

BROADCASTERS' COMPETITIVE ADVANTAGES IN THE MOBILE VIDEO MARKETPLACE*

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BACKGROUND

The National Association of Broadcasters (NAB), through its FASTROAD (Flexible Advanced Services for Television & Radio On All Devices) program has been examining the impact of the possible introduction of multiple technology solutions for mobile/handheld DTV (M/H DTV) in the United States as compared to a single solution that may be standardized by the Advanced Television Standards Committee (ATSC). M/H DTV holds a tremendous potential for use of the digital spectrum by over-the-air television stations as these stations enter into an all-digital transmission environment

NAB commissioned BIA Financial Network and LECG to conduct a study to analyze these issues. The main purpose of this report was to evaluate whether or not the television broadcasting industry will be better served with a single mobile/handheld standard for DTV, rather than having several competing systems, and to consider whether market success is sensitive to the timing of such M/H DTV standardization.

This white paper is excerpted from chapter five of the full report which can be found on the NAB FASTROAD website at <http://www.nabfastroad.org/jan14rptfinaldouble.pdf>. In this paper we consider broadcasters' competitiveness in the mobile video marketplace. We also explore competition among network operators in the mobile video infrastructure including 700 MHz, L-Band, WiMAX, Cellular networks and Satellite video.

THE MOBILE/HANDHELD COMPETITIVE ENVIRONMENT

The M/H competition for local broadcasters consists of systems capable of distributing video content to one or more M/H device types (e.g., cellular phones, vehicles) and to do so in a reliable way that meets consumer expectations and is transparent to the end-user. Note that the focus is on infrastructure competition, namely, competition among operators of wireless networks to use their facilities to transmit video signals to M/H devices. In this context, control over content may be important in that it may provide a competitive advantage to broadcasters but the focus of this analysis is not upon content competition *per se*.

BROADCASTER COMPETITIVE ADVANTAGES

There are four core competitive advantages that local broadcasters have relative to the other mobile competitors. Competitive advantages do not guarantee a successful outcome. Rather, such advantages represent points of relative strength that should be emphasized in business planning and execution.

1. Substantially Lower Capital Requirements

The incremental capital cost (i.e., variable cost after the sunk cost of the analog-to-digital conversion) at the transmitter to send a M/H signal could be as low as \$100,000.¹ That is a very low cost of entry given the market opportunities. Therefore, to incorporate M/H DTV capability

into 1,700 broadcast transmitters² would cost approximately \$170 million, a capital cost that would be spread among all owners of broadcast properties based on the number of transmitters in service. Furthermore, broadcasters already have the spectrum necessary for digital broadcasting and do not have to participate in any spectrum auctions and/or buy/aggregate spectrum from any other source(s).

The capital spending requirements of broadcasters contrast very favorably with those of potential infrastructure competitors. For example, in order to launch MediaFLO as a national service, Qualcomm purchased spectrum at auction, purchased additional spectrum from third parties that controlled 700 MHz spectrum in other markets, and now is in the process of building out a nationwide 700 MHz broadcast service. In its annual report, Qualcomm states that it had an asset base (at cost) of \$329 million as of the 2006 fiscal year end, up from \$98 million as of the end of the prior year.³ Qualcomm's reported capital spend is consistent with Kagan's estimate that the cost of a nationwide 20 channel 700 MHz broadcast television network (covering two-thirds of the U.S. population) would be \$450 million.⁴ (The \$450 million estimate was for the build-out and did not include capital spending to acquire spectrum).

However, it is very important to note that the full capital cost advantage of broadcasters only exists so long as the competitor has not yet built out its network. Once a competitor builds out its network, then the capital spend of the competitor becomes a sunk cost, and the competitive advantage of broadcasters is reduced significantly. However, even after the build out, the advantage is not eliminated since the competitor has a much larger investment upon which a satisfactory return must be returned (i.e., broadcasters could price below the competition and still earn their required return on a much smaller capital investment).

2. Low Cost and Routine Access to Content

Local broadcasters have established access to content. Some of this content is created and owned by local broadcasters (e.g., news) or is otherwise licensed for broadcast in that market (e.g., network and syndicated programming).

Infrastructure-type competitors, such as MediaFLO and cellular operators, lack established access to content. They can and do purchase the rights to content. However, purchasing such content adds to the cost of their service and provides broadcasters with a clear competitive advantage.⁵

In addition to the overall programming cost advantage, broadcasters create and own local content (e.g., news) that, as shown by the ratings, is often extremely popular from early morning to late evening all days of the week. The non-broadcaster mobile television services tend to be national services without local content (e.g., MediaFLO). Once again, the advantage is with broadcasters.

