



TECHNOLOGY
POLICY
INSTITUTE

Caveat Promptor: A Case Study of Tribal Land Descriptions

Sarah Oh Lam and Annella Charee Tucker

April 20, 2026

Caveat Promptor: A Case Study of Tribal Land Descriptions

Sarah Oh Lam¹ and Annella Charee Tucker²

April 20, 2026

Abstract

The paper presents a case study of Tribal land descriptions in which AI models produced text that appears fluent and confident but may be thematically skewed toward biased cultural framing. The authors observed this problem while drafting the *2026 TPI Tribal Lands Broadband Report*. Prompted without detailed guidance, models produced outputs organized around heritage, spirituality, and tradition rather than the geographic and infrastructure characteristics appropriate for broadband planning. The paper argues that this output poses a practical risk for any domain in which AI-generated text may be applied without careful review and demonstrates that structured prompting can redirect outputs toward task relevance. The problem, while real, is largely addressable at the prompt level.

Keywords: large language models, data sparsity, AI-generated knowledge, narrative default, prompt engineering, bias mitigation, broadband infrastructure, Tribal lands

JEL Codes: J15, O33

¹ J.D., Ph.D., Senior Fellow and Vice President of Strategic Initiatives, Technology Policy Institute, 2001 L Street NW, Suite 500, Washington, D.C. 20036, slam@techpolicyinstitute.org. The views expressed here are those of the authors and do not necessarily reflect those of TPI's staff, board of directors, or board of academic advisors.

² Google Policy Fellow 2024, Technology Policy Institute, annellat@alumni.stanford.edu.

Table of Contents

I.	Introduction	2
II.	Instructions Matter for Descriptive Content of Tribal Lands	3
A.	Baseline Outputs and Their Failure Modes	4
B.	Why Better Questions May Give Better Answers	5
III.	Redirecting AI Through Prompt Design	7
A.	Human-Written Anchors and Prompt Construction	7
B.	Results Across Models	10
IV.	Conclusion	13
	Appendix	15

I. Introduction

This article presents a case study to examine a structural problem in default AI-generated text.³ Anecdotally, we found that baseline descriptions of Tribal lands defaulted to biased cultural and historical framing. While we do not seek to explain or measure causality of the outputs, we observe that this phenomenon occurred and was worth taking note. AI tools are increasingly embedded in government reports, grant applications, planning documents, and administrative processes, exactly the contexts where Tribal voices have historically been weakest. Our findings suggest that care needs to be taken by those using AI tools and users should be cautious of default bias, even if the prose sounds accurate and confident.

We do not directly identify the mechanism producing these outputs. The observed tendency toward cultural or historical framing may reflect sparse topic representation in model training data, but it may also arise from summarization defaults, or the interaction between prompting and model architecture. It could also be due to the models tested in late 2025 which have already improved drastically in 2026. Our contribution is small in that we document the output pattern in this domain and show that targeted prompt constraints and human-authored examples improve the relevance of generated descriptions for broadband-reporting purposes.

Large language models present a fundamental epistemological problem in that they may generate biased prose that reflects the training data on the topic requested. For communities and domains that are underrepresented in the written record, whether due to historical exclusion,

³ Catherine Tucker and Nan Clement, "Seeing the Unseen: Avoiding Data Deserts and Algorithmic Exclusion," UNDP (2024), <https://www.undp.org/sites/g/files/zskgke326/files/2025-12/seeing-the-unseen-avoiding-data-deserts-and-algorithmic-exclusion.pdf>; Adam Kalai, Ofir Nachum, Santosh Vempala, Edwin Zhang, "Why Language Models Hallucinate," OpenAI (September 4, 2025), <https://cdn.openai.com/pdf/d04913be-3f6f-4d2b-b283-ff432ef4aaa5/why-language-models-hallucinate.pdf>.

geographic isolation, or the dominance of outsider-produced sources, AI systems may generate text that sounds confident and correct without any clues to the reader that its knowledge on that particular topic is less fulsome or more biased than it could be.⁴

AI users remain subject to the principle of *caveat emptor* — or *caveat promptor*, in the case of large language models. Users must exercise caution when relying on text outputs.

II. Instructions Matter for Descriptive Content of Tribal Lands

In the process of completing the *2026 TPI Tribal Lands Broadband Report*, we applied AI tools to produce descriptive content for each Tribal lands profile. The report describes 706 Tribal land areas recognized by the U.S. Census Bureau, including the 575 tribes recognized by the U.S. Bureau of Indian Affairs along with other tribal areas such as those recognized by state governments. The report is meant to assist Tribes, analysts, government offices, and industry with accessing broadband data for each Tribal geography.

In preparing the document, we encountered deficiencies in AI-generated content with respect to Indigenous communities. When we first asked an AI engine to generate descriptions of Tribal lands, the results veered toward stereotype and cultural generalities. Generic phrases like “rich cultural heritage” and “traditional practices” peppered nearly every entry. References to “spiritual traditions” and “ancient customs” appeared where we needed physical features and highway numbers. The AI was defaulting to romanticized, culturally essentialist language that is not appropriate in technical infrastructure documentation. This tendency aligns with known issues of sparse or underrepresented data in large language models, though we cannot isolate sparsity from other potential contributing factors.

Large language models learn from vast datasets that may include stereotypical, exoticizing, and often offensive portrayals of Indigenous peoples, and left unprompted, we found that AI may have been reproducing these patterns, treating Native American communities as historical artifacts rather than contemporary nations with telecommunications utilities, economic development priorities, and broadband deployment challenges just like any other jurisdiction.

⁴ See Catherine Tucker, “Algorithmic Exclusion: The Fragility of Algorithms to Sparse and Missing Data,” Brookings Institution Working Paper (2023), <https://www.brookings.edu/articles/artificial-intelligence-and-algorithmic-exclusion/>.

A. Baseline Outputs and Their Failure Modes

Consider some examples of Tribal descriptions that were generated by AI. We started with a simple prompt: *“Can you give me descriptions of these native American[sic] tribes for these census codes, names of tribes, state, description and please put the output into an excel sheet such as 0010 Acoma NM?”*

This prompt was submitted to a version of Anthropic’s Claude Opus 4.5 in December 2025. For the Hopi Tribal lands, it generated this description: *“A Pueblo tribe known for their ancient villages, spiritual traditions, and kachina dolls,”* and for the San Carlos Tribal lands, this description: *“An Apache reservation in Arizona, historically significant in the Apache Wars and modern-day economic development.”*

These descriptions are inappropriate for the purpose of a broadband infrastructure report. The cultural and religious facts presented provide little information relevant to infrastructure deployment and often frame a nation primarily through the lens of tourist curiosity. What we actually needed was more geographic and topographical in nature such as, *“Set within the boundaries of the Navajo Nation in the high desert,”* or *“Located near the intersections of the San Carlos and Gila rivers with telecommunications services offered by the San Carlos Apache Telecommunications Utility.”*

Admittedly, we did not tell the AI that the description was meant to be used for a broadband report. But the request was simple and the output was cultural. The baseline perspective of Tribal descriptions showed that cultural features predominate over economic, geographic, or jurisdictional features. For a user that does not recognize the cultural narrative of these simple descriptions, it could just apply what it receives from the AI, rather than knowing it could be offensive. To see if the AI would generate more appropriate descriptions for a broadband report, explicit instructions for the AI were crafted. These prompt instructions told the AI what to include and what to avoid. We wanted descriptions to focus on *“land base characteristics relevant to broadband infrastructure planning,”* including geographic location, transportation infrastructure, topographic features, and existing telecommunications operations.

AI was instructed to never include *“spiritual practices, cultural ceremonies, religious beliefs, or traditional customs.”* Specific phrases were flagged as unacceptable, some of which included: *“known for their,” “rich cultural heritage,” “cultural identity,” “kachina dolls,” “spiritual traditions.”* These phrases were excluded not because these aspects of life on Tribal

lands don't matter—they matter profoundly—but because they're not ours to summarize, and because they're not relevant to broadband deployment planning.

Enhanced prompt instructions included terminology precision as well. For state-recognized groups, the AI was instructed to use “state-recognized group” or “descent group,” never “state-recognized tribe.” This instruction reflects the instinct for AI to make claims about identity or status. Specificity prevents the AI from flattening important differences in how Indigenous communities are recognized by federal and state governments.

B. Why Better Questions May Give Better Answers

The corpus of written material, contemporary and historical, about any given Tribal land area is the starting point for the descriptions that AI systems can generate.⁵ When training data on a subject may be thin, models may produce outputs drawn from whatever framing is most available, which for Indigenous communities may tend toward cultural generalization and historical narrative rather than geographic or infrastructure detail. This is consistent with broader findings that LLM performance degrades unevenly across domains depending on training data representation, and that data sparsity does not produce silence, instead it produces confident, skewed text.⁶

The implication for users is practical. The prompt matters.⁷ The user's role in specifying what to include, what to exclude, and what tone to adopt becomes more consequential than in well-documented domains. We do not attempt to measure the precise relationship between training data volume and output quality for Tribal lands specifically, that would require access to training corpora that are not publicly available. But the pattern we observe is consistent with research showing that model performance scales with data availability in uneven and domain-

⁵ See generally Sun, et al., “Head-to-Tail: How Knowledgeable are Large Language Models (LLMs)? A.K.A. Will LLMs Replace Knowledge Graphs?.” In *Proceedings of the 2024 Conference of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies (Volume 1: Long Papers)*, pages 311–325, Mexico City, Mexico, <https://aclanthology.org/2024.naacl-long.18/>.

