Emergency Connectivity Fund Solution: Hotspots Around Town

Creating hotspot zones is one way that libraries and schools connect their communities to the internet. A Wi-Fi hotspot zone is a location with publicly accessible internet service (e.g., in a park, at a farmer's market, at a community center, or grocery store) that community members use to connect a Wi-Fi enabled device to the internet.

This guide is meant to help libraries design, plan, and implement a program where the library creates one or more Wi-Fi hotspot zones in the community via wired or cellular technologies. The guide also includes an overview of what libraries need to consider when requesting funding through the FCC's Emergency Connectivity Fund (ECF) program. More ECF-eligible programming scenarios are available at www.ala.org/advocacy/ECF.

Goals

To support the activities of community members who do not have access to affordable high-speed internet access in their home, the community hotspot zone will:

- Increase internet access in community areas where the service is not available.
- Enable students with devices to do research and complete homework.
- Allow users to search and apply for jobs.
- Allow community members to apply for social services.
- Support entrepreneurs and small start-ups.
- Allow community members to participate in activities related to our society, democracy, and the economy.

Pros

- Since the Wi-Fi hub is publicly available, it can be used to drive people to specific locations or events.
- Fairly easy to set up and support the end user.
- Multiple Wi-Fi enabled devices can use the hotspot connection to access the internet at the same time, as long as all devices are within approximately 30-300 ft of the hotspot, depending on the solution.

Cons

- Hotspot location has to be covered by a wireless service provider or a wired connection.
- Limited number of devices can connect to the hotspot at a time. Check the hotspot and service provider specifications to determine user limits.

- Some service providers throttle internet speeds once a certain amount of data has been used in a billing cycle. When this happens, internet speeds become slower and can take longer to complete tasks on the internet. (Libraries are encouraged to try and find an internet provider that has no data limits.)

Staff Skill Level Needed to Set Up the Wired Network Solution

Staff who select the service provider need to understand specific terminology to select the internet service provider(s) and plan that best meets the programmatic goals. Terms that may be used in the service agreement include: data limits, throttling, bandwidth, etc.

Staff Skill Level Needed to Set Up the Cellular Solution

Staff who select the cellular service provider need to understand specific terminology to select the plan and service provider(s) that best meets the programmatic goals. When selecting a provider these terms will be used in describing the terms of services of a cellular agreement: data limits, throttling, bandwidth, roaming, 5 GHz, 2.4 GHz, and LTE. The selector should also understand the basics of how cellular technology works and what physical barriers (e.g. tall buildings, thick walls, dense vegetation) could impact cellular signal coverage and strength.

After the contract is signed, additional terminology will be used that aids in tracking and troubleshooting hotspot issues. Those terms include: MEID (Mobile Equipment Identifier), MDN (Mobile Directory Number), and SIM (Subscriber Identity Module).

Staff Skill Level Needed to Monitor the Solution

The library will need to have a plan in place to monitor the health of the service. This includes ensuring hardware is working as expected, that there is a persistent internet signal with the appropriate upload and download speeds, that the Wi-Fi signal is broadcasting, etc. There are many software programs available for network monitoring (for wired and enterprise-level hotspots), and you can ask your service provider about tools or dashboards they may provide to monitor connectivity in real-time. If the library already has a system in place to monitor their IT infrastructure, this support could be added into the internal processes. When selecting the service provider, the library should ask what support is available to library staff and end users.

The library will need to determine what is the level of service for addressing any issues. Understand what the response time will be for the various vendors (e.g., the internet service provider, the hardware manufacturer(s) for the router or other equipment)? Is the standard service adequate, or will the library want to increase the service level? Most vendors provide

different levels of service. The quicker the response time, the more expensive the service. The library will need to weigh the cost with how long the location can go without service.

Staff Skill Level Needed to Support End Users

Because the Wi-Fi hotspots zones are not in the library, the library will need to determine what level of support will be provided to the end user. Will the library provide signs in the area that people can use to troubleshoot common issues? Will there be a phone number they can call for help, and when will that service be available? What happens after hours? Can the internet service provider offer some assistance to end users? (Support should be a key factor when evaluating providers.)

