Session OTH-1034:
"IP TV, Remote Control, Set-Top Box, Apps and Programming Guide Accessibility"

CSUN San Diego, CA
March 16, 2011

IBM

About the Speakers

CHRISTINE BANKE

- Chris is an accessibility strategy expert in IBM Research, currently responsible for integrating IBM's innovative accessibility expertise, services, technologies and initiatives into mainstream markets.

DAN SHIRE

- Dan is a user experience and accessibility specialist in IBM Canada's Global Services team. He works with Canadian customers to design, develop and test business solutions that meet customer needs for ease of use and accessibility compliance. Dan also served as a member of the Ontario government standards development committee for accessible information and communication

PHILL JENKINS

- Phill is a Senior Software Engineer in the Human Ability and Accessibility Center of IBM Research. Phill has been leading accessibility efforts in IBM for over a decade and was appointed by the President effective January 2009 to a four year term on the U.S. Access Board, a federal agency (www.access-board.gov/) dedicated to accessible design for the Americans with Disabilities Act (ADA), Section 508 of the Rehabilitation Act, and represents the Access Board on the Election Assistance Commission Board of Advisors.
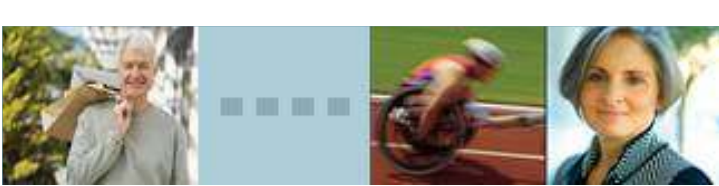
Topics

- **Introduction**
- **Sustainable Measures**
- **Usability and Testing**
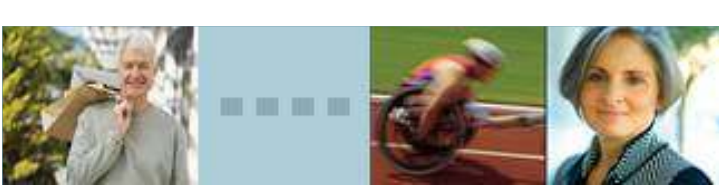- **Heuristic Analysis**
- **Future of Television**

What you will Learn
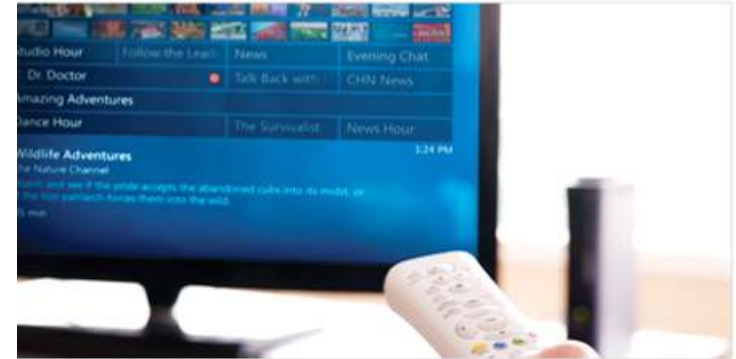
- **Together we'll explore:**
  - what IP TV is
  - the latest trends in IP TV
  - an accessibility assessment process
  - recent findings on the accessibility of the latest TV technologies, controls, and programming media content
  - technical assessments that includes testing with persons with disabilities
  - the issues and promises of this emerging technology
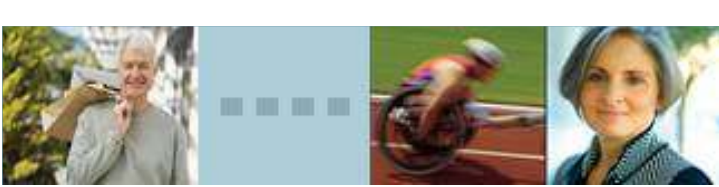 - how people/organizations/companies sustain it

What is IP (Internet Protocol) TV?

- ## From a consumer view:
  - Similarities with Cable TV
  - Similarities with Satellite TV
  - Still have a remote, TV, set-top box, programming guide

- ## Broadcast programming
  - On-demand, pay-for-view, etc.

