ENABILISE PROJECT
STAGE 1 REPORT

Understanding Assistive Mobility Technology Needs for People Over 55
ENABILISE PROJECT
STAGE 1 REPORT: IDENTIFYING ASSISTIVE MOBILITY TECHNOLOGY NEEDS

PROJECT RESEARCHERS
Ms Leanne Taylor
Dr Eliza de Vet
Prof Lorna Moxham
Dr Tamantha Stutchbury
Mr Mark Sewell
Ms Nicky Sloan
Prof Geoffrey Spinks

REPORT AUTHOR
Dr Eliza de Vet

September, 2015
BACKGROUND

Australia’s population is ageing. Over the next 50 years, the proportion of people 55 years or older will rise from one-quarter to one-third (Australian Bureau of Statistics 2013). This growing demographic presents a challenge for Australia’s already overstretched aged care system, particularly as the number of age-related disabilities will increase, not only due to higher numbers of older people, but longer life expectancies (Australian Productivity Comission 2011). To meet demand, the Australian Productivity Commission (2011: XXIV) recommends that ‘the aged care system should aim to: promote the independence and wellness of older Australians and their continuing contribution to society’.

Maintaining mobility with age will be essential for living well, longer, as mobility is implicated in physical and psychological wellbeing. Mobility facilitates regular social contact, access to support groups and services, and minimises loneliness and isolation (Colmer 2007; Australian Productivity Comission 2011; Brown & Flood 2013). Remaining active, even simply in the home, increases muscle strength, balance and functional ability and decreases the risk of chronic disease and health conditions, including depression (Satariano et al. 2012; Ikezoe et al. 2013). Maintaining some level of mobility improves the feasibility of ageing at home – a situation viewed by older people as important to their quality of life (Australian Productivity Comission 2011; Australian Insitute of Health and Welfare 2013).

Supporting mobility through greater access to and improvements in assistive mobility technology (AMT) is imperative. To do so efficiently, AMT must support individuals at the point in which their mobility begins to decline, avoiding injury and fear of falling, both of which result in reduced activity participation (Allison et al. 2013; Brown & Flood 2013). While ‘older’ people normally encompasses ages 65 years and older, in terms of mobility, ages 55 to 64 are also important. While the proportion of individuals with mobility issues severely affecting core activities rises with age, in absolute terms, the age cohort 55 to 64 has one of the highest numbers of people with mobility issues living in households (Australian Bureau of Statistics 2012; 2013). Incorporating age cohort 55 to 64 into discussions on mobility support for older people will help facilitate the provision of mobility assistance as issues arise rather than the need to intervene in debilitating problems.
Assistive Mobility Technology And Consumer-Driven Designs

For the purpose of this study, ‘assistive technology’ refers to ‘an umbrella term for any device or system that allows an individual to perform a task they would otherwise be unable to do or increases the ease and safety with which the task can be performed’ (Cowan & Turner-Smith 1999: 325). ‘Mobility’ encompasses functional mobility – ‘the manner in which people are able to move around in the environment in order to participate in the activities of daily living and, move from place to place. Movements include standing, bending, walking and climbing. Functional mobility provides opportunities for a person to engage in physical activities at home, school and in the community thereby contributing to health related quality of life’ (Forhan & Gill 2013: 130).

There is substantial scope to improve AMT. Currently, the process of designing and manufacturing new AMT involves minimal consultation with older people and their carers, as new AMT is released into the market in response to technological innovation. This often results in complicated designs, rather than simple, situation based solutions (Colmer 2007; Sugihara et al. 2015). Consumer input into AMT designs is crucial if older people are to have greater control over the support they receive, regaining the dignity and respect they deserve (Australian Productivity Commission 2011).

In response to the need for greater consumer consultation, this project aims to develop new AMT guided by the ‘needs’ of consumers. To identify ‘needs’, this study not only consults consumers, but consumers’ support networks that are involved in mobility decisions and assistance. This includes carers, Allied Health professionals, managers of aged care services and technology distributors.

