Building In-House Road Maintenance Departments & Reducing Contractor Dependency for Road Repairs

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Agenda

- Navigate the transportation infrastructure for road maintenance within the tribal communities
- Current challenges: heavy contractor reliance, high costs, under funded maintenance budgets and skilled workforce
- Goal: Empower tribes to self-manage more road repair work
- How to ……
  - Reduce contractor dependency
  - Enhance the tribal road maintenance departments

Road Maintenience is Important

Bureau of Indian Affairs Transportation Road Maintenance Hierarchy

Department of the Interior (DOI / Assistant Secretary – Indian Affairs (AS-IA)

BIA / BIA DOT

- Sets Policy
- Standards
- Program Oversights
  - BIA Road Maintenance
  - Road Construction Across Indian Country

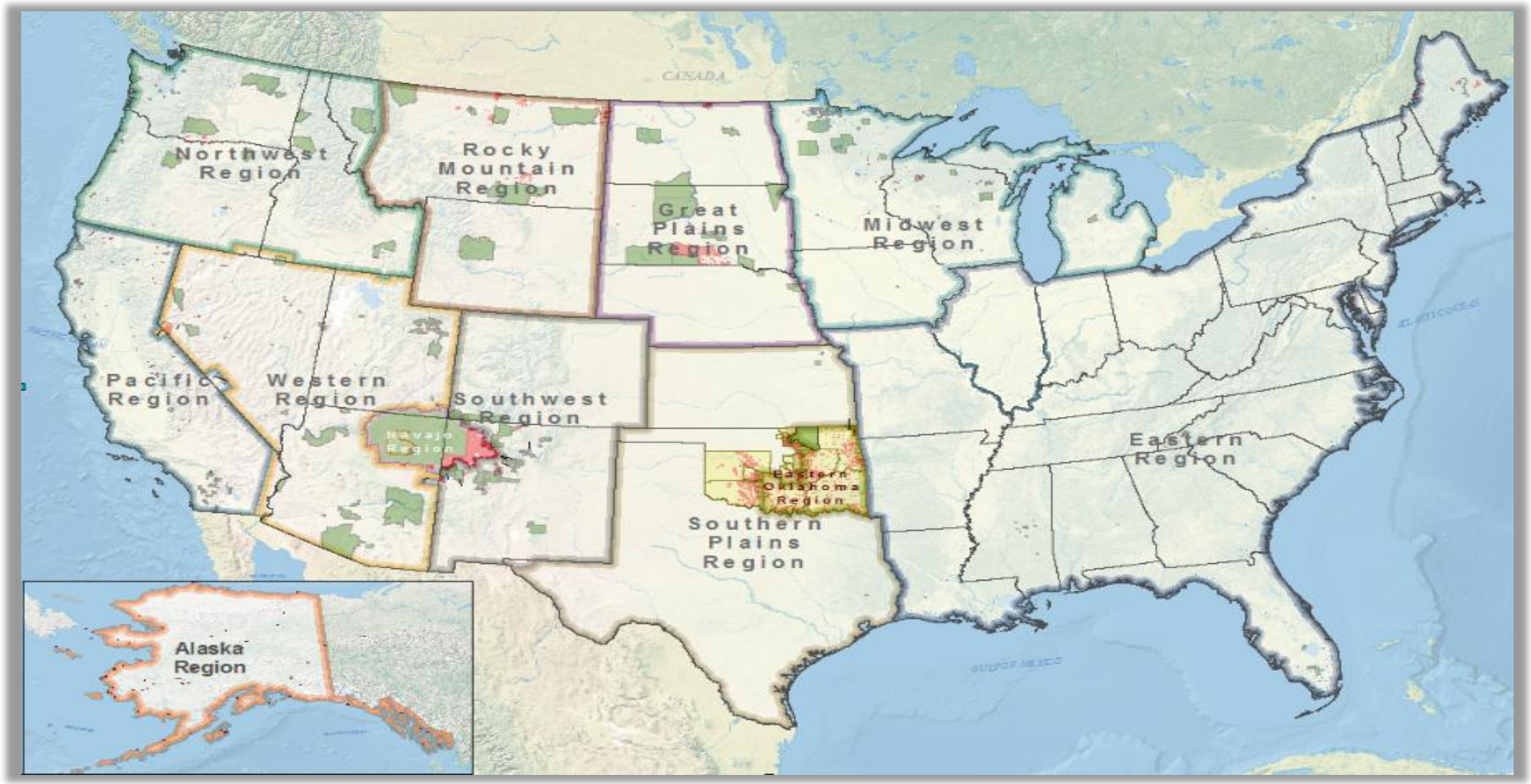
BIA Regional Offices (12 Regions)

