



WORKING PAPER

Who's driving this bus? A culturally and legally informed approach for electrifying student transportation in Indian Country

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CONTENTS

Glossary	2
Executive summary	4
Introduction.....	5
Methodology.....	6
Background: US Indian policy and Native education in context	6
Findings:.....	12
Discussion:	21
A framework for an equitable ESB transition for Tribal Nations and Native communities	23
Conclusion and recommendations	24
Appendices.....	26
Abbreviations	39
Endnotes.....	40
References.....	42
Acknowledgments.....	48

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Suggested Citation: Compton, M., and A. Curran. 2025. "Who's driving this bus? A culturally and legally informed approach for electrifying student transportation in Indian Country." Working Paper. Washington, DC: World Resources Institute. Available online at doi.org/10.46830/wriwp.20.00049.

Highlights

- American Indian and Alaska Native students rely on school transportation more than any other racial group in the United States.
- This paper identifies historical, legal, and systemic barriers limiting equitable electric school bus (ESB) deployment in Tribal Nations and Native communities, and analyzes intersections of Native education systems, transportation infrastructure, and Tribal sovereignty in shaping ESB transitions.
- The paper proposes a framework for non-Native ESB stakeholders emphasizing self-education and Tribal sovereignty to address historic and systemic barriers to an equitable ESB transition.
- Next steps identified through the work include developing Tribe-tailored resources, supporting data collection, fostering partnerships, and offering case-by-case support for Tribal Nations.

Glossary

Concepts and Terminology surrounding the Indigenous people of Turtle Island is nuanced and complex. In particular, collective terms and labels carry important distinctions and histories. For example, many Tribal Nations are often identified by a name ascribed by US settlers—e.g., the Nez Perce Tribe—which is different than the actual name of the Tribal Nation and its citizens—e.g., the Nez Perce people are actually called Nimiipuu, which, as is often the case, means “the people” in *nimiipuutimt* (the Nimiipuu language).

This terminology is evolving and often subjective. When working with Tribal Nations and Native communities, the best approach is to always seek guidance from the specific Nations and communities with whom you are working for preferred language. In this paper, we use the following terms, which may be unfamiliar to readers without experience working in Indian Country. For additional resources on terminology, see “Indigenous Identity: More than Something Else” (NAP 2020) and *Tribal Nations and the United States: An Introduction* (NCAI 2020).

checkerboarding	A term used to describe the fragmented ownership of Tribal lands, which exists today as a direct result of the federal allotment policy and the General Allotment Act of 1887 (Dawes Act). Allotment forced the division of Tribal lands (typically held by Tribal Nations and used pursuant to Tribal law) into a “checkerboard” of parcels, deeded to individual Tribal citizens under federal property law and remaining, or “surplus,” lands deeded to non-Native buyers and homesteaders. Initially, Tribal citizen-owned parcels could, and were frequently, sold to non-Native owners. This led to a checkerboard of ownership—Tribal trust lands, individual Native allotments, and non-Native fee lands. Eventually, the sale of allotment parcels was restricted and ownership fractionated by dividing small parcels among an increasing number of Native heirs over generations (ILTF n.d.). See Appendix A.
consultation	The legally mandated requirement for government agencies to conduct meaningful government-to-government dialogue with Tribal Nations regarding projects that may impact Tribal rights, lands, resources, or citizens. Federal consultation is required by treaty rights, the federal trust responsibility, and various federal laws. Some states also require government-to-government consultation with Tribal Nations under state law. Consultation is legally distinct from consent because it does not mandate that Tribal Nations must approve the final decision or participate in the project’s design and development phases (ICC n.d.).
energy sovereignty	Principle affirms the self-determination of each Tribal Nation to build its own energy resources pursuant to its specific needs and capabilities, including to control decisions regarding all elements of energy development and associated regulation in pursuit of fulfilling its energy demands or economic interests (Raimi and Davicino 2024).
equity	Fairness and impartiality in procedures, processes, distribution of risks and benefits, rights, and access to resources (e.g., economic, environmental, health, social) and opportunities, accounting for historical and systematic disadvantages. This concept recognizes that individuals have different needs and power based on their markers of identity (e.g., race, gender, class, age), and that these disparities should be identified and addressed (Tracer and Li 2017).
Free, Prior, and Informed Consent	<p>International human rights consent standard established by the United Nations Declaration on the Rights of Indigenous Peoples in 2007 (UN 2007), including definitions for the following terms:</p> <p>Free means consent must be given without pressure, threats, or deceptive practices that could influence decision-making.</p> <p>Prior means consent must be obtained well before any project approval or activity begins, allowing adequate time for Indigenous communities to follow their traditional decision-making and consultation processes.</p> <p>Informed means comprehensive information must be shared covering all relevant project details such as the project’s characteristics, scale, timeline, and potential for reversal; the project’s objectives and expected duration; geographic locations and communities that will be impacted; initial evaluations of possible economic, social, cultural, and environmental effects and associated risks; key personnel who will implement the project; and the processes and procedures the project will involve (OHCHR n.d.).</p> <p>Notably, the United States voted against this declaration. In the time since, the Barack Obama administration announced the United States’ support of the declaration in 2010 (DOS 2010).</p>
Indian	An evolving term that was historically used to refer to Native Americans and is still sometimes used by Native Americans themselves. Contemporarily, “Indian” is largely a legal term of art, not typically employed by non-Native people and organizations, and used only when referring to US Law—e.g., “federal Indian law,” the body of federal law addressing the United States’ relationship to Tribal Nations; Title 25 of the US Code, which is titled “Indians”; relevant laws such as the Indian Reorganization Act of 1934 and the Indian Self-Determination and Education Assistance Act of 1975; and “Indian Country” (see below).

Indian Country	The lands and geographic areas where Tribal Nations retain jurisdiction and interest. The term originated from a legal definition in the Major Crimes Act, which delineates certain lands for the purposes of Tribal criminal jurisdiction and defines "Indian country" (lowercase c) to include reservations, allotments, and dependent Indian communities, as defined in 18 US Code § 1151 (1935). However, today the term Indian Country (capital c) is frequently used by Tribal Nations and Native people with positive sentiment and leveraged broadly as a general description of Native spaces and places within the United States.
intersectionality	A term naming how individuals' various identities often combine, overlap, or intersect, creating multiple layers of social injustice and oppressive circumstances—or privilege. The general concept is that people experience more than one type of oppression or privilege because of the various factors that make up their identities (e.g., race, gender, class, age). Intersectionality recognizes that individuals' lives are shaped by their identities, relationships, and markers of identity. These combine to create intersecting forms of oppression and privilege, depending on a person's context and existing power structures (e.g., patriarchy, ableism, colonialism, racism). An intersectional approach identifies hidden structural barriers and supports an understanding of how individual experiences differ, even within groups (Carbado et al. 2013).
Native American	A citizen (sometimes referred to as an "enrolled member") or descendent of a Tribal Nation, sometimes shortened as "Native." Importantly, "Native American" denotes a political connection to an Indigenous sovereign (by citizenship and/or kinship) in what is now known as the United States and is a political, not a racial, distinction. Related terminology includes the following: <ul style="list-style-type: none"> ▪ <i>Alaska Native</i>: a subset of Native Americans belonging to the Tribal Nations of Alaska. ▪ <i>Native Hawaiian or Kanaka Maoli</i>: the Indigenous people of Hawaii, who are referred to separately because the United States fails to recognize the sovereignty of the Kingdom of Hawai'i, creating unique legal, historical, and cultural issues in the relationship between Kanaka Maoli and the United States. ▪ <i>Indigenous</i>: This term is sourced from international law—e.g., the United Nations Declaration on the Rights of Indigenous Peoples—and more broadly references the Indigenous peoples of all lands throughout the world. Because this framework addresses only Tribal Nations and Native communities in the United States, focusing on structures developed under US law, we use "Native American."
Native community	A term for local communities of Native people, which may be formally or informally organized and exist both within and outside of Tribal lands. This term is to be distinguished from Tribal Nations (see below), which represent the sovereign governments, similar to how a community group might represent state citizens or a particular issue but not the state government or a governmental entity.
partnership	A term we use to distinguish advanced Tribal engagement and relationships, indicative of relationships that go beyond single-issue, transactional interactions and are marked by mutual benefit, open dialogue, long-term focus, and respect.
self-determination	Tribes' right to decide upon the development and implementation of federal programs and policies that directly impact their Nation or their citizens (BIA 2017a).
sovereignty	Tribal Nations' inherent right to autonomous governance reinforced by the US Constitution, treaties, Supreme Court rulings, executive orders, and legislation (NCAI 2020).
Tribal Nation	A federally recognized Tribe in the United States. Sometimes referred to as a "Tribe," we use the term "Tribal Nation" to acknowledge the essential political nature and inherent sovereignty of Tribal Nations, as recognized under US law. When referring to a Tribe in Canada, we use the term "First Nation."
Turtle Island	A term used by some Native Americans for what is now known as North and Central America. It reflects the limitations of the United States (as a term and geographic concept) and identifies the preexistence of the land and its Indigenous occupants. The term originates from creation stories of some Tribal Nations that describe the continent as being formed on the back of a giant turtle (Kimmerer 2015).

Executive summary

Background

This paper examines the historical, institutional, and systemic barriers that Tribal Nations face in transitioning to ESBs, while highlighting pathways to ensure equitable implementation. Drawing on academic and gray literature, legal and policy analysis, and Tribal-led perspectives, it offers a foundational understanding of the laws, histories, and governance structures shaping Native education and transportation. Part of World Resources Institute's Electric School Bus Initiative equity research series, this paper aims to inform stakeholders on how to respect Tribal sovereignty, address systemic inequities, and maximize benefits for Native communities.

The US Constitution recognizes Tribal sovereignty, and treaties established the federal government's legal obligations to Tribal Nations, including commitments to provide education (US Const., art. I, § 8; NCAI 2020). However, these obligations have been historically undermined by assimilation policies, such as the federal boarding school system, which separated Native children from their families and eroded cultural connections (NCAI 2020). Education and transportation for Native students today operate in the shadow of these policies.

Tribal Nations differ widely in geography, governance, land status, economic resources, and infrastructure. Many face overlapping jurisdictional challenges, limited taxing authority, and chronic underfunding for roads, energy, and transportation. These structural realities affect ESB deployment feasibility and design.

Findings

Barriers

- **Limited understanding of Tribal governance and education systems** among non-Tribal stakeholders, leading to ineffective or mismatched ESB programs
- **Overlapping and inconsistent jurisdiction** over land, roads, and infrastructure, complicating planning, permitting, and maintenance
- **Data gaps** on Native student enrollment, transportation patterns, infrastructure status, and energy capacity, hindering evidence-based decisions

- **Insufficient transportation and energy infrastructure**, including deteriorated roads, sparse electric vehicle supply equipment, and limited site capacity, creating major implementation hurdles
- **Inequitable access to funding** due to restrictive program requirements, procurement rules, and recognition status

Benefits

- **Health gains** from eliminating diesel exhaust exposure, which disproportionately affects Native children, who have higher asthma rates than the national average (ESB Initiative 2025; Brim et al. 2008)
- **Opportunity for improved educational outcomes** through more reliable and safer transportation, potentially boosting attendance and academic performance (Fisher 2014; Levin 2023)
- **Infrastructure and economic development** via clean energy investment, job creation, and capacity-building in Tribal Nations (DOT 2025)

Discussion

Electrifying school transportation in Indian Country isn't simply a technology swap; it requires addressing deep-rooted infrastructure inequities, legal complexities, and historical harms. Success depends on tailoring projects to each Tribal Nation's governance, land status, and priorities. The ESB transition can catalyze improvements beyond transportation in strengthening roads, expanding on-site and grid capacity, and fostering Tribal-led clean energy enterprises. However, equity demands that Tribal Nations lead decision-making, with non-Tribal partners acting in support rather than control.

Recommendations and further action

The following bullets summarize a framework for a just transition to ESBs in Indian Country, targeted to non-Native stakeholders and implementers:

- **Understand the history.** Stakeholders must educate themselves on the history of US-Tribal relations, Native education, and the impacts of federal policies on transportation and infrastructure.

- **Address systemic barriers.** Solutions must confront structural issues like jurisdictional fragmentation, data deficits, and underfunded infrastructure.
- **Center Tribal sovereignty.** Respect the sovereign authority of Tribal governments to set priorities, make decisions, and control data related to ESB projects.

Based on this paper's findings, non-Native ESB stakeholders should take the following actions, grounded in the framework's principles:

- **Educate and train staff** on Tribal histories, sovereignty, and education policy; treat this paper as a starting point, with learning tailored to each engaged Tribe.
- **Develop materials tailored to Tribes** for ESB deployment that address historical and systemic barriers, infrastructure readiness, and funding access.
- **Support Tribal-led data collection** for student transportation and electrification needs, ensuring Tribal ownership and control of the data.
- **Build partnerships** with Native-led organizations to increase impact and ensure culturally informed approaches.
- **Provide tailored, case-by-case support** to Tribal Nations pursuing ESB transitions, and respect those that choose not to adopt ESBs.

Introduction

In collaboration with partners and communities, the Electric School Bus (ESB) Initiative of World Resources Institute aims to build unstoppable momentum toward an equitable transition of the entire US school bus fleet from fossil fuel to electric. This paper builds upon the working papers “Equity Framework to Guide the Electric School Bus Initiative” (Moses and Brown 2023)¹ and “Electric School Bus Initiative Advocacy Stakeholder Analysis: A Baseline Report” (Brown and Curran 2023)² as part of foundational research.³ The stakeholder analysis identified the need for further research on Tribal rights and justice. Recognizing historical burdens on Tribal Nations and Native communities, the ESB Initiative prioritizes these groups to ensure they receive early benefits from electrification. Even more so considering American Indian and Alaska Native (AIAN) students rely on school transportation more than any other racial group in the United States, with 42 percent relying on the bus to get to school compared with the national average of 31 percent (FHWA 2022).

Despite existing inequities, 70 districts serving Native students committed⁴ to transitioning over 400 buses (Lazer and Freehafer 2024). The Eastern Band of Cherokee Indians (EBCI) is a leader in this transition, having converted its entire school fleet, reflecting its government's long-standing environmental conservation commitment (Mckie 2024) (Appendix D highlights other Tribes' ESB and clean energy initiatives). EBCI is one of many Tribes experiencing the benefits of electrification, including operations savings and reduced emissions, the latter of which is critical as Native children have statistically higher asthma rates than nonNative children (13 percent versus 8.6 percent, respectively) (ESB Initiative 2025; Brim et al. 2008).

Working in Indian Country requires an understanding of the unique history and legal context of Tribal Nations in the United States. The political status of Tribal Nations and their citizens demands an informed, tailored approach to transportation electrification. Non-Native entities must educate themselves on Tribal Nations' history with the United States and the federal and state policies implemented to the detriment of Tribes, specifically regarding Native education and transportation. This paper supports transportation electrification stakeholders⁵ by explaining how Tribal history, laws, structures, and cultures influence electric vehicle (EV) transitions within modern Native education and transportation systems and identifies measures to address the multifaceted ESB deployment challenges for Tribes. This paper establishes an informed framework for engaging with Tribal Nations and Native communities and acts as an educational resource—including key background information in the appendices. However, this should be considered the starting point, not the end, of self-education regarding deploying ESBs in Native communities.

The unique nature of each Tribal Nation

There are 574 Tribal Nations recognized as independent political sovereigns by the United States (BIA 2024b). Each is unique. Like states with differing regulatory approaches, Tribes maintain distinct governance based on their cultures, customs, histories, laws, and citizens. For example, some Tribal Nation economies depend on fossil fuel development while others have banned such development on their lands (Raimi and Davicino 2024). Some Tribes possess large, contemporary land bases while others have little to no land due to historical takings and/or federal termination. Some exist within ancestral territory while others have been removed. These distinctions require individual approaches to each relationship. This paper focuses on federally recognized Tribes, as it analyzes federal policies and programs that typically exclude non-federally recognized Tribes.⁶

Methodology

This paper’s findings and recommendations draw from primary and secondary sources, including legal acts and cases, historical accounts, Tribal-led resources and studies, federal policy, and third-party news articles and reports. Our approach encompasses a wide-ranging review of white and gray literature⁷ and publicly available data using internet and academic searches for terms including variations of “Tribal schools,” “Tribal education,” “electric vehicles,” “Indian Country,” “Native American education,” “Bureau of Indian Education,” and “school bus.” Research included analysis of federal, state, and Tribal laws governing the structure, administration, and funding of education and transportation systems operating within Tribal Nations and Native communities through online searches and the legal

research service Westlaw. The review examined public transportation systems through Tribal and non-Tribal media, federal reports, education studies, and consultations with Native education entities. Researchers assessed the development of electric vehicle supply equipment (EVSE) in Tribes through online searches and consultations with Tribal EV experts. Limitations of this study include inadequate datasets on school districts serving Native students as well as those on school transportation specifics, infrastructure, road conditions, and energy access in Indian Country, which are gaps discussed in Box 1 and in the “Findings” and “Discussion” sections.

Box 1 | Authors’ note

While statistics on Native Americans are cited throughout this report, inconsistencies in how Tribes and Native people are counted create significant data-accuracy issues. Most federal data categorize Native Americans as American Indian/Alaska Native (AIAN), which is used to classify “race” and is also a political class (Krakoff 2017). For example, the US Census lists AIAN as a race but also asks for Tribal affiliation. Native people are often misrepresented and undercounted in data collection, particularly by subsuming them in the mixed race or “other race” category without distinction (Echo-Hawk et al. 2025). For example, US Department of Education (ED) post-secondary data “topcode” Latino or Hispanic students, meaning students identifying as both AIAN and Latino are counted only as Latino, erasing their Native identity in the data (Cook et al. 2025). No consistent methodology exists for counting Native peoples across disciplines; even federal government methodology varies by department. While Tribal Nations pursue various data-sovereignty efforts, including conducting their own data collection through Tribal censuses, existing federal and third-party data remain flawed and insufficient.