Participatory Action Research

This project draws on the principals of Participatory Action Research (PAR), a research approach which aims to generate action in response to identified problems. PAR encourages the inclusion of stakeholders in the research project (Stringer 2007). As part of Stage 1 of the Enabilise research project, stakeholders (i.e. older people with mobility issues and their support networks) shared their personal experiences through focus groups and results have been circulated among stakeholders and used to inform Stage 2 of the project (see below). This is what Green and Thorogood call a ‘cylindrical research design’ of action research (2014: 49).
Stakeholder Steering Committee and project aim

In 2014, AusIndustry and Illawarra Forum Inc. convened to discuss ways to encourage innovation in the health and community sector. Subsequently, researchers from the University of Wollongong’s Global Challenges Program were invited to facilitate the project. Preliminary project ideas were presented at the Illawarra Forum Conference with positive feedback. It was here that the Aged and Community Services Association of NSW & ACT joined the project and the Stakeholder Steering Committee was established. Together, the Steering Committee developed the project aim, which sought to develop new AMT that responds to the mobility needs of older people.

The project is divided into three stages:

- **Stage 1** (current stage) – Understand the mobility issues experienced by people over the age of 55 not adequately serviced by existing AMT. Research method: stakeholder focus groups;
- **Stage 2** – Identify core mobility issues not adequately addressed by existing ATMs. Research method: a large-scale survey; and,
- **Stage 3** – Develop AMT that responds to needs that have been identified. Research method: AMT design, prototype and trial.

STAGE 1: IDENTIFYING MOBILITY ISSUES

Stage 1 of the Enabilise research project aimed to identify current mobility issues and existing AMT constraints. During May and June of 2015, five focus groups were held involving 47 participants. Focus groups ran for 1 to 1.5 hours in length.

Participants included:

- 14 consumers;
- 2 unpaid carers;
- 13 Allied Health professionals;
- 13 aged care service managers and support staff; and
- 5 managers from AMT distribution centres and repair services.
Focus groups were facilitated by Leanne Taylor (AusIndustry) and were audio-recorded and transcribed. Transcriptions were thematically coded using NVivo software. (Note: unpaid and paid carers were invited to take part in focus groups, but both stakeholder groups were difficult to recruit).

The remainder of this report summarises AMT needs, suggestions and desires discussed in focus groups. Results only identify issues and not the number of participants encountering similar problems (the latter is reserved for Stage 2). Identified needs reflect the perceptions of participants and have not been substantiated by market research (i.e. AMT equipment that meet these needs may already be available).

FOCUS GROUP FINDINGS

Ambulating technologies

WALKING FRAMES

[Discussions around walking frames primarily referred to three or four wheeled walkers (with or without a seat and/or basket), but also included rollator (two-wheeled), static (pick-up) and forearm support frames. The following results refer to all walking frames unless specified.]

Walker width and manoeuvrability: Walker width presents a substantial limitation when moving around the home. Doorways are often too narrow to pass through (particularly those leading to the toilet), as are hallways and bedside spaces. Walker turning capacities are also restricted in many rooms. As a result, many older people ‘furniture surf’ and/or try to walk independently, frequently resulting in falls. Forearm support frames are particularly problematic as they are unable to pass through the majority of doorways, are not collapsible and have very large turning circles. While all frames could benefit from greater manoeuvrability, this is particularly pertinent to forearm support frames due to shoulder control.

Wheels and ground surface: Standard walkers are suited to solid flat surfaces which reduce ground-wheel friction and limit the energy required for pushing (although too little friction can also be an issue). Common problems
encountered are ground surfaces with high ground-wheel friction that require greater pushing force, such as carpet, linoleum, grass and unsealed pavements, as well as changes in ground surface/wheel-ground friction. While larger wheel sizes reduce the above issues, they decrease walker manoeuvrability and pose a greater trip hazard.

