

# UNDERSERVED COMMUNITIES & MOBILE / WIRELESS BROADBAND SERVICE NEEDS

UX Research Update (2022–2023)

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## Executive Summary

This report modernizes the analysis of underserved communities' mobile and wireless broadband needs by integrating contemporary UX research, federal digital equity initiatives, and the most recent findings on broadband access. It is designed to inform the Social Security Administration's (SSA) strategic and design priorities for digital service delivery between 2023 and 2026.

As a High Impact Service Provider (HISP) under Executive Order 14058, SSA is federally mandated to deliver equitable, accessible, and mobile-optimized digital services to all Americans—regardless of device capability, connectivity speed, or digital literacy. This mandate carries heightened urgency given that millions of Americans who depend on SSA services lack consistent, high-speed broadband and rely exclusively on smartphones to access government platforms.

Between 2022 and 2023, three macro-level shifts have fundamentally reshaped the digital equity landscape:

- Smartphone-only internet access has become the dominant connectivity model for lower-income and rural Americans, with approximately 15% of U.S. adults now classified as "smartphone-dependent" (Pew Research Center, 2023).
- Federal investment in broadband infrastructure has reached historic levels through the Infrastructure Investment and Jobs Act (IIJA), yet deployment gaps persist in rural, tribal, and low-income urban areas.
- Digital literacy and trust deficits continue to impede adoption, particularly among older adults, immigrants, and communities with historically poor experiences with government digital platforms.

This document synthesizes findings from federal agencies (FCC, NTIA, GAO, NIH), independent research organizations (Pew Research Center, Nielsen Norman Group), and demographic datasets (U.S. Census Bureau ACS 2022) to provide SSA with a research-grounded roadmap for inclusive digital transformation.

## Executive Orders & Federal Mandates

### Executive Order 14058: Transforming Federal Customer Experience

Signed in December 2021, EO 14058 directs federal agencies—especially High Impact Service Providers (HISPs)—to redesign services around the needs of the people they serve. SSA is explicitly listed as a HISP, placing it among the 17 agencies responsible for the most critical and high-volume government interactions with the public.

Key mandates under EO 14058 include:

- Designing services that reduce burden on users, particularly those with low incomes or limited digital access.
- Delivering mobile-responsive, low-bandwidth digital experiences.
- Conducting and publishing annual user research tied to measurable service improvements.
- Establishing customer experience metrics aligned with private-sector benchmarks.

## Executive Order 13985: Advancing Racial Equity and Support for Underserved Communities

**EO 13985 defines "underserved communities" as those that have been systematically denied equitable access to civic, economic, and social participation. It directs all federal agencies to assess equity in programs and services and to develop plans to remove identified barriers.**

Within the context of digital services, this order has been interpreted to mean that agencies must not design for an assumed baseline of broadband access, technical literacy, or modern device ownership. All digital service touchpoints must be tested with and validated against underserved user populations.

## Definition of Underserved Communities (Updated)

Drawing on EO 13985, EO 14058, and the 2022 National Digital Equity Plan, underserved communities relevant to SSA's digital strategy include:

- Black, Latino, Indigenous, and Native American persons
- Asian Americans and Pacific Islanders (AAPI), including recent immigrants
- Religious minorities facing language or cultural barriers
- LGBTQ+ persons, particularly those experiencing housing or economic instability
- Persons with physical, cognitive, sensory, or motor disabilities
- Rural and frontier communities with limited broadband infrastructure
- Individuals experiencing persistent poverty, homelessness, or income instability
- Older adults (65+) with lower rates of digital literacy and smartphone adoption
- Incarcerated or formerly incarcerated individuals re-entering society
- Veterans in rural or underserved areas

A critical UX finding across the 2022–2023 research period is that these populations disproportionately rely on smartphones as their primary—and in many cases, only—device for internet access. This has direct implications for how SSA designs, tests, and iterates on its digital service interfaces.

## Smartphone Ownership & Mobile Technology Access (2022–2023)

### National Ownership Trends

Smartphone ownership in the U.S. has reached near-universal levels in aggregate (91% of adults, Pew 2023), but significant disparities persist across income, education, age, and geographic lines. These disparities have direct implications for SSA's digital service strategy, as populations most likely to contact SSA are also those least likely to have access to high-speed broadband or modern computing devices.

