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Ennes Workshop: Mobile DTV & Beyond

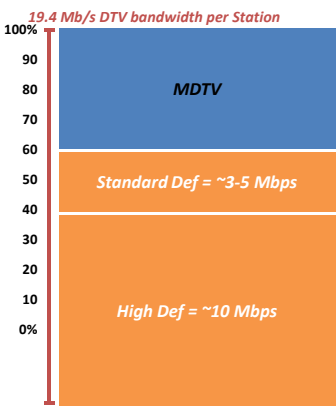
Meet the Challenge of an Industry Opportunity

Mark Rushton, Roundbox

Mobile DTV: State of the Business



Reinvent Over-The-Air Television




19.4 Mb/s DTV bandwidth per Station

- **A/153 Mobile DTV (MDTV) became an ATSC Standard in Oct. 2009**
 - Completely backward compatible to ATSC A/53 DTV Standard.
 - Broadcaster can use the available license without additional restrictions
 - New ATSC Candidate Standard: Non-Real-Time Content Delivery
- **(70+) Commercial call-letters on-air with MDTV today.**
- **(20+) PBS call-letters awarded CPB funding Mobile by June.**
- **Some key tech features of Mobile DTV -**
 - IP-based – audio / video / data payloads
 - Power management optimized battery
 - Doppler compensation – ensures reception in moving cars, trains, etc.
 - A/V signal ~500 kbps focuses on 10" & below


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Mobile DTV: State of the Business



Four industry entities have emerged with MDTV focus:

- **Open Mobile Video Coalitions (OMVC)**
 - OMVC host a Broadcasters Technology, Broadcast Business and Manufacturers forums.




- Model Stations
- DC Showcase
- Forums

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Mobile DTV: State of the Business





- **Mobile Content Venture (MCV) & Pearl Mobile DTV, LLC (Pearl)**
 - MCV is joint-venture comprising 12 major broadcast groups dedicated to developing a national mobile content service that delivers live TV and on-demand video.
 - Established MDTV content distribution agreement in the affiliate contract.
 - Established business models based on Conditional Access technology requiring an opt-in from the MDTV viewer.
 - Connected devices.
 - By-passes Clear-To-Air for a Free-To-Air and Premium Subscription Model.
 - Opt-in adds Audience / Service Measurement metrics.





























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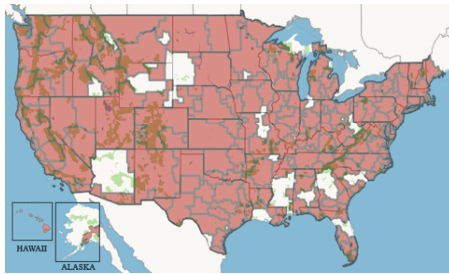
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Mobile DTV: State of the Business



- **The Mobile 500 Alliance**
 - Business alliance of leading television broadcasters to develop strong partnerships to accelerate the nationwide availability of a commercial mobile DTV Service, infra-structure & MDTV content.



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Mobile DTV: State of the Business



- **CPB, NTIA PTFP & PBS**
 - Open CPB invitation to PBS stations to apply for MDTV funding: April & June.
 - Open PTFP round – not for mobile – but it supports upgrades to adjacent infra-structure & MDTV content.



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Mobile DTV: Challenges



- **Content rights for MDTV distribution**
 - Will “all” broadcast and cable networks come on-board?
- **Devices – it comes down to a BOM cost.**
 - OEM / vendor does not want to implement multi-CAS products on a device.
 - Can broadcast entities solidify on CTA/FTA/Premium play so device guys “hit go”?
 - Is it big enough to become a check box when ordering a device?
- **Education**
 - Overcoming the opt-out: “Show me the business plan.” “Show me the content.”
- **Fixed & MDTV NRT Applications**
 - Browse and Download, Push, Portal
 - Develop EAS, Education, Interactivity, Coupons, PPV, VOD applications.
- **Who shows up with the back-office?**
 - How will Premium channel billing happen?
 - Can the service roll-out work across multiple go-to-market entities?