Equipment Needed

Wired Service Option
- Modem, router, or modem/ router combo
- Wired network connection
- Internet service
- Antenna or booster may be needed to extend the Wi-Fi signal

Cellular Service Option
- Hotspot or modem/router, depending on the solution
- Cellular service for the hotspot
- Antenna or booster may be needed to extend the Wi-Fi signal

ECF Program Requirements

The Universal Service Administrative Company (USAC) is administering the ECF program. Listed below are some of the requirements library staff should be aware of as they develop a device lending program. An ALA summary of the FCC's ECF Order also provides direct references to key provisions referenced below.

Eligible Expenses

Applicants should review the program's Eligible Services List to ensure their request is compliant with the program rules. The list below highlights eligible expenses of interest:

- Hotspot hardware (reimbursable up to $250 per hotspot).

- Includes any component from the manufacturer necessary for the equipment to operate, such as cords and chargers.
- A manufacturer's multi-year warranty for a period of up to three years that is provided as an integral part of an eligible component, without a separately identifiable cost, is also eligible.
- Modems (e.g., air cards), routers, or services that combine a modem and router
- Mobile broadband Internet access services for the hotspot (i.e., data plan) or fixed broadband internet access for the wired solution.

Installation, activation, and initial configuration costs, taxes, shipping charges, and other reasonable fees incurred with the purchase of the eligible equipment and services are eligible for support under the ECF program.

CIPA Compliance

The American Library Association created [The Emergency Connectivity Fund and CIPA Compliance](#) scenarios to help libraries determine if their ECF request needs to be compliant with the Children's Internet Protection Act (CIPA) to meet program requirements.

Inventory Requirements

The ECF program requires that libraries who receive funds from this program document eligible services and equipment. Applicants should review the program's [Device and Service Inventory Requirements](#) to ensure their documentation is compliant with the program rules.

Libraries must retain their records to demonstrate compliance with all the ECF Program rules for at least 10 years from the last date of service or delivery of equipment.

Certification of Need

The ECF requires that the user sign an acceptable use policy (AUP), that states the ECF equipment or service is intended only for patrons who do not have internet access sufficient to meet their needs. A library may enable this certification, for instance, via a splash page that opens when an end user logs in via their device.

How to Set Up the Program

The number of hotspot connections needed will depend on various factors. These questions will help determine how many hotspots will be needed:
- What is the goal of providing Wi-Fi hotspot zones around the community? Examples include:

- Providing internet service to families with school-age children who do not have access to the internet at home because service is unavailable, inadequate, or unaffordable.
- Ensure areas in which the library performs outreach activities in the community have internet access.
- Provide internet access that is consistently accessible were people who are underconnected regularly gather e.g. community centers, homeless shelters, public housing, parks, etc.
- Activate civic spaces.

- How many locations does the library want to set up? Will these be fixed locations, or will the library want to rotate the service from location to location?
  - When planning where to place a Wi-Fi zone, the library should determine who they want to serve, where they are, and where in their community free Wi-Fi already exists. This service should create new zones or enhance existing Wi-Fi zones if they are popular but under connected. Avoid overlapping or duplicating service whenever possible.
  - Once the library has selected potential locations a site assessment will need to be undertaken to determine the best solution (e.g., wired or cellular).
    - A wired connection can only be an option if a there is a wired internet connection near the location, or if it can be installed in the location for a fee the library can afford.
    - If a wired connection is not available or the library wants to move the equipment from place to place over time, the cellular option is the way to go. Before finalizing the solution, the library will need to work with the cellular provider to ensure there is good cellular service coverage in your area that is robust enough to meet your programmatic needs.
    - If both a wired and cellular connection is available in your chosen location compare both options to determine which one is best. Things to consider include set-up costs, monthly costs, service support from the vendor, bandwidth capacity, upload/download speeds, etc.
- How many people are likely to be at each location at a given time?
- How are people likely to use the internet service? Will they browse the internet or check email, which uses a small amount of data, or will they be attending video conference meetings or streaming media, which requires more bandwidth?
- If there is a data cap, will the library procure more than one hotspot so if the data cap is reached on one device it can be swapped with another that still has data available? (Libraries are encouraged to try and find an internet provider that has no data limits.)

