering
- Optimized network design: deliver the relative highest performance for the relative lowest cost

Business
- Full understanding of long-term business case and ROI – not just costs – as the basis for bidding

Regulatory
- FCC experience and relationships: USF and auctions, pre-/during-/post-auction activities

Auctions
- Savvy, no-mistakes bidding strategy to go up against highly experienced competing bidders

Operations
- Proven deployment and operational capabilities to meet FCC and customer expectations post-auction

Rigorous mapping, modeling, auction simulation, and other analytics

FCC Rules for Bidding Consortia

Prohibited Communications (anti-collusion) FCC auction rules permit bidding consortium members to share auction information, strategy, and advisors. All consortium members are considered to be a single bidder.

After short-form filing window closes, communications between rival bidders are prohibited until after the end of the auction

NOTE Joint bidding agreements – i.e. agreements between two separate bidders relating to RDOF funding or build-out plans – are NOT permitted in RDOF Phase I

Value of a Consortium

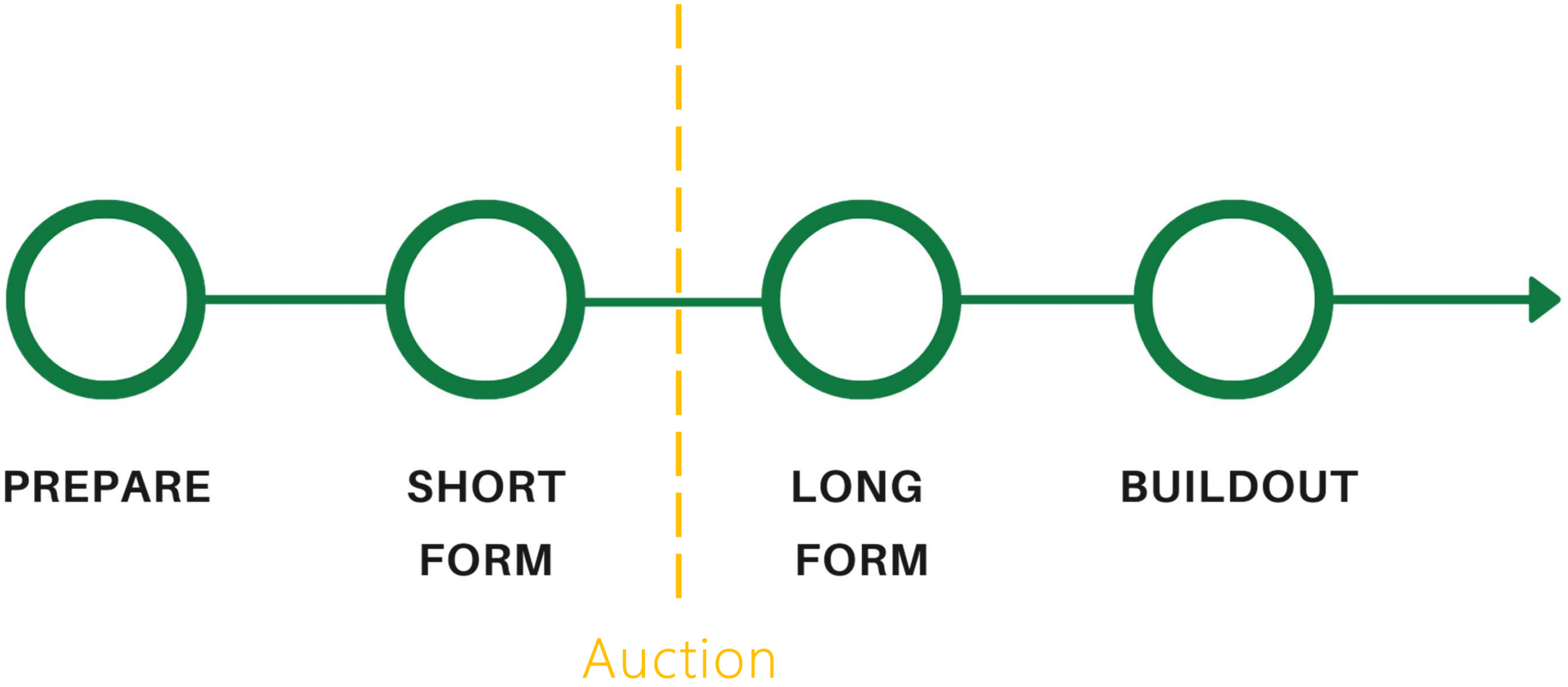
Consortium Benefits

1. Turnkey, cost-effective access to all needed experts
2. Streamlined, low cost way for a co-op to enter the FCC process: low risk, high reward
3. Shared costs for regulatory support, data and mapping, financial modeling, and bidding strategy
4. Access to joint bidding strategies for succeeding locally in both inter- and intra-geographic auction competition

POLL:
How Likely is Your Organization to Bid in RDOF?

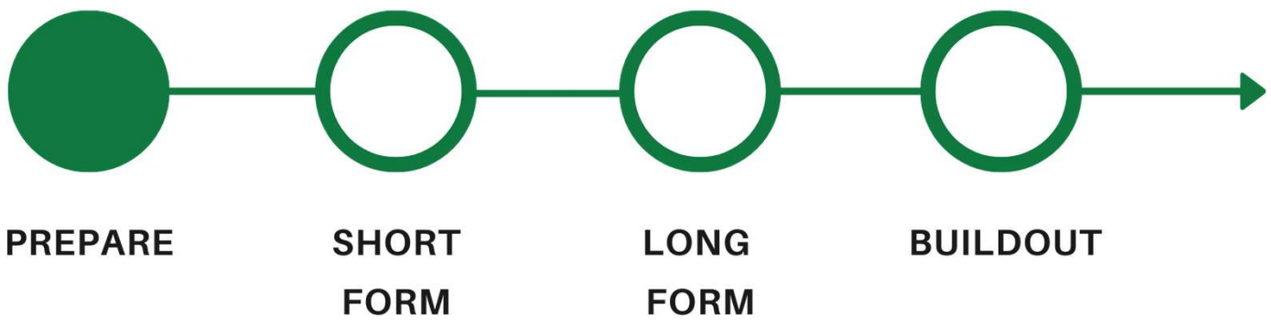
Preparation

Get Ready



RDOF Preparation Checklist

- ❑ Learn the Rules
- ❑ Size Up the Competition
- ❑ Know Your Numbers
- ❑ Put it All Together



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Step 1: Learn the Rules

- Review RDOF Order/Rules
- Identify eligible geographic areas of interest (we like CBG)
- Determine how you will handle reporting obligations

Step 2: Size Up the Competition

- Identify competitors in target bid areas
- Estimate likely competitor bids
- Weight competitor bids by performance tiers

Key Inputs: Service availability, proximity, O&M burden by technology

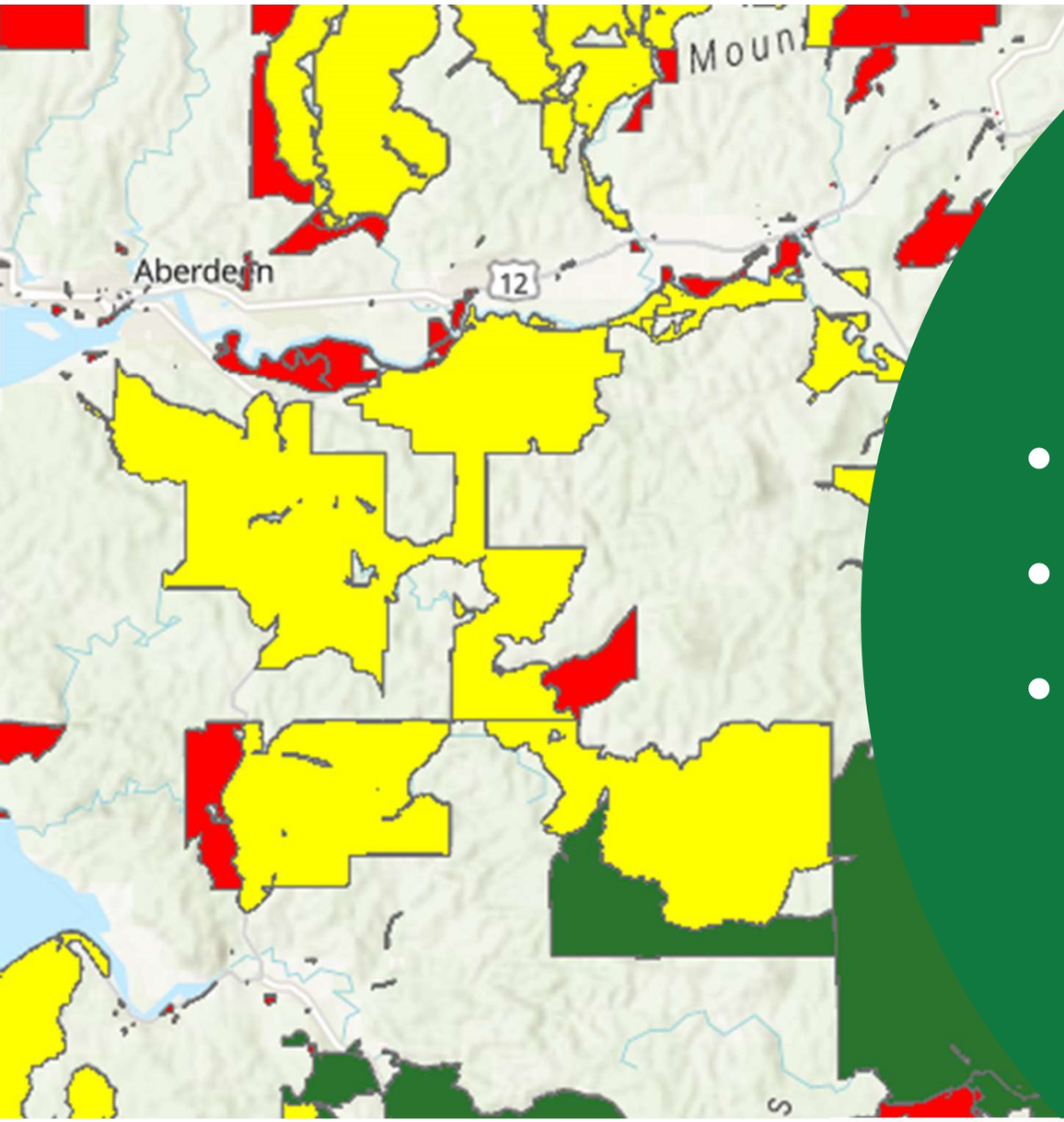
Step 3: Know Your Numbers

- Measure proximity of your infrastructure to eligible locations
- Estimate your costs to deploy & maintain
- Determine where you'd fall in Weight and Performance Tiers

Key Inputs: Eligible Locations, proximity, O&M burden

Step 4: Put it All Together

- Compare your cost vs. Competition
- Compare likely performance weighting
- Score and prioritize (ex. by cost advantage, reserve amount, performance advantage)



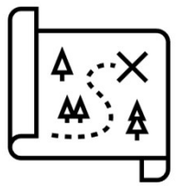
What it Could Look Like

- Stack rank Census Block Groups
- Prioritize areas based on data
- Conduct further analysis only in areas best for your business

Where You Start: Precise Location Data

Where You Start

1



REVIEW

FCC Data + RDOF Order

2

SELECT

Census Block Groups of Interest

3

LOCATE

Eligible Locations

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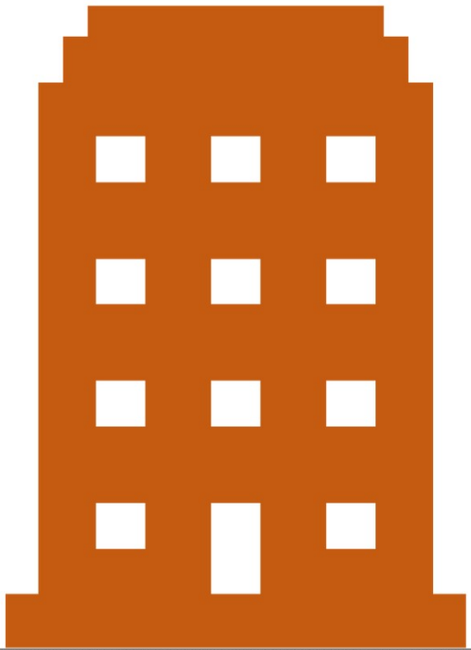
Avoid Shaky Analyses With Accurate Location Data



- Target Bid Ranges
- Business Case
- Performance Ranking
- Cost Estimates
- Competitor Analysis

FOUNDATION:

