VCTI

SPECTRUM PLANNING, INC.
The Mapping Innovators

Broadband IQ ™

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VCTI

Empowering the broadband ecosystem to **dramatically improve the performance of capital investments** in growth and network expansion

- **30+ Years** serving the broadband industry
- **300+** Software Engineers
- **AI** Center of Excellence
- **$2 Billion+** Project Value Supported
- **$877** Million Client Grant Wins
- **2024 ISE Gold** Level Award Product Innovation
- **2025 ISE Silver** Level Award Product Innovation

VCTI

BROADBAND IQ™

Where to Build

ISE Network Innovators' Awards Silver

- Market Expansion Strategy
- Qualified Target Identification & Prioritization
- Address/Location Integrity & Mapping
- Grant Opportunity

How to Build

ISE Network Innovators' Awards Gold

- Fiber IQ™ Cost Analysis
- Route Optimization
- Automated Enterprise CPQ
- High-Level Plan
- Construction-Ready Low-Level Design

SOFTWARE SERVICES

AI Center of Excellence

- Operations
- Training
- Market Research
- Product Development
- Product Management

Network Technologies

- OSS & Inventory
- Cloud & Virtualization
- Optical Core
- Microservices

CONSULTING

Grant Support

- Grant Scoreboard – Win Probability
- Maps and Analysis to Support Local Engagement
- Bid Compliance/Process Management
- Protests & Challenges

Sales Target Optimization

- Address-Location Integrity
- Identification & Mapping of all serviceable locations FTTH and Fixed Wireless
- Residential & Enterprise Sales/Wholesale

Key Clients

COX, CISCO, COMCAST, archtopfiber, brightspeed, amdocs, LUMEN, CONTERRA NETWORKS (Fiber Driven. People Powered.), cspire, Sparklight, Infinera

