

**The Economic Impact of Pay and Specialty
Service Migration from Analog to Digital
to High Definition**

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Executive Summary

The Canadian Association of Broadcasters asked Wall Communications to undertake an analysis of the economic impacts of migrating analog specialty services to a fully digital environment as well as transitioning all pay and specialty services from a standard definition to high definition (HD) environment. The objective of the analysis is to examine the expected impacts of these two factors on average Canadian pay and specialty service revenues and costs, as well as the Canadian pay and specialty services industry as a whole.

First, we calculated “average” revenue, cost and earnings levels individually for analog specialty, category 1 & 2 digital specialty and pay/PPV programming services based on the most recently available actual financial and statistical data. Average pay and specialty service revenues and costs are used as a “base case” for the economic impact analysis, reflecting the impact of the current regulatory framework on the finances of specialty and pay services.

Second, we developed alternative “post-transition” estimates of average revenue and cost impacts associated with the migration to a fully digital distribution, HD environment. These alternative revenue and cost estimates are used to measure the economic impacts associated with the post-transition regulatory framework relative to the current framework or base case. Under this approach, the impacts of digital migration and HD conversion are estimated in a purely “static” fashion – i.e., reflecting the differences between post-transition and base case revenues, costs and earnings for specialty and pay services. Transitional considerations and impacts are excluded to avoid unnecessarily complicating the analysis.

The first component of the economic impact modeling involves the migration of all existing analog pay and specialty services to a fully digital distribution environment. Once this migration process is complete, all broadcast distribution undertaking service subscribers (whether cable, DTH, MDS or DSL) would receive programming services in fully digital format.

To model the effects of digital migration we take into account, among other things, the following factors:

- i) expected reductions in average subscriber levels for analog specialty services among cable subscribers;
- ii) expected offsetting changes to average subscriber levels for category 1 & 2 digital specialty service among the same cable subscriber base;
- iii) budget constraints for programming service subscribers;
- iv) potential changes in wholesale or advertising rates; and
- v) potential impacts on pay and specialty service operating expenses (specifically Canadian programming expenditure levels).

The second component of the economic impact modeling involves estimating the likely incremental costs of converting pay and specialty services to HD format. For this purpose, we conducted a number of interviews with senior executives in the Canadian pay and specialty industry in order to collect estimates of the likely incremental capital costs, and incremental technical and programming operating expenses, resulting from the conversion from standard definition to HD programming format for an average pay and specialty service. Based on the input received through this interview process, we developed two sets of incremental cost impacts that we expect “base-case” pay or specialty services to incur, on average, as they convert to HD programming formats.

The first set (Scenario 1) is based on more optimistic estimates of likely capital cost requirements and incremental programming costs, including the lowest possible satellite distribution cost estimates currently available (i.e., using MPEG4 transmission rates). The second set (Scenario 2) is based on more conservative (i.e., higher) incremental capital requirements and programming costs, together with the satellite distribution costs based on a mix of compression technologies (i.e., MPEG2 and MPEG4). Based on these two scenarios, we estimate that HD-related capital costs would likely range between \$2 and \$4 million, while technical operating costs would be expected to increase by \$1.2 to \$2.25 million annually, and incremental programming costs would increase by 5% to 15% annually, relative to the base case.

In summary, our analysis reveals that the combined impact of digital migration and the transition to high definition results in a significant decline in revenues for analog services. While these losses are expected to be offset in part by gains made by category 1 & 2 digital services, substantial increases in operating costs for all pay and specialty services, due to the conversion to HD, are expected to reduce if not eliminate industry earnings altogether.

More specifically, we estimate that the specialty and pay sector will see an annual \$80 million net reduction in revenues. At the same time, total annual operating expenses for the sector is estimated to increase by \$193 million to \$429 million under Scenarios 1 and 2, respectively. Consequently, industry earnings are estimated to decline sharply – i.e., industry pre-tax profits decline from 18% in the base case to 1% under Scenario 1 and to -14% under Scenario 2.

While the study does not attempt to model all of the possible reactions that services may undertake in response to this financial pressure, we note that while technical and distribution costs tend to be largely fixed under the scenarios modeled, overall programming spending is variable. Therefore, not only would absolute programming spending commitments fall by up to \$83 million annually in the case of analog specialty services (as they are calculated as a percentage of revenue), but in some cases, services may be forced to seek reductions in

their percentage commitments in order to restore acceptable levels of profitability.

Moreover, it also appears that some pay and specialty services would simply not have the financial resources to convert to HD format. This is particularly evident in the case of category 1 & 2 digital specialty services, many of which have yet to break even since their launch three years ago. The same may also be true in the case of some analog specialty services. We also consider, therefore, an alternative scenario where some services (i.e., all category 1 & 2 digital specialty services for simplicity) are assumed not to upgrade to HD format. Even under this scenario, however, the negative impact on industry earnings as a result of digital migration and HD conversion is significant, leaving the industry in a loss position.

Lastly, it should be noted that potential costs for set-top boxes have not been included in the analysis. Including potential set-top box costs (e.g., for cable customers migrating to a digital environment or for HD programming services more generally) would have the effect of reducing, on average, subscribers' expenditures on programming services. If this were the case, the revenue impacts in our analysis would be understated as would be the declines in industry earnings.

1.0 Introduction

The Canadian Radio-television and Telecommunications Commission (Commission) recently launched two closely inter-related proceedings. One deals with the framework for the migration of pay and specialty services from an analog to digital distribution environment.¹ The second deals with the framework for the licensing and distribution of high definition (HD) pay and specialty services.² Alternative frameworks considered by the Commission in the context of these proceedings could have significant implications for Canadian pay and specialty services' financial viability as well as their ability to meet their existing licence conditions relating to, among other things, Canadian programming commitments. The alternative frameworks could also have important implications for broadcast distribution undertakings (BDUs) as well as programming services subscribers.

The Canadian Association of Broadcasters asked Wall Communications to undertake an analysis of the economic impacts of migrating analog specialty services to digital environment as well as transitioning all pay and specialty services from a standard definition to HD environment. The objective of the analysis is to examine the expected impacts of digital migration and conversion to HD on average Canadian pay and specialty service revenues and costs as well as the Canadian pay and specialty services industry as a whole. The analysis does not extend however to the consideration of the potential impacts on BDUs.

For the purpose of the analysis, we rely on average revenues and costs for Canadian pay and specialty services, calculated using the most recently available financial information collected by the Commission and corresponding service subscriber level statistics as measured by Mediastats.³ This information, which reflects the current regulatory framework for the licensing and distribution of analog and digital pay and specialty services, is used to model the "base case" or reference point for the economic impact analysis.