3. Lower Coverage Cost Per POP⁶

Broadcasters transmit high power signals using spectrum that is ideal for wide area coverage for one-to-many (i.e., broadcast) applications, such as a mobile video service. Except at 700 MHz,⁷ potential competitors control spectrum that may be appropriate for wireless voice or data in a cellular configuration using relatively low power transmitters.⁸ Therefore, broadcasters can cover more geographic area (and therefore more population) for less cost than any competitive systems (i.e., cost per POP). For example, the average cost per POP for Sprint's \$5 billion WiMAX build out is estimated to be approximately \$53 (excluding spectrum acquisition costs).⁹ This cost advantage includes competitors at 700 MHz (e.g., MediaFLO) since the competitors have to both pay for the spectrum and the build out of their network.

This competitive advantage of broadcasters operates in two ways: (1) the cost per person served in dense areas is less than competitors; and (2) larger geographic areas can be covered by broadcasters for a cost that only allows competitors to cover a much smaller geographic area. This is important because there is an expectation that "users have come to expect ubiquitous coverage and the availability of video services -- anywhere, any time..."¹⁰

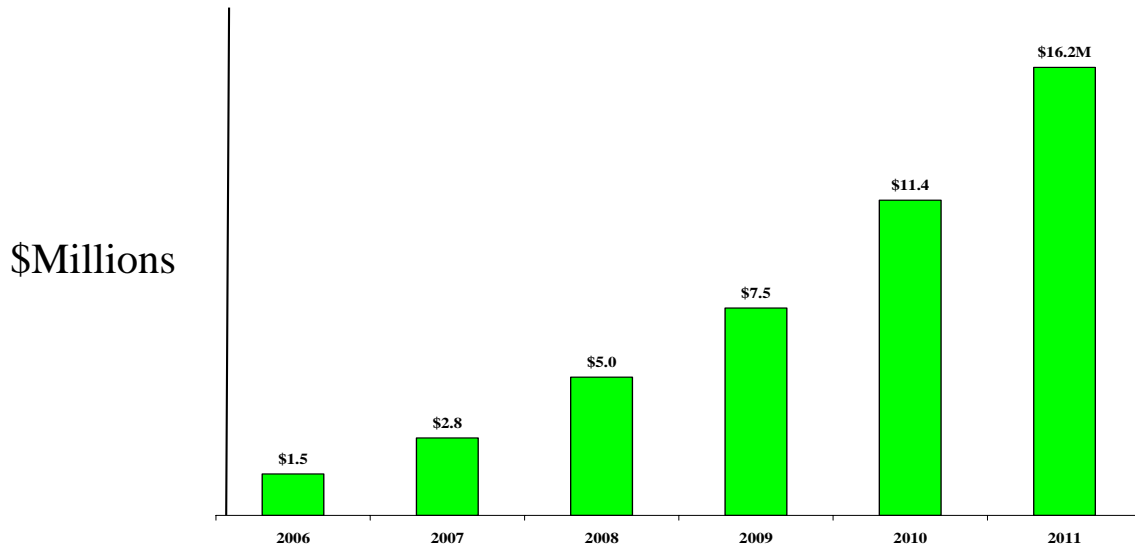
4. Access to Advertising Revenue

Local broadcasters routinely market and sell access to audiences to national, regional, and local ad buyers. Monetizing audiences is a core competency of successful commercial broadcasters. None of the other competitors has much (if any) experience with an advertising revenue model, nor do the competitors have in place the large local sales staffs necessary to sell to advertisers and their agents.

MOBILE ADVERTISING REVENUE TO SUPPORT A M/H DTV SERVICE

Mobile advertising delivers its messages over mobile devices, such as cellular phones or PDAs. Mobile advertising is projected to grow at the highest growth rate (41%) in the 2006-2010 period of any media category¹¹ (although off a very small base). Other forecasts for the growth of mobile advertising are even more optimistic. IDG has published a forecast assigning an annual compounded growth rate of over 100% through 2012.¹² Exhibit 1 shows projected mobile advertising spend based on eMarketer's review of trends and third party forecasts. These trends show: (1) a rapid increase in mobile ad spend off a small current base; and (2) mobile is a key focus area for advertisers and their agents.

Exhibit 1. Mobile Advertising Spending



Source: eMarketer “Mobile Advertising” Includes Text, Audio, Product Placement, and Video Advertising formats

What is important for broadcasters is that “mobile” is of increasing importance to advertisers and a M/H DTV service will enable broadcasters to leverage their existing advertising experience and sales experience. After launching a M/H DTV service, broadcasters could sell and deliver multi-platform advertising programs (on air, web sites, and mobile) that would enhance the value broadcasters deliver to advertisers, as well as communicate that broadcast television can combine elements of both new and old media.

