

BEFORE THE FEDERAL COMMUNICATIONS COMMISSION

Washington, D.C. 20554

In the Matter of	)	
	)	
Modernizing the E-Rate Program	)	WC Docket No. 26-133
	)	
Schools and Libraries Universal Service Support Mechanism	)	WC Docket No. 13-184
	)	
Draft Eligible Services List for Funding Year 2027	)	DA 26-647

COMMENTS OF JASON KRONEMEYER

Jason Kronemeyer, Community Technologist with the EUPConnect Collaborative, Research Fellow with the Quello Center at Michigan State University, and adjunct faculty at Bay Mills Community College, respectfully submits these comments in response to the Wireline Competition Bureau's Public Notice releasing the draft Eligible Services List for Funding Year 2027 (DA 26-647, rel. June 30, 2026), and in connection with the Commission's Notice of Proposed Rulemaking and Further Notice of Proposed Rulemaking in *Modernizing the E-Rate Program* (FCC 26-41). These comments are grounded in the commenter's applied field experience with Section 11x(6) school-infrastructure feasibility and consolidation planning in Michigan's Eastern Upper Peninsula, including feasibility work for North Dickinson County Schools and consolidation planning work associated with Sault Area Public Schools.

SUMMARY

The draft FY2027 Eligible Services List (ESL) proposes no substantive changes to eligible services and raises only questions aimed at *narrowing* the program — specifically, whether Managed Internal Broadband Services (MIBS) remain cost-effective and how to treat variable-priced Network-as-a-Service (NaaS) offerings. The commenter respectfully submits that this is the wrong bearing at the wrong moment.

The original E-Rate mission — delivering broadband to the schoolhouse door — is largely accomplished. The frontier has moved *inside the building*, where aging copper infrastructure must be rewired around converged information, communications, and energy technology (ICET). The ESL's Category One / Category Two taxonomy, and its per-student Category Two budget of \$201.57, do not name or fund this converged architecture, forcing districts into case-by-case eligibility disputes or deferral of investments that generate a documented ten-year return. This timing is consequential: the nation's school buildings are entering a capital cycle in which deferred maintenance, bond refinancing, facility consolidation, and electrification pressures are converging at once, and the FY2027 ESL will shape what districts can fund during that window.

The commenter recommends that the Commission (1) recognize ICET convergence in the ESL taxonomy by naming structured fiber cabling, Passive Optical LAN (POLAN), Power-over-Ethernet and Fault-Managed Power Systems (FMPS), and resilience/energy-integration systems; (2) create a capital modernization track distinct from the annual Category Two budget, evaluated on ten-year

total cost of ownership; (3) preserve MIBS and NaaS as the essential on-ramp for small and rural entities, and modernize FCC Forms 470 and 471 to accommodate usage-based pricing rather than narrowing eligibility; (4) retain and coordinate special construction and self-provisioned fiber with BEAD and state programs; and (5) evaluate Universal Service Fund investments by outcomes, not inputs.

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I. INTEREST OF THE COMMENTER

The commenter is a community technologist and data scientist who has led or contributed to Section 11x(6) school-consolidation and infrastructure feasibility work in Michigan’s Eastern Upper Peninsula, a rural, high-cost region bordered by the Great Lakes and international boundaries. This includes feasibility work for North Dickinson County Schools in partnership with the Dickinson-Iron Intermediate School District, and consolidation planning work associated with Sault Area Public Schools. The commenter also leads the EUPConnect Collaborative, a regional initiative focused on broadband, digital equity, and infrastructure modernization, and serves as a Research Fellow with the Quello Center at Michigan State University. These comments draw directly on that applied field experience with the physical and financial realities of modernizing school infrastructure in the communities E-Rate exists to serve.

II. THE DRAFT FY2027 ESL FREEZES THE LIST AT THE MOMENT IT SHOULD MODERNIZE

The draft FY2027 ESL (DA 26-647) proposes to carry Category One and Category Two forward substantially unchanged from FY2026. The only significant questions the Bureau raises concern *contraction* — whether MIBS remains sufficiently cost-effective to stay eligible, and how to handle the variable pricing common to NaaS.

Read alongside the modernization NPRM (FCC 26-41), which questions whether E-Rate has met its mission now that nearly all schools reach fiber broadband, the direction is clear and, respectfully, misdirected. The Commission is correct that the problem of *reaching* the schoolhouse door is largely solved. But that is precisely why the program’s attention must now turn to what happens *inside* the building. Freezing the eligible list — and asking only what to cut — at the exact moment districts must rewire aging facilities is the wrong bearing.