Alternative "post-transition" estimates of average revenues and costs impacts associated with the migration to a fully digital distribution, HD environment are also developed. These alternative revenue and cost estimates are used to measure the economic impacts associated with the post-transition regulatory

¹ Broadcasting Public Notice 2005-1, *Determinations with respect to the establishment of rules to govern the distribution of specialty services on the basic service of fully digital cable undertakings; and call for proposals for a framework to guide the migration of pay and specialty services from analog to a digital distribution environment*, 7 January 2005.

² Broadcasting Public Notice 2004-58, *Call for comments on a proposed framework for the licensing and distribution of high definition pay and specialty services*, 6 August 2004.

³ Sourced from the Commissions' annual Pay and Specialty Statistical and Financial Summaries (i.e., covering the one-year period September 2003 to August 2004) and Mediastats pay & specialty subscriber data for the same period.

framework relative to the current framework or base case. Under this approach, the impacts of digital migration and HD conversion are measured in a purely “static” fashion. Transitional considerations and impacts are excluded to avoid unnecessarily complicating the analysis.

Consideration of the subscriber level, wholesale rate and advertising rate impacts as well as incremental technical and programming cost impacts, among other considerations, are taken into account in modeling the likely effects of moving to a fully digital programming service distribution environment and transitioning all pay and specialty services to HD programming format. In addition, we also highlight the resulting potential impacts on Canadian programming expenditures.

Information used to determine alternative cost impacts associated with the conversion from standard to HD programming format was collected through interviews with a number of senior executives in the pay and specialty services industry responsible for technology and programming related matters. In addition, satellite-based distribution cost information provided by Telesat was also taken into account.

The balance of this report is set out as follows. Section 2 provides a brief overview of the Canadian pay and specialty services sector, with a focus on the analog specialty services which are the subject of the digital migration proceeding. It also includes an overview of digital programming service subscriber levels and HDTV-ready television set and HD programming service penetration levels. Section 3 describes how the base case “average” analog specialty, category 1 & 2 digital and pay/PPV services are developed, and the associated underlying assumptions. Section 4 describes the methodology used and underlying assumptions to estimate the likely economic impacts associated with the migration to a fully digital environment and the transition to HD programming. This section also includes a summary of the economic impact results along with important caveats that should be borne in mind in interpreting the results. Conclusions are summarized in section 5.

2.0 The Canadian Pay and Specialty Services Industry

2.1 Overview

The Canadian pay and specialty programming services sector has grown rapidly since its launch some 20 years ago. As of August 2004, there were 115 Canadian pay and specialty services in operation.

Of this total, 49 are Canadian “analog” specialty services, consisting of 28 English-language services, 14 French-language services, 2 bilingual services and 5 ethnic services. Most analog specialty services have been available to

analog as well as digital programming service subscribers in Canada for many years. Consequently, they are all generally well established in the marketplace.

It should be emphasized from the outset that “analog” specialty services are provided to subscribers in both analog and digital format depending on the subscriber’s television programming service provider -- e.g., analog cable versus DTH or digital cable. Regardless of whether such services are distributed in analog or digital format, they are referred to as analog specialty services throughout this report.

In addition to the analog specialty services, there were 52 category 1 & 2 digital specialty services in operation as of August 2004, consisting of 16 category 1 and 36 category 2 services. The vast majority of these are English-language services, with the exception of several third-language services. The number of category 2 services has increased only marginally since their launch in the fall of 2001.⁴ Due largely to the more limited base of digital programming service subscribers at this time, category 1 & 2 digital specialty services are still effectively in the start-up phase of their operations.

Finally, there were also six Canadian pay and eight PPV services in operation as of August 2004. In the latter case, terrestrial and DTH versions of PPV services provided by a single programming service provider are included in the total. Some Pay and PPV services are available to both analog and digital programming service subscribers, although increasingly they are available only as digital services, particularly in the case of PPV services.

2.2 Digital Programming Service Subscriber Levels

The number of “digital” programming service subscribers has grown quickly since their initial launch in the late 1990s. As of August 2004, the total number of digital programming service subscribers reached roughly 4.2 million.⁵ At the same time, the total number of analog and digital programming service subscribers (including residential and commercial customers) was just over 10 million. Consequently, the share of digital subscribers relative to total subscribers reached roughly 42% as of August 2004.

Much of the initial growth in digital subscribers was driven by the growth in DTH subscribers. As of August 2004, there were roughly 2.3 million DTH subscribers. The year-over-year growth in DTH subscribers has started to slow in the last two years as the service has matured.

⁴ Several new category 2 services have launched in the current broadcast year, including several French-language digital services.

⁵ All programming service subscriber data presented in this section is based on information drawn from the Commission’s Broadcasting Policy Monitoring Reports, Mediastats and Decima Research Inc.’s Digital Domain Report: Tracking the Growth and Development of the Canadian Digital TV Distribution Market, prepared November/December 2004.

The growth in digital cable subscribers has also been rapid since the service's launch in 2001. The number of digital cable subscribers reached a level of roughly 1.8 million as of August 2004.

In contrast, the number of MDS digital programming service subscribers is very limited. As of August 2004, there were less than 50,000 MDS programming service subscribers, and their numbers have generally been declining over the last several years.

In addition, several telephone companies have launched or plan to launch DSL-based digital programming services. While the number of such subscribers was limited as of August 2004 -- i.e., roughly 50,000 in total -- there is considerable potential for growth in DSL subscribers in the next few years, although it is likely that many of these subscribers will migrate from a cable or DTH service.

While there is every reason to believe that digital programming service penetration should continue to grow steadily in the coming years,⁶ without fundamental changes in cable marketing strategies, overall digital subscriber penetration may grow by no more than 10% per year. If this is the case, it would take more than another five years just to reach a digital service penetration level of over 60% of total programming service subscribers.

2.3 HD Programming Service Penetration

The adoption of HD technology in Canadian households is in the early stages of development at this time. A recent survey conducted by Decima Research found that just under two-thirds of Canadians are aware of HD technology.⁷ However, the results indicated that only 16% of survey respondents have a HDTV-ready set in their households.

Moreover, the survey also found that ownership of a HDTV-ready set did not necessarily translate into the ability to watch HD television programming. Only 42% of the survey respondents with HDTV-sets indicated that they also subscribe to HD television programming services through their cable or DTH programming service provider.

In any event, it is difficult to accurately determine the penetration level for HD television programming services based on survey results given potential misunderstandings in respondent's minds about the nature of HD technology and programming. Assuming that all respondents reported accurately, the Decima survey results suggest that, at most, 7% of cable/DTH service customers subscribed to HD programming services as of early 2005.

