



Cashing In on Mobile Digital Television's Enormous Opportunities

BIA Financial Network Webinar
February 21, 2008

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Agenda

- Introduction - What is the challenge we face?
 - Lynn Claudy, NAB
- The Study: Multiple Systems for Mobile / Handheld Digital Television
 - Rick Ducey and Mark Fratrick, BIA
- Setting the Standard for Digital Television
 - Mark Richer, ATSC
- Road to Mobile DTV
 - Dan Hsieh, MTC Solutions
- Conclusion and Q&A



Who is BIA?

- BIA Financial Network, Inc., (BIAfn), is recognized as the leading provider of financial intelligence and investment resources to the media, technology, telecommunications and related industries.
- BIA provides expert financial, strategic and operational advisory services and investment resources that enable its clients to build enterprise value and increase operational efficiency.
- Over the years, BIA has provided its clients with detailed research, financial solutions and digital strategies, and has several divisions designed to meet the financial, strategic and marketing needs of your organization.

Lynn Claudy, NAB



The Problem: The ATSC DTV Standard Does Not Currently Support Mobile/Handheld Reception

- The Problem Solvers
 - Advanced Television Systems Committee (ATSC)
 - Standards development
 - Mark Richer, President
 - Open Mobile Video Coalition (OMVC)
 - Industry Consensus
 - Dan Hsieh, consultant
- NAB's role
 - Supporter/participant in ATSC and OMVC
 - FASTROAD technology advocacy program
 - BIA M/H DTV Study
 - Research/analysis useful to ATSC, OMVC, other industry players
 - Mark Fratrick, VP and Rick Ducey, Chief Strategy Officer



Multiple Systems for Mobile / Handheld Digital Television

BIA Financial Network

Dr. Mark Fratrik, Vice President
Dr. Rick Ducey, Chief Strategy Officer
BIA Financial Network
February 21, 2008



Purpose of the Study

1. Impact of possible introduction of multiple technologies for M/HDTV.
2. Is TV industry better served with single standard?
3. Is M/H DTV market success sensitive to timing of M/H DTV standard? By how much?





Overview

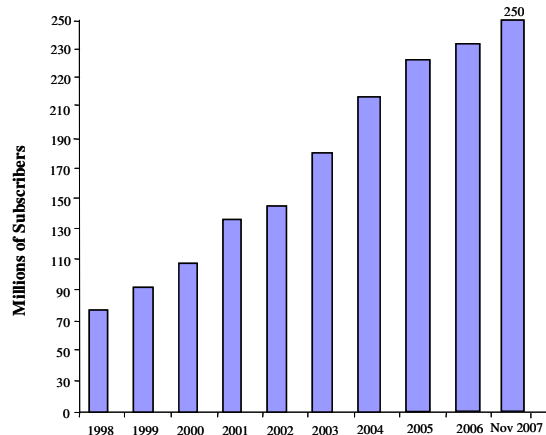
- Information Gathering Process
- Review of Mobile Television Marketplace
- Broadcasters Economic Potential
- Importance of Standards in Broadcasting Technologies & Consumer Equipment
- Impact on Broadcasters' Success Under Four Standard Setting & Business Scenarios
- Conclusions

Information Gathering Process

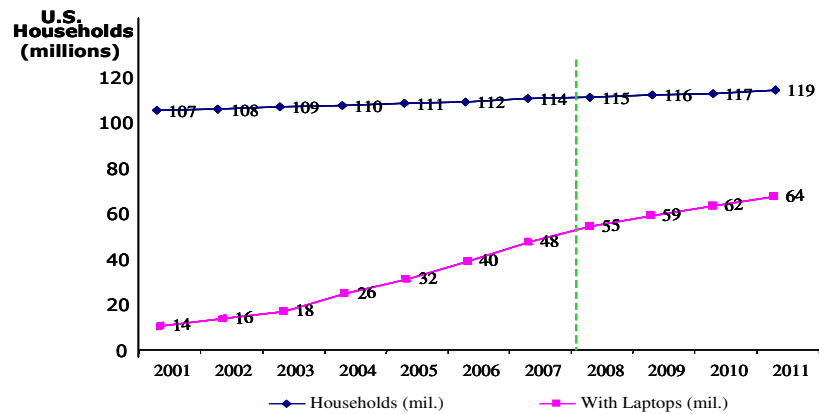
- Reviewing Literature – Public, Industry, & Academic
- Interviews with Participating Companies and Organizations



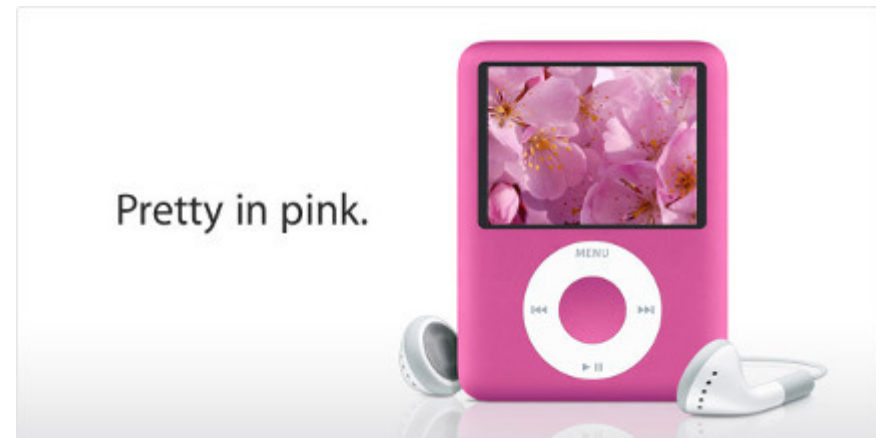
Areas of the Study



Note: All figures are end of year except 2007; Net U.S. subscriber add rate (2007) = 2.0M/month
 Source: Cellular Telecommunications & Internet Association