The urgency is not abstract. The ESL comment window is the only formal opportunity this year to tell the Bureau what the list should fund, and it closes on July 30, 2026. At the same time, the NPRM asks whether the program itself should be narrowed or reoriented. If the ESL stays silent on converged infrastructure while the modernization proceeding moves toward retrenchment, E-Rate risks locking in a pre-digital definition of school infrastructure precisely when the nation’s buildings must be rewired.

That risk is grounded in the physical reality of the building stock. Most of the school buildings that will still be in service in 2050 already exist today; they were built or last modernized between the 1960s and 1990s, designed around analog systems, and engineered without the need for high-capacity data networks. Such buildings do not fail overnight — they fall behind until they cannot catch up. School districts across Michigan and the country are entering a capital cycle in which deferred maintenance, bond refinancing, facility consolidation, and electrification pressures converge simultaneously. The FY2027 ESL will shape what districts can fund during that window. Freezing it now means treating the building as an afterthought at the very moment the building itself has become the frontier.

The commenter uses the word *modernize* deliberately, consistent with the Commission’s own framing. Modernization should mean aligning the eligible-services taxonomy with the architecture that schools are actually being designed and rebuilt around, not holding the list static while narrowing its edges.

III. WHAT THE ELIGIBLE SERVICES LIST FAILS TO NAME

The modern school building is no longer a data network with lights attached; it is a converged information, communications, and energy system. The ESL’s current taxonomy does not name the following converged technologies, leaving them to inconsistent, case-by-case eligibility determinations during application review:

A. Whole-building structured fiber cabling. Cabling is nominally eligible under Category Two, but the FY2026–2030 Category Two budget of \$201.57 per student (with a \$30,175 floor and \$66,385 for Tribal libraries) was never scaled to *rewire a building*. The physical scope is significant: a small building rewire runs on the order of \$120,000–\$150,000 in cabling alone; a medium-sized building runs \$150,000–\$750,000; and a large building can run \$750,000–\$2 million. Much of the nation’s school stock runs on aging Cat5e/Cat6 copper in distributed closets that are themselves points of failure and recurring cost. Structured fiber re-cabling — a physical layer with a 20-to-30-year lifecycle — should be recognized as a fundable modernization at the scale it requires.

B. Passive Optical LAN (POLAN). POLAN replaces power-hungry closet switches with passive optical splitters served from a centralized optical line terminal, and pairs naturally with converged power. Independent, real-world evidence is consistent: an APOLAN cost study found POLAN 40–56% less expensive across deployment scenarios ranging from a single building to a multi-building campus, and White Plains School District reported an initial network build roughly 30% lower after replacing legacy switching across nine buildings with POLAN. Yet optical network terminals are only narrowly eligible as Category One equipment when carrier-owned. A modernized ESL should treat POLAN electronics, splitters, and optical network terminals as first-class eligible internal infrastructure.

C. Converged power: PoE and Fault-Managed Power Systems (FMPS). In a converged building, the network is also the power distribution system. Power-over-Ethernet now drives lighting, sensors, displays, access control, and IP audio, and DC Fault-Managed Power Systems (Class 4 power) extend that convergence safely from a centralized node. FMPS is not an experimental or proprietary concept: it is a formally recognized power class, defined as “Class 4” in Article 726 of the 2023 National Electrical Code (NFPA 70) — the first new power class added to the Code in decades — and governed by the UL 1400-1 (systems) and UL 1400-2 (cable) safety standards.¹

¹National Fire Protection Association, *National Electrical Code (NFPA 70)*, Art. 726 (2023 ed.) (establishing Class 4 “Fault-Managed Power Systems”); Underwriters Laboratories, UL 1400-1 (Outline of Investigation for Fault-Managed Power Systems) and UL 1400-2 (fault-managed power system cable). *See generally* Mark C. Ode, *Class*

The commenter’s North Dickinson study is architected around exactly this model — a single central network-and-power location feeding the building over a hybrid fiber-and-copper backbone supporting Class 4 fault-managed power. A PoE lighting retrofit at one middle school used 30% fewer fixtures and could be installed by the IT cabling team rather than licensed electricians on every run. The ESL and its list of ineligible components, however, continue to treat “electrical infrastructure” and equipment “servicing only ineligible items” as categorically off-limits, an artifact of a pre-convergence era. That a nationally codified, UL-listed power-distribution technology has no place in the eligible-services taxonomy is itself evidence that the list has fallen behind the built environment it is meant to support.