⁶ See Decima Research Inc., *The Digital Domain: Consumer Attitudes on Digital Television services, Benefits, and Features in Canada*, 2004.

⁷ Decima, *Canadian Communications Report*, Volume 31, Issue 5, 11 March 2005.

Penetration of HDTV-ready sets in Canadian households can be expected to grow significantly in the coming years, especially as the cost of the HDTV-ready sets decline and the range of available HD television programming grows. However, at this time, it is difficult to predict at what point at least one HDTV-ready set will be found in most Canadian households and the majority of households will be subscribed to some form of HD programming services.

3.0 The Base Case for Pay and Specialty Services

For the purpose of modeling the economic impacts of digital migration and HD conversion, we calculated “average” revenue, expense and earnings levels individually for analog specialty, category 1 & 2 digital specialty and pay/PPV programming services. In each of the three cases, the respective averages are based on the most recently available actual financial and statistical data -- i.e., data for the year ending August 2004 -- and the corresponding number of reporting units in each of the three respective programming service categories.

The calculated averages by type of pay and specialty service are used as a “base case” scenario reflecting the current regulatory framework. The estimated average revenues and costs resulting from digital migration and HD conversion, which are discussed in detail in Section 4 below, are compared to the base case scenario in order to depict the likely economic impacts arising under alternative post-transition scenarios. In this respect, we measure economic impacts relative to the derived “average” pay and specialty service revenues and costs as well as at the level of the Canadian pay and specialty industry as a whole.

It should be noted, however, that average pay or specialty service revenues and costs, as derived for the purpose of this analysis, are not intended to represent an “average” or “typical” pay or specialty service. Individual services can vary significantly given the substantial variations in penetration and wholesale rates among services, especially when taking into account service language and genre differences. For instance, some services may enjoy penetration rates of close to 100% in their respective markets and, as a result, enjoy revenues well above an industry average. In contrast, third-language services typically have much lower subscriber levels and revenues compared to an industry average. As a result, deviations from the average can be very large not only in terms of subscribers and revenues, but all aspects of aspects of a service’s operations.

3.1 Financial Assumptions

As noted, base case average revenues, expenses and earnings have been derived by dividing the aggregate 2004 financial data for each sub-sector of the Canadian pay and service sector by the corresponding number of programming services operating in each sub-sector in the same year. Table 1 below provides

a summary of the base case averages for analog specialty, category 1 & 2 digital specialty and pay/PPV services.

Table 1
CANADIAN PAY & SPECIALTY SERVICES
BASE CASE AVERAGE REVENUES AND COSTS
(**\$000 unless otherwise indicated**)

	Analog Specialty	Category 1 & 2 Digital Specialty	Pay & PPV
REVENUE			
Residence/Bulk/SMATV	13,379	641	14,519
DTH	3,887	1,334	12,029
Advertising	14,158	259	0
Other	429	30	23
TOTAL REVENUE	31,852	2,264	26,571
EXPENSES			
Program expenditures	16,826	1,599	15,735
Technical	1,336	642	779
Sales and Promotion	2,611	264	1,777
Administration & General	2,893	554	1,695
TOTAL EXPENSES	23,666	3,059	19,987
Operating Income	8,186	-794	6,584
Less: Depreciation	423	168	317
P.B.I.T.	7,763	-962	6,267
Less: Interest	1,390	244	221
Adjustments	-542	90	-566
PRE-TAX PROFIT	6,915	-1,296	6,612
CANADIAN PROGRAM AMORTIZATION			
<i>Acquisition of rights</i>	6,862	338	2,707
<i>Filler Programming/Program Production</i>	6,362	405	598
<i>Other</i>	146	4	1,180
Total Canadian Programming	13,370	747	4,485
<i>Canadian Programming/Revenue (%)</i>	42%	33%	17%
PROFITABILITY			
Operating Margin (%)	26%	-35%	25%
P.B.I.T. Margin (%)	24%	-42%	24%
Pre-tax Margin (%)	22%	-57%	25%

Derived from the CRTC's 2000-2004 Pay and Specialty Statistical and Financial Summaries.

As can be seen from Table 1, average revenues and costs for the category 1 & 2 digital service sub-sector are much smaller in scale compared to the analog specialty service and average pay/PPV service sub-sectors, reflecting the fact that category 1 & 2 digital services generally have a much smaller subscriber bases. Furthermore, while average earnings in the analog and pay/PPV service sub-sectors are strong, the category 1 & 2 digital specialty service sub-sector is experiencing very large losses, reflecting the fact that these service is still in the start-up phase of operation.

In many respects average revenues, expenses and earnings for the analog specialty and pay/PPV service sub-sectors are very similar with two notable

exceptions. Pay/PPV services have no advertising revenues and, on average, far less is spent on Canadian program content in the pay/PPV sub-sector (measured as a percentage of revenues) compared to both analog and digital specialty service sub-sectors.

For the purpose of modeling the economic impacts of digital migration and HD conversion relative to the base case, several other industry characteristics are taken into account. These include:

- i) average subscriber levels,
- ii) average wholesale or affiliation rates (or in the case of pay/PPV monthly revenues per subscriber), and
- iii) average monthly advertising rates per subscriber in the case of analog and digital specialty service sub-sectors.

3.2 Average Subscriber Levels

To model the impact of alternative post-transition scenarios on average pay and specialty service revenues we require estimates of the average number of cable and DTH subscribers for analog specialty, category 1 & 2 digital specialty and pay/PPV services, respectively, for the 2004 base case period. To develop these estimates, we used Mediastats pay and specialty service subscriber data for 2004 to calculate average "subscriber share" estimates for pay and specialty services separately for cable and DTH subscribers.

More specifically, cable and DTH customer-specific subscriber share estimates were measured on the basis of the total number of cable and DTH subscribers for individual pay and specialty services relative to the total number of national cable and DTH programming service subscribers. Subscriber shares for individual pay and specialty services can vary considerably -- e.g., from well below 5% in the case of some digital specialty and ethnic services to over 90% in the case of CBC Newsworld and RDI. Subscriber share levels depend on many factors, including the nature of the service (e.g., sports, lifestyle, documentary versus drama and entertainment), the format of the service (digital only versus analog/digital) and the language of the service, not to mention the pricing and packaging. Average cable and DTH customer-specific subscriber shares were then separately derived for analog specialty, category 1 & 2 digital specialty and pay/PPV services.