Background: US Indian policy and Native education in context

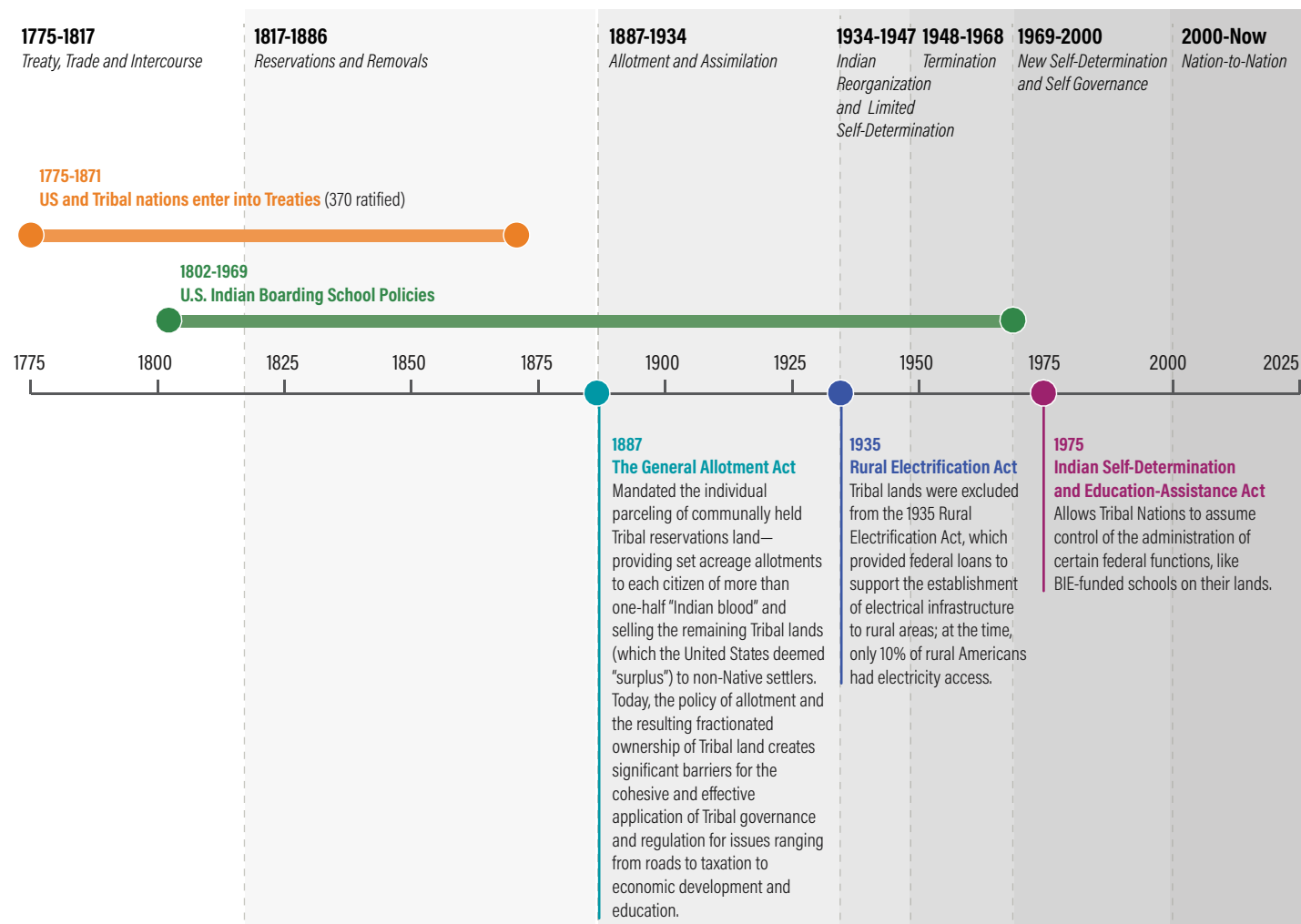
For non-Native entities, working within Indian Country requires grounding efforts in the histories, laws, and cultures that define Tribal Nations’ and Native communities’ relationships with the United States regardless of topic, technology, or initiative.⁸ These histories shaped the present-day conditions under which Tribes operate, influencing school transportation systems and pathways to electrification, as discussed in this paper’s “Findings” and “Discussion” sections.

Nation-to-Nation relationship

Since “time immemorial,”⁹ tens of millions of Indigenous peoples have governed societies across Turtle Island (CBC 2022). European governments recognized Tribal Nations’ inherent sovereignty through diplomacy, commerce, culture,

and warfare, even while seizing continental lands and resources (Echohawk 2013). The US Constitution continued this recognition, acknowledging “Indian tribes” as one of three sovereign entities alongside US states and foreign nations (US Const., art. 1, § 8).¹⁰ This nation-to-nation relationship has been maintained and defined through treaties, legislation, policies, and judicial opinions (NCAI 2020). However, the US approach to Tribal relationships eventually collapsed into a single “Indian policy” that has fluctuated based on shifting federal priorities. Sometimes the United States has treated Tribes as self-governing allies. Other times, it has advanced policies designed to dismantle Tribal sovereignty and exterminate Native people through both cultural erasure via forced assimilation into US governance and society and physical violence (NCAI 2020). These shifts in federal Indian policy are categorized in seven eras outlined in Figure 1, with overviews in Appendix A.

Figure 1 | The seven eras of the United States' and Tribal Nations' nation-to-nation relationship



Notes: ^a Kte'pi 2023. Abbreviation: BIE = Bureau of Indian Education. For more information on the Seven Eras, see Appendix A.

Source: Authors.

Tribal sovereignty

Tribal sovereignty is the inherent authority of Tribal Nations to self-govern that the United States has long recognized under its own laws, as detailed above (NCAI 2020). Tribal sovereignty and its corollary, self-determination, enable Tribes to pass their own laws and regulations managing their lands, resources, and citizens. When engaging with Tribes, it's critical to respect their status as sovereign nations and engage as one would with prominent levels of government. Additionally, consideration of consent principles, like Free, Prior, and Informed Consent, helps ensure that Tribal sovereignty is centered and respected.

Recognition of sovereignty

Federal recognition represents US acknowledgment of Tribal Nations' political sovereignty, the basis for the government-to-government relationships, and the rights of Tribes under federal law. However, the United States as the sole determiner of their political recognition is an inherent impediment to true sovereignty for Tribes (Gilio-Whitaker 2019). Table 1 outlines the recognition processes.

Table 1 | **Federal and state government processes for recognition of sovereignty**

RECOGNITION TYPE	RECOGNITION PROCESS
Federal	<p>Tribes can gain federal recognition through three means:^a</p> <ul style="list-style-type: none"> • Congressional act • US court decision • Completing a lengthy administrative process established and overseen by the Bureau of Indian Affairs^b
State	<p>State recognition is an entirely separate process whereby states recognize Tribal Nations under state law. Methods and standards for state recognition vary greatly among states and do not confer federal benefits or rights.</p>

Notes: ^a BIA n.d. ^b The “Procedures for Establishing that an American Indian Group Exists as an Indian Tribe” are found in Part 83 in the Code of Federal Regulations and administered by the Bureau of Indian Affairs’ Office of Federal Acknowledgment (BIA n.d.). Most recently, in 2019, the United States recognized the Little Shell Tribe of Chippewa Indians of Montana, which had been recognized by the state of Montana since 2003.

Treaty rights

Between 1776 and 1871, the United States ratified 370 treaties with Tribal Nations, facilitating westward expansion through the acquisition of Indigenous lands (NARA 2022). While treaties differ in negotiated exchanges and acknowledgment of rights, they include federal commitments to provide benefits, including education and infrastructure:

- Tribal Nations ceded land to the United States.
- In return, the federal government promised benefits including food, weapons, education, annuities, health care, infrastructure, and military protection against settler encroachment.
- Tribes reserved certain lands and rights, such as exclusive territories and shared-use areas for hunting, fishing, and gathering.
- There was a mutual guarantee of peace and cooperation between the United States and Tribes.

Particularly relevant is a US commitment to provide education—an obligation the federal government must still fulfill to Nations with such agreements. Although Congress halted treaty-making in 1871, treaties don’t expire, and their provisions remain federal law today (Hirsch 2014).¹¹

The federal trust responsibility

The federal trust responsibility is a legal obligation deriving from Tribal treaties and the federal government’s self-appointed status as “trustee” and superior. The United States’ trustee role

was a legal scheme created by the Supreme Court of the United States (SCOTUS) in the “Marshall Trilogy,”¹² three early 1800s opinions establishing Tribal Nations as “domestic dependent nations,” that is, “distinct independent political communities” nonetheless subject to “superior” US authority.¹³ SCOTUS further characterized Tribes as legally subjugated to the United States “like a ward to its guardian” due to their non-Christian practices and communal property systems.¹⁴ This guardianship coupled with ongoing treaty obligations created the “federal trust responsibility,” a US law principle where the federal government assumes conservator role of Tribal assets (BIA 2017b).

In meeting its trust responsibility for Native education, the federal government has monetary obligations to support Native students regardless of school type (e.g., state public school versus Bureau of Indian Education [BIE] school). However, this minimal monetary obligation includes significant barriers. As trustee, the United States mandates legal ownership of all Tribal trust lands, holding them “in trust” for the benefit of the Tribal Nations (NCAI 2020). This restrictive ownership model requires federal approval for almost all activities impacting Tribal resources. Additionally, US ownership means Tribes cannot tax their trust lands, thus lacking the same taxing authority as states and municipalities to generate revenue for essential services like infrastructure, investment, and education. The United States’ self-assumed authority and ownership over Tribal assets—including education, energy development, and transportation infrastructure—are frequently barriers to Tribal Nations’ self-determination in developing and administering transportation electrification projects.

Tribal-state relationships

Both federally and state-recognized Tribes maintain relationships with state governments, but Tribal sovereignty varies across these relationships, impacting Tribes' abilities to deploy transportation and infrastructure projects (NCAI 2020). These relationships differ significantly from federal-Tribal relationships and are more recent, as US federal Indian policy was based on direct federal-Tribal relationships, excluding states. For example, under the Marshall Trilogy, Georgia was prohibited from applying state laws on Cherokee Nation lands, limiting jurisdiction to Tribal and federal authority.¹⁵ However, later federal policies—allotment, termination, and Public Law 280 (see Appendix A for further background)—undermined Tribal sovereignty,¹⁶ reducing federal obligations and increasing state authority. Today, state approaches to relationships with co-located Tribal Nations vary widely. Some work closely with Tribes on policy goals, while many challenge Tribal sovereignty.¹⁷ These dynamics impact transportation electrification infrastructure development and regulation.

Traditional education systems

Tribal Nations long maintained total responsibility for educating their members. Before European and US contact, each Tribe developed its own policy for educating children through family, clan, and community systems that gave Native children daily and continuing instruction in survival, social and spiritual skills, relations, and values. Today's Tribal education systems are entwined with the federal government but no less varied.

History of Native education policy

The history of US education policies affecting Tribal Nations is distinct yet closely aligned with broader US federal Indian policy. Like federal policy, it has been inconsistent, multifaceted, and marked by periods of harsh measures leaving a legacy that endures. Given this history, ESB stakeholders must recognize the lasting impacts on modern Native education systems.

For instance, Native student transportation originated as part of policies aimed at forced assimilation. In the late 19th and early 20th centuries, Native children were intentionally separated from their families and cultures and transported to federally funded boarding schools (BIA 2022 and BIA 2024a). The government paid to transport children away from their homes but didn't fund home visits. Restricting transportation was a way to separate them from their communities. Modern systems serving Native students must be designed with respect and acknowledgement of this history.

Education as a treaty obligation

After 1776, the United States frequently agreed to provide vocational education as compensation for ceded Tribal lands but often failed to meet commitments. This was an integral part of a general policy of “civilizing” Native Americans and deconstructing Tribal sovereignty and lifeways (Creel et al. 2005, §18.02). President Thomas Jefferson recommended two means for rapid US territorial expansion into Tribal lands: assimilating Native children, and encouraging Tribal Nations to accumulate debt purchasing American goods (Jefferson 1803). Jefferson saw education as a means “[t]o encourage them to abandon hunting, to apply to the raising stock, to agriculture and domestic manufacture, and thereby prove to themselves that less land and labor will maintain them in this, better than in their former mode of living” (Jefferson 1803). Once indoctrinated, “the extensive forests necessary in the hunting life will then become useless, and they will see advantage in exchanging them for the means of improving their farms, and of increasing their domestic comforts” (Jefferson 1803).

More than 150 treaties between Tribes and the United States guaranteed “education” in the form of vocational training (BIA 2024c).¹⁸ For example, the 1794 Treaty with the Oneida, Tuscorora, and Stockbridge Indians promised to construct a mill and train young Tribal citizens in “the arts of the miller and sawyer” in exchange for land (OIN 1794). Later treaties were more direct regarding US education objectives. The 1868 Fort Laramie Treaty with the Great Sioux Nations mandated the following:

- In order to insure the civilization of the Indians entering into this treaty, the necessity of education is admitted, especially of such of them as are or may be settled on said agricultural reservations, and they, therefore, pledge themselves to compel their children, male and female, between the ages of six and sixteen years, to attend school, and it is hereby made the duty of the agent for said Indians to see that this stipulation is strictly complied with.¹⁹

The United States routinely failed to fulfill treaty obligations. Promised education and resources were often delayed and largely controlled by Indian agents—appointed, non-Native US representatives sent to live among Tribes. Nevertheless, to this day, treaty commitments remain in force, obligating the federal government to provide educational services for Native Americans.²⁰

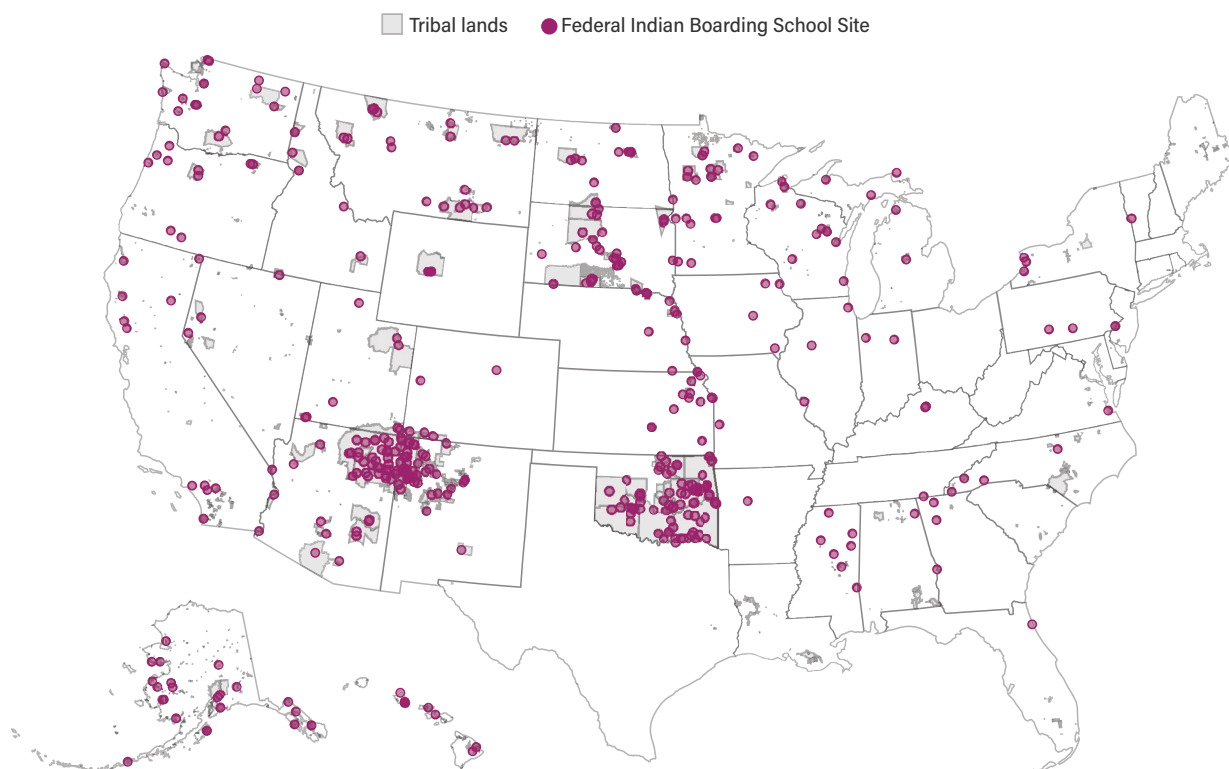
The Federal Indian Boarding School Initiative

The formal federal boarding school system was developed by the United States over various acts and policies and in concert with Christian institutions²¹ beginning in 1802—a particularly traumatic phase that present-day Native communities still remember and that non-Native entities engaging in Tribal education should understand (see Box 2) (Juneau et al. 2013). According to a Department of the Interior (DOI) investigation, between 1819 and 1969, the federal Indian boarding school system consisted of 417 federal schools across 37 states or then-territories (Figure 2), institutions more akin to internment camps than schools (BIA 2024a). These schools served children as young as 3 and up to 22. While curriculums focused on vocational training in agriculture and the industrial arts, their purpose was separating Native children from their Tribal Nations and replacing traditional Tribal and cultural education. Congress recognized the importance of placing Native children “in positions where they can be controlled, and finally compelled, by stern necessity, to resort to agricultural labor or starve” and required on-site residence with mandatory separation from parents and families. The result was cultural genocide. Removing

Native children from families, and forcibly replacing their family structures, cultures, and communities, was a tool to eradicate Tribes and take Tribal lands (BIA 2022, 39–42; NABS n.d.)

Between 1871 and 1969, the United States appropriated more than US\$23.3 billion (fiscal year 2023 inflation-adjusted dollars) for boarding schools (BIA 2024a). Hundreds of thousands of Native American children were removed from their homes and families. Though total numbers taken remain unknown, by 1900 there were 20,000 children in Indian boarding schools, and by 1925 that number had more than tripled (BIA 2022). Children were taken to schools away from their communities; punished for speaking their native languages; banned from acting in any way that might be seen to represent traditional or cultural practices; and stripped of traditional clothing, hair, and personal belongings. They suffered physical, sexual, cultural, and spiritual abuse and neglect, and experienced treatment that in many cases constituted torture (BIA 2022). At least 972 Native children died while attending a federal boarding school and many more remain unaccounted for (BIA 2024a).

Figure 2 | **Federal Indian boarding school sites**



Source: Reproduced from BIA 2024d.

Box 2 | Why do I need to know this history?

School bus electrification necessarily exists in the context of education policy. And federal Indian education policy has historically sought to dismantle and undermine Tribal Nations. It's important to know the history of how education was used against Native peoples, the traumatic legacy that remains, and that education and student transportation may be a sensitivity when non-Native entities insert themselves. For example, prior federal Indian education transportation appropriations included amounts for the forced relocation of Native children to Indian industrial, Indian day, and public schools, and specifically for their "placement under the care and control of white families."^a By understanding the history and significance of these policies one can approach discussions of contemporary federal appropriations for Native students with appropriate awareness.

Note: ^a BIA 2024a.

Transfer of federal education obligations to states

In 1928, Congress commissioned the “Meriam Report” to assess conditions facing Native peoples, including children in federal boarding schools (Meriam 1928). The report harshly criticized these schools, especially off-reservation institutions, for inflicting physical and emotional harm on Indian students. In response, the Bureau of Indian Affairs (BIA) shifted responsibility for Native education to the states. Thus, integrating Native children into the public school system became the BIA’s educational policy from the 1930s to 1970s (NARF 2010). Many of the federal boarding and day schools were closed; other school properties were conveyed to the states.

