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*New Transportation Technologies
for Older People*

OECD/MIT International Symposium
*Human Factors of Transport Technology for
Older Persons*
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by
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“Freedom to Move is Life Itself”

- Ageing Well
- Mobility is a key element of a healthy active life (direct demand)
- Access to commercial, social and medical activities is critical for independence (derived demand)

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Mobility for Seniors

- In the West, majority of the baby boomer population are auto-dependant
- Decrease in access to the private auto results in severe problems
- Mobility alternatives (public, private, personal) needed

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Transit Usage by Older Users

- 2% of trips in the US
- 3% in Netherlands
- 11% of trips in the UK
- 10% -30% of trips in Canada
- Majority off-peak
- Bus trip usage decreases for people after 60 years old in US, but increase in UK, Netherlands, Norway and Canada.

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Key Factors Affecting Mobility

- Abilities of individual (functionality, knowledge, affordability)
- Geographical location of activities (urban, local/neighborhood, suburban, rural)
- Availability of transportation services & infrastructure

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Transit Options

- Fixed route:
(subway, light rail, commuter rail, fixed route urban bus)
- Flex route:
(route deviation, point deviation, flag stop, request-a-stop, service route/community bus, paratransit)

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Low Floor Bus



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Fixed Route

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This slide features a blue background with the title 'Low Floor Bus' in yellow italicized font. It contains two photographs: the top one shows a white and red bus with 'KIA' branding parked outdoors, and the bottom one shows the interior of the bus with yellow handrails and blue seats. The date '2003-09-12' is in the bottom left, 'Fixed Route' is in the bottom center, and the number '7' is in the bottom right.

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Community Bus



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Flex Route

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This slide features a blue background with the title 'Community Bus' in yellow italicized font. It contains a photograph of a light blue and white bus parked in front of a building. The date '2003-09-12' is in the bottom left, 'Flex Route' is in the bottom center, and the number '8' is in the bottom right.

ACCESS/EGRESS MODES FOR TRANSIT

- **Motorized:**
(powered wheelchair, scooter, electric bike, golf cart, Segway, NEV)
- **Non-motorized:**
(walk, bicycle, tricycle, assisted walking, wheelchair)

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ACCESS/EGRESS MODES FOR TRANSIT

	
Segway	Neighborhood Electric Vehicle

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Older Transit User Safety Issues

As Passengers

- Transit vehicle accidents
- Slip and fall
- Emergency evacuation

As Pedestrians

- Slip and fall
- Crosswalk design and crossing time
- Construction zones

Facts on Safety

- Low accident rates involving public transport, all age groups
- 69% of non-collision accidents to older users due to falls (walking to stops, in vehicles and stations)
- Fragility index high (6 times of those aged 20-50)

Older Transit User Security Issues

Perception regarding lack of safety for public transport

- Anxiety of waiting at stops
- Anxiety of handling fares
- Unfamiliarity with surroundings & services
- Unfamiliarity with technologies
- Fear of violence & threats

Facts on Security

- Most travel by seniors during off peak
- Seniors are most afraid after dark
- Behaviour of young people in groups seen as threatening
- Transit crime level generally low

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Physical (Agility) Issues

Problematic Situation	Non Technology Solutions	Technology Solutions
<ul style="list-style-type: none">• Fare payment• Lose balance	<ul style="list-style-type: none">• Pre-purchased tickets/passes• Handrail and grip bars	<ul style="list-style-type: none">• User friendly vending machine design• Smart cards

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Physical (Fragility) Issues

Problematic Situation	Non Technology Solutions	Technology Solutions
<ul style="list-style-type: none">• Anxiety for personal Safety• Inclement weather• Increase introspection	<ul style="list-style-type: none">• Enhanced security measures• Transit shelter• Human assistance	<ul style="list-style-type: none">• Video surveillance• Emergency communication systems