Source: Forrester Research, *The State of Consumers and Technology: Benchmark 2006*



The Competitive Framework Also Was Considered

- Cellular Networks

- 700 MHz/MediaFLO



- L-Band Services



- WiMAX Service



- Satellites



Broadcasters Have Definite Competitive Advantages

Lower Capital Requirements

- \$100,000 Variable Cost
- \$170M vs. MediaFLO (\$450M)

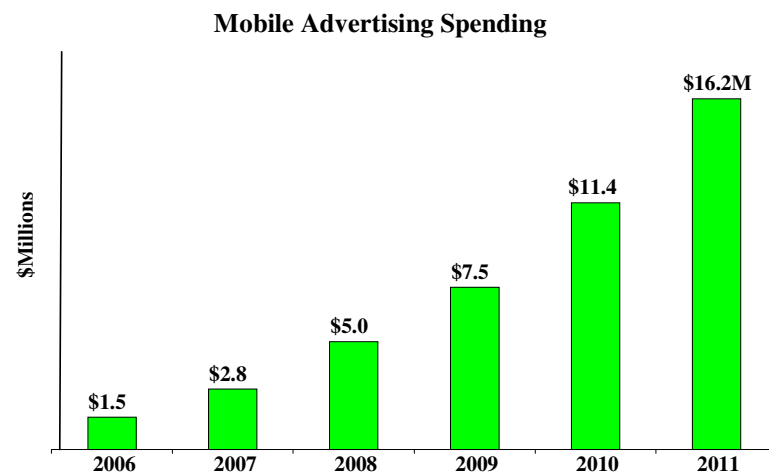
Access to Content

- Created
- Licensed

Lower Average Cost per Pop

- Sprint WiMAX = \$53/Pop
(build out without spectrum)
- Broadcasters
- Assigned Spectrum

Access to Advertising Revenue



Two Business Models May Apply

Summary Of Broadcaster Business Opportunities (2009-2011)

| Receive Devices | Potential Broadcaster Business Model at Launch | |
|---|--|-------------------------------|
| | Advertising Based Revenue | Subscription Based Revenue |
| 1. Cellular Telephone High Priority | Yes | Yes |
| 2. Stand alone video receiver-player High Priority | Yes | No – Potential over long term |
| 3. Vehicles Lower Priority | Yes | Yes |
| 4. Laptop Computers Least Priority | Yes | No – Potential over long term |

A “Standards War” Can Only Erupt if Broadcasters Acquiesce

Prerequisites for a “War”

1. “Losing” candidate decides on entry using its own system (“rogue system”)
2. At least one transmitter manufacturer produces equipment using the rogue system
3. A subset of receive devices manufacturers produce to the rogue system
4. *Critical mass of broadcast groups elect to use the rogue system*

Four Scenarios for Analysis of Standard Setting Impact

| # M/H DTV Systems in the Market | ATSC Standard Feb 2009 | No ATSC Standard Feb 2009 |
|--|-------------------------------|----------------------------------|
| 1 | Scenario 1 | |
| 2 | Scenario 2 | Scenario 3 |
| 3 | | Scenario 4 |

Additional Steps Necessary for Broadcaster Success in M/H DTV

1. Companies must negotiate, with RAND terms, rights to intellectual property.
2. Broadcasters must clarify their rights with program owners.
3. Reliable audience measurement procedures must be put in place.
4. A significant number of broadcasters provide M/H DTV services by Christmas 2009.
5. CE and cellular service providers offer M/H DTV devices by holiday season 2009.

Scenario 1 – Baseline Economic Impact

- Number of M/H DTV Receivers by 2012
 - Cellular Handsets – 130 million
 - Portable M/H Receivers – 25 million
- Incremental Additional Viewing – 1 hour/week
- Average Value of Additional Viewing Hours
- Growth of OTA Advertising through 2012
- Additional Advertising Revenues to
 - OTA Television Industry: **\$2 billion**
 - Local Television Stations: **\$1.1 billion**

Scenario 2 – Economic Impact

- Time Delay in Successful Introduction
 - 18 months
- Number of M/H DTV Receivers by 2012
 - Cellular Handsets – 65 million
 - Portable M/H Receivers – 12.5 million
- Additional Advertising Revenues to
 - OTA Television Industry: **\$1.1 billion**
 - Local Television Stations: **\$0.6 billion**

Scenario 3 – Economic Impact

- × Time Delay in Successful Introduction
 - + 24 to 30 months
- × Number of M/H DTV Receivers by 2012
 - + Cellular Handsets – 22 to 43 million
 - + Portable M/H Receivers – 4 to 8 million
- × Additional Advertising Revenues to
 - + OTA Television Industry: \$0.4 to 0.8 billion
 - + Local Television Stations: \$0.2 - \$0.4 billion

Scenario 4 – Economic Impact

- × Time Delay in Successful Introduction
 - + 36 to 40 months
- × Number of M/H DTV Receivers by 2012
 - + Cellular Handsets – 13 million
 - + Portable M/H Receivers – 2.5 million
- × Additional Advertising Revenues to
 - + OTA Television Industry: \$0.2 billion
 - + Local Television Stations: \$0.1 billion

Summary of Economic Impact

| Scenario | Local Station Share of M/H DTV Advertising Revenue (\$ Billions) |
|-----------------|---|
| 1 | \$1.1 |
| 2 | \$0.6 |
| 3 | \$0.2 to \$0.4 |
| 4 | \$0.1 |

