

Poster Guidance

Please use the template below for arranging your poster. How sections are arranged within the poster is up to the PI's discretion. However, your post must address the following:

- a)Project Challenge** - *describe the challenge/issue being addressed by this project*
- b)Intellectual Merit** – *describe the vision of the project to address the identified challenges and the technical and social advancements resulting from its research and the impact on specific application domains (e.g., transportation, community planning, and health and wellbeing etc.)*
- c)Major Outcomes/Progress** - *describe project activities and research outcomes to date*
- d)Broader Impact** – *describe the immediate, as well as long-term impact on society – who will care and who benefits from the outcomes?*
- e)Future Goals** - *planned activities and expected outcomes in the coming year*

This scale of this template is adjusted for a 48”(W) x 36” (H) poster size.

Text should be easy to read and follow. Be mindful of margins.

Use of images/graphics is strongly encouraged. Use high-resolution images.

Please use the fonts and colors used within the template for headers and text.

PI's should print and bring their posters to the PI meeting. **A digital version of the poster should be submitted at this link by Tuesday, February 6th.**

Reach out to vsharma@nsf.gov and jkravetz@nsf.gov if you have questions.

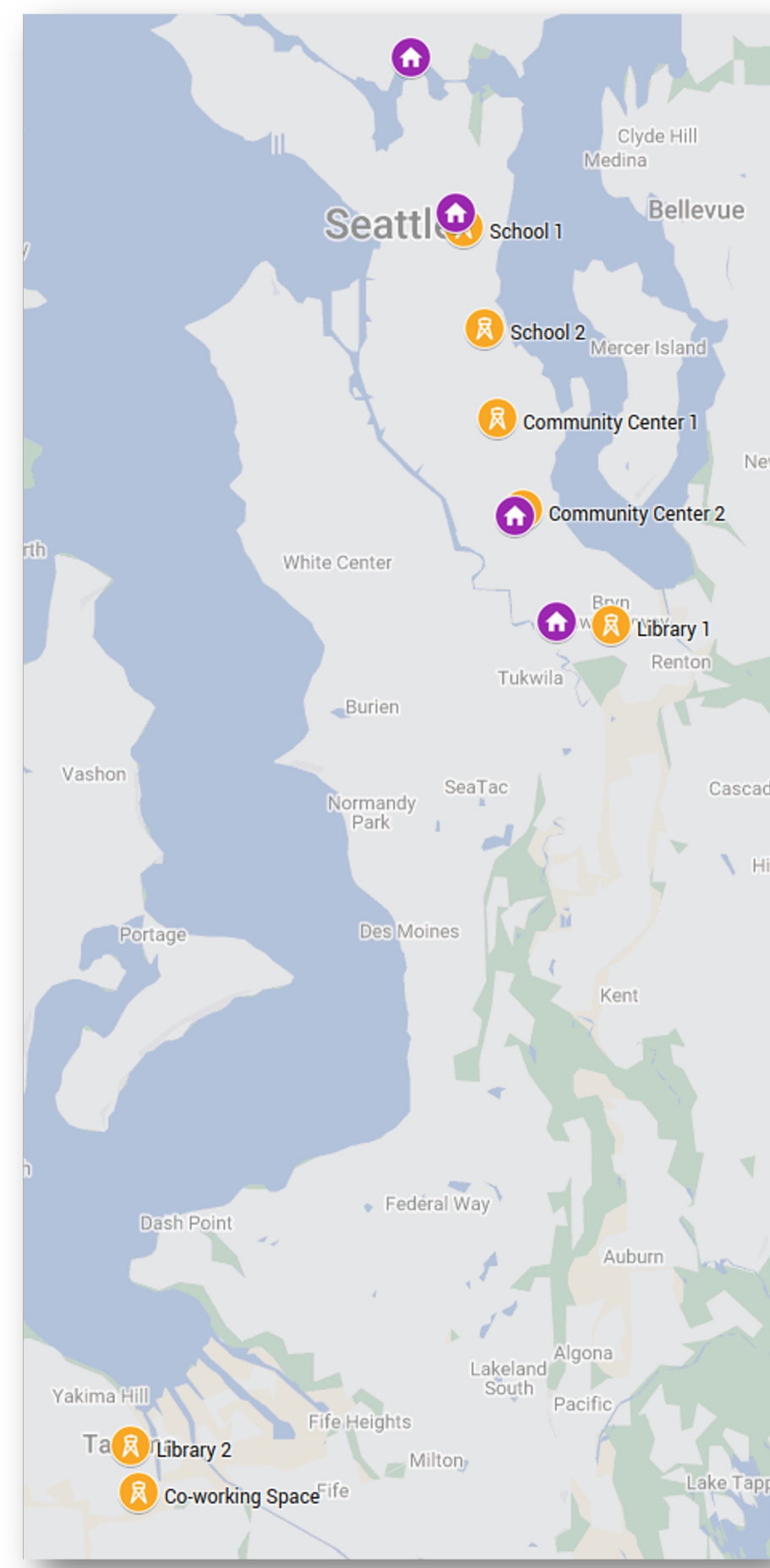
Innovations for Community-Held Infrastructure

Kurtis Heimerl, Jason Young, Emma Slager (UW), Chris Webb (SCC), Shaun Glaze (BBR)
IRG-2 FY 2021 Award ID# 2125101



Seattle Community Network

We partner with the Seattle Community Network (SCN), a community-run cellular (4G LTE) Internet access network dedicated to providing fair access to underserved communities throughout the Puget Sound. SCN specifically supports low-income populations, including the unhoused, in Seattle.