D. Energy-integration and resilience controls. A fiber-rich campus is the control plane for solar-plus-storage microgrids, load tiering, and grid-enabled buildings — the systems that keep communications, security, and emergency instruction operating during outages, in some documented cases for up to 96 hours in island mode. The ESL provides no vocabulary for the information-and-communications layer of this resilience infrastructure, even though it is inseparable from the eligible broadband network on which it rides.

E. The integrated safety and emergency-communications fabric. Districts increasingly converge public address, intercom, E911, panic-alert initiation, and mass notification onto the IP network. In the commenter’s North Dickinson work, this convergence was the district’s principal motivation, as it was the only district in its intermediate district not yet integrated into shared emergency-notification and access-control systems. Much of this fabric is stranded as ineligible because it touches safety systems, even though it is delivered over — and wholly dependent upon — the eligible internal network.

IV. WHY IT MATTERS: THE TEN-YEAR RETURN THE CURRENT LIST FORGOES

The case for naming these technologies is fiscal as much as technical, and it directly answers the Bureau’s stated concern with cost-effectiveness. A building re-architected around converged fiber and POLAN rather than patched copper yields a ten-year-plus return: a conservatively estimated 30-to-50% reduction in information-technology energy consumption,² wiring closets decommissioned and repurposed for instructional use, active-switch refresh cycles of five-to-seven years replaced by passive splitters requiring no comparable replacement, and simplified operations.

The scale of deferred need is documented across the commenter’s studies. The Section 11x(6)

⁴ *Fault-Managed Power Systems: An Overview of This New Classification in the 2023 NEC*, Electrical Contractor Magazine (Apr. 14, 2023); D. Lorusso et al., *Introduction to Fault-Managed Power*, IEEE Symposium on Product Compliance Engineering (ISPCE 2025) (documenting compliance with UL 1400-1, UL 62368-1, ATIS-0600040, and IEC 61508).

²The 30-to-50% figure is conservative relative to both peer-reviewed and industry analysis. For peer-reviewed treatment of passive optical network energy efficiency, see J. Lorincz, E. Čusto & D. Begušić, *A Comprehensive Analysis of Methods for Improving and Estimating Energy Efficiency of Passive and Active Fiber-to-the-Home Optical Access Networks*, 25 Sensors 6012 (2025), doi:10.3390/s25196012; and *Energy Conservation in Passive Optical Networks: A Tutorial and Survey*, IEEE Access (2024), <https://ieeexplore.ieee.org/document/10522488>. For industry analysis, see FTTH Council Europe, *Leveraging Fibre Network Benefits with Optical LAN Technology* (Mar. 2026) (reporting up to approximately 70% lower energy consumption for Optical LAN relative to legacy switching, alongside 40–56% upfront cost reductions), <https://www.ftthcouncil.eu/resources/all-publications-and-assets/2670/>; and Tellabs, *Optical LAN Energy Usage Comparison Unveils Rippling Effect for Building Power and Cooling Savings* (June 7, 2022) (energy cost model comparing a 188-switch traditional LAN to an Optical LAN design serving 9,000 endpoints, showing approximately 60% savings in both network power and building air-conditioning load), <https://tellabs.com/optical-lan-energy-comparison-unveils-rippling-effect-for-building-power-and-cooling-savings/>.

feasibility study for North Dickinson County Schools — a small rural district consolidating shared services with the Dickinson-Iron ISD under a \$108,394 planning grant — identified approximately \$6.95 million in ten-year repair needs, including roughly \$2.67 million in HVAC and \$1.69 million in electrical and power systems: precisely the categories a converged ICET design allows a district to plan and finance once rather than piecemeal. At a larger scale, consolidation planning work associated with Sault Area Public Schools positions that multi-building district to pursue on the order of \$32.5 million in state consolidation funding, grounded in 2025 State Facilities Study repair estimates and the case for consolidating into modern, converged campuses. The lesson holds across scales: the building itself is now the frontier, and the returns compound whether a district is retiring a handful of data closets or several aging schools.

Extended across the more than 100,000 schools and libraries the program connects nationwide,³ the implication is direct: the nation’s school buildings must be rewired, and an eligible-services list that funds only thin internal connections — and now proposes to freeze even that — pushes districts to defer the very modernization that would pay for itself. There is, additionally, a workforce return: converged ICET buildings serve as living laboratories for career and technical education in energy, networking, and building-systems trades, converting infrastructure investment into local skills.