LOCATION-BASED ADVERTISING REVENUE

It is expected that M/H DTV services may involve broadcasters entering into partnerships (e.g., with cellular operators, with vehicle manufacturers such as GM). Cellular phones and vehicles with GPS allow location-based advertising. The government requires cellular operators to be able to locate subscribers making emergency calls. Given that location can be determined, there is the potential to tailor advertising to that location (e.g., daily specials offered to carriers of mobile phones within one mile of a store or shopping center). Market research suggests that several location-based formats can drive store traffic including: (1) sale alerts; (2) store finder services; (3) gift finder services; and (4) downloaded coupons/vouchers.¹³

Cellular operators and automobile manufacturers do not have the in-place sales force or the market knowledge to sell location-based advertising, but broadcasters could leverage their organizations and market knowledge to do so. This competence can be brought to the table when negotiating a deal with potential partners around M/H DTV service offerings.

BROADCASTER BUSINESS MODELS

Revenue/business opportunities for M/H DTV can be divided into two categories, opportunities that:

1. Relate to the traditional role of broadcasters delivering a mass market to advertisers (usually involves no charge to the consumer, but is distributed on a free-to-air basis); and/or
2. Diversify the traditional broadcaster revenue base to include subscriptions, transactions, and paid carriage for third parties over the broadcaster's high-speed digital infrastructure.

New providers of information and entertainment are becoming competitive with broadcasters for advertising dollars. Since the ad spend in the U.S. remains relatively constant at 2.2% of gross domestic product (GDP), more competition for ad spend dollars puts pressure on broadcasters to: (1) increase audience size; and/or (2) segment the audience so that advertisers will pay a premium; and/or (3) deploy enhanced capabilities that will make programming and associated advertising more attractive to consumers and, therefore, more valuable to advertisers (including downloading of supplemental advertiser-supplied information). Advertising over a M/H DTV service has the potential to achieve all three.

With respect to traditional advertising revenues, interviews with representatives of the advertising community stress that any claim on incremental advertising revenues by broadcasters must be supported by proof that larger -- and/or more qualified/premium audiences -- are actually delivered. Therefore, there are three prerequisites for broadcasters to generate incremental revenues from M/H DTV services: (1) the impact must be measured;¹⁴ (2) the effect must be differentiating and not result from cannibalization of broadcaster audiences;¹⁵ and (3) the impact must be material (e.g., achieving a measured increase of at least one percent [1%] in share).¹⁶

Non-traditional opportunities are somewhat varied and limited only by the capabilities of the digital infrastructure and the willingness-to-pay of the buyers. Examples include: (a) all forms of subscription revenue in which the business relationship is between the subscriber and a business entity that might be a broadcaster, but is more likely to be a partner to a broadcaster, such as a cellular operator; and (b) distribution of content in electronic format for which other parties are the rights holders (e.g., downloads of real time traffic maps to subscribing vehicles paid for by a third party such as GM).

Exhibit 2 summarizes the near-term M/H DTV opportunities for the broadcast industry. There are three key assumptions behind this exhibit:

1. The critical period is 2009-2010, because the take off for mobile video service is forecasted for this period¹⁷ and therefore this is a window of opportunity for broadcasters to launch M/H DTV services, line up partners/suppliers, and test their business models. This timing coincides with the overall campaign designed to explain and promote the transition to broadcast DTV that will be effective in February 2009.

2. At launch, the primary content to be provided over M/H DTV transmissions will be essentially identical to the programming offered on the main DTV signal (e.g., primarily network and syndicated programming with local news, weather, and traffic). There may be some time shifting and/or additional local content (e.g., tailored news) added especially in later years. However, the launch of an M/H DTV service by broadcasters does not require programming an entirely different channel.

3. The analysis is at the broadcast industry level, not at a broadcast group level. It was beyond the scope of this analysis to analyze optimal M/H DTV strategies at the broadcast group level.

Exhibit 2: Summary of Broadcaster Business Opportunities (2009-2011)

Receive Devices	Potential Broadcaster Business Model at Launch		Key Stakeholder(s)	Dependent on M/H DTV Standard	Near-Term Opportunity (2009-2011)	Comments
	Ad Based Revenue	Subscription Based Revenue				
1. Cellular Telephone High Priority	Yes	Yes	1. Cellular Operators 2. Handset Manufacturers 3. Google	Yes	Yes	Business models (advertising vs. subscription) are mutually exclusive; either/or but not both
2. Stand alone video receiver-player High Priority	Yes	No – Potential over long term	Device Manufacturers (e.g., Apple, Microsoft)	Yes	Yes	Potential fee only for advanced services; would require interactivity and conditional access
3. Vehicles Lower Priority	Yes	Yes	Automobile Manufacturers	Yes	No – Factory-installed Maybe – third party-installed	Long lead time for factory-installed options Potentially more of a near-term data-casting opportunity
4. Laptop Computers Least Priority (for M/H Service)	Yes	No – Potential over long term	Laptop Manufacturers	Maybe (See comments)	Yes	May not require M/H DTV receive capabilities in short-run so long as can receive main OTA DTV signal

M/H DTV BUSINESS OPPORTUNITIES FOR BROADCASTERS

The opportunities are organized by receive device because the device dictates the participating stakeholders and the size and nature of the opportunity. While stakeholders overlap across some devices (e.g., Nokia in cellular handsets and stand-alone video receivers), most of the key players in key markets do not (e.g., Verizon Wireless, AT&T, GM, Dell).

