

Categories have been arranged for alignment with CEN's [Strategic Plan](#).

1. Provide Value

- DDoS Mitigation Summary Review

- 2023-2024 Academic Year (August 1, 2023 – December 1, 2023)

Number of TMS Mitigations	Volume of Traffic Passed by TMS	Volume of Traffic Dropped by TMS	Volume of Largest TMS Mitigation	Rate of Largest TMS Mitigation	Duration of Longest TMS Mitigation
143 ↓5.92%	523.93 GB ↓90.25%	7.45 TB ↑118.52%	2.47 TB ↑352.40%	21.95 Gbps ↑21.60%	0d 13h 13m ↑254.59%

Bottom row indicates increase or decrease from prior period (March 29 2023 4:51 - August 01 2023 4:00).

- 2023 Calendar Year (January 1, 2023 – December 1, 2023)

Number of TMS Mitigations	Volume of Traffic Passed by TMS	Volume of Traffic Dropped by TMS	Volume of Largest TMS Mitigation	Rate of Largest TMS Mitigation	Duration of Longest TMS Mitigation
404 ↑87.04%	10.51 TB ↑22.25%	35.81 TB ↑184.28%	16.63 TB ↑1145.20%	25.26 Gbps ↓6.88%	0d 23h 45m ↓97.87%

Bottom row indicates increase or decrease from prior period (January 31 2022 8:58 - January 02 2023 5:00).

- CT Library Fiber Consortium (CLFC) – Fiber to the Library (FTTL)

- ALL primary principal libraires connected and completed as of October 2023!
- Project to connect libraries to fiber internet through federal E-rate and matching State Library bonded funds. Many library locations connect underserved communities where broadband internet options have remained relatively unchanged for decades. This project provides high-quality enterprise grade *dedicated* internet service at reasonable costs to bridge gaps in the digital divide and help libraries continue to thrive as information activity hubs and community assets. The program beginning in September 2016 across all project phases (1–8) brought total fiber-connected primary principal libraries to 150 representing 78% of all 191 primary principal libraries statewide.
- Impact statements from connected libraries:
https://libguides.ctstatelibrary.org/ld.php?content_id=45093658
- Any remaining libraries not currently connected to CEN are eligible to connect with ARPA-CPF funds allocated to CEN. The CEN Connect / ARPA-CPF project is available as of November 2023 and must end by December 2026 per program rules.

- CT Library Fiber Consortium – Internal Connections (FTTL-IC) <https://ctedunet.net/fttl-ic/>

- The goal is to help libraries with internal network infrastructure to better serve library operations.
- Libraries will receive assessments, prioritized remediation plans, and awards to assist each.
- Phase 1 – Assessments: 41 libraries in program; 41 assessments complete & delivered.
- State library prioritized awards using standardized assessment, total funds available, and Adjusted Equalized Net Grand List per Capita (AENGLC) rank. AENGLC, more specifically AENGLC rank, is used in determining the state support percentages for reimbursement under adult education, school construction and health services. <https://portal.ct.gov/SDE/Fiscal-Services/AENGLC>
- Of the 41 assesses, 5 have refused Phase 2 funds, 36 are proceeding. Those who refused took recommendations and implemented them themselves, some with American Rescue Plan (Act (ARPA) State and Local Fiscal Recovery Funds (SLFRF) from their municipalities.
- Phase 2 – Remediations: State library has authorized funding recommendations and is in process of getting award contracts signed to release releasing funds to individual libraries for equipment and labor to remediate issues.

- CEN, through subcontractor Novus Insight, will follow up with statements of work (SOWs), confirmation of equipment bill of materials, labor estimates, aggregation of orders, procurement, and installation scheduling.
- New Member-Customers since the last Commission meeting (in order of turn up)
 - Cloudsmart Inc.
 - Kent School
 - Department of Transportation (DOT) - *CEN is providing transport connectivity to DOT Headquarters and 62 Maintenance facilities and garages over a period of two years. Sites will be listed as they are completed. 5 sites were completed as of the last report.*
 - Branford Maintenance Garage
 - New Canaan Maintenance Garage
 - Thomaston District 4 Headquarters
 - Plainfield Signs & Markings Facility
 - Danbury Maintenance Garage
 - East Granby Repair Garage
 - Pomfret Maintenance Garage
 - Southbury Maintenance & Electrical Facility
 - New Haven District 3 Headquarters & Garage
 - Trumbull Property & Facilities Region 3
 - Colchester Maintenance Garage
 - Meriden Maintenance Garage
 - Rocky Hill District 1 Headquarters Office Bldg.
 - Glastonbury Maintenance Garage
- Exiting Member-Customers since the last Commission meeting disconnecting (in order of turn down)
 - Rensselaer Polytechnic Institute (RPI) – closed and sold the building/campus.