In exchange for educating Indians, the states insisted on federal funding. The Johnson O’Malley Act of 1934 authorized the

secretary of the interior to contract with states for, among other things, the education of Indians (US House 2001). The Impact Aid Law of 1950 authorized federal payments to public schools that serve children residing on Indian trust lands that are exempt from state property taxation (GAO 1977). Table 2 explains the main federal funding mechanisms: Impact Aid, Indian Education, and Johnson-O’Malley Programs (West Ed 2015). Except for some remaining federal Indian schools, the federal role in Indian education became primarily financial. Significant control of education standards, policies, and teaching methods for American Indians was vested in the states. This has created a range of educational systems that serve Tribal Nations and Native communities.

Table 2 | Comparison of federal funding programs for Native students

	IMPACT AID, SECTION 7003	INDIAN EDUCATION FORMULA GRANTS (AKA INDIAN EDUCATION PROGRAM)	JOHNSON-O'MALLEY PROGRAM
SUPPORTING LEGISLATION	Title VII of Every Student Succeeds Act ^a	Title VI of Every Student Succeeds Act ^b	Johnson-O'Malley Act of 1934
PURPOSE	Replace lost tax revenue for districts with federal or Tribal land	Support cultural and academic needs of Native students	Provide supplemental support for Native students' academic and cultural needs
USE	General school expenses	Targeted Native education programs for Native students	Academic, cultural, language, transportation, dropout prevention programs for Native students
ELIGIBILITY CRITERIA	Schools with students living on Indian lands or federal property	Schools with 10+ Native students or ≥25% Native enrollment	American Indian and Alaska Native students must be between ages 3 and 12th grade and either be enrolled members of a federally recognized Tribe, have at least one-fourth Indian blood, or be descendants of Tribal members, with priority given to those living on or near a reservation

Table 2 | Comparison of federal funding programs for Native students (Cont.)

	IMPACT AID, SECTION 7003	INDIAN EDUCATION FORMULA GRANTS (AKA INDIAN EDUCATION PROGRAM)	JOHNSON-O'MALLEY PROGRAM
ELIGIBLE ENTITIES	Local educational agencies	Indian Tribes and Tribal organizations & local educational agencies	Indian Tribes and Tribal organizations & local educational agencies
ADMINISTRATOR	Impact Aid Office, under the Office of Elementary and Secondary Education, under ED	Office of Indian Education, under ED	BIE, under DOI

Notes: ^a Prior to the passing of Every Student Succeeds Act (ESSA) in 2015, this program was called Title VIII of the Elementary and Secondary Education Act (ESEA) (ED 2025a). ^b Prior to the passing of ESSA, this program was called Title VII of the ESEA (ED 2025b). Abbreviations: ED = Department of Education; BIE = Bureau of Indian Education; DOI = Department of the Interior.

Source: Authors using information from ED 2025a, ED 2025b, and BIE n.d.b.

Modern federal Indian education policies

Today, the BIA and BIE reside under the DOI Office of the Assistant Secretary for Indian Affairs, and are overseen separately (BIE n.d.a).²² The BIE continues to maintain the United States’ educational obligations to Tribal Nations and Native students, including programs for Native students attending public schools, BIE-funded schools, and post-secondary institutions, including Tribal colleges and universities. Only in the modern era have BIE’s programs, even in small part, been operated for the benefit of Tribes. The 1975 Indian Self-Determination and Education Assistance Act formalized the policy of Tribal self-determination in Native education systems and created funding and contracting opportunities for Tribally guided Native education (BIE n.d.c). Contracting opportunities usually take the form of 638 contracts, whereby a Tribal Nation assumes control of the administration of certain federal functions on its lands and provides those services pursuant to a federal contract with the administrating agency (e.g., BIE).

In 2011, President Barack Obama signed Executive Order (EO) 13592,²³ which established the White House Initiative on AIAN Education to help expand educational opportunities and improve educational outcomes for AIAN students (White House 2011). The Joe Biden administration renewed the federal commitment to Native students in 2021 with EO 14049²⁴ (White House 2021). However, in January 2025, the second Donald Trump administration issued EO 14148,²⁵ rescinding EO 14049 (White House 2025a).

The context of EO 14148 makes it clear that this action is part of the Trump administration’s dismantling of diversity, equity, and inclusion (DEI) (Agoyo 2025). However, EO 14049 wasn’t an action related to DEI programs. While the title of EO 14049 included the term “equity,” the order sought to address sovereign Tribal Nations and their citizens—who hold a political,

not racial, relationship with the federal government. In addition to conflating Tribal Nations with DEI, the rescission also undermines the federal government’s commitment to advancing Tribal educational opportunities—in violation of treaty and trust obligations.

Findings: contemporary landscape of Native education and transportation

Building upon the historical context outlined in this paper’s “Background” section, the “Findings” examine the legacy of US Indian policy on contemporary education and transportation structures, which impact the deployment of ESBs in Indian Country. Mapping the intersections of past and present is essential for identifying a route for a just transition. The findings outline the different educational and transportation infrastructure systems impacting Native students and the multilayered systems of administration, funding, infrastructure, and jurisdictions that ESB projects must navigate. Transportation systems in this context include the understanding of energy infrastructure on Native lands because energy access is necessary for transportation electrification.

Education systems and structures

Like Tribal Nations’ relationships with the United States, contemporary Native education systems are complex. They include an additional layer of federal oversight compared with school systems serving non-Native populations. School transportation administration mirrors this complexity and requires a tailored understanding of each Tribe-serving school’s situation. This section identifies the three most common school systems serving Native students today—public schools, BIE-funded schools, and

Native language immersion and cultural schools. In the context of school bus electrification, the type of school impacts how school transportation is administered (Figure 4), especially when considering the procurement of school buses. This differentiation and its challenges are examined further in the “Discussion.”

Public schools: The overwhelming majority of Native students attend public schools,²⁶ with the federal government providing Impact Aid payments to support Native student education (NCES 2019; GAO 1977). Approximately 93 percent, or about 550,000, Native students are in the kindergarten through 12th grade (K–12) public school system, comprising just over 1 percent of the public school student population (TED 2013;

GAO 2019). Additional funding is provided by the federal government to public schools for Native students. Public schools serving Native students are both on and off Tribal lands, varying by school district. Traditional public schools are the only option in 84 percent of high-density school districts, making school choice limited.²⁷

Even though most Native students attend public schools, there's a long-standing mistrust between Tribal Nations and public school systems, rooted in the memory of the United States' use of public education to force assimilation and its continued lack of respect for Native cultures and sovereignty (Clarren 2017). Table 3 outlines various issues Native students face.

Table 3 | **Intersectional challenges of contemporary Native education**

INTERSECTIONAL ISSUE	SUPPORTING DATA
Education services for disabled students	The Individuals with Disabilities Act covers 15% of Native students with a disability in public schools, meaning nearly 1 in every 6 Native students. A May 2020 Government Accountability Office report identified that many of Indian Country's students with disabilities are not receiving appropriate or sufficient special education services. ^a
Absenteeism	Native American students are absent from school at a much higher rate than their peers. ^b For the 2021–22 school year, 47% of Native American and Alaska Native students were chronically absent, a 16.8% increase from 2020 (pre-COVID pandemic) numbers. ^c For the 2022–23 school year, among the 34 states reporting data, half recorded absenteeism rates among Native American and Alaska Native students that exceeded the state average by at least 9 percentage points. ^d
Safety in school	In 2018, over a quarter (27%) of Native students aged 12–18 reported experiencing bullying at school. ^e Native students are significantly more likely than any racial, ethnic, or political group to report being afraid of attack or harm while at school—with 14% of Native students aged 12–18 reporting this concern. ^f This rate is over twice that of any other racial or ethnic group and about three times the national average. Reports of bullying include a rise in hair cutting without consent wherein Native students have their hair cut by fellow students or school administrators. ^g
The use of Native mascots	Nearly 2,000 schools in the United States have Native mascots, logos, or nicknames. ^h Studies have identified that these mascots generate negative psychological impacts on Native students. ⁱ
Biased discipline	Native students have some of the highest rates of suspension of any racial or ethnic group. For example, a little over 21% of Native middle and high schoolers reported having been suspended at least once in their life, compared with 12% of white middle and high schoolers. ^j

Sources and notes: ^a GAO 2020. ^b Clary 2024. ^c Chang and Leong 2024. ^d Mumphrey et al. 2024. ^e NIEA n.d. ^f NIEA n.d. ^g NIEA n.d. ^h The states with the highest number of secondary schools with such mascots are Ohio (77), California (75), New York (58), Illinois (52), and Texas (51) (NCAI 2023). ⁱ Davis-Deano et al. 2020. ^j SNAHEC and CCEAL n.d.

Native students not attending public schools attend either BIE-funded schools or Native language immersion and cultural schools. The federal government continues to fund nearly 200 schools throughout the United States through BIE. These legacy boarding schools now operate pursuant to BIE regulations. Conversely, Native language immersion and cultural schools have been established to revitalize and sustain Indigenous lan-

guages and cultures by teaching students primarily in a Native language while grounding them in their Tribe's history, traditions, values, and worldview.

BIE-funded schools: The BIE funds 183 elementary and secondary schools, serving in the capacity of a state education agency to administer and oversee the education programs in

BIE-funded schools (Figure 3). During the 2020–21 school year, approximately 35,000 Native students attended BIE-funded schools, or about 7 percent of all Native students. Of that total, 24,240 of those students attended Tribally controlled schools, and the other 10,289 attended BIE-operated institutions.²⁸ BIE schools are funded by the federal government, and the amount of funding is dependent on congressional appropriations (BIE 2025a).

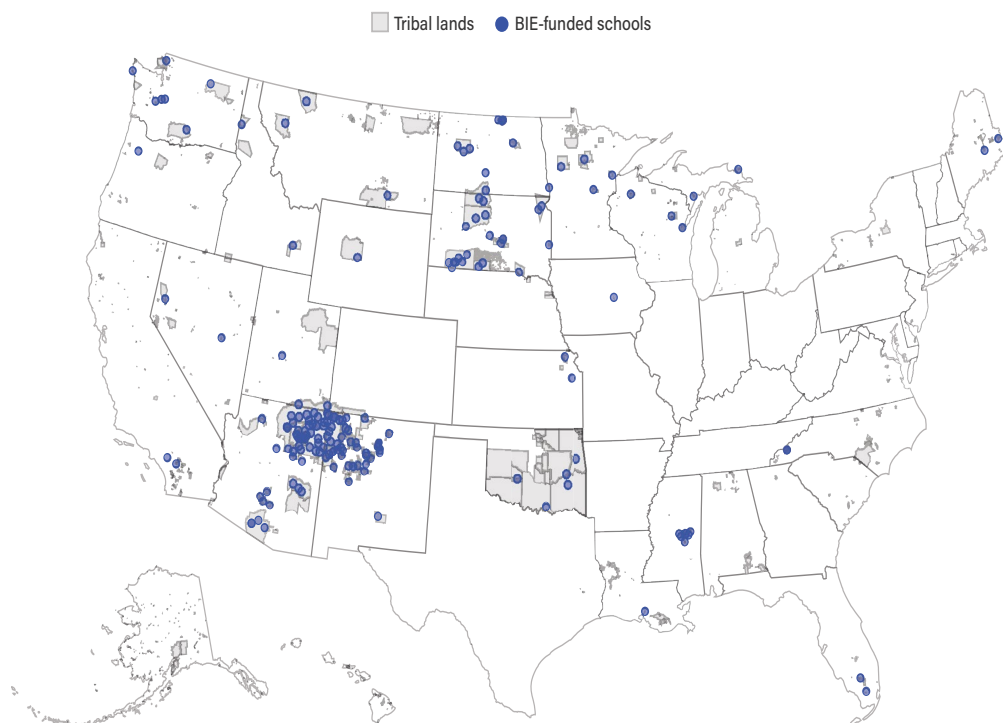
BIE-operated schools are those that are funded, administered, and operated by the BIE. The BIE’s statutorily defined mission is to “provide quality education opportunities from early childhood through life in accordance with a Tribe’s needs for cultural and economic well-being, in keeping with the wide diversity of Indian tribes and Alaska Native villages as distinct cultural and governmental entities” (BIE n.d.a). Of the 183 BIE-funded schools, 55 are BIE-operated elementary and secondary schools (BIE 2024).

Tribally controlled schools receive funding from the BIE but are operated by Tribal Nations or Tribal organizations. Historically, the BIE operated all BIE-funded schools; however, 1978 legislation empowered Tribal Nations to assume responsibility

for the federal funds used to operate these schools by contracting with the BIE taking over administration and operation of the school. As a result, today most BIE-funded schools are now under Tribal control, but a few BIE-operated schools remain. Although these schools are financially supported by the BIE, they function independently of both local educational agencies and direct BIE administration. Due to their federal funding, Tribally controlled schools are subject to specific federal laws and standards. Funding is generally provided through grants established under the Tribally Controlled Schools Act of 1988 (US House 2002).

Native language immersion and cultural schools: The vast majority of Native students don’t have charter, magnet, or BIE options available to them (NCES 2019). However, as Tribal Nations have sought to reclaim the right to educate their own children in recent years, native language instruction has been introduced in some Tribal schools. The status of these schools can be either private or nonprofit, charter, or Tribally controlled. This is determined on a state-by-state basis and each immersion school is unique to the community it serves.

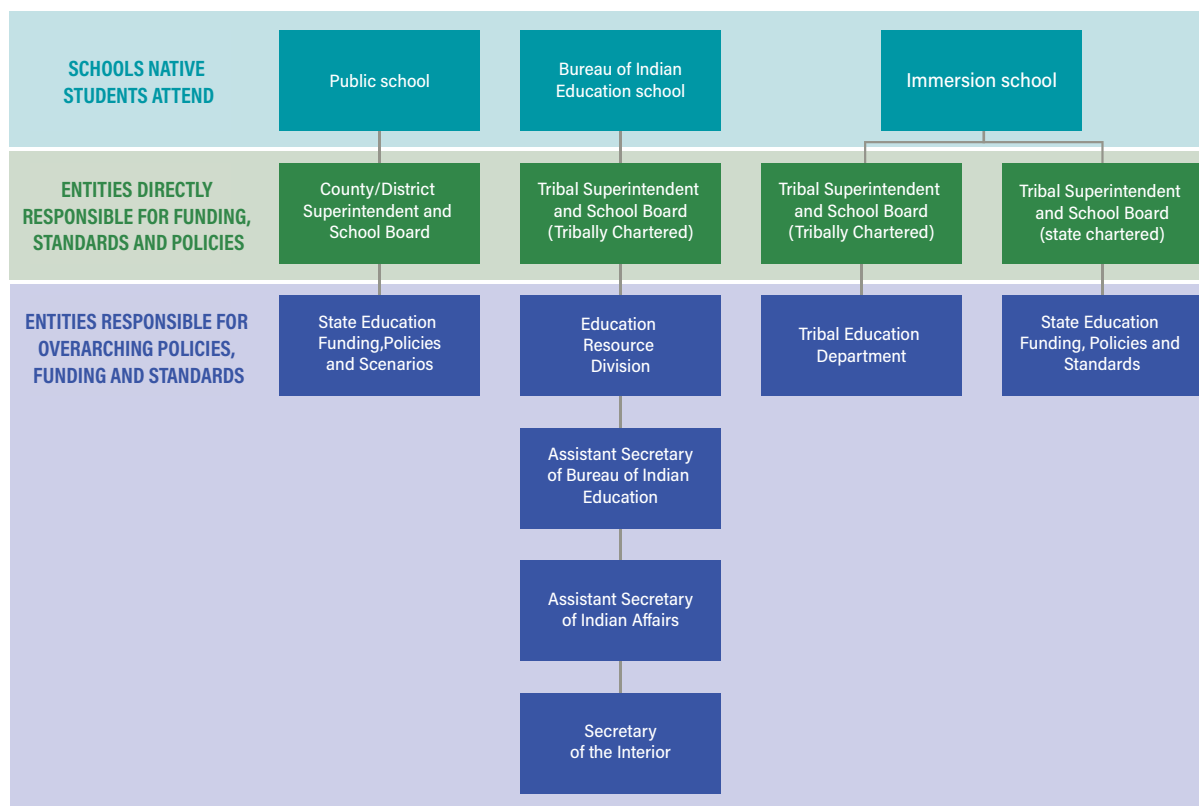
Figure 3 | **Locations of BIE-funded schools**



Note: Abbreviation: BIE = Bureau of Indian Education.

Source: Reproduced from GAO 2017.

Figure 4 | Example illustration of school decision-making structures



Source: Authors.

Disparate funding

Despite federal and state funding commitments, schools that serve Native students receive less funding per student than schools that serve non-Native students, which impacts school capacity to plan, maintain, and improve school transportation systems. State and local funding make up 88 percent of public schools' funding (PGPF 2025). These schools exist within traditional state and county district systems, funded through state and local tax dollars. However, due to the lack of taxing infrastructure for Tribal Nations, a disproportionate number of Native schools are (Every Student Succeeds Act) Title VII eligible and states and counties systemically fail to access available Title VII funding to support those schools and students (West Ed 2015). School districts with a majority Black, Latino, and Native students receive 16 percent less in state and local funding than districts with majority white students (Morgan 2022). BIE schools receive even less funding per student, 57 percent less than public schools, at an average of \$7,467 compared with \$17,277 per pupil in 2025 (BIE 2025a; Hanson 2025). A 2018

report also concluded that the United States is not meeting its obligations to Tribal Nations with inadequate funding for education, public safety, health care, and other provisions (Fonseca 2018).

Student transportation

Twenty-four percent of Native students attend rural schools, at a rate more than 2.5 times that of any racial or ethnic group (NIEA n.d.). With most Tribal Nations located in rural areas, they can have smaller fleets (Lazer et al. 2024). As a result of Indian Country being made up of primarily rural areas, and historic underfunding, Native student transportation is a key issue for Native students (Deweese and Marks 2017; Pinto 2021). In the BIE's fiscal year 2023 Tribal Budget Formulation Priority Ranking Tool—a survey of all 185 BIE-funded schools to self-identify priorities in education-related budget lines—BIE schools ranked student transportation as the

second most important budgeting issue (Pinto 2021). To respond to complaints from Tribal Nations that the federal government underfunds student transportation, the BIE held listening sessions throughout 2021 (Dearman et al. 2021). While this transportation issue has been identified, it's not clear whether these listening sessions or budget priorities have led to any policy change or additional data collection to support policy change.

Transportation data availability

Accurate and reliable data are essential for successful transportation electrification deployment. Systemically, there is a lack of data or poor data collection for Native populations in the United States across topics. The US Census is a primary culprit, with Native populations as the most undercounted racial group (Kesslen 2019). For the 2020 Census, some estimate that 6 percent of Native people living on reservations weren't counted (CB 2022). This has significant ramifications, including less funding for critical federal programs (e.g., infrastructure, education) and less political representation (Kesslen 2019).