Twelve Deputy Regional Directors for Indian Services Offices

Transportation Specialist

- Planning
- Design
- Construction
- Maintenance
- Supervise/Coordinate Work with Tribes – Level Agencies (BIA)

Bureau of Indian Affairs (BIA) -12 Regions



Bureau of Indian Affairs (BIA) -12 Regions

Region	Regional Office	Tribes	Population Estimates
Alaska	Anchorage, Alaska	229	180,000
Eastern	Nashville, Tennessee	34	62,000
Eastern Oklahoma	Muskogee, Oklahoma	17	88,000
Great Plains	Aberdeen, South Dakota	16	278,000
Midwest	Bloomington, Minnesota	36	N/A
Navajo	Window Rock, Arizona	1	400,000
Northwest	Portland, Oregon	45	N/A
Pacific	Sacramento, California	104	281,000
Rocky Mountain	Billings, Montana	10	71,000
Southern Plains	Anadarko, Oklahoma	24	116,000
Southwest	Albuquerque, New Mexico	24	67,000
Western	Phoenix, Arizona	53	172,000
		593	1,715,000

BIA Agency / Reservations Offices

Superintendents & Road Maintenance Staff

Agency Level Engineers / Supervisors

- Plan (5 year plan included) / Schedule
- Carry out day-to-day Maintenance on BIA System Roads
  - IAM 82 procedures and program reporting forms

BIA Agency Offices

Who are they? Local field offices of the Bureau of Indian Affairs, under the U.S. Department of the Interior. Each Agency serves one or more federally recognized tribes within its jurisdiction.

Role in roads: Superintendents & Road Maintenance Staff Agency-Level Engineers/Supervisors

- Oversee and administer federal road maintenance and construction programs (like the **BIA Road Maintenance Program (RMP)**).
- Manage the BIA-owned roads within their service area (sometimes called the "reservation roads system").
- Handle compliance, regulations, and **funding allocations**.
- Provide technical assistance and sometimes contract oversight if a tribe has not assumed direct responsibility.

Authority:

- They operate under federal authority — they carry out federal obligations but do not represent a tribe's sovereign decisions.

Tribal Transportation / Road Departments

Who are they?

Departments within tribal governments, directly accountable to the Tribal Council or governing body.

Role in roads:

- Manage, plan, and execute road maintenance and construction on tribal lands — either with their own equipment and staff (in-house) or by contracting services.
- Administer tribal shares of the **Tribal Transportation Program (TTP),** which is a federal funding program but tribally controlled once allocated.
- Set tribal priorities (deciding which roads to repair, what equipment to purchase, how to staff).
- Coordinate with BIA, state DOTs, and counties on interjurisdictional roads.

Authority:

- They represent **tribal sovereignty** — meaning they make decisions for their people, independent of BIA oversight (though they still follow federal funding guidelines – **May use 25% of their TTP share for maintenance**).

Current State of Tribal Road Maintenance

156,715

National Tribal Transportation Facility Inventory (NTTFI) includes over 156,715 miles of public roads

- BIA 29,358 Miles of Roads >1,000 bridges
- Tribal Miles of Roads 20,606

$50M

BIA Road Maintenance (FY 2025): $50.084 M

- Scope includes pavement/gravel / earth road maintenance
- Bridge maintenance, snow/ice emergency work, ferry ops.

29,358

System size: 29,358 / miles :

- 7,400 paved (25%)
- 4,800 gravel (16%)
- 16,900 earth
- 1,073 bridges

FY 2023 acceptable condition: 13% roads / 72% bridges.

Sources: Bureau of Indian Affairs

Current State of Tribal Road Maintenance

$613M

TTP (FY 2025):

Approx. $613 M total program funding separate from BIA's maintenance line.

25%

TTP maintenance usage cap: 25% or $500k, road sealing not capped.

BIA RMP can buy maintenance equipment.