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Mobile DTV: Opportunities



- **Opportunity for Broadcast Industry to Cooperate**
 - Agreed upon a set of services.
 - Does that mean support for FTA, CTA, Premium on Devices?
 - What is the right kind of user experience?
 - Does device support ATSC and ATSC MDTV?
 - Does this mean a ‘neutral’ 3rd party for Key Management & Audience / Service Measurement metrics?
- **Opportunity for Broadcasters really see the OEMs need to differentiate**
 - User experience blends live broadcast with NRT Widgets and interactivity on a integrated receiver.
 - Device OEM embrace broadcast model.
 - Device supports 3G, 4G, Bluetooth, WIFI and MDTV.
 - Device OS supports middleware and middleware supports applications.

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Mobile DTV: MDTV vs. 3G / 4G Video

- **FAQ: Won't 3G / 4G provide ubiquitous, mass market mobile broadband video?**
- **Answer: No - 3G / 4G is still too expensive**
 - 3G = -\$1 Over the Air (OTA) cost to deliver 5 min of 15fps QVGA video to a single user
 - 4G = -\$0.10 for 5 min of 15fps video
 - By contrast, Internet CDN = \$0.002 for 5 min of video - and decreasing 30-50% / year!
 - Mobile DTV = zero marginal cost, unlimited consumption of very high quality video
- **3G / 4G has other strengths vs. Mobile DTV**
 - Mobile DTV = zero cost, mass market, limited # of broadcast channels
 - 3G/4G = theoretically unlimited #, niche, personalized, on-demand, 2-way content
- **Therefore, ideal mobile video strategy embraces a "Long Tail" approach**
 - Build an audience = use Mobile DTV for low margin, high volume, mass market content
 - Upsell the audience = use 3G/4G for higher margin, personalized, on demand, content

Bearer Tech	Cost/MB*	Cost for 5 Min of QVGA Video		
		5 FPS	15 FPS	30 FPS
		(~50 kb/s)	(~150 kb/s)	(~300 kb/s)
GPRS	\$ 0.415	\$ 6.23	\$ 18.68	\$ 37.35
WCDMA	\$ 0.069	\$ 1.04	\$ 3.11	\$ 6.21
CDMA 1x	\$ 0.059	\$ 0.89	\$ 2.66	\$ 5.31
CDMA EVDO	\$ 0.022	\$ 0.33	\$ 0.99	\$ 1.98
WiMax / LTE	\$ 0.002	\$ 0.03	\$ 0.10	\$ 0.20
Internet (CDN)	\$ 0.0001	\$ 0.0008	\$ 0.0023	\$ 0.0045

*Based on QCOM & Roundbox estimates

Mobile TV Hampered By Perceived Cost: Survey 58% of Respondents Who Have Not Tried Mobile Video Cite Cost as Factor - Multichannel News, March 10, 2009

The perceived cost of mobile TV and video services continues to be the No. 1 reason consumers say they haven't tried them, according to a recent survey.

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Mobile DTV: MDTV vs. MediaFLO – 2 Different Business Models

- **MediaFLO = nationwide Mobile TV network**
 - Like Mobile DTV, it is an "out of band" broadcast distribution network to mobile devices
 - Built by Qualcomm & MediaFLO USA, Inc (MUI)
 - Currently covers > 100 markets
- **Mobile DTV and MediaFLO are complimentary**
 - Similar tech... But different biz models
 - Future, dual mode devices?
 - Free, Mobile DTV can build the market "base" that could be up sold to MediaFLO in the future?