Other issues relate to sloping ground (that can cause fear of falling, particularly when the ground slants forward), and driveway lips (where the driveway meets the road) which are too high for standard wheels to roll over.

**Function:** Walkers are limited to walking. They provide limited or no support for other standing tasks such as cooking, cleaning, shopping, carrying bedside commodes etc. Walkers also block access to facilities such as bathroom sinks. When not in use they can be inconvenient and unsafe to keep nearby creating access issues (for example, in nursing homes walkers need to be parked at the side of rooms which promotes ‘furniture surfing’ and risky unassisted walking). Another concern is walker balance and support that can be compromised if the user leans back.

**Transportability – weight and dimensions:** A key limitation of current walkers is their size and weight, reducing car transportability (the issue is exacerbated in forearm support frames). While most walkers have a collapse mechanism, these are not always sufficient as handles often protrude and walker bulkiness remains difficult to manage. Weight is a compounding issue. Participants commonly stated that they, and/or their family and friends, struggled to lift or could not lift their walker into a car (users were left with the task as taxi drivers do not assist in this manner). Participants across a number of focus groups noted that it was not uncommon for outings to be avoided or abandoned because of AMT transportability issues.

**Hand breaks:** Standard bicycle-style hand breaks cause a number of problems. This style requires hand strength and dexterity (often lacking in users), and fixes hands in positions that are not always comfortable. Hand break cords were also reported to get caught on furniture. Push-down breaks were recognised as an alternative, but not suitable for everyone.
**Physical and mental requirements:** All walkers require the use of two hands, two legs and memory. For those who lack an arm or leg, or have limited function in one limb, walkers are not suitable and wheelchairs are used instead despite a person’s remaining capacities. People with dementia often forget to use, or that they have, a walker – a common cause of falls.

**Desirable attributes:** Handles with grip and softness options, sweat-free handles that do not catch on clothing, a bell or horn, a functional seat, lights and reflectors for night use, tray and basket to carry items (e.g. tea cups), choices in basket materials and design, and easy collapse/erect mechanisms.

**WALKING STICKS**
Retrieval was the central issue for walking sticks. When users required two hands for tasks, walking sticks frequently fell from their leaning position against walls or furniture or were left a short distance away if a task required some movement. Participants identified wristbands and quad walking canes as existing solutions, but both were thought to increase the risk of tripping.

**Desired attributes:** fold-up capacities, handle softness and grip options, and a bell or horn.

**WHEELCHAIRS**
Common needs identified for wheelchairs were lighter, more compact designs that maintained strength and reduced cost. Such design improvements would greatly enhance wheelchair transportability.

In a hospital setting, participants reported that while wheelchairs have adjustable components (e.g. footrest height), appropriate changes are often not made as the physical strength and time required is too demanding.

**SCOOTERS**
Scooters were perceived as a device that enhanced individuals’ freedom. Desired adjustments to current designs included greater manoeuvrability, comfort and baggage capacity.

**STAIRS AND CHAIRLIFTS**
Stairs in and around the home were identified as a significant barrier and risk in everyday life. Current chairlift solutions are expensive and not suitable for all
properties. Additionally, most chairlifts only transfer the user and not AMTs or other items (e.g. laundry, shopping). They are also notorious for breaking down, risking hospital admissions if toilets are located upstairs.

In houses without chairlifts, participants reported that it is common for equipment duplicates to be divided between floors – a strategy that promotes the use of cheaper products. In all focus groups, participants emphasised that there is no feasible option for negotiating stairs and there is substantial need for an AMT that can overcome this daily barrier.

GENERAL COMMENTS ON AMBULATING TECHNOLOGIES

Bariatrics and tall people
There are limited AMT options for bariatric and tall people who require greater weight capacities from their equipment. Currently, not all large-sized equipment has increased weight capacities. Further, while some equipment is available, there are few (if any) appropriate options for tall people who need narrow, strong frames and wheelchairs.