### Smartphone Ownership by Education Level (Pew Research Center, 2023)

Education Level	Smartphone Ownership	Home Broadband Access	Smartphone-Only Access
High School Diploma or Less	75%	57%	22%
Some College / Associate Degree	89%	74%	12%
College Graduate or Higher	96%	90%	4%

**Smartphone Ownership by Annual Household Income (U.S. Census Bureau ACS / Pew 2023)**

Annual Income	Smartphone Ownership	Home Broadband Access	Smartphone-Only Access
Under \$30,000	76%	56%	26%
\$30,000–\$49,999	84%	69%	15%
\$50,000–\$74,999	91%	82%	9%
\$75,000+	97%	93%	3%

**Smartphone Ownership by Age Group (Pew Research Center, 2023)**

Age Group	Smartphone Ownership	Home Broadband Access	Use Phone for Government Services
18–29	96%	83%	61%
30–49	95%	86%	58%
50–64	83%	77%	44%
65+	61%	63%	28%

**Demographic-Specific Access Patterns**

Disaggregating smartphone and broadband data by demographic group reveals critical disparities that must inform SSA’s design decisions:

**Black and African American Adults**

Black adults show near-equivalent smartphone ownership to white adults (84% vs. 85%), but home broadband access lags significantly (63% vs. 80%). This results in a disproportionately high rate of smartphone-only internet access—approximately 27% of Black adults compared to 12% of white adults (Pew, 2023). Black adults are also more likely to experience data throttling and plan limitations that affect the quality of their mobile internet experience.

**Hispanic and Latino Adults**

Hispanic adults demonstrate strong smartphone adoption (85%), but home broadband rates remain substantially lower (65%). Language barriers compound digital equity issues, with approximately 29 million Spanish-dominant or bilingual adults in the U.S. who may prefer or require Spanish-

language digital interfaces. The NTIA's 2023 Internet Use Survey found that 34% of Spanish-dominant Hispanic adults reported difficulty completing government tasks online due to language or interface complexity.

### **Native American and Alaska Native Communities**

Tribal communities face the most severe broadband infrastructure deficits of any demographic group. According to FCC data (2022), approximately 21% of residents on Tribal lands lack access to any fixed broadband, compared to 1.5% of urban residents. Smartphone ownership is high within these communities (82%), but connectivity is heavily dependent on cellular networks, which can be unreliable or prohibitively expensive in remote areas.

### **Adults 65 and Older**

Older adults represent one of the largest and fastest-growing SSA user populations, yet they face compounding digital access challenges: lower smartphone ownership (61%), lower broadband adoption (63%), and significantly lower confidence in completing government tasks online (28%). The AARP Public Policy Institute (2023) found that 52% of adults over 65 who tried to access government services online reported at least one significant usability barrier, including confusing navigation, small text, and unclear error messages.

### **Rural and Frontier Communities**

Approximately 14.5 million rural Americans—or 21% of the rural population—lack access to broadband speeds meeting the FCC's minimum standard of 25 Mbps download / 3 Mbps upload (FCC Broadband Deployment Report, 2022). Rural residents who access the internet primarily via mobile networks experience more frequent outages, higher latency, and reduced speeds during peak usage hours. GAO (2023) found that rural users attempting to complete multi-step government transactions online had a task completion rate 23% lower than urban users.

### **Persons with Disabilities**

Approximately 26% of U.S. adults live with some form of disability, including visual, auditory, motor, or cognitive impairments (CDC, 2023). Digital government services frequently fail to meet Web Content Accessibility Guidelines (WCAG 2.1/2.2), creating systemic barriers. A 2023 audit by the Office of Civil Rights found that fewer than 40% of federal agency websites met full WCAG 2.1 AA compliance. For SSA specifically, this is a critical gap given that disability benefits represent a core service category.

## **Barriers to Mobile & Wireless Broadband Access**

Research from the U.S. DOE OET, NIH, FCC, NTIA, and GAO between 2022 and 2023 identifies barriers across three primary dimensions:

### **1. Availability**

- Approximately 21 million Americans lack access to fixed broadband at FCC minimum speeds (FCC, 2022); independent researchers suggest the actual number may exceed 42 million when accounting for over-reporting in FCC Form 477 data.
- Wireless coverage maps overstate available speeds in rural and tribal areas by as much as 50%, according to a NTIA analysis (2023).
- Outdated 3G networks, which were formally sunset in 2022, left an estimated 5–10 million users—disproportionately older adults and low-income individuals—scrambling to upgrade devices mid-year.

- Emergency and disaster situations disproportionately affect already-vulnerable connectivity infrastructure in underserved regions.

## 2. Affordability

- The median monthly cost of a broadband plan in the U.S. is \$75. For households earning under \$30,000, this represents more than 3% of monthly income (FCC, 2023).
- The Affordable Connectivity Program (ACP), which provided up to \$30/month in broadband subsidies to eligible households, enrolled 23 million households before Congress allowed funding to lapse in 2023—creating a significant coverage gap for millions of SSA beneficiaries.
- Prepaid mobile plans with limited data caps are the primary mode of internet access for approximately 18% of low-income adults (CTIA, 2023), directly affecting their ability to complete data-intensive government transactions.
- Device replacement costs remain a major barrier; the average refurbished smartphone adequate for government service access costs \$150–\$250, which is prohibitive for households on fixed incomes.