Current Member Count = 686

*Effective 12-1-21 member count process has been adjusted to reflect multi-site organizations as one member throughout the community.

2. Ignite Innovation

- PerfSONAR Servers
 - 12/4 Update - Site surveys complete. Servers on order.
 - perfSONAR is the **performance Service-Oriented Network monitoring Architecture**, a network measurement toolkit designed to provide federated coverage of paths, and help to establish end-to-end usage expectations, ensuring friction free use of networks for scientific applications. This infrastructure helps to identify and isolate problems as they happen, making the role of supporting network users easier for engineering teams, and increasing productivity when utilizing network resources.
 - Scope is to install 100Gbps PerfSONAR servers at the hub and extranet sites to provide independent tooling for measurement of capacity and throughput helping ensure the highest quality of network experience for the membership, and will make these available to the community to run diagnostics from any member site.
- NTIA Middle Mile Grant Program
 - 12/4 Update - assessing self-funding opportunities and may pursue through state funds.
 - Awards announced 6/16/2023; CEN's proposal was *not selected*. Program summary:

- \$1 billion program allocation within in Infrastructure Investment Jobs Act (IIJA)
- Over 260 applications were submitted totaling \$7.47 billion in funding requests.
- Applications for the Middle Mile program was due by September 30, 2022. NTIA extended the application deadline to Nov. 1, 2022, for eligible entities that submitted applications for projects that would deploy in areas impacted by natural disasters.
- Eligible awardees for the program included states, Tribal governments, utility companies, telecommunication companies, and nonprofit entities.
- CEN proposal debrief; Aug 9, 2023, with NTIA program director.
 - CEN proposal was strong, though ultimately fell short. Most significant opportunity that may have had influence was matching funds. All awarded proposals were at least 50% whereas CEN's was at 41%. Other feedback highlighted many strengths and few other opportunities.
 - CEN Director editorial: NTIA requested additional information and dialog up to the week before awards were announced. We were *very close*.
- Award Summary Information
 - \$930 million awarded to 35 entities June 16; \$50 million awarded to 3 entities later.
 - Over 12,000 route miles of construction; \$77.5K per mile
 - Extremely competitive solicitation: ~14% hit rate; 7.5X over subscribed.
 - Zayo was the only multiple award winner; 3 proposals; ~10% of the funding.
 - Project size and level of match mattered.
 - Large projects favored (total project cost below)
 - Median \$43.3 million
 - Mean \$50.8 million
 - Minimum \$4.6 million (Pueblo CO)
 - Maximum \$187.6 million (California Dept. of Technology) [~13% of funding]
 - Exceeding the minimum match requirement (30% except Tribes) was critical.
 - Median match 50%
 - Mean match 48%
 - Only 17% (6) of the grants had an interstate component.
 - Lead Organization Distribution
 - Regional telecoms – 7 (20%)
 - Electric utilities – 5 (14%)
 - Joint ventures (JVs) – 5 (14%)
 - National telecoms – 4 (11%) [three to Zayo and one to WANRack]
 - States – 4 (11%) [California, Kansas, Maine, and Nevada]
 - Cooperatives – 4 (11%) [two electric and two telecom co-ops]
 - Counties – 2 (6%)
 - Cable providers – 1 (3%)
 - Tribes – 1 (3%) [Omaha Tribe of Nebraska]
 - Research and education networks (RENs) – 1 (3%) [MCNC!]
 - Public/private partnerships (P3s)– 1 (3%)
- Submittal History
 - CEN Submitted a proposal for the 'Connecticut Scaled Open Access Network and Anchor Resiliency' project (CT-SOANAR) on September 29, 2022, in response to a Notice of Funding Opportunity, NTIA-MMG-2022 announced May 5²⁰²², applications due Sept 30, 2022, notice of awards as early as March 1, 2023.
 - \$20.7M Project, \$12.2M requested from NTIA, \$8M from CEN/CT, \$500K in-kind contribution.