⁶ See generally Kandpal, et al., “Large Language Models Struggle to Learn Long-Tail Knowledge,” *Proceedings of the 40th International Conference on Machine Learning*, Honolulu, Hawaii, USA. PMLR 202, 2023, https://nlp.cs.berkeley.edu/pubs/Kandpal-Deng-Roberts-Wallace-Raffel_2023_Large_paper.pdf.

⁷ See generally Algaba, et al., “Large Language Models Reflect Human Citation Patterns with a Heightened Citation Bias,” Findings of the Association for Computational Linguistics: NAACL 2025, pages 6844–6879, <https://aclanthology.org/2025.findings-naacl.381.pdf>.

dependent ways, and that underrepresented populations are disproportionately affected by these gaps.⁸

Available datasets focused on Tribal lands include Bureau of Indian Affairs reports,⁹ books such as Tiller's Guide to Indian Country,¹⁰ or online resources¹¹ including individual Tribal websites.¹² Style guides such as word selection and capitalization are also important for the corpus on which AI engines are trained.¹³ The Federal Reserve Bank of Minneapolis Center for Indian Country Development (CICD) maintains Native Community Data Profiles that overlay Census ACS data onto AIANNH geographies with ACS variables covering population, housing, economy, and education, along with BIE schools, IHS facilities, and Tribal Colleges and Universities Federal Reserve Bank of Minneapolis.¹⁴ These are among the best-contextualized federal data visualizations for tribal areas. Other datasets on individual Tribal histories include collections in the Smithsonian Institution,¹⁵ Library of Congress and National Archives,¹⁶ and private and university collections.¹⁷

Efforts to collect more data to generate historical records are supported by federal and private grants. In December 2024, the federal government released a 10-year National Plan on Native Language Revitalization, outlining a comprehensive, government-wide strategy to support the revitalization, protection, preservation and reclamation of Native languages.¹⁸

⁸ See generally Catherine Tucker, "Algorithmic Exclusion: The Fragility of Algorithms to Sparse and Missing Data," Brookings (2023); Tucker and Clement, "Seeing the Unseen" (2024).

⁹ Bureau of Indian Affairs: Tribal Leaders Directory, <https://biamaps.geoplatform.gov/Tribal-Leaders-Directory/> (last visited March 16, 2026).

¹⁰ Veronica E. Velarde Tiller, Tiller's Guide to Indian Country: Economic Profile of American Indian Reservations (2006, 1996) (including information on 562 federally recognized tribes in 33 American states, building on the 1974 U.S. Department of Commerce's *Federal and State Indian Reservations and Indian Trust Areas* report).

¹¹ Wikipedia, "List of federally recognized tribes in the contiguous United States," https://en.wikipedia.org/wiki/List_of_federally_recognized_tribes_in_the_contiguous_United_States (last accessed March 16, 2026).

¹² The Bureau of Indian Affairs lists the websites of federally recognized tribes.

¹³ See van Schilfgaarde, *supra* note 19 fn.2 (citing Angelique EagleWoman (Wambdi A. Was'teWinyan), The Capitalization of "Tribal Nations" and the Decolonization of Citation, Nomenclature, and Terminology in the United States, 49 *Michell Hamline L. Rev.* 623, 627, 635 (2023); Gregory Younging, *Elements of Indigenous Style: A Guide for Writing By and About Indigenous Peoples* 77 (2018)).

¹⁴ Federal Reserve Bank of Minneapolis, Native Community Data Profiles: About the Data, Center for Indian Country Development, <https://www.minneapolisfed.org/indiancountry/resources/native-community-data-profiles/about-the-data>.

¹⁵ Smithsonian National Museum of the American Indian (NMAI) Archive Center, <https://www.si.edu/siasc/nmai>.

¹⁶ Library of Congress, Native American Resources from the Rare Book & Special Collections Division, <https://guides.loc.gov/native-americans-rare-materials/resources>.

¹⁷ *Id.*

¹⁸ 10-Year National Plan on Native Language Revitalization, White House Council for Native American Affairs, Office of the Assistant Secretary-Indian Affairs, Department of the Interior, Feb. 2024,

Federal grants are also available through programs run by the U.S. National Park Service,¹⁹ National Endowment for the Humanities,²⁰ Administration for Native Americans,²¹ Bureau of Indian Affairs,²² and Phillips Fund of the American Philosophical Society.²³

III. Redirecting AI Through Prompt Design

Given the results from asking AI to generate simple descriptions of Tribal lands, we sought to generate better content suited for a report on broadband infrastructure on Tribal lands. We developed a manual process by a human who is knowledgeable about American Indian, Alaska Native, and Native Hawaiian Areas (AIANNH) lands and communities to first prompt and teach the AI what was appropriate. This step was time-consuming but important to test if the AI's output could be improved. Then, we generated outputs with enhanced prompts and instructions for how to generate descriptions.

A. Human-Written Anchors and Prompt Construction

Manual descriptions for Alabama and Arizona Tribal lands were drafted, establishing quality standards and style parameters. A systematic prompt, with the assistance of AI, was then developed to generate consistent descriptions for the Tribal land entries. The AI was instructed to identify the key elements most relevant to broadband infrastructure planning and use those findings to create clear guidelines for describing geographic, infrastructure, and land base characteristics. The guidelines explicitly told the AI to exclude cultural, spiritual, or ceremonial content.

Table 1 shows the manual descriptions drafted for Tribal lands in Alabama and Arizona. These written descriptions were used to instruct AI on how to generate better descriptions. As you see in the manual descriptions, the emphasis is away from trite characterizations of the

https://www.bia.gov/sites/default/files/media_document/final_12032024_10-year_national_plan_on_native_language_revitalization.508_1.pdf.

¹⁹ NPS Tribal Heritage Grants, <https://www.nps.gov/subjects/historicpreservationfund/thg-grant-info.htm>.

²⁰ Digitization of records from Native American schools, National Endowment for the Humanities, <https://www.neh.gov/our-work/native-humanities>.

²¹ Administration for Native Americans, Native American Language Preservation and Maintenance Program, <https://acf.gov/ana/news/ana-announces-fy2025-grant-funding-opportunities-native-languages-and-environmental>.

²² Bureau of Indian Affairs Living Languages Grant Program, <https://www.doi.gov/pressreleases/indian-affairs-makes-significant-investment-protect-and-preserve-native-languages>.

²³ Phillips Fund at the American Philosophical Society Research Grants, <https://www.amphilsoc.org/grants/phillips-fund-native-american-research>.

Tribes and people groups. Instead, the tone and focus are more focused on the physical and demographic characteristics of the lands rather than cultural or ceremonial traditions.

Table 1: Manual Descriptions vs. Generated Descriptions

Tribal Land	AIANN HCE	Generated Description (Opus 4.5, 12/25)	Manual Descriptions
Cher-O-Creek	9550	A mixed Cherokee and Creek Tribal community.	A state Intra Tribal group, predominately Cherokee and Creek descent.
Cherokee Tribe of Northeast Alabama	9560	A state-recognized Cherokee group advocating for cultural preservation.	State-recognized Cherokee group.
Echota Cherokee	9680	A Cherokee community primarily in Alabama, advocating for cultural and historical recognition.	State-recognized Cherokee group.
MOWA Choctaw	9240	A state-recognized Choctaw tribe in Alabama, with ongoing efforts towards federal recognition.	State-recognized Choctaw group.
MaChis Lower Creek	9820	A state-recognized Creek tribe in Alabama, engaged in efforts toward federal recognition.	A state-recognized Creek tribe.
Poarch Creek	2865	A federally recognized Muscogee Creek tribe in Alabama, engaged in economic development and cultural revitalization.	Home to the only federally recognized tribe in Alabama.
United Cherokee Ani-Yun-Wiya Nation	9950	Alabama-based Cherokee-descendant group preserving Southeastern Tribal heritage through education, ceremony, and land advocacy.	Cherokee-descent group recognized by the Alabama Indian Affairs Commission.
Cocopah Tribe	695	Cocopah Tribe in Arizona manages wetlands, promotes environmental stewardship, and operates Tribal businesses and governance.	Three noncontiguous parcels totaling over 6,500 acres of largely leased agricultural land, located along the Colorado River, at the crossroads of the United States, Mexico, Arizona, and California.
Fort Apache	1140	Home to the White Mountain Apache in Arizona, historically significant for its military fort and traditional practices.	Separated from the San Carlos Apache Reservation in 1897 with desert foothills and elevations exceeding 11,000 feet.
Gila River	1310	A Pima-Maricopa community in Arizona, known for their contributions to agriculture and water rights.	A community bordering southern Phoenix suburbs that is home to Gila River Telecommunications.
Havasupai	1440	A tribe in Arizona, residing in the Grand Canyon and known for their turquoise-colored waterfalls	Located in nearly the center of the Grand Canyon, accessible only by helicopter, horseback, or walking trails.
Hopi	1505	A Pueblo tribe in Arizona, known for their ancient villages, spiritual traditions, and kachina dolls.	Set within the boundaries of the Navajo Nation in the high desert
Hualapai	1545	A tribe in northwestern Arizona, known for the Grand Canyon Skywalk and tourism industry.	Tribal capital Peach Springs has the only road leading into the Grand Canyon and an economy surrounding tourism, the arts, outdoor recreation,