Laptop Computers

Laptops are ideal receivers for digital television broadcasts -- relatively large screens, high resolution capability, significant power sources, and a potential return channel via Ethernet, Wi-Fi or cellular modem connection. While laptops are portable, the usual in-use situation is at rest (e.g., table top).

Our understanding is that: (a) the laptop platform is an excellent candidate to be equipped with a digital tuner to receive the main OTA DTV broadcast signal; and that (b) there is no provision in the proposed ATSC standard for auto-selection logic to have the DTV tuner default to the M/H DTV signal only when the main DTV signal is not available.¹⁸ Therefore, at least for the period of consideration used in this report (2008-2012), laptops are not considered a M/H DTV business opportunity for broadcasters (but do constitute an audience-expanding opportunity for the main DTV signal which, in turn, could augment broadcaster advertising revenues).

M/H DTV for Vehicles

Datacasting

There are approximately 16 million new vehicles sold each year in the U.S. Everyone of them is a candidate for a factory-installed "vehicle information center" to which text and graphics could be downloaded to include advertising and promotional material. This vehicle information center would not be video-capable since it would not be safe to have the screen where a driver could be distracted and cause an accident. The business opportunity for participating broadcasters¹⁹ with respect to this information center is two-fold: (a) provision of local content (e.g., weather, traffic) that could be formatted for vehicles; and (b) use of transmission facilities to datacast to vehicles. Because the car manufacturer would control access to the vehicle, broadcasters would be partners with one or more manufacturers who would expect to be paid for provision of basic access to the mobile audience and/or on a subscription basis by vehicle owners for advanced services provided.

We have found no public revenue forecasts for this type of datacasting service. However, using reasonable assumptions,²⁰ by 2012, the revenue for broadcasters may be in the \$15-\$20 million range. While the size of this revenue stream is not particularly large, it is important to note that there would be almost no incremental cost so that nearly the whole amount would be operating income.

Video Reception

In addition to the datacasting service, there is an opportunity for increased advertising revenue if the in-vehicle entertainment centers that are provided as an option in vans and some SUVs could be equipped for M/H DTV reception. For example, Chrysler's Town & Country van offers a "MyGIG infotainment center" as a \$1,700 option. This package features two LCD flip-down screens for DVD play, satellite radio, MP3 play capability, and a hard drive that can hold/play music, as well as navigation information. It would be in this type of package that an OTA M/H DTV service could be inserted. However, van sales in the U.S. are less than one million annually.²¹ Those equipped with optional entertainment centers are a subset of the van category. The bottom line, is that this opportunity is relatively small -- maybe 200,000 to 300,000 vehicles per year across the entire U.S. within the 2007-2012 timeframe.

There is also the potential for M/H DTV reception in public transit and taxis. In order for this opportunity to be realized, transit and taxi fleet operators would have to include M/H DTV receive systems in the vehicle specifications that they provide to vehicle manufacturers (or arrange for third party or self-installation). Therefore, the operators would have to be convinced that M/H DTV reception would support increased fares and/or provide a competitive advantage. As with individual cars with entertainment centers, it is difficult to see any material increase in advertising revenue from M/H DTV in mass transit/taxis in the timeframe covered by this study.²²

Portable M/H Video Devices

Almost all digital audio consumer electronics companies manufacture and sell M/H video-capable devices, as do some companies not always thought of as consumer electronics companies, such as Microsoft under its Zune brand of products and associated download services.

The opportunity for broadcasters is to have M/H DTV receive capability incorporated into multiple brands and models. Essentially, consumer electronics manufacturers would build-in a tuner that allows users to tune in the OTA M/H DTV service of their choice.²³ Given that such receive capability were built into the players as an additional functionality, there should be incremental advertising revenue to broadcasters based on: (a) increased viewership from the mobile audience of M/H device users; and (b) improved demographic targeting on M/H device users who tend to be younger, techno-savvy and affluent.²⁴

Unit sales of MP3 players increased 56% (2005-to-2006) while, during the same time, average sales prices decreased approximately 8% (from \$152 to \$140).²⁵ The average price drop is somewhat deceptive in that the storage capability, functionality, and scope (music, video, and photos) have increased consistently in this category since Apple launched the original iPod for the 2001 Christmas buying season.