Materials
Issues regarding materials used included: fast wearing foam handles and padding, hand breaks snapping, easy adjustment parts breaking, and surface sterilisation (principally for hospital and leased equipment).

Adjustments
Adjustments to ambulating technologies could be improved by reducing the time, physical strength and steps required, while maintaining structural integrity. The need for user-friendly adjustments is pertinent not only in hospital settings where regular changes are necessary, but in the home as equipment is often left in its original position.

EVERYDAY TASKS AND ISSUES

Toileting
Toileting is one of the highest fall activities. This is due to a culmination of behavioural and environmental factors: increased urgent urination among older people; ambulating equipment slowing movement; hard, wet and/or protruding surfaces in bathrooms or toilet cubicles (often causing severe injury, even
death); small hallways, doorframes and room sizes, limiting AMT access and forcing individuals to ‘furniture surf’; transiting to and from the toilet; and, accessing hand basins (often obscured by walkers).

The capacity to install or provide support around toilets is commonly restricted by room size and layout (baths situated alongside toilets are often used for support and prohibit the installation of handrails). While new bathrooms, including those in aged care facilities, may adhere to disability standards, the angle and height of hand rails and toilet seats are often impractical having been constructed for the lower height of wheelchairs rather than walkers.

Toileting assistive technologies, such as the bidet (a toilet with built-in water jet and dryer) and electronic sensors designed to avoid incontinence, have been trialled in some nursing homes with little success. Participants felt the AMTs' shortfalls were the outcome of: incompatible hospital-AMT systems; patience awareness and unease of being monitored; cultural perceptions of hygiene in Australia; and, unfamiliar sights and sensations – ‘residents were frightened of it’. Facilitating toileting tasks through AMT designs is crucial, not only to reduce the risk of falling, but dehydration, as older people limit fluid intake to avoid the toileting process.

**Transport**

Transferring into and out of a car is a key issue for older people. Primary problems relate to low seating and the obstruction created by doors, problems exacerbated when parked on a slope or next to a high curb. Participants were aware of existing AMT devices, but felt these only provided some assistance or were too expensive.

For older people dependent on scooters, taxis or modified vans are necessary. For people dependent on taxis, distant and frequent outings are not an option.

Other transport issues included: public transport and toilet access, the ‘nuisance’ of carrying luggage for incontinence (including a change of clothes), stairs, and moving shopping or other items between the car and house.
SURRENDERED DIVING LICENCES, LEISURE ACTIVITIES, HOLIDAYS & DAY TRIPS

Driving licences
Surrendering a driving licence is one of the most difficult tasks older people face. It marks the end of total independence and a milestone in the ageing process. Gaining a scooter licence often restores some sense of independence.

Leisure activities
Older people often forgo loved leisure activities, commonly due to lost transport independence and constraints from the aging body. Lawn bowls, gardening and beach walking were three such activities, as the physical demands of lifting balls, working at ground level and walking over sand were no longer manageable.

Holidays and day trips
Holidays and day trips are inaccessible for many older people. A number of participants from the consumer focus groups had not been on holidays for decades and the possibility of a holiday ‘would be one thing that would really be fantastic’. Complicating holiday plans were poor health (including incontinence), surrendered car licences, taxi dependence, a lack of wheelchair accessible accommodation, and substantial equipment requirements for overnight stays (including commodes, bed transfers, hospital beds, sleep apnoea machines etc).

SHOPPING
Shopping has both its problems and advantages. Older people often struggle to carry shopping when dependent on a walking stick or walker (shopping was often tied to the walker). Additionally, narrow isles leave little room for scooters to turn and a lack of seating and rest areas leave older people tired and sore, especially as shopping centres are increasing in size. At the same time, shopping provided a sense of normality for some older people who relinquish their walking sticks and walkers for the support of shopping trollies – a device used by able-bodied shoppers.
MISCELLANEOUS

Other everyday problems recorded included: telephone audibility that is either too quiet or distorted when volume is turned high; no small hospital seats for short patients; reaching for items on the floor and from high shelves; the trip hazard presented by the ridge on the floor of sliding doors that lead to the outside; reduced capacity to conduct housework; equipment storage (particularly when multiple AMTs are owned); and, changes in older people’s feet size throughout the day, forcing them to walk on the back of shoes (namely slippers) or wear shoes that are too big.