ACCURATE COORDINATES + COUNTS

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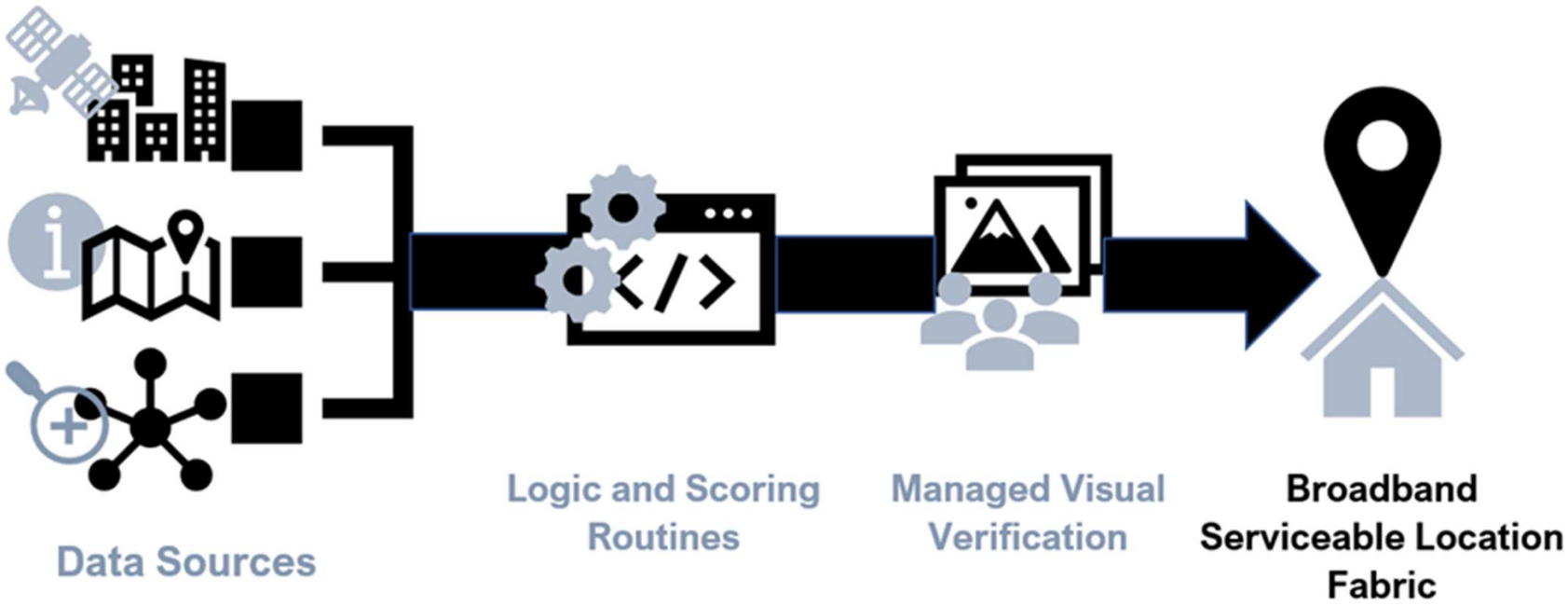
CQA Broadband Serviceable Location Fabric

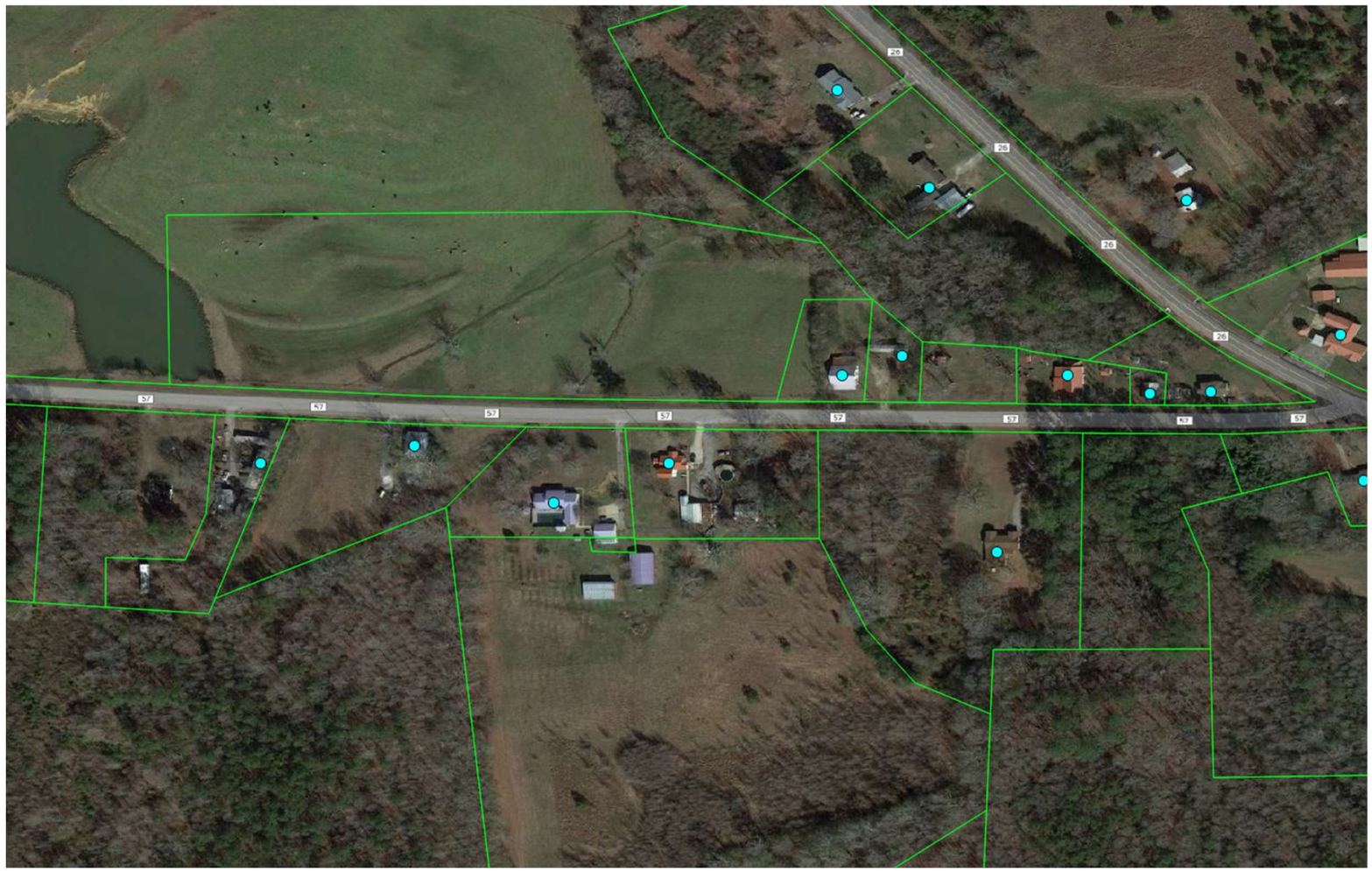


Overview: The Fabric aggregates hundreds of millions of data points, applies statistical scoring, and managed crowdsourcing to pinpoint the rooftop locations of virtually every structure that is a candidate for broadband. The BSLF provides a foundation for precise location and service availability.

BroadbandFabric: Multiple Data Source Approach

BroadbandFabric

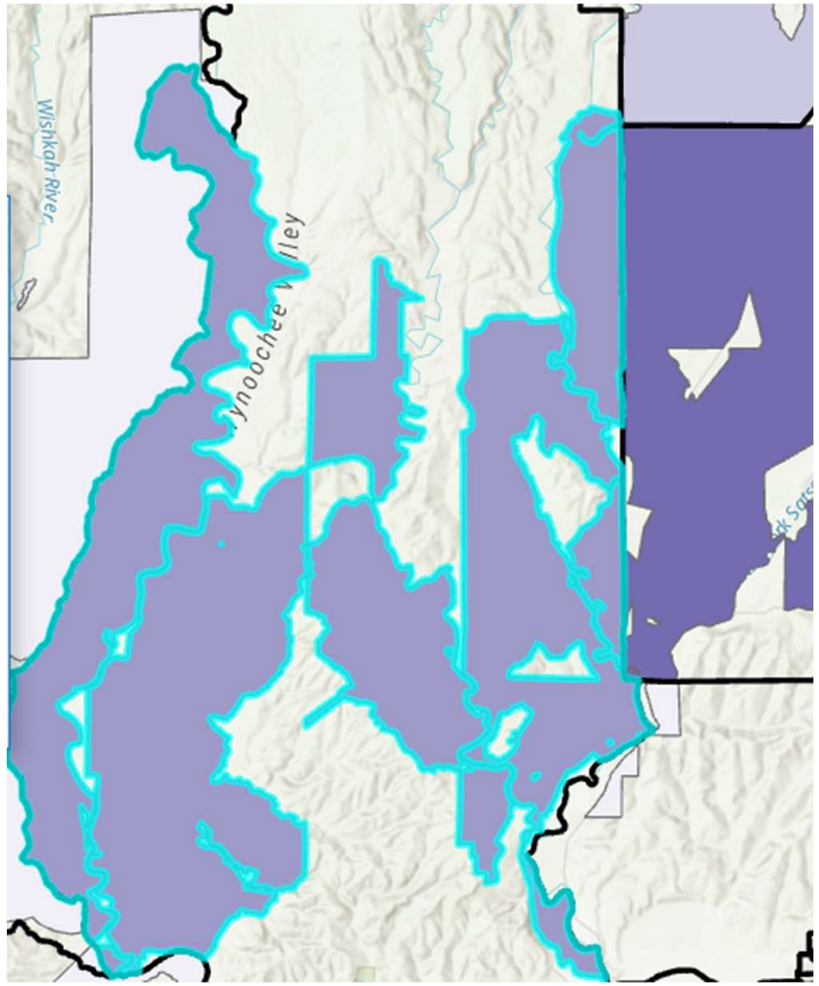
- Combines multiple data sets to generate an accurate depiction of where a serviceable structure resides geospatially



Sample: RDOF Census Block Group

Where are the 395 locations?

Auction 904 Initial Eligible Areas - WA	
state	WA
geoid	530270004005
FCC_Locations	395
Reserve_Prices	396958



RDOF Eligible CBG

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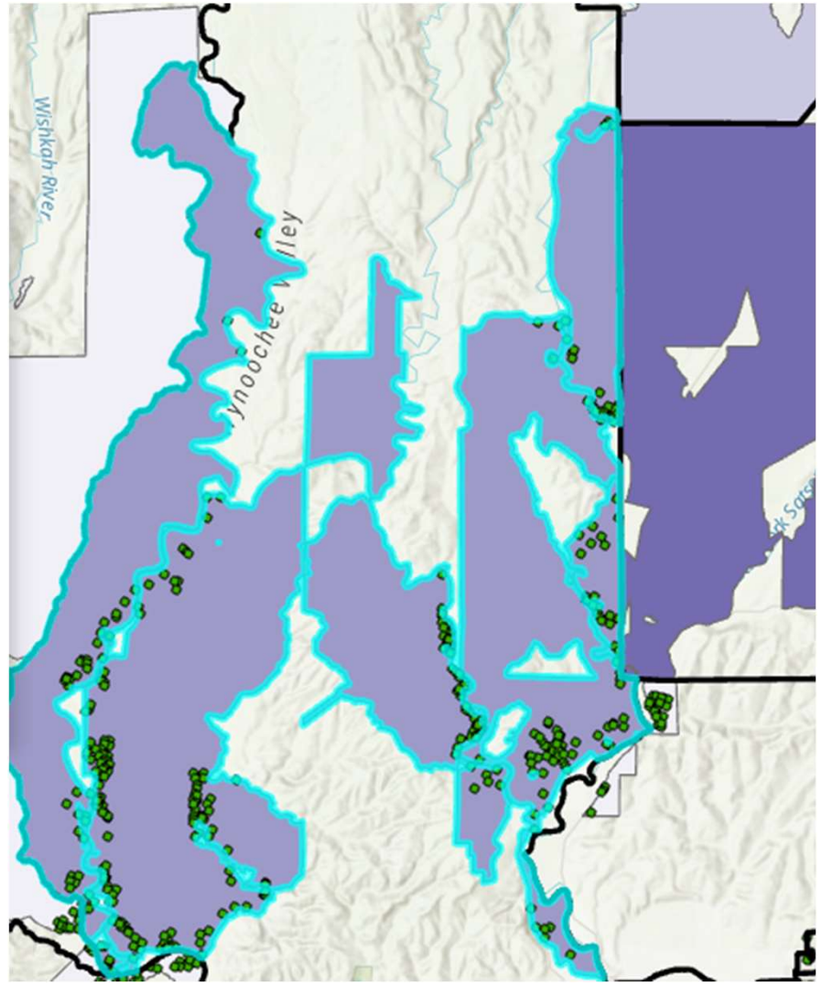
Sample: RDOF Census Block Group

We found rooftop coordinates for 378.