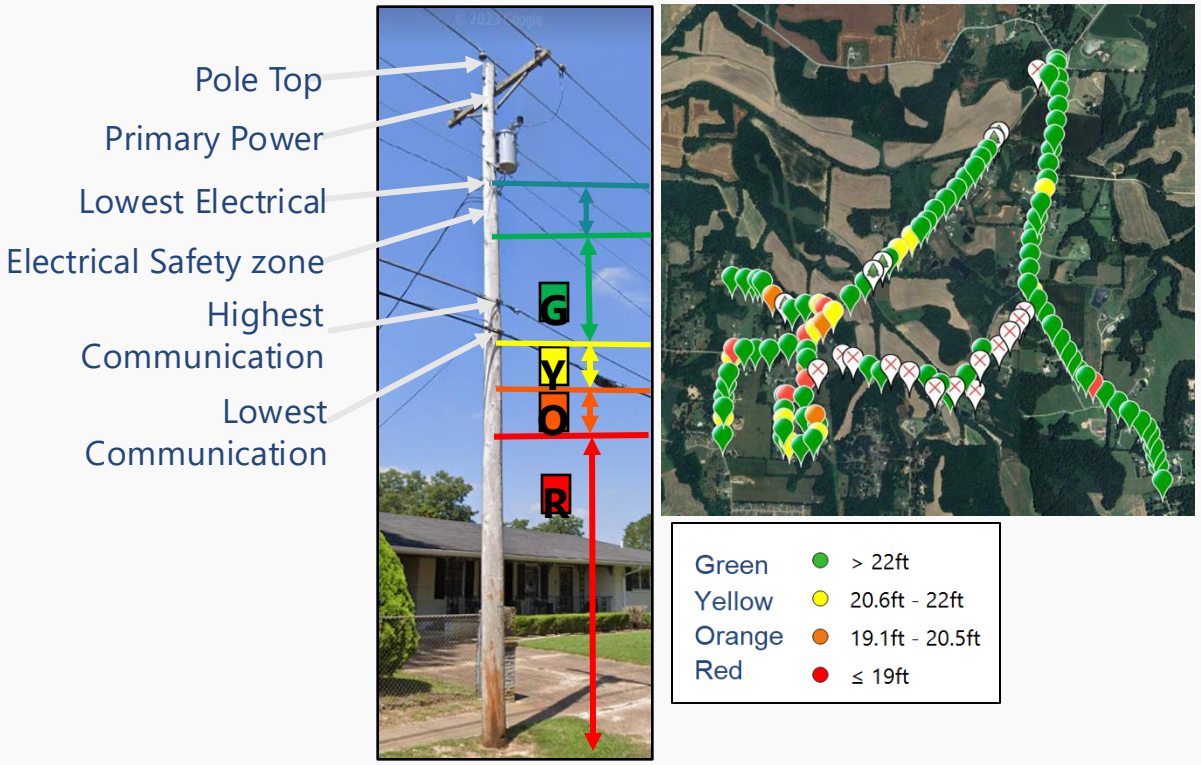
FIBER IQ™: VIRTUAL COST ESTIMATION

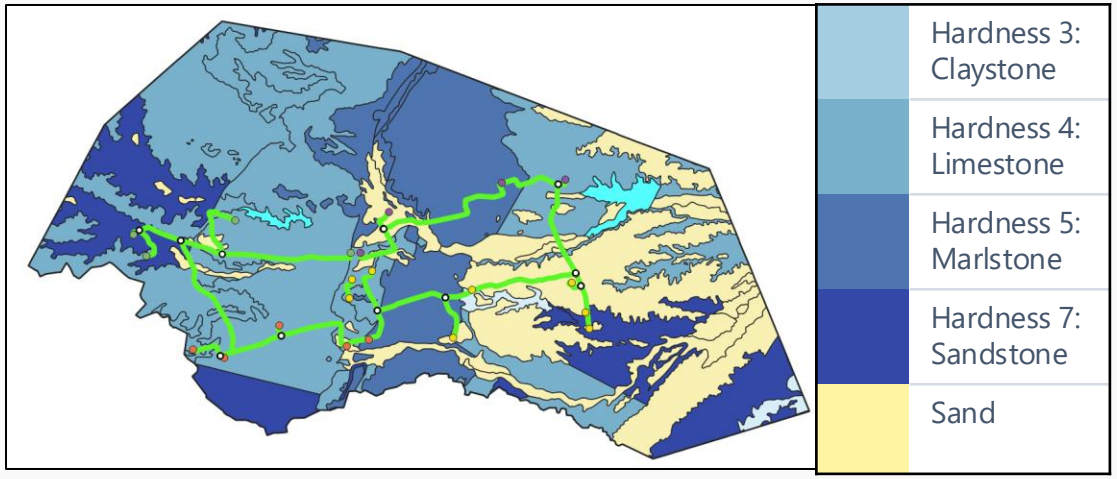
Pole IQ™ Automates:

Pole Viability Assessment
Make Ready Estimation
GeoLocation & Mapping Along Route

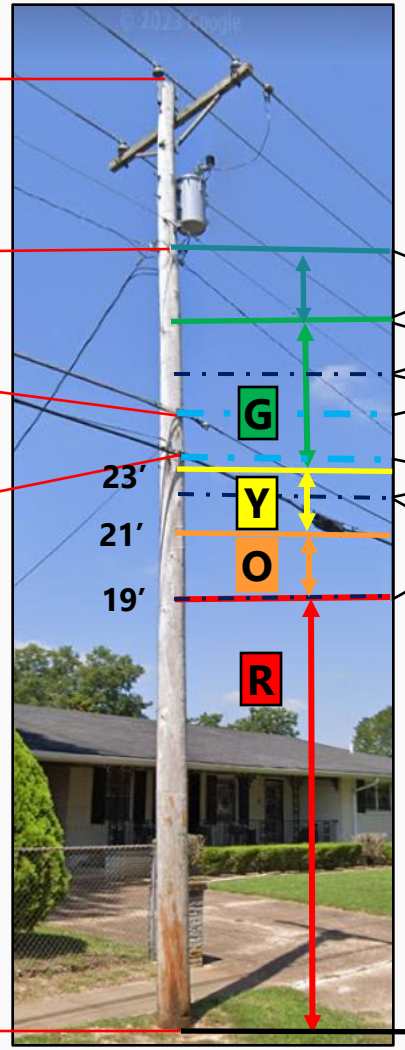
Geology IQ Automates:

Mapping of Geology on Route,
Hardness of Ground Substrate
Build Cost/Construction Implications





POLE IQ™: POLE AND CABLES



Pole Top (PT)

Lowest Electric Cable (LEC)

Highest Communication Cable (HCC)

Lowest Communication Cable (LCC)

Pole Base

Safety Zone (3’ 4”)

Space For New Cable (Top Attachment)

Clearance of 12” Existing Cable to New Cable

Space For New Cable (Bottom Attachment)

Span length is taken into consideration via color coding spans based on spacing.