It should be emphasized that "subscriber share" estimates, as calculated for the purpose of this study, do not represent service "penetration" rates as that term is normally used within the pay and specialty services industry. Penetration rates also vary widely. Some services, those with dual status, experience 100% penetration of systems in their language area where they are carried. Services carried on a higher analog tier may experience penetration rates within their

language market of between 70 and 80%. However, the ratio of the total number of subscribers for an individual analog service relative to the total national number of programming service subscribers, including both official languages, is generally considerably lower than the service's "penetration" rate. The difference between service subscriber shares and penetration rates results from the significant differences in the subscriber base used for the two calculations. The subscriber share estimates used in this study differ further still since they are measured among cable and DTH subscribers separately.

Average Analog Specialty Service Subscriber Levels

While there are exceptions, in general, the subscriber share levels of Canadian analog specialty services are higher among cable subscribers compared to DTH subscribers. On average, as of August 2004, we estimate that the average share of total programming subscribers held by analog specialty service among cable subscribers is roughly 8% higher than that among DTH subscribers -- i.e., 49% versus 41%, respectively.⁸ The lower average subscriber share levels of analog services among DTH subscribers likely reflects the greater flexibility DTH subscribers have in choosing discretionary services above the basic service tier.

These average subscriber share levels for cable and DTH subscribers have been used to determine the base case average number of analog specialty service subscribers. Consequently, in the base 2004 period, 49% of cable subscribers are assumed to subscribe, on average, to analog specialty services -- i.e., roughly 3.9 million subscribers -- and 41% of DTH subscribers are assumed to subscribe to analog specialty services -- representing a further 0.9 million subscribers. Consequently, in total, we estimate that, on average, there are roughly 4.8 million analog specialty service subscribers during the 2004 base period.⁹

Average Category 1 & 2 Digital Specialty Service Subscriber Levels

The situation is reversed in the case of category 1 & 2 digital specialty services. Subscriber share levels for these services are generally much higher among DTH subscribers relative to "digital" cable subscribers. On average, we estimate that the average subscriber share level of category 1 & 2 digital specialty services

⁸ These average subscriber share estimates were derived using Mediastats programming service subscriber data for the month of August 2004. The total number of cable subscribers used in the calculation is 7.9 million, which includes both residential and commercial subscribers. The total number of DTH subscribers is 2.3 million. The relative average penetration rates are based on English- and French-language analog services only. Ethnic analog specialty services were excluded since in most cases they have very low penetration rates. In any event, like their English- and French-language counterparts, ethnic service penetration is higher among cable subscribers relative to DTH subscribers.

⁹ Note that in this and the subscriber estimates that follow, cable subscribers are also assumed to include MDS and DSL subscribers during the base year period.

among DTH customers is roughly 19%. It is only 8% on average in the case of digital cable subscribers,¹⁰ which translates into a cable penetration rate of 1.7% overall when calculated on the base of all cable subscribers (analog and digital).

These average subscriber share levels have been used to determine the base case average number of category 1 & 2 digital specialty service subscribers. They yield a total of 432,000 DTH subscribers and 135,000 digital cable subscribers. The total average number of subscribers is, therefore, estimated to be 566,000 for the 2004 base period.

Average Pay/PPV Service Subscriber Levels

Determining average subscriber share levels in the case of Canadian pay and PPV services is complicated by the fact that pay and PPV services are marketed in fundamentally different ways. Nevertheless, to simplify the analysis, the average subscriber share level for Canadian pay services has been used to approximate subscriber levels for the base case average pay/PPV service.

As in the case of category 1 & 2 digital services, subscriber share levels for Canadian pay services are generally higher among DTH subscribers compared to cable, with one notable exception being the Family Channel. On average, the average subscriber share level for Canadian pay services is 19% among DTH customers and 11% among cable customers.¹¹

These subscriber share levels have been used to determine the base case average number of pay/PPV service subscribers. They yield an estimate of roughly 432,000 DTH subscribers and 869,000 cable subscribers. The total subscriber count therefore is roughly 1.3 million for the 2004 base period.

Table 2 provides a summary of the estimated subscriber shares and resulting subscriber levels by industry sub-sector.

¹⁰ These estimates are derived using Mediastats subscriber data for the month of August 2004. Note that several very low-penetration, third-language category 2 digital services were excluded from the calculations

¹¹ These estimates are derived using Mediastats subscriber data for August 2004.

Table 2
CANADIAN PAY & SPECIALTY SERVICES
Base Case Subscriber Shares and Levels
2004 Base Period

	Analog Specialty	Category 1 & 2 Digital Specialty	Pay & PPV
Subscriber Shares (%)			
Analog & Digital Cable	49%	1.7%	11%
Digital Cable		8%	
DTH	41%	19%	19%
Subscriber Levels (000s)			
Cable	3,873	135	869
DTH	931	432	432
TOTAL	4,804	566	1,301

Note: Total base case cable and DTH subscribers are 7.9 M and 2.3 M, respectively.

3.3 Implied Wholesale Rates

Based on the estimated base case average number of cable and DTH subscribers by type of pay and specialty services, implicit average wholesale rates can be derived separately for DTH and cable operators. These rates are required to determine the impact on average subscription-related revenues, under alternative post-transition framework scenarios, of assumed changes in the average number of subscribers to analog, category 1 & 2 digital and pay/PPV services. Note that the derived implicit average wholesale rates are simply a product of the estimated base case average subscriber levels discussed in the previous section.

For analog specialty services, the implicit base case cable wholesale rate is \$0.29 per month per subscriber whereas the implicit base case DTH wholesale rate is slightly higher at \$0.35.

For category 1 & 2 digital specialty services, the relationship between cable and DTH wholesale rates is reversed, the implicit base case cable wholesale rate is \$0.40 per month per subscriber whereas the implicit base case DTH wholesale rate is lower, at \$0.26.

Lastly, for pay/PPV services, deriving an implicit wholesale rate is not entirely appropriate given the differences in marketing approaches between pay and PPV services. Nevertheless, for the purposes of this analysis, an implicit base case average "revenue" per subscriber has been calculated. For the 2004 base period, the average base case revenue per month per cable pay/PPV subscriber is \$1.39, whereas the figure is considerably higher in the case of DTH subscribers, \$2.32.

Table 3 provides a summary of base case wholesale rates revenues per subscriber by type of programming service.