Eligible activity under BIA's maintenance rules

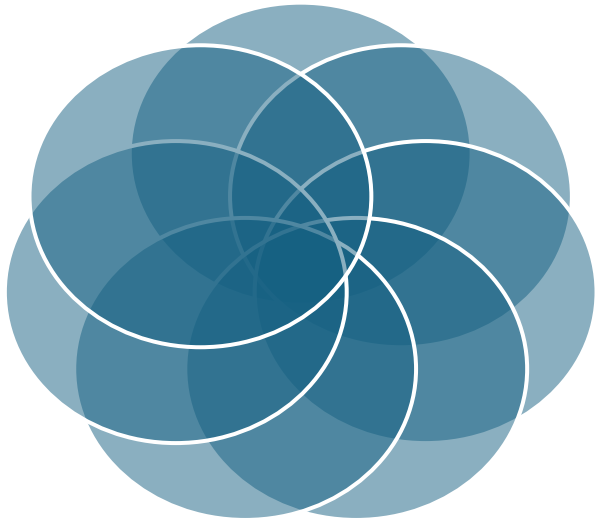
Sources: Bureau of Indian Affairs , Federal Highway Administration, Legal Information Institute, GovInfo

Current State of Tribal Level Road Maintenance

Most Common Tribal Road Maintenance Problems

Overlapping jurisdictions → unclear responsibilities

Contractor Dependency



Data gaps hinder priority-setting & funding cases

Chronic underfunding; large maintenance backlogs

Harsh weather & climate impacts (floods, snow, washouts)

Majority of roads unpaved → dust, erosion, weather damage

Actionable Fixes
Road Maintenance at the Tribe Level

- Adopt cost-saving methods (e.g., full-depth reclamation, gravel stabilization)
- Shift more work in-house with tribal crews & equipment
- Use condition surveys & digital mapping to improve data accuracy
- Form intergovernmental MOUs (Maintenance Operation Units) to clarify road ownership & maintenance roles
- Build grant-writing and asset-management capacity
- Pilot resilient designs to withstand weather extremes

Road Maintenance Budget Sources

BIA Road Maintenance Program (RMP) – core upkeep funds

Tribal Transportation Program (TTP) – flexible set-asides, construction + equipment

Excess/Surplus Federal Property Program – acquire low/no-cost equipment

IIJA/BIL competitive grants (Bridge Program, PROTECT, RAISE, etc.)

President's FY Budget ($ Millions) – potential expansion beyond $50M RMP base

State/County partnerships for shared routes (e.g., school-bus roads)

Components of 5-Year Transportation Improvement

Programs (TIPs) – BIA's 5-year road maintenance plans

#1 Routine Maintenance

#3 Corrective / Major Repairs

#5 Winter & Emergency Maintenance

#7 Planning & Reporting

#2 Preventive Maintenance

#4 Safety & Operations

#6 Equipment & Facility Needs

- Note: TIP structure with annual updates to adapt to funding and priority changes.