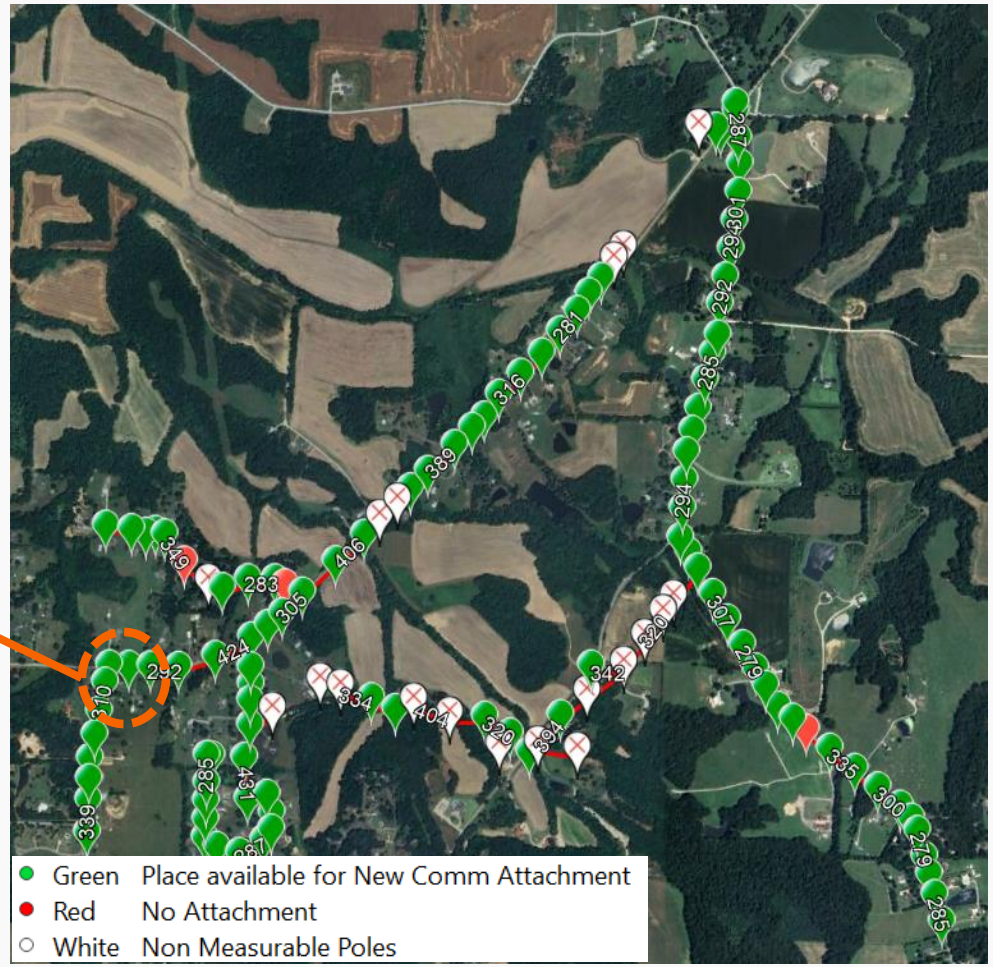
Pole - Pole Span

Green ≤ 250'

Red > 250'

Note: Measurements shown here are for illustration purposes only.

POLE IQ™: SPAN LENGTH



Span length is taken into consideration via color coding spans based on spacing.

POLE IQ™: ANALYSIS

Pole Labels			
Ranges (Feet)	Labels	GYOR	Count
More than 31.0 ft		G5	4
29.1 ft – 31.0 ft		G4	4
27.1 ft – 29.0 ft		G3	7
25.1 ft – 27.0 ft		G2	16
23.1 ft – 25.0 ft		G1	51
21.1 ft – 23.0 ft		Y1	74
19.1 ft – 21.0 ft		O1	83
≤19.0 ft		R1	84
Non-Measurable		NM	73
Rear Easement		R	142
Total	**538**		

Note: Pole label based on height of the lowest attachment

Attachment Possibilities																								
	Top and Bottom (TB)				Top (T)				Bottom (B)				New Comm Attachment (NW)				Middle(M)				No Attachment (NA)			
Pole Labels	C	E	Tf	G	C	E	Tf	G	C	E	Tf	G	C	E	Tf	G	C	E	Tf	G	C	E	Tf	G
G5														3							1			
G4	1													2							1			
G3	1								1					5										
G2	1				1				4					8							2			
G1	4				2				8					31							6			
Y1	16				8				26					9							9	6		
O1	15				20			1	15					1			2				25	4		
R1					49												4				30			1
Grand Total	**38**				**81**				**54**				**59**				**6**				**85**			

Note: Attachment possibility based on height of lowest attachment

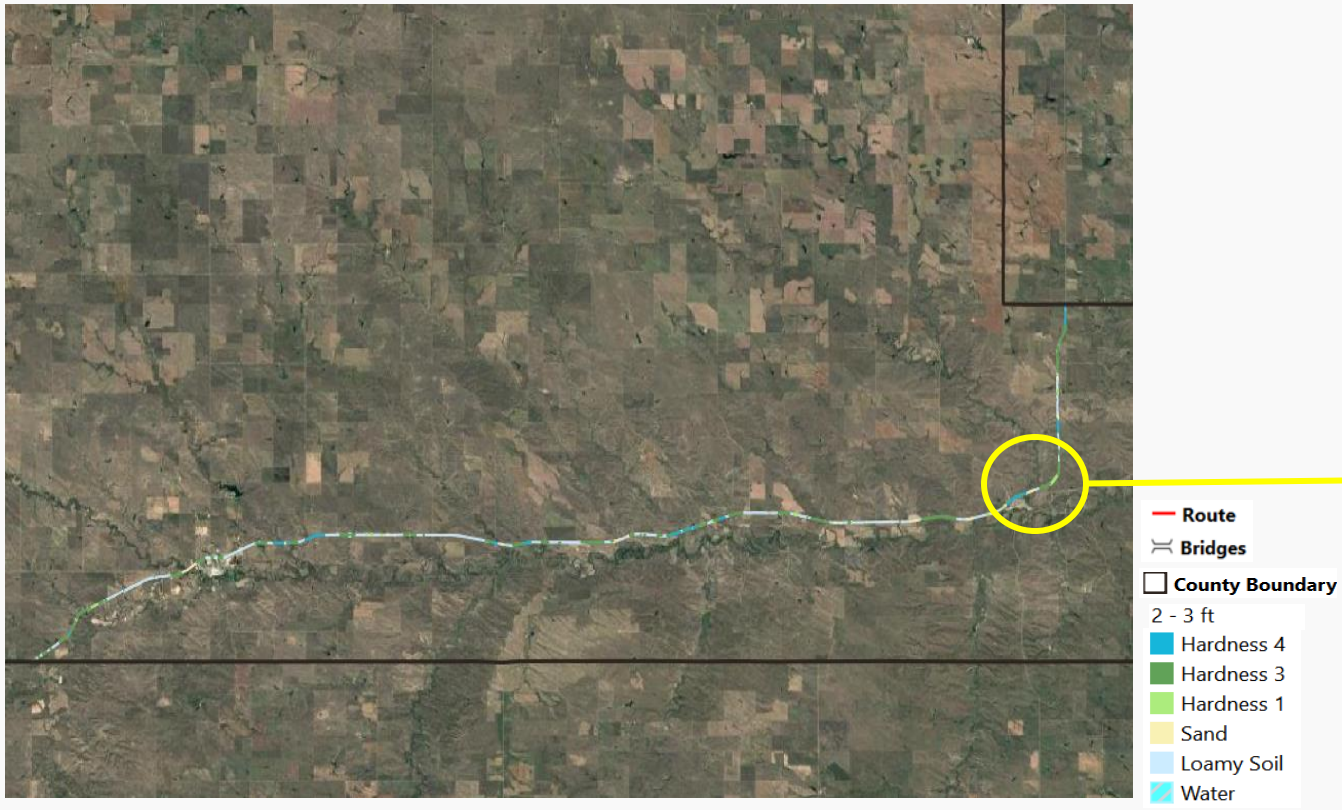
Pole Legend : C=Communications / E=Electrical / Tf=Transformer / G=Guy
Color code defined by the height of the lowest attachment(s) (communication cable, electric cable) on the pole

