

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 and adjunct faculty at Bay Mills Community College, 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 Upper Peninsula, including feasibility work for North Dickinson County Schools and consolidation planning 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, it asks whether Managed Internal Broadband Services (MIBS) remain cost effective and how to treat variable priced Network-as-a-Service (NaaS) offerings. That is the wrong bearing at the wrong moment.

The original E-Rate mission of 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 and Category Two taxonomy, along with its per student Category Two budget of \$201.57, does not name or fund this converged architecture. That omission forces 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. The FY2027 ESL will shape what districts can fund during that window. The Commission should recognize ICET convergence in the ESL taxonomy, create a capital modernization track distinct from the annual Category Two budget, preserve MIBS and NaaS as the essential on ramp for small and rural entities, retain and coordinate special construction and self provisioned fiber with BEAD and state programs, and evaluate Universal Service Fund investments by outcomes rather than 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 Upper Peninsula, a rural and high cost region bordered by the Great Lakes and international boundaries. This work includes feasibility planning for North Dickinson County Schools in partnership with the Dickinson-Iron Intermediate School District, and consolidation planning associated with Sault Area Public Schools. The commenter also leads the EUPConnect Collaborative, a regional initiative focused on broadband, digital opportunity, and infrastructure modernization. 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. Specifically, the Bureau asks whether Managed Internal Broadband Services (MIBS) remain sufficiently cost effective to stay eligible, and how to handle the variable pricing common to Network-as-a-Service (NaaS).

This is the wrong bearing at the wrong moment. Read alongside the modernization NPRM (FCC 26-41), which asks whether E-Rate has met its mission now that nearly all schools reach fiber broadband, the direction is clear and misdirected. The Commission is correct that the problem of reaching the schoolhouse door is largely solved. That is precisely why the program's attention must now turn to what happens inside the building.

Freezing the eligible list and focusing only on potential reductions at the exact moment districts must rewire aging facilities is the wrong policy direction. 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 remains 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 school buildings that will still be in service in 2050 already exist today. Many 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 are converging at once. The FY2027 ESL will shape what districts can fund during that window. Freezing the list now treats 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 align the eligible services taxonomy with the architecture that schools are actually being designed and rebuilt around. It should not hold 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 current ESL taxonomy does not name the following converged technologies, which leaves 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 through FY2030 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 can run on the order of \$120,000 to \$150,000 in cabling alone. A medium sized building can run \$150,000 to \$750,000. A large building can run \$750,000 to \$2 million. Much of the nation's school stock runs on aging Cat5e and Cat6 copper in distributed closets that are points of failure and recurring cost. Structured fiber recabling is a physical layer with a 20 to 30 year lifecycle and 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. It also pairs naturally with converged power. Independent, real world evidence is consistent. An APOLAN cost study found POLAN 40 to 56 percent less expensive across deployment scenarios ranging from a single building to a multi building campus. White Plains School District reported an initial network build roughly 30 percent 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. DC Fault-Managed Power Systems, also known as Class 4 power, extend that convergence safely from a centralized node. FMPS is not experimental or proprietary. It is a formally recognized power class, defined as Class 4 in Article 726 of the 2023 National Electrical Code (NFPA 70), and governed by the UL 1400-1 systems and UL 1400-2 cable safety standards.[1]

The commenter's North Dickinson study is architected around this model. It uses a single central network and power location feeding the building over a hybrid fiber and copper backbone that supports Class 4 fault-managed power. A PoE lighting retrofit at one middle school used 30 percent fewer fixtures and could be installed by the IT cabling team rather than requiring 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. That approach reflects a pre convergence era. A nationally codified, UL listed power distribution technology should have a place in the eligible services taxonomy.

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. These are the systems that keep communications, security, and emergency instruction operating during outages. In some documented cases, they support island mode operation for up to 96 hours. 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, because 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 well as technical, and it directly answers the Bureau's concern with cost effectiveness. A building re architected around converged fiber and POLAN rather than patched copper yields a return that extends beyond ten years. The return includes an estimated 30 to 50 percent reduction in information technology energy consumption,[2] decommissioned wiring closets that can be repurposed for instructional use, replacement of five to seven year active switch refresh cycles with passive splitters that do not require comparable replacement, and simplified operations.

The scale of deferred need is documented across the commenter's studies. The Section 11x(6) 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. This included roughly \$2.67 million in HVAC and \$1.69 million in electrical and power systems. These are precisely the categories a converged ICET design allows a district to plan and finance once rather than piecemeal.

At a larger scale, consolidation planning associated with Sault Area Public Schools positions that multi building district to pursue approximately \$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. An eligible services list that funds only thin internal connections, and now proposes to freeze even that, pushes districts to defer modernization that would pay for itself. There is also a workforce return. Converged ICET buildings can 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 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. Many small rural districts and libraries in Michigan's Upper Peninsula have limited capacity to design, deploy, and manage a modern converged network in house. 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 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 not independently architect, staff, or maintain. A managed model converts an otherwise impossible capital and talent burden into a predictable operating relationship. It is often the vehicle through which small districts capture the shared services efficiencies that make consolidation viable.

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. FCC Forms 470 and 471 are structured around a fixed monthly cost, which can 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 simply the lowest line item on a bid. It is the ability to operate a modern, secure network at all.

VI. RECOMMENDATIONS

The commenter recommends that the Commission and the Bureau:

1. **Recognize ICET convergence in the ESL taxonomy.** Add explicit eligible categories for structured fiber cabling, POLAN electronics, splitters, optical network terminals, PoE, 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 instead 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. It would also 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, modernize FCC Forms 470 and 471 to accommodate variable usage based pricing, and evaluate managed service and NaaS bids against the realistic in house capacity of the applicant and the lifecycle cost of ownership. Cost effectiveness should compare architectures rather than serve as a rationale for exclusion.
4. **Retain and coordinate special construction and self provisioned or dark fiber.** For border, island, and high cost rural regions such as Michigan's Upper Peninsula, these tools 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. Modern infrastructure should be 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 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 that purpose. The commenter 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

[1] National 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 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).

[2] The 30 to 50 percent 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 percent lower energy consumption for Optical LAN relative to legacy switching, alongside 40 to 56 percent 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 percent 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/>.

[3] Universal 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).