- ## **Not** – IP video on laptop or mobile
  - Not Netflix, YouTube, or … on a mobile, tablet, or laptop
  - We're talking about living room large HD TV monitors

- ## Bundled with other services:
  - VOIP Home Phone
  - Internet service, Hotspot services, . . .
  - Web access to voice mail, video recording, TV guides, etc.
  - Wireless services and apps

IP TV available in many countries

The Americas

USA — at&t U-verse	USA — nTelos
USA — CenturyLink	USA — RTC
USA — SureWest	Canada — MTS allstream
Canada — TELUS	Mexico — MAXCOM
Dominican Republic — Claro tv	

Europe, Middle East and Africa

UK — BT Vision	Germany — Deutsche Telekom	Switzerland — swisscom
Portugal — meo	Portugal — vodafone	Denmark — TDC
Italy — INFOSTRADA TV	Hungary — T	Montenegro — Crnogorski Telekom
Slovakia — T··Com·	Macedonia — Makedonski Telekom	Greece — hol tv
Russia — Beeline	UAE — du	France — viapass tv

China and Asia Pacific

Singapore — mio TV
China — 广数传媒

IPTV platform by Microsoft Mediaroom

How IP TV works?

- Programming content
  - From providers, Broadcasters, Hollywood, etc.

- Fiber optic cable to main network
  - Not Netflix, YouTube, or … on a mobile, tablet, or laptop
  - We're talking about living room large HD TV monitors

- Standard phone wires "last mile"
  - IPTV platform by Microsoft Mediaroom

- Inside the home
  - Internet router, phone wires or cable, set top boxes

Internet Access Gateway

Video signal provided over separate "virtual circuit"

The Internet

IP network uses VLANs to keep Internet and video signals separate

Main Facilities

Fibre optic cable connects the DSLAM to main network

Standard phone cabling (ie. "the last mile") connects a customer to the DSLAM

Remote DSLAM

Motorola VIP1200
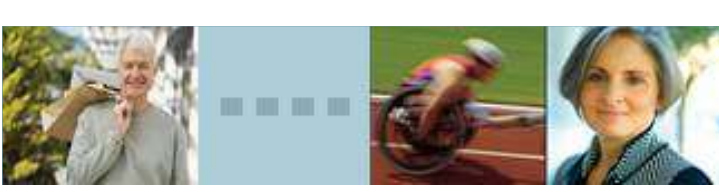
Motorola VIP1216 (PVR)

Alcatel Cellpipe 61v

Project Overview

IP TV is an emerging accessibility challenge

- Goes beyond captioning, DV, and accessible remotes
- Strategic Business – who dominates TV/web/mobile?
- Competition is Everywhere
- New standards & regulatory requirements

Our projects revolve around both a tactical accessibility assessment and a strategic company initiative

- **Non-Traditional Accessibility Assessment**
    - IP TV vs Web applications
    - Set-top box & Remote Control Devices
    - Apps & Programming Guide
- **New Governance & Process Transformation Project**
    - New business concerns relative to accessibility
    - How do companies/organizations address integrate & sustain accessibility

Part 1: Sustainable Measures

Examine your Organizations Accessibility "As-Is State"

- <u>Identify gaps</u> against accessibility best practices across the following dimensions:
    - **Organization - Roles & Responsibilities**
    - **Standards and Guidelines**
    - **Products & Offerings Development, Test & Project Management Processes**
    - **Procurement**
    - **Development and Testing Tools**
    - **Customer Support Practices**
    - **Training & Skills Development**

- <u>Prioritizing the findings</u> into strategic recommendations
- <u>Build a roadmap</u> to methodically integrate accessibility best practices across these dimensions
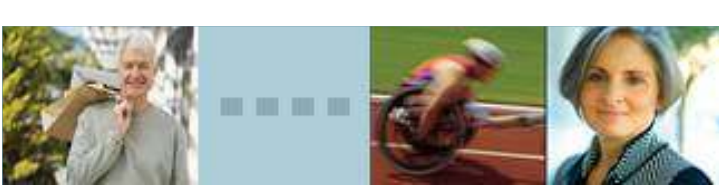
Process   **Technology**

People

Sustainable Measures

Identify Key Stakeholders & Map to the Dimensions

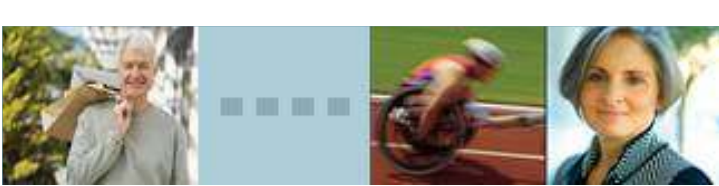| Key Stakeholders	Definition	Example Organizations
Owning	• Overarching accountability are responsible for maintaining the policies • Ensure that the policies are available throughout the corporation and remains current with regulatory requirements , legislation as well as any other relevant company policies	Line of Business (LoB), Corporate Affairs, Public Relations, HR, or CIO's Office, etc.
Governing	Responsible for determining that the policy is followed and providing guidance for complying with the policy	Legal, Project Management Office, I/T Program Office, Architecture and Standards, Testing Center of Excellence, etc.
Delivering	Responsible for ensuring that products, whether developed or procured are designed for accessibility and supporting process and resources to do so are available, respectively	Procurement, Product Development and Test Teams, Project Management Teams, Customer Service, Call Center, eLearning, etc