GEOLOGY IQ™

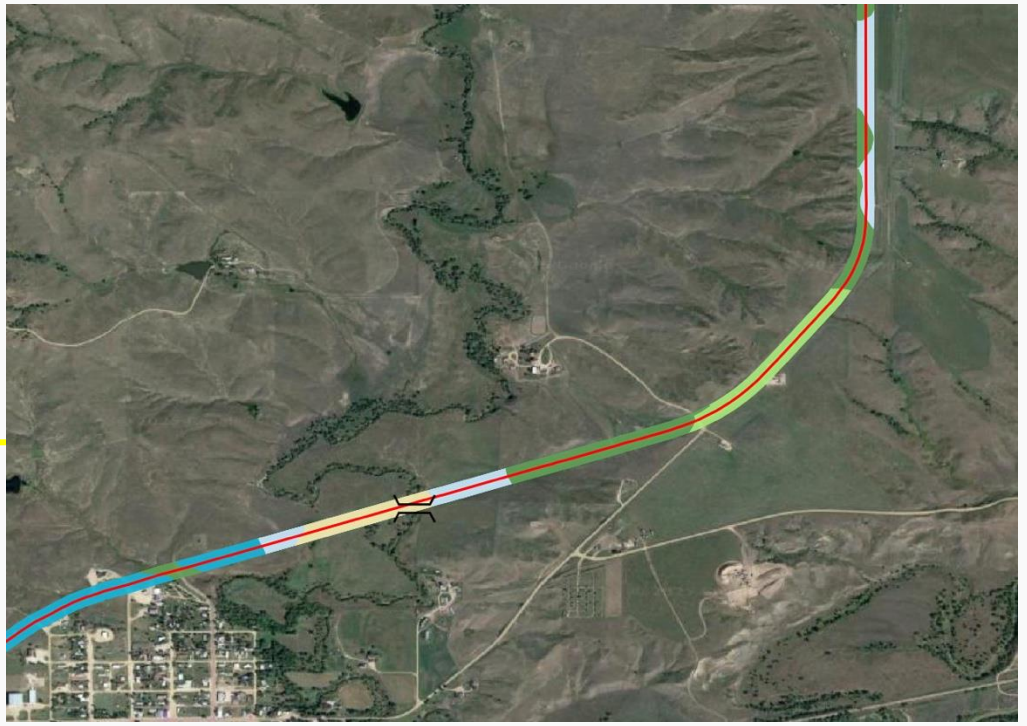
Process to Assure Accuracy

- Data is a mash-up of USGS and USDA data, translated into layman's terms.
- Mohs hardness scale is used as the standard to define soil composition and relevant construction implications
- USGS dataset summarizes web soil survey and remote sensing data without depth
- USDA dataset uses detailed web soil survey with depth and many other features
- VCTI results are compared to, and validated against known borehole/core-drill data
- VCTI's set of proprietary algorithms analyze the data and make it usable.

100 FT BUFFER ROUTE & GEOLOGY IQ™



Project route & geology with 100 ft buffer at 2~3 ft depth



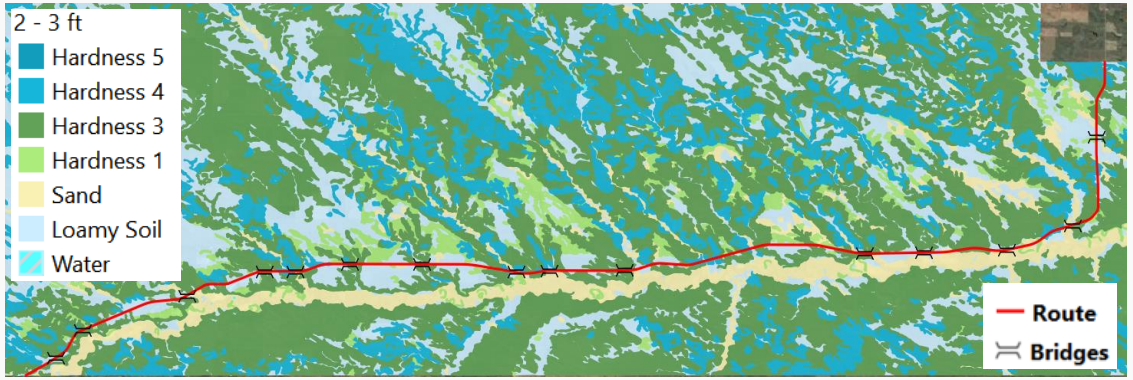
Zoomed-in View with 100 ft buffer at 2~3 ft depth