For example, a low end estimate would be, if 20% of the MP3 players (as classified by CEA) sold in the U.S. had M/H DTV receive capability for the 2009 Christmas season, then by

2012 there would be an embedded base of approximately 20 million M/H DTV-capable MP3s. This mobile audience with known demographics could then be sold to advertisers, thereby increasing advertiser revenue for broadcasters.²⁶ Importantly from a financial perspective, the incremental advertising revenue for broadcasters would have almost zero marginal cost so it would drop directly to the bottom line.

The size of the available audience would vary by the percentage of devices sold that had M/H DTV receive capabilities. For example, at the high end, if the percentage were 50% in the 2009 (as opposed to the 20% used in the above example), then the number of M/H DTV-capable DTV players in circulation in the U.S. by 2012 would approximate 50 million potential viewers across all TV markets with concentration in an audience with favorable demographics. On the issue of the potential volume of M/H video devices, three factors favor high volumes: (1) for manufacturers, the economies of scale dictate that there needs to be very high volume runs; (2) the embedded base of such devices – as is the case with almost all consumer equipment under \$300 – swaps out at about two-three years, so there is real potential for a rapid take up; and (3) broadcast programs are the most popular type of programs. These three points in combination make a high volume assumption both logical and supportable.

For device manufacturers to incorporate M/H DTV receive functionality rapidly, there would be several prerequisites: (a) there would be M/H DTV programs transmitted across the full range of U.S. TV markets; (b) consumers would want to watch this programming; (c) the addition of M/H DTV capability would not adversely impact the purchase decisions of consumers (e.g., due to a required increase in the size of the MP3 player); and (d) the cost of the chips, components, and intellectual property licenses was acceptable to both manufacturers and consumers, in terms of the impact on both the wholesale and retail prices of the device. In addition, rapid deployment would require consumer and manufacturer confidence that there was a dominant, if not single, M/H DTV system in the market.

Cellular Handsets

In general, there are two major scenarios by which broadcasters would work with cellular network operators. The first scenario involves free-to-air transmission of M/H DTV services by local broadcasters to cellular handsets containing tuners that allow the user freedom to tune to the M/H DTV service of their choice.²⁷ Under this scenario, compensation to the broadcasters would consist of payments by advertisers for access to a formerly unreachable mobile audience.²⁸

The second scenario involves sale of content to be re-transmitted over non-broadcaster facilities (e.g., MediaFLO) chosen by the operators to be received on the handsets of their subscribers. In this scenario, compensation to broadcasters would most likely be in the form of a monthly payment per subscriber by the cellular operator to the participating broadcasters.²⁹

When looking at the potential revenue from delivery to cellular handsets, it is important to

understand the size of the potential market for cellular-based mobile television. Forecasts vary, but the overall consensus is that mobile television will be a material business for cellular operators. Our review shows that forecasters generally expect the following: (1) mobile television in the U.S. to be a viable business; (2) take off in the 2009-2010 period; (3) tens of millions of subscribers; and (4) an annual spend by subscribers that generates a revenue stream for cellular operators in excess of \$1 billion by 2011. A sample of forecasts is provided below.

ABI Research³⁰

2011: 27 million wireless customers spend \$2.3 billion to subscribe to “broadcast mobile video services” from cellular operators approximate spend per month = \$7 per customer)

IDC³¹

2011: 24 million audience to watch video on mobile phones

Veronis Suhler Stevenson³²

2011: over 50 million “mobile TV subscriptions”

OVUM³³

2011: 49 million cellular subscribers spending \$1.7 billion on mobile video (approximate spend per month = \$3 per customer)

From the perspective of OTA broadcasters, what is important about these forecasts is the following:

- The near-term (2009-2011) ramp up of subscribers constitutes the “window of opportunity” for broadcasters;
- Substantial revenue is forecasted for cellular operators providing mobile video services;
- The “worst case” forecast is for 20+ million subscribers and an annual subscription spend over \$1 billion; and
- The forecasts indicate a low monthly subscription fee paid to the cellular operators, probably in the range of \$5 per subscriber.³⁴

FREE-TO-AIR HANDSET RECEPTION SCENARIO

Under this scenario, broadcasters either: (1) negotiate successively to have cellular operators allow handsets to have OTA M/H DTV service reception capability (“closed” model); or (2) work with handset manufacturers to have M/H DTV receive capability built into the handsets, so that users could receive free-to-air broadcast programs (“open” model).³⁵ As described earlier, most likely, the process would develop along the following lines. The cellular handset market has three tiers: (a) the high end top tier in which there is little or no operator subsidy for handsets (approximate price point = \$500 and above for a handset); (b) a middle tier with subsidy and

price points at or above \$150; and (c) a “low end, basic” tier. Most likely, the progression for M/H DTV capability would be introduction into the top tier and then, if the functionality proves popular with cellular subscribers, the M/H DTV functionality would be moved down rapidly into the middle tier.³⁶