**Impact on Total Station Values -
\$750 Million to \$9.1 Billion**



Conclusions

1. Broadcasters Excited About New Applications Including M/H DTV
2. ATSC Standard Setting Process Schedule – Testament to Broadcaster/Manufacturer Interest
3. Certain Steps Besides Standard Setting Necessary for Success
4. If the Standard Setting Schedule Realized – Maximized Success for Broadcasters Introducing M/H DTV



Setting the Standard for Digital Television

Advanced Television Systems
Committee

Mark Richer, President
Advanced Television Systems Committee
February 21, 2008



The ATSC



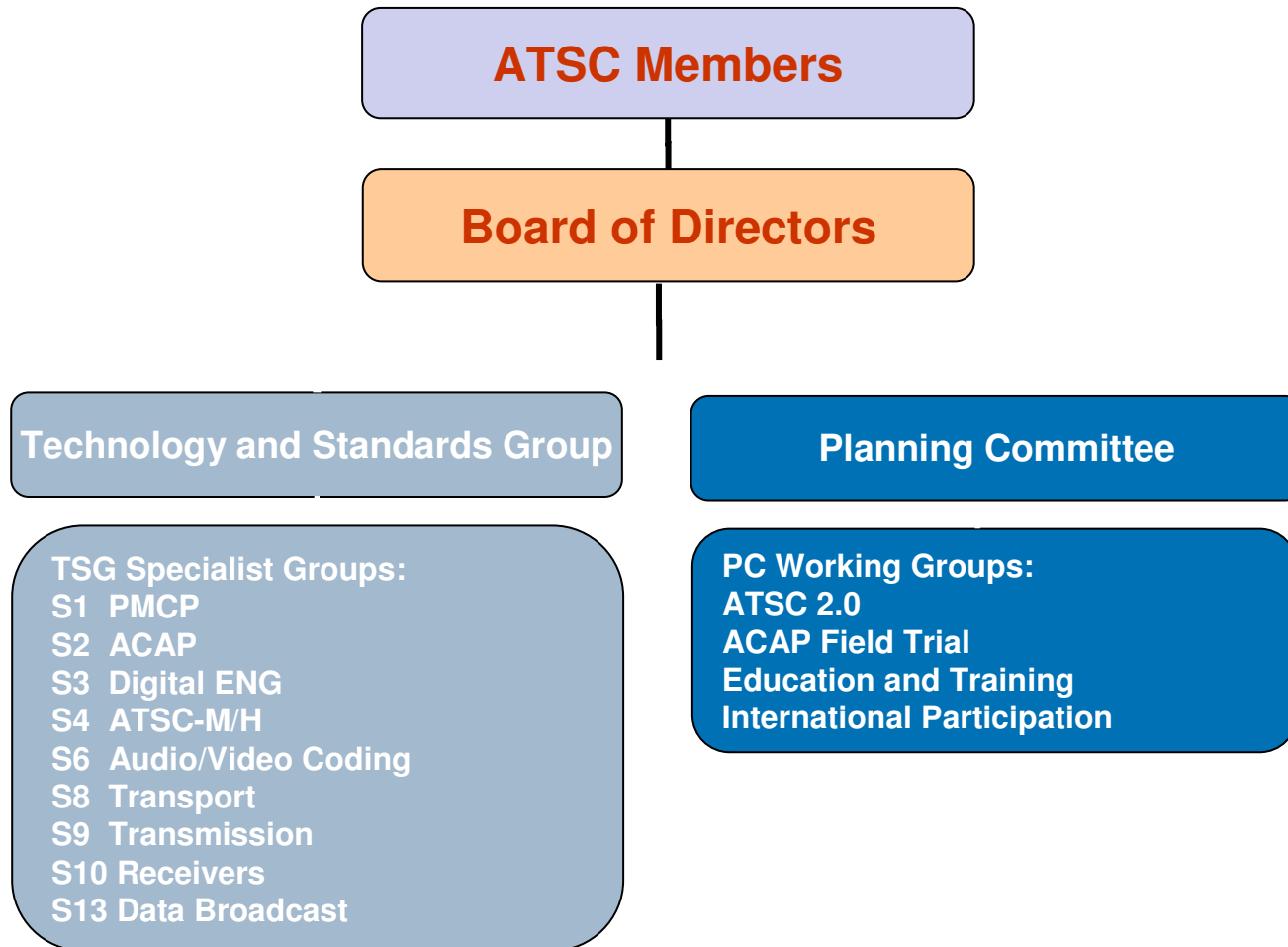
- Standards Development Organization for Digital Television
 - Focused on terrestrial digital television broadcasting
 - ATSC is an open, due process organization.
 - All Standards and RPs are available free of charge at www.atsc.org.
- Membership organization:
 - Founded by CEA, IEEE, NAB, NCTA, and SMPTE.
 - Approximately 150 organizational members:
 - Broad, cross-industry participation—broadcasters, cable, satellite, motion picture, consumer electronics, computer, automotive, and professional equipment manufacturers.