- The CT-SOANAR project will advance the Middle Mile Grant Program objectives and the strategic broadband goals of the State of Connecticut by accomplishing the following:
 - Encourage middle mile infrastructure expansion and extension to reduce the cost of newly connecting unserved and underserved areas to the Internet backbone.
 - Promote broadband connection resiliency through alternative network connection paths that prevent single points of failure.
 - Materially reduce end user broadband prices resulting from funded middle mile infrastructure
 - Materially reduce latency experienced by end users in remote or insular areas.
 - Benefit high-poverty counties, persistent poverty counties, and/or a substantial number of end users/households that meet the defined criteria.
 - Offer access to the funded middle mile infrastructure, in perpetuity, on an open access basis.
 - The CT-SOANAR topology enables connection of unserved anchor institutions.
 - Demonstrate the project's climate and natural disaster resilience.
 - Use community benefit agreements.
- CT-SOANAR incorporated input from our key stakeholders, including planned last-mile providers, community and anchor institutions, existing CEN customers who will benefit from the proposed upgrades, and Connecticut's Office of the Governor. Additional state-level broadband stakeholders who were consulted include the Office of Consumer Council - State Broadband Office, the Bureau of Energy and Technology Policy's Office of Telecommunications and Broadband, the CT Commission for Educational Technology, and the Office of Policy and Management.
 - 19 letters of support reflect the agreement of all these stakeholders that this project is the highest priority middle mile initiative for Connecticut.
 - Governor Lamont has committed to the broader American Rescue Plan Act (ARPA), BEAD, and Digital Equity programs along with the Middle Mile Grant Program to define a holistic set of activities to address middle mile, last-mile, multi-dwelling unit, urban, and rural needs, and affordability across the state.
- Grant Development team included CEN Director Ryan Kocsondy, CEN Team Leads Paul Tarsa, Peter Correia, and Rick Cheung; CEN Optical Engineer Raymond Carcano; Executive Sponsor Mark Raymond, CT-DAS CIO; State assistance from David Lukens, OPM, for GIS mapping; Michael Barrera, DAS, as Staff Council. Consultant team headed by Rob Vietzke, CEN's first director and now of <https://insightinfraseservices.com/>, consisting of a project manager, grant writer, editor, and strategic broadband advisor. Note: CEN self-funded the consultants.
- eduroam <https://www.eduroam.us/>
 - 12/4 Update - still in contracting and procurement for agreement with eduroam / Internet2.
 - Goal is to address digital divide issues impacting learning and provide a more seamless network access experience for students.
 - Current subscribers and users: New Haven Public Schools, Darien Public Schools, Suffield Academy, Waterbury Public Schools, Middletown Schools, and Choate Rosemary Hall.
 - Tom Dillon helped coordinate activities as CET Infrastructure Advisory Council Chair, with CEN resources and fiscal support. This is a crossover item between CET Infrastructure Advisory and CEN Service Management Advisory Councils.
 - 71 respondents to Secure WiFi & eduroam readiness in schools and libraries. Will re-send and collect more info.

- CEN's application for the Internet2 eduroam [Support Organization](#) program was accepted and will be one of 5 across the country. <https://internet2.edu/internet2-announces-new-eduroam-support-organizations/>
- Agreement reached with Internet2 on terms for extending eduroam purchasing agreement through the end of 2023, to be succeeded by Support Organization agreement in 2024.
 - New Support Organization agreement between UConn/CEN and eduroam in procurement contracting. A new agreement is more conducive to scale roll out.
 - The new Participant agreement between CEN and its members has been reviewed and approved by DAS and UConn legal.
 - Middletown Schools and Choate Rosemary Hall have signed agreements and will be on board.
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3. Foster Collaboration