ROUTE & GEOLOGY IQ™ - 0 ~ 4 FT

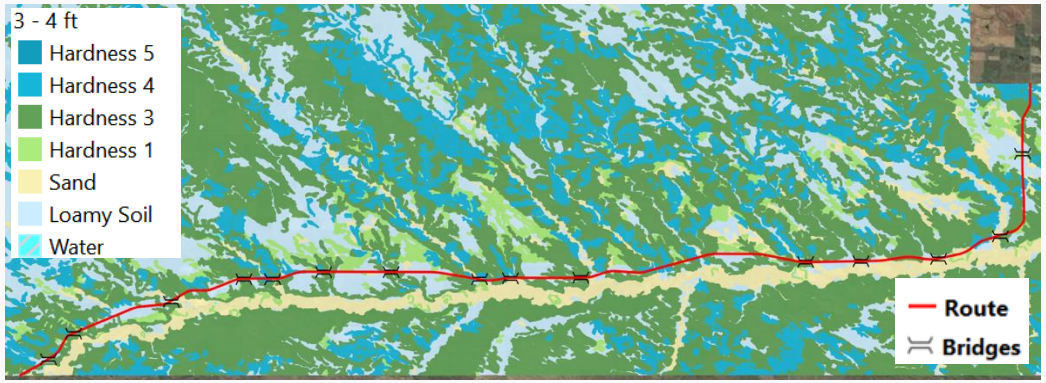
Soil type at 0-1 ft

Soil type at 1-2 ft

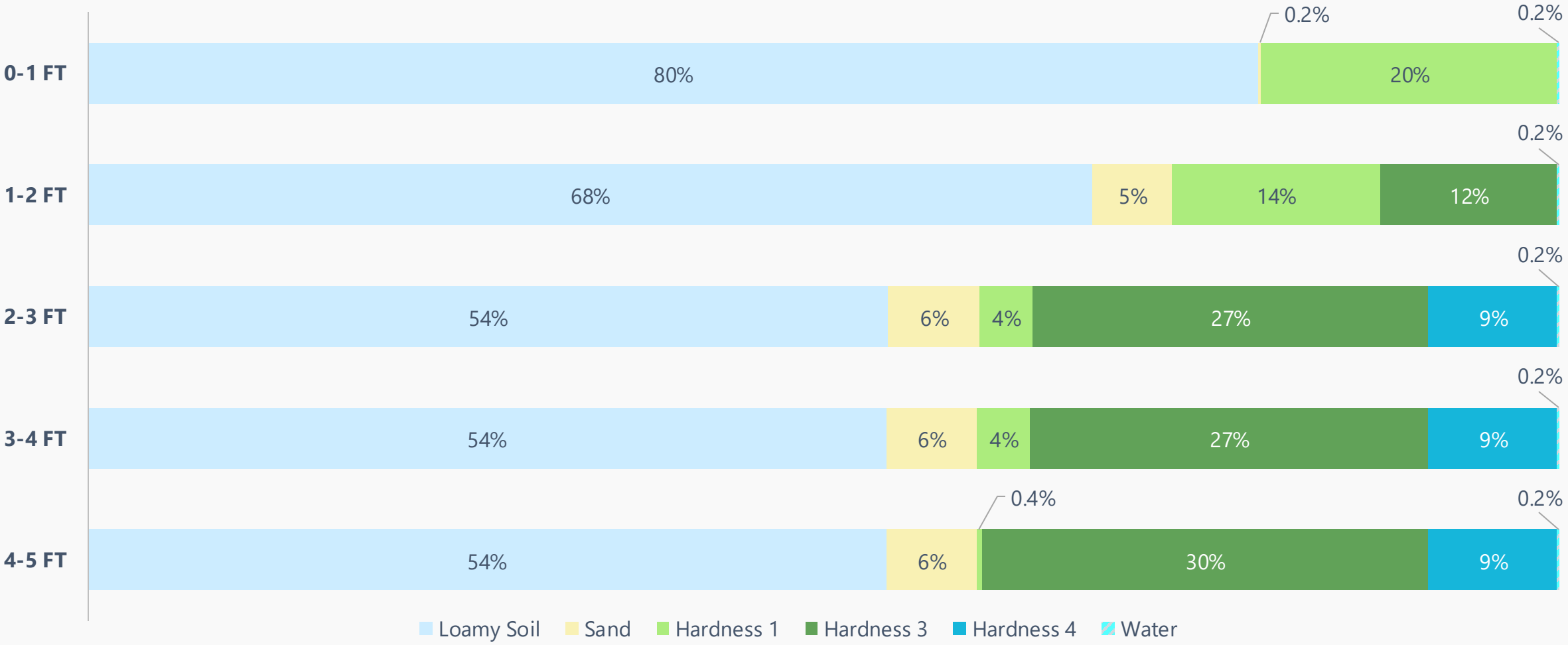
Soil type at 2-3 ft



Soil type at 3-4 ft



GEOLOGY IQ™ SUMMARY



Note: The soil graph is representative of the soil composition of the route.