About the ATSC

- The ATSC DTV Standard has been adopted by:
 - United States
 - Canada
 - South Korea
 - Mexico
 - Honduras

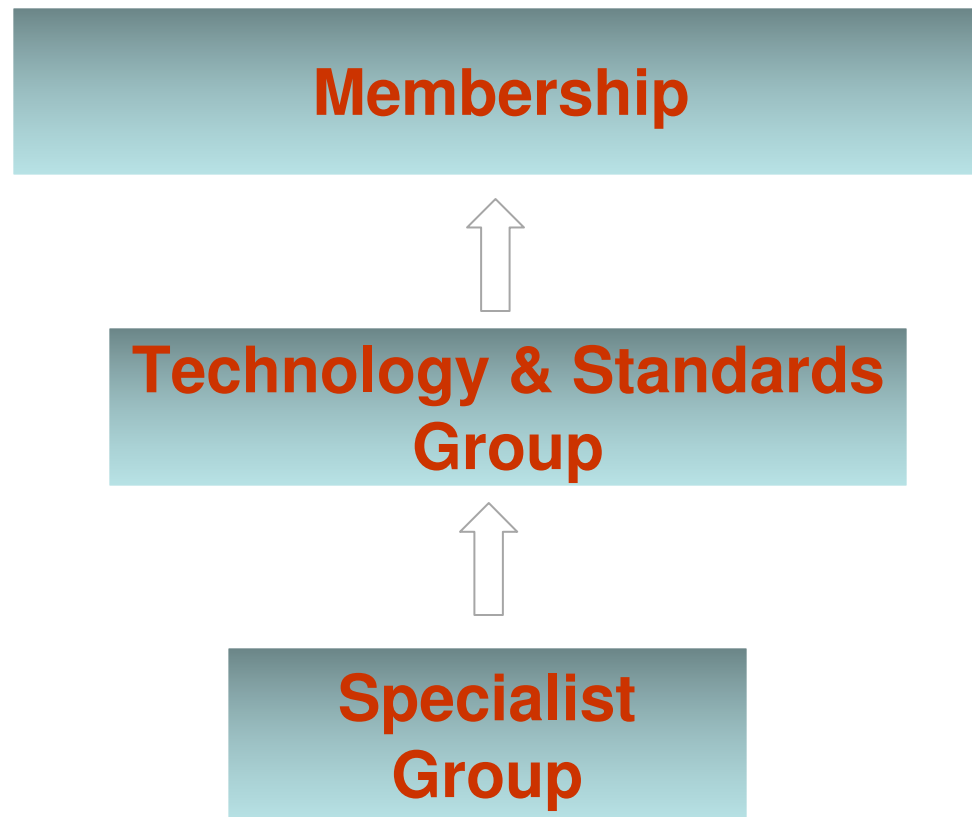


ATSC Organization

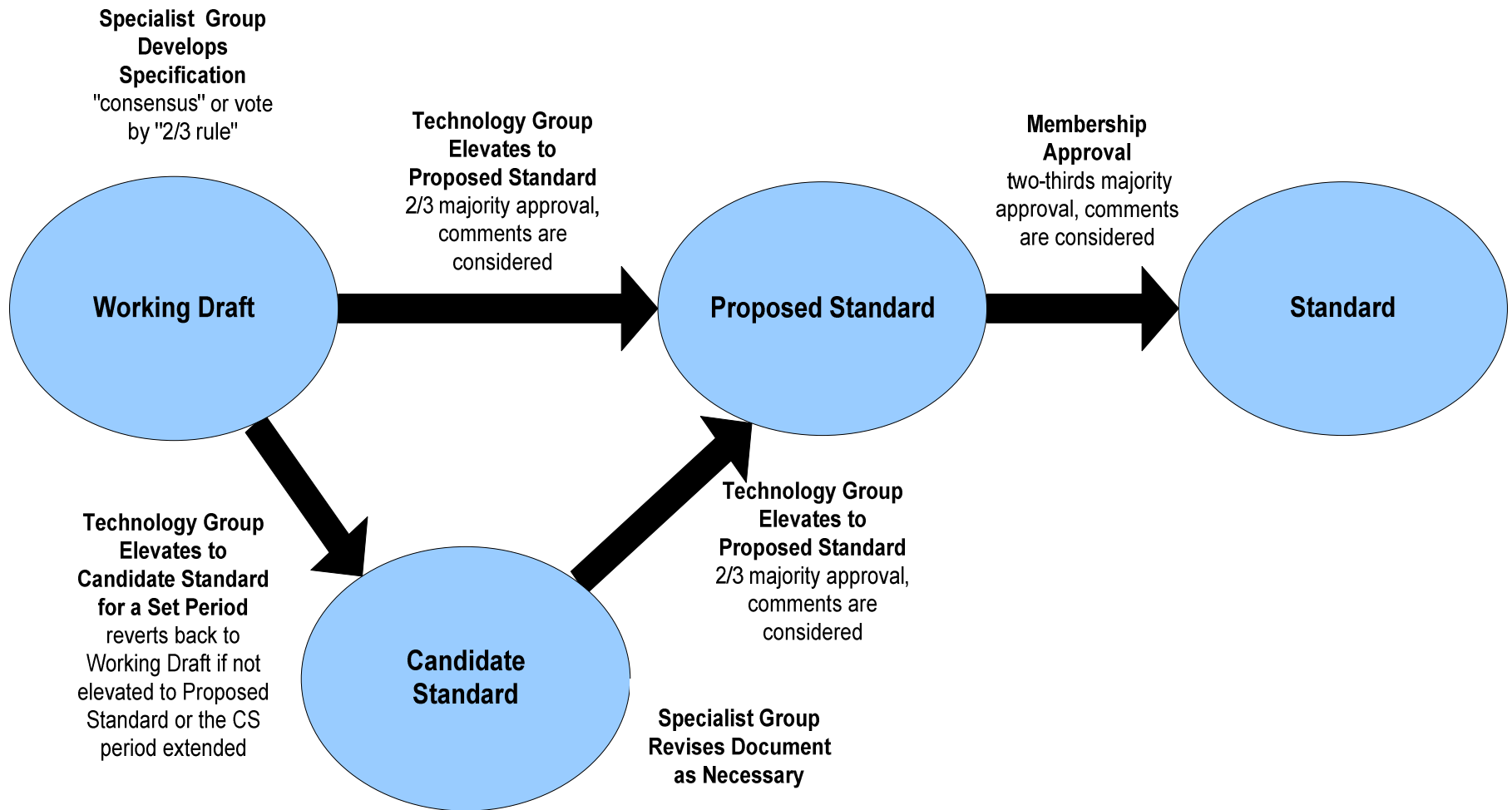


ATSC Approval Process

- Standards and Recommended Practices require three levels of approval before publication