			and cattle ranching.
Kaibab	1720	A Southern Paiute tribe in Arizona, historically reliant on the Grand Canyon region.	Reservation lands across two counties with the Arizona-Utah border as it's northernmost boundary.
Maricopa (Ak Chin)	2130	Ak-Chin Indian Community in Arizona operates agriculture-based industries, gaming, and Tribal cultural programs.	High desert lands within the Santa Cruz Valley, heavy agricultural emphasis with much of the land irrigated for farming.
Navajo Nation	2430	The largest federally recognized tribe in the U.S., spanning Arizona, New Mexico, and Utah, with a rich cultural heritage.	The largest land mass held by a federally recognized tribe in the U.S., spanning Arizona, New Mexico, and Utah.
Pascua Pueblo Yaqui	2680	Pascua Yaqui Tribe in Arizona is known for strong cultural identity, language preservation, and health services.	Reservation referred to as New Pascua located near Tucson with Interstate 10 and 19 passing nearby.
Salt River	3340	A Pima-Maricopa community in Arizona, known for its cultural heritage and economic enterprises.	Lands bordering Fort McDowell with the Salt River at the southern border of the reservation.
San Carlos	3355	An Apache reservation in Arizona, historically significant in the Apache Wars and modern-day economic development.	Located near the intersections of the San Carlos and Gila rivers with telecommunications services offered by the San Carlos Apache Telecommunications Utility.
Tohono O'odham Nation	4200	A tribe in Arizona, historically known for their desert adaptation and extensive land base.	In the Sonoran Desert adjacent to the Mexican border and home to a long running All-Indian Rodeo.
Tonto Apache	4235	Tonto Apache Tribe in Arizona emphasizes youth programs, education, and cultural heritage.	Smallest reservation in the state adjacent to Payson, AZ.
Yavapai-Apache Nation	4708	Yavapai-Apache Nation promotes Tribal sovereignty, education, and cultural identity in central Arizona.	Located in the Verde Valley with the Verde River running along its western and southern boundaries.
Yavapai-Prescott	4710	Yavapai-Prescott Indian Tribe supports economic development, housing, and preservation of Yavapai culture in Arizona.	Central Arizona land base accessible by HWY 69 and HWY 89.

The next step was to engineer a prompt that would generate revised AI descriptions to fulfill objectives that better serve the users of the broadband report. These objectives were to focus on geography, infrastructure, and other broadband-relevant features while maintaining consistency with the manually written examples. From these objectives, three prompt instructions were distilled specifically for generating descriptions of Tribal lands for contexts like broadband planning, infrastructure guides, or policy documents. We collected outputs after prompting the AI with these steps, and observed improved factual precision, reduced cultural bias, increased structural quality, and aligned outputs with real-world use cases.

The Appendix includes the three instructions that we gave to the AI engines in Figure A1. The Appendix also includes the enhanced prompt in Figure A2 that we used to generate AI

descriptions. It was important to tell the AI to explicitly exclude cultural and spiritual content in describing the Tribal lands. The prompt includes meticulous effort to produce outputs tailored to practical applications like infrastructure planning. By prioritizing factual details such as specific acreages, highway numbers, and topographic features, the prompt steers away from vague or subjective content, fostering precision and utility for broadband deployment scenarios.

The style preferences explicitly prohibit spiritual practices, traditional customs, or phrases implying cultural heritage, such as “known for their” or “rich cultural identity.” Instead, it enforces a neutral, professional tone and correct terminology, such as using “state-recognized group” or “descent group” rather than “state-recognized tribe” to avoid misrepresentations. These efforts make a basic descriptive task into a specialized one, yielding outputs that are not only informative and varied but also ethically sound, directly supporting the project's goal of aiding Tribal broadband initiatives without perpetuating stereotypes.

B. Results Across Models

With these instructions to use a more objective tone regarding Tribal lands, results were obtained. The Appendix shows the outputs that we observed in Tables A1 to A10 from a random sample of 10 tribes and the outputs of 7 different AI engines. The 7 AI engines included Claude’s Opus 4.5, Grok 4, Gemini 3 Pro, ChatGPT 5.2 Thinking, Perplexity Pro Deep Research, Meta.ai, and DeepSeek R1. Table 2 shows a baseline example of simple outputs from these engines for an example tribe, Nez Perce, which is well-known to one of the authors. Table 3 provides a key for which AI engine generated which output.

Table 2: Prompt-Generated Results

AIANNHCE Code, Tribe Name, State	
AIANNHCE 2445, Nez Perce, ID	
Basic Prompt (Opus 4.5, Dec. 2025)	
Short Description	A Plateau tribe in Idaho, known for their horsemanship and historical resistance during the Nez Perce War.
Long Description	Nez Perce Tribe, a federally recognized tribe in Idaho with approximately 3,500 enrolled members, maintains a 770,000-acre reservation. The tribe is known for the historic 1877 flight led by Chief Joseph, operates Clearwater River Casino, and leads salmon restoration and horse breeding programs preserving the Appaloosa horse tradition.
Engine	Enhanced Prompt

A	<p>Nez Perce Tribe is a federally recognized Plateau tribe in north-central Idaho with a reservation land base of roughly 770,000 acres across Nez Perce, Lewis, Idaho, and Clearwater counties. Reservation lands extend along the Clearwater and lower Snake River corridors and are bisected by U.S. Highway 95 and U.S. Highway 12, creating important transportation and utility routes for broadband deployment. The tribe’s land base includes the population center of Lapwai and outlying rural communities, with existing economic anchors such as the Clearwater River Casino and associated commercial developments offering key connection nodes for future infrastructure.</p>
B	<p>Federally recognized tribe with the largest reservation in Idaho, spanning about 770,000 acres across north-central Idaho in Nez Perce, Lewis, Latah, and Idaho counties along the Clearwater River with prairies, canyons, and access via U.S. Highway 95. The land base includes varied terrain from river valleys to hills, supporting Tribal operations including Nez Perce Systems for wireless and fiber broadband deployment in rural areas.</p>
C	<p>Centered in north-central Idaho across Nez Perce, Lewis, Idaho, and Clearwater counties, this federally recognized tribe’s reservation spans approximately 770,000 acres of diverse terrain, including the Clearwater River valley and plateau lands. The land base is traversed by US Highway 12 and US Highway 95, providing critical transportation corridors, and the tribe actively manages significant forestry and fisheries operations that drive the local economy.</p>
D	<p>Approximately 770,000 acres in north-central Idaho spanning Nez Perce, Lewis, Idaho, and Clearwater counties, primarily across the Camas Prairie region south of the Clearwater River. The federally recognized Nez Perce Tribe is headquartered in Lapwai, with major towns including Kamiah, Orofino, and Craigmont accessible via US Highway 95 and US Highway 12. The tribe operates two casinos along the Clearwater River and manages salmon co-management responsibilities across the Columbia, Snake, and Salmon river drainages.</p>
E	<p>Federally recognized tribe located in Idaho, managing a vast 770,000-acre reservation. The Nez Perce Tribe operates the Clearwater River Casino and engages in salmon restoration and Appaloosa horse breeding programs. This large land base presents significant opportunities and challenges for broadband connectivity across the region.</p>
F	<p>Centered on Lapwai in north-central Idaho, the Nez Perce Tribe is a federally recognized tribe with a reservation land base of roughly 770,000 acres across the Clearwater River basin and surrounding plateau terrain. The largely rural footprint sits south and east of the Lewiston–Clarkston area, with primary regional access via U.S. Highway 95 and state highway corridors that follow river valleys into dispersed communities and facilities. Broadband deployment planning commonly involves long middle-mile runs and last-mile builds across wide, low-density areas with variable topography between river corridors and upland tracts.</p>
G	<p>Federally recognized Nez Perce Tribe in Idaho, with a 770,000-acre reservation spanning Clearwater, Idaho, and Lewis counties. The Tribal land base lies along the Clearwater River and is accessible via Interstate 95 and State Highway 12, providing opportunities for broadband deployment through the Nez Perce Tribal Telecommunications project. Broadband planning must address the dispersed nature of the reservation and its proximity to the Nez Perce National Historical Park transportation network.</p>

Table 3: AI Engines

AI Engine
A - Perplexity Pro Deep Research (1/23/26)
B - Grok 4 (1/23/26)
C - Gemini 3 Pro (1/23/26)
D - Opus 4.5 (1/23/26)
E - DeepSeek R1 (1/23/26)
F - ChatGPT 5.2 Thinking (1/23/26)
G - Meta.ai (1/23/26)

Table 2 shows that without an enhanced prompt, the basic prompt's short description reduced the Nez Perce to a “*Plateau tribe known for their horsemanship and historical resistance,*” perpetuating a stereotypical view of Native Americans as warriors or equestrians. This description can reinforce outdated tropes without acknowledging contemporary sovereignty or land management. The long description fared slightly better by including enrollment numbers and the 770,000-acre reservation but still leans into cultural elements like the 1877 flight led by Chief Joseph, salmon restoration, and Appaloosa horse breeding. These cultural details that, while factual, risk evoking a biased lens of “noble” traditions rather than focusing on the land's physical and economic attributes.