#1

Routine Maintenance

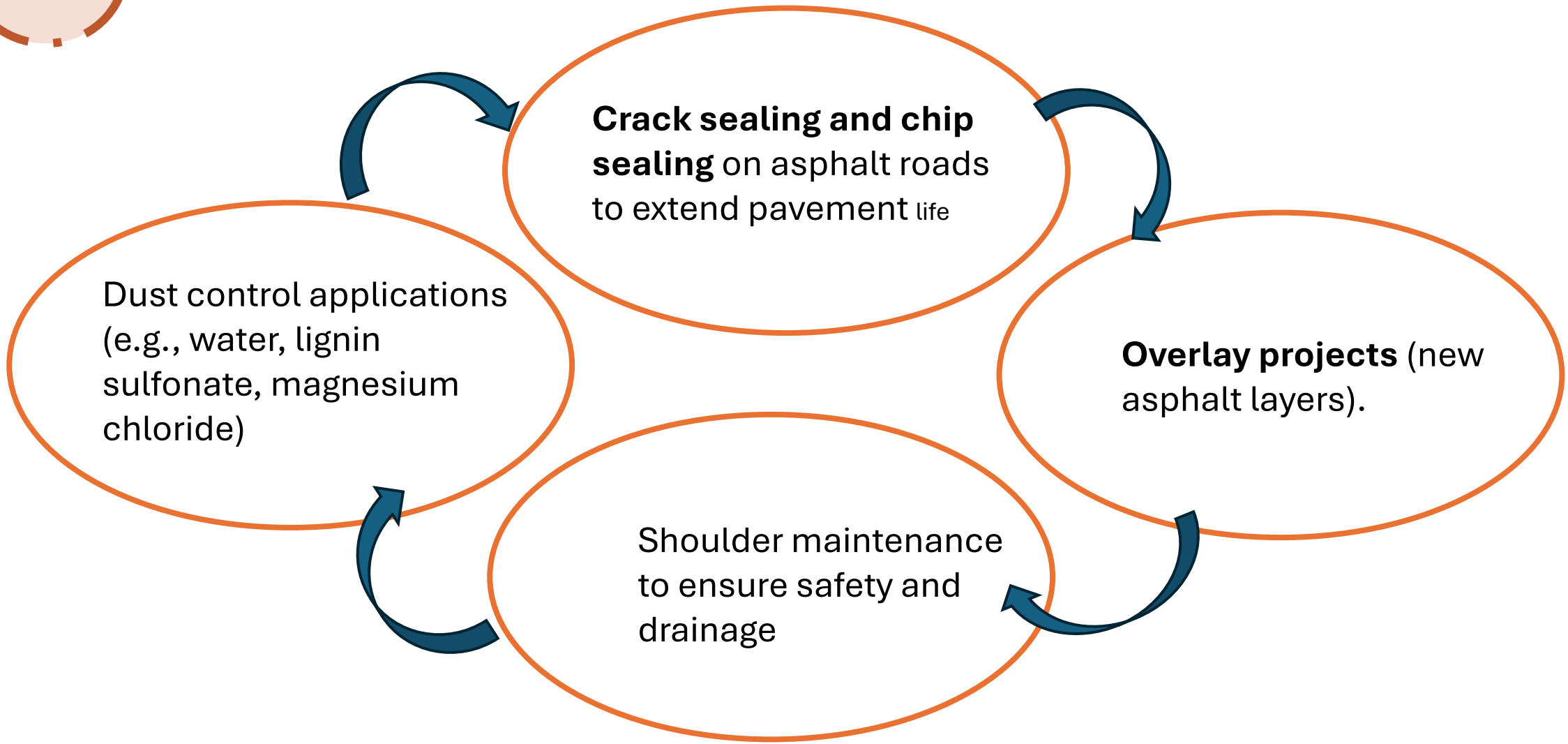
Grading of gravel/dirt roads (to correct rutting and wash-boarding)

Pothole patching and surface repairs on paved roads.

Dust control applications (e.g., water, lignin sulfonate, magnesium chloride)

Shoulder maintenance to ensure safety and drainage

#2 Preventive Maintenance



#3 Corrective / Major Repairs

Full Depth Reclamation (FDR) of failing asphalt sections and Gravel Roads.

Landslide or washout repairs on unstable slopes.

Drainage structure reconstruction (major culvert or ditch work).

Bridge deck replacement or major rehabilitation.

#6 Equipment & Facility Needs

Road maintenance equipment replacement cycles (reclamation machines, graders, dump trucks, plows, compactors).

Storage yard and shop upkeep

Fuel and materials stockpiling (salt, gravel, asphalt).

What shows up in real TTIPs

Exact language

Certification / cover page (example: Stillaguamish Tribe, 2023):

- Facilitating public involvement
- Consistency with the Tribal Long-Range Transportation Plan (LRTP)
- Projects listed as **"Official" NTTFI = National Tribal Transportation Facility Inventory**.
  - It has been formally approved and recognized by the BIA/FHWA
  - It becomes eligible for TTP Funding (Construction, Maintenance, and improvements)
- Projects **programmed for construction in the next 4 years**
- **Financially constrained**
- Carry-over of uncompleted projects
- Coordination with State DOT/MPO for regionally significant projects (if applicable).


Before
Rt 30 mp 11


After
Rt 30 mp 11

Let's Talk about what you can do starting today……

- FDR & Milling
- Road Stabilization
- Reducing Contractor Constraints and Dependency

Base Failure Repair: Full-Depth Reclamation

FDR is an in-place recycling method for reconstruction of existing flexible pavements using the existing pavement section material as the base for the new roadway-wearing surface.

- ***This process can include adding chemicals*** to the base layer in order to increase its strength capacity
- The treatment of the base layer and recycled asphalt ***provides a stronger foundation*** for present and future traffic
- This process effectively produces a ***cost-effective solution that maximizes limited budgets***
- The new chemically treated base section provides engineering benefits that perform as a foundation for the new wearing surface.