V. SMALL AND RURAL ENTITIES CANNOT MODERNIZE WITHOUT MANAGED SERVICES

The commenter respectfully submits that the draft’s scrutiny of MIBS and NaaS is aimed at the wrong target and would fall hardest on the applicants least able to absorb it. For a small, rural district or library — the profile of most Eastern Upper Peninsula applicants — the capacity to *design, deploy, and manage* a modern converged network in-house is nearly nonexistent. These entities typically have no advanced network engineer on staff, no network operations center, and no facilities engineer conversant in optical LAN, PoE, and fault-managed power. The specialized talent a converged building demands is precisely the talent scarcest in the communities E-Rate is meant to serve.

Managed Internal Broadband Services and Network-as-a-Service are the mechanisms that close this gap. They are not a cost-control loophole to be regulated away; they are the on-ramp that allows a district with one or two IT generalists to operate infrastructure it could never independently architect, staff, or maintain. A managed model converts an otherwise impossible capital-and-talent burden into a predictable operating relationship, and it is often the vehicle through which small districts capture the shared-services efficiencies that make consolidation viable at all.

Accordingly, proposals to cap MIBS by applicant size, or to reimburse it only on a narrow hours-worked basis, would disproportionately harm the smallest applicants. With respect to NaaS, the difficulty is not the model but the paperwork: because FCC Forms 470 and 471 are structured around a fixed monthly cost, they penalize legitimate usage-based pricing. The remedy is to modernize the forms, not to strand districts that can only afford infrastructure delivered as a service. For a small entity, cost-effectiveness is not the lowest line item on a bid; it is the ability to operate a modern, secure network at all.

³Universal Service Administrative Company, *Open Data Portal — E-Rate Data* (“100,000+ schools and libraries connected”), <https://opendata.usac.org/>. See also Federal Program Inventory, *Universal Service Fund — Schools and Libraries* (CFDA 32.004) (reporting more than 98,000 schools and 11,000 libraries among recipients).

VI. RECOMMENDATIONS

The commenter respectfully recommends that the Commission and the Bureau:

1. **Recognize ICET convergence in the ESL taxonomy.** Add explicit, named eligible categories for structured fiber cabling, POLAN electronics/splitters/optical network terminals, PoE and Class 4 Fault-Managed Power distribution, and the information-and-communications layer of resilience and energy-integration systems. Where a component serves both the eligible network and a converged function, adopt clear cost-allocation guidance in lieu of blanket ineligibility.
2. **Create a capital modernization track distinct from the annual Category Two budget.** A \$201.57-per-student allowance cannot rewire a building. A lifecycle-based modernization category, evaluated on ten-year total cost of ownership and return on investment, would fund the physical layer at the scale and cadence it requires and would allow E-Rate to stack cleanly with state consolidation programs such as Michigan’s Section 11x, 11y, and 12e rather than working at cross purposes with them.
3. **Preserve MIBS and NaaS as the small-entity on-ramp.** Decline to cap or narrow MIBS by applicant size. Instead, (a) modernize FCC Forms 470 and 471 to accommodate variable, usage-based pricing, and (b) evaluate managed-service and NaaS bids against the realistic in-house capacity of the applicant and the lifecycle cost of ownership, making cost-effectiveness a comparison of architectures rather than a rationale for exclusion.
4. **Retain and coordinate special construction and self-provisioned/dark fiber.** For border, island, and high-cost rural regions such as the Eastern Upper Peninsula, these remain essential. Rather than withdraw support in light of BEAD, the Commission should coordinate E-Rate with BEAD and federal energy incentives through fund-stacking and utility partnerships.
5. **Evaluate USF investments by outcomes.** Assess Universal Service Fund support against connectivity, skills, application, and community outcomes, so that “modern infrastructure” is measured by the institutional and human capacity it enables, not solely by transmission capacity delivered.

VII. CONCLUSION

The Commission is right that the original mission of reaching the schoolhouse door is substantially accomplished. The modern mission — the one the draft FY2027 Eligible Services List has not yet caught up to — is to help the nation’s schools rewire the building itself around converged information, communications, and energy technology, and to capture the decade-long return that convergence makes possible. Across a small rural district and a larger multi-building system alike, the finding is the same. Modernizing the Eligible Services List to name these technologies is not an expansion of E-Rate’s purpose; it is fidelity to it. The commenter respectfully urges the Commission and the Bureau to modernize, rather than merely freeze or narrow, the Eligible Services List.

Respectfully submitted,

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Dated: July 16, 2026