The revenue source would be payments by advertisers to broadcasters for delivering access to, and viewing by, the mobile audience. The size of the potential audience would be a function of: (1) the number of handsets in circulation with M/H DTV receive capability; and (2) the number of viewers and duration of viewing. For example, if 25% of the phones sold each year had M/H DTV receive capability, then,³⁷ after three years, the embedded base of such phones would be in the range of 60-70 million. Likewise, if the penetration rate of M/H DTV receive capability were 50% of phones sold annually, then the embedded base after three years would be twice as many - or approximately 120 to 140 million by year end 2012. The obvious goal would be to make M/H DTV receive capability as ubiquitous as digital-cameras-in-handsets are today.

The free-to-air scenario involves no guaranteed payments from cellular operators to participating broadcasters.³⁸ Rather, this scenario involves business as usual for broadcasters who would have the potential to reach a broader audience and then sell that reach to advertisers. All broadcasters would compete for those advertising dollars, just as they do today. Most likely, broadcasters would be selling a multi-platform ad campaign involving OTA, their web site, and mobile audience access.

Content Retransmission Scenario

The general analogy here would be retransmission by the cable industry of local broadcast stations. However, when dealing with cellular operators, there would be two very important differences from the cable industry: (1) the channel capacity of the cellular video services is limited (i.e., 16-20 compressed channels); and (2) there is no legal compulsion to retransmit all -- or any -- of the broadcast stations in a given market. Therefore, most likely, the cellular operators would only want to work with two to four local broadcasters in top tier markets and one or two (if any) outside the top tier. As shown on Exhibit 15, the potential payments to participating broadcasters could be substantial, in that they would flow directly to the bottom line.³⁹

Exhibit 3. Content Retransmission Potential Payments By Cellular Carriers to Participating Broadcasters

High-End Payment Calculation

- a. $(50\text{M subscribers}) \times (\$5) \times (12\text{ months}) = \3B annual cellular mobile video revenue
- b. 50% of revenue allocated to pay for content = \$1.5B
- c. 25% of content payments allocated to pay for broadcast content = \$375M

Low-End Payment Calculation

- a. $(20\text{M subscribers}) \times (\$5) \times (12\text{ months}) = \1.2B annual cellular mobile video revenue
- b. 50% of revenue allocated to pay for content = \$600M
- c. 25% of content payments allocated to pay for broadcast content = \$150M

Assumptions:

- Cellular subscription fee = \$5/month.
- "Broadcasters" include both networks and local stations.

It is important to remember that, in this scenario, the local transmission facilities being used by the cellular operators are chosen by the operators (e.g., MediaFLO) and are not necessarily those of the broadcaster. Those operators are simply paying for the right to retransmit broadcaster-controlled content over facilities chosen by the cellular operators. Under this scenario, cellular handsets are not enabled generally to receive OTA M/H DTV services.⁴⁰

The ATSC M/H DTV standards selection process is relevant to this scenario. In the event timely choice of a single standard cannot be made and/or a "format war" erupts, then it would be difficult to negotiate with cellular operators to allow handsets to receive M/H DTV services on an OTA basis.⁴¹ In effect, this content retransmission scenario is the default scenario for broadcasters in the absence of timely selection of a single M/H DTV standard.⁴²

Annual payments to participating broadcasters under the content retransmission scenario could reach \$375 million (Exhibit 4). These payments would be almost entirely operating income as there would be little or no incremental cost to deliver content to cellular operators for retransmission.

In addition, there would be incremental advertising from reaching an audience of mobile television subscribers that may number up to 50 million. Also, the demographics (e.g., younger, tech-savvy) of this audience of subscribers would be of particular interest to specific advertisers. Finally, the actual viewing patterns of the audience may be trackable and reportable by the cellular operator who may know the viewing patterns of subscribers.⁴³

Exhibit 4 summarizes the differences between the "content retransmission" scenario and the "free-to-air" scenario.⁴⁴