Sustainable Measures: Project Outcomes

Execute the accessibility roadmap resulting in a deep penetration of accessibility policy, employee responsibility and process integration across the organization

- Cross-Organization Roles & Responsibilities Identified and Measured
- "Corporate" Accessibility Policy & Governance Published & Communicated
- Employees trained on Policy, Process and Developer/Test Techniques
- Accessibility Requirements built into the fabric of your organizations processes
  - Project Management & Project Charters
  - Concept & Design, Development & Test
  - I/T Architectural Guiding Principles
  - Procurement
- Accessibility Standards Documented and Published

Part 2: Usability and Persons with Disabilities

Effective usability & accessibility assessments require:

- Good **planning**
  - Engagement of interested parties
  - Commitment to the process – time, people, agreement to take real action
  - Following the principles of good usability: effective, efficient and satisfying

- Good **delivery**
  - Careful setup
    - Environment
    - Structured test scripts
    - An objective and repeatable process

- Good **analysis** and reporting of the results
  - Looking for patterns, and also for informative "wild cards"
  - Specific and actionable recommendations
  - A follow-up plan to monitor progress

Usability & Testing with Persons with Disabilities

Good planning:

- Interviews conducted with 12 representatives:
  - Low vision and blindness (3), dexterity and mobility (5), hearing loss and deafness (4)
 - Participants were leaders in their fields of knowledge – specialists, Dr., MBA

People with disabilities frequently embrace technology – early adopters, flexible, enthusiastic.

Networking to share information and issues – extremely effective and well organized

In Canada, there are stable government programs in place to assist with periodic technology acquisition – especially when the technology can help enable employment

Technology is moving so quickly:
- Hard to keep pace
- Amazing innovations – e.g. iPhone and iPad provide accessibility features for many individuals. These 'commodity' items are complementing traditional assistive technology that costs $ thousands.
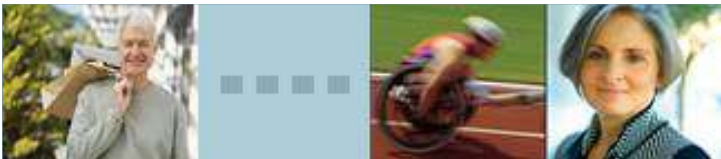
Usability & Testing with Persons with Disabilities

Good delivery:

- Tested with 12 participants:
    - Blind (3), Vision loss (3), Deaf (2), Hard of hearing (2), Dexterity & mobility (2)
- Pre-defined Test scripts
    - 10 typical scenarios – check schedule, search for a movie, order a movie, program the PVR, turn on CC, read the user's manual, etc.
    - Pre and post questionnaires –
        - Special requirements, familiarity with technology, background
        - Which features the participants liked and disliked best.
- Environment
    - Simulated living room – big-screen TV, typical lighting and ambient noise levels

- Objective and repeatable process
    - Minimal coaching during the scenarios – let the participant work it out

- Important – we test the technology, not the person – supportive/positive approach

Usability & Testing with Persons with Disabilities

Good analysis and reporting of results:

Critical to prioritizing the findings

Sample Usability & Accessibility Findings

- Blind

  - I can't do anything except turn it on and off, channel surf and adjust the volume using the remote.

- Low Vision

  - It's difficult to use the program guide or the menus – the font is very small and the words are hard to see on the busy background.

- Hearing Loss & Deaf

  - Are these programs closed captioned?

  - How do I turn on closed captions?

  - I'd like to rent this video on demand, but it doesn't tell me if it's closed captioned or not. I won't rent unless I'm sure.