GEOLOGY IQ™ AT DEPTH – 2 ~ 3 FT

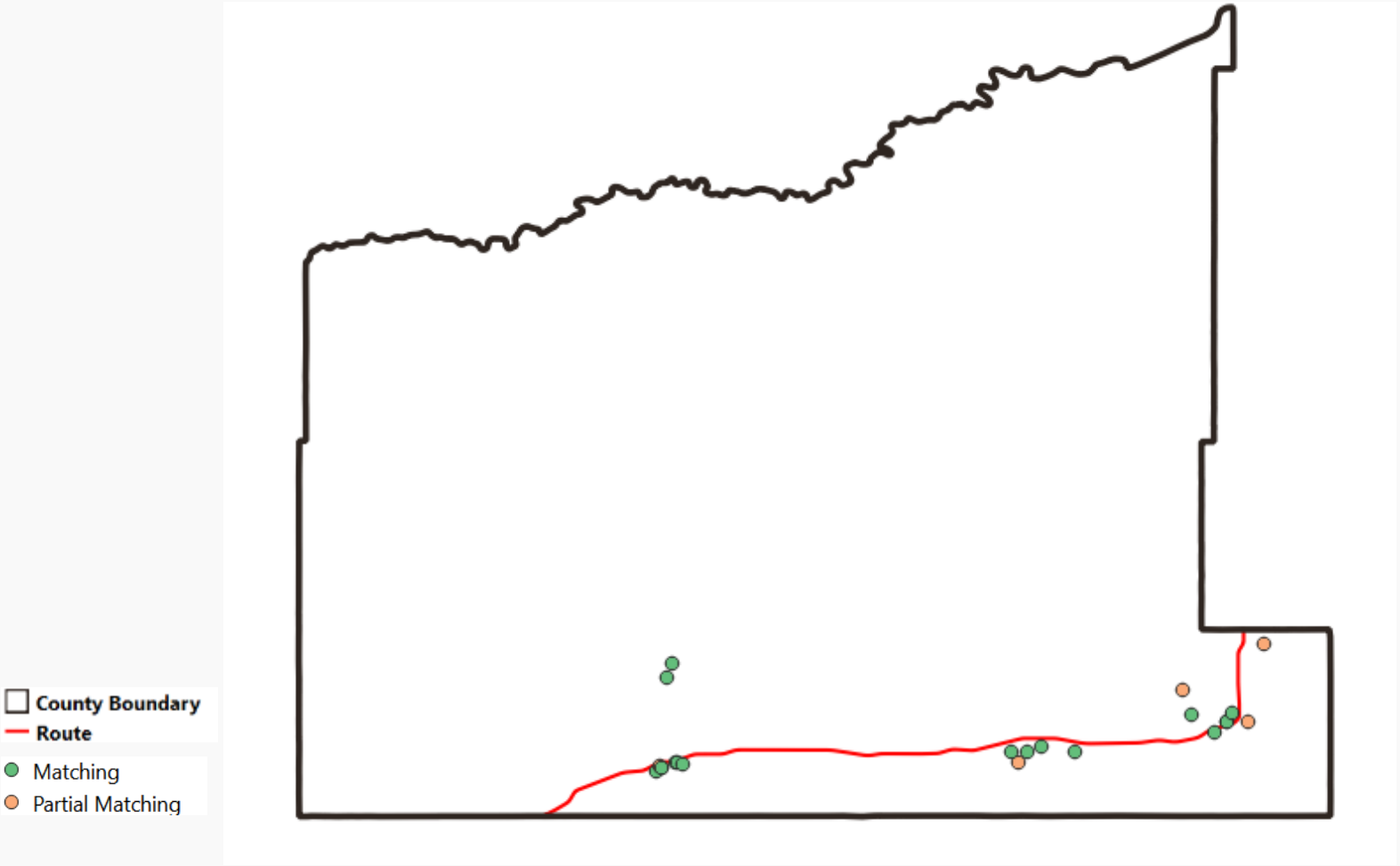
	Hardness Type	Texture	Parent Material	Route length (ft)
	Hardness 4	Bedrock, Weathered Bedrock	Calcareous Shale	18,594 (9%)
	Hardness 3	Bedrock, Clay, Stratified Clay To Silty Clay Loam, Very Gravelly Sand, Weathered Bedrock	Slope Alluvium, Clayey, Sandy and Gravelly Alluvium, Shale	56,973 (27%)
	Hardness 1	Parachannery Clay, Stratified Fine Sandy Loam To Clay Loam To Loamy Sand, Very Gravelly Loam	Clayey Alluvium, Calcareous Shale, Shale	7,690 (4%)
	Sand	Clay Loam, Gravelly Sand, Stratified Fine Sand To Silt Loam To Silty Clay Loam	Clayey Alluvium, Calcareous Loamy Alluvium, Sedimentary Rock, Shale	13,061 (6%)
	Loamy soil	Clay Loam, Silty Clay, Silty Clay Loam, Stratified Clay To Silty Clay Loam	Mixed Alluvium, Clayey Alluvium, Clayey Shale, Shale	115,332 (54%)
	Water	-	-	372 (0.2%)
			TOTAL	212,022 (40.1 miles)

BOREHOLE VALIDATION

Source – **Water wells**

Out of 22 borehole samples

- Matching - 17
- Partial Matching – 5



BOREHOLE VALIDATION

- Partial match of the borehole to USDA data definition:
  - Where some of the soil component's hardness matches the results found in USDA data.
  - Where soil components are not clearly mentioned in the borehole data compared to USDA data.

