

October 2025

Design Opportunity 2 of 8

Bus interior flexibility and accessibility

***ncat**
national
centre for
accessible
transport





Design Opportunity 2 of 8

Bus interior flexibility and accessibility

This is one of eight design opportunities developed from ncat's extensive research with disabled passengers across the UK.

For those who wish to explore the full evidence base, detailed findings can be found in the accompanying research report.

Contents

1

Barriers

2

Design opportunity

3

Objectives: **Flexible seating and space**

Objectives: **Finding and reaching a seat safely**

Objectives: **Awareness and behaviour around priority seats**

Objectives: **Reliable availability of priority seating and wheelchair spaces**

Objectives: **Help finding and reaching a seat**

Objectives: **Dedicated or specialist bus services**

4

Target users

5

Design scope and constraints

6

Next Steps

7

Contact Us



Barriers

Bus interiors are often of a fixed design/layout, offering little flexibility for people with diverse access needs. Through engagement with disabled passengers via interviews, focus groups, and survey responses, key themes emerged.

These included: passengers with wheelchairs or mobility aids face limited and contested space; priority seating that is inconsistently respected or understood; navigating through aisles can be stressful or unsafe.

Existing interiors tend to prioritise maximum seating or generic layouts over equitable access. There is often competition for limited space among wheelchairs, prams, and luggage, and a lack of clear visual or tactile cues for orientation.

Meanwhile, the opportunity for modular, reconfigurable, or more human-centred interiors remains largely unmet.



Bus interior flexibility and accessibility

How might we redesign bus interiors to be more flexible, dignified, and intuitive for people with a range of impairments, so they can travel safely, comfortably, and independently?

***ncat**



Objectives: Flexible seating and space

“

There is a constant battle for the wheelchair area, parents with buggies often occupy it. I've even faced verbal and once physical abuse and had to get off the bus and wait an hour for the next.

”

“

Would be great to have a seat for a carer or companion close to the wheelchair area on buses.”

”



Objectives: Flexible seating and space

“

Wheelchair space often positioned on buses facing away from the live travel information.

”

“

Sometimes buses allow two wheelchair users to sit side-by-side... why not make this standard?

”



Objectives: **Flexible seating and space**

What if buses offered flexible, well-designed spaces that reflected the full range of passenger needs?

- ▶ **How might we increase the number and variety of seating and space configurations available on buses, including spaces for wheelchair users, mobility aids, and assistance dogs?**
- ▶ **What would a modular or adaptive layout look like, one that can flex based on passenger needs during different times of day or routes?**
- ▶ **Could pre-booking systems or reconfigurable elements (for example, folding seats, designated zones) support more reliable and equitable access?**



Objectives: Finding and reaching a seat safely

“ The worst thing on the bus is to find a seat and to take it before the bus starts to move. ”

“ The seating layout is always different, it’s confusing. ”

“ I felt unstable facing backwards on the bus downhill. Would be great to have a way to clamp a chair in place. ”



Objectives: **Finding and reaching a seat safely**

What if passengers could easily find and reach an appropriate seat, even with limited vision or mobility?

- ▶ **How might interior layouts of buses be made more intuitive to navigate for passengers using canes, rollators, or wheelchairs?**
- Could cues inside the bus (visual, tactile, audio) help people**
 - ▶ **find the right kind of seating for their needs, like priority seating or available seats?**
- ▶ **How could consistent seating layouts or handrail placements across vehicles reduce confusion and improve predictability?**



Objectives: Awareness and behaviour around priority seats

“

On buses, some people use priority seating just for extra legroom.

”

“

Depending on what aid I use, the public sees me differently, so sometimes people don't want to give up their seats.

”



Objectives: Awareness and behaviour around priority seats

What if all passengers understood who priority seating is for and how it helps others travel safely and with dignity, even for needs you can't always see?

- ▶ **How might we make the purpose of priority seating clearer through signage, design, or onboard prompts?**
- ▶ **Could design or subtle messaging reduce conflict and assumptions, especially around non-visible disabilities?**
- ▶ **What design or service touchpoints could support drivers and passengers in maintaining more inclusive onboard behaviour?**



Objectives: Reliable availability of priority seating and wheelchair spaces

“

It would give peace of mind knowing there's a space on the bus for me...it's pot luck [currently].

”



Objectives: Reliable availability of priority seating and wheelchair spaces

What if disabled passengers knew in advance whether the space they needed would be available and where it was?

- ▶ **How might technology help passengers check whether a priority seat or wheelchair space is occupied before boarding?**
- ▶ **Could drivers or systems provide real-time updates about space availability (for example, via app, stop displays or announcements)?**
- ▶ **What would a reliable booking system look like for people needing accessible space on buses?**



Objectives: Help finding and reaching a seat

“ It’s not easy to find a seat, the guide dogs are not trained to do that. ”

“ Once a bus driver helped me to navigate to my seat, and that was great. ”

“ Cannot tell if someone is already sat in a seat - don’t want to end up on someone’s lap. ”



Objectives: **Help finding and reaching a seat**

What if passengers were supported, digitally or by people, to get to the right seat safely and confidently?