Mobile DTV <i>FM / Broadcast TV Model</i>	MediaFLO <i>Cable / Satellite TV Model</i>
Free (with available, premium upgrades)	Monthly subscription
Ad supported content (ABC, CBS, NBC...)	Premium content (MTV, ESPN, CNN...)
Channel lineup varies by market	Uniform channel lineup coast to coast
Clear-to-Air = open client architecture	Encrypted signal + specialized client
Reuses existing broadcast network	100% new broadcast network
Available to any device / operator	Currently exclusive to specific ATT + Verizon phones
Similar to ISDBT & DMB in Japan & Korea	Similar to DVB-H in Europe

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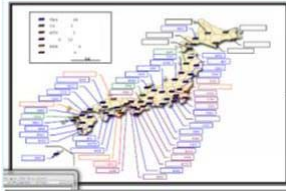
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Mobile DTV: Japan & Korea Examples


- **Mobile DTV follows a pattern established by similar systems in Japan & Korea**
 - Both launched in 2005 & generated massive penetration within just a few years
 - Both anchored by Free To Air services
 - Both support diverse devices including phones, car nav, game consoles, etc.
 - Both countries are blanketed by high quality 3G / 4G networks

- **Japan - ISDB-T**
 - 40 M devices vs. 125M population (2008)
 - All 3 mobile operators have embraced & provide "connected ISDB-T" experiences
 - Custom service guide + interactivity
 - Softbank forced Apple to support an ISDB-T receiver accessory for their iPhone launch
 - 62 min / day avg viewing
 - Started with simulcast TV, added data + special, mobile-only video afterwards


- **Korea - S/T-DMB**
 - 27M viewers vs. 50M population (2010)
 - Satellite (pay) & terrestrial (free) distribution
 - Up to 2 hrs / day viewing



Japan Local TV Network Map



Korea DMB Service



For the US to achieve a similar penetration rate to either Japan or Korea it would have to sell over 100 million broadcast Mobile TV devices in the next 3 years... we expect [ATSC] to rocket to half a million customers in its first full year. – ARChart, Feb 2009


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Mobile DTV: User Experience

Announcement-Enabled Broadcast



Signaling Only

➔



Announcement

- **Announcement = A Richer User Experience**
 - Announcement is based on OMA-BCAST's extensible, XML-based metadata model
 - More metadata = graphically-rich, branded representation within aggregated guide
 - Springboard for advanced services



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Mobile DTV: NRT Widgets



Taking Broadcast Beyond TV...

- ATSC Mobile DTV currently focuses on Television services...
- “Mobile DTV Widgets” add Non Real Time (NRT) data services to the mix
- Potential NRT content services include news, weather, sports, video clips, and/or web pages which are consumed by the viewer on demand

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Mobile DTV: NRT Widgets – User Experience

- 1 When a user tunes to a supporting station, ATSC-M/H announcement data informs the receiver that a catalog of “widgets” are also available. The widget catalog provides widget icons and descriptions for the UI.

Mobile DTV: NRT Widgets – User Experience II



- When a user selects the Headline News widget, the user interface displays a list of currently available article headlines.

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Mobile DTV: NRT Widgets – User Experience III



- Selecting a headline brings up a detailed view of the associated news article with a full-size image and article text.

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Mobile DTV: NRT Widgets – Large Opportunity for Broadcast



Rich Program Listings

Horoscopes

News Headlines

Weather Forecasts

Downloadable / Video Content

- **Mobile DTV Widgets bring together the best of web + broadcast + wireless**
 - Uniquely combines web-like on-demand user experience with broadcast-based content distribution
 - Establishes a new data service within the Broadcasters' home turf ; Google can't distribute widgets
- **Provides broadcaster a new, powerful mechanism to touch viewers**
 - Creates a new, station-centric, "portal"-like experience driving brand awareness & stickiness
 - Reach consumers outside of 24-hr linear TV constraints with random access, on-demand consumption
 - Drive new distribution, eyeballs & ad revenue from existing TV and web assets

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Mobile DTV: Broadcasters Possess Widget-Ready Content



- **Just as Mobile DTV easily leverages existing broadcaster DTV video...**
- **Mobile DTV Widgets easily leverages existing broadcaster web content**
 - Assures immediate synergies between widgets & existing content production operations
- **Content available through broadcaster web sites is often already in suitable format for distribution**
 - RSS / ATOM new feeds
 - Video clips
 - Traffic images

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