ATSC Due Process



The Opportunities of ATSC DTV

- Quality counts:
 - High-definition television (HDTV)
 - 5.1 Dolby digital sound
- Quantity counts:
 - Multicasting
 - Multiple SDTV
 - HDTV and SDTV
- Data is important:
 - Enhanced and interactive services
 - Program related services/non-program related services

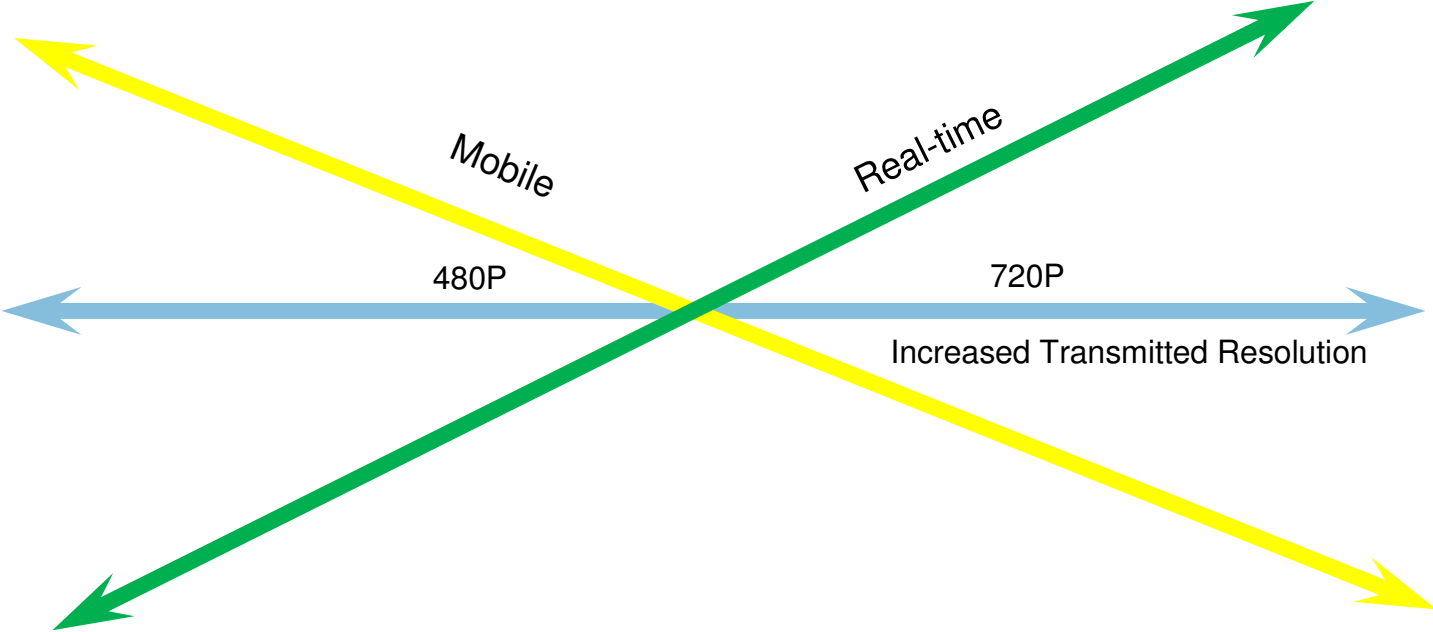
ATSC Strategic Plan - Major Recommendations

- Focus on documentation of *service levels* that group standards together to form a logical bundling of features and functions:
 - **ATSC 2.0**: New services for the conventional fixed DTV receiver.
 - **ATSC-M/H**: Delivery to mobile and handheld devices.
- Development of a standard for **non-real-time** delivery of services.
 - **ATSC-NRT**: Likely to be incorporated into **ATSC 2.0** and **ATSC-M/H**
- Move interactive television forward through the **ACAP demonstration and field trial** project.

Strategic Plan Revision 2007

- Studies regarding transmission of 1080P@60 Video
 - Ad Hoc Group of the Board of Directors
- Studies regarding transmission of 3-D TV
 - Ad Hoc Group of the Board of Directors
- Investigation of the possibility to “get more bits through the channel” -Breaking the 19.39 MBs barrier
 - Planning Committee

ATSC Program Service Options





The Future of Broadcasting

- The broadcasting industry must leverage
 - Local
 - Content
 - Brand
 - Sales contacts
 - Untethered nature
 - It's wireless!

Future of Broadcasting

Leverage Wireless



Target devices that move!

ATSC-M/H

- ATSC-M/H will be a standard for delivery of real-time and non-real-time television content and data to mobile and handheld devices (ATSC-M/H).
 - ATSC-M/H services will be carried in DTV broadcast channels.
 - Broadcasters in the U.S. will not be given additional spectrum for mobile & handheld.
 - ATSC-M/H will be backwards compatible.
 - Broadcasters can simultaneously provide HDTV and other services to legacy receiving equipment.
- Allows broadcasters to leverage their wireless and local attributes.

ATSC-M/H Applications

- Potential applications for ATSC-M/H include:
 - Free (advertiser supported) television services delivered in real-time.
 - Non-real-time content download for later playback.
 - Mobile and handheld subscription-based TV
 - Interactive television.
 - Real-time navigation data for in-vehicle use.