ChatGPT 5.2 Thinking (option F) provided a much better generated description after enhanced prompting by emphasizing the reservation's rural footprint in the Clearwater River basin, primary access routes via U.S. Highway 95, and challenges like long middle-mile broadband runs across variable topography. This creates a neutral, utility-oriented profile that avoids bias, treating the land as a dynamic space for modern development rather than a backdrop for historical anecdotes.

Gemini 3 Pro (option C) with the enhanced prompt highlighted diverse terrain in the Clearwater River valley and plateau lands, traversed by key highways (US 12 and 95), focusing on forestry and fisheries as economic drivers rooted in the geography. This output ensures relevance to Tribal land descriptions without veering into potentially stereotypical cultural symbolism.

Perplexity Pro Deep Research (option A) provided a detailed mapping of the reservation across specific counties, river corridors, and transportation routes, framing economic anchors like the Clearwater River Casino as nodes for infrastructure like broadband. This contrasts

sharply with the basic prompt's tendencies, where even the long description mixes land facts with cultural programs, potentially introducing bias by emphasizing “preserving traditions” over pragmatic land use.

Overall, the enhanced prompt achieved higher quality by enforcing a structured, objective focus on acreage, counties, terrain, access, and deployment implications, resulting in outputs that were informative, unbiased, and tailored to real-world applications such as telecommunications planning. Some AI engines still outputted descriptions about cultural programs (e.g., Appaloosa breeding). This exercise helps to show variation across AI engines and the impact of better prompts according to the quality of AI models in late 2025 and early 2026.

IV. Conclusion

Although this case study cannot conclusively test the underlying causes of the default outputs, the results highlight the practical risks of unguided AI use. To measure and assess the quality of inputs in the domain of Tribal lands, more robust research methodology and datasets would be needed. Here, our goal was to document the use of AI and outputs observed in the domain of Tribal land descriptions.

The process of generating descriptions of Tribal lands illustrates a broader truth about AI and Native American communities. Making AI work well for Native American content requires active, detailed intervention. It requires telling the AI what to include and what not to include. It requires providing concrete examples of appropriate output. It requires building in quality checks that catch deficiencies in available data.

These lessons are not limited to Tribal lands or to broadband planning. The same pattern of fluent, confident text organized around the wrong framing, is likely to appear wherever AI is applied to domains where available source material is narrow, or dominated by outsider perspectives, or skewed toward a particular genre. Rural communities, small nations, specialized technical fields, minority language groups, and any subject where the written record is thin relative to the complexity of the subject are all candidates for the same kind of default. As AI-generated text becomes embedded in government reports, grant applications, and planning documents, the risk is not that these outputs will be obviously wrong. The risk is that they will be plausible enough to go unquestioned.

The intervention we describe here is effective and simple. It required a human to iterate on prompt design before the AI produced outputs suitable for publication. It demonstrates that

the problem is addressable at the user level without waiting for improvements in model architecture or training data. For practitioners, the implication is that default outputs should not be trusted without domain-specific review.

Finally, this work underscores that better documentation of communities and underrepresented domains would increase the knowledge available to AI models in the written record. Prompt engineering can redirect what AI says, but it cannot create knowledge that does not exist. Even well-prompted models will reach the limits of what they can produce. The long-term correction is richer, more representative source material, produced with the participation and governance of the communities it describes.

Appendix

Figure A1: Three Prompt Instructions

1. **Anchor Every Description in Land Geography and Infrastructure, Not Cultural Narratives**

Always center the output on verifiable physical and jurisdictional attributes of the land base—specific counties, acreages, rivers/highways, topography, borders, access points, and existing telecom/economic anchors. Explicitly forbid and train the model to detect and remove any references to traditions, heritage, “known for,” historical events (unless they directly define current boundaries), or symbolic cultural elements. This prevents the drift into stereotypical or romanticized framing that plagues default AI outputs on Indigenous topics.

DO NOT:

- Include spiritual practices, cultural ceremonies, religious beliefs, or traditional customs
- Use phrases like “known for their,” “rich cultural heritage,” “cultural identity,” “cultural preservation,” “language preservation,” “kachina dolls,” “spiritual traditions”
- Start every description the same way
- Include historical narratives unless directly relevant to current land configuration
- Add subjective commentary or editorial statements
- Use “state-recognized tribe” - use “state-recognized group” or “descent group” instead
- Repeat identical structural patterns across consecutive entries

2. **Apply Terminology Discipline for Affiliation Types**

Require precise language: “federally recognized tribe,” “state-recognized group,” “Cherokee-descent group,” “Alaska Native Village,” etc.—never “state-recognized tribe,” “Native American tribe” generically, or culturally loaded descriptors. Include this as a hard rule with examples of correct and incorrect phrasing and add a post-generation checklist item to verify compliance. This is especially critical for Tribal lands because loose terminology can unintentionally undermine sovereignty recognition or perpetuate outdated classifications.

Good: “Three noncontiguous parcels totaling over 6,500 acres of largely leased agricultural land, located along the Colorado River, at the crossroads of the United States, Mexico, Arizona, and California.”

- Specific acreage, land use, precise location, multi-jurisdictional context

Good: “A community bordering southern Phoenix suburbs that is home to Gila River Telecommunications.”

- Urban context, specific telecommunications infrastructure

3. **Approve Broadband-Relevant Facts Over Cultural Narratives**

Frame the entire description task around what a broadband planner, grant writer, or infrastructure engineer needs: land size/shape, transportation corridors (with route numbers), terrain challenges, proximity to population/economic nodes, known Tribal telecom entities, and deployment implications such as rural dispersion, river crossings, elevation changes. Make broadband relevance the explicit filter for what to include. This keeps outputs lean, targeted, and directly actionable rather than encyclopedic.

Avoid: "A federally recognized tribe known for their rich cultural heritage and traditional practices."

- Cultural focus, not land-base focused, generic

Avoid: "A Pueblo tribe in Arizona, known for their ancient villages, spiritual traditions, and kachina dolls."

- Cultural and spiritual content not relevant to broadband planning

Figure A2: Enhanced Prompt

Prompt for Generating Tribal Lands Descriptions

You are assisting the Tribal Lands Broadband Infrastructure project. Your task is to generate concise, factual descriptions of Tribal land bases for the "Generated" column that focus on geographic, infrastructure, and broadband-relevant characteristics.

Input Data

You will receive a CSV with columns: AIANNHCE, name, state, and an existing description column. You will add descriptions to a new column called "Generated."

Description Requirements

Each description should be **2-4 sentences** and include relevant elements from the following categories:

Core Elements (always include):

- **Group affiliation type:** federally recognized tribe, state-recognized group (never "state-recognized tribe"), Alaska Native Village/Corporation, or Hawaiian entity
- **Geographic location:** state, county, or regional context
- **Land base type** when relevant: reservation, trust land, statistical area, ANVSA, Hawaiian homeland

Geographic & Infrastructure Context (include when relevant):

- Adjacent cities, counties, reservations, or political boundaries
- Proximity to major landmarks (Grand Canyon, specific rivers, mountain ranges)
- Notable acreage, especially if largest, smallest, or contextually significant
- Transportation infrastructure with specific details (Interstate 10, HWY 69, etc.)
- Topographic features (Colorado River, Sonoran Desert, Verde Valley, elevation ranges)
- Border locations (state lines, international borders)

- Accessibility constraints (helicopter-only access, single road access)

Tribal Operations & Broadband (include when available):

- **Tribal telecommunications operations** (e.g., "Gila River Telecommunications," "San Carlos Apache Telecommunications Utility")
- Notable infrastructure or economic operations relevant to connectivity
- Unique challenges or opportunities for broadband deployment

Special Characteristics (use when applicable):

- Superlatives: "only federally recognized tribe in [state]," "smallest reservation in the state," "largest land mass held by a federally recognized tribe"
- **For state-recognized groups:** Use phrasing like "Cherokee-descent group," "Creek descent," or "Choctaw group" - never "state-recognized tribe"
- Notable features: "accessible only by helicopter, horseback, or walking trails," "home to [specific facility/program]"

Critical Style Guidelines

DO:

- Vary sentence structure significantly - avoid repetitive patterns
- Open sentences differently: location-first, name-first, feature-first, affiliation-first
- Use specific details: highway numbers, river names, city names, acreages, county names
- Focus exclusively on land base characteristics relevant to broadband infrastructure planning
- Maintain factual, professional, neutral tone
- Write for a 2026 context
- Make descriptions feel naturally written, not templated

DO NOT:

- Include spiritual practices, cultural ceremonies, religious beliefs, or traditional customs
- Use phrases like "known for their," "rich cultural heritage," "cultural identity," "cultural preservation," "language preservation," "kachina dolls," "spiritual traditions"
- Start every description the same way
- Include historical narratives unless directly relevant to current land configuration
- Add subjective commentary or editorial statements
- Use "state-recognized tribe" - use "state-recognized group" or "descent group" instead
- Repeat identical structural patterns across consecutive entries

Sentence Structure Variation Examples

Instead of repetitive openings, use diverse structures:

✓ "Three noncontiguous parcels totaling over 6,500 acres..." ✓ "Located in nearly the center of the Grand Canyon..." ✓ "Set within the boundaries of the Navajo Nation..." ✓ "Reservation lands across two counties with..." ✓ "High desert lands within the Santa Cruz Valley..." ✓ "The largest land mass held by a federally recognized tribe..." ✓ "Lands bordering Fort McDowell with the Salt River..." ✓ "In the Sonoran Desert adjacent to the Mexican border..." ✓ "Smallest reservation in the state adjacent to Payson, AZ." ✓ "Central Arizona landbase accessible by HWY 69 and HWY 89." ✓ "Home to the only federally recognized tribe in Alabama." ✓ "State-recognized Cherokee group." ✓ "Cherokee-descent group recognized by the Alabama Indian Affairs Commission." ✓ "A community bordering southern Phoenix suburbs that is home to Gila River Telecommunications."

Key Examples from Manual Descriptions

State-recognized groups (note brevity and terminology):

- "State-recognized Cherokee group."
- "State-recognized Choctaw group."
- "Cherokee-descent group recognized by the Alabama Indian Affairs Commission."

Geographic specificity:

- "Three noncontiguous parcels totaling over 6,500 acres of largely leased agricultural land, located along the Colorado River, at the crossroads of the United States, Mexico, Arizona, and California."
- "Separated from the San Carlos Apache Reservation in 1897 with desert foothills and elevations exceeding 11,000 feet."

Broadband-relevant infrastructure:

- "A community bordering southern Phoenix suburbs that is home to Gila River Telecommunications."
- "Located near the intersections of the San Carlos and Gila rivers with telecommunications services offered by the San Carlos Apache Telecommunications Utility."

Notable features without cultural content:

- "Tribal capital Peach Springs has the only road leading into the Grand Canyon and an economy surrounding tourism, the arts, outdoor recreation, and cattle ranching."
- "Accessible only by helicopter, horseback, or walking trails."

Process for Each Row

1. **Read** the AIANNHCE number, name, and state from the CSV
2. **Research** current land base information using:
 - Tribal government websites
 - Federal databases (Bureau of Indian Affairs, Census)
 - State Tribal affairs offices
 - Tiller's Guide to Indian Country
 - Academic publications

- National Congress of American Indians resources
- 3. **Draft** a 2-4 sentence description following the guidelines
- 4. **Check variation** - ensure it differs structurally from the previous 3-5 entries
- 5. **Remove** any cultural/spiritual content
- 6. **Verify** factual accuracy and broadband relevance
- 7. **Add** to the "Generated" column

Quality Checklist

Before finalizing each description:

- [] 2-4 sentences (occasionally 4 for complex geographies)
- [] Focuses on land base, geography, and infrastructure
- [] Includes group affiliation type (federal/state/AK Native/Hawaiian)
- [] Contains NO cultural, spiritual, or ceremonial content
- [] Uses varied sentence structure from surrounding entries
- [] Includes specific geographic or infrastructure details
- [] Relevant to broadband deployment and planning
- [] Uses "state-recognized group" or "descent group" terminology (never "state-recognized tribe")
- [] Professional, factual, neutral tone

What Makes a Good Description

Good: "Three noncontiguous parcels totaling over 6,500 acres of largely leased agricultural land, located along the Colorado River, at the crossroads of the United States, Mexico, Arizona, and California."

- Specific acreage, land use, precise location, multi-jurisdictional context

Good: "A community bordering southern Phoenix suburbs that is home to Gila River Telecommunications."

- Urban context, specific telecommunications infrastructure

Good: "State-recognized Cherokee group."

- Concise, correct terminology, sufficient for state-recognized groups

Avoid: "A federally recognized tribe known for their rich cultural heritage and traditional practices."

- Cultural focus, not land-base focused, generic

Avoid: "A Pueblo tribe in Arizona, known for their ancient villages, spiritual traditions, and kachina dolls."

- Cultural and spiritual content not relevant to broadband planning

Generate descriptions that match the professional quality, factual precision, and structural variety demonstrated in the manually written Alabama and Arizona examples.

Table A1: AIANNHCE 540, Cattaraugus, NY

A - Perplexity Pro Deep Research (1/23/26), B - Grok 4 (1/23/26), C - Gemini 3 Pro (1/23/26), D - Opus 4.5 (1/23/26), E - DeepSeek R1 (1/23/26), F - ChatGPT 5.2 Thinking (1/23/26), G - Meta.ai (1/23/26)

AIANNHCE 540, Cattaraugus, NY	
	<u>Basic Prompt (Opus 4.5, Dec. 2025)</u>
Short	Part of the Seneca Nation in New York, with a strong focus on self-governance.
Long	Cattaraugus Reservation, part of the Seneca Nation of Indians with approximately 2,603 enrolled members residing there, encompasses 21,618 acres in Cattaraugus, Chautauqua, and Erie Counties, New York. The Seneca Nation, 'Keepers of the Western Door' of the Haudenosaunee (Iroquois) Confederacy, maintains a strong focus on self-governance, operating the Seneca Allegany and Seneca Niagara casinos.
Engine	<u>Enhanced Prompt</u>
A	Spanning approximately 22,000 acres across three counties in western New York, Cattaraugus Territory comprises rural, noncontiguous parcels located 40 miles from Buffalo. Interstate 90 and state routes provide primary access, with businesses concentrated along US 20 and NY 5 serving the approximately 2,600 federally recognized Seneca Nation members. The territory operates the Seneca Transit System for regional connectivity.
B	Federally recognized Seneca Nation reservation spanning approximately 21,618 acres across Cattaraugus, Chautauqua, and Erie Counties in western New York. The territory extends along Cattaraugus Creek from near Gowanda downstream to the Lake Erie shoreline, featuring rural landscapes with access via NY Route 438 and proximity to Buffalo about 40 miles away.
C	Federally recognized Seneca Nation territory spanning 21,618 acres across Cattaraugus, Chautauqua, and Erie counties. The reservation lies along Cattaraugus Creek extending to Lake Erie, with infrastructure including U.S. Route 20, NY Route 438, and Interstate 90. Broadband deployment is supported by a fiber-to-the-premise network and 2.5 GHz wireless license to serve over 1,200 residential and commercial structures.
D	Situated along Cattaraugus Creek from Gowanda to Lake Erie, this 21,618-acre territory of the federally recognized Seneca Nation of Indians spans Cattaraugus, Chautauqua, and Erie counties in western New York. Interstate 90 crosses the reservation, with additional access via US 20, NY 5, and NY 438.
E	Part of the Seneca Nation, located primarily in Cattaraugus County, New York. This reservation encompasses 21,618 acres across three counties. It operates under the Seneca Nation's governance structure.
F	A Seneca Nation of Indians reservation spanning parts of Erie, Chautauqua, and Cattaraugus counties in western New York, stretching inland from Lake Erie along Cattaraugus Creek. NY Route 438 is the primary route through the land base, with Interstate 90 crossing the reservation near Irving and US 20/NY 5 also passing through.
G	Federally recognized Seneca Nation territory in western New York, encompassing the 21,618-acre Cattaraugus Reservation in Cattaraugus, Chautauqua, and Erie counties. The land base borders the city of Salamanca and is served by State Route 219 and Interstate 86, facilitating broadband infrastructure projects coordinated with the Seneca Nation Telecommunications Authority. The reservation's multi-county configuration presents unique connectivity challenges for rural broadband expansion.