Intellectual Merit:

Grounded in the principles of community empowerment, we work with SCN and other partners to explore **the potential for community-led infrastructure development.**

Infrastructure Design: How should local compute infrastructure best be designed to operate with small stakeholder community networks? What are the social and political implications of these services?

Community Sensing: How might network-integrated sensing platforms be used to support community-driven data collection and improve local resilience?

Network Security: How can small community organizations run secure networks while sharing resources and building social capital among marginalized and under-served communities?

Progress:

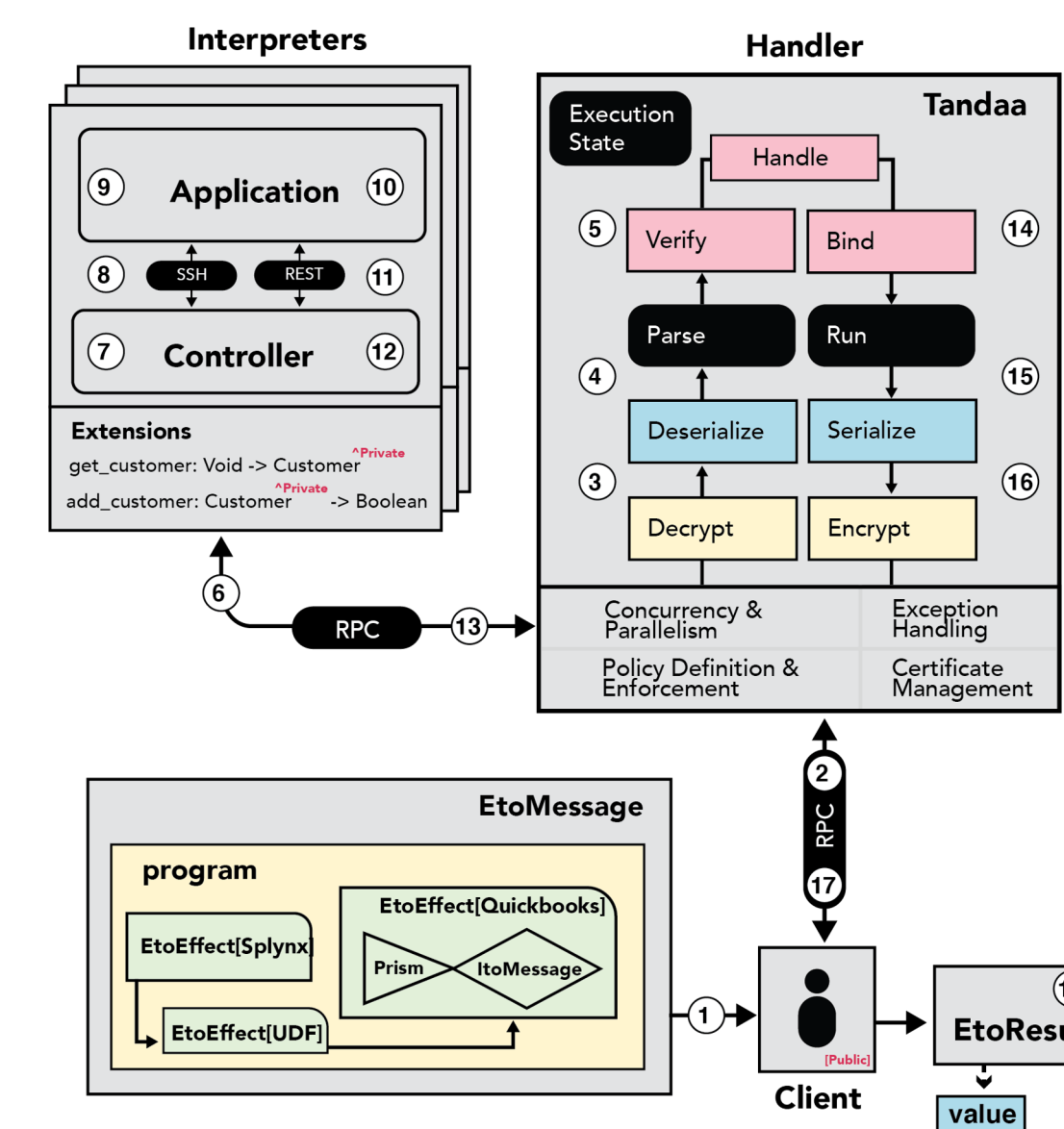
Community Networking: This grant supported significant network operation, including the development of new core network architectures, interconnection at the local IXP, and **winning the IEEE Connecting the Unconnected PoC award.**



Community Sensing: Working with local Tiny House Villages (THVs), we explore the use of IoT among unhoused populations in Seattle. Preliminary workshops have discovered a rich set of requirements, needs, and opportunities. **Please ask us for our pre-print paper if interested.**

Language-based security for ad-hoc infrastructure:

Community infrastructure, being small-scale and opportunistic, is often built in an ad-hoc manner comprised of varying tools and inviting significant security concerns. We have developed a language-based tool (Etanda) to securely manage connections between these services.



Broader Impacts

Tiny House Villages: Deployments of sensing technology with THVs, providing connectivity and improving villager experiences.

Tacoma Internet Outreach: Outreach via Tacoma Cooperative Network to disconnected Tacomans, bringing low-cost connectivity.



Hackathon: Partnership with Seattle Makers to bridge unhoused and hacker communities and build tools for marginalized people.



Ongoing Work:

Network Deployment: Deploy dAuth into production and explore opportunities for eSIMs in private cooperative networks.

Sensor Design and Installations: Installing equipment into two THVs, Northlake and Central District, in collaboration with Seattle's Nickelsvilles.

Secure Ad-Hoc Infrastructure: Etanda has been similarly completed and we are targeting deployments with partners running larger-scale networks in the developing world.