ATSC-M/H Proponents

- Request for Proposals issued in May 2007
- Formal proposals were received from the following organizations:
 - Coding Technologies
 - Coherent Logix
 - DTS
 - LG Electronics/Zenith/Harris
 - Micronas Semiconductor
 - Nokia
 - QUALCOMM
 - Samsung/Rohde & Schwarz
 - Thomson

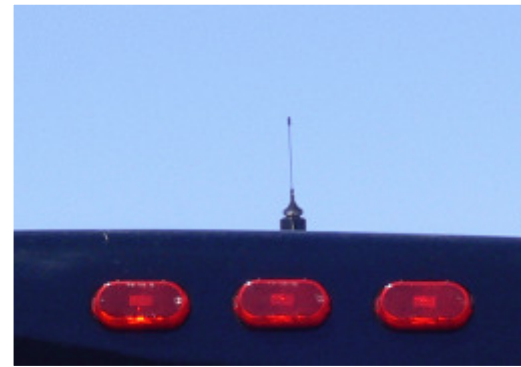
ATSC-M/H System Proposals

- The following **full-system** proposals currently exist:
 - LG Electronics/Zenith/Harris
 - Samsung/Rohde & Schwarz/Nokia
 - Micronas/Thomson
- Proposals for specific elements include:
 - Coherent Logix to support any physical layer system
 - Audio codecs (Coding Technologies and DTS)
 - Management & Presentation Layers (Qualcomm)
 - Interactive TV services (MobiTV)

ATSC-M/H

- The initial work has been divided into three primary elements:
 - Physical Layer, which encompasses the backward-compatible additions to the DTV emissions stream to facilitate mobile and handheld reception.
 - Management Layer, which includes signaling, announcement, file delivery, and other functions such as conditional access and content protection.
 - Presentation Layer, which focuses on the video and audio decoding systems.

Mobile DTV Demonstrations



Independent Demonstration of Viability (IDOV)

- The goal of IDOV is to ensure that the technical proposals under consideration can be realized to enable Mobile/Handheld services in early 2009
- IDOV to be conducted by the Open Mobile Video Coalition (OMVC)
 - OMVC is an alliance of U.S. commercial and public broadcasters (representing 800 stations) committed to the development of mobile digital television
 - Mission is to accelerate the development of mobile digital broadcast television
 - Will conduct IDOV in San Francisco and Las Vegas

ATSC-M/H Schedule

- Goal is to facilitate broadcasters ability to announce the launch of new mobile and handheld services by February 2009.
 - Independent Demonstration of Viability (IDOV)
 - Underway in San Francisco
 - IDOV should be complete in mid March
 - Report to ATSC Specialist Group on May 15
 - ATSC-M/H 1.0 Candidate Standard by the end of 4th Quarter 2008
 - ATSC-M/H 1.0 Standard in first or second quarter of 2009



Road to Mobile DTV

Open Mobile Video Coalition (OMVC)

Dan Hsieh
President, MTC Services, LLC
Member, OMVC
February 21, 2008



Open Mobile Video Coalition 800+ TV Stations and Growing ...



OMVC Position Within Largest Station Groups

| Rank | TV Group | Revenue (000) | OMVC Member |
|------|---------------|---------------|-------------|
| 1 | Fox | \$2,440,040 | Yes |
| 2 | CBS | 1,914,575 | |
| 3 | NBC | 1,827,275 | Yes |
| 4 | ABC | 1,237,550 | |
| 5 | Tribune | 1,099,875 | Yes |
| 6 | Gannett | 1,023,750 | Yes |
| 7 | Hearst-Argyle | 846,625 | Yes |
| 8 | Belo | 796,925 | Yes |
| 9 | Univision | 739,925 | |
| 10 | Cox | 648,900 | Yes |
| 11 | Raycom | 635,639 | Yes |
| 12 | Sinclair | 616,950 | Yes |
| 13 | LIN | 518,600 | Yes |
| 14 | Media General | 440,625 | Yes |
| 15 | E.W. Scripps | 439,250 | |
| 16 | Post-Newsweek | 424,150 | Yes |
| 17 | Clear Channel | 362,375 | |
| 18 | Meredith | 358,900 | Yes |
| 19 | Gray | 354,900 | Yes |
| 20 | Sunbeam | 256,200 | |

| Rank | TV Group | HH Coverage | OMVC Member |
|------|---------------|-------------|-------------|
| 1 | Ion Media | 63% | Yes |
| 2 | Fox | 48% | Yes |
| 3 | Univision | 44% | |
| 4 | CBS | 39% | |
| 5 | NBC | 36% | Yes |
| 6 | Tribune | 36% | Yes |
| 7 | Trinity | 35% | |
| 8 | ABC | 24% | |
| 9 | Sinclair | 22% | Yes |
| 10 | Hearst-Argyle | 18% | Yes |
| 11 | Gannett | 18% | Yes |
| 12 | Belo | 14% | Yes |
| 13 | Entravision | 13% | |
| 14 | Pappas | 13% | |
| 15 | Clear Channel | 12% | |
| 16 | Raycom | 10% | Yes |
| 17 | Cox | 10% | Yes |
| 18 | E.W. Scripps | 10% | |
| 19 | Media General | 9% | Yes |
| 20 | Meredith | 9% | Yes |
| 21 | LIN | 9% | Yes |
| 22 | Post-Newsweek | 7% | Yes |
| 23 | Nexstar | 7% | |
| 24 | Gray | 6% | Yes |
| 25 | Young | 6% | |

14 of the Top 20 by Revenue

15 of the Top 25 by Coverage

*Note: 2006 figures. Does not include 361 public television stations
Source: BIA*