- Dexterity and Mobility

  - If I drop the remote, it may be 5 hours before my home-assistant comes back in to pick it up for me.
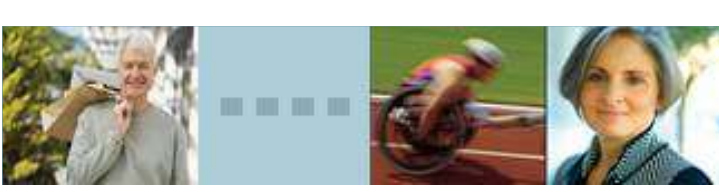
Usability & Testing with Persons with Disabilities
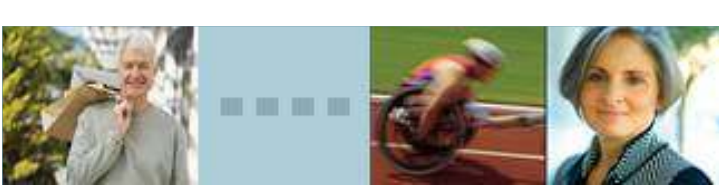
Good analysis and reporting of results:

Disability Group	Issues	Recommendation
Blind	Most 'core' IPTV features and benefits are not available to blind customers because the menu and program guide content is not read aloud. Most programming is not Described Video (DV) Remote is complex with limited tactile feedback, no key announcement.	Engage technology suppliers to address foundational accessibility gaps. Can they share their development plan? Work with content suppliers. Support user's choice of remote (selected remotes only) - requires some testing and documentation.
Vision loss	Fonts are fixed size, making it harder to read content and navigate the functionality (menus and program guides). Contrast an issue for some conditions. Live program in background makes it hard to see the foreground content (guide, menus). Remote – as above.	Design and implement user selectable choices: font size 2 or 3 high contrast colour schemes turn on/off the background program image These choices would be persistent for the household (ideally at set-top box level). Tactical timeframe with significant benefits for many users (common frustration).
Deaf	Inconsistent indication of Closed Captioned content (CC) – may not always be passed over from the guide supplier. Deaf and hard of hearing customers cannot search on CC programs. Video on Demand – there is no indication whether the movie has CC. Customers will not rent a movie to discover they cannot watch it without CC.	Ensure that CC information is provided by the program guide supplier and that it is displayed on the IPTV guide, program summary and program details screens. Extend search function to allow choice of CC. Video on Demand – clearly indicate CC movies. Remote control – dedicated CC button

Usability & Testing w/ PwD

Good analysis and reporting of results:

| Disability Group	Issues	Recommendation
Hard of Hearing	As above for deaf	As above
Mobility and Dexterity	Remote – 1.Close buttons 2.Small buttons 3.Rolls on flat surface For users with dexterity issues (e.g. cerebral palsy, arthritis) the remote is very hard to use.	Minimum – test a number of popular 'universal remotes' commonly used by PwD so we can answer customer questions. Better – test and provide customer with a choice of a large button remote (including CC and SAP buttons to benefit deaf and blind). We were told by a subscriber of a competitive product (cable TV) that they provide this as a free option.
Common to multiple groups	Background programming content (behind the menu and schedule) is not always the user's preference. Product documentation – challenges with current printed format. Could be improved with guidance to user groups.	Enable user choice of this feature: on or off. Provide accessible documentation (web) – compliant HTML and PDF. Include 'hints' to help users get a quick start (e.g. how to turn on CC, how to select bigger menu fonts, turn off background images, etc.)

Part 3: Heuristic Analysis

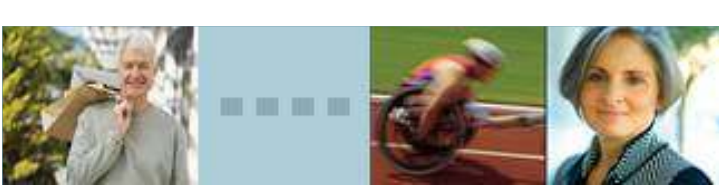| Information and Communication Technology (ICT) Standards and Guidelines	
(Draft published in U.S. Federal Register 22 March 2010): www.access-board.gov/sec508/refresh/draft-rule.htm	
	Policy application
U.S. Section 508 of Rehabilitation Act	Applies to ICT that is procured, developed, maintained, or used.
U.S. Section 255 of Telecommunications Act	Applies to manufacturers of telecommunications products.
U.S. American with Disabilities Act Accessibility Guidelines (ADAAG)	Applies to buildings and facilities covered in the ADA
W3C Web Content Accessibility Guidelines (WCAG) 2.0	Applies level A and AA provisions to web content.
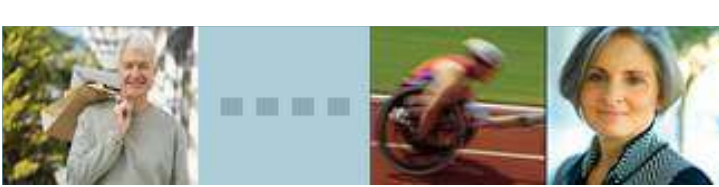
Heuristic Analysis – ICT w/ closed functionality