- EDAC - Engagement and Development Advisory Council
 - Co-Chairs, Karen Skudlarek, UCONN, and Cathy Drury, Coventry Public Schools,
 - Note: John Mercier stepped down.
 - 11th Annual CEN Conference program planning has started.
 - 2-day event on May 8-9, 2023, at CT Convention Center
 - Day 1 – half or full day workshops; Day 2 – traditional annual conference format
 - Registration is Open: <https://web.cvent.com/event/9154698d-b763-4aa9-a7b6-3bb7041c53bb/summary>
 - Call for sessions is still open: <https://web.cvent.com/event/9154698d-b763-4aa9-a7b6-3bb7041c53bb/websitePage:299b4db3-2dad-426f-8d4c-c87213e05fb6>
 - Day 1 Workshops Posted
 - <https://web.cvent.com/event/9154698d-b763-4aa9-a7b6-3bb7041c53bb/websitePage:645d57e4-75eb-4769-b2c0-f201a0bfc6ce>
 - Event: Apply ITIL/ITSM Best Practices to Educational Technology Service Delivery
 - Date: Wednesday, September 26, 2023, 1PM – 2PM
 - Registered: 77 Attended: 59

- Presenters: [Wanda Wager.pdf](#) and Wade Arenburg (ACES)
- Session Recording:
https://kaltura.uconn.edu/media/CEN+Member+TrainingA+Apply+ITIL+ITSM+Best+Practices+to+Educational+Technology+Service+Delivery/1_g3lp4b4y
- Abstract: Understand the origins of information technology service management (ITSM) and evidence-based best practices, activities, governance, and improvement capabilities. Evidence-based practices include agile management, Lean (waste reduction) and DevOps (holistic) practices. Relate the guiding principles to your work: focus on value, start where you are, progress iteratively with feedback, collaborate and promote visibility, think, and work holistically, keep it simple and practical, and optimize and automate. Link service management to your organization's overall business model and educational digital transformation. Discuss an iterative approach to adopting best practices.
- SMAC- Service Management Advisory Council
 - Co-Chairs: Ken Sayers & Jonathan Garbutt
 - Committee members are organizing around aggregated services available for members.
 - Unified Communications - with DAS procurement, initial kickoff complete, SMAC detail work will be edited into state contracting format.
 - Security Services - building new survey feedback for community to help provide priority and direction for committee and CEN to pursue.
 - CIPA filtering - on hold, discussing options.
 - Services Reviews: We're beginning to walk through services to review service lifecycles and https://ctedunet.net/wp-content/uploads/sites/2510/2021/12/2020-10-20_CEN_Service_LifeCycle_Process23.pdf
- Connecticut Higher Education Roundtable on Information Security (CHERIS) <https://ctedunet.net/cheris/>
 - Co-Chairs: Brad Tudisca, CEN; Owen Brandt, ECSU; John Schaeffer, Conn College
 - Forum of Higher Education IT security professionals that meets quarterly to collaborate on IT solutions, discuss best practices, and share security challenges.
 - The second meeting was June 2023; the next meeting was in September 2023.
- Cyber Nutmeg <https://ctedunet.net/cybernutmeg/>
 - CEN partnering with CT National Guard (CTNG) to organize Cyber Nutmeg 2023 and help expand its reach. Event was run solely by CTNG in 2021 and 2022.
 - Date: Friday, October 20, 2023 @ 8AM-5PM
 - Venue: Central Connecticut State University (CCSU) Student Center and Applied Innovation Hub
 - Cyber Nutmeg 2023 is a one-day event designed to heighten your awareness of cybersecurity threats and defenses you can deploy to protect your organization.
 - This event is intended for state, municipal, and educational leaders, including but not limited to first selectmen, mayors, town managers, superintendents, and the IT and cybersecurity professionals who support them. Cyber Nutmeg consists of three main components: Threat Briefing from the FBI, Homeland Security, and CT Counter Terrorism and Intelligence (CTIC); Cyber Security Awareness Training/workshops; a National Guard led Tabletop exercise where blended groups can work collaboratively to focus on today's most prevalent threats (insert threat theme(s) here).
 - 2023 Attended: 205 Registered: 254 Sponsors: 7
 - 2022 Attended: not tracked Registered: 67 Sponsors: n/a
 - 2023 Financial Overview
 - Revenue: \$29,475
 - Expenses: (\$24,341)
 - In-kind contributions (\$38,675)



- Profit/Loss: (\$33,541)
- Profit/Loss not including in-kind contributions: \$5,134.
- Commentary - Success for first year partnership. Positive feedback on the event from all. 279% increase in registrations from 2022 to 2023!
- Photo Archive: https://drive.google.com/drive/folders/1F_vZz28ccuch2tmzPuuiGa-TeE-LT8XR
- Special Thanks to the Program Advisory: CTNG - Joel Fulsang, members: Jonathan Garbutt, Joseph Bazeley, Jeff Levin, Roberta Pratt, Chris Bernard, Jeff Brown, David Palmbach, Sheri DeVaux, Gregory Freidline, William H Turner, Bill Turley, CEN (Ryan, Deanna, Paul, Rachael, Emma, Dick).