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Physical (Mobility) Issues

Problematic Situation	Non Technology Solutions	Technology Solutions
<ul style="list-style-type: none"> • Slip & fall • Emergency evacuation • Vehicle-pedestrian conflict • Construction zones • Inclement weather 	<ul style="list-style-type: none"> • Stable non-slip walking surfaces • Grab bars and handrails • Eliminate level changes • Adequate clearance for mobility aids • Direct and reduced distance of access • Maintenance (ice and snow removal) • Transit shelter 	<ul style="list-style-type: none"> • Powered mobility aids • Low floor vehicles • adjustable crossing times for crosswalks • Countdown traffic signals

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Sensory (Visual) Issues

Problematic Situation	Non Technology Solutions	Technology Solutions
<ul style="list-style-type: none"> • Slip & fall • Missed stop • Wrong Vehicles 	<ul style="list-style-type: none"> • Remove barriers/level changes • Good colour contrast and legible information in terminal and vehicles • Legible & comprehensible e maps, fares & schedules • Visual and tactile cues • Good lighting • Phones with large lettering 	<ul style="list-style-type: none"> • Audible pedestrian signal • Audible PA systems • "Talking Sign" • Automated information kiosks • Audio signals and cues

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Sensory (Hearing) Issues

Problematic Situation	Non Technology Solutions	Technology Solutions
<ul style="list-style-type: none">• Missed stop• Missed PA announcement• Vehicle-Pedestrian conflict• Communication difficulties• Balance	<ul style="list-style-type: none">• Visual cues• Note pad and pencil• Aids to balance (grab bars)	<ul style="list-style-type: none">• Audio loops• Visual signalling devices• Electronic messaging systems• TTD• Personal data assistant (PDA)• Volume control phones• Improved Acoustics• Voice to text machines

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Sensory (Speaking) Issues

Problematic Situation	Non Technology Solutions	Technology Solutions
<ul style="list-style-type: none">• Communicating travel requirements• Obtaining help	<ul style="list-style-type: none">• Note pad and pencil• Sign language	<ul style="list-style-type: none">• TTD• Voice to text machines• Volume control phones

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Cognitive Issues

Problematic Situation	Non Technology Solutions	Technology Solutions
<ul style="list-style-type: none">• Way finding• Understanding written and verbal instructions	<ul style="list-style-type: none">• Legible and well placed signage• Good maps• Universal and standardized design• Environments free of complex sensory stimulation• Human Assistance	<ul style="list-style-type: none">• Multi-media presentation of information• Self service machines used on our own speed and in privacy• Help Line

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Needs and Solutions

1. Accessible Information

- Maps (print & electronic)
- Schedule (real time or static)
- Interactive Voice Response (IVR) Systems
- Computerized Reservation & Dispatching Systems

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Needs and Solutions



Electronic Information Systems

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Needs and Solutions



Electronic Information Systems

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Needs and Solutions

2. Accessible Infrastructure

- Accessible sidewalks & path ways
- Cross-walks (audible signals, countdown signals, adjustable crossing time for pedestrian signals)
- Accessible terminals and bus shelters
- SOS (visual alert systems, video monitors, alarms, cellular phones)
- Accessible detours in construction zones

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Needs and Solutions



Countdown Signals

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Needs and Solutions

3. Accessible Vehicles:

- Easy access features
- Electronic fare payment and smart card
- Electronic information systems
- Audio loops
- Emergency evacuation equipment & instructions

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Recommendations

1. Modal

- Mobility counseling
- Mobility training
- Personal mobility alternatives
- Uniform and disaggregated datasets

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Recommendation (cont'd)

2. Policy

- Implement existing accessible information/web guidelines
- Adopt universal design practices
- Clarify licensing issues of powered personal mobility devices

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Recommendation (cont'd)

3. Research

- Human factors studies on legibility (vision) & comprehension (cognition)
- Enhanced audio/visual systems for transit applications
- Usability of computerized information systems and ITS (both vehicle & pedestrian systems)

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Contact Information

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