As for Native students, a landscape analysis of AIAN student data in US K–12 public schools found that up to 70 percent of them are not represented in school data reporting or analysis (AIR and IESLN 2023). ED has been identified as collecting worse demographic data than any other federal agency, especially for AIAN-identifying students (Cook et al. 2025).

With incomplete data on Native students, it is unsurprising that reliable data on Native student transportation remain scarce and largely anecdotal. This lack impacts the ability of ESB projects to effectively and accurately design fleets that meet district needs. A 2017 Government Accountability Office (GAO) report found that the two central databases maintained

by BIA that track basic road conditions were incomplete and inconsistent in their coding of data (GAO 2017). No centralized source provides information on average miles for Native students to travel to school or the modes of transportation relied upon. The authors reached out to the BIE in late 2023 requesting any data the bureau had on student transportation. The BIE responded in February 2024 that it had some data provided by the BIE property management team but was still in the process of analysis, and the data entailed only bureau-operated schools' fleet sizes and not Tribally controlled schools. As of April 2025, we had no update on this data effort. The lack of reliable and meaningful data about Native students not only poses a huge barrier to meeting their basic needs, like school transportation, but also makes it impossible for the federal government to fulfill its legal obligations (Cook et al. 2025).

Electric fleet transportation

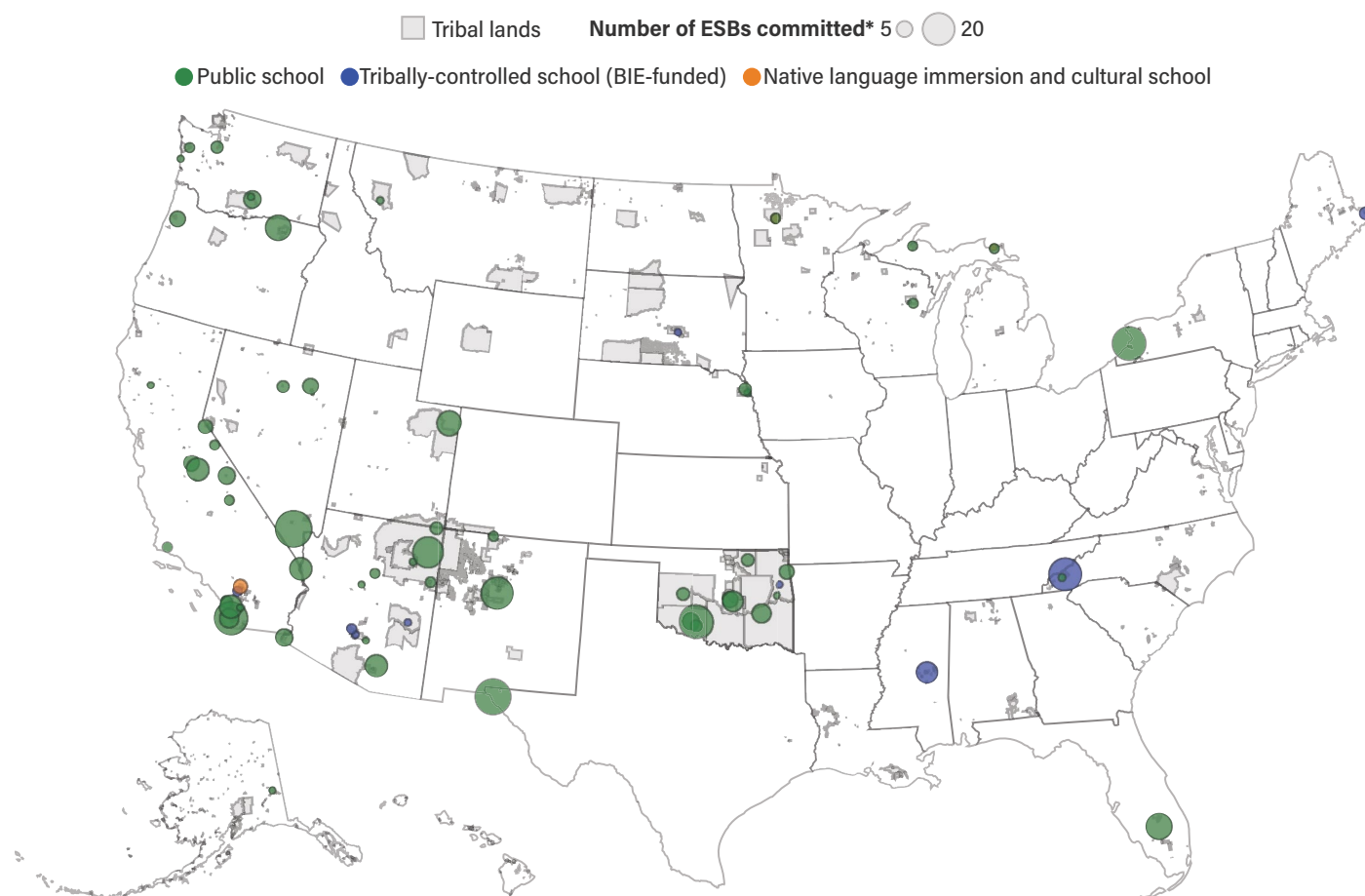
While comprehensive data on Native school transportation fleets are unavailable, the ESB Initiative's dataset tracking committed ESBs can be disaggregated by fleets serving Native students across school types. We identified school types by cross-checking BIE's school directory and ED's list of public schools receiving Impact Aid for Native students, supplementing with news articles. This methodology remains imperfect due to the absence of standardized identification for public schools serving Native students. As of July 2025, of the approximately 14,000 committed ESBs nationwide, 414 (3 percent) serve Tribal Nations and Native communities (Lazer and Freehafer 2025). Table 4 and Figure 5 present the categories of schools serving Native students, the number of schools under each category with committed ESBs, and the total number of ESBs across these schools. A disaggregated listing of schools is in Appendix B.

Table 4 | **Number of Native-serving schools with ESBs and number of ESBs serving Native students in 2025**

SCHOOL CATEGORY	NUMBER OF NATIVE-SERVING SCHOOLS WITH COMMITTED ESBs	NUMBER OF COMMITTED ESBs
Public school receiving Impact Aid	58	366
BIE-funded school	9	41
Native language immersion and cultural school	3	7
Grand total	70	414

Note: Abbreviations: ESB = electric school bus; BIE = Bureau of Indian Education.
Source: Lazer and Freehafer 2025.

Figure 5 | Where electric school buses are serving Native students



Note: *ESBs awarded, ordered, delivered, or in operation.

Source: Lazer and Freehafer 2025.

Electric transportation funding programs

Although recent federal and state funding programs for electric transportation have prioritized Tribes, they still encounter administrative and structural barriers to funding. Under the Biden administration, the federal government prioritized Tribal Nations and Native communities as part of the administration's Justice40 Initiative to direct at least 40 percent of the benefits of climate and clean energy investments to "disadvantaged" communities (White House 2021b). Funding programs like the Environmental Protection Agency's (EPA's) Clean School Bus Program (CSBP) and Clean Heavy-Duty Vehicles (CHDV) grant program²⁹ created prioritization and provided larger fund-

ing amounts for Tribes. However, their designs didn't always account for the barriers that Tribes face when applying for and implementing federal award dollars.

- **Minimum vehicle replacement requirement.** Both CSBP and CHDV have included a minimum number of buses that need to be replaced to be an eligible applicant. This requirement is difficult for many Tribes to meet due to their smaller fleet sizes serving smaller, rural populations (Lazer et al. 2024). In addition, because of historic disinvestment, Tribes may not have a fleet of vehicles but could be interested in the opportunity. The requirement to replace a vehicle excludes these Tribes.

- **Scrappage requirement.** The requirement to scrap a vehicle is a condition of receiving funding for most medium- and heavy-duty replacement programs, like CSBP, CHDV, and the Tribal Diesel Emissions Reduction Act program. This leaves behind Tribes that don't already have vehicles, and are thus unable to meet scrappage requirements, or are wary of not having a gas-fueled bus available as back-up in case something goes awry with the new technology.
- **Limits on eligible applicants.** Nonprofits weren't eligible applicants for CSBP and other federal programs, and in cases where they were eligible, they didn't receive the same priority for working in a J40 community or as a Tribal enterprise. This was a barrier in accessing funds for EBCI as the Cherokee Boys Club (CBC) is the Tribal nonprofit entity that owns and operates the school buses for Cherokee Central Schools. This created more hurdles as the EBCI government had to apply and do a "pass-through" grant to the CBC.
- **Federal procurement requirements.** We learned of a school district under the BIE that was forced to turn down an ESB funding award due to the BIE's federal procurement requirements that limit sources and mandate competitive processes for funding and acquisition of resources, including school buses.
- **Federal recognition.** For many federal and state programs, Tribal recognition is an eligibility prerequisite (Wilkes 2021). This leaves many Tribal Nations without the ability to receive or apply for resources simply because the United States hasn't given them recognition or has terminated recognition.

In its last year, the Biden administration issued EO 14112³⁰ to address these and other barriers in federal programs. However, the specific issues cited above were not addressed before his administration left office and the Trump administration rescinded the initiative through EO 14236³¹ (White House 2025c).

Transportation and energy infrastructure

For many within Indian Country, electrifying school transportation doesn't start with placing a new bus or deploying EVSE. Because of the legacies of US Indian policy and continued underinvestment in Tribal lands, particularly in transportation and energy infrastructure, these infrastructure needs must be addressed before districts can determine if transitioning to ESBs is the right path for them. The following sections detail the transportation and energy infrastructure prerequisites for school transportation electrification.

Roads

The road to deploying ESBs in Tribal Nations and Native communities is often unpaved³²—literally and figuratively. Transportation infrastructure in Indian Country remains underdeveloped after decades of underfunding (NCAI 2013). Reservation roads, the primary transportation network for residents and visitors, represent the most underbuilt road network in the United States (GAO 2017). Improving and maintaining roads within Tribal Nations is challenging due to funding constraints, overlapping jurisdictions, and adverse weather (GAO 2017). This infrastructure gap hinders economic development, public health, and education.

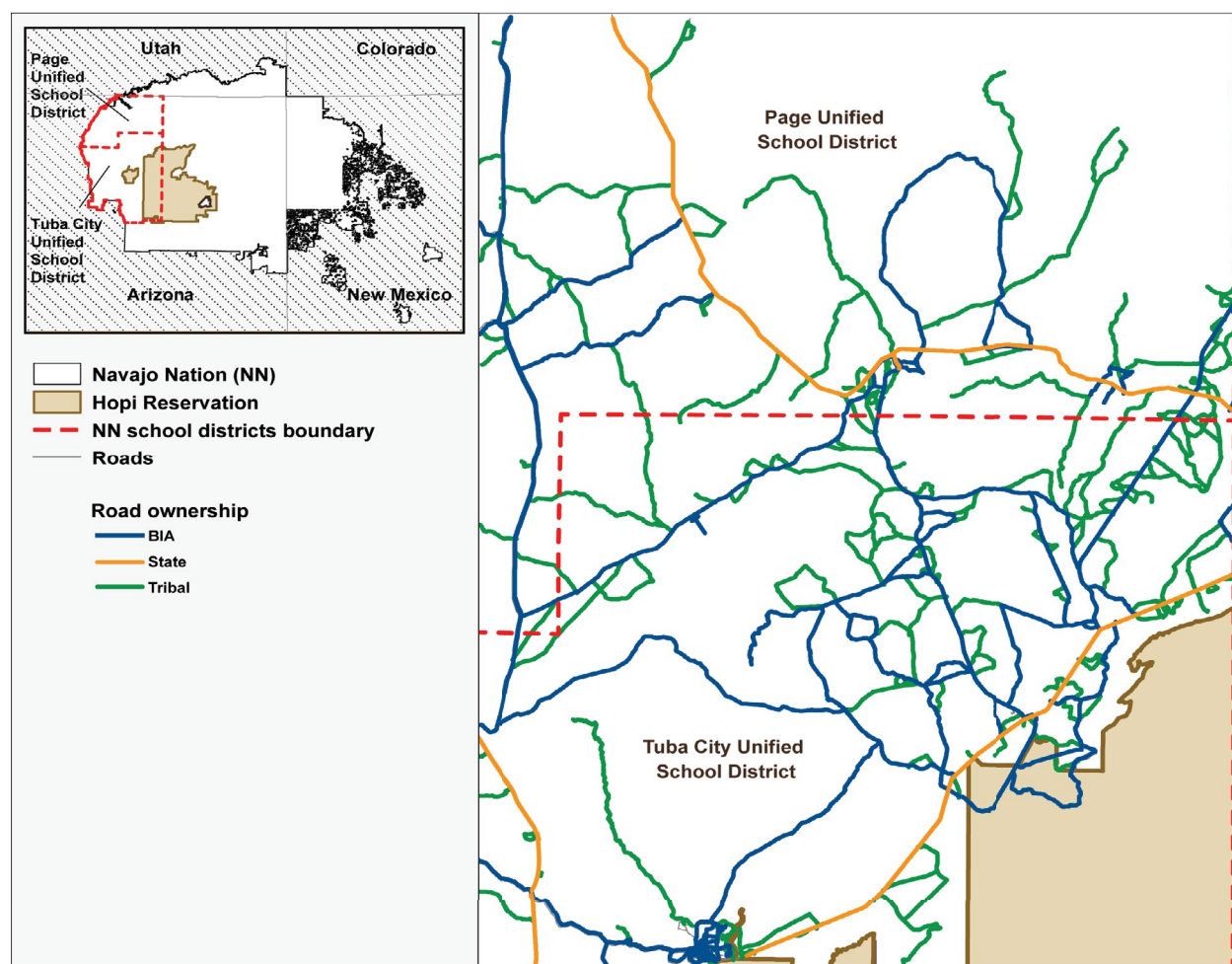
There are more than 160,000 miles of Indian reservation roads in the United States (CRS 2022; Black 2015). As a relic from the allotment policies, these roads have multiple owners, including Tribal Nations, the BIA, states, and counties—presenting significant and unique issues in their repair and reconstruction (Figure 6). The BIA, located within DOI rather than the Department of Transportation (DOT), began road construction and repair in the 1920s. Until the 1980s, the federal funding level for all roads in Indian Country was less than what a single midsize city received for its transportation budget (Black 2015). This neglect has left Tribal road systems decades behind.

Since the late 1980s, the federal government has attempted to address this infrastructure gap through programs like the DOT Indian Reservation Roads Program, now known as the Tribal Transportation Program (TTP). Created under the Federal Highway Aid Act of 2012, the TTP receives annual appropriations and is the main source of funding for Tribal roads to address the transportation needs of Tribal governments (US House 2008; FHWA n.d.).

Even with increased funding, TTP roads remain underfunded and unsafe. While state governments spend between \$4,000 and \$5,000 per road mile on maintenance, Indian Country receives less than \$500 per road mile (US Senate 2010). Over 60 percent of TTP roads remain unimproved earth and gravel, and approximately 24 percent of Indian Country's 8,000+ bridges are classified as deficient (GAO 2017). Indian Country roads and bridges have an immediate need for more than \$258 million in basic, necessary maintenance funding (Griswold 2022).

While we found no data that ESBs would perform differently than fossil-fuel buses on equivalent road conditions, roads remain a critical infrastructure need for Tribal Nations, particularly when it comes to getting kids to school safely (Glaze and Amdur-Clark 2014; GAO 2017). The historical underinvestment in Tribal roads and continuing jurisdictional quagmires regarding road maintenance will remain difficult barriers for the implementation of all student transportation services.

Figure 6 | Example of multiple jurisdictions of road ownership in Navajo Nation



Source: Reproduced from GAO 2017.

Electrification capacity

Deploying ESBs within Tribal Nations and Native communities presupposes the availability of electric on-site and grid capacity. However, most Tribal Nations and Native communities lack equitable access to electricity (US Senate 2023). This includes both areas of Tribal land without electrical service and areas of limited service, with Tribal lands and schools existing at the end of utility grid systems and functioning with outdated and frequently malfunctioning infrastructure. To wit, over 75 percent of the unelectrified homes in the United States are located on Tribal lands (APPA 2020), and 14 percent of households on Native American reservations remain without access to electricity (DOE 2023; Meisen and Erberich n.d.). In Navajo Nation

alone, approximately 45,000 people still live in homes without electricity (DOE 2023). Additionally, Tribal Nations experience power outages at 10 times the rate of other areas (DOE 2023).

Despite these gaps, Tribal lands hold vast renewable energy potential. The National Renewable Energy Laboratory estimates that Tribal lands in the contiguous 48 states could produce approximately 17,600 billion kilowatt-hours per year (kWh/year) of solar energy potential and 535 billion kWh/year of wind energy (MacCourt 2010). However, this potential remains largely unrealized due to the existing infrastructure deficits; permitting challenges stemming from federal laws that create a

patchwork of zoning and taxation authority on reservations; and the lack of knowledge from the broader business community with regard to Tribal lands project development.

To gain electrical access and control, some Tribal Nations are developing their own utilities and utility regulatory boards and have begun to electrify off-grid homes on their respective reservations (DOE 2023). A Tribal utility acts like a non-Tribal utility in that it controls the area under its jurisdiction and interacts with the utilities surrounding it to provide utility services to its customers. Similarly, a Tribal utility commission or board operates like a state public utility commission to regulate the provision of utility services to its citizens. Even in the absence of a Tribal utility or utility commission, Tribal Nations can apply Tribal law to deliver utility services on Tribal lands to improve citizen access. However, Tribal efforts to regulate off-reservation electric utilities and co-ops are often opposed by those utilities and co-ops, which are entities necessary for the delivery of electrical service to Tribal members (Court of Appeals 2022).

A prime example of a Tribal utility is the Navajo Tribal Utility Authority (NTUA), which brings electricity, natural gas, water, wastewater treatment, and photovoltaic energy across the 26,000-square-mile Navajo Nation (DOE 2023). NTUA has improved the infrastructure needed to control and manage the delivery of utility service in Navajo Nation, which multiple state utility commissions, utility companies, and co-operatives would otherwise direct. NTUA recently used revenues from a utility-scale solar development to support projects like Light Up Navajo for off-grid homes in Navajo Nation. However, tribal utilities like NTUA also suffer from inequities—paying more to electrify reservation homes, recovering less of their expended costs, and taking more time to connect off-grid homes due to their forced interaction with state and federal utility systems unprepared for the physical and political landscape of Indian Country (APPA 2020).

Any approach in assessing and addressing the grid infrastructure deficits where they exist in Indian Country will need to be done on a case-by-case basis as Tribal Nations vary in grid infrastructure needs and current grid capabilities.

Charging stations and EV infrastructure

The development of EV infrastructure throughout the United States has been rapid but, prior to 2023, was largely planned by federal and state governmental entities and implemented by developers to the exclusion of Tribal Nations. EVSE deploy-

ment is particularly difficult in Indian Country due to the infrastructure deficits—i.e., road status and grid capacity as described above.