4. Promote Advocacy

- Governor's Biennium Budget, HB5037, American Rescue Plan Act - Coronavirus Relief Fund (ARPA-CPF)
 - CEN advocating for Community Anchor Institution connectivity - \$73M total.
 - PA 22-118 <https://search.cga.state.ct.us/2022/PA/pdf/2022PA-00118-R00HB-05506-PA.pdf> as amended by PA-22-146
 - Program funds for projects include:
 - Next Generation Infrastructure - complete equipment upgrade of the CEN platform
 - Fiber to Municipalities & Libraries - connect remaining CAIs to CEN platform.
 - Fiber to Charter Schools - Connect remaining charter schools to CEN platform.
 - Community WiFi Phase 2 - grant program to expand community WiFi for entitled connected to CEN.
 - All projects were submitted Sept 21, 2022, through OPM to US Treasury for funding allocations. Sept 23, 2022 - US Treasury announced they are low on administrative funding for the program, impacting approvals of proposals. https://home.treasury.gov/system/files/136/Adeyemo-Administrative-Flexibility-Grantee-Letter_20220923.pdf
 - **Received approval from US Treasury on September 12, 2023!**
 - 3 groups of feedback questions asked answered. One e-mail clarification. 30 detailed questions in total. Responses submitted 7/18, 8/2, and 8/24.
 - OPM Allocated funds October 24, 2023
 - Office of the Governor announces program November 2, 2023. <https://portal.ct.gov/Office-of-the-Governor/News/Press-Releases/2023/11-2023/Governor-Lamont-Announces-Federal-Approval-of-CT-Education-Network-Broadband-Infrastructure-Plan>
 - Branding efforts underway; program name is CEN Connect
 - CEN Member Services team hosted two virtual focus groups with current CEN Library and Municipality members to offer guidance in the messaging and communication strategy for the program.
 - Tagline 'Where Connectivity Builds Community' was selected through survey of advisory council members.
 - Communication strategy includes multiple channels of engagement with prospective members (i.e., print/direct mail, web pages for each of the four program facets, in person presentations with respective groups/affiliations, press release, email, and direct call campaigns)
- CEN Connect Program Overview) <https://ctedunet.net/cen-connect/>



CEN Connect is a program that provides direct investment in middle-mile broadband infrastructure in support of Connecticut's municipalities, schools, colleges, universities, libraries, healthcare, open access, and cultural arts institutions, through upgrades and expansion of the Connecticut Education Network (CEN). In

addition, the program offers grant funding opportunities to attach to the CEN platform for Community Wi-Fi access to CT citizens in need.

Program funding is made available as part of Governor Lamont's Connecticut Plan for the American Rescue Plan Act of 2021. Program Components include:

- Next Generation Infrastructure (NGI) – *Comprehensive upgrade of CEN network electronics*
 - Provides a comprehensive update to expand capacity, increase speeds, further lower latency, and support long term growth in Internet use. The NGI project impacts the over 670 currently connected members providing connectivity to thousands of community anchor institutions (CAIs) and nearly 1.9M Connecticut citizens. It also serves as the backbone for new institutional members, and an attachment point for high performance Community WiFi. The resultant CEN NGI network will offer current and future CEN member organizations significant benefits including:
 - Statewide 400G Network in 2026!
 - Increasing member handoff by 4X-40X current capability (1G – 100G)
 - Providing true dedicated service to every CAI connected
 - Enabling automation and telemetry for greater visibility and control
 - Bandwidth stability for 10 years
- Connecting Connecticut's Communities Initiative – Municipalities, Libraries, and Charter Schools
 - For those who are not yet connected to CEN, this project provides them the opportunity to benefit from a fully funded fiber build to connect their municipality to CEN for primary or backup internet and obtain access to the full range of products, services, and community resources and events that distinguish CEN from all other Connecticut Internet service providers.
 - Use cases include Primary or Resilient (Backup) Internet, and Improved cybersecurity!
 - 97 municipalities, 6 Council of Governments (COG), 63 libraries, and 14 charter schools
 - Note: IJJA BEAD program administered by CT DEEP is *unsure if any funding* will be made available for Community Anchor Institutions, which is the 3rd priority after unserved and underserved residences and business; we want to encourage this program for these anchors to connect to an enterprise level solution vs waiting for BEAD.
- Community WiFi Grant Program - Expansion of Public WiFi
 - This is a competitive sub-grant administered by CEN in collaboration with CET. Expanding on the 2020 successful launch of the community wireless components of the Governor's Everybody Learns Initiative, Community Wireless will offer connectivity options to all Connecticut residents, both urban and rural, and target underserved, typically economically disadvantaged groups and communities of color in each municipality.
 - This project will be managed utilizing a grant structure allowing community entities to partner and propose solutions utilizing CEN as their Internet provider, will require sustainability plans and include options to expand 'eduroam.'
 - Grant guidance will be developed with a contracted partner and if coming soon.
- Community Webinars / Info sessions
 - November 16
 - November 29
 - December 5 <https://events.teams.microsoft.com/event/69df9039-6c70-48f1-96ab-8748c9fdbce2@17f1a87e-2a25-4eaa-b9df-9d439034b080>

5. Enhance Core Resources

- CEN Staff
 - CEN currently has 14 full-time staff members, 4 part-time student workers, 1 volunteer (1 day /week), 1 fellow, and 1 special payroll.
 - Searches
 - Project Manager – re-post this quarter.
 - Network Security Analyst – failed search, offer rejected; will re-post
- DDoS Detection & Mitigation Enhancements
 - Upgraded the on-net detection appliance to ensure latest technologies and capabilities are available for DDoS mitigation and notification.
 - Completed DDoS 'dirty' and 'clean return' traffic transport upgrades increasing total capacity of the traffic flows across the system by 5X.
 - Above combined with the new DDoS mitigation appliance provides modularity, stability, and longevity of the system for the next 5 years.
 - Status: *Project Complete!*
- Route Reflectors (RR)
 - Project to replace existing route reflectors with new ones that have greater route scale and features, and enable Ethernet Virtual Private Network (EVPN) capabilities.
 - Technical: A route reflector is a designated/dedicated router that will advertise and reflect routes learned from other iBGP peer routers in a service provider network. This allows all iBGP speakers within your autonomous network to learn about the available routes in a more efficient manner and without introducing loops.
 - Status: *Project Complete!*
- 400 Gbps Testing & Triangular Core Capacity Augment
 - 400Gbps technologies represent the latest in speed, capability, and capacity for advanced carrier and enterprise networks.
 - We are in the early planning stages to augment the triangular core with 400Gbps links adding capacity and resilience to current network infrastructure and in preparation for Next Generation Infrastructure upgrades.
 - Status: Ongoing
- Next Generation Packet Equipment Selection Process
 - Staff are nearing completion of review and scoring of proposals for the Next Generation Infrastructure upgrades. Platform upgrades will modernize the network infrastructure and provide ample capacity, capability, and speeds for the next 7-10 years.
 - The vendor selected will perform the equipment upgrade as part of the ARPA-CPF project(s).
 - Status: Vendor and reseller selected, updating POs, and aligning to budget.
- 6 Member Ring Upgrades to 40G & 100G
 - Project to upgrade our 6 busiest / heaviest trafficked member rings by augmenting the backbone capacity to each. New equipment needed to be installed as well as coordination for upgrades while in service. In the end, 42 member locations now have access to 4X capacity to each site providing 40G or 100G backbone and improving the variety of handoff options to the local member.
 - Status: *Project Complete!*
- Groton Data Center (GDC) 100Gbps Upgrade
 - Project to upgrade capacity and throughput to GDC for use by State and Uconn
 - Replace equipment and upgrade 2x10Gbps links with 2x100 Gbps.
 - Status: *Project Complete!*

- In partnership with the Northeast Research and Education Network (NEREN)
 - CEN now has access to a 400G capable network throughout southern New England
 - Upgrades to the NEREN optical footprint included Hartford, Storrs, Springfield, Cambridge, Boston, Worcester, and Providence.
 - Status: *Project Complete!*