Table 3
CANADIAN PAY & SPECIALTY SERVICES
Base Case Implicit Wholesale Rates/Revenues per Subscriber
2004 Base Period

	Analog Specialty	Category 1 & 2 Digital Specialty	Pay & PPV
Subscriber Revenues (000s)			
Cable	\$ 13,379	\$ 641	\$ 14,519
DTH	\$ 3,887	\$ 1,334	\$ 12,029
Subscriber Levels (000s)			
Cable	3,873	135	869
DTH	931	432	432
Implied Wholesale Rates (\$/mth/sub)			
Cable	\$ 0.29	\$ 0.40	\$ 1.39
DTH	\$ 0.35	\$ 0.26	\$ 2.32

3.4 Implied Advertising Rates

Just as implicit average wholesale rates can be derived for pay and specialty services, so can implicit per subscriber advertising rates. These rates are required to determine the impact on average advertising-related revenues, under alternative post-transition framework scenarios, resulting from assumed changes in subscriber levels. As in the case of the base case wholesale rates, the derived average implicit per subscriber advertising rates are simply a product of the estimated base case average subscriber levels discussed in Section 3.2.

For analog specialty service, the implicit monthly advertising rate per subscriber is \$0.25, whereas the advertising rate for the base case category 1 & 2 digital specialty service is much lower, \$0.04. The lower advertising rates for category 1 & 2 digital specialty services reflects their far lower subscriber levels and, more generally, far lower viewing shares.

Pay/PPV services do not generate any advertising revenues; consequently, the calculation is not relevant in their case.

Table 4 provides a summary of the data used to derive base case average implicit advertising rates for analog and digital specialty services.

Table 4
CANADIAN PAY & SPECIALTY SERVICES
Base Case Implicit Advertising Rates per Subscriber
2004 Base Period

	Analog Specialty	Category 1 & 2 Digital Specialty	Pay & PPV
Advertising Revenues (000s)	\$ 14,158	\$ 259	\$ -
Subscriber Levels (000s)	4,804	566	1,301
Implied Advertising Rates (\$/mth/sub)	\$ 0.25	\$ 0.04	\$ -

4.0 Economic Impacts of Digital Migration and HD Conversion

4.1 Methodology

The first component of the economic impact modeling undertaken for this study involves the migration of all existing analog pay and specialty services to a fully digital distribution environment. For this purpose, we have not attempted to model the transition period from today's mixed analog/digital to a future fully digital environment, but rather to simply estimate the economic impacts associated with alternative "post-transition" framework scenarios where all pay and specialty services are distributed in a fully digital environment versus the base case or current programming distribution environment.

Under the base case, as described in the previous section, only 21% of cable subscribers receive digital cable services. In other words, out of the approximate 8 million residential and commercial cable subscribers in total during the 2004 base period, roughly 1.8 million subscribed to digital programming services. The balance -- roughly 6.2 million in total -- subscribed strictly to analog programming services. In the post-transition framework scenarios considered below, we assume that all cable subscribers receive digital programming services. Consequently, in conjunction with already fully digital DTH, MDS and DSL services, all television programming services would be delivered in a fully digital environment under alternative post-transition scenarios.

The second component of the economic impact modeling undertaken for this study involves the conversion of all pay and specialty services to HD format. Again, we have not attempted to model the transition process from today's limited HD format pay and specialty services to a future fully HD format environment. In the alternative post-transition framework scenarios considered below, we estimate a range of cost impacts associated with conversion of all pay and specialty services to HD format relative to the base case.

In order to develop plausible alternative post-transition framework scenarios, we conducted a number of interviews with senior executives in the Canadian pay and specialty industry in order to collect estimates of the likely incremental capital costs and incremental technical and programming operating expenses resulting from the conversion from standard to HD programming format for an average pay and specialty service. Based on the input received through this process, we developed two sets of incremental cost impacts that base case average pay or specialty services could reasonably be expected to incur to convert to HD programming format.

The migration to a fully digital environment and the conversion from standard definition to HD programming formats are occurring simultaneously. Consequently, the economic impacts of these two events are analyzed jointly in what follows. The following two sections discuss the assumptions and considerations underlying, first, the transition to a fully digital environment and, second, the conversion from standard definition to HD.

4.2 Digital Migration – Assumptions

There are several factors that are taken into account in modeling the economic impact of digital migration. These include:

- i) analog specialty service subscriber impacts (which will ultimately depend on service packaging arrangements);
- ii) wholesale rate changes (if any);
- iii) per-subscriber advertising rate changes (if any);
- iv) indirect effects on other “non-analog” pay and specialty services;
- v) subscriber budget constraints (including consideration of digital set-top box costs, if any); and
- vi) potential operating cost changes.

Subscriber Share Impacts

The key factor that will ultimately affect subscriber share levels for analog pay and specialty services in a fully digital environment is their pricing and packaging. Currently analog pay and specialty services are generally made available to cable subscribers in a tiered fashion over and above the basic tier programming services. Separate prices apply to each available discretionary service tier, with discounts typically applying when all tiers are purchased jointly by a subscriber. This approach has resulted in generally high subscriber share levels for analog specialty services among cable subscribers. However, in a fully digital environment, subscriber share levels would likely decline as is the case for DTH, where subscribers tend to have more flexibility in terms of choosing programming services.

In a fully digital environment, cable companies would have a range of service pricing and packaging options at their disposal. In general, the greater the degree of packaging flexibility cable companies provide to their subscribers relative to their current packaging arrangements, the greater the potential declines in cable subscriber levels for analog specialty services.

For the purpose of this study, we have chosen to focus our analysis on a single digital migration scenario -- i.e., the case where the average subscriber share level among cable subscribers of analog specialty services drops by 8% from 49%, the base case level, to 41%. In other words, for the post-transition scenarios considered, we assume that the average subscriber share level for analog specialty services is the same among cable and DTH subscribers, reflecting the view that cable and DTH subscribers' flexibility to choose programming services in a fully digital environment would likely be similar.

Note that the 8% subscriber share decline is the assumed average impact of moving from analog to fully digital distribution environment. Individual analog services may experience different impacts, some more pronounced, some less.

Wholesale Rates

Moving analog specialty services into smaller service or theme packages compared to existing analog cable tiering arrangements could justify an increase in the average wholesale rates. Indeed, at one extreme, the wholesale rate for a given analog specialty service could be increased to a degree necessary to make the service "whole" at least with respect to subscriber revenues. However, to avoid arbitrary rate changes, average wholesale rates are assumed to remain unchanged in the post-transition scenarios examined in this study.

Per Subscriber Advertising Rates

Similarly, while changes in subscriber share levels can be expected to impact viewing shares for individual specialty services, in the post-transition scenarios that follow, monthly advertising rates per subscriber are assumed to remain fixed. To the extent that subscriber share levels change relative to the base case, however, advertising revenue changes are taken into account as a result of changes in the average number of subscribers.