Auction 904 Initial Eligible Areas - WA	
state	WA
geoid	530270004005
FCC_Locations	395
Reserve_Prices	396958
Fabric_Locations	378



RDOF Eligible CBG

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Sample: RDOF Census Block Group

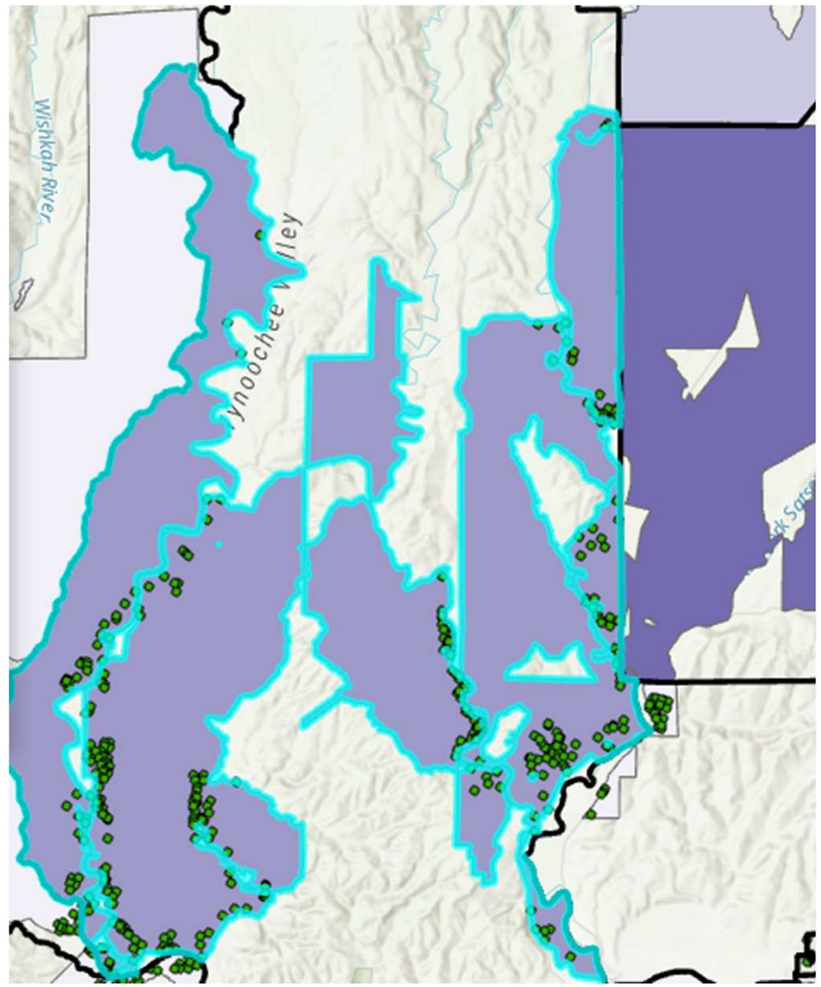
Accurate locations enables accurate estimates for:

Proximity of your infrastructure

Cost to deploy + maintain

Potential Revenue in area

Optimal Network Designs by technology type



RDOF Eligible CBG

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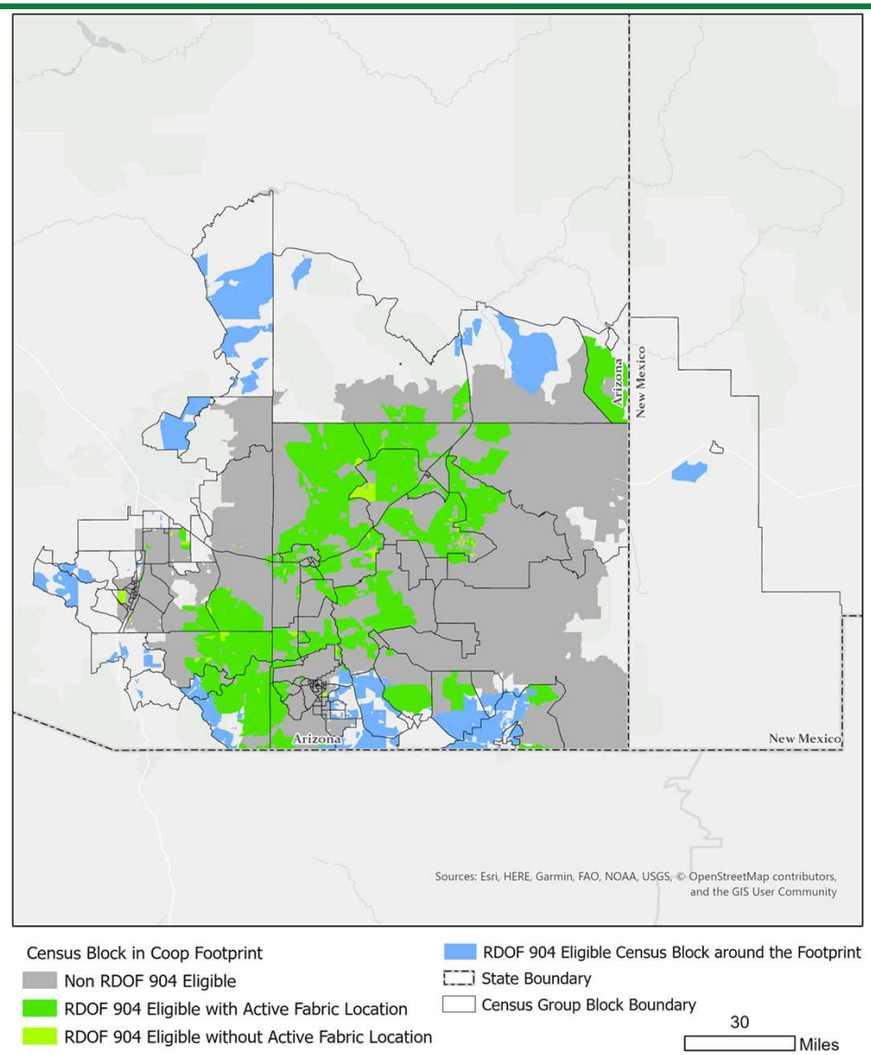
Where You Start: Business Case

The Business Case *(Sneak peak of Part 2)*

Having identified the area of interest and the locations to build to, the business case analysis and strategy can start



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The Business Case *(Sneak peak of Part 2)*

What RDOF funds are available…in my area…in close proximity?

High Estimate (C-H) — Any CBG that the carrier's boundary intersects
Low Estimate (I-M) — Any CBG that falls fully within the Carrier's boundary
Mid Estimate (N-R) — Any CBG that where 75% of the eligible CBs are within this Carriers's boundary
Fabric Estimate (S-W) — Any CBG whose CB fabric points fall mostly (90%) within the Carrier's boundary (

	Count CBGs	Count Eligible Fabric Locations	Eligible FCC Locations for CBGs intersected by the Carrier	FCC Locations for CBGs Fully within Carrier	Count Eligible Fabric Locations in CBs within Carrier	FCC Locations for CBGs Whose Fabric Locations are Mostly within Carrier	Count of Meters in Eligible CBGs	FCC 10 Yr Reserve for CBGs intersected by the Carrier	FCC 10 Yr Reserve for CBGs Fully within Carrier	FCC 10Yr Reserve for CBGs whose Fabric Locations are Mostly within Carrier	Count of Eligble CBs	Count of CBs in Eligible CBGs
High Estimate	34		6,227				-	25,328,020			719	
Low Estimate	4			270			-		1,502,700			39
Mid Estimate	9			1,818			-		7,559,120			216
Fabric Estimate		5,857			3,300	1,104	-			4,933,930		

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The Business Case *(Sneak peak of Part 2)*

What is the potential business case?

Demand/Subscribers

Total Locations:	69,380.00	Housing Units:	62,964.10	Business Locations:	6,415.90
Assumed Take Rate:	38.6%	Assumes a market-wide average take rate levelized over 10 years. Take rates vary across rate plans/services and locations types such as residential and businesses.			
Total Subscribers:	25,833.20	Residential:	24,012.40	Business/Orgs:	1,820.80

Initial Investment with Success Capital

Total Investment (upfront and success based capital costs) to Deploy Network (excludes maintenance capital):	$44,563,747.60

Summary of Business Case (levelized multi-year run rate)

Total Annual Costs:	$8,210,288.01	Annual Capital Costs:	$5,139,195.28	Annual Operational Costs:	$3,071,092.73
Annual Revenue:	$17,344,557.70	Annual Contribution Margin:	$9,134,269.69		
Total 30-Year Levelized Net Present Value of Business (assuming sale of assets at end):	$79,928,599.87				

Subscriber Statistics

Per Active Subscriber Statistics	Capital Per ACTIVE line	$	2,213.17
	Net Non-Recurring Cost ("Customer Turn Up") per Line TOTAL	$	(25.61)
	Total Monthly Revenue Run Rate per ACTIVE line	$	71.78
	Total Monthly Cost per ACTIVE Line Run Rate	$	33.98
	Monthly Capital Costs per ACTIVE line	$	21.27
	Monthly Operating Expenses Per ACTIVE line	$	12.71
	Levelized Monthly Contribution per ACTIVE line Run Rate	$	37.80

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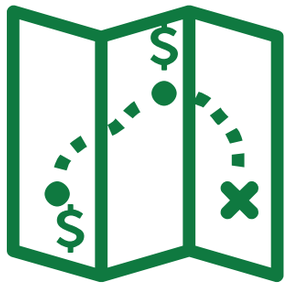
CQA BroadbandFabric

Built for Broadband. Built for Rural.



How We Can Help

- **Vetted Locations** in all RDOF-eligible areas, with rooftop coordinates
- **RDOF Estimates and Strategy**
- **Cost & Investment Data** for all areas of interest, including funding requirements
- **Competitor Analysis** including estimated performance tier rankings and relative cost
- **Planning, Designing and Operating**

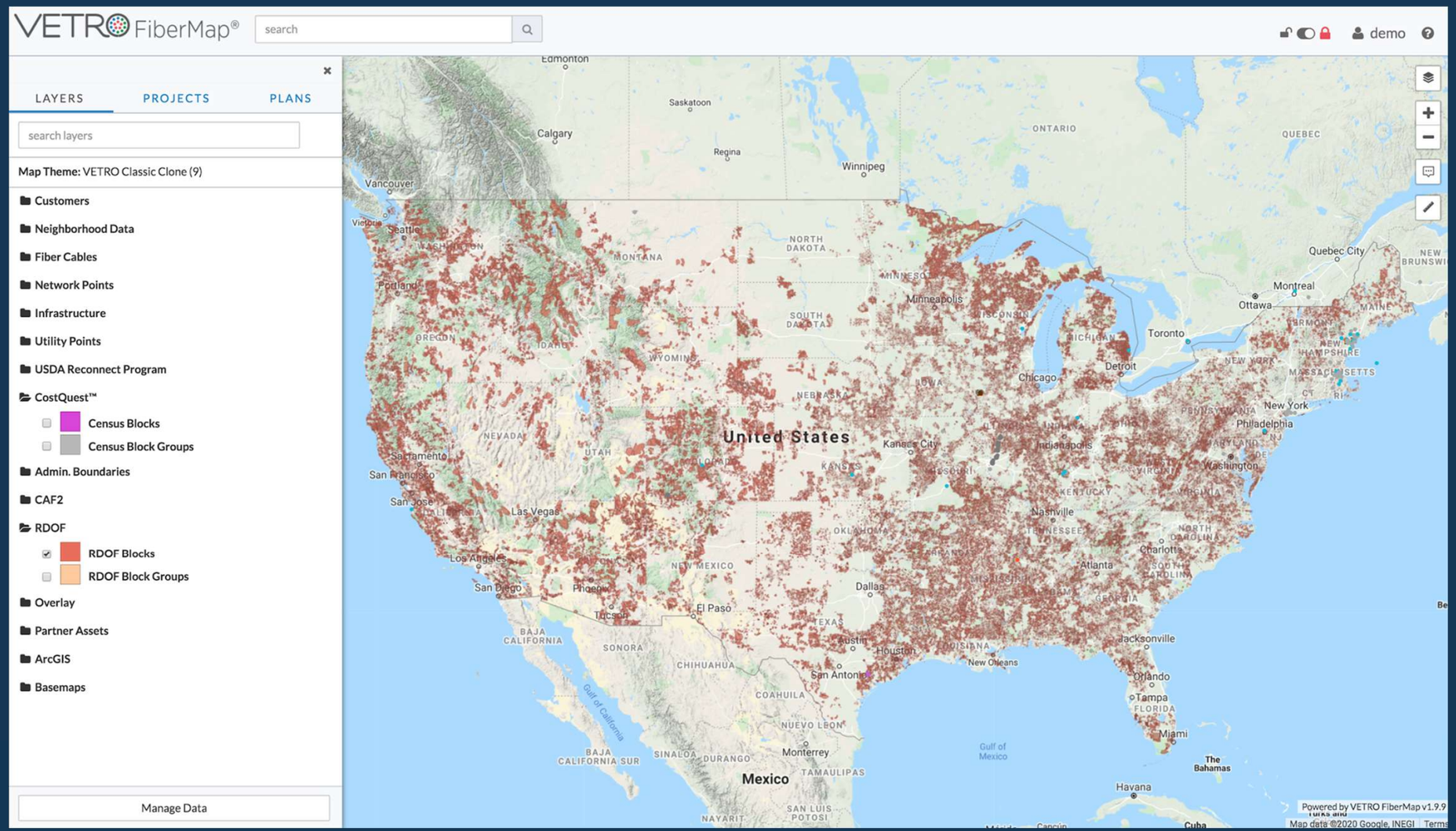
A Mapping Platform Can Help


VETRO
FiberMap®
The MAPPING Platform to;
1. PLAN: evaluate available funding
2. DESIGN: quickly design and estimate costs
3. OPERATE: build and manage the network

plan design operate

RDOF Areas:

Auction Areas in a VISUAL context



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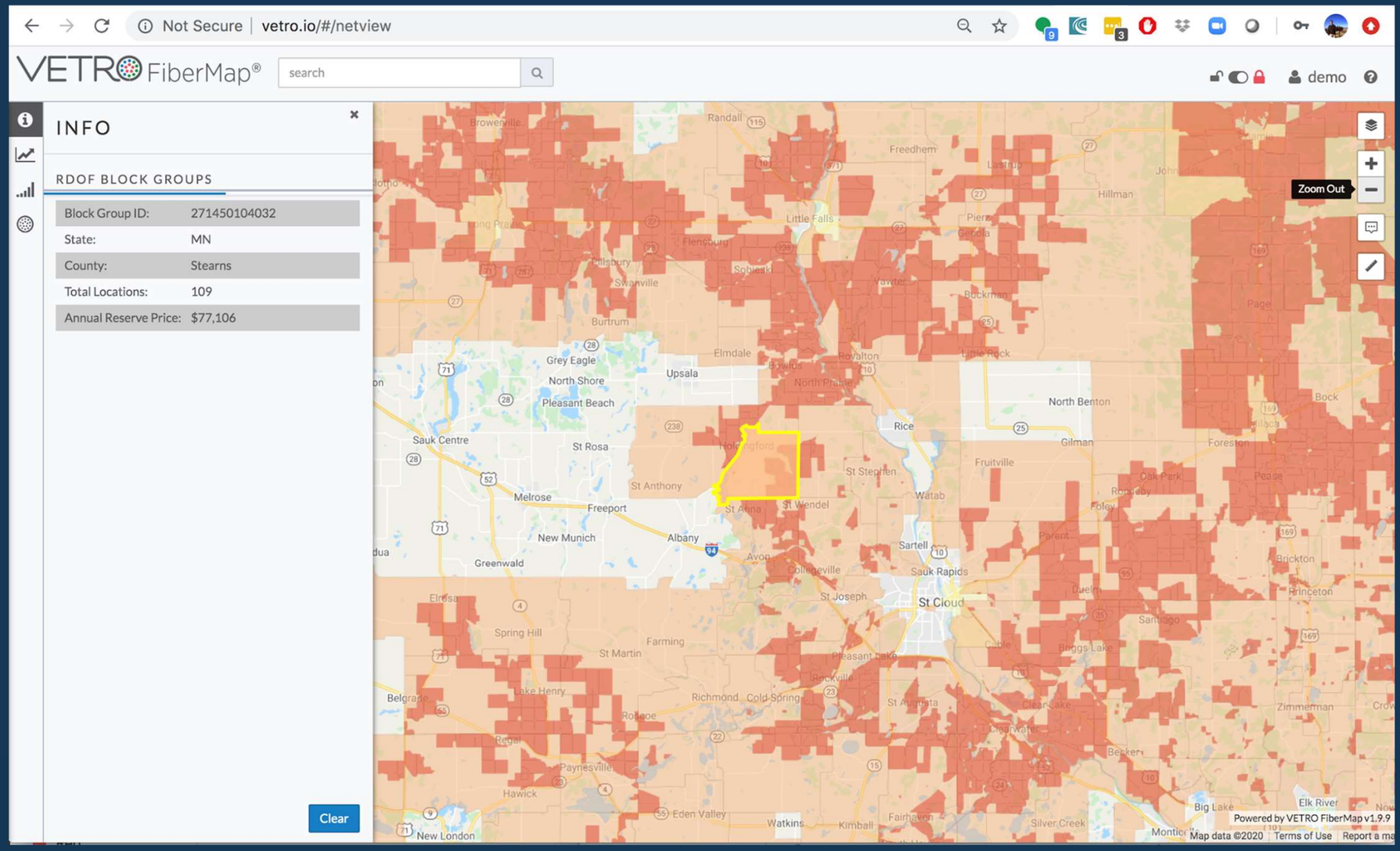
RDOF Areas:

Blocks & Block Groups in a RELATIONAL context



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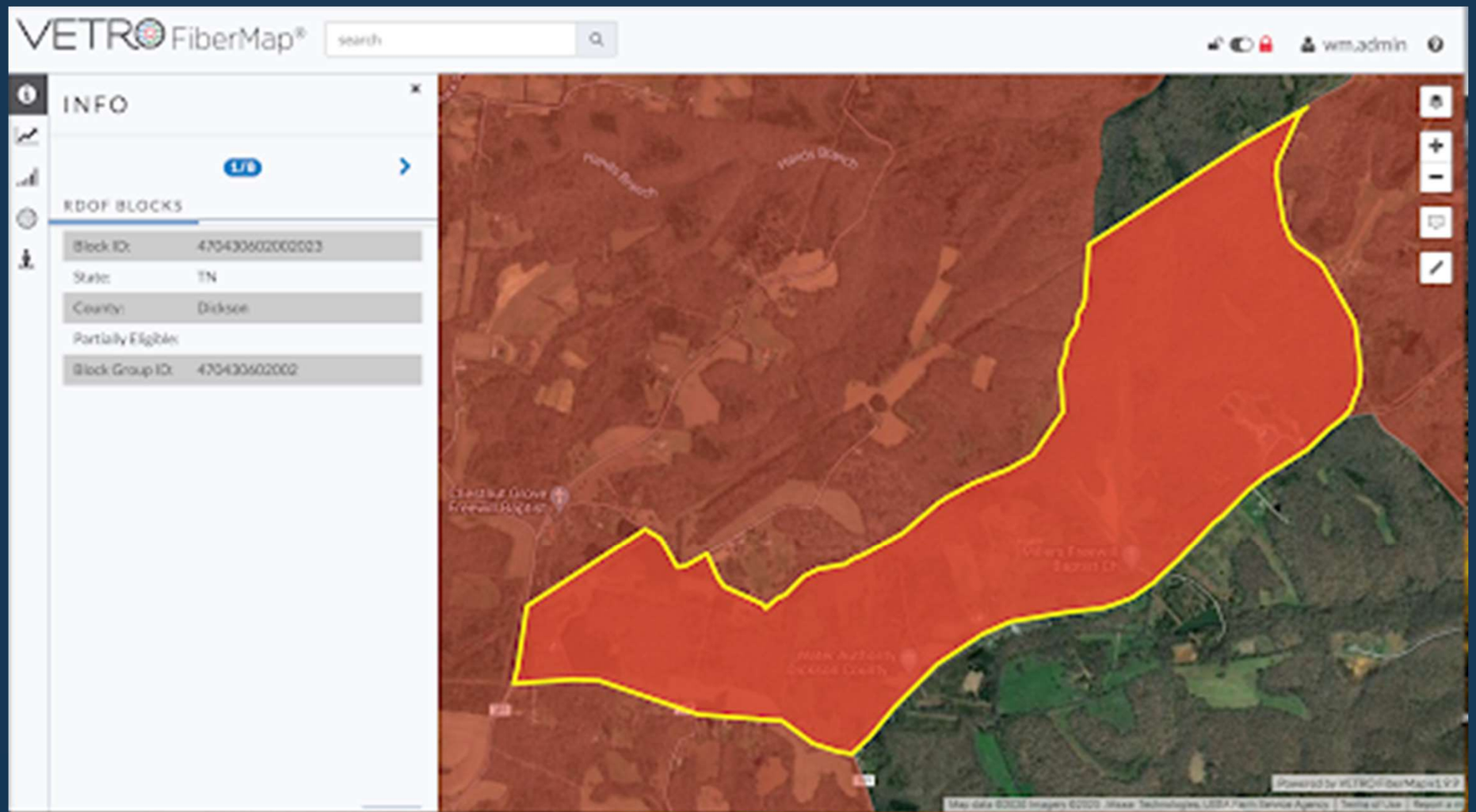
RDOF Areas:

Blocks in a DETAIL context



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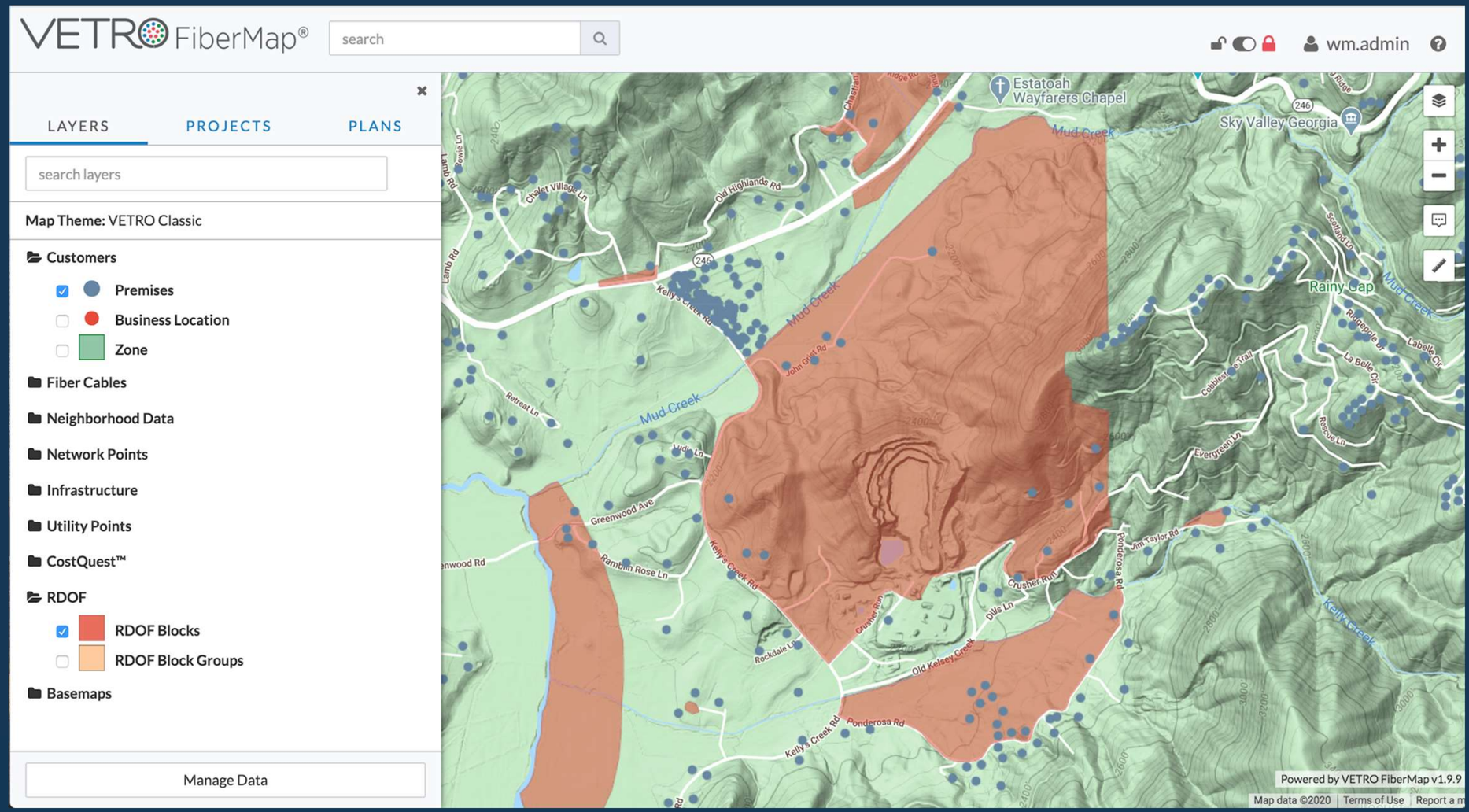
RDOF Areas:

Layering in LOCATIONS within the Blocks

(CQ FABRIC)



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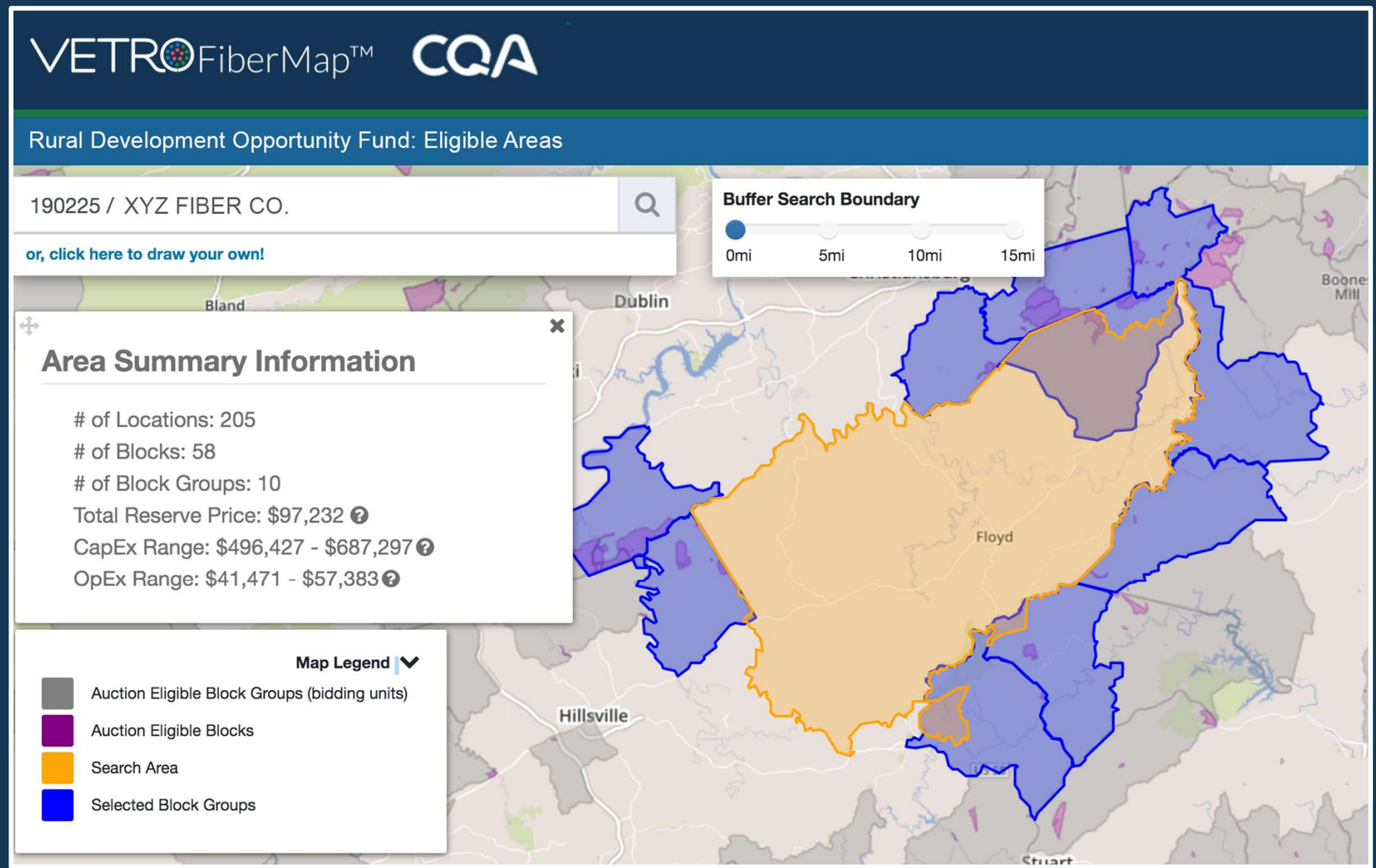
RDOF Areas:
Summarizing funds 'near me' quick and easy first look

(CQ CapEx Est)



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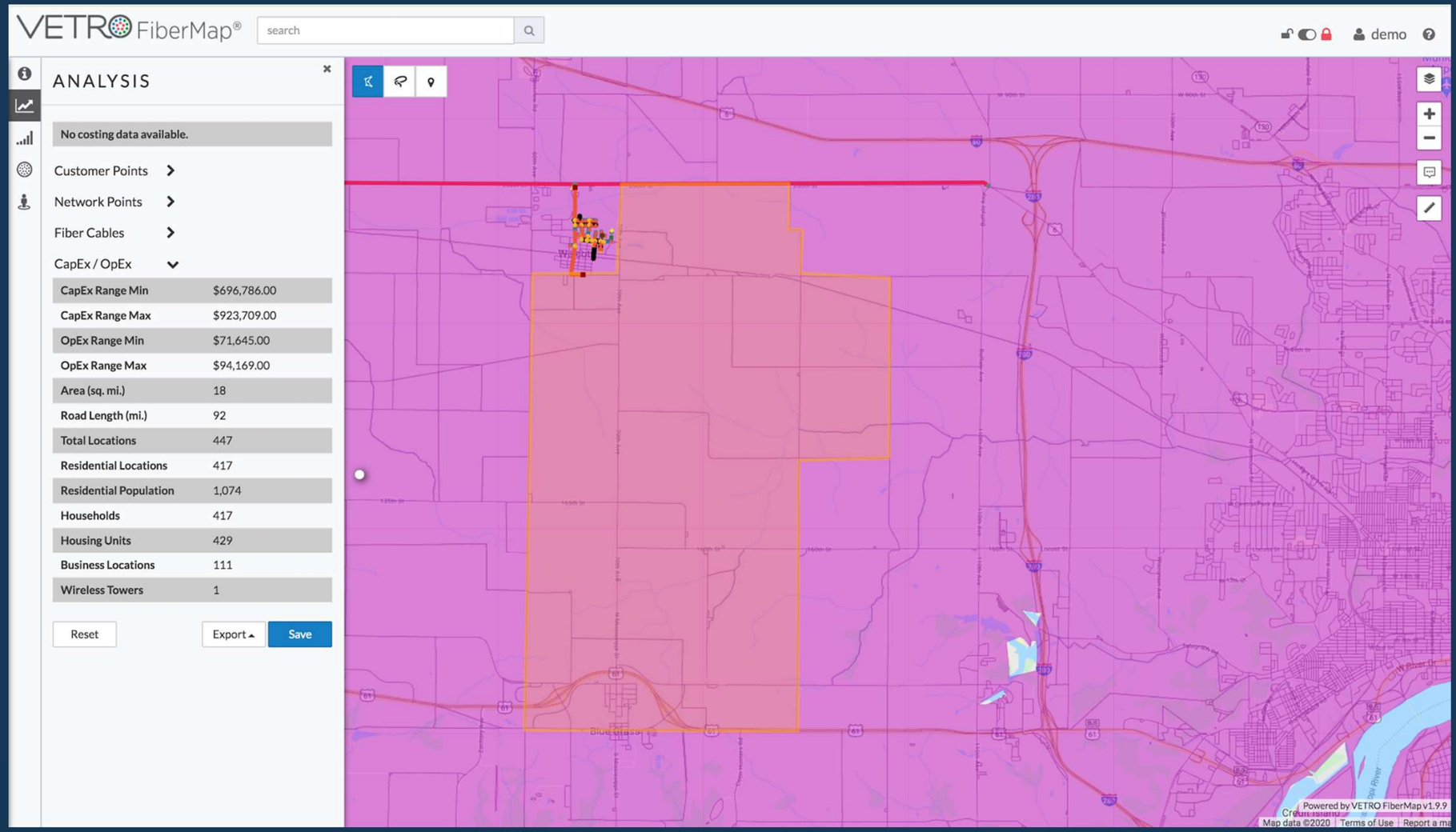
RDOF Areas:

Summarizing funds;
next level exploration
“analysis with polygons”

blocks



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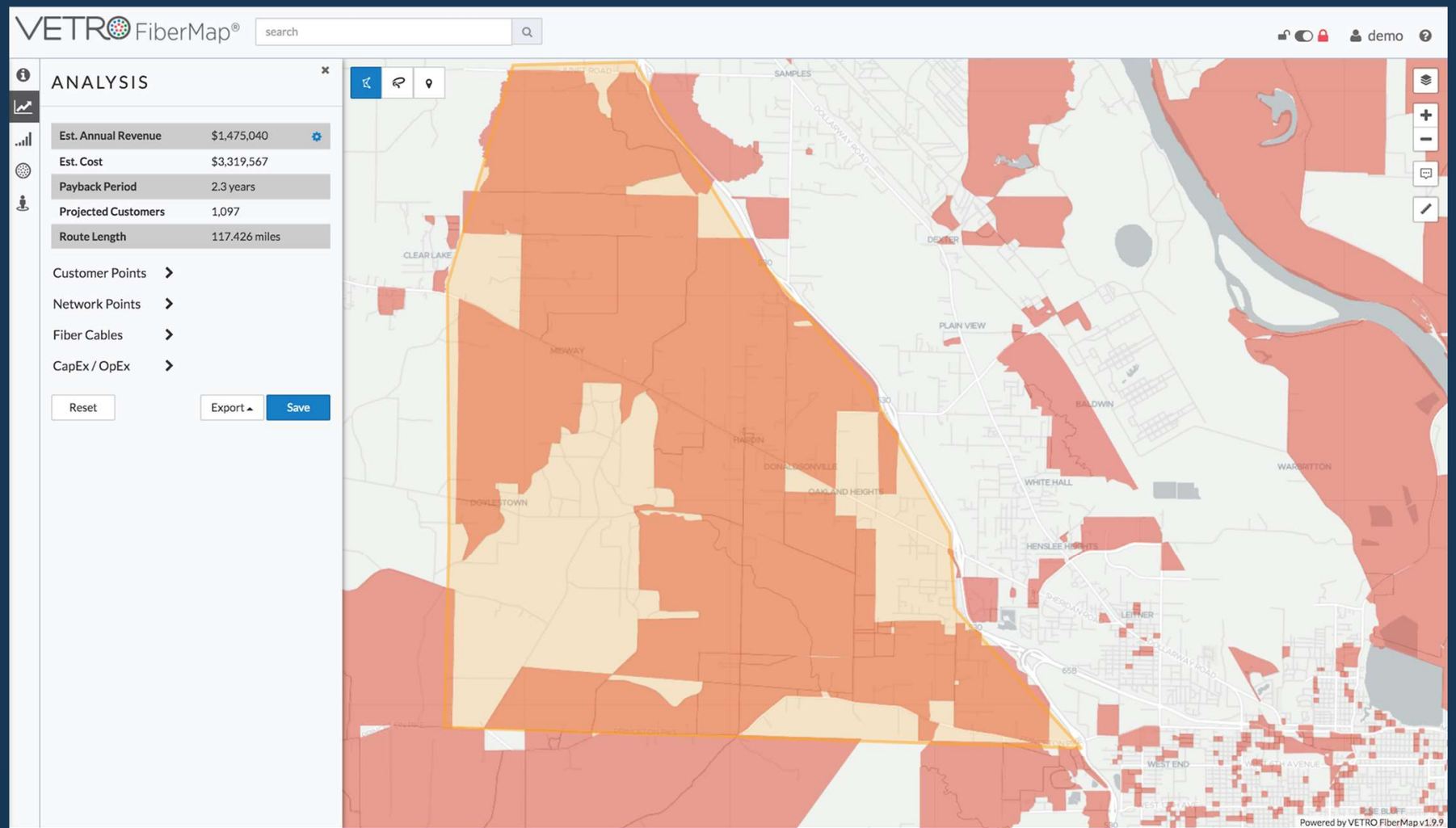
RDOF Areas:
Summarizing funds;
next level exploration
“analysis with polygons”