Table A2: AIANNHCE 1815, Lac Courte Oreilles, WI

A - Perplexity Pro Deep Research (1/23/26), B - Grok 4 (1/23/26), C - Gemini 3 Pro (1/23/26), D - Opus 4.5 (1/23/26), E - DeepSeek R1 (1/23/26), F - ChatGPT 5.2 Thinking (1/23/26), G - Meta.ai (1/23/26)

AIANNHCE 1815, Lac Courte Oreilles, WI	
	<u>Basic Prompt (Opus 4.5, Dec. 2025)</u>
Short	A Wisconsin-based Ojibwe tribe, known for education and treaty rights advocacy.
Long	Lac Courte Oreilles Band of Lake Superior Chippewa Indians, a federally recognized Ojibwe tribe in Wisconsin with approximately 7,000 enrolled members, maintains a 76,000-acre reservation. The tribe actively exercises treaty rights, operates Lac Courte Oreilles Ojibwe College, and is known for wild rice harvesting and environmental protection efforts.
Engine	<u>Enhanced Prompt</u>
A	Set in northwestern Wisconsin's mixed forest landscape, the Lac Courte Oreilles reservation encompasses approximately 69,000 acres in Sawyer County with additional off-reservation trust lands in Rusk, Burnett, and Washburn Counties. Located 11 miles southeast of Hayward and surrounded by Chequamegon National Forest, the federally recognized Ojibwe band's landbase features numerous lakes including Lac Courte Oreilles itself, which provides subsistence resources across its forested terrain.
B	Federally recognized Ojibwe reservation covering about 76,000 acres, primarily in Sawyer County in northwestern Wisconsin near Hayward. The land base includes extensive lake systems (around 10,500 acres of water) and additional trust lands in Burnett and Washburn Counties, situated in mixed forest terrain with opportunities for connectivity in a region roughly 90 miles south of Duluth, Minnesota.
C	Located in Sawyer County, this federally recognized Ojibwe reservation comprises approximately 76,000 acres of mixed forest and 25 community villages. Situated 11 miles southeast of Hayward, the land base is bisected by Highway 47 and County Highways B and K. The tribe is pursuing broadband feasibility studies to address connectivity gaps for the nearly 40% of households without internet service.
D	A 76,465-acre reservation in Sawyer County, northwest Wisconsin, with approximately 10,500 acres of lakes. The federally recognized Lac Courte Oreilles Band of Lake Superior Chippewa maintains this Ojibwe homeland 11 miles southeast of Hayward and 90 miles south of Duluth, with additional trust lands in Burnett and Washburn counties.
E	Federally recognized Ojibwe tribe situated in Wisconsin. The 76,000-acre reservation includes lands vital for treaty rights and sustains the Lac Courte Oreilles Ojibwe College. Telecommunications services are managed by the tribe.
F	The Lac Courte Oreilles Band of Lake Superior Chippewa Indians (federally recognized tribe) governs a reservation in northwestern Wisconsin centered in Sawyer County, southeast of Hayward. The land base totals about 76,465 acres—including roughly 10,500 acres of lakes and about 66,000 acres of forest and wetlands—creating a dispersed, lake-and-woodland footprint for broadband deployment.
G	Federally recognized Ojibwe tribe in Wisconsin, maintaining a 76,000-acre reservation in Sawyer County. The Tribal lands are adjacent to the Namekagon River and accessible by Highway 27 and Highway 70, supporting broadband initiatives through the Lac Courte Oreilles Tribal Broadband Utility. Infrastructure planning focuses on the reservation's forested terrain and dispersed community centers.

Table A3: AIANNHCE 2745, Pechanga, CA

A - Perplexity Pro Deep Research (1/23/26), B - Grok 4 (1/23/26), C - Gemini 3 Pro (1/23/26), D - Opus 4.5 (1/23/26), E - DeepSeek R1 (1/23/26), F - ChatGPT 5.2 Thinking (1/23/26), G - Meta.ai (1/23/26)

AIANNHCE 2745, Pechanga, CA	
	<u>Basic Prompt (Opus 4.5, Dec. 2025)</u>
Short	A Luiseño tribe in California, known for its casino and strong efforts in Tribal sovereignty and cultural preservation.
Long	Pechanga Band of Indians, a federally recognized Luiseño tribe in Riverside County, California with approximately 2,000 enrolled members, maintains a 6,700-acre reservation. The tribe operates Pechanga Resort Casino—one of the largest casinos in California—and the Pechanga Cultural Center preserving Luiseño heritage.
Engine	<u>Enhanced Prompt</u>
A	A federally recognized Luiseño tribe occupying approximately 7,080 acres in the foothills south of Temecula Valley in Riverside County, Pechanga’s reservation spans portions of Riverside and San Diego counties’ ancestral territory. Located within rolling terrain adjacent to the Temecula River, the reservation's geographic position provides access to both county and regional transportation corridors.
B	Federally recognized Luiseño reservation totaling around 6,700-7,250 acres in Riverside County, southern California, east of Interstate 15 and Highway 79 near Temecula. The noncontiguous parcels lie in a Mediterranean climate zone with hot, dry summers, supporting Tribally owned infrastructure including Pechanga Western Electric for local electrical service.
C	A federally recognized Luiseño land base of approximately 7,000 acres located in Riverside County near Temecula. Situated east of Interstate 15 and Highway 79 South, the reservation features a diverse topography ranging from valley floors to mountainous elevations. Tribal operations include Pechanga Western Electric, a utility managing energy infrastructure and grid resilience for government and commercial facilities.
D	Federally recognized Luiseño tribe maintaining approximately 7,080 acres in Riverside County adjacent to Temecula, with elevations ranging from 1,100 to 2,600 feet. The Pechanga Tribal Utility provides electric service to commercial buildings and government facilities on the reservation.
E	Federally recognized Luiseño tribe located in Riverside County, California, managing a 6,700-acre reservation. The Pechanga Resort Casino represents a significant infrastructure presence. Tribal telecommunications operations exist there.
F	Pechanga Band of Indians (federally recognized tribe) maintains a 5,500-acre reservation in Riverside County, California, adjacent to Temecula. The reservation lies east of Interstate 15 and Highway 79 South, placing much of the community near major regional transportation corridors.
G	Federally recognized Luiseño tribe in Riverside County, California, with a 6,700-acre reservation near the Temecula Valley. The land base is linked to Interstate 15 and State Route 79, and the tribe operates the Pechanga Telecommunications Network for internal broadband services. Broadband deployment opportunities exist in the reservation’s suburban proximity and existing utility infrastructure.

Table A4: AIANNHCE 4225, Tonawanda, NY

A - Perplexity Pro Deep Research (1/23/26), B - Grok 4 (1/23/26), C - Gemini 3 Pro (1/23/26), D - Opus 4.5 (1/23/26), E - DeepSeek R1 (1/23/26), F - ChatGPT 5.2 Thinking (1/23/26), G - Meta.ai (1/23/26)

AIANNHCE 4225, Tonawanda, NY	
	<u>Basic Prompt (Opus 4.5, Dec. 2025)</u>
Short	A Seneca Nation territory in New York, historically significant in Haudenosaunee governance.
Long	Tonawanda Band of Seneca, a federally recognized tribe in New York with approximately 1,200 enrolled members, maintains a 7,549-acre reservation. The band maintains traditional Seneca governance through hereditary chiefs and clan mothers.
Engine	<u>Enhanced Prompt</u>
A	Reservation lands of approximately 7,550 acres extending across Erie, Genesee, and Niagara Counties in western New York near Akron. The Tonawanda Creek runs through the territory where the federally recognized Seneca Nation band maintains 1,200 enrolled members, with road access from Akron and regional connections northeastward to Buffalo area transportation networks.
B	Federally recognized Tonawanda Band of Seneca reservation encompassing about 7,549 acres across Erie, Genesee, and Niagara Counties in western New York near Akron. The territory features rural lands along Tonawanda Creek, with divided census areas and access near major routes between Buffalo and Rochester.
C	Spanning Genesee, Erie, and Niagara counties, the federally recognized Tonawanda Band of Seneca reservation covers roughly 7,500 acres traversed by Tonawanda Creek. The territory is bordered by the towns of Alabama, Pembroke, and Newstead, with internal access limited by unpaved roads in some sectors. Proximity to the STAMP industrial site presents unique infrastructure planning conditions near the reservation boundaries.
D	Federally recognized Tribal land of the Tonawanda Band of Seneca, distinct from the Seneca Nation of Indians, comprising 7,549 acres in Genesee, Erie, and Niagara counties near Akron, New York. Tonawanda Creek flows through the reservation, which is adjacent to the Iroquois National Wildlife Refuge.
E	Federally recognized Seneca Nation territory in New York, encompassing 7,549 acres. Situated within the Seneca Nation's lands, it operates under traditional governance structures. It is part of the larger Seneca Nation reservation system.
F	The Tonawanda Seneca Nation is a federally recognized tribe with a roughly 7,500-acre reservation near Akron in western New York. The reservation lies mainly in Genesee County, with portions extending into Erie and Niagara counties, and is bordered by the towns of Alabama, Pembroke, Newstead, and Royalton.
G	Federally recognized Seneca tribe in New York, holding a 7,549-acre reservation in Genesee and Niagara counties. The reservation lies near the Niagara River and is served by State Route 5 and Interstate 90, enabling broadband projects managed by the Tonawanda Seneca Communications Authority. The geographic split between two counties requires tailored connectivity solutions for remote areas.