Full depth versus road reconstruction & Stabilization

PCA

think harder. concrete

Advantages of the FDR Process

- Use of in-place materials
- Little or no material hauled off and dumped
- Maintains or improves existing grade
- Conserves virgin material
- Saves cost by using in-place "investment"
- Saves energy by reducing mining and hauls
- Very sustainable process

What is Asphalt Milling?

The milling process involves removing the existing asphalt layer to prepare it for asphalt resurfacing.

Road crews use a specialized milling machine with rotating cutting drums to grind away the existing pavement

Milled Roads






Should Indian Tribes Use Asphalt Milling or Full Depth Reclamation for Road Repairs?

Your Asphalt Road Condition: If your asphalt has surface defects, minor cracks, or unevenness, pavement milling might be a good solution. It selectively removes the top layer of asphalt while preserving the underlying layers. FDR is better if you have an unstable road base or alligator cracks and potholes

Your Road Repair Budget: Asphalt milling can be less expensive short term because it fixes only the asphalt surface. Full depth reclamation is a more in depth process that may involve an upfront investment. The right equipment can lessen the impact to your budget.

Asphalt Pavement Outcome: Asphalt milling will address defective asphalt surfaces, improve road smoothness, or prepare for a new asphalt layer. Full depth reclamation is a long term road repair solution. It addresses the underlying structural issues and provides a stable road foundation.

Environmentally Friendly: both asphalt milling and full depth reclamation recycle asphalt. With the milling process, you will need to haul away the used material for other projects. Full depth reclamation recycles the asphalt millings as road base, avoiding the cost of transportation and purchasing new materials.

Cold-in-place Recycling (CIR) for Pavement Rehabilitation, Particularly on Low-volume Roads

- A considerable amount of CIR and FDR rehabilitation work is performed in conjunction with the proactive PMS. **Because these strategies are more cost-effective than overlay, mill and overlay, or reconstruction**, NDOT can rehabilitate more roads with less money.
- **In light of the increasing cost of hot-mix asphalt (HMA) mixtures and the limited availability of good materials, cold in-place recycling (CIR) offers an attractive alternative for rehabilitating asphalt pavements.**
- The CIR layer is treated as a stabilized base course followed by a thin HMA overlay.
- Cold in-place recycling (CIR) and full-depth reclamation (FDR) are two pavement rehabilitation strategies that have been used for more than 20 years. These strategies have allowed NDOT to save more than $600M over the past 20 years compared with complete reconstruction costs.
- The basic concept of the mix design is to assess the ability of the CIR process in providing a flexible and stable mix that can withstand the combined action of traffic loads and environment

Full Depth Reclamation

Gravel and Dirt Road Stabilization

Definitions of Road Stabilization (BIA Context)

DEFINITION

In Bureau of Indian Affairs (BIA) road maintenance terminology, road stabilization refers to any treatment or method used to **improve the structural integrity, durability, and safety of a roadway—especially unpaved (gravel or dirt) roads.** The purpose is to reduce dust, minimize erosion, improve load-bearing capacity, and extend the road's service life.

Stabilization can be either **temporary** (e.g., dust palliatives) or **permanent** (e.g., chemical or mechanical stabilization techniques).

Common BIA Road Stabilization Methods

- **Mechanical Stabilization**
  - Mixing soil, sand, gravel, or aggregates to improve strength and drainage.
  - Compaction to increase density and reduce rutting.
- **Chemical Stabilization**
  - Adding chemical agents (calcium chloride, magnesium chloride, lignin sulfonate, or synthetic polymers) to bind soil and reduce dust and wash boarding.
  - Cement or lime treatment for clay soils to harden the surface.
- **Bituminous Stabilization**
  - Using asphalt emulsions or foamed asphalt to stabilize base layers of gravel/dirt roads.
  - Provides a semi-paved, longer-lasting surface.
- **Dust Control Agents**
  - Chloride salts, lignosulfonates, or resins sprayed on unpaved roads to control airborne dust.
  - Often considered part of stabilization in the BIA maintenance program.

What Stabilization Material is Your Tribe using?