routes



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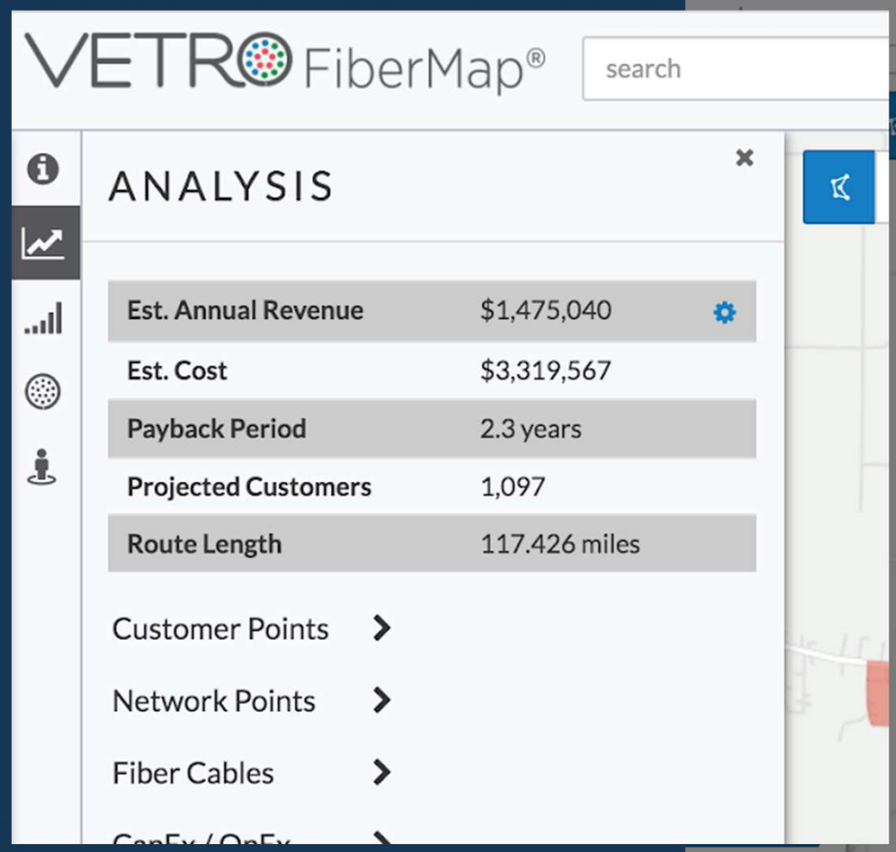

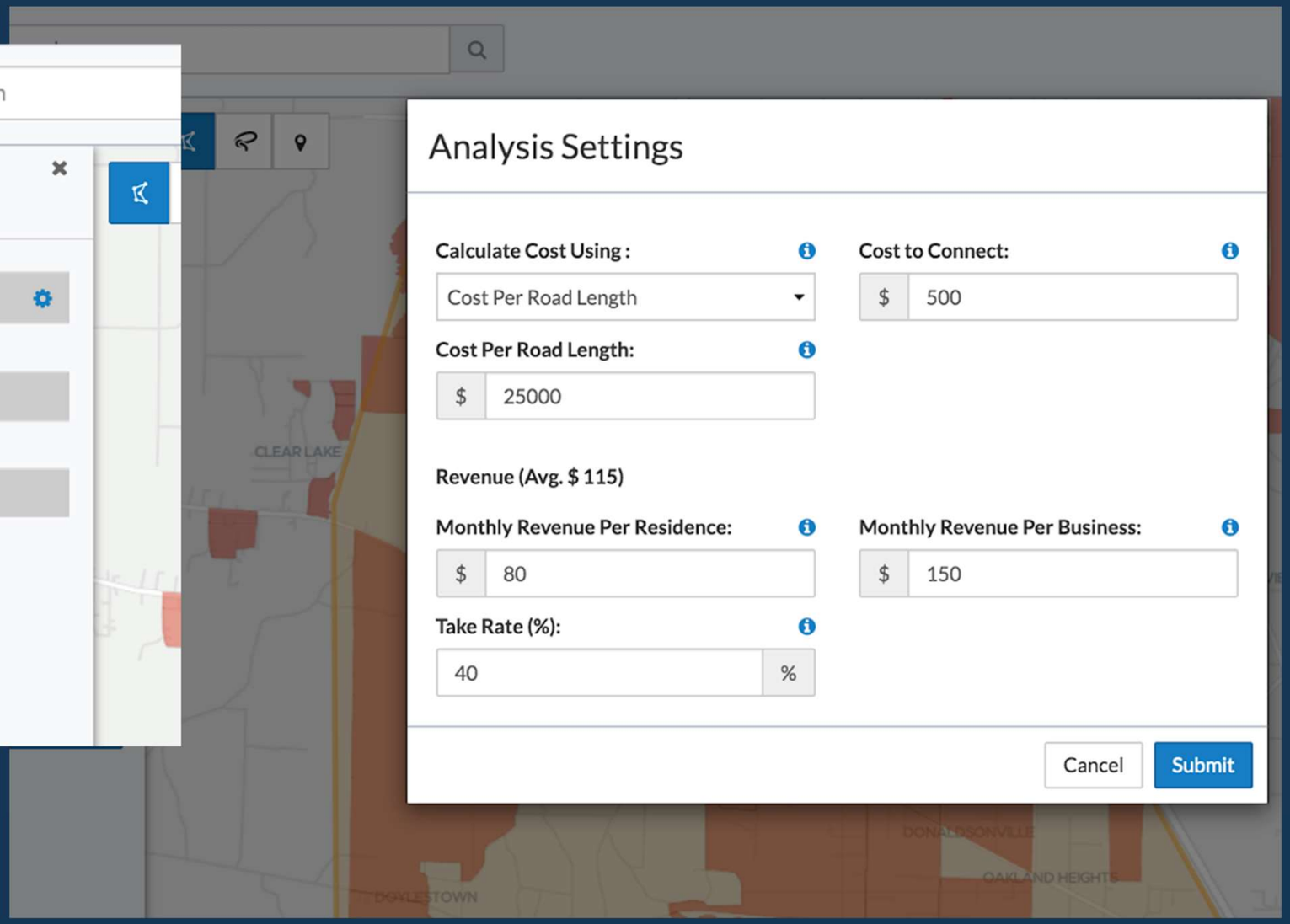

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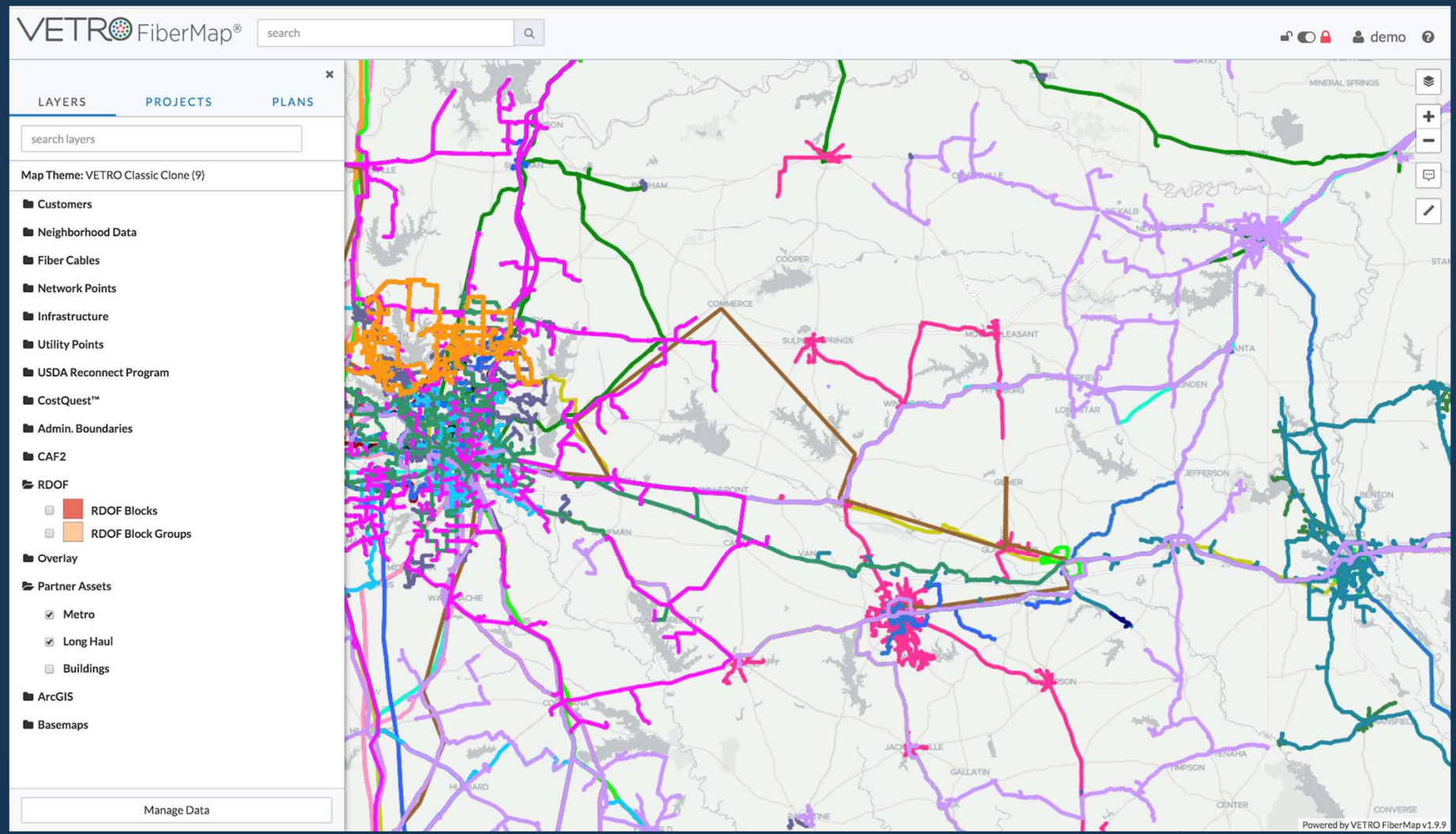
RDOF Areas:

Review existing networks



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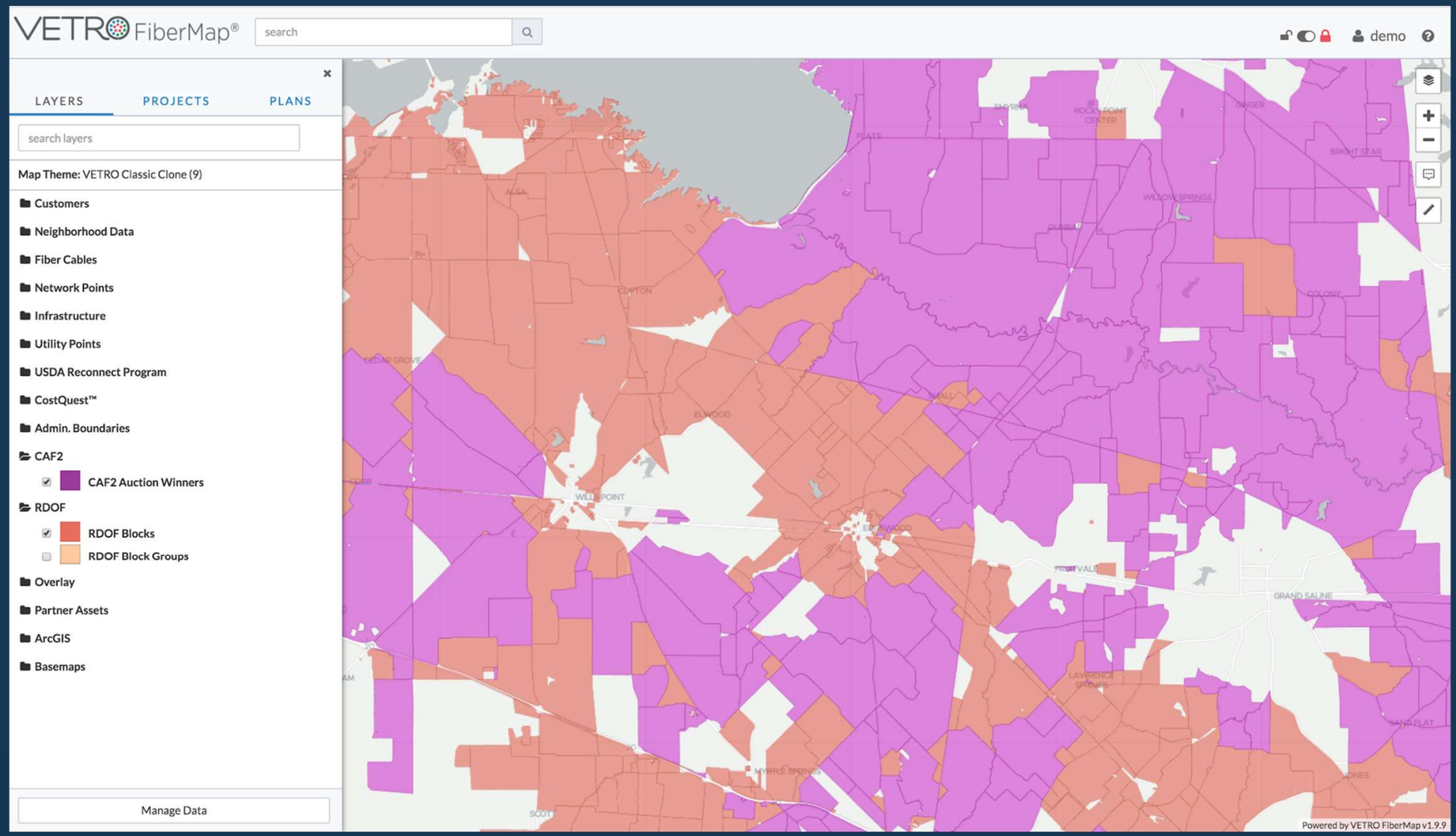
RDOF Areas:

Review prior funding awards



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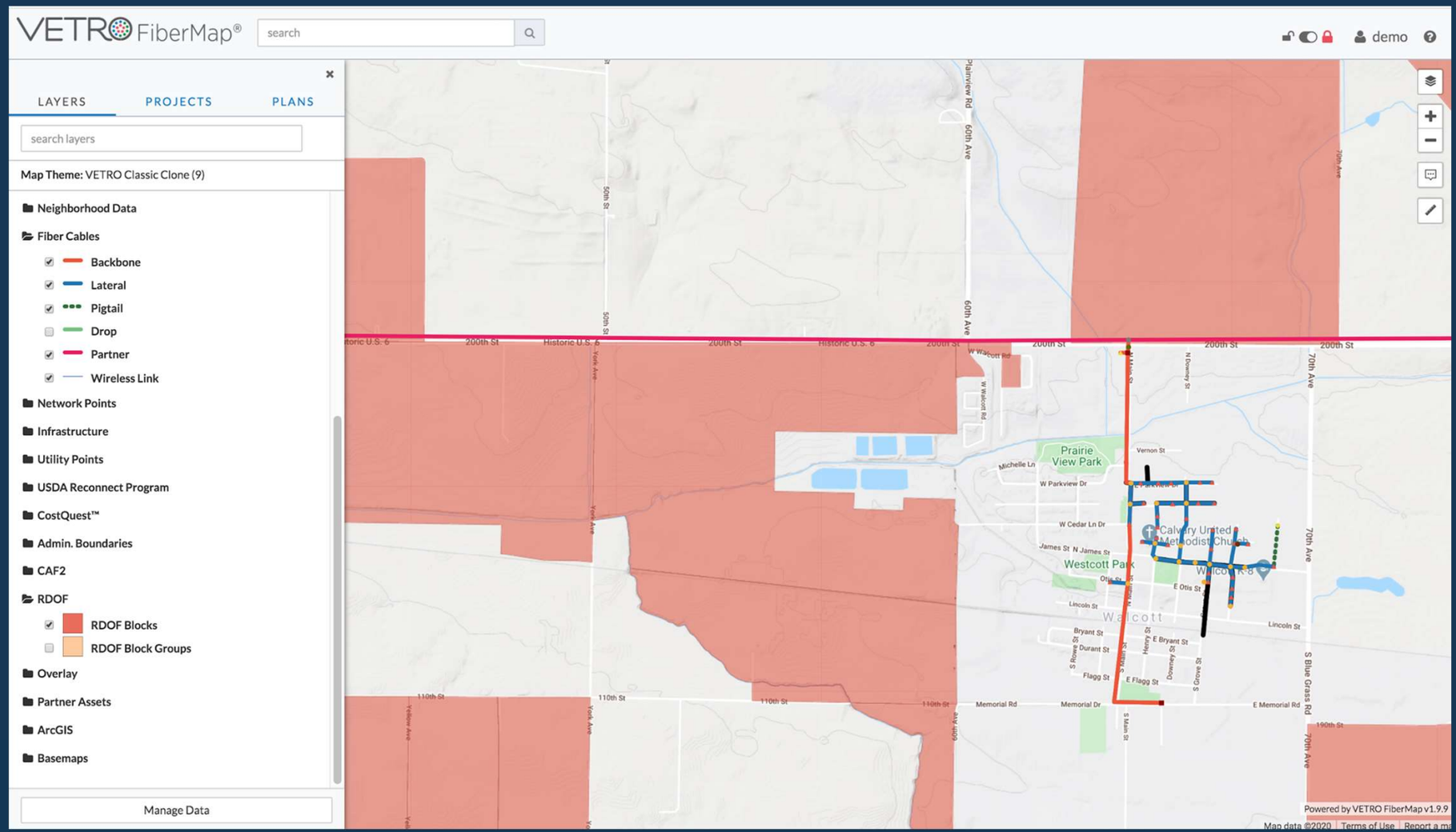
RDOF Areas:

Bring on your current network mapping!



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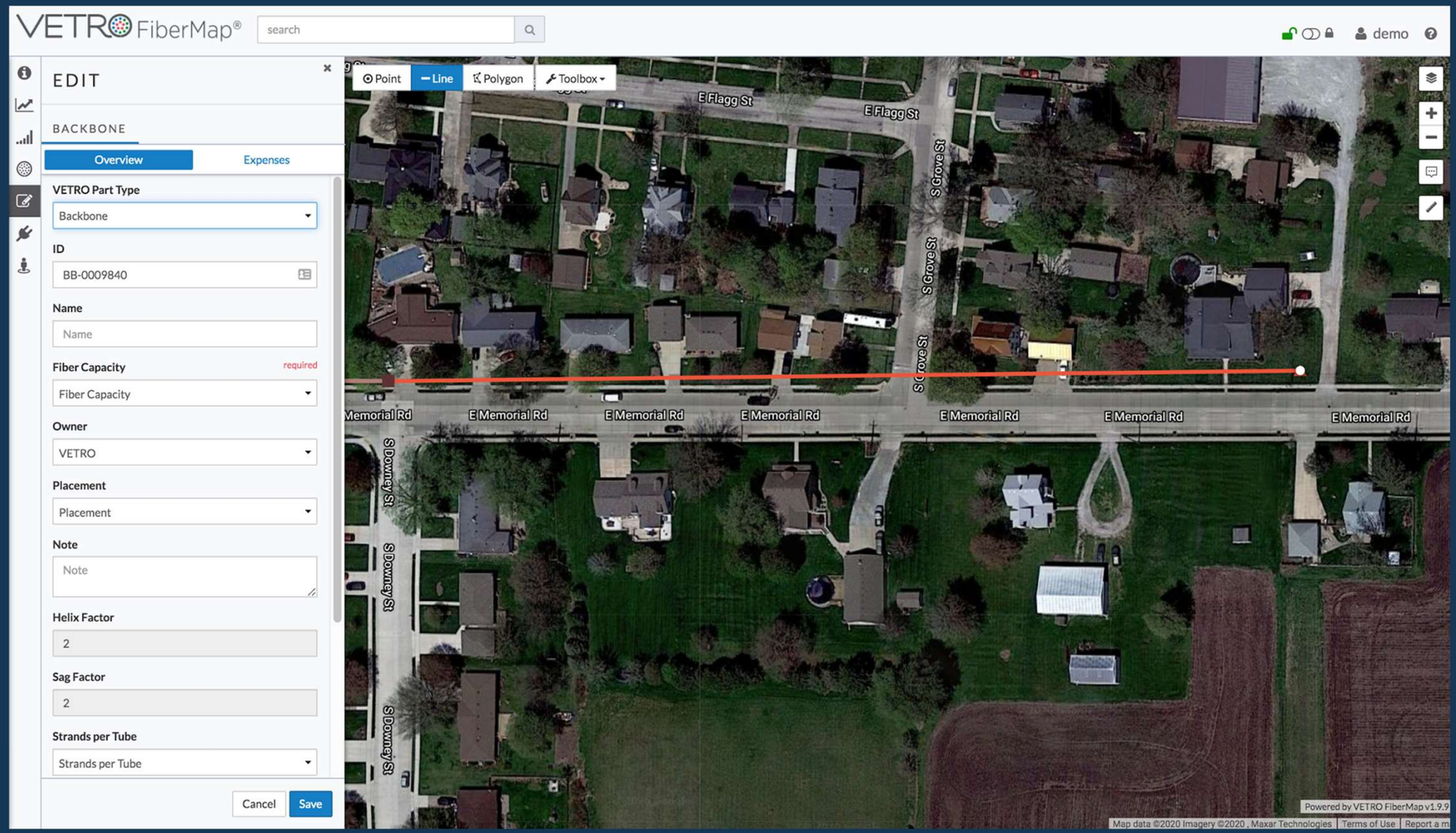
Manual Design



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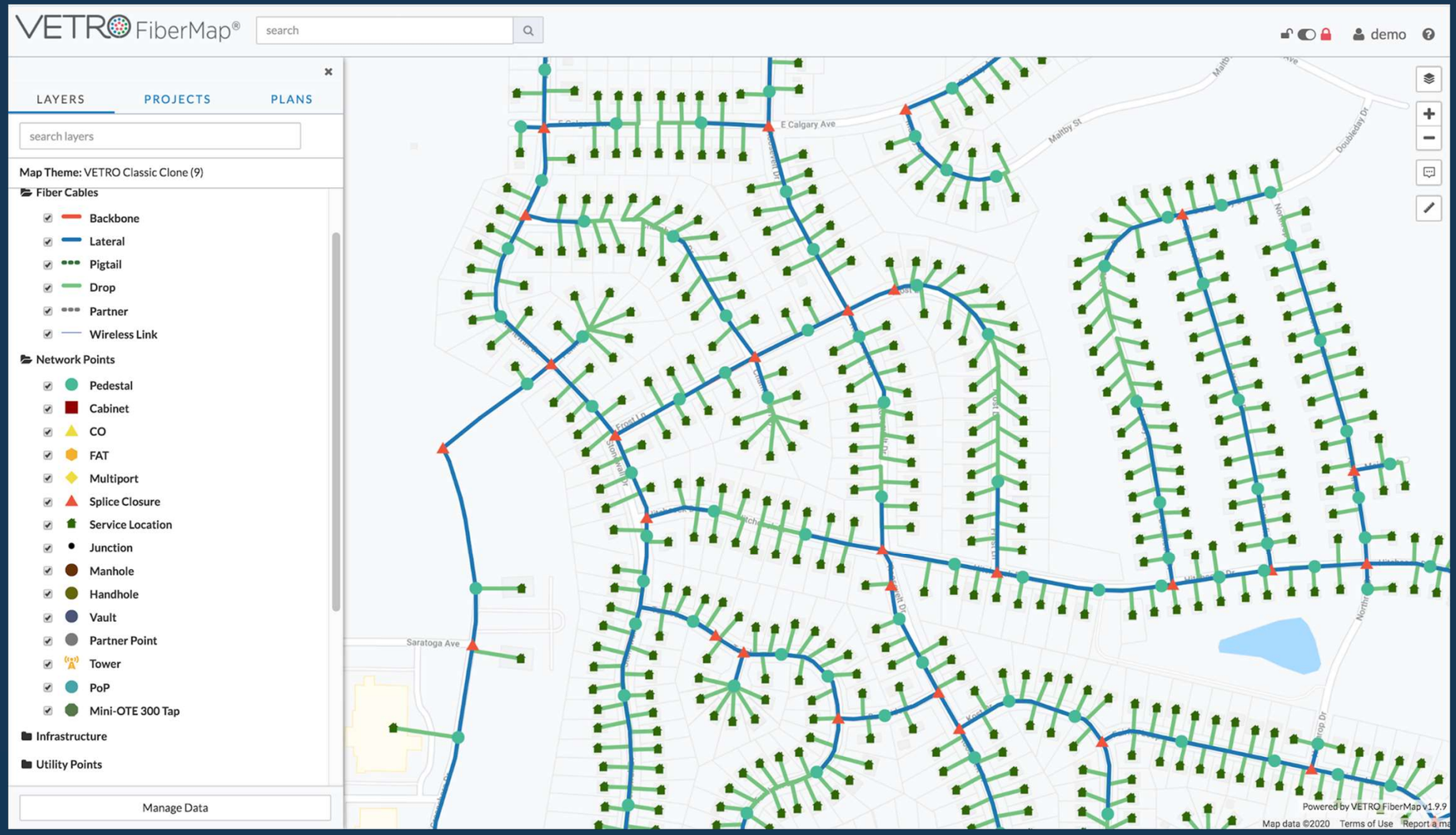
Automated Design