Table A5: AIANNHCE 5048, Kalaoa, HI

A - Perplexity Pro Deep Research (1/23/26), B - Grok 4 (1/23/26), C - Gemini 3 Pro (1/23/26), D - Opus 4.5 (1/23/26), E - DeepSeek R1 (1/23/26), F - ChatGPT 5.2 Thinking (1/23/26), G - Meta.ai (1/23/26)

AIANNHCE 5048, Kalaoa, HI	
	<u>Basic Prompt (Opus 4.5, Dec. 2025)</u>
Short	Upland Big Island Hawaiian Home Lands region near Kona, offering agriculture and housing options for beneficiaries with expansive mountain and ocean views.
Long	Kalaoa, a Hawaiian Home Lands community on Hawai'i Island (Big Island), provides agricultural and residential homestead opportunities for Native Hawaiian beneficiaries under the Hawaiian Homes Commission Act of 1921. The community supports Native Hawaiian families in maintaining connections to their ancestral lands and cultural practices.
Engine	<u>Enhanced Prompt</u>
A	Located on the western slopes of Hualālai volcano at approximately 680 feet elevation, Kalaoa comprises Hawaiian Home Lands on the Big Island near Kona, approximately 33 miles south of that city. The coastal upland setting provides both ocean and mountain access with volcanic landscape characteristics typical of Hawaii County's leeward regions.
B	Hawaiian Home Lands community on the west (Kona) side of Hawai'i Island (Big Island), providing agricultural and residential parcels for Native Hawaiian beneficiaries under the Hawaiian Homes Commission Act. Located upland near Kailua-Kona with mountain and ocean views, the area supports homestead opportunities in a leeward coastal region accessible via regional highways.
C	This Hawaiian Home Lands community is situated in the North Kona district on the island of Hawai'i. The area encompasses residential and agricultural homesteads within the Kealakehe-La'i 'Ōpua region, characterized by upland elevations and volcanic terrain. Infrastructure planning focuses on expanding water and roadway systems to support beneficiary housing and subsistence farming.
D	Hawaiian Home Lands tract on Hawaii Island (Big Island) comprising approximately 483 acres in four discontinuous lots near the Kona coast. Elevations range from 150 to 800 feet, with access from Queen Kaahumanu Highway providing connections to the North Kona region.
E	Hawaiian entity governing Kalaoa lands on Hawai'i Island under the Homes Act. This community offers agricultural and residential homestead opportunities across its lands. It provides access to Native Hawaiian beneficiaries.
F	Department of Hawaiian Home Lands (Hawaiian entity) administers Hawaiian homelands at Kalaoa on Hawai'i Island in the North Kona region of Hawai'i County. DHHL parcels here include lands mauka of the Queen Ka'ahumanu Highway across from the NELHA/HOST Park entrance, where utility extensions and last-mile network planning interface with adjacent industrial infrastructure.
G	Hawaiian Home Lands entity on Hawai'i Island, administering a 45-acre homestead area in the Kona district. The land base is accessible via Hawaii State Route 11 and lies near the Kona International Airport, supporting broadband initiatives through the Kalaoa Community Broadband Cooperative. Infrastructure planning emphasizes mountainous terrain and dispersed homestead locations.

Table A6: AIANNHCE 5740, Modoc, OK

A - Perplexity Pro Deep Research (1/23/26), B - Grok 4 (1/23/26), C - Gemini 3 Pro (1/23/26), D - Opus 4.5 (1/23/26), E - DeepSeek R1 (1/23/26), F - ChatGPT 5.2 Thinking (1/23/26), G - Meta.ai (1/23/26)

AIANNHCE 5740, Modoc, OK	
	<u>Basic Prompt (Opus 4.5, Dec. 2025)</u>
Short	Oklahoma-based Modoc Nation is a federally recognized tribe with roots in Northern California, focusing on sovereignty and cultural revival.
Long	Modoc Nation, a federally recognized tribe in Oklahoma with approximately 200 enrolled members. Descended from Modoc people who were relocated from California and Oregon after the Modoc War of 1872-1873, the tribe preserves Modoc cultural traditions.
Engine	<u>Enhanced Prompt</u>
A	The smallest federally recognized tribe in Oklahoma with approximately 200-250 enrolled members, Modoc Nation is headquartered in Miami in Ottawa County's northeast corner. The tribe's landbase represents descendants relocated in 1873 from northern California and southern Oregon who adapted to prairie and forest environments in Indian Territory.
B	Federally recognized Modoc Nation lands in Ottawa County, northeastern Oklahoma, near the Missouri border southeast of Miami. The small reservation base includes a 600-acre ranch property for operations, situated in a rural corner with limited contiguous holdings focused on Tribal administration.
C	Headquartered in Miami, Ottawa County, the federally recognized Modoc Nation manages a land base that includes trust properties and the 1,200-acre Modoc Nation Ranch. The tribe operates diverse economic enterprises such as Modoc Power, which provides energy solutions, and Eagle TG for technical services. Geographic context is defined by the Neosho River valley and the tribe's location in the northeastern corner of Oklahoma.
D	Headquartered in Miami, Oklahoma, the Modoc Nation is the smallest federally recognized tribe in the state, with jurisdictional area in Ottawa County near the Kansas and Missouri borders. The tribe operates a 600-acre bison range on original allotment land and participates in the Inter-Tribal Bison Council.
E	Federally recognized tribe in Oklahoma with approximately 200 enrolled members. Descendants of Modoc people relocated from California and Oregon, the landbase reflects this history. It exercises self-governance through its Tribal council.
F	Headquartered in Miami, Oklahoma, the Modoc Nation is a federally recognized tribe with a re-established land base and jurisdictional area centered in Ottawa County near the Kansas–Missouri line. Tribal government and program facilities are consolidated at the Modoc Tribal Complex in Miami, providing a fixed hub for interconnection and middle-mile planning in a largely rural service area.
G	Federally recognized Modoc Nation in Oklahoma, with trust lands totaling 2,300 acres in Ottawa County. The land base is adjacent to the town of Miami and connected by State Highway 69 and Interstate 44, facilitating broadband projects through the Modoc Tribal Telecommunications Office. Connectivity challenges include rural dispersion and limited existing utility infrastructure.

Table A7: AIANNHCE 6535, Georgetown, AK

A - Perplexity Pro Deep Research (1/23/26), B - Grok 4 (1/23/26), C - Gemini 3 Pro (1/23/26), D - Opus 4.5 (1/23/26), E - DeepSeek R1 (1/23/26), F - ChatGPT 5.2 Thinking (1/23/26), G - Meta.ai (1/23/26)

AIANNHCE 6535, Georgetown, AK	
	<u>Basic Prompt (Opus 4.5, Dec. 2025)</u>
Short	A Native Alaskan village, engaged in land preservation and cultural heritage.
Long	Georgetown, a federally recognized Alaska Native village, is home to a Alaska Native community that maintains traditional cultural practices and traditional subsistence practices. The village exercises self-governance through its Tribal council and participates in regional Native corporation activities.
Engine	<u>Enhanced Prompt</u>
A	Accessible by boat, snowmobile, or aircraft, the federally recognized Native Village of Georgetown sits on the upper Kuskokwim River in the Kilbuck-Kuskokwim Mountains at the confluence with the George River, 16 miles downstream of Red Devil in the Bethel Census Area. The remote Interior Alaska village was established following gold discoveries in 1909 and now maintains approximately 150 Tribal members dispersed for economic reasons.
B	Federally recognized Alaska Native village on the Kuskokwim River in the Kilbuck-Kuskokwim Mountains, Bethel Census Area, southwestern Alaska. The remote community lies at the convergence with the George River, accessible primarily by air or river in a wilderness setting with no road connections.
C	Sited at the convergence of the George and Kuskokwim rivers, this federally recognized Alaska Native village lies in the Kilbuck-Kuskokwim Mountains. The settlement is located approximately 16 miles northwest of Red Devil and is accessible primarily by boat, snowmachine, or small aircraft. Land holdings include surface estates managed in coordination with The Kuskokwim Corporation.
D	Federally recognized Alaska Native village on the north bank of the upper Kuskokwim River in the Kilbuck-Kuskokwim Mountains, at the confluence with the George River. Located in the Bethel Census Area, accessible by boat, snowmobile, or small aircraft, with Tribal members affiliated with The Kuskokwim Corporation.
E	Alaska Native village located in the Yukon-Kuskokwim Delta region of Alaska. This federally recognized community operates under its Tribal council and manages village lands. It participates in regional Native corporation activities.
F	Native Village of Georgetown (federally recognized Alaska Native Village) is the Georgetown ANVSA in the Bethel Census Area on the upper Kuskokwim River near the mouth of the George River in the Kilbuck-Kuskokwim Mountains. With no road connections, access is typically by small plane, boat, or winter travel over snow and river routes—key constraints for transporting equipment and maintaining networks.
G	Federally recognized Alaska Native Village in the Yukon-Koyukuk Census Area, with an Alaska Native Village Statistical Area (ANVSA) of approximately 1,800 acres. Access is limited to the Alaska Highway system and seasonal river transport, requiring specialized broadband solutions managed by the Georgetown Village Communications Utility. The remote location presents significant infrastructure and environmental deployment challenges.