Indirect Effects on Other Services

As noted, repackaging analog specialty services in a fully digital environment is expected to have a negative effect on the subscriber share levels of analog specialty services. On the other hand, in a fully digital environment, there is a greater likelihood that subscriber share rates for category 1 & 2 digital specialty services would increase since all cable subscribers would be able to receive analog as well as digital services. Therefore, any analog services that are

dropped by subscribers may be replaced entirely or, at least, in some measure by existing digital specialty services (including category 1 & 2 digital specialty services or pay/PPV services).

In the post-transition scenarios that follow, the average subscriber share of digital category 1 & 2 digital specialty services is assumed to increase in response to decreases in the subscriber share of average analog specialty services. As described further below, the key factor limiting subscriber share increases in category 1 & 2 digital specialty services is the subscriber's budget constraint.

As to pay/PPV services, their pricing and packaging may not differ to any significant degree in either a mixed analog/digital or fully digital environment. Pay services have largely already migrated to digital at this time.¹² Moreover, they are typically offered on a stand-alone or smaller pay package basis. Migration to a fully digital environment could have a positive affect on PPV services given that all programming subscribers would have access to PPV content. For simplicity, however, no subscriber share or revenue per subscriber changes are assumed to occur in the case of pay/PPV services under the post-transition scenarios examined in this study.

Subscriber Budget Constraint

According to Statistics Canada household spending survey data, the average Canadian household spent \$460 on rental of cable and DTH services in 2003. This amounts to roughly \$38 per month per household. Excluding households which do not subscribe to any form of television programming service (i.e., about 19% of all Canadian households), the average monthly expenditure for households subscribing to television programming services increases to roughly \$47 per month.

There are a number of factors that could potentially alter an average household's expenditures on television programming services in a fully digital distribution environment. For example, to the extent that migration requires subscribers to incur costs for a digital set-top box (i.e., either on a one time or a recurring rental charge basis), the percentage of a subscriber's average monthly expenditures devoted to discretionary programming services could decrease as a result. In fact, it is possible that some subscribers may drop their television programming service entirely if they were required to purchase directly or indirectly one or more digital set-top boxes. A further possibility is that those households that see overall expenditures for programming services initially reduced (because they can drop certain analog services in a digital world that were previously mandatory) may choose to use their "savings" on other forms of electronic information and entertainment. That is, they would spend any such savings outside of the programming services basket.

¹² This is supported by Mediastats subscriber data for Canadian pay services measured in August 2004, although there are exceptions to as in the case of the Family Channel.

On the other hand, while likely less probable, attractive changes in packaging and pricing in a fully digital environment could increase subscribers' average expenditures on programming services increases.

Although these impacts could have either a positive or negative impact on the financial performance of programming services, there is no good data available to construct quantitative assumptions. For the purpose of the post-transition scenarios that follow, therefore, it is assumed that total expenditures on television programming services remain unchanged (measured purely in terms of wholesale subscriber revenues received by the programming services themselves).¹³ Consequently, in our analysis, reduced analog specialty service subscriber-related revenues are assumed to be offset by increased category 1 & 2 digital specialty service subscriber-related revenues.

Operating Expenses

It should also be borne in mind that any analog service experiencing a decline in subscribers and, as a result, operating revenues is likely to cut costs in response. One area that is susceptible to immediate cost-cutting is programming and, more specifically, Canadian programming expenditures. For instance, as revenues decline, so would expenditures on Canadian programming, at least to the extent that a programming service's Canadian programming commitments are linked to its revenues.

In the post-transition scenarios that follow, the potential impacts on Canadian programming expenditures are highlighted.

4.3 HD Conversion – Assumptions & Cost Estimates

There are several areas where the conversion from standard definition to HD format can impact pay and specialty services. These include:

- i) broadcast centre and/or production studio upgrades (HD capital costs);
- ii) technical operating cost increases (e.g., signal distribution expenses, both terrestrial and satellite);
- iii) programming expenditure increases (for acquired programming and/or in-house production);
- iv) revenue impacts (due to subscriber level, wholesale rate or advertising rate changes, if any); and
- v) subscriber budget constraints (affected by potential HD set-top box costs).

¹³ In effect, this assumes that the retail mark-up on analog and digital programming services are, on average, equal.

Capital Costs

In broad terms, the costs required to convert to HD format include broadcast centre upgrades (i.e., master control, editing equipment, servers and other facilities) and production studio upgrades (i.e., control room, HD cameras, audio equipment and other facilities). HD conversion requirements, however, can vary widely depending on the nature of the service and the state of its existing facilities. For instance, many pay and specialty services may not require production studios given the nature of their programming. As well, broadcast centre and production studio facilities can be potentially shared among pay and specialty services. These considerations mitigate HD-related cost increases incurred by the average pay and specialty service.

Based on the capital cost estimates provided by the individuals interviewed for this study, incremental HD-related capital costs to upgrade broadcast centre facilities generally range from \$1 to \$2 million. Over and above these costs, incremental HD production studio related costs can range up to another \$1 to \$2 million. Longer term capital cost requirements could potentially be higher still if the existing facilities need to be replaced outright.

Mobile HD production units to cover live events can generate significant additional costs. However, live event coverage is not the norm for the vast majority of existing pay and specialty services, with the exception of, for instance, sports or news specialty services.

Given the range of likely incremental capital costs, we have established two alternative post-transition scenarios for this study. Under the first scenario, incremental capital costs, on average, are assumed to be \$2 million, reflecting the lower end of the cost estimate range. Under this scenario, it is assumed that more modest HD upgrades are undertaken on average. Under the second scenario, incremental capital costs, on average, are assumed to be \$4 million, reflecting the alternative case where more extensive HD upgrades are undertaken.

Technical Operating Costs

Given the higher bandwidth requirements associated with a HD programming service signal (i.e., anywhere from 5 to 6 times the bit rate of a standard definition signal), HD-related incremental signal distribution costs can be significant. These costs include both terrestrial distribution costs (i.e., to a local head-end or satellite uplink facility) as well as the uplink and space segment costs to distribute the signal more widely. There are of course alternative technologies (such as MPEG4) which could be used by pay and specialty services to improve efficiencies and lower distribution costs.

Based on information collected through the interview process along with information provided by Telesat, we have developed two alternative technical operating expense estimates.¹⁴ First, assuming the pay and specialty services are able to fully take advantage of the most efficient known technology (i.e., MPEG4), we estimate that incremental satellite distribution costs would be \$1.15 million per year. Second, assuming the services are able to partially take advantage of the most efficient current technology, we estimate that incremental satellite distribution costs would be of \$2.2 million per year (i.e., using a mix of compression technologies, MPEG2 and MPEG4).