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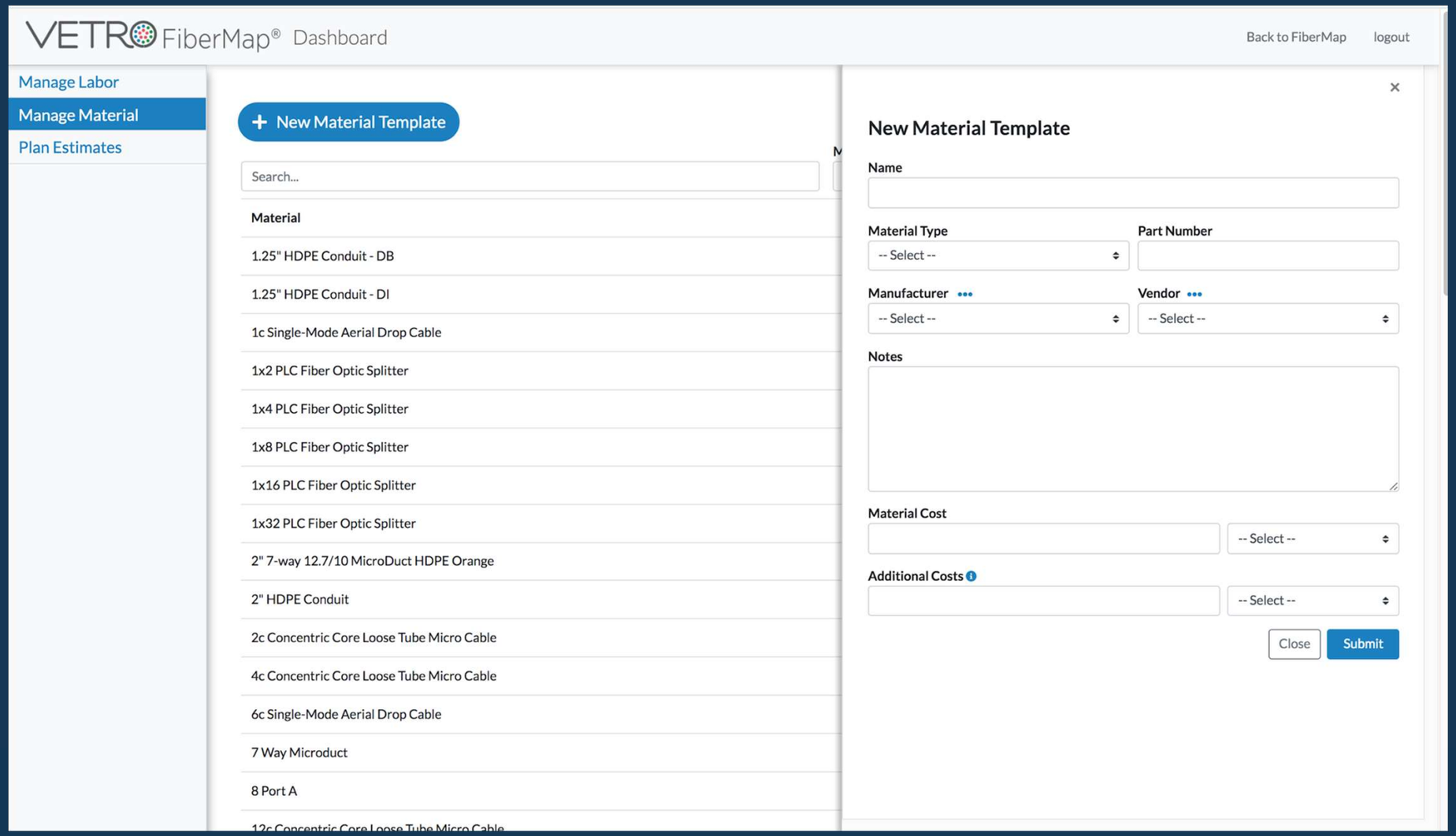
Assign Materials and Labor Costs



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Leading to Design Level Cost Estimates

Plan Estimate						
Item	Total		Description	Cost (R)	Per kilometer	Per Address
Residences Passed	0		Labor	15,553.56	20,511.58	N/A
Businesses Passed	0		Materials	2,546.64	3,228.02	N/A
Addresses Passed	0		Fixed Costs	10,000.00	12,675.62	N/A
Aggregate Total Length (km.)	0.79		Subtotal	28,100.20	36,415.22	0.00
Aggregate Length (km.)	0.76		10% Contingency	2,810.02	3,641.52	0.00
			Total with Contingency	30,910.22	40,056.74	0.00

Labor						
Item Type	ID	Description	UOM	Price	Quantity	Cost
FAT	28	FAT Setup	each	200	3	600.00
Multiport	29	Multiport Setup	each	300	1	300.00
Backbone	24	Cable Installation (BB)	foot	10	96.93	969.30
Lateral	25	Cable Installation (LA)	foot	7	1,315.65	9,209.55
Pigtail	26	Cable Installation (PT)	foot	5	524.51	2,622.55
Drop	27	Cable Installation (DR)	foot	3	550.72	1,652.16
Patch Panel	30	Patch Panel Setup	each	100	2	200.00
					Total Labor Cc	15,553.56

Materials							
Item Type	ID	Description	UOM	Price	Quantity	Additional C	Cost
Patch Panel	52	96 Port PP	each	150.00	1	100.00	250.00
FAT	10	Aerial Terminal Closure HFX2	each	125.00	1	50.00	175.00
				Subtotal:	2.00	150.00	425.00
Lateral	62	12c Concentric Core Loose Tube Micro Cable	foot	1.55	1,368.80	0.00	2,121.64
				Subtotal:	1,368.80	0.00	2,121.64
				Total Material Cost:		150.00	2,546.64

Fixed Costs		
Name	Cost	Description
Machinery	10,000.00	

Plan Estimate | Raw Material | Raw Labor | Fixed Costs | +

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- **Design>Construction**
- **Database of Record**
- **Asset Management**
- **Network Documentation**
- **Fiber Management System**

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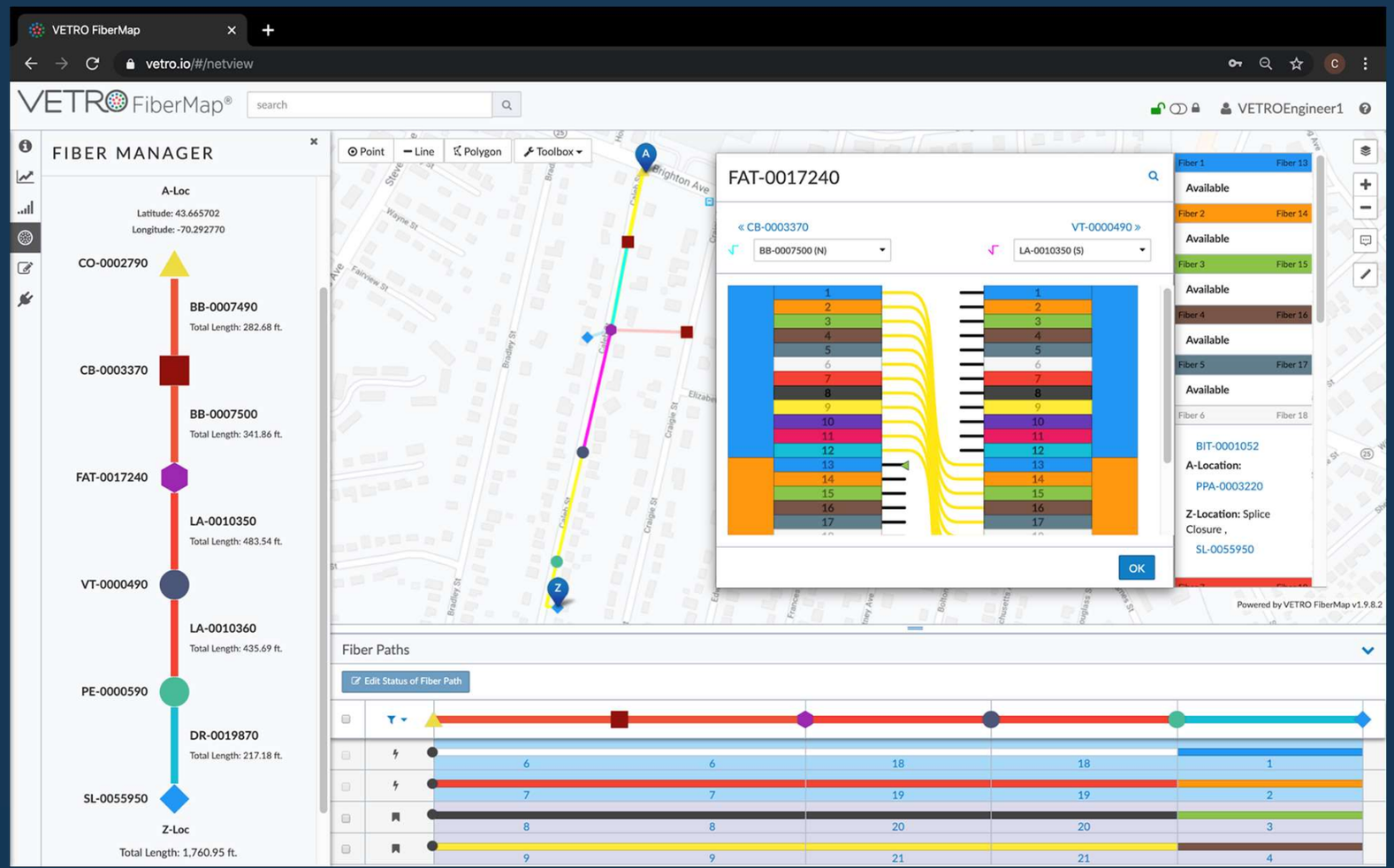
After you WIN RDOF Support…

All of this data and work can stay in one place for build and operate phases - your fiber management platform



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Webinar 2: JUNE 9th

DESIGN, DATA, and DETAILED COSTING


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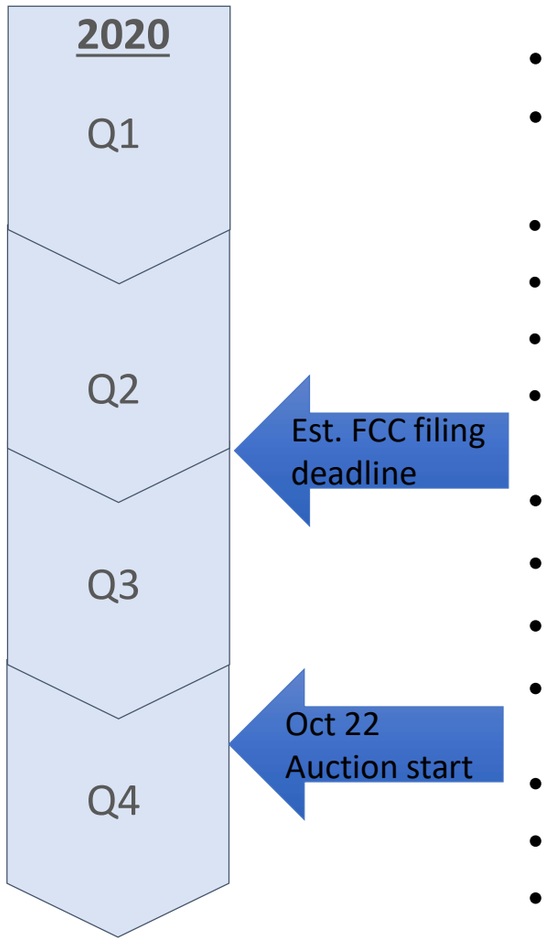
THE FIBER PLATFORM

Next Steps

Best Practice Auction Preparation Steps



- GIS mapping: initial RDOF eligibility analysis and opportunity assessment
- Initial feasibility analysis (network build costs, rough business case)

- Detailed GIS mapping: Full RDOF competitive bidding outlook
- Develop high-level bidding strategy given final rules and procedures and reserve amounts
- Full RDOF opportunity analysis (probabilities)
- Full business case projection (with and without RDOF $); initial go/no-go decision

- Formal FCC filing deadline for RDOF participation (short form); prohibited comms rules apply
- Detailed sensitivity analysis of business case; specify risk-adjusted subsidy targets
- Develop and test strategic auction scenarios (competitive behavior, progress to clearing)
- Stand-up auction IT capabilities and bidding “war room” personnel and procedures

- Finalize bidding strategy (including walk-away price); auction simulation
- Full testing of FCC IT links, bidding plans and procedures; FCC mock auction
- Auction start October 22

Register for Part 2:

SCAN ME

Q&A

broadbandfabric@costquest.com

sales@vetrofibermap.com

CQA Model • Measure • Manage

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QUADRA PARTNERS, LLC