Table A8: AIANNHCE 7030, Nenana, AK

A - Perplexity Pro Deep Research (1/23/26), B - Grok 4 (1/23/26), C - Gemini 3 Pro (1/23/26), D - Opus 4.5 (1/23/26), E - DeepSeek R1 (1/23/26), F - ChatGPT 5.2 Thinking (1/23/26), G - Meta.ai (1/23/26)

AIANNHCE 7030, Nenana, AK	
	<u>Basic Prompt (Opus 4.5, Dec. 2025)</u>
Short	Athabascan village and railroad town near Fairbanks with rich dog mushing history and Indigenous cultural life.
Long	Nenana, a federally recognized Alaska Native village, is home to a Athabascan community that maintains traditional cultural practices and traditional subsistence practices. The village exercises self-governance through its Tribal council and participates in regional Native corporation activities.
Engine	<u>Enhanced Prompt</u>
A	The Athabascan Native Village of Nenana occupies land at the confluence of the Nenana and Tanana Rivers, 50 miles southwest of Fairbanks on the Alaska Railroad and George Parks Highway. Infrastructure at this strategic transportation hub includes the 700-foot Mears Memorial Bridge, railroad depot, and river access; the village recently received a Tribal Broadband Connectivity Program grant for fiber-to-home service reaching 362 households and 30 businesses, with deployment expected in 2027.
B	Federally recognized Alaska Native village in Interior Alaska, Yukon-Koyukuk Census Area, about 55 road miles southwest of Fairbanks along the George Parks Highway. Positioned at the confluence of the Nenana and Tanana Rivers, the community benefits from Alaska Railroad access at mile 412 and proximity to major transportation corridors.
C	A railbelt community and federally recognized Alaska Native village, Nenana is situated at the confluence of the Nenana and Tanana rivers. Located 55 miles southwest of Fairbanks on the George Parks Highway, the village serves as a transportation hub with Alaska Railroad access and the 12-mile Totchaket Road. Infrastructure includes the Nenana River Bridge and electric utility services provided by Golden Valley Electric.
D	Federally recognized Athabascan community at mile 412 of the Alaska Railroad, on the Tanana River at its confluence with the Nenana River. Located 55 road miles southwest of Fairbanks on the George Parks Highway, with transportation links north to Fairbanks and south to Anchorage via both highway and rail.
E	Alaska Native village situated along the Tanana River in the Tanana Chiefs District, near Fairbanks. Governed by its Tribal council, the village manages its lands. It participates in regional Native corporation activities.
F	Along the Tanana River in Interior Alaska, the Nenana ANVSA corresponds to the federally recognized Nenana Native Association. Nenana is about 55 road miles southwest of Fairbanks on the George Parks Highway and sits at mile 412 of the Alaska Railroad, giving it road-and-rail logistics advantages for broadband construction and backhaul.
G	Federally recognized Alaska Native Village in the Yukon-Koyukuk Census Area, with an ANVSA encompassing 2,100 acres near the Tanana River. The community is linked to the Alaska Railroad and Highway 3, supporting broadband initiatives through the Nenana Tribal Broadband Project. Infrastructure planning must address extreme weather and limited road access for service delivery.

Table A9: AIANNHCE 7495, Sleetmute, AK

A - Perplexity Pro Deep Research (1/23/26), B - Grok 4 (1/23/26), C - Gemini 3 Pro (1/23/26), D - Opus 4.5 (1/23/26), E - DeepSeek R1 (1/23/26), F - ChatGPT 5.2 Thinking (1/23/26), G - Meta.ai (1/23/26)

AIANNHCE 7495, Sleetmute, AK	
	<u>Basic Prompt (Opus 4.5, Dec. 2025)</u>
Short	A Yup'ik community in Alaska, historically significant for salmon fishing.
Long	Sleetmute, a federally recognized Alaska Native village, is home to a Alaska Native community that maintains traditional cultural practices and traditional subsistence practices. The village exercises self-governance through its Tribal council and participates in regional Native corporation activities.
Engine	<u>Enhanced Prompt</u>
A	Nestled on the east bank of the upper Kuskokwim River 1.5 miles north of the Holitna River confluence, the Yup'ik and Athabascan village of Sleetmute is located 79 miles east of Aniak in Alaska's Interior. This remote subsistence community of fewer than 100 residents sits within the traditional fishing and harvesting territory along the Kuskokwim's upper reaches.
B	Federally recognized Alaska Native village on the east bank of the Kuskokwim River in Bethel Census Area, southwestern Alaska, 1.5 miles north of its junction with the Holitna River. The remote CDP covers over 100 square miles of land and water, located 79 miles east of Aniak with primary access by air or river in a vast wilderness area.
C	Positioned on the east bank of the Kuskokwim River near its junction with the Holitna River, this federally recognized Yup'ik village lies roughly 79 miles east of Aniak. The community relies on river navigation and air transport for access, with the riverbank serving as the primary corridor for boat and snowmachine travel. Geographic features include a high flood hazard zone that impacts local infrastructure planning.
D	Federally recognized Alaska Native village on the east bank of the Kuskokwim River, 1.5 miles north of its junction with the Holitna River in the Bethel Census Area. Located 79 miles east of Aniak and 166 miles northeast of Bethel, the village is part of The Kuskokwim Corporation.
E	Alaska Native village located on the St. Lawrence Island, part of the Bering Sea region. This federally recognized community operates under its Tribal council and manages village lands. It participates in regional Native corporation activities.
F	Village of Sleetmute (federally recognized Alaska Native Village) is the Sleetmute ANVSA on the east bank of the Kuskokwim River, about 1.5 miles north of its junction with the Holitna River in the Bethel Census Area. The community is off the road system and relies on air access and river travel, shaping transport costs and redundancy options for broadband infrastructure.
G	Federally recognized Alaska Native Village in the Bethel Census Area, with an ANVSA of 1,500 acres on the Kuskokwim River. The land base is accessible only by river transport and seasonal air service, necessitating satellite-based broadband solutions overseen by the Sleetmute Village Communications Office. Unique geographic isolation drives specialized connectivity strategies.

Table A10: AIANNHCE 9815, Lumbee, NC

A - Perplexity Pro Deep Research (1/23/26), B - Grok 4 (1/23/26), C - Gemini 3 Pro (1/23/26), D - Opus 4.5 (1/23/26), E - DeepSeek R1 (1/23/26), F - ChatGPT 5.2 Thinking (1/23/26), G - Meta.ai (1/23/26)

AIANNHCE 9815, Lumbee, NC	
	<u>Basic Prompt (Opus 4.5, Dec. 2025)</u>
Short	The largest state-recognized tribe in North Carolina, known for their ongoing fight for federal recognition.
Long	Lumbee Tribe of North Carolina, a state-recognized tribe with approximately 55,000 enrolled members—the largest tribe east of the Mississippi and ninth largest in the nation. The tribe maintains a strong presence in Robeson County and has been seeking full federal recognition.
Engine	<u>Enhanced Prompt</u>
A	A federally recognized tribe as of December 2024, the Lumbee Tribe of North Carolina comprises approximately 60,000 enrolled members—the largest Native American population east of the Mississippi River. The tribe's territorial service area spans Robeson, Scotland, Hoke, and Cumberland Counties in eastern North Carolina, with primary settlement and historical presence centered in Robeson County along the Lumber River.
B	State-recognized group with a primary presence in Robeson County and surrounding areas (including Hoke, Cumberland, and Scotland Counties) in southeastern North Carolina. The non-reservation land base centers along the Lumber River region, supporting a large enrolled population in a rural to semi-rural setting now advancing toward full federal recognition benefits.
C	With a primary land base across Robeson, Hoke, Cumberland, and Scotland counties, this state-recognized Lumbee group is centered around the town of Pembroke. The community's geography is defined by the winding Lumber River, with population density supporting distinct settlements rather than a single reservation tract. Infrastructure includes Tribal headquarters in Pembroke and proximity to the University of North Carolina at Pembroke.
D	Federally recognized tribe as of December 2025, with approximately 55,000 members—the largest tribe east of the Mississippi River. Tribal territory spans Robeson, Hoke, Cumberland, and Scotland counties in southeast North Carolina, with headquarters in Pembroke.
E	State-recognized Cherokee group with the largest enrollment in North Carolina. Located primarily in Robeson County, its state-recognized status is governed by the North Carolina Indian Affairs Commission.
F	The Lumbee Tribe of North Carolina is a federally recognized tribe as of December 18, 2025, with Tribal territory in southeastern North Carolina across Robeson, Hoke, Cumberland, and Scotland counties. The population center around Robeson County sits on the Interstate 95 / Interstate 74 corridor near Lumberton, tying middle-mile routing and carrier interconnection opportunities to this major transportation and utility corridor.
G	State-recognized Lumbee descent group in Robeson County, North Carolina, with a statistical land base of approximately 55,000 acres. The Tribal lands are adjacent to Interstate 95 and U.S. Route 74, enabling broadband expansion projects coordinated with the Lumbee Regional Broadband Initiative. The large geographic spread requires multi-jurisdictional infrastructure planning for effective service delivery.