End user access
- The ECF requires a user to agree to an acceptable use policy (AUP), that states the ECF equipment or service is intended only for people who do not have internet access sufficient to meet their needs.
- Can anyone access the Wi-Fi, or library card holders only?
- Support. Because this service is available outside the library, how will the library assist users with questions and problems? Ideas to consider include:
  - The library could post signs in the areas that help users troubleshoot basic issues. Signage should be available in languages commonly used in the community.
  - The library could have a hotline that patrons call for assistance. This service could be provided by the library or perhaps the internet service provider.
  - If the service is being hosted in or near a partner organization, maybe they would be willing to provide basic end user support.

Option 1: Wired Hotspot Connection

Wired internet connections can broadcast a Wi-Fi signal up to 300 feet depending on the capacity of the connection. The range and number of people who can connect at once will depend on the equipment, type of network cabling available, bandwidth available, number of devices attached to the hotspot at one type and how people are using the internet (e.g., email uses a small amount of data while streaming services use more data).

1. Select location and ensure it has a wired internet connection.
2. Select the internet service provider that provides a high-speed connection and bandwidth necessary to support the users web browsing. Inform the internet service provider that you will be using this connection to provide Wi-Fi access to the community at this location.
3. Working with the internet service provider, identify a space that is secure, has electricity to run any needed equipment, is protected from weather and flooding, and can't be accessed by unauthorized people.
4. Set up the needed hardware, including connecting your router and modem or all-in-one router/modem combo device, to the internet service connection.
5. Create a public Wi-Fi network. Will the network be open, or will you require a password?
6. Enable web encryption to add an extra layer of security.
7. Set up an authorized use page that states the Wi-Fi internet connection is intended for users who do not have internet access sufficient to meet their needs. When users click to accept the terms of service, they are granted Wi-Fi access. If they don't accept the terms of service, they will not have access to the Wi-Fi.

Option 2: Consumer Cellular Hotspot

Consumer hotspots can broadcast a Wi-Fi signal up to 30 feet depending on the location and signal strength. Depending on the solution selected, up to 10-15 devices can wirelessly connect to the Wi-Fi hotspot at one time. The more devices connected, the slower the internet speed. If the hotspot is in a low traffic location this solution could meet their needs and is the easier of the two options to set up. For assistance in selecting a service provider see the guide Selecting the Right Cellular Service Provider.

1. Select the service provider and hotspot. Be sure to explain how this service will be used to ensure that the plan supports the program goals.
   a. Note: Some wireless service providers can route the internet traffic through a CIPA-compliant filter. See The Emergency Connectivity Fund, E-rate, and CIPA Compliance for information about whether this is needed for your program.
2. Identify a power source for the hotspot. Hotspot charges can last between 6-10 hours depending on the model and how much it is used.
3. Install and secure the hotspot. Select a location that can receive and send data signals but also in a place staff can access the hotspot to troubleshoot hardware issues.
4. Create a public Wi-Fi network. Will the network be open, or will you require a password?
5. Enable web encryption to add an extra layer of security (if possible).
6. Set up an authorized use page that states the Wi-Fi internet connection is intended for users who do not have internet access sufficient to meet their needs. When users click to accept the terms of service, they are granted Wi-Fi access. If they don't accept the terms of service, they will not have access to the Wi-Fi.

Option 3: Enterprise-Level Cellular Hotspot (Super Hotspot)

Enterprise-level wireless connections can broadcast a Wi-Fi signal up to 300 feet, depending on the location. The range and number of people who can connect at once will depend not only on the equipment used but the strength of the cell signal at each location, number of devices attached to the hotspot at one type and how people are using the internet. Depending on the solution selected, between 10-100 people can connect at a time. For assistance in selecting a service provider see the guide Selecting the Right Cellular Service Provider. While the enterprise level hotspot is usually more expensive than the consumer hotspot solution it supports more devices, has a higher bandwidth capacity available and the signal can broadcast farther distances allowing the library to offer a more robust service.

