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Carleton University | Accessibility Institute

Carleton University | Faculty of Engineering and Design

Enabling Independence: Assessing Activities of Daily Living to Inform Safety Standards for Built Environments

Executive Summary

2026-03-31

Carleton University

What this project was about

Enabling Independence: Assessing Activities of Daily Living to Inform Safety Standards for Built Environments was a three-year research project (2023–2026) led by researchers at Carleton University's Accessibility Institute and Faculty of Engineering and Design. Accessibility Standards Canada funded the work.

We studied how smart technologies in the places people live, work, and spend time can help support activities of daily living (everyday tasks that people need or want to do to live independently). We did this to help the design of future accessibility and safety standards.

The project focused mainly on:

- people with disabilities, and
- older adults who want to age in place (live safely in their own home as they get older).

What we learned can also apply to many settings, including private homes, workplaces, rental and shared housing, and long-term care.

What we did

This project brought together two kinds of expertise:

- community-based research (learning from lived experience), and
- engineering research (understanding how technology works, and where it falls short).

We organized the work into three connected parts.

1) We reviewed research, reports, and standards

We looked at academic studies, public reports, and international standards. We focused on:

- common barriers to independent living, and
- the types of technologies people currently use to support their everyday living.

2) We learned directly from people

We worked with community members through:

- workshops where young adults with disabilities helped shape ideas and priorities, and
- focus groups with older adults and care partners.

3) We explored current and emerging technologies

We examined existing and new tools that could help monitor and support everyday life. We focused on the needs and ideas raised by participants. We shared findings through conferences, invited talks, and peer-reviewed publications to build understanding of accessible design in engineering.

What we found

Smart home technologies and wearable devices can support independence in practical ways, such as:

- reminders,
- basic automation (for example, simple actions triggered automatically),
- health tracking, and
- support for everyday routines.

But people also raised important concerns, including:

- privacy and who controls personal information,
- unfair outcomes when technology works better for some people than others,
- loss of control if technology "takes over" instead of supporting the person, and
- unequal access because of cost, complexity, or poor design.

Our review of standards suggested that some risks could be reduced by following existing guidance about protecting devices and information, handling health information responsibly, and helping different devices work together. However, this guidance is not widely used in real-world products—especially when people use consumer smart home products as supports for independent living.

Across both age groups, many people said they were interested in using technology that helps them live more independently. They often cared most about help with small, everyday needs, not only rare emergencies like falls.

Participants also emphasized that accessibility matters across the whole life of a product, including:

- setup and installation,
- updates,
- repairs and maintenance, and
- long-term support.

People also valued:

- being able to tailor settings to their own needs,
- having more than one way to use a tool (for example, voice, touch, or other options), and
- keeping control over what the technology does.

Recommendations

Based on what we learned, we recommend the following to keep the focus on user control and independence:

- Plan for the full life of the product. Design and standards should include setup, installation, updates, maintenance, and long-term support.
- Make products dependable and safe. Technology should keep working in a safe way, even if one part fails, especially when it supports essential daily activities.
- Ask for permission and respect choices. Companies should clearly ask users what they agree to when it comes to privacy, data ownership, and how personal information is used (including when it is used to build or improve AI tools).
- Help devices work together. People should be able to connect different tools and choose what works best for them, rather than being locked into one system.
- Recognize how people actually use technology. Standards and designers should plan for and help with the growing practice of using everyday consumer devices for personal monitoring and support.