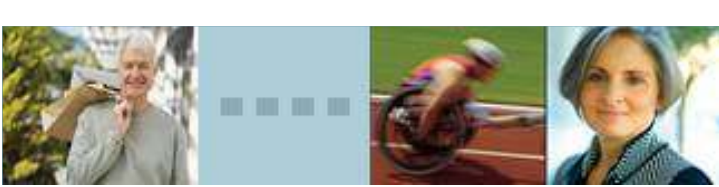| Criteria 300* ICT that has closed functionality	Applicable	Guide	Remote	Media Content	Set top box	Notes
303 Biometrics	Yes	NA	Pass	NA	Pass	A non-biometric alternative not needed
304 Preservation of information	Yes	Fail	NA	Fail	NA	Closed Captions and DVS not always passed thru
305 Color	Yes	Mostly	Pass	NA	Mostly	
306 Flashing	Yes	Pass	Pass	NA	Pass	Flashes do not violate the general or red thresholds
307.2 Clear Floor Space	No					
307.3 Height	Yes	NA	NA	NA	Pass	Within reach ranges
307.4 one hand operation	Yes	NA	Pass	NA	Pass	Operable with one hand
307.4.1 Force 22N max	Yes	NA	Pass	NA	Pass	
307.5.1 Tactilely Discernible	Yes	NA	Pass	NA	Pass	Tactilely discernible without activating the control
Etc. . .	Yes					
307.6.2 Mode without vision	No					When no physical contact

- *U.S. Information and Communication Technology (ICT 508/255 Refresh) Accessibility Standards and Guidelines (draft 2010)
- Possible 'one-stop shopping' for technical accessibility standards – benefits industry and government and users
  [Sample analysis, not attributable to any single provider]

Heuristic Analysis – ICT platforms, apps, interactive content

Criteria 400* Platforms, applications, & interactive content	Applicable	Guide	Remote	Media Content	Set top box	Notes
403.2.1 Pause or stop audio	Yes	Pass	Pass	NA	NA	
403.2.2 Volume Control	Yes	Fail	?	NA	NA	Volume control independent from overall system volume
403.3 Resizable Text	Yes	Fail	NA	NA	NA	2X enlargement needed
404.2 Keyboard Interface	Yes	Mostly	Pass	NA	Mostly	All functionality operable through a keyboard interface
404.3 No keyboard traps	Yes	Pass	NA	NA	NA	
404.3.1 Keyboard exit	Yes	Pass	NA	NA	NA	
404.3.1.1 Standard exit	Yes	Pass	NA	NA	NA	
404.3.1.2 Non standard exit	Yes	NA	NA	NA	NA	None available
404.4 keyboard shortcuts	Yes	Fail	NA	NA	NA	No presentation in one mode
404.5 Visible focus	Yes	Pass	NA	NA	NA	Yellow border easier to see
405.2 Control of time limits	Yes	Fail	NA	NA	NA	No user control
Etc. . .	Yes					
413 Authoring tools	No					

- *U.S. Information and Communication Technology (ICT 508/255 Refresh) Accessibility Standards and Guidelines (draft 2010)
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 [Sample analysis, not attributable to any single provider]

Part 3: Heuristic Analysis

Information and Communication Technology (ICT) Standards and Guidelines	
(Draft published in U.S. Federal Register 22 March 2010): www.access-board.gov/sec508/refresh/draft-rule.htm	
Chapters of provisions	**Description**
✓ 200 Functional performance criteria	Without vision, without hearing, . . .
✓ 300 Common functionality	Biometrics, color, operable parts, . . .
✓ 400 Platforms, applications, & interactive content	Software accessibility
500 Electronic Documents	Text, forms, tables, etc
600 Media	Audio and video content
700 Hardware	Reach, connections, text labels
800 Audio output	Interactive, held to ear
900 Conversational functionality	Video phone in TV?
1000 Support documentation and services	User manuals and help desk
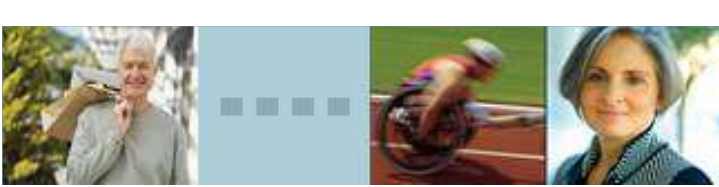
Challenges and paradigms shifts
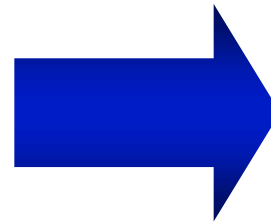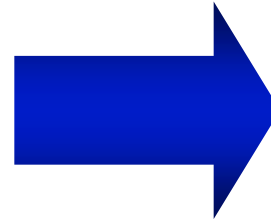
# The future of Television is here