GENERAL ISSUES AND INSIGHTS

Acceptance and aesthetics

Personal acceptance of AMT is a key barrier to AMT uptake and appropriate use, particularly for more supportive equipment. Older people frequently refuse to use AMTs despite their benefits (often lifesaving), to maintain dignity and/or avoid a sense of lost independence and the perception of being aged or disabled. Even when devices are used, negative impacts to personal image, identity and esteem are experienced. While the need for assistance is unavoidable, resistance and negative emotions are compounded by equipment that has a clinical appearance and looks similar to AMTs used by parents and grandparents.

Among focus groups, participants noted limited or no choice in AMT colour and patterns, important aesthetic features that could help to reflect personality and individualism, while camouflaging the clinical appearance of AMTs. Although some participants reported opting for AMT functionality over appearance, others acknowledged colour had been more influential in choice than support. Participants from the AMT distribution focus group noted that if consumers were given a choice, they would often pay more for aesthetically pleasing AMTs.

Buying factors

Cost and government subsidies were the primary factor when deciding on AMTs. Other decision factors included functionality, equipment weight, weight capacity, stability, comfort, aesthetics, custom design, hospital discharge requirements, Allied Health recommendations, trial options, Australian
Standards, durability, materials, waiting times, loan availability, stocked options (often limited by government contracts and subsidies), purchase accessibility, choice, information and education, dexterity and strength requirements from the user, warranty, service, and to some degree ‘keeping up with the Joneses’. Older people commonly inherit and use equipment with personal and family history.

**Source of technology information**

Older people were informed about and sourced equipment through a number of avenues: neighbours, family, internet searches (including EBay), ‘op-shops’, hospitals and Allied Health professionals, chemists, store shelves (including Aldi and Australia Post), newspapers, directly from manufacturing companies (identified from previous equipment), local distribution centres (on location or in store) and local flee-markets. Allied Health professionals were informed through ‘expos’, emails, equipment suppliers, and manufacturing and distribution representatives.

**Focus group ideas for new equipment**

Focus groups raised a number of ideas to fill current gaps in the market. Ideas included:

- An affordable robot to lift walkers into cars.
- Alternate/electronic breaks for walkers.
- New wheel technology for walkers.
- A walking stick that stands upright, and ideally, follows you around.
- Oxygen tank and IV attachments for walkers and other AMT.
- A walker that grows with you. This idea was raised in a number of focus groups. Such a device was seen to overcome issues of cost, storage and sentimentality (older people are reluctant to part with reliable equipment).
- A prompt that reminds dementia patients to use their walker.
- Devices that could prevent falls, reduce the number of falls and/or severity of impacts. Falls were a reoccurring theme in a number of discussions, unsurprising as falls are a primary cause of injury and death among the elderly.
• An engaging computer ‘app’ directed at older people and their families to assess core physical strength and tailor exercises to maintain or increase mobility independence.
• Technology that combats fear of falling in older people (the idea referred to existing eye-wear technology that assists with social phobias).
• AMTs that assist people with one functioning arm to cook (including opening jars) – one focus group participant had already built his own.
• A walker that negotiates stairs and other difficult environments.
• Forearm support frames that can move through standard doorways, has a smaller turning circle, can move over carpet and linoleum, is collapsible and has a weight capacity of over 120 kilograms.
• Lightweight, strong and affordable wheelchairs.
• Affordable AMTs that can assist older people to transfer to and from the car with ease.

WHERE TO FROM HERE?
Findings from Stage 1 will inform a large-scale survey (Stage 2), which aims to identify core issues experienced by older people.

Survey results will inform Stage 3 of the project – AMT development, prototyping and trialling.
REFERENCES