- ▶ **How might visual indicators, voice prompts, or driver-led assistance help people locate available seating?**
- ▶ **Could human or digital support reduce the stress of navigating crowded aisles or figuring out where to sit?**
- ▶ **What built-in design features could support orientation and mobility inside the bus?**



Objectives: Dedicated or specialist bus services

“ My partner and I both use wheelchairs, sometimes we can’t travel together. ”

“ In Edinburgh, two wheelchair users can travel together. Would be great if more places had that. ”

“ Could pre-bookable shuttle-style services offer better reliability and comfort for some passengers? ”



Objectives: **Dedicated or specialist bus services**

What if some buses or services were specifically designed to prioritise disabled passengers, particularly during peak times or in underserved areas?

- ▶ **Could pre-bookable shuttle-style services offer better reliability and comfort for some passengers?**
- ▶ **How might dedicated vehicles or scheduled services support those who can't always rely on regular buses?**



Target users

This opportunity primarily focuses on the needs of:

- ▶ **Wheelchair users and people with limited mobility**, who often face difficulties with contested space, lack of dedicated areas, or unsafe navigation through crowded aisles
- ▶ **Blind and visually impaired passengers**, who rely on consistent layouts, clear tactile or audio cues, and predictable interior design to find and reach seating safely
- ▶ **People with non-visible disabilities**, for whom subtle visual indicators and respectful behaviour around priority seating can make a significant difference
- ▶ **People with non-visible disabilities**, for whom subtle visual indicators and respectful behaviour around priority seating can make a significant difference

It also aims to consider the needs of:

- ▶ **Elderly passengers**, who may require extra space for mobility aids, stable handholds, and seating that is easier to access
- ▶ **Neurodivergent passengers and people with cognitive impairments**, who may benefit from sensory-friendly spaces, clear signage, and low-stress environments
- ▶ **Deaf or hard-of-hearing passengers**, who may rely more heavily on visual seat-finding cues and non-verbal prompts for orientation or updates.

Design scope and constraints

In scope:

This brief focuses on physical and spatial design changes to bus interiors that improve access, comfort, and confidence for disabled passengers as well as design interventions that encourage more inclusive passenger behaviour (for example, around priority seating and respectful use of shared spaces).

In-scope proposals should:

- ▶ Support a range of impairments: physical, sensory, cognitive, and neurodivergent
- ▶ Improve seating layout, mobility within the bus, and space allocation (for example, for wheelchair users or assistance dogs)
- ▶ Enhance clarity of priority seating through visual, audio, or spatial design
- ▶ Introduce tools or features to help passengers locate and reach their seating safely
- ▶ Explore modular or flexible layouts that adapt to different user needs
- ▶ Consider behaviour, communication, and staff support that affect the passenger experience
- ▶ Be realistic for operators to implement within existing or upcoming bus fleets.

Design scope and constraints

Out of scope:

This opportunity does not cover:

- ▶ Changes to bus exteriors or stop infrastructure
- ▶ National policy changes around vehicle regulation
- ▶ Full bus redesigns that are not feasible within current operational or cost constraints
- ▶ Scheduling, ticketing, or broader operational planning unrelated to interior access
- ▶ Solutions that rely solely on smartphone technology without accessible alternatives.



Stakeholders

- ▶ **Bus operators and transport providers**
- ▶ **Vehicle manufacturers and interior designers**
- ▶ **Local and regional transport authorities**
- ▶ **Bus drivers and on-board staff**
- ▶ **Disabled passengers and advocacy groups**
Other passengers, whose awareness and behaviour affect access to
▶ **seating and shared spaces**
- ▶ **Urban mobility consultants and service designers**
- ▶ **Technologists working on assistive tools or live occupancy systems**
- ▶ **Passengers with a wide range of physical, sensory, or cognitive needs.**

Next Steps

Visit the [Translating research into design opportunities project page](#) to find links to the full report, along with a shorter ‘highlights’ version that is also translated into easy-read and BSL.

The main project page also has direct links to the 8 individual design opportunities as below:

- 1 Bus stop accessibility**
- 2 Bus interior flexibility and accessibility**
- 3 Personalising ‘live’ travel information**
- 4 Train station accessibility**
- 5 Awareness of diverse travel needs**
- 6 Clarifying operator-passenger commitments**
- 7 Improving existing assistance services**
- 8 Identifying and sharing inclusive transport practices (vehicle, infrastructure, service, etc.)**

Contact Us



ncat website: www.ncat.uk



LinkedIn: www.linkedin.com/company/ncat-uk



Email: info@ncat.uk



 **ncat**
national
centre for
accessible
transport