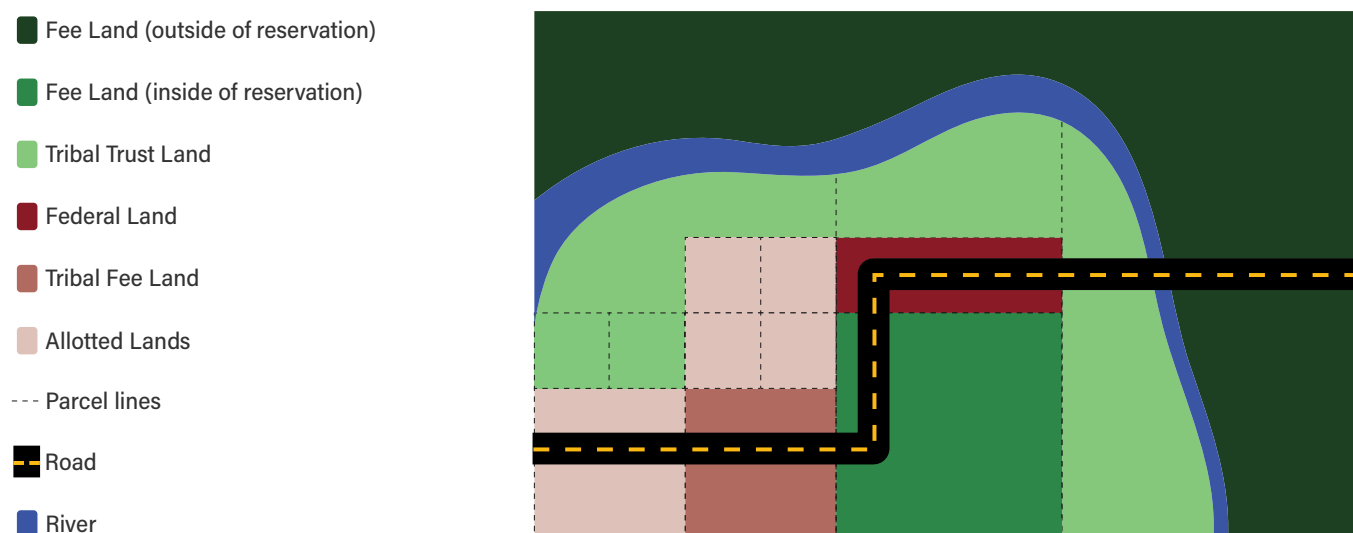
However, former Biden administration programs³³ sought to address the barriers and include Tribal Nations to a greater extent in EV infrastructure planning (WHCNA 2022). The goals of the EV Initiative for Tribal Nations were to ensure the following: Tribal Nations are part of the EV future of the country; federal resources for EV development are equitably shared and supportive of Tribal economies; and the physical buildout of a national EV network includes Tribal lands and Native communities. The initiative also recognized that historic infrastructure inequities have long barred economic development opportunities within many Tribal Nations and Native communities and was committed to working with Tribal governments and citizens. The second Trump administration's policy initiatives have made clear that EV infrastructure is not a priority.

Jurisdiction of infrastructure

At the heart of systemic change for Tribal Nations and Native communities is jurisdiction. The legacy of US federal Indian policy has resulted in a “checkerboard” of jurisdiction over Tribal lands and a diaspora of Native people (Figure 7). This is due to policies like the federal trust responsibility and allotment, the dislocation of Native adults and children from their Tribal communities, and the encroachment of state and county authority onto Tribal lands (for taxation, zoning, and other regulatory purposes). Tribal roads provide a ready example of the issues of overlapping jurisdiction. Tribal lands may be owned by a Tribal Nation, the state, the federal government, an individual Native American, or an individual non-Indian. This varied ownership creates interspersed parcels or a checkerboard pattern of ownership on some Tribal lands.

According to federal, state, county, and Tribal transportation officials, documentation of road ownership and rights-of-way does not always exist or is not always known (another gap in data for Tribal lands), a deficiency that further complicates the ability of stakeholders to conduct road maintenance and improvement activities. Also, different, changing, or uncertain management responsibilities pertaining to roads on Tribal lands that are owned by different stakeholders can make collaboration challenging as the decision-making on road priorities and funding sources are also dispersed.

Figure 7 | Illustration of checkerboarding on Indian reservation land



Note: In this illustration of checkerboarding, allotted lands are the parcels of land belonging to individual Tribe members. Tribal fee land is a parcel of land the Tribe has purchased back from allotment. Fee land inside the reservation refers to the "surplus" parcels of land sold to non-Native settlers. Tribal trust land refers to the remaining parcels of land that were not allotted to Tribe members or "surplus." The thick black line represents a road that cuts across five jurisdictions.

Source: Lepwe, Inc.

Discussion: cross-cutting barriers and benefits

Electrifying school transportation in Indian Country presents unique challenges and promising benefits. Cross-cutting barriers include overlapping jurisdictions, inadequate road and electric infrastructure, limited access to funding, and systemic data gaps that can complicate ESB implementation. These challenges are rooted in a complex history of federal Indian policy identified in the "Background" section and require tailored, community-specific solutions. Despite these obstacles, transitioning to ESBs offers critical health, educational, and economic benefits, including cleaner air, improved student attendance, and opportunities for infrastructure development and economic growth. Appendix C highlights the disproportionate impact of critical mineral mining for EV batteries on Tribal Nations, creating complex equity considerations for the ESB transition that must balance environmental justice with clean transportation goals.

Barriers

LACK OF UNDERSTANDING OF THE UNIQUE STRUCTURES AND ADMINISTRATION

The "Background" section provides historic context of US Indian policy because of its impacts on the current landscape for education and school transportation administration, which has resulted in significant variances in legal regime jurisdiction, land base, and financial and human resource capacity. By having this understanding, non-Native implementers are better able to discern which Native and non-Native parties to coordinate with for project development and deployment.

The implementation of ESB fleets must consider the unique and individual structures, needs, and constraints of each Tribal Nation and Native community. For example, the way in which a school would implement an ESB fleet will differ depending on whether the school is a BIE school where funding comes from the federal, not the state or local, government; the school is operated by the Tribal Nation under a 638 contract; the Tribal district operates in a rural or urban setting; the roads are paved, gravel, or dirt; and a commercial electric fleet can be supported by the existing electrical infrastructure, as well as the existing workforce and industries. Additionally, as discussed in the

“Findings” section, many existing funding opportunities that support the ESB transition don’t consider these unique structures and administrative characteristics, which makes it even more imperative that organizations consider and support Tribal Nations and Native communities in their distinct efforts.

Overlapping and inconsistent jurisdiction over roadways and infrastructure

As discussed in the “Findings,” Tribal lands might be “fractionated” as a direct result of federal allotment policies, resulting in a checkerboarded jurisdiction that school bus electrification projects need to navigate and coordinate. Overlapping jurisdiction in Indian Country will affect everything from zoning of charging stations to taxing authority to regulating electric grids and upgrading roads. For example, two adjacent school districts within the Navajo Nation use many of the same roads for their school bus routes. These roads not only have multiple road owners, but also have different types of road surfaces—paved, gravel, and earth—which require different types of maintenance. Because of differences in priorities among road owners, the amount of maintenance performed on the roads varies, leading to differences in road conditions and potential impediments to transportation.

LACK OF SUFFICIENT DATA TO SUPPORT PROGRAMS AND POLICIES

Throughout this framework, various gaps in available data are identified—e.g., Native student data, Native student transportation data, Tribal road data, electric utility capacity within Tribal Nations, and the availability of EV charging stations in Indian Country. The availability of data and the effectiveness of policy are inextricably linked in Indian Country. The systemic gaps in data for Tribal Nations and Native communities have often meant a lack of awareness in policymaking—both within and beyond the context of ESBs. Further identifying and filling these gaps will be essential in deploying electrification projects in Indian Country.

LACK OF SUFFICIENT TRANSPORTATION AND ENERGY INFRASTRUCTURE ON OR NEAR TRIBAL LANDS

An equitable transition requires addressing the historical disinvestment and systemic underfunding of transportation and EV infrastructure within Tribal Nations and Native communities. This includes those identified in the “Findings,” specifically the lack of roads and physical transportation system, the lack of EV infrastructure and equipment (including charging stations and facilities and resources to maintain EVs), and the lack of grid capacity to support the installation of new charging stations.

INEQUITABLE ACCESS TO FUNDING AND PROGRAMS

As discussed in the “Findings,” programs intended to support the transition to ESBs and corresponding infrastructure often overlook the unique histories, needs, and systems within Indian Country in their implementation. This can lead to debilitating policies that prevent the full and effective participation of Tribal Nations and Native communities, even when Tribes are prioritized in these programs as was seen under the J40 Initiative. In particular, the EPA’s programs that fund clean transportation have various requirements that prevent many Tribal schools from applying to the programs or their ability to accept awarded funds.

Benefits

HEALTHIER AIR QUALITY

Native communities suffer from a chronic lack of economic opportunity, poor health care, and inadequate protection from sources of pollution, all of which can exacerbate the impact of diseases linked to poor air quality (MCAF 2023). While diesel exhaust pollution is dangerous for everyone, its impacts are not felt equally. Indigenous adults and children experience higher rates of chronic diseases linked to poor air quality including asthma, diabetes, heart disease, and chronic obstructive pulmonary disease (MCAF 2023). Additionally, diesel exhaust pollution can be more of a burden on Tribal Nations and Native communities because they often rely on old or “legacy” fleets of diesel vehicles (MCAF 2023).

The deployment of ESBs can help address the impact of poor air quality. ESBs have zero tailpipe emissions of harmful air pollutants and the lowest greenhouse gas emissions of any school bus type, even when accounting for emissions from the generation of electric power. They are the only school bus option with zero tailpipe emissions. This reduces student exposure to harmful pollutants like nitrogen oxides, which contribute to respiratory and heart disease. Because of this, switching to ESBs reduces students’ exposure to unsafe air pollutants.

BETTER NATIVE STUDENT TRANSPORTATION AND ACADEMIC SUCCESS

With additional infrastructure as a requirement to operate ESBs, the transition presents an opportunity to improve grids and roads that act as a barrier to kids getting to school safely, all while implementing clean transportation for students. The federal government identified inadequate transportation as a critical issue for Native schools affecting student attendance and performance, with government investigators finding that the availability of buses and accessible bus routes can improve Native student attendance (GAO 2017). Studies have noted

the direct link between transportation infrastructure and education success (Fisher 2014; Levin 2023). Data from 2014 found chronic absenteeism rates were higher by 65 percent for American Indian and Pacific Islander students than white peers (GWB Institute 2018). Data from 2016 found American Indian and Pacific Islander students are over 50 percent more likely to lose three weeks of school than white peers (Moser 2016). The aforementioned 2017 GAO report noted officials at all 10 schools across three Tribes cited poor road conditions as a factor of school absences for Native youth on Tribal lands (GAO 2017).

Drivers and students also experience a better environment while riding. Numerous schools operating ESBs have emphasized the benefit of reduced noise pollution for riders and the community (Huntington and Kaplan 2021; ESB Initiative 2025). Not only are the buses quieter, but Shawnee Public Schools also reported that this environment led to better behavior on their ESBs. They cited there was a 50 percent reduction in reported behavioral incidents for routes that switched to electric between the 2022–23 and 2024–25 school years (Riedl and Curran 2025).

IMPROVED INFRASTRUCTURE AND ECONOMIC OPPORTUNITY

Secondary and tertiary opportunities could also occur from a transition to transportation electrification. Fleet deployment in Indian Country could catalyze broader infrastructure improvements and economic opportunities (Lofstrom 2021). The development of EV charging architecture would improve grid resiliency, the availability of electricity, and the opportunity for new types of transportation, tourism, and economic development. For example, the improvement of roads could increase access to Tribal business centers and marketplaces, and the installment of EV charging stations within Tribal Nations, especially in rural regions, could bring more travelers to stop there to refuel. And with longer EV refueling times, Tribal businesses could see revenue brought in as customers wait for their EVs to charge (DOT 2025). Additionally, the improvement or deployment of transportation electrification infrastructure can serve as a catalyst for workforce development and training, helping to prepare communities for meaningful participation in the emerging green economy (ESB Initiative 2025). For example, Cherokee Boys Club, which provides transportation services for the Eastern Band of Cherokee Indians, trained EV technicians and provided EV training for high school interns by converting golf carts to solar electric.

A framework for an equitable ESB transition for Tribal Nations and Native communities

1. UNDERSTAND THE HISTORY OF TRIBAL NATIONS AND NATIVE EDUCATION

A transition toward equity must account for the systemic injustices of the past. A foundational understanding of the histories and laws governing Tribal Nations is essential for supporting Native communities. ESB implementers should prioritize educating employees, contractors, and affiliates so they can work effectively in Indian Country and avoid actions that fail to consider or unintentionally exclude Native communities.

2. IDENTIFY AND ALLEVIATE HISTORICAL AND SYSTEMIC BARRIERS TO PARTICIPATION IN THE ESB TRANSITION

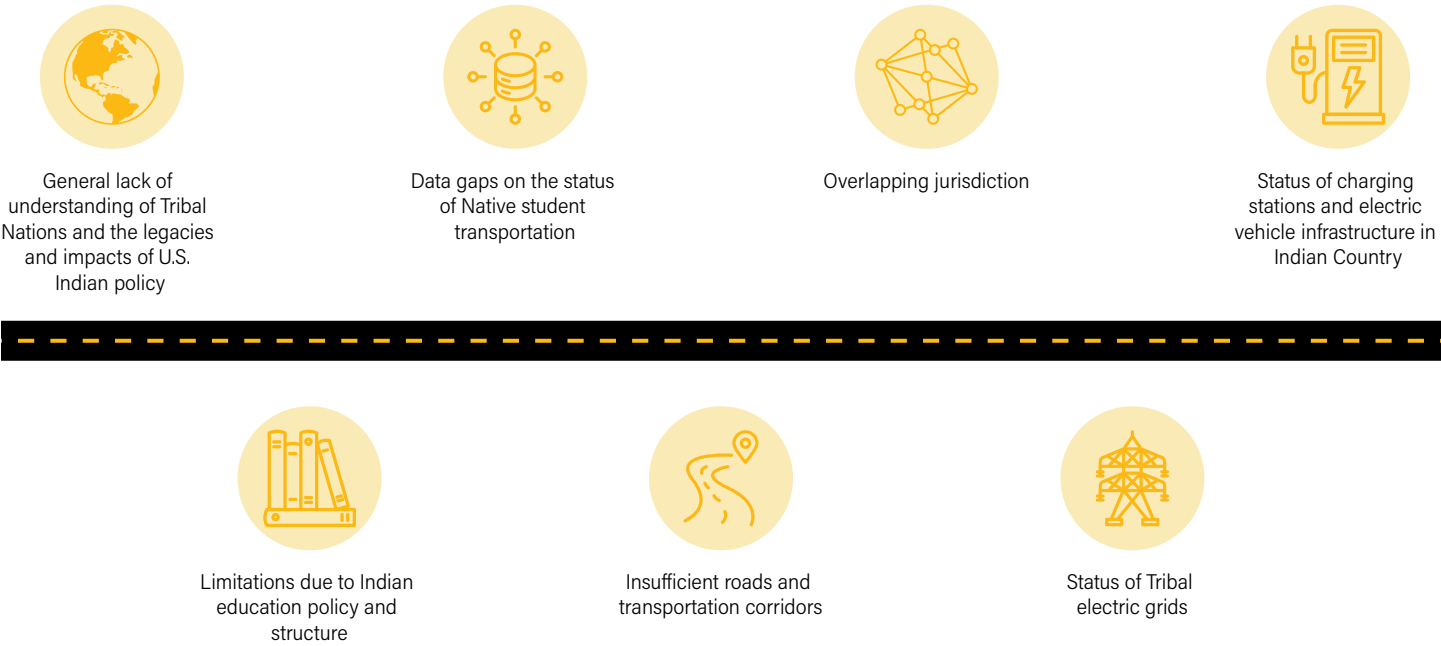
An equitable ESB transition for Native students starts not with buses or charging stations, but by understanding the operational contexts and systemic and institutional barriers beyond individual schools' control that must be addressed first (Figure 8). This also requires actionable support from funding agencies, recognizing that Tribal Nations may need to start at a different point in the transition process, like making preliminary infrastructure improvements to roads and electrical grids.

3. CENTER TRIBAL SOVEREIGNTY

An equitable transition must respect Tribal governments' sovereign authority over their Nations' priorities, spending, and operations. Stakeholder interviews with Tribal rights and justice organizations found Tribal sovereignty as a primary consideration when working with Tribes on ESB transitions (Brown and Curran 2023). Potential collaborators must recognize the significance of Tribal sovereignty by treating each Tribal Nation as independent and aligning initiative goals with the Tribe's goals. By using the principles of Free, Prior, and Informed Consent, private entities can ensure that their efforts align with the goals and policies of a Tribal Nation.

Respecting sovereignty requires understanding that Tribal governments function as complete government entities with elected officials, constituent accountability, and term limits. However, unlike US federal and state governments, Tribal governments operate with limited revenue and lack comparable taxing authority. Some Tribal governments will choose not to participate in the ESB transition due to resource constraints, opportunity costs of not achieving other policy goals, or because of concerns regarding negative impacts of the EV industry on land and resources due to critical mineral extraction. Stakeholders supporting ESB adoption must acknowledge and respect Tribal autonomy.

Figure 8 | Example of identifying barriers to deploying ESBs in Indian Country



Source: Authors.

Conclusion and recommendations

This paper overviews the historical and legal context of US Indian policy, which shapes contemporary Native education and transportation systems, establishing how past policies created current administrative, infrastructure, and jurisdictional challenges. It documents the complex landscape of Native education systems (i.e., public schools, BIE-funded schools, and Native language and culture immersion schools), each requiring tailored electrification approaches. The analysis identifies significant data gaps and systemic barriers, from inadequate infrastructure to federal programs that inadvertently exclude Tribal Nations despite prioritization. Importantly, this work reframes narratives around Tribal “lack of capacity” by demonstrating how reduced capacity is the result of centuries of federal policies intentionally restricting Tribal authority, providing justification for priority-based support rather than penalty-based exclusion (Rogers 1962). Grounded in the principles of the framework above,

Table 5 outlines actions that all non-Native ESB stakeholders can undertake in providing Tribal Nations priority-based support in the ESB transition, identifying the who, how, and when for each recommended activity.

By centering Tribal sovereignty throughout the electrification transition process, the framework and these recommended actions enable non-Native stakeholders to support Tribes in ways that build capacity rather than impose external control that undermines Tribal self-determination. The ultimate success of electric school bus deployment in Indian Country depends on whether the transition strengthens Tribal Nations’ abilities to provide safe, healthy transportation while advancing their broader economic and policy goals.