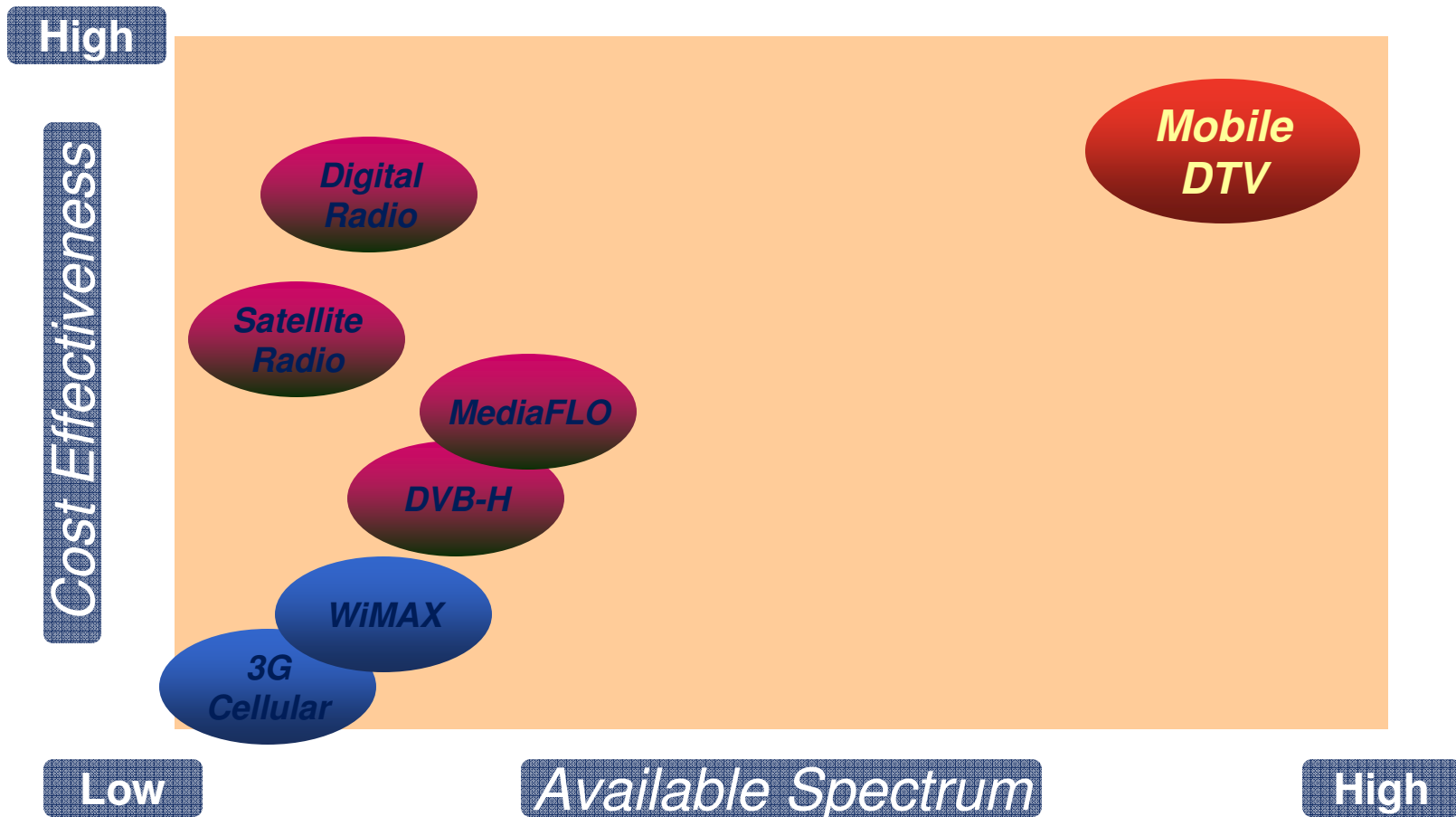


Open Mobile Video Coalition

Mission **Facilitate and accelerate the development and deployment of mobile DTV services**

- Activities**
- 1. Define mobile DTV system requirements**
 - 2. Encourage mobile DTV product manufacturing**
 - 3. Evaluate various technologies**
 - 4. Support consumer research**
 - 5. Assessing potential economic models**
 - 6. Educating/liaising with other industries/regulators**

DTV Spectrum Ideal For Mobile Video



Technical Activities to Date

A-VSB Field Tests

MPH Field Tests

SFN Field Tests

Locations:

- Las Vegas (Sinclair)
- Tampa (ION)
- Washington, DC (Gannett)
- Chicago (ION)

- Las Vegas (Sinclair)
- Washington, DC (ION, Gannett)
- Columbus (Dispatch)
- Chicago (Fox)
- Washington, DC (Fox)

- New York (ION)

Description:

- A-VSB broadcast simultaneous with HD main feed
- Testing mobile reception using test van

- MPH broadcast simultaneous with HD main feed
- Mobile test suite implemented using test van

- Low power repeater network set up
- Testing interference and coverage

Early learning:

- Robust mobile video reception
- Coexists with 8VSB main signal

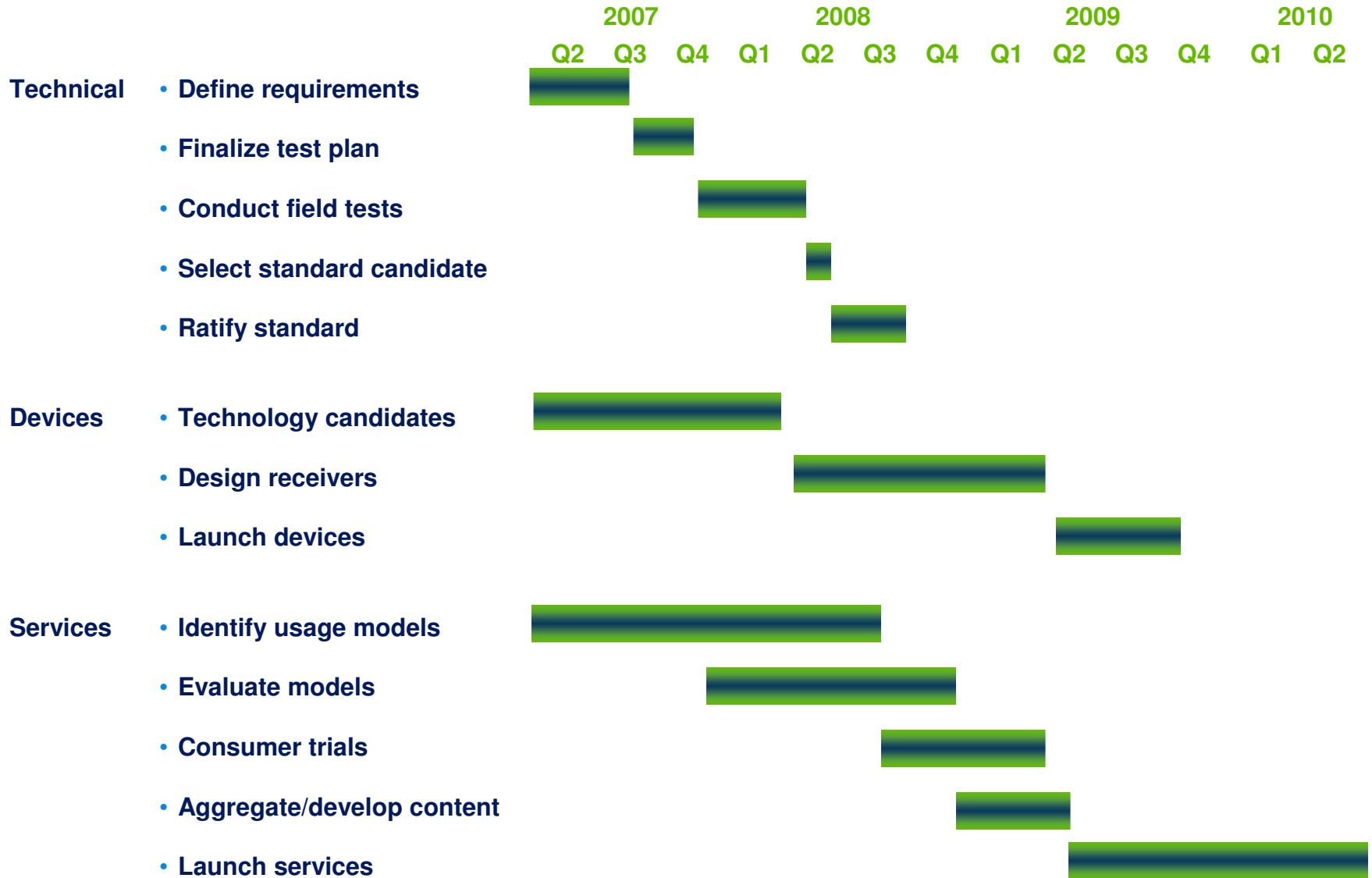
- Robust mobile video reception
- Coexists with 8VSB main signal

- Good coverage
- Acceptably low interference levels

Independent Demonstration of Viability (IDOV)

- **OMVC conducting IDOV to ensure candidate physical layer technologies can be realized in hardware to provide Mobile/Handheld services by Q1 2009**
- **OMVC has developed IDOV test plan to run from Feb-Mar 2008**
- **OMVC coordination with ATSC to drive early equipment availability (prior to 2/18/08)**
- **Coordinate delivery and integration for Lab verification**
 - **Backwards compatibility, performance benchmarking, interface verification, etc.**
 - **Ensure each system meets expectations of OMVC**
- **Assist in integration of supplied systems for field demonstrations**
 - **Market locations and specifics under consideration**
 - **Verify system suitability**
- **Deploy systems and gather relevant data**
- **3/08 through 4/08 – Prepare report for submission to OMVC Board for review and action**
- **May 08 – Present report to ATSC**

Target: Service Launch in Q1 2009



Digital Broadcast "Tripleplay"

"DTV: TV to The Power of Three."



High Definition Quality



High Speed Mobility



Anywhere.



Anytime.



Multicast Variety



Any Speed.



Multiple Systems for Mobile / Handheld Digital Television: Presentation Conclusion

Lynn Claudy
Senior Vice President, NAB
Webinar Moderator
February 21, 2008



Call to Action

- A link to the full report is available on BIA's website at: <http://www.bia.com/mhdtv/>
- If you are interested in conducting research related to this issue, or you face other challenges, contact Mark Fratrik to discuss putting BIA's experience and knowledge to work for you.
E-mail Mark Fratrik at: mfratrik@bia.com
- BIA also conducts strategic consulting. To learn more, please contact Rick Ducey.
E-mail Rick Ducey at: rducey@bia.com

Thank you for your time and interest

Speaker Contact Information

Rick Ducey: rducey@bia.com

Mark Fratrik: mfratrik@bia.com

Mark Richer: mricher@atsc.org

Dan Hsieh: dan.hsieh@mtcllc.net

**Link to On-Demand Presentation and BIA's Blog
will be distributed by E-mail next week**

We will now take questions. Submit Questions via the “Question and Answer” box. If we do not get to your question today, we will contact you directly in the coming days.

Is there an industry topic you want us to cover? Don't wait! E-mail Michael Hackmer today at: mhackmer@bia.com