Mechanical Stabilization Methods

- Virgin aggregate
- Reclaimed Asphalt Pavement (RAP)
- Crushed Portland Cement Concrete (PCC)

Chemical stabilization is achieved with the addition of:

- Lime
- Portland Cement
- Fly ash
- Cement kiln dust
- Calcium/magnesium chloride
- Other proprietary chemical products

Bituminous stabilization can be accomplished with the use of:

- Liquid asphalt
- Asphalt emulsion
- Foamed Asphalt
- For increased stabilization requirements, combinations of all three can also be used.

Examples in Tribal Road Maintenance Stabilization

- **Example 1 – *Navajo Nation*:**
  Magnesium chloride applied to long stretches of dirt road to reduce dust and improve surface strength.
  - Result: fewer maintenance cycles, reduced grader passes, and improved safety for school buses.
- **Example 2 – *Standing Rock Sioux Tribe*:**
  Used Full Depth Reclamation (FDR) with cement stabilization on a heavily used reservation road.
  - Result: transformed a failing gravel road into a durable base that could support asphalt overlay, reducing contractor costs long-term.
- **Example 3 – *Alaska Native Villages*:**
  Mechanical stabilization with imported gravel and geotextiles on tundra roads.
  - Result: improved year-round access in extreme freeze-thaw conditions.

Example of Road Maintenance Partnership

Portland Cement Stabilization Video:

Benefits for Reducing Contractor Dependency for Road Repairs

- Empower tribes with tools, training & funding
- Reduce costs, delays, and dependency on contractors
- Strengthen sovereignty and create local jobs
- Cost savings over time
- Job creation and skill-building within the community
- Increase self-determination and reliance
- Faster response to road issues
- Sustainable infrastructure planning

Work Crew Development

Hire and Train Tribal Crews

Develop local road maintenance teams by hiring tribal members and providing training in asphalt repair, grading, chip sealing, and full depth reclamation (FDR).

Certifications & Skills Development

Encourage staff to get certifications through FHWA, BIA training programs, and state DOTs.

Partnerships with Technical Schools

Work with community colleges or vocational schools to build a pipeline of skilled workers

Acquire or Share Equipment

Purchase Essential Road Repair Equipment

Tribes can use **Tribal Transportation Program (TTP)** funds, **Road Maintenance Program (RMP)** funds, or even federal equipment surplus programs (like GSA Excess Property) to obtain graders, asphalt recyclers, compactors, and paving equipment.

Equipment Pools /Co-ops

Smaller tribes can form regional equipment cooperatives to share expensive machines, reducing the cost burden.

Maintenance Facilities

Maintenance Facilities
Building in-house repair shops ensures equipment stays functional and reduces reliance on outside mechanics.

Maximize Federal and State Funding

- **Leverage Multiple Budgets**
  Combine BIA Road Maintenance funds ($50M nationally), TTP funds ($613M), and set-aside programs (like Tribal High Priority Projects) to purchase and maintain equipment.

- **Apply for Competitive Grants**
  Programs like the **Rural Surface Transportation Grant Program** or **RAISE Grants** can support tribal infrastructure projects.

- **Excess/Surplus Federal Equipment**
  Access no- or low-cost equipment via the Federal Surplus Property Program.

Implement Cost-Effective Methods – Bringing Work Back-in-Tribe

- **Asphalt Recycling (Full Depth Reclamation, Cold In-Place Recycling)**
  These methods save money by reusing existing materials rather than importing new aggregate or asphalt.

- **Gravel Road Stabilization**
  Use chemical or mechanical stabilizers to extend the life of unpaved roads and reduce frequent grading.

- **Preventive Maintenance**
  Crack sealing, chip seals, and routine drainage work prevent major failures, cutting down expensive contractor interventions.

Governance and Planning

Integrate Road Work into Tribal Long-Range Transportation Plans (LRTPs)

Planning for in-house maintenance ensures funding is aligned with self-performed work.

Develop Standard Operating Procedures (SOPs)

Having consistent tribal protocols for road repair improves efficiency and accountability.

Prioritize Roads Strategically

Use asset management systems to decide which roads can be maintained by in-house crews and which need specialized contractors.

Success Stories (Proven Models)

Some tribes (e.g., Navajo, Choctaw, and smaller Midwest tribes) have shown ***cost savings of 20–40%*** by doing chip seals and FDR in-house versus contracting.

Shared equipment models between tribes have reduced per-project costs and increased independence from BIA contractors.