Exhibit 4. Summary of Scenario Differences

Scenario Elements	Free-to-Air Scenario	Content Retransmission Scenario
1. Revenue Source(s)	<ul style="list-style-type: none"> Advertising revenue 	<ul style="list-style-type: none"> Retransmission fees Advertising revenue
2. Participating Broadcasters	<ul style="list-style-type: none"> All broadcasters that choose to transmit a M/H DTV service 	<ul style="list-style-type: none"> Networks + limited number of large station groups
3. Importance of timely selection of M/H DTV standard	<ul style="list-style-type: none"> Prerequisite for market participation 	<ul style="list-style-type: none"> Provides negotiating leverage with cellular operators
4. Cellular network operator model	<ul style="list-style-type: none"> Better fit for early launch with “open” model 	<ul style="list-style-type: none"> Possible under either an “open” or “closed” model, but probably a better fit with the “closed” model

CONCLUSIONS

- Digital television broadcasters have four competitive advantages available to them in the mobile video marketplace, including: (1) substantially lower capital requirements; (2) low cost and routine access to content; lower coverage cost per pop; and (4) access to advertising revenue.
- Mobile video is of increasing importance to advertisers and a M/H DTV service will enable broadcasters to leverage their existing advertising experience and sales experience.
- After launching a M/H DTV service, broadcasters could sell and deliver multi-platform advertising programs (on air, web sites, and mobile) that would enhance the value broadcasters deliver to advertisers, as well as communicate that broadcast television can combine elements of both new and old media.
- In terms of mobile video devices, we see that broadcaster strategies linked to cellular handsets and portable video players are more likely to pay off in the short run.
- Three prerequisites for broadcasters to generate incremental revenues from M/H DTV services: (1) the impact must be measured; (2) the effect must be differentiating and not result from cannibalization of broadcaster audiences; and (3) the impact must be material (e.g., achieving a measured increase of at least one percent [1%] in share).

END NOTES

- 1 The cost will be for a non-redundant exciter and multiplexer. Some observers have noted that broadcasters may also need to purchase and deploy “gap filler” low power transmitters to deliver reliable M/H broadcast services in certain markets. Estimates in our interviews ranged from \$100,000 to a high of \$350,000.
- 2 Includes commercial and public broadcasting transmitters; excludes low power stations and translators.
- 3 Qualcomm Annual Report (2006), p. 53.
- 4 Kagan Research (2006), p. 7.
- 5 Before launch of a M/H DTV service, there is a need for legal research and analysis with respect to distribution rights for programming to M/H devices. Clarification is required of the precise rights that the networks have to broadcast purchased programs (e.g., by NBC from Warner Brothers) over a M/H DTV service. Clarification is also required with respect to the program rights of local broadcasters with respect to broadcasting network programs to M/H devices.
- 6 In the wireless industry, “POPs” refers to the number of people (the population) in a specific geographic area. The “cost per POP” is calculated by dividing the projected/actual cost to provide a wireless service (such as M/H DTV) to an area, divided by the total population of that area.
- 7 Originally used for UHF analog television broadcasts.
- 8 For a discussion of the economic impact of spectrum propagation characteristics, see Morgan Stanley’s “700 MHz Primer: Beachfront Property for Sale” (February 14, 2007), pp. 8-10.
- 9 Assumes 95 million people covered for a \$5 billion upfront capital spend. See Parks Associates Report (August 16, 2007).
- 10 HP, “Accelerating 3G,” p. 10.
- 11 IBM Global Business Services, “The End of Advertising As We Know It” (2007), Figure 1, p. 5.
- 12 “Mobile Advertising Prepares for Take-Off,” *InfoWorld* (September 11, 2007).
- 13 Enpocket, “Mobile Marketing: A Vertical Perspective” (2006), p. 17. One of the best known mobile marketing firms, Enpocket was purchased by Nokia in September 2007.
- 14 Enhanced broadcasting technologies will allow programs to reach consumers outside-the-home and/or through use of non-traditional receiver devices (e.g., laptops). Therefore, deployment of next generation audience measurement technologies (e.g., Arbitron’s PPM) are a prerequisite to realize incremental advertising revenues for broadcasters.
- 15 An example of cannibalization would be to take a station’s audience and spread the same absolute number of viewers/listeners across two or three channels multicast by the station.
- 16 “One percent” seems to be a materiality threshold for the advertising community. Less than a one percent share gain appears to be regarded as just noise in the measurement system.
- 17 See the assumptions built into the forecasts (ABI Research, IDC, Veronis Suhler Stevenson, and OVUM) cited below in the “Cellular Handsets” section.
- 18 This situation assumes simulcast of identical programming on both the main DTV signal and the M/H DTV signal. It is not certain that this situation would prevail.
- 19 The participating broadcasters would most likely be limited to those groups that have broad geographic coverage.
- 20 The assumptions are as follows: (1) service launch in the 2011 model year; (2) GM leads with Ford and Toyota following quickly; (3) 2M vehicles participate in 2011 and 5M in 2012; and (4) broadcaster revenue for content and transmission equates to \$2-\$3 per participating vehicle per year.
- 21 *Dallas News*, “Chrysler Van is Functional – But Not Fun” (November 12, 2007).
- 22 There would most likely be trials in this period. Also, there might be the basis for a datacasting service for fleet vehicles, but that remains to be seen.
- 23 Another option, especially in the 2009-2010 period, is for some type of “plug-in” M/H DTV receiver that could allow consumers to retrofit their previously-purchased MP3s. In addition, a plug-in would allow the M/H DTV capability to be purchased separately by new buyers of MP3s, in case the factory-installed version was delayed or in short supply.
- 24 The viewing on MP3 players would have to be measured and reported by market so that advertisers could know what they are purchasing, but this is standard procedure in the broadcast industry.
- 25 NPJ Group press release (January 2, 2007).
- 26 To generate additional advertiser spend, the incremental viewers would have to be: (1) measurable reliably; (2) truly be incremental for a given program at a specific timeslot; and (3) be material (i.e., probably in the