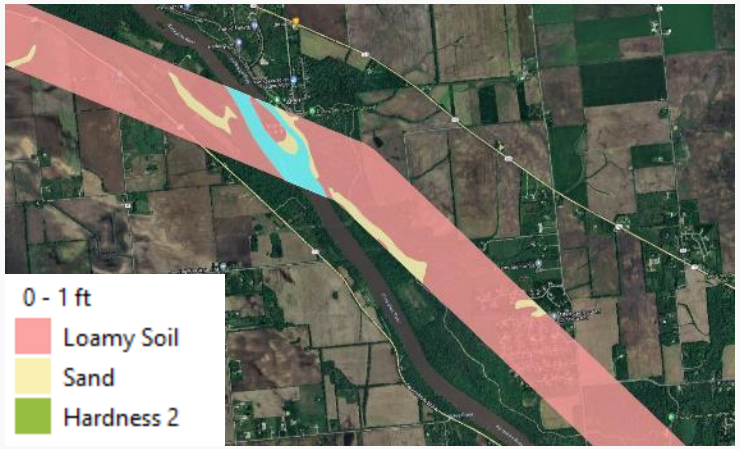
Row Labels	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Haakon																						
0-1 FT																						
1-2 FT															H							
2-3 FT		S							S	S	S											
3-4 FT		S							S		S											
4-5 FT		S							S		S											
5-6 FT		S							S		S											
Status	M	P	M	M	M	M	M	M	P	P	P	M	M	M	P	M	M	M	M	M	M	M

Matching (M)
Partial Matching (P)
Not Matching (N)

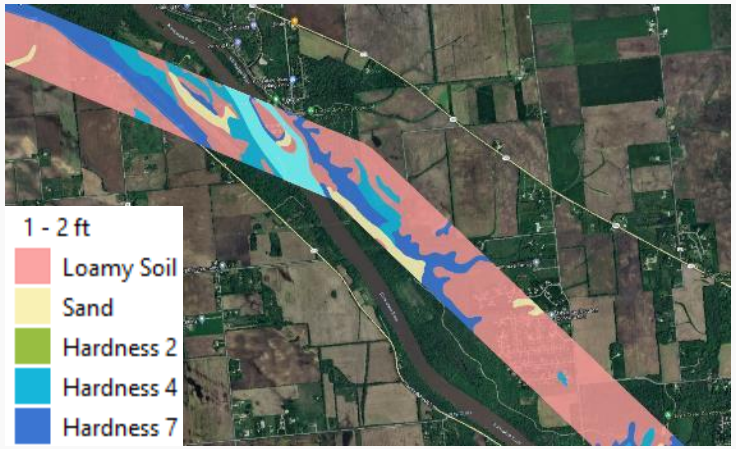
*S - the borehole data indicates a softer soil component than data collected via USDA employed in VCTI Geology IQ
*H -the borehole data indicates a harder soil component than data collected via USDA employed in VCTI Geology IQ