1. Select the service provider. Be sure to explain to them how this service will be used to ensure that the plan supports the program goals.
   a. Some vendors will offer bundles that include the necessary hardware (antenna, router, cellular service) and installation. If using the ECF, not all equipment, like the antenna, is an eligible expense. Can the library cover those expenses?

2. Purchase an antenna and router that is compatible with the use case. It should be rated for outdoor use. Work with the service provider to ensure the equipment is compatible with their service.
3. Identify the power source for the equipment.
4. Identify a way to secure and protect the hardware from the weather and from unauthorized people accessing the device.
5. Install the equipment in a location that can receive and send unobstructed data signals but also in a place staff can access the hotspot to troubleshoot hardware issues. Work with the service provider to ensure the equipment is installed with an unobstructed connection.
6. Create a public Wi-Fi network. Will the network be open, or will you require a password?
7. Enable web encryption to add an extra layer of security.
8. Set up an authorized use page that states the Wi-Fi internet connection is intended for users who do not have internet access sufficient to meet their needs. When users click to accept the terms of service, they are granted Wi-Fi access. If they don't accept the terms of service, they will not have access to the Wi-Fi.

Assessment

How will the library assess this service to ensure it is meeting the project goals and documents the benefits to the funder and the community? When launching a new service, you should identify both quantitative and qualitative data to gather.

- Examples of data to gather at each location:
  - Number of sessions
  - Total and average time a device utilized the location's network
  - Average length of session
  - Data use statistics, including amount of data used, max data used, and average data use
  - Time of day and weekly usage trends
- End-user survey. Could be a pop-up window before they connect to the hotspot device. The following surveys were used in hotspot lending programs but could be adopted to fit this use case:
  - Immediate User Survey
    https://drive.google.com/file/d/1uI6ipVyb9KqOUVUSB5JcJ2RB8igItY8L/view
  - Kansas Public Libraries MiFi Pilot Survey Questions (starts on page 11)
    https://kslib.info/DocumentCenter/View/4842/MiFi-Pilot---Project-report---Kansas-Public-Libraries-2015-12?bidId=

Possible Funding Sources

In addition to the ECF program, other funding may be available to support and sustain your hotspot program, including:

- IMLS
- State Library grants
- State or local funding provided to government entities through the American Recovery Act Plan
- Private funding sources such as grants and foundations
- Library's operational budget
- Library Friends group or Foundation

Library Examples

- Bethlehem Public Library Wi-Fi Out and About https://www.bethlehempubliclibrary.org/services/wifi-out-and-about/
- Buena Vista Public Library Free Wi-Fi @ McPhelemy Park https://buenavistalibrary.org/2020/10/25/librarymcphelemy/
- Neuse Regional Libraries Community Drive-in Wi-Fi https://www.neuselibrary.org/wi-fi-for-all/
- Seattle Public Library for Homeless Communities https://www.spl.org/programs-and-services/civics-and-social-services/social-services-referrals#:~:text=Hotspots%20can%20be%20reserved%20online,and%20shelters%20to%20distribute%20hotspots.&text=If%20you%20have%20a%20question,call%20206%2D386%2D4636.

Additional Resources

- BKLYNCONNECT Playbook: A Resource for Researching, Designing and Implementing a Public Wi-Fi Pilot Program in Your Neighborhood Playbook https://www.bklynlibrary.org/sites/default/files/documents/general/BKLYNConnect_Playbook.pdf
- Planning and Implementing a Wi-Fi zone for your Town (from the Vermont Council on Rural Development) https://www.vtrural.org/programs/digital-economy/services/wifi/toolkit#_Toc404328637
- The American Library Association and the Public Library Association Hotspot playbook http://www.ala.org/pla/initiatives/digitallead/hotspot-playbook
- Mobile Beacon offers mobile hotspots to libraries. Learn more about their program. http://www.techsoup.org/mobile-beacon