In addition, we have included a further \$50,000 for increased terrestrial distribution and other technical operating costs associated with conversion to HD format.

In sum, for the two post-transition scenarios we consider, incremental technical operating expenses are estimated to be \$1.2 million per year under the first scenario and \$2.25 million per year under the second.

HD Programming Costs

Based on input from the interview process, there is general agreement that the cost of producing HD programming is higher than standard definition, especially so in the case of live events. At this very early stage of development of HD programming for pay and specialty services, however, interviewees noted that there is little information to determine the premium, if any, that would apply to acquired HD versus standard definition programming. In fact, the general view was that the rights for the two should not be separated and, therefore, disentangling the incremental costs of HD versus standard definition program costs would be very difficult if not impossible at this time.

While little in the way of hard evidence is currently available, most interviewees were of the view that any incremental HD-related programming costs for acquired and production programming combined would be “modest” at best. Therefore, for the purpose of this analysis, we have assumed that a pay or specialty service converting to HD format would incur incremental programming expenses of between 5% and 15%.

For analog specialty and pay/PPV services, this amounts to an average increase in programming costs of \$0.8 million to \$2.5 million annually. In the case of a category 1 & 2 digital specialty services, this amounts to an average increase of

¹⁴ In both cases, incremental HD distribution costs apply over and above existing standard definition distribution costs which are assumed to continue. The incremental HD distribution costs include two satellite distribution cost components: (i) uplink/space segment charges to ExpressVu subscribers and (ii) uplink/space segment charges to cable/Star Choice subscribers.

\$80,000 to \$250,000 per year given their much smaller base case expenditures on programming.

Revenue Impacts

Conversion to HD format could have some revenue increasing potential for pay and specialty services, especially for first-mover programming services. As noted, we have not attempted to model temporary impacts during the transition period. Post transition, when all pay and specialty services are assumed to be available in HD format, it is unclear whether there would be any gain in subscribers, on balance, or any changes in wholesale or advertising rates arising purely from a change in format. For this reason, we have assumed that there are no additional revenues associated with the conversion to HD format.

Subscriber Budget Constraint

Currently subscribers require a HDTV-ready set and HD digital set-top box to receive HD programming services. The cost of this equipment can be expected to reduce the average subscriber's ability to purchase HD pay and specialty programming services in the short to medium term. This would clearly be the case if the HD set-top box were to represent a significant share of a subscriber's monthly recurring charges for television programming services (i.e., in the case where the HD set-top box is rented rather than purchased outright).

As in the case of digital migration, we have assumed that the cost of the HD set-top box or any similar equipment does not affect the average subscriber's budget for programming services. Consequently, average pay and specialty services subscriber levels are assumed to be unaffected by the conversion of pay and specialty services to HD format. In effect, this assumes that at the point in time when all pay and specialty service are available in HD format, the cost of HD signal decoding equipment will be negligible.

4.4 Post-Transition Scenario Analysis – Industry Sub-Sector Impacts

Based on the assumptions, cost estimates and considerations discussed in the two preceding sections, the economic impacts of two post-transition scenarios are analyzed relative to the base case scenario.

The assumptions relevant to the migration of analog specialty services to a fully digital distribution environment include the following:

- i) the average subscriber share of analog specialty services among cable subscribers declines by 8%, falling from 49% to 41%;
- ii) at the same time, the average subscriber share of the average category 1 & 2 digital specialty service among cable subscribers increases by 5.5%, from 1.7% to 7.2% (note that this increase was

established based on the assumption that the subscriber-related revenue losses of analog services roughly equal the gain in category 1 & 2 digital specialty service subscriber-related revenues);

- iii) no net impact on average pay/PPV service revenues;
- iv) no change in wholesale or advertising rates;
- v) no impact on pay and specialty service operating expenses

The alternative cost and revenue impacts of transitioning pay and specialty services from standard definition to HD format are summarized in Table 5 below.

Table 5
HD Conversion Cost and Revenue Impact Assumptions

Incremental Cost Items	SCENARIO 1 (‘000s)	SCENARIO 2 (‘000s)
Capital Costs (broadcast centre and production studio)	\$2,000	\$4,000
Technical Operating Expenses (satellite, terrestrial and other)	\$1,200	\$2,250
Programming Expenses (acquired and produced programming)	~ 5% increase	~ 15% increase
Average Analog	\$800	\$2,500
Average Cat 1 & 2 Digital	\$80	\$250
Average Pay & PPV	\$800	\$2,500
Revenues	\$0	\$0

Note that in the case of capital cost impacts, the depreciation rate on the capital expenditures is assumed to be 20% (i.e., a 5 year amortization period) and the interest rate on funds is assumed to be 8%.

4.4.1 Impact on Analog Specialty Services

We first estimated the combined economic impacts of digital migration and HD conversion on analog specialty service average revenues and costs using the assumptions listed above. For both HD cost scenarios, the average cable subscriber share for analog specialty services is assumed to have declined by 8% to a level of 41%.

Table 6 summarizes the results of the two scenarios.

The revenue impacts are the same under both scenarios, since they involve the same digital migration cable subscriber share assumptions. Relative to the base

case, average analog specialty service revenues decline by just over \$4 million (or 12.5%) as a result of the fall in subscribers. Subscription revenue losses account for roughly 55% of the total revenue reduction, with advertising revenue losses accounting for the balance.

Consistent with the HD cost assumptions set out in Table 5, under Scenario 1, programming and technical expenses increase by \$0.8 million and \$1.2 million, respectively. These expense impacts increase to \$2.5 million and \$2.25 million, respectively, under Scenario 2.

The combined effect of the estimated revenue losses and additional expenses lower operating revenues by roughly \$6.0 million under Scenario 1 and \$8.8 million under Scenario 2. The additional incremental depreciation costs lower profits before interest and taxes (PBIT) further still by \$6.4 million and \$9.6 million under Scenarios 1 and 2, respectively. As well, the additional interest costs result in a reduction of pre-tax profits by \$6.6 million and almost \$10 million under the two respective post-transition scenarios.

Under both scenarios, average earnings margins for analog specialty services decline sharply, with pre-tax earnings dropping from 22% to just 1% under the Scenario 1 and to loss position of -11% under Scenario 2.