GEOLOGY IQ™ SOIL DEPTH VARIATION EXAMPLE

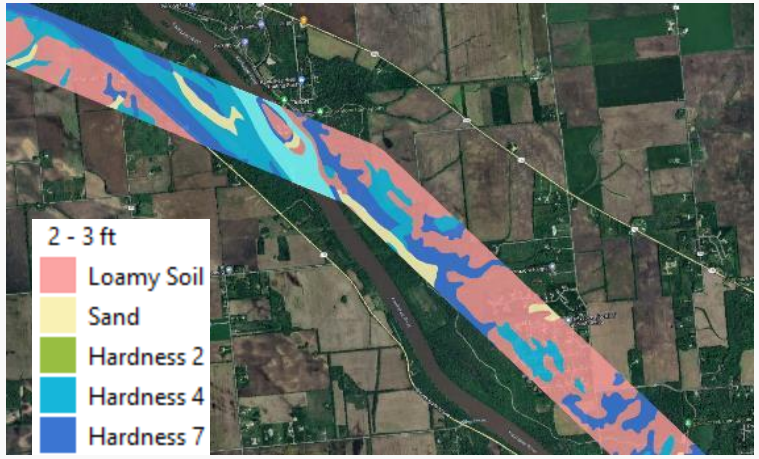
Soil type at 0-1 ft



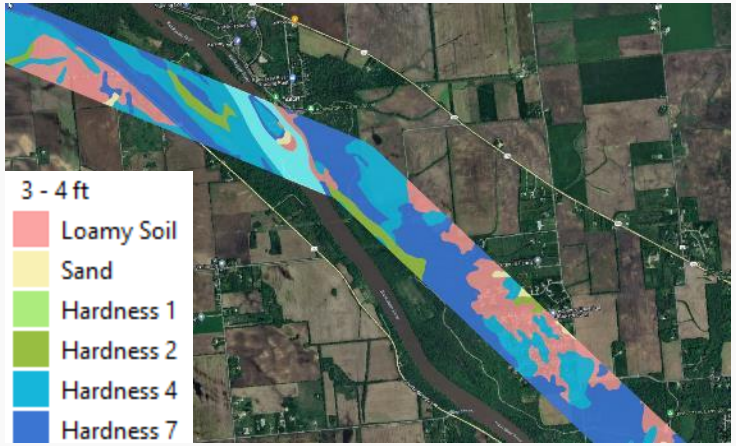
Soil type at 1-2 ft



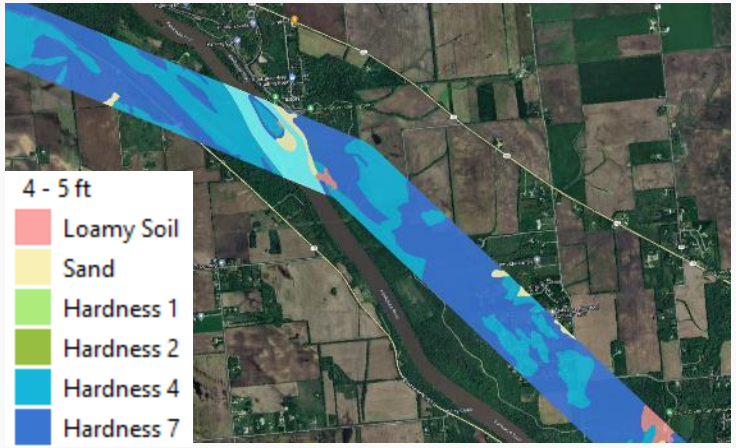
Soil type at 2-3 ft



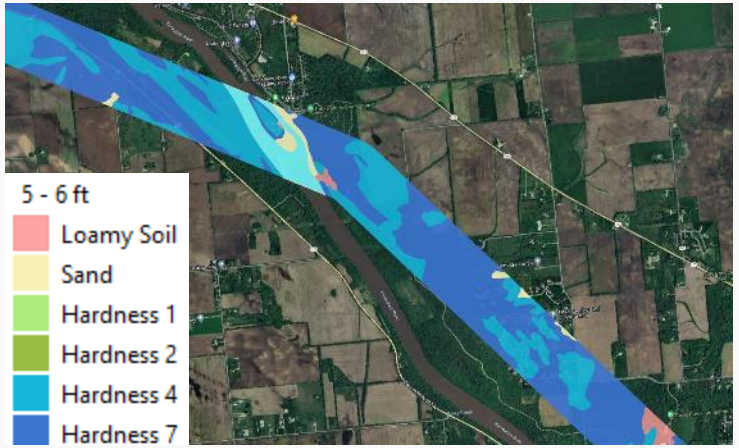
Soil type at 3-4 ft



Soil type at 4-5 ft



Soil type at 5-6 ft



GEOLOGY IQ™ & DISTRIBUTION NETWORK

Distribution of Geology Types within a 100 feet Buffer

Source: USDA dataset

WHY VCTI

Recognized as a **leader in leveraging AI** to deliver more **accurate demand optimization** and **build cost insights** early in the investment decision process, enabling **capital efficiency improvements of 20%+** with significant **de-risking of investments**.

ROI & NPV Projections based on data-driven insights specific to the target market rather than industry averages or tribal knowledge

Market Opportunity Data on Serviceable Locations that excludes auxiliary structures but includes every location within reach of the project

Analysis that is based on best-in-class performance leveraging AI for accuracy and faster time to market

Rich expertise from >30 years' building network technology, planning broadband networks & helping service providers optimize investments

>$1.5B Value Supported

$362M Grant Wins

55+ Customers

>10M Broadband Locations Planned

POLE IQ™: LABELS, HEIGHTS & RANGES

Pole Label defines: Height Range of Pole Top, Range of Lowest Attachment, Type of Lowest Attachment, and New Communications (Comm) Attachment Position

Pole Height (Pole Top) Ranges	Labels
More than 59.0 ft	O
56.1 ft – 59.0 ft	N
53.1 ft – 56.0 ft	M
50.1 ft – 53.0 ft	L
47.1 ft – 50.0 ft	K
44.1 ft – 47.0 ft	J
41.1 ft – 44.0 ft	I
38.1 ft – 41.0 ft	H
35.1 ft – 38.0 ft	G
32.1 ft – 35.0 ft	F
29.1 ft – 32.0 ft	E
26.1 ft – 29.0 ft	D
23.1ft – 26.0 ft	C
20.1ft – 23.0 ft	B
Less than 20.0 ft	A

Category	Lowest Attachment Ranges	Labels for lowest Attachment Ranges
Green	More than 31.0 ft	G5
Green	29.1 ft – 31.0 ft	G4
Green	27.1 ft – 29.0 ft	G3
Green	25.1 ft – 27.0 ft	G2
Green	23.1 ft – 25.0 ft	G1
Yellow	21.1 ft – 23.0 ft	Y1
Orange	19.1 ft – 21.0 ft	O1
Red	≤19.0 ft	R1

Type of Lowest Attachment	Labels
Communication	C
Electrical	E
Transformer	Tf
Over Head Guy (OHG)	G

New Attachment Position	Labels
Top	T
Bottom	B
Top & Bottom	TB
New Comm Attachment	NW
No Attachment	NA
Non-Measurable	NM