Challenges with Being Contractor Dependent

- Cost Overruns and Budget Constraints
- Delays in Scheduling Issues
- Lack of Local Contractors
- Regulatory and Compliance Burdens
- Limited Oversight Capacity
- Contract Management Challenges
- Lost Local Workforce Opportunities
- Tribal Sovereignty & Jurisdictional Conflicts

Typical Cost Breakdown – FDR with Asphalt Overlay

Component	Cost Range (Per Square Yard)	% of Total	Notes
1. Mobilization & Traffic Control	$0.50 – $1.50	5–10%	Setup, signs, detours, flagging
2. Pulverization / Reclamation	$1.50 – $3.50	15–20%	Includes milling & mixing base
3. Grading & Compaction	$0.50 – $1.50	5–10%	Moisture conditioning, shaping
4. Stabilizing Additives (if needed)	$0.50 – $2.00	5–15%	Cement, lime, emulsions
5. Asphalt Paving (Overlay)	$6.00 – $12.00	40–60%	For 2"–4" hot mix asphalt
6. Tack Coat / Prime Coat	$0.30 – $0.75	2–5%	Adhesion between layers
7. Striping & Marking	$0.10 – $0.50	1–3%	Pavement markings, signage
8. Testing & Quality Control	$0.10 – $0.40	1–3%	Soil/asphalt compaction, mix tests
9. Contingency / Misc.	$0.50 – $1.50	5–10%	Drainage, cleanup, erosion control

- **Per Square Yard**: **$10 – $23**
- **Per Lane Mile** (12-ft wide, ~14,000 sq yd): **$140,000 – $320,000**

Milling and FDR Machines

Reclamation / FDR Machines

Funding Sources for Equipment Acquisitions

TTP Formula Funds (FHWA) - $613 Million

With prior approval and a written lease-vs-buy cost analysis, and the purchase must be listed on a FHWA-approved TTIP. eCFR

Maintenance cap: TTP funds may be used for maintenance up to 25% of a tribe's TTP share or $500,000 (whichever is greater); road sealing is not subject to this cap.

-)

BIA Road Maintenance (RMP, TPA line) - $50 Million

The BIA Transportation Facility Maintenance / rules include as eligible activities the "leasing, renting, or purchasing of maintenance equipment."

(List of eligible uses for the BIA maintenance program.) GovInfo

Tribal High Priority Projects (HPP) – TTP set-aside (competitive)

Equipment may be purchased when it is tied to a funded construction project and consistent with Federal law and program guidance.

Under the Infrastructure Investment and Jobs Act (IIJA), $9 million per year from the Tribal Transportation Program (TTP) is set aside exclusively for the Tribal HPP Program.

Excess/Surplus Federal property (no-/low-cost equipment) (No budget $'s)

FHWA Federal Lands can facilitate transfer of excess/surplus personal property to tribes to enhance transportation.

Tribes can take ownership of equipment that federal agencies no longer need—free of charge, aside from handling and transportation costs.

Approximate BIA Regional Allocations:

Region	Regional Office	Tribes	Approx Annual BIA Budget (Millions)
Alaska	Anchorage, Alaska	229	$2.0 - $2.5
Eastern	Nashville, Tennessee	34	$.8 - $1.2
Eastern Oklahoma	Muskogee, Oklahoma	17	$1.0 - $1.5
Great Plains	Aberdeen, South Dakota	16	$3.5 - $4.5
Midwest	Bloomington, Minnesota	36	$1.5 - $2.5
Navajo	Window Rock, Arizona	1	$4.0 - $5.0
Northwest	Portland, Oregon	45	$2.5 - $3.5
Pacific	Sacramento, California	104	$1.5 - $2.0
Rocky Mountain	Billings, Montana	10	$2.0 - $3.0
Southern Plains	Anadarko, Oklahoma	24	$2.0 - $2.5
Southwest	Albuquerque, New Mexico	24	$2.5 - $3.5
Western	Phoenix, Arizona	53	$3.0 - $4.0

Call to Action

- Use budgets to build maintenance equipment inventory to enable FDR and Stabilization within Local Tribal or Agency Jurisdiction
- Hire Consultants to supplement the Tribal knowledge gap about opportunities
- Partner with DOT's, Public Works Departments (Counties and Municipalities)
- Develop ways to partner with Contractors
- Use budgets and financial resources available to your tribe to build your respective Road Maintenance Department staffs
- Contract -out for parts of the project you can not do in-house, i.e. Chip Seal, Stabilization or Asphalt Overlays.

Questions & Discussion

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