order of a one percent or more gain).

27 The impact of including an ATSC tuner to receive M/H DTV signals in cellular handsets remains to be determined. The main addition to the handset would be the ATSC tuner and possibly new video and audio decoders. Other changes could involve the power supply, the keyboard, and the antenna. Taking up space within a handset is an issue that will involve multiple stakeholders, including cellular network operators, device manufacturers (and their supply chains), handset software providers (such as Google), and

28 broadcasters. The value proposition presented by broadcasters would have to be substantial. Most likely, this free-to-air scenario could be implemented faster with an “open” model in which cellular network operators do not control the functionality of the handsets that operate on their networks. See the discussion of the “open” versus the “closed” model in the prior chapter.

29 In this second scenario, an M/H DTV system is not required because the chosen infrastructure may be MediaFLO or other facilities not controlled by local broadcasters.

30 **ABI** Research, “U.S. Mobile Broadcast Video Market: Five Predictions” (July 26, 2006).

31 IDC, “U.S. Mobile Commercial Video and Television 2007-2011 Forecast” (March 2007), quoted by Sprint on their web page (posted September 26, 2007) as part of the Sprint announcement that seven primetime broadcast hits will be available on-demand over the Sprint network.

32 Veronis Suhler Stevenson, *Communications Industry Forecast 2007-2011*, 21st edition (2007), p. 325.

33 OVUM, *Wireless Content Forecast* (U.S. only), custom data run prepared for this report.

34 The low spend per month is the prerequisite for creating a mass mobile television market. The current \$20/month subscription fee is not considered viable in the long term.

35 For more details on the “closed” and “open” models, see the discussion of cellular telephones as receive devices in Chapter IV.

36 In the event that subscribers did not buy handsets when available in the top tier, then movement into the more mass market middle tier would be problematical.

37 Assumes the following: (a) 100 million or more cellular phones sold annually; (b) introduction of M/H DTV-capable handsets by Christmas 2009; (c) the embedded base of handsets turns over in its entirety every 2 to 2.5 years; and (d) in 2010, the penetration percentage is 15% increasing to 25% in 2011 and 2012. These handsets are also assumed to be able to operate on open cellular networks. That open network outcome may be achieved de jure (formal agreement of the cell operators following the announcement by Verizon) or de facto (the cell operators acquiesce to handset manufacturers including tuners in handsets yet receive no subsidies from the operators). Why might a de facto situation evolve? One reason could be the cost of including broadcast channels in a subscription service is less profitable than the stimulus to handset sales (and therefore subscriber increases) due to including free broadcast reception in the handset. At the same time, the small operators like Alltel and T-Mobile might have nothing to lose by allowing free to air reception so the majors have to go along to compete

38 In fact, it may involve the cellular operators requesting payments from broadcasters (under a “closed” model).

39 In the content retransmission scenario, an M/H DTV system is not required because the infrastructure chosen by the network operators may be MediaFLO or other facilities not controlled by local broadcasters. To do so would cannibalize subscription revenue (i.e., if broadcast programs are available on M/H devices free-to-air, then why would a cellular customer pay a subscription fee to receive local broadcast content?). The consent of the operators is critical under the “closed” network model. Under the “open” model, the handset manufacturers become the decisive stakeholder group.

42 This does not mean that timely selection of a M/H DTV standard means that there will automatically be a different outcome out of negotiations with the cellular operators. Rather, timely selection of a standard opens up a broader range of potential outcomes and provides broadcasters with more negotiating leverage. Viewer measurement is critical to achieving credibility with advertisers. Cellular network operators should know which, and how many, subscribers access video-on-demand programs and also know the number of purchasers of their subscription channels, but may not know who is watching what, for how long, on their subscription channels.

44 As noted previously, under the content retransmission scenario, the cellular operators use non-broadcaster controlled infrastructure so the choice of an M/H DTV system is not relevant.