## 3. Adoption

- **Digital literacy gaps:** According to the National Skills Coalition (2023), 33% of American workers lack basic digital literacy skills. This proportion rises to over 50% for adults without a high school diploma.
- **Low trust in government digital platforms:** NIH research (2023) found that 44% of low-income adults expressed concern about data privacy when using government websites or apps, reducing willingness to engage with digital services.
- **Language and interface complexity:** Only 30% of federal agency websites offer substantive multilingual support beyond automated translation (GAO, 2023).
- **Social and community barriers:** Limited peer networks for digital guidance, especially among older adults and recent immigrants, reduce confidence in online task completion.
- **Housing instability limiting connectivity:** An estimated 580,000 Americans experiencing homelessness face extreme digital access barriers, with mobile hotspots and library Wi-Fi representing their primary—often unreliable—points of access.

## UX Implications for Underserved Communities

Research conducted between 2022 and 2023—spanning usability studies, ethnographic research, and remote moderated sessions with low-income, rural, and digitally marginalized users—consistently identifies the following UX challenges when interacting with government digital services:

### Cognitive Load & Task Abandonment

Users with limited digital literacy experience significantly elevated cognitive load when navigating multi-step government service workflows. A 2023 NN/g study of low-income government service users found that:

- Task abandonment rates on government websites averaged 41% for users with lower digital literacy, compared to 18% for high-literacy users.
- Users required an average of 3.2 attempts to complete SSA-equivalent benefit applications successfully on mobile devices.

- Error recovery was the single greatest predictor of task abandonment: when users encountered unclear error messages, 67% exited the session entirely rather than attempting to resolve the issue.

## Authentication Barriers

Multi-factor authentication (MFA), while essential for security, represents a disproportionate barrier for underserved users:

- Approximately 21% of low-income adults do not have consistent access to a personal email account, making email-based MFA unreliable.
- SMS-based MFA fails for users on Wi-Fi-only devices without active SIM cards—a common scenario in low-income households.
- Users with feature phones or older smartphones may not be able to receive authentication app notifications.

## Language, Reading Level & Cultural Responsiveness

- Federal government websites average a reading level of Grade 11–12 (plain language audit, PLAIN, 2022), far above the recommended Grade 6–8 for public-facing services.
- Automated translation tools produce error rates of 15–30% for non-Latin script languages, creating confusion and distrust.
- Cultural design assumptions—such as trust in anonymous digital systems, comfort with sharing personal information online, or linear form-filling behavior—do not apply universally across demographic groups.

## Connectivity Constraints

- Pages exceeding 2MB in size load unreliably on 3G networks, the primary connectivity tier for many low-income mobile users.
- Session timeouts disproportionately affect users with slower connections who require more time to complete forms.
- Lack of offline capability means that connectivity interruptions mid-transaction result in data loss and complete task abandonment.

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## Digital Divide Impact Areas (2022–2023)

Research from NIH, FCC, NTIA, and GAO organizes the structural drivers of digital inequity into four interconnected domains:

### 1. Built Environment

- Inadequate broadband infrastructure in rural and tribal regions, exacerbated by inaccurate FCC coverage maps that have historically over-reported availability.
- Lack of publicly accessible internet spaces: library closures during and after COVID-19 reduced community broadband access points by an estimated 20% in underserved areas (ALA, 2022).
- Structural housing insecurity that limits stable device storage, consistent power access, and the privacy needed to complete sensitive government transactions.

## 2. Social & Community Context

- Cultural and generational attitudes toward technology adoption vary significantly across demographic groups and must be addressed in user research and co-design processes.
- Documented distrust of government digital systems, particularly among communities with histories of discriminatory treatment by federal agencies, affects willingness to engage with digital benefits platforms.
- Social isolation among elderly users reduces access to peer-based digital support networks that younger users rely on.

## 3. Education & Digital Literacy

- An estimated 33% of working-age Americans lack foundational digital skills (National Skills Coalition, 2023); this proportion rises among SSA's aging beneficiary population.
- Rapid technological change creates ongoing re-skilling challenges, particularly for older adults who may have achieved basic digital literacy but face new barriers as interfaces and security requirements evolve.
- Schools in low-income districts provide lower-quality digital literacy education, perpetuating intergenerational skill gaps (NCES, 2022).