Table 5 | Steps to implement the framework for an equitable ESB transition for Tribal Nations and Native communities

ACTIVITY	DESCRIPTION	WHO	HOW	WHEN
Educate and train staff on Tribal history and policies	This paper starts ESB stakeholders' education on historical and legal contexts impacting Tribes in the ESB transition. Pursuing an equitable transition requires comprehending systemic inequities and their historical origins, while actively educating staff and contributing to other stakeholders' education.	All ESB stakeholders and implementers	<ul style="list-style-type: none"> • Research the specific histories and current policies of the Tribal Nation you plan to partner with • Incorporate Tribal history and policy training into onboarding and ongoing staff professional development • Share learnings with other ESB stakeholders 	Begin before first Tribal engagement and continue throughout the ESB transition process
Co-create Tribe-specific resources	A Tribal road map could parallel the ESB Initiative's step-by-step guide by incorporating the recognized historical and systemic barriers Tribes face accessing electrification. Resource(s) could include programs for assessing and improving Tribal roads, strategies for working with utilities on grid capacity or developing Tribal utility commissions, funding access guidance for BIE schools, and options for Tribal construction and ownership of EV infrastructure.	Research and advocacy organizations and ESB implementers	<ul style="list-style-type: none"> • Conduct listening sessions with Tribal implementers and Native-led organizations to identify needs • Co-develop the road map with Tribal partner(s) • Integrate technical, funding, and policy resources specific to each Tribe in specific one-on-one cases 	Throughout life of project or action
Support data collection	How many Tribal schools want ESBs but face infrastructure, funding, or administrative constraints? How many roads do they travel that are unpaved? This key information, and more, is not known. Without these data, developing effective policies remains challenging. By supporting data collection in Indian Country while ensuring Tribal Nations shape data collection efforts and maintain data ownership, ESB stakeholders can enhance Tribal participation in the transition.	Research and advocacy organizations and ESB implementers	<ul style="list-style-type: none"> • Partner with Native-led organization(s), Tribal governments, and/or schools to design appropriate data collection methods centered on data sovereignty • Provide technical and funding support for data gathering • Ensure data agreements protect Tribal ownership 	Throughout life of project or action
Develop partnerships to address systemic barriers	Non-Native stakeholders should identify organizations working on Native student transportation electrification and develop supportive partnerships to amplify their impacts in Indian Country. Building relationships and trust with Tribal Nations and within Native communities takes time and commitment. This may go beyond typical project scope and timelines.	All ESB stakeholders and implementers	<ul style="list-style-type: none"> • Identify and connect with Native-led organizations active in clean transportation • Attend and contribute to Tribal conferences, community events, and meetings • Support Tribal priorities, even when not directly tied to ESB goals 	Begin relationship-building immediately; maintain ongoing engagement
Support Tribal Nations on a case-by-case basis	Tribal governments may choose not to pursue ESBs for various reasons, regardless of potential benefits. ESB stakeholders should focus on engagement and partnerships with Tribal Nations that desire to transition to ESBs by continuing to support infrastructure development and addressing historical inequities. For Tribal Nations desiring to transition, different levels of engagement may be required depending on the individual Tribe's needs.	All ESB stakeholders and implementers	<ul style="list-style-type: none"> • Tailor support to each Tribe's readiness and priorities • Offer technical assistance, funding navigation, and infrastructure planning • Respect Tribal decisions and timelines 	As Tribes express interest; flexible timing based on each Tribe's pace and project funding availability

Note: Abbreviations: ESB = electric school bus; EV = electric vehicle; BIE = Bureau of Indian Education.

Source: Authors.

Appendix A. Overview of the eras and impacts of US federal Indian policy

The source for Appendix A is *Cohen's Handbook of Federal Indian Law* unless indicated differently in the text (see Creel et al. 2005).

The Treaty, Trade, and Intercourse Era (1775–1817)

As the United States transitioned from British colonies to its own independent country, it leveraged relationships with Tribal Nations to support and validate its own nascent sovereignty. These nation-to-nation relationships created international validation of the United States as owning a distinct sovereign authority, separate from the British throne. To this end, while the British throne had previously taken the approach of issuing a general land base for Tribal Nations in the Royal Proclamation of 1763—establishing one continuous boundary line along the western border of the colonies past which non-Native settlement was prohibited (Farrand 1905)—after independence, the United States eradicated this general boundary and entered into treaties with individual Tribal Nations to provide for non-Native settlement further west and the sale of land by the United States to individual, non-Native settlers. Each treaty was unique, as was the relationship between the United States and each specific Tribal Nation, but treaties generally provided for a negotiated agreement of peace between the sovereigns through the exchange of land and resources (Anderson et al. 2020).

The Reservations and Removal Era (1817–86)

As the United States entered and came out of the Civil War, the federal government leaned into a second phase of treaty-making wherein the United States sought to continue the westward expansion of its European-based system of individual property rights under US law, and Tribal Nations sought to maintain their communal property rights and cultures (Anderson et al. 2020). During this era, US federal policy was to contain Tribal Nations' sovereignty and self-determination through agreements that restricted Tribal residence and self-governance to delineated reservations while recognizing broader Tribal rights to resources—e.g., rights to hunt, gather, fish, trade, and transit—in broader geographic areas ("Treaty areas") (Creel et al. 2005).

When agreements could not be reached, Congress began assuming authority to forcibly relocate Tribal Nations without their consent. In the Indian Removal Act, signed into law by President Andrew Jackson on May 28, 1830, Congress assumed such authority and authorized the president to grant unsettled lands west of the Mississippi in exchange for Tribal lands within existing state borders. President Jackson relied on this authority to forcibly relocate Tribal Nations from his home state of South Carolina and the other southeastern states of Tennessee, Georgia, Florida, Alabama, and Mississippi. This became known as the "Trail of Tears."

In 1871, due to an internal power struggle between the House of Representatives (which controls budgeting and appropriation authority) and the Senate (which possesses the authority to ratify treaties), a provision was tacked on to a House appropriations bill in 1871 that prohibited further treaties with Tribal Nations. After the United States ceased treaty-making, US federal Indian policy shifted from diplomacy, focused on mutual consent, to an assumed superiority of Congress over Tribal Nations bound only by a moral mandate to act in the "best interest" of Native Americans, a standard that Congress defined at will (Harvey 1982).

The Assimilation Era (1887–1934)

In this post-Civil War era, the United States was eager to establish a strong, overarching federal power. For US Indian policy, this meant the creation of a seamless federal oversight authority: congressional legislation. Federal laws passed by the US Congress were deemed to have the ability to unilaterally dictate the activity of Tribal Nations.³⁴ This "plenary power doctrine," as it became known, was created by SCOTUS to justify Congress's authorization of forcible assimilation measures. Congress passed laws focused on conforming the activities of individual Native Americans to US culture to diminish the relevance and efficacy of Tribal Nations. The following three key assimilation policies passed by Congress during this period are the focus of this paper:

- The *Major Crimes Act* of 1885 authorized, for the first time, federal jurisdiction over "Indians" within "Indian Country" by applying federal laws to "major crimes" committed by Native Americans and replacing Tribal criminal and community care laws with the US criminal justice system. This brought individual Native Americans under the jurisdiction of the United States. Notably, this law made "assault against a minor under the age of 16 years" a federal crime, even if committed by a Native American, displacing Tribal laws that sought to address the protection of Tribal children. Related to education, the act solidified that only the federal government could prosecute such crimes—a fact and authority very relevant to boarding schools and other education facilities where Native children were mandated to attend.
- The *General Allotment Act* of 1887 mandated the individual parceling of communally held Tribal reservation lands—providing set acreage allotments to each citizen of more than one-half "Indian blood" and selling the remaining Tribal lands (which the United States deemed "surplus") to non-Native settlers. This was a unilateral revision by the United States of treaty agreements with Tribal Nations and an unprecedented thwarting of Tribal self-governance, whereby Tribal property law and land management systems (typically focused on communal ownership and

conservation of resources) were replaced by European-based systems of individual property ownership (focused on individual property rights and subjugation of natural resources).

This policy reduced the land base of Tribal Nations from 140 million acres to approximately 50 million acres of the least desirable land (US Senate 1969). This policy was identified by the US Senate as “[g]reed for Indian land and intolerance of Indian cultures combined in one act to drive the American Indian into the depths of poverty from which he has never recovered” (US Senate 1969). **Today, the policy of allotment and the resulting fractionated ownership of Tribal land creates significant barriers for the cohesive and effective application of Tribal governance and regulation for issues ranging from roads to taxation to economic development and education.**

- The *Federal Indian Boarding School Initiative* of 1870–1969 used education, in addition to assumption of control over land and policing authority, as a key control and assimilative tool to disable Tribal Nations. As the 1880 *Annual Report of the Secretary of the Interior* stated: “Past experience goes far to prove that it is cheaper to educate our wards than make war on them” (DOI 2022). The BIA started building its boarding school system in the 1870s but it was during the assimilation period, and particularly after the 1887 Allotment Act, that it was fully pursued (US Senate 1969).³⁵

Under the Federal Indian Boarding School initiative, Native American children were mandated to attend schools funded and organized by the United States. The schools were often operated by Christian religious institutions and children were often forcibly removed from their homes, many times without parental consent (BIA 2024a). For example, under the Act of March 3, 1893 (Ch. 209, § 1, 27 Stat. 628, 635), Congress authorized the secretary of the interior to withhold rations, including those guaranteed by treaties, to Tribal Nations and families whose children did not attend a boarding school. The goal was to ensure the children were “divorced from [traditional] camp life, and with a plain English education instructed well in farm or mechanical labor.” This effort was often summarized as “Save the man. Kill the Indian” (Pratt 1892).³⁶

Boarding schools removed Native children from their families and as a means to dissolve their social, political, and cultural connections from their communities and Tribal Nations.³⁷ A key component of the curriculum was that Native children were forbidden from speaking or learning their own native languages—which was decimating for the continuation of Tribal laws and histories that were largely transmitted orally. Native children were

not only physically separated from their families and nations, but they also lost the very ability to describe how they were previously connected to them.

Each of these congressionally mandated assimilation measures were initiated by Congress with the intent of dissolving the authority of Tribal Nations through the assimilation and forced naturalization of Tribal citizens (US Congress 1924).³⁸

The Indian “New Deal” Era (1934–47)

As the United States entered the Great Depression, it became apparent that the policies of the Assimilation Era were not only ineffective but also costly to operate and maintain. A change in the federal approach to working with Tribal Nations and Native Americans was spurred by a first-ever investigation into US Indian policy, titled *The Problem of Indian Administration* (Meriam 1928). The Meriam Report sought to review the scope of US federal Indian policy and its effect on the social and economic conditions of Native Americans. The report’s two major findings were that Indians were excluded from the management of their own affairs; and Indians were receiving a poor quality of services (especially health and education). Following the Meriam Report, and in line with the other Roosevelt-era New Deal programs initiated by the federal government, the United States introduced a series of approaches to completely overhaul federal Indian policy.

The centerpiece of the United States’ new approach was the Indian Reorganization Act of 1934 (IRA), which officially ended the highly damaging policy of allotment and, instead, sought to reinstate support for Tribal Nation governments—with the hope that those Tribal Nation governments could engage in sufficient governance and economic development to self-sustain their lands and peoples. The act also provided Tribal Nations with technical assistance to adopt constitutions and organize as central, Western-style governments;³⁹ an opportunity for Tribal governments to charter federal corporations (to address the inability of Tribal Nations to assess taxes on their lands, which under US law must be owned by the United States and held in trust for the Tribal Nations); and the first-ever initial internal education effort at the DOI with the publishing of the first edition of Felix S. Cohen’s *Handbook of Federal Indian Law* in 1941 (Cohen 1941). However, this period of support for Tribal sovereignty was relatively brief and followed by a period of extreme anti-Tribal policies.

The Termination Era (1948–61)

Just as Tribal governments were starting to operate the funding and programming promised by the New Deal, US Indian policy abruptly reversed course. During the 1950s, the United States was fighting the Cold War—heavily focused on combatting the alleged evils of communism and simultaneously extolling the virtues of capitalism—and in this battle the communal ownership of land and

vast natural resources held by Tribal Nations was perceived as an affront to American goals. As Nevada Senator George Malone argued, the country was “spending billions of dollars fighting Communism [but] perpetuating the systems of Indian reservations and tribal governments, which are natural Socialist environments” (Cornell 1990). As a result, the United States resolved to end political recognition of Tribal Nations, once again focusing on the forced assimilation of individual Native Americans into mainstream, English-speaking, Christian American society.

A 1949 Hoover commission report called for the “complete integration of Indians into the mass of the population as full tax-paying citizens” (Hoover 1949). The following year, Dillon Myer, the director of the World War II Japanese relocation and internment program, was appointed Indian commissioner and he enthusiastically set about liquidating Tribal property and rights. Along with the chair of the Senate Committee on Indian Affairs, Arthur V. Watkins of Utah, Myer worked to “emancipate the Indians” from the “ward status required by their affiliation with Tribal Nations” (Watkins 1957, 50, 55). Although the language of the policy was centered on “freeing” individual Native Americans from “arbitrary Tribal control,” the so-called liberation actually stripped Tribal Nations and their citizens of their sovereignty by requiring stronger federal controls—e.g., requiring BIA approval for almost all actions of Tribal governments, including the hiring of their own attorneys or use of their own funds, including for travel to Washington to air grievances and lobby US political officials.

To accomplish this, the US Congress passed numerous laws to dissolve reservations, abandon all treaty obligations, cease all federal programs and funding that supported Tribal Nations, and transfer federal oversight functions to states. In 1953, Congress passed House Resolution 108, approved by both the House of Representatives and Senate without debate, which moved forward the policy of termination. Subsequently, Congress passed specific termination acts on a Tribe-by-Tribe and region-by-region basis.⁴⁰ In all, 109 Tribal Nations’ political statuses were terminated, and 1,362,155 acres of Tribal land were taken from Tribal ownership by the United States and redistributed to individuals, states, or private entities.

In addition to termination, Congress enacted various other policies to diminish Tribal political sovereignty and the connection of Tribal citizens, including Public Law 280, which extended state criminal and civil jurisdiction over most reservations in California, Minnesota, Nebraska, Oregon, and Wisconsin without Tribal consent; the removal of Native children through a partnership between the BIA and the Child Welfare League of America, which sought to place Native children in non-Native homes outside of reservations; and the Native American Urban Relocation program, which provided transportation and financial and educational incentives for Native adults and

families living on reservations to relocate to urban centers outside of reservations. The total effect of these policies was the decimation of reservation society and Tribal sovereignty.

The New Self-Determination and Self-Governance Era (1969–2000):

The civil rights movements of the 1960s and 1970s included strong resistance to the US Tribal termination policies. Under President John F. Kennedy, Congress did not terminate another Tribe after 1962 and began to move back toward a policy of collaboration with and support of Tribal governments. The Lyndon B. Johnson presidency’s War on Poverty also furthered the return toward Tribal self-determination—emphasizing community control and effort and providing the first federal funding for a reservation-based legal services program.

The Self-Determination Era was formally introduced in a speech by Richard Nixon on July 8, 1970. In his “Special Message on Indian Affairs,” President Nixon addressed Congress and in no uncertain terms stated that “this policy of forced termination is wrong” (Nixon 1970). He encouraged Congress to reject termination in favor of the Tribal right to control and operate federal programs, programs that he noted were “the solemn obligations which have been entered into by the United States Government” and specific commitments made in “written treaties and through formal and informal agreements” (Nixon 1970).

Following Nixon’s speech, the federal government embraced the approach of self-determination, passing the Indian Self-Determination and Education Assistance Act in 1975, which created federal appropriations and a contracting process to support Tribal self-governance (US Congress 1975). From there, Congress has generally continued to support the economic and political rebuilding being conducted by Tribal Nations. Tribal Nations also set about developing and rebuilding functional government and economic systems, most of which were destroyed by termination policies. Many Tribal Nations also amended their IRA constitutions to make them better fit their own Tribal laws, cultures, and customs (Harmon 2019).

However, this era is also pocked with social backlash to Tribal rights and rulings from federal courts that worked to limit the ability of Tribal governments to successfully manage their lands, resources, and communities. In Washington and Wisconsin, non-Native citizen groups protested at the sites of Tribal treaty fishing activities and filed lawsuits challenging Tribal rights. Additionally, during this era the federal courts created laws limiting the jurisdiction of Tribal governments over non-member individuals and businesses who choose to enter, live, and work within reservations when they commit crimes (*Oliphant v. Suquamish Indian Tribe* 1978) and those who seek to build, construct, or operate businesses that violate Tribal zoning laws, and of Tribal courts to adjudicate civil matters they are involved

in (*Brendale v. Confederated Tribes and Bands of the Yakima Indian Nation* 1989; *Nevada v. Hicks* 2001) (Smith 2013; Radermacher 2002). Nevertheless, Tribal Nations and their governments experienced a period with only minor federal headwinds operating against self-determination.

The Nation-to-Nation Era (2001–Present):

In the 30 years following the Termination Era, many Tribal Nations made significant progress in developing strong, robust governments. This led the way to a revitalization of the nation-to-nation relationship between Tribal governments and the US federal government. This era has been marked with a renewed focus on and ability for self-governance and self-determination, including enforcement of treaty rights, a demand to uphold the federal trust responsibility, and a strong federal policy of recognizing Tribal governments.

Three key acts summarize this era so far:

- *The Federal Tribal Consultation Policy:* In 2000, President Bill Clinton issued Executive Order 13175, "Consultation and Coordination with Indian Tribal Governments" (White House 2000). This EO strengthened the government-to-government relationship with Tribal Nations by requiring federal agencies to consult with Tribal Nations on the potential impacts of federal policy on Tribal lands, resources, and citizens. This process was supported by Presidents George W. Bush and Barack Obama and was a significant focus in the Joe Biden–Kamala Harris administration, with new executive orders seeking to hold federal agencies accountable for their consultation processes and standards.
- *The Cobell litigation and settlement:* The Cobell litigation was a class-action lawsuit filed against the United States by the Native American Rights Fund on behalf of Elouise Cobell and over

500,000 individual Indian trust beneficiaries. The lawsuit claimed that the government had failed to properly manage Native trust assets, including failing to maintain a basic accounting of income generated by leases on Indian lands. The case was settled by the federal government in 2009 for \$3.4 billion, which was less than a third of the amount identified by the plaintiffs' experts as owed to the Tribal citizens. The settlement included \$1.4 billion paid to the plaintiffs; \$2 billion to repurchase fractionated land interests and return them to Tribal ownership through the "Land Buy Back" program; and the creation of the Cobell Education Scholarship Fund, which is funded from the purchase of fractionated lands. The litigation and related settlements were among the few times that the federal government recognized its failure to meet its basic trust obligations to Tribal Nations and Native Americans.