- ## Motion controls
  - Nintendo's Wii
  - Microsoft's Kinect

- ## Downloadable apps
  - Netflix, Flickr, Vudu, etc.

- ## Internet access
  - Google TV, Yahoo TV, Apple TV, . . .
  - AT&T U-verse, Bell Fibe, . . .

- ## Streaming media
  - D-Link's Boxee Box, etc,
  - YouTube, Pandora, Facebook, etc.

- ## Videoconferencing
  - Skype, UMI, TV-CC10W, . . .

Summing it Up!

- **Sustainable approach**
  - Integrate accessibility into the organization & product life cycle

- **Usability and Design analysis required**
  - Including community and persons with disabilities

- **Comprehensive technical standards and guidelines**
  - Adaptable to physical constraints and non-traditional uses?
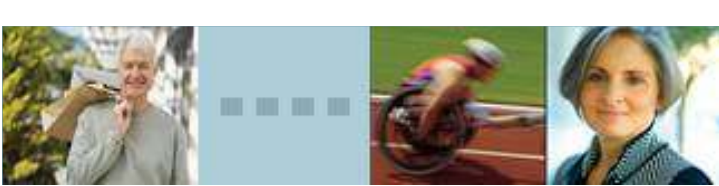
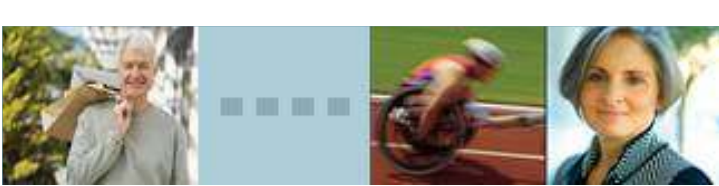# Listed below are more IBM sessions of interest:

Wednesday, March 16

✓ **WEB-2045** 8:00 - 8:30 (Gibbons)
How IBM is Making its Web Applications (WAI/ARIA) More Accessible

✓ **OTH-1034** 9:20 - 10:20 (Cunningham)
IPTV, Remote Control, Set Top Box, Apps & TV Guide Accessibility

❑ **WEB-2040** 10:40 - 11:40 (Windsor C)
Advancing Mobile Usability and Web Access for Everyone, IBM

❑ **DHH-2003** 10:40 - 11:40 (America's Cup C)
IBM AbilityLab Digital Media Captioner and Editor

❑ **OTH-2001** 10:40 - 11:40 (Windsor C)
Need for and Benefits of a Global Public Inclusive Infrastructure Panel

❑ **OTH-1012** 3:10 - 4:10 (Emma A)
Accessible Travel: Evolving the Practice of Providing Geo-Data Services to Improve Mobility Panel

Listed below are more IBM sessions of interest:

Thursday, March 17

- **WEB-3049** 10:40 - 11:40 (America's Cup D)
  HTML 5 Accessibility Panel

- **WEB-2040** 10:40 - 11:40 (Windsor C)
  Advancing Mobile Usability and Web Access for Everyone

- **WEB-1012** 12:00 - 12:30 (Emma B)
  Effective Video Captioning Using Collaborative Editing, IBM

- 4:00 - 5:30 Lifetime Achievement Award Celebration for Jim Thatcher, retired IBM

Listed below are more IBM sessions of interest:

Friday, March 18

- **WEB-2032** 8:00 - 9:00 (Cunningham)
  Accessible Analytics: Complex Charts, Large Datasets, Node Diagrams

- **WEB-1038** 12:00 - 12:30 (Gibbons)
  Unifying Video Captions and Text-Based Audio Descriptions

- **WEB-2037** 12:00 - 12:30 (America's Cup)
  Collaborative Web Accessibility Improvement System:
  A Real-World Deployment