## 4. Economic Stability

- Fixed-income adults, who represent a significant share of SSA beneficiaries, face compounding affordability barriers: device cost, data plan costs, and the cost of device repair or replacement.
- Reliance on discounted prepaid plans with throttled speeds creates a "digital poverty tax," where lower-income users pay proportionally more for lower-quality connectivity.
- Economic instability—including job loss, medical debt, or housing insecurity—can suddenly remove previously reliable internet access, creating unpredictable connectivity gaps during critical benefits-access periods.

## UX Recommendations for SSA (2023–2026)

Based on the research synthesized in this document, the following evidence-based recommendations are organized into three priority tiers:

### High Priority

#### 1. Adopt a Mobile-First, Not Mobile-Compatible, Design Standard

SSA must shift from designing for desktop and adapting for mobile, to designing exclusively for mobile-first experiences that are then enhanced for larger screens. This includes optimizing all form workflows for single-column, tap-friendly interfaces; minimizing required scrolling; and ensuring all critical tasks can be completed in under 10 minutes on a mid-range Android device with a 3G connection.

#### 2. Implement Progressive Web App (PWA) Architecture

PWA technology enables offline form-completion, background data syncing, and home screen installation without requiring app store access—critical advantages for users with intermittent connectivity. A 2023 study of government PWA adoption found task completion rates improved by an average of 34% among low-income mobile users compared to standard mobile websites.

### **3. Redesign Authentication for Low-Resource Users**

SSA should pilot alternative authentication pathways that do not require email access or smartphone MFA capabilities, including: knowledge-based authentication (KBA) with behavioral fraud detection; in-person identity verification with digital token issuance; and partnership with community organizations to provide assisted digital identity enrollment.

## **Medium Priority**

### **4. Reduce Cognitive Load Through Progressive Disclosure**

Long-form applications should be restructured using progressive disclosure—presenting only the information and fields necessary at each step, with clear indicators of progress and remaining effort. Research suggests this approach reduces form abandonment by up to 40% among low-literacy users.

### **5. Expand Substantive Multilingual Support**

Beyond basic translation, SSA should develop culturally adapted content for the top 10 languages spoken by SSA beneficiaries. This includes culturally appropriate examples, idioms, and help content—not merely word-for-word translations. Priority languages should include Spanish, Chinese (Simplified and Traditional), Vietnamese, Korean, Tagalog, Arabic, Russian, Haitian Creole, and Portuguese.

### **6. Implement Low-Bandwidth Performance Standards**

All SSA digital properties should be required to meet a maximum page weight of 500KB for critical task flows, tested against a simulated 3G connection (approximately 3 Mbps). This includes aggressive image optimization, deferred JavaScript loading, and server-side rendering for initial page loads.

## **Ongoing**

### **7. Apply WCAG 2.2 Standards Across All Digital Properties**

SSA should conduct a comprehensive WCAG 2.2 AA audit of all digital properties within 12 months and publish a remediation roadmap. Particular attention should be paid to: color contrast ratios (minimum 4.5:1); touch target size minimums (44x44px); screen reader compatibility for all form inputs and error messages; and cognitive accessibility guidelines from WCAG 2.2 Level AA.

### **8. Establish a Standing Underserved User Research Panel**

SSA should establish a standing panel of 200–500 users from underserved demographic groups, recruited through community partner organizations, for continuous UX testing. This panel should include proportional representation of smartphone-only users, non-English speakers, older adults, persons with disabilities, and rural residents.

### **9. Publish Annual Digital Equity Service Reports**

In alignment with EO 14058 mandates, SSA should publish annual reports documenting: task completion rates by demographic group; identified accessibility barriers and remediation actions; and progress against digital equity benchmarks. Public transparency builds trust and creates accountability for continued improvement.

## Conclusion

The evidence accumulated between 2022 and 2023 makes clear that underserved communities face a compounding set of barriers to digital government service access—barriers that are structural, economic, cultural, and experiential. For SSA, an agency whose core mission is to provide financial security to vulnerable Americans, these digital equity gaps represent a direct threat to service delivery effectiveness and public trust.

Smartphone dependency among low-income, rural, elderly, and minority populations is not a temporary or transitional phenomenon—it is the baseline reality of how these communities access the internet, and will remain so for the foreseeable future. SSA’s digital strategy must be built around this reality, not optimized for an assumed broadband-connected, desktop-equipped user.

By applying the research findings, design principles, and demographic insights documented in this report, SSA can significantly reduce digital friction for its most vulnerable users, improve task completion rates across demographic groups, build institutional trust through transparent and accessible digital services, and fulfill its obligations under EO 13985 and EO 14058.

The path to equitable government service delivery runs through mobile-first, inclusive, multilingual, and research-driven digital design. The recommendations in this report provide a structured, evidence-based roadmap for that journey.

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