- *Federal legislation recognizing Tribal Nations on par with states and other domestic sovereign governments:* Increasingly during the 2010s and 2020s, federal legislation began to recognize Tribal Nations and implement domestic governments for the purpose of federal funding and program implementation. Tribal Nations and their governments are included as governmental entities able to receive and distribute (according to their own laws and policy goals) federal funding for a variety of Covid, infrastructure development, and tax programs under the American Rescue Plan, the Bipartisan Infrastructure Law, and the Inflation Reduction Act.

Many, but certainly not all, of the federal actions during this era have reinforced the nation-to-nation relationship with and the sovereignty of Tribal Nations. However, as students of the history of US federal Indian policy know, that could change at any moment.

Appendix B. ESBs serving Tribal Nations and Native communities

We identified the Tribal Nations in Tables B-1–B-3 through school district websites first; if no mention was found, we used Google maps to identify Tribal Nations within or near school district boundaries.

This is an imperfect identification and Tribal Nation(s) may be missing representation. Any errors are the authors' own.

Table B-1 | **Public schools receiving Impact Aid payments for Native students, 2024**

SCHOOL	TRIBAL NATION(S)	STATE GEOGRAPHY	ESBS COMMITTED	ESBS AWARDED	ESBS ORDERED	ESBS DELIVERED	ESBS OPERATING	PERCENT OF FLEET THAT IS ELECTRIC
Alaska Gateway School District	Native Village of Dot Lake; Mentasta Traditional Council; Native Village of Eagle; Tetlin Native Corporation; Northway Village Council; Tanacross Village Council; Tok Native Association	AK	1	0	0	0	1	10%
Cedar Unified School District	Navajo Nation; Hopi Tribe	AZ	1	0	0	0	1	7%
Chinle Unified School District	Navajo Nation	AZ	18	15	0	0	3	25%
Clarkdale-Jerome School District	Yavapai-Apache Nation	AZ	1	1	0	0	0	13%
Coolidge Unified School District	Ak-Chin Indian Community; Fort McDowell Yavapai Nation; Gila River Indian Community; Salt River Pima-Maricopa Indian Community; San Carlos Apache Tribe; Tohono O'odham Nation	AZ	1	1	0	0	0	2%
Flagstaff Unified School District	Navajo Nation; Hopi Tribe; Hualapai Tribe	AZ	2	0	0	2	0	100%
Mohave Valley School District	Fort Mojave Indian Tribe	AZ	10	3	0	0	7	45%
Red Mesa Unified School District	Navajo Nation	AZ	3	0	0	0	3	13%
Sanders Unified School District	Navajo Nation	AZ	2	2	0	0	0	8%
Somerton School District	Cocopah Indian Tribe	AZ	6	4	0	0	2	Unknown
Tucson Unified School District	50+ Tribal Nations	AZ	10	0	10	0	0	Unknown

Table B-1 | **Public schools receiving Impact Aid payments for Native students, 2024 (Cont.)**

SCHOOL	TRIBAL NATION(S)	STATE GEOGRAPHY	ESBS COMMITTED	ESBS AWARDED	ESBS ORDERED	ESBS DELIVERED	ESBS OPERATING	PERCENT OF FLEET THAT IS ELECTRIC
Alpine County Unified School District	Washoe Tribe of Nevada and California	CA	4	0	3	0	1	Unknown
Bishop Unified School District	Bishop Paiute Tribe; Big Pine Paiute Tribe; Utu Utu Gwaitu Paiute Tribe of the Benton Paiute Reservation	CA	6	0	3	0	3	43%
College School District	Santa Ynez Band of Chumash Mission Indians	CA	2	0	2	0	0	Unknown
Eastern Sierra Unified School District	Utu Utu Gwaitu Paiute Tribe of the Benton Paiute Reservation; Bridgeport Indian Colony	CA	2	0	0	0	2	18%
Fallbrook Union High School	No data	CA	3	3	0	0	0	Unknown
Lakeside Union Elementary	Barona Band of Mission Indians	CA	22	0	8	14	0	100%
Lone Pine Unified School District	Lone Pine Paiute-Shoshone Tribe	CA	2	0	2	0	0	50%
Mariposa County Unified School District	Southern Sierra Miwuk Nation (American Indian Council of Mariposa County) ^a	CA	5	0	4	0	1	14%
Santee School District	No data	CA	7	0	6	0	1	30%
Stony Creek Joint Unified	Grindstone Indian Rancheria of Wintun-Wailaki Indians	CA	1	0	0	0	1	33%
Valley Center-Pauma Unified School District	Rincon Band of Luiseño Indians	CA	10	4	2	0	4	36%
Warner Unified School District	Los Coyotes Band of Cahuilla and Cupeño Indians; Mesa Grande Band of Diegueño Mission Indians; Lipay Nation of Santa Ysabel	CA	1	1	0	0	0	13%
Yosemite Unified School District	Picayune Rancheria of the Chukchansi Indians; North Fork Rancheria	CA	10	0	0	0	10	43%
Glades County School District	Seminole Tribe of Florida (Brighton Reservation)	FL	13	0	0	0	13	72%
Brimley Area Schools	Bay Mills Indian Community; Sault Ste. Marie Tribe of Chippewa Indians	MI	2	2	0	0	0	25%
L'anse Area Schools	Keweenaw Bay Indian Community	MI	2	0	0	0	2	20%

Table B-1 | **Public schools receiving Impact Aid payments for Native students, 2024 (Cont.)**

SCHOOL	TRIBAL NATION(S)	STATE GEOGRAPHY	ESBS COMMITTED	ESBS AWARDED	ESBS ORDERED	ESBS DELIVERED	ESBS OPERATING	PERCENT OF FLEET THAT IS ELECTRIC
Red Lake Public School District	Red Lake Nation	MN	2	0	0	2	0	18%
Dixon School District	Confederated Salish & Kootenai Tribes	MT	1	1	0	0	0	25%
Swain County Schools	Eastern Band of Cherokee Indians	NC	1	0	0	0	1	4%
Umó'ho' Nation Public School	Omaha Tribe of Nebraska	NE	1	1	0	0	0	Unknown
Winnebago Public Schools District	Winnebago Tribe of Nebraska	NE	3	3	0	0	0	Unknown
Albuquerque Public Schools	Navajo Nation; the Pueblos of Acoma, Cochiti, Isleta, Jemez, Laguna, Sandia, San Felipe, Santa Ana, Santo Domingo, Zia; To'hajiilee (Canoncito Navajo)	NM	20	20	0	0	0	5%
Dulce Independent Schools	Jicarilla Apache Nation	NM	2	0	0	0	2	40%
Clark County School District	Las Vegas Paiute Tribe; Moapa Band of Paiutes	NV	26	0	0	0	26	1%
Elko County School District	Te-Moak Tribe of Western Shoshone (Elko Band Colony); Shoshone-Paiute Tribes of the Duck Valley Reservation	NV	5	5	0	0	0	7%
Lander County School District	Te-Moak Tribe of Western Shoshone (Battle Mountain Band)	NV	3	3	0	0	0	23%
Evans-Brant Central School District (Lake Shore)	Seneca Nation	NY	22	0	0	20	2	47%
Cache Public Schools	Comanche Nation	OK	6	6	0	0	0	Unknown
Clinton Public Schools	Cheyenne and Arapaho Tribes	OK	3	0	0	0	3	Unknown
Colcord Public Schools	Cherokee Nation	OK	4	4	0	0	0	Unknown
Dale Public Schools	Citizen Potawatomi Nation	OK	5	5	0	0	0	Unknown
Geronimo Public Schools	Comanche Nation	OK	3	0	0	0	3	Unknown

Table B-1 | **Public schools receiving Impact Aid payments for Native students, 2024 (Cont.)**

SCHOOL	TRIBAL NATION(S)	STATE GEOGRAPHY	ESBS COMMITTED	ESBS AWARDED	ESBS ORDERED	ESBS DELIVERED	ESBS OPERATING	PERCENT OF FLEET THAT IS ELECTRIC
Lawton Public Schools	Comanche Nation; Kiowa Tribe	OK	23	23	0	0	0	Unknown
McAlester Public Schools	Choctaw Nation	OK	7	0	0	0	7	Unknown
Pawhuska Public Schools	Osage Nation	OK	3	3	0	0	0	Unknown
Shawnee Public Schools	Citizen Potawatomi Nation; Choctaw Nation; Muscogee (Creek) Nation; Absentee Shawnee Tribe; Sac and Fox Nation; Kickapoo Tribe; Iowa Nation (Baxoje); Seminole Tribe	OK	8	0	0	0	8	Unknown
Webbers Falls Public Schools	Cherokee Nation	OK	1	0	0	0	1	Unknown
Pendleton School District	Confederated Tribes of the Umatilla Indian Reservation	OR	13	13	0	0	0	35%
Willamina School District	Confederated Tribes of the Grand Ronde	OR	5	5	0	0	0	25%
Socorro Independent School District	Ysleta del Sur Pueblo (Tigua Pueblo)	TX	25	0	0	0	25	9%
Uintah School District	Ute Indian Tribe	UT	12	0	0	2	10	20%
Lake Quinalt School District	Quinalt Indian Nation	WA	2	0	0	0	2	25%
North Beach School District	Quinalt Indian Nation	WA	1	0	0	0	1	7%
North Kitsap School District	Suquamish Tribe; Port Gamble S'Klallam Tribe	WA	3	0	0	0	3	4%
Toppenish School District	Yakama Nation	WA	6	3	0	0	3	25%
Wapato School District	Yakama Nation	WA	1	1	0	0	0	3%
Menominee Indian School District	Menominee Indian Tribe of Wisconsin	WI	2	2	0	0	0	14%
Grand total ESBS committed			366					

Notes: Schools identified as participating in the Environmental Protection Agency's Clean School Bus Program in 2024.^a Tribe recognized by California, but not recognized by the federal government. Abbreviation: ESB = electric school bus.

Source: Lazer and Freehafer 2025.

Table B-2 | **BIE-funded schools with committed ESBs**

SCHOOL	TRIBAL NATION(S)	STATE GEOGRAPHY	ESBS COMMITTED	ESBS AWARDED	ESBS ORDERED	ESBS DELIVERED	ESBS OPERATING	PERCENT OF FLEET THAT IS ELECTRIC
Casa Blanca Community School	Gila River Indian Community	AZ	1	1	0	0	0	Unknown
Gila Crossing Community School	Gila River Indian Community	AZ	2	2	0	0	0	Unknown
Theodore Roosevelt School (boarding school)	White Mountain Apache Tribe	AZ	1	0	0	0	1	Unknown
Noli School	Soboba Band of Luiseño Indians	CA	2	0	0	0	2	12%
Sipayik Elementary School	Passamaquoddy Tribe of Pleasant Point (Sipayik)	ME	3	0	1	0	2	100%
Choctaw Central High School	Mississippi Band of Choctaw Indians	MS	9	0	0	0	9	Unknown
Cherokee Central Schools	Eastern Band of Cherokee Indians	NC	21	0	5	0	16	100% ^a
Sequoyah High School	Cherokee Nation	OK	1	0	0	0	1	Unknown
Lower Brule Day School	Lower Brule Sioux Tribe	SD	1	0	0	0	1	Unknown
Grand total ESBs committed			41					

Note: ^a In addition to 21 committed ESBs, 16 in operation, and 5 on order, Cherokee Central Schools have 5 spare diesel buses. Abbreviations: ESB = electric school bus; BIE = Bureau of Indian Education.

Source: Lazer and Freehafer 2025.

Table B-3 | **Private or charter Native language immersion and cultural schools with ESBs**

SCHOOL	TRIBAL NATION(S)	STATE GEOGRAPHY	ESBS COMMITTED	ESBS AWARDED	ESBS ORDERED	ESBS DELIVERED	ESBS OPERATING	PERCENT OF FLEET THAT IS ELECTRIC
Morongo School	Morongo Band of Mission Indians	CA	4	0	0	0	4	Unknown
Ojibwe Charter School	Bay Mills Indian Community	MI	1	0	0	0	1	33%
Endazhi-Nitaawiging	Red Lake Nation	MN	2	0	1	0	1	Unknown
Grand total ESBs committed			7					

Note: Abbreviation: ESB = electric school bus.

Source: Lazer and Freehafer 2025.

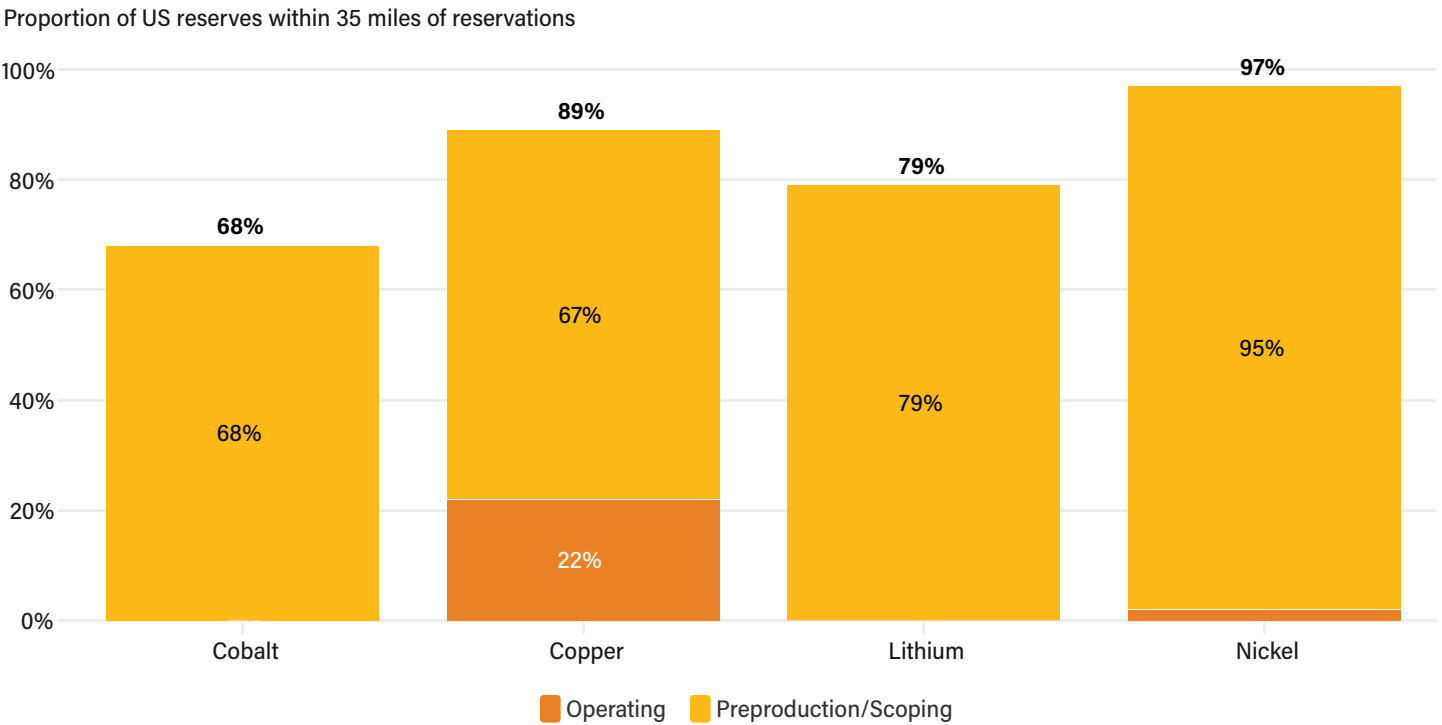
Appendix C. Mining and the supply chain impacts of EV batteries

In support of Tribal sovereignty and self-determination, ESB stakeholders should understand the potential impact that supplying the batteries required for EVs and other clean energy technologies could have on Tribal Nations within the US geography (Box C-1 highlights sustainable practices like battery and critical-mineral recycling). EV batteries require critical minerals, and a 2021 MSCI analysis found most US deposits of critical minerals exist within 35 miles of Tribal lands (Block 2021). With the demand for increased production and use of EVs, the environmental impacts of mining those resources will be largely endured by Tribal Nations—including impacts to Tribal treaty resources (which are geographically specific). For example, a new open-pit copper and nickel mine in northern Minnesota, which identified that much of its production could be used in EV batteries and infrastructure, recently had its permits revoked after the Fond du Lac Band of Lake Superior Chippewa

Indians won a lawsuit claiming that federal agencies failed to consider the mine’s impact on the Tribe’s treaty waters and, in particular, its drinking water (FDL 2023).

The lithium-ion batteries that power almost all EVs use five “critical minerals”: lithium, nickel, cobalt, manganese, and graphite; copper is another crucial mineral although not currently designated by the US Geological Survey as “critical” (Northey 2023). The aforementioned MSCI report analyzed 5,336 US mining properties in the S&P Global Market Intelligence database. Ninety-seven percent of nickel reserves, 79 percent of lithium reserves, 68 percent of cobalt reserves, and 89 percent of copper reserves in the United States—where mines are either in operation or in preproduction or scoping stages—are located within 35 miles of a reservation (Block 2021) (Figure C-1). The MSCI report did not attempt to quantify mining impacts to specified Tribal resources outside of reservations, including treaty resources and cultural and historical resources.

Figure C-1 | Metal reserves within 35 miles of Native American reservations



Source: Modified from Block 2021.

Box C-1 | **Battery and critical mineral recycling: EPA Tribal Waste Management Program**

The EPA developed its Tribal Waste Management Program to address waste management services in Indian Country.^a The main priority of the program is to promote proper waste disposal and recycling as a means of making current Tribal waste systems more sustainable. For example, through the program, the Coyote Valley Band of Pomo Indians in Redwood Valley, California, partnered with Cherokee Nation to develop a battery recycling program.^b

Notes: ^a Pierron 2022. ^b EPA 2025.

Appendix D. Examples and illustrations to support the ESB transition in Indian Country

Electric school bus deployment by Tribal Nations

Maine Indian Education

The following section is sourced from an ESB Initiative's Electric School Bus Series article on Sipayik Elementary in Pleasant Point (Sipayik) Reservation (Kowalczyk and Curran 2025).

Maine Indian Education (MIE) operates three schools: Sipayik Elementary School, Indian Township School, and Indian Island School. Sipayik Elementary has about 120 students, 80 percent of whom rely on the bus to get to school. With funding from EPA's 2023 CSBP rebate, MIE electrified the buses serving students at Sipayik Elementary School, including Passamaquoddy Tribe students in Pleasant Point (Sipayik) Reservation. The school currently operates two ESBs and has one more on the way, fully electrifying Sipayik Elementary's fleet.

The transition was driven by multiple factors: addressing higher rates of respiratory conditions in the Passamaquoddy community, reducing greenhouse gas emissions, and achieving significant cost savings. MIE has experienced 80 percent savings in energy costs and 60 percent savings in maintenance costs and estimates the elimination of approximately 25 tons of greenhouse gas emissions per ESB annually.

What makes this transition particularly innovative is how MIE has woven Passamaquoddy cultural values into the electrification process. As a safety feature due to their quiet nature, the ESBs play a traditional Passamaquoddy travel song recorded by Tribal elder Wayne Newell when operating at low speeds, replacing standard pedestrian warning sounds. The integration of Passamaquoddy language preservation into the ESB transition is the first step in MIE's plans to incorporate ESBs in classroom and cultural learning.

The project received community backing from Tribal elders who supported the initiative through traditional blessing ceremonies, and students have become active partners, expressing pride in their emission-free transportation. This model demonstrates how transportation electrification can serve as a vehicle for cultural preservation and environmental education in Tribal communities.

Eastern Band of Cherokee Indians

The following section is sourced from author conversations with Cherokee Boys Club staff members Katie Tiger and Donnie Owle (Pers. Comm. 2025).

In March 2022, EBCI, in partnership with the CBC, became the first Tribal school in North Carolina, and among the pioneering Tribal schools nationally, to procure an ESB. The bus, serving Cherokee Central Schools, symbolized the beginning of a transformative journey within the Tribally operated school system, serving around 1,600 students from K–12. Today, CBC has 16 ESBs delivered with 5 more on the way. This transition is driven by the EBCI's and CBC's dedication to environmental conservation, reflected in the school's array of green practices and a Tribal resolution emphasizing renewable energy, technology, and a forward-thinking approach to preserve the environment for future generations.

The adoption of ESBs was a result of collaborative efforts with key partners like the Land of Sky Clean Vehicles Coalition, Duke Energy, Carolina Thomas, the US Environmental Protection Agency, and the Cherokee Preservation Foundation. While navigating through funding complexities, Katie Tiger's emphasis on environmental benefits and job opportunities led to choosing ESBs over alternatives such as propane school buses. The ongoing program comprises four phases and involves partnerships with Duke Energy for vehicle-to-grid technology. By transitioning all of the route buses to electric, EBCI and CBC are benefitting from immediate fuel savings and annual maintenance savings, and can serve as a model for other districts interested in electrifying their school buses.

Development of EV infrastructure by Tribal Nations

Standing Rock Sioux Tribe

Standing Rock, located across the borders of North and South Dakota, is implementing a \$13.4 million inter-Tribal EV charging network and increasing the use of electric vehicles for Tribal government programs (Achterling 2024). The charging station network is part of a larger regional Tribal charging station project being implemented by Native Sun Community Power Development based in Red Lake Nation.

Development of electric infrastructure to overcome utility shortages

Blue Lake Rancheria

Blue Lake, a Tribal Nation in Humboldt County near Eureka, California, has received national attention for proving that a renewable energy microgrid is a successful solution to public safety power shutoff events. Tribal leaders designed the microgrid to provide climate-resilient infrastructure in preparation for earthquakes and tsunamis, but on October 9, 2019, the microgrid became exceptionally useful when PG&E shut off power to 30 counties for 28 hours for wildfire mitigation. Humboldt County and its population of 136,000 people were left in the dark and emergency services for people with critical medical needs were directed to Blue Lake Rancheria. The Tribe's microgrid saved lives during the 28-hour outage and highlighted its invaluable investments, design, and operations. According to Jana Ganion, energy director for Blue Lake Rancheria, "With future electricity shutoffs, rural communities, Native American reservations, in particular, need to be especially resilient. Many, many tribal nations are located at the end of the line in terms of the electricity grid, they may have no power, they may have poor quality power. Microgrids are just a way to do an end-run around all of that" (Neumann 2020).

Moapa Band of Paiute Indians

A Tribal Nation in southern Nevada, Moapa has completed a 252-kW microgrid. This microgrid system includes solar, battery storage, and energy-efficient generators. Its system saves an estimated \$700,000 annually in fuel costs for the Moapa Travel Plaza, which is the largest employer of the Tribe (MBP n.d.).

The Village of Tuntutuliak

Tuntutuliak is an Alaska Native village (Tribal Nation) in a remote area of western Alaska, comprising nearly 400 Yup'ik citizens. There are approximately 56 similar villages almost identical to Tuntutuliak within this region, all struggling with extremely high energy costs for heating, transportation, and electricity. These villages primarily use diesel-burning generators for electricity, which are very expensive to operate. Energy costs consume approximately half of their overall budgets. Tuntutuliak, however, is reducing its village's dependence on diesel generators by installing a renewable energy system that uses wind power, smart-grid technology, and residential thermal storage. Its project is paving the way to a new energy landscape for rural Alaska (AFN n.d.).

Eastern Band of Cherokee Indians

The following section is sourced from author conversations with CBC staff Katie Tiger and Donnie Owle (Pers. Comm. 2025).

Where the three previous examples demonstrate how Tribes have used microgrids and renewable energy to address electric utility shortages and support energy sovereignty, these Tribes have not (at the time of writing) chosen to use these energy resources to support EV infrastructure. EBCI, in partnership with CBC, is installing a 400-kW solar microgrid to support eight fast-charging stations for its electric school bus fleet. As of July 2025, the microgrid was mid-construction with a target completion date of fall 2026.

Improving Tribal roads

Citizen Potawatomi Nation

Citizen Potawatomi Nation (CPN), a Tribal Nation in Shawnee, Oklahoma, used funds from the DOT's Federal Highway Administration Tribal Transportation Program to enter contracts to maintain county and city roads on Tribal lands that required maintenance. Through the contract, CPN Roads Department has overseen more than \$9.6 million in construction and repair of roads, parking lots, and other motor vehicle infrastructure since 2020, including resurfacing and widening roads (CPN 2015).

Abbreviations

AIAN	American Indian and Alaska Native	EPA	Environmental Protection Agency
BIA	Bureau of Indian Affairs	ESB	electric school bus
BIE	Bureau of Indian Education	ESB Initiative	Electric School Bus Initiative
CBC	Cherokee Boys Club	EV	electric vehicle
CPN	Citizen Potawatomi Nation	DOE	Department of Energy
CSBP	Clean School Bus Program	DOI	Department of the Interior
DEI	Diversity, Equity, and Inclusion	DOT	Department of Transportation
EBCI	Eastern Band of Cherokee Indians	SCOTUS	Supreme Court of the United States
ED	Department of Education	TTP	Tribal Transportation Program
EO	executive order		

Endnotes

1. To learn more about how the ESB Initiative centers equity in its work, see Moses and Brown (2023).
2. The advocacy stakeholder analysis included interviews with US-based organizations focused on environmental and climate justice, disability rights and justice, Tribal rights and justice, and health equity regarding their views and involvement in the ESB movement and their views on the involvement of the ESB Initiative, utilities, and manufacturers in the equitable transition to ESBs. To learn more about the report's findings and recommendations, see Brown and Curran (2023).
3. Other equity baseline research includes Brown and Jackson (2023), Shorter et al. (2024), Lazer et al. (2024), Brown et al. (2025), and Brown and Jackson (2025).
4. The ESB Initiative defines a committed ESB as an ESB in any stage of the procurement process: funding awarded, bus ordered, bus delivered, or bus operating.
5. For the purposes of this paper, the term "stakeholder" encompasses school districts; manufacturers; dealers; utilities; financial institutions; local, state, and federal governments; advocacy groups; communities; and any entity interested or involved in the electrification of school buses.
6. Non-federally recognized Tribes may be recognized by state governments or unrecognized by both state and federal governments.
7. White literature is produced by traditional academic or commercial publishing systems. Gray literature comes from other sources (e.g., news articles, blogs, webpages).
8. The history of US federal Indian policy should not be mistaken for Tribal cultural histories, which predate the formation of the United States and continue to independently exist and thrive. It is important to understand the impacts and continuing legacy of federal policy on Tribal Nations. Although US policies were successful in suppressing a significant portion of independent Tribal activity, Tribal governance and self-determination have persevered throughout the past 249 years of US existence.
9. In other words, since the beginning of time.
10. "Congress shall have the Power . . . To regulate Commerce with foreign Nations, and among the several States, and with the Indian Tribes."
11. In 1871, the House of Representatives added a rider to an appropriations bill ceasing to recognize Tribal Nations as entities "with whom the United States may contract by treaty" (known as the Indian Appropriations Act of 1871). This dramatic shift in federal Indian policy came from a power struggle between the House of Representatives and the Senate over control of Indian affairs—with the House frustrated by the demands that Senate-ratified treaties placed on the federal budget (Hirsch 2014).
12. This self-decreed supremacy of US law was based on the Doctrine of Discovery. The Doctrine of Discovery is a legal principle originally decreed by the Pope of the Catholic Church in the 15th century, which held that only Christian sovereigns were capable of possessing authority over land and waters because the governance and property systems of non-Christian inhabitants were inadequate and thus invalid.
13. Supreme Court of the United States, *Johnson & Graham's Lessee v. McIntosh*, 21 U.S. (8 Wheat) 543 (1823), <https://supreme.justia.com/cases/federal/us/21/543/>.
14. Supreme Court of the United States, *Cherokee Nation v. Georgia*, 30 U.S. (5 Pet.) 1 (1831), <https://supreme.justia.com/cases/federal/us/30/1/>.
15. Supreme Court of the United States, *Worcester v. Georgia*, 31 U.S. (6 Pet.) 515 (1832). In this vein, state ESB transition mandates, like those in California and New York, do not apply to and cannot be enforced upon federally recognized Tribal Nations. Only a federal transition mandate would apply to Tribal Nations.
16. This shift was reinforced in the 1970s and 1980s when states successfully diminished Tribal sovereignty through court cases, particularly regarding criminal jurisdiction, taxation, and regulation (Blackhawk 2023, part 2, ch. 10).
17. Washington State has signed numerous compacts and agreements with the Tribal Nations located within the state's borders, including compacts on marijuana, taxation, and the Centennial Accord Millennium Agreement (WA GOIA 1999). On the other side of the scale, Tribes in South Dakota, for example, are constantly engaged in legal battles with the state to ensure their Tribal sovereignty is respected (Lakhani 2020; NARF 2024).
18. A list of treaties including education provisions was collected as part of the BIA's Federal Indian Boarding School Initiative in 2024. See BIA (2024c) for the list.
19. *Treaty of Fort Laramie with Sioux, Etc.*, Apr. 29, 1868, 15 Stat. 635, 637.
20. Supreme Court of New Mexico, *Prince v. BOARD OF ED. OF CENT. CON. IND. SCH. D.* (1975). No. 10061. <https://law.justia.com/cases/new-mexico/supreme-court/1975/10061-0.html>.
21. The Indian Civilization Act Fund of 1819 (PL 15-85), the Peace Policy of 1869, and later acts created a public-private relationship wherein Indian reservations were distributed among the major religious denominations, which, in an unprecedented delegation of power by the US government to church bodies, were given governmental authority and access to military resources to demand the attendance of Native children to federally funded, church-operated schools (BIA 2024a, 19).
22. Under the second Trump administration, EO 14210 established the "Department of Government Efficiency" Workforce Optimization Initiative. As of August 2025, BIA and BIE were undergoing formal government-to-government consultations with Tribes on the development of their respective Agency Reorganization Plans (BIE 2025b).

23. Called "Improving American Indian and Alaska Native Educational Opportunities and Strengthening Tribal Colleges and Universities," the EO addressed opportunities for students to learn their native languages, cultures, and histories and receive a complete and competitive education that prepared them for college and a career, including a commitment to improve educational opportunities for students attending Tribal colleges and universities. The EO required a memorandum of understanding between DOI and the US Department of Education "to facilitate a new partnership ...to improve [American Indian/Alaska Native] education" (White House 2011).
24. Joe Biden's EO 14049 is also known as "White House Initiative on Advancing Educational Equity, Excellence, and Economic Opportunity for Native Americans and Strengthening Tribal Colleges and Universities," superseding Obama's EO 13592.
25. Donald Trump's EO 14148 is also known as "Initial Rescissions of Harmful Executive Orders and Actions."
26. The National Indian Education Study (NIES) of the US Department of Education's Office of Indian Education provides the most comprehensive data on Native student enrollment and achievement. The study was conducted every two years from 2005 to 2011. After 2011, the NIES reporting cycle was changed to every four years. The most recent report is the NIES for 2019. The 2019 NIES included data from 15 states: Alaska, Arizona, Michigan, Minnesota, Montana, Nebraska, New Mexico, North Carolina, North Dakota, Oklahoma, Oregon, South Dakota, Utah, Washington, and Wyoming. The five states with the largest proportions of Native public-school students are Alaska (22.0 percent), Oklahoma (12.0 percent), Montana (11.0 percent), South Dakota (10.7 percent), and New Mexico (10.3 percent) (NCES 2019).
27. ED's Office of Indian Education classifies Native student populations in public schools based on density. Schools or districts where less than 25 percent of the student body is Native American are considered "low density," while those with 25 percent or more Native American students are categorized as "high density." Within high-density school districts, about a quarter (24 percent) of Native public-school students attend majority Native schools and about half (49 percent) attend schools where less than 10 percent of the student body is Native (NCES 2019).
28. The states with the highest number of BIE-funded students are Arizona (9,113 students), New Mexico (7,439 students), South Dakota (5,352 students), North Dakota (3,193), and Mississippi (2,104) (NCES 2019). A full list of BIE-funded schools can be found in the BIE School Directory at <https://www.bie.edu/schools/directory>.
29. The EPA used school districts receiving Impact Aid payments as prioritization criteria for Tribes for the Clean School Bus Program.
30. Joe Biden's EO 14112 is also known as "Reforming Federal Funding and Support for Tribal Nations to Better Embrace Our Trust Responsibilities and Promote the Next Era of Tribal Self-Determination."
31. Donald Trump's EO 14236 is also known as "Additional Rescissions of Harmful Executive Orders and Actions."
32. Sixty percent of roads on Tribal lands are unpaved (DOT 2022).
33. An example includes the National Electric Vehicle Initiative for Tribal Nations from the White House Council on Native American Affairs' Economic Development, Energy, and Infrastructure Committee (WHCNA 2022).
34. Supreme Court of the United States, *United States v. Kagama*, 118 U.S. 375 (1886), <https://supreme.justia.com/cases/federal/us/118/375/>: "But this power of congress to organize territorial governments, and make laws for their inhabitants, arises, not so much from the clause in the constitution in regard to disposing of and making rules and regulations concerning the territory and other property in the United States, as from the ownership of the country in which the territories are, and the right of exclusive sovereignty which must exist in the national government, and can be found nowhere else."
35. As identified in the Senate's 1969 Kennedy report: The land policy of allotment was directly related to the government's Indian education policy because proceeds from the destruction of the Indian land base were to be used to pay the costs of taking Indian children from their homes and placing them in federal boarding schools—a system designed to dissolve the Indian social structure (US Senate 1969).
36. This phrase was first used by Brigadier General Richard Henry Pratt, who founded and was the longtime superintendent of Carlisle Indian Industrial School in Carlisle, Pennsylvania, the largest federal Indian boarding school. The term is cited to a speech delivered in 1892 during the National Conference of Charities and Correction, held in Denver, Colorado.
37. To this day it is not known how many Native children were taken from their families and forced into US Indian boarding schools. We do know that by 1900, 20,000 Native children were in boarding schools, which grew to approximately 61,000 children by 1925, meaning that nearly 83 percent of Indian school-age children were attending boarding schools at that time (NABS n.d.).
38. Quite literally, Tribal citizens were naturalized as American citizens without their consent on June 2, 1924, when Congress enacted the Indian Citizenship Act, which granted citizenship to all Native Americans and made them subject to US law. One benefit of the act is that Native Americans gained the right to vote in US elections, at least until 1957 when many states passed laws barring Native voting.
39. Tribal constitutions adopted under the Indian Reorganization Act were based on a "model constitution" provided by the BIA and required approval by the Department of the Interior—affirming US paternalism over the affairs of Tribal governments. Additionally, this new US-modeled form of government rarely meshed with that of the traditional Tribal government, failing to respect the "experience in self-government, the nature of land ownership, the solidarity of the community, and the extent of the contests with non-Indians" of those traditional Tribal governments (Anderson et al. 2020). Nevertheless, by 1940, 105 Tribes chose to adopt constitutions under Section 16 of the Indian Reorganization Act (e.g., the Constitution and By-Laws of the Hopi Tribe were approved in Dec. 1936).
40. For example, Menominee Termination Act, 68 Stat. 250 (1954), and Klamath Termination Act, 68 Stat. 718 (1955).

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Acknowledgments

We wish to thank the many people who offered their time and expertise to review and provide comments on the numerous iterations of this paper. Internal reviewers who provided helpful guidance include Alexander Dane, Amy Todd, Anamaria Martinez Ordoñez, Brian Zepka, Brittany Barrett, Carla Walker, Carlos Muñoz-Piña, Celine Salcedo-La Viña, Gregg Kresge, Hannah Harasaki, Jessica Wang, Katherine Roboff, Meredith Epstein, Michelle Levinson, Natalia Akopian, Simone Athayde, and Sue Gander. External reviewers who provided invaluable insights include Falisha Lucas (CALSTART), Katie Tiger (Cherokee Boys Club), Michelle Mitchell (Confederated Salish and Kootenai Tribes), Nikki Cooley (Institute for Tribal Environmental Professionals), and Ramon Sanchez (Alliance for Tribal Clean Energy). We also thank Carla Walker for her leadership throughout the research process, Sophie Young and Eleanor Jackson for their generous support in editing, TaNeel Filesteel for research support, Kate Archambault and Jordan Chase for finance and operations support, Renee Pineda and Allison Meyer for review process support, Sarah DeLucia for copyediting, Sara Staedicke and Claire Wangui for design and layout support, and Romain Warnault for production.

This publication was made possible thanks to the support of the Bezos Earth Fund, which provides funding for the Electric School Bus Initiative.

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About WRI

World Resources Institute works to improve people's lives, protect and restore nature, and stabilize the climate. As an independent research organization, we leverage our data, expertise, and global reach to influence policy and catalyze change across systems like food, land and water; energy; and cities. Our 2,000+ staff work on the ground in more than a dozen focus countries and with partners in over 50 nations.

About the Electric School Bus Initiative

Founded in partnership with the Bezos Earth Fund in 2020 and in collaboration with partners and communities, WRI's Electric School Bus Initiative (ESB Initiative) aims to build unstoppable momentum toward an equitable transition of the US school bus fleet to electric—bringing health, climate, and economic benefits to children and families across the country and normalizing electric mobility for an entire generation.

About Lepwe, Inc.

Lepwe, Inc. works to address that knowledge gap by facilitating trainings on the legal rights and cultural histories of Tribal Nations and assisting projects in the development of purposeful and informed Tribal engagement strategies. Through education, engagement, and equity, Lepwe, Inc. is building stronger partnerships between Tribal Nations and the non-Native entities that seek to consult, engage, and invest in them.



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