Table 6
CANADIAN ANALOG SPECIALTY SERVICES
AVERAGE REVENUES AND COSTS
Digital Migration & Transition to HD Format

	BASE CASE (2004)	POST-TRANSITION FRAMEWORK			
		Scenario 1	Difference	Scenario 2	Difference
REVENUE (\$000)					
Cable	13,379	11,194	-2,185	11,194	-2,185
DTH	3,887	3,887	0	3,887	0
Advertising	14,158	12,295	-1,863	12,295	-1,863
Other	429	429	0	429	0
TOTAL	31,852	27,805	-4,047	27,805	-4,047
EXPENSES (\$000)					
Programming	16,826	17,626	800	19,326	2,500
Technical	1,336	2,536	1,200	3,586	2,250
Other	5,505	5,505	0	5,505	0
TOTAL	23,666	25,667	2,001	28,417	4,751
Operating Income	8,186	2,138	-6,048	-612	-8,798
Depreciation	423	823	400	1,223	800
PBIT	7,763	1,315	-6,448	-1,835	-9,598
Interest	1,390	1,550	160	1,710	320
Adjustments	-542	-542	0	-542	0
Pre-tax Profit	6,915	307	-6,608	-3,003	-9,918
PBIT Margin	24%	5%	-20%	-7%	-31%
Pre-tax Profit Margin	22%	1%	-21%	-11%	-33%

With such significant negative impacts arising from the combined effects of digital migration and HD conversion, analog specialty services would need to boost revenues and/or rein in costs in any way they could to help mitigate these effects. One option in this respect would be to attempt to increase wholesale rates. To make the average analog specialty service “whole” relative to the base case, in terms of subscription revenues, would require an average cable wholesale rate increase of roughly 16%. However, even if this were possible, there would be further losses in advertising revenues to make up.

In addition, in view of the estimated reduction in analog specialty service revenues, Canadian programming expenditures could be reduced at least up to the point where the base case ratio between these expenditures and total revenues would be reestablished. Consequently, while overall programming expenditures would have increased due to incremental HD programming costs, the percentage of Canadian programming expenses to overall programming expenditures could be reduced.

In fact, given the estimated reduction in average revenues, Canadian programming expenditures could be reduced, on average, by up to \$1.7 million per year. If all analog services reduced their Canadian programming expenditures to this degree, the total analog sector-wide impact would be a reduction in Canadian programming expenditures of roughly \$83 million.

Aggregate economic impacts for all analog specialty services combined are summarized in Table 7. Under the two scenarios considered, total revenues decline in total by \$198 million. At the same time, total operating expenses increase by \$98 to \$233 million and capital expenditures by \$98 to \$196 million under Scenarios 1 and 2, respectively.

Table 7
ALL CANADIAN ANALOG SPECIALTY SERVICES
AGGREGATE ECONOMIC IMPACTS
Digital Migration & Transition to HD Format

(\$ 000)	POST-TRANSITION FRAMEWORK	
	<u>Scenario 1</u>	<u>Scenario 2</u>
REVENUES	-198,336	-198,336
EXPENSES		
Technical	58,800	110,250
Programming	39,200	122,500
Total	98,000	232,750
CAPITAL EXPENDITURES	98,000	196,000

4.4.2 Impact on Category 1 & 2 Digital Specialty Services

As noted, the migration of analog services to a fully digital environment is assumed to have a positive effect on category 1 & 2 digital specialty services. The population of subscribers that are able to receive these services would increase dramatically in a fully digital environment. However, any increase in subscribership to these services as analog cable subscribers become digital cable subscribers would be limited by the average subscriber's programming services budget constraint. Consequently, for the purpose of this modeling analysis, it is assumed that increases in category 1 & 2 digital service subscriber-related revenues would be roughly equal to subscriber-related revenue losses incurred by analog specialty services.

Given the assumed 8% reduction in the proportion of cable subscribers receiving the average analog specialty service, we estimate that the corresponding increase in the proportion of cable subscribers receiving the average category 1 & 2 digital specialty service would increase from 1.7% to 7.2%. At this level of penetration, the increase in subscription revenues for all category 1 & 2 digital specialty services roughly equals the reduction in subscription revenues for analog services.

Table 8 summarizes the economic impacts of the joint effects of digital migration and the conversion to HD programming format on average revenues and costs for category 1 & 2 digital specialty services.

The revenue impacts are again the same under scenarios 1 and 2 since the increase in subscriber shares is the same in both cases. In total, average revenues for category 1 & 2 digital specialty services are estimated to increase roughly \$2.3 million. Most of the revenue increase comes from subscription revenues since implicit per subscriber advertising rates are very low for category 1 & 2 digital specialty services given their relatively low base case subscriber levels.

Total operating expenses increase substantially under Scenarios 1 and 2 relative to the base case. Programming expenditure increases are limited since they are assumed to increase on a percentage basis relative to the base case; however, the technical expenses, which are driven by satellite distribution costs, increase dramatically. Under Scenario 1, operating expenses rise by \$1.3 million (an increase of over 40%) and, under Scenario 2, operating expenses rise by \$2.5 million (an increase of roughly 80%). The increases in HD capital related costs, depreciation and interest expenses, add a further cost of \$0.6 million roughly \$1.1 million under Scenario 1 versus Scenario 2.

Table 8
CATEGORY 1 & 2 DIGITAL SPECIALTY SERVICES
AVERAGE REVENUES AND COSTS
Digital Migration & Transition to HD Format

	BASE CASE (2004)	POST-TRANSITION FRAMEWORK			
		Scenario 1	Difference	Scenario 2	Difference
REVENUE (\$000)					
Cable	641	2,710	2,069	2,710	2,069
DTH	1,334	1,334	0	1,334	0
Advertising	259	457	198	457	198
Other	30	30	0	30	0
TOTAL	2,264	4,531	2,267	4,531	2,267
EXPENSES (\$000)					
Programming	1,599	1,679	80	1,849	250
Technical	642	1,842	1,200	2,892	2,250
Other	818	818	0	818	0
TOTAL	3,059	4,339	1,280	5,559	2,500
Operating Income	-794	192	986	-1,028	-234
Depreciation	168	568	400	968	800
PBIT	-962	-376	586	-1,996	-1,034
Interest	244	404	160	564	320
Adjustments	90	90	0	90	0
Pre-tax Profit	-1,296	-870	426	-2,650	-1,354
PBIT Margin	-42%	-8%	34%	-44%	-2%
Pre-tax Profit Margin	-57%	-19%	38%	-58%	-1%

On balance, gains in subscriber-related revenues more than offset the estimated incremental HD conversion costs under Scenario 1. In this case earnings (measured in terms of PBIT or pre-tax profit margins) increase sharply, but nevertheless remain well below zero. Under Scenario 2, the revenue gains just fail to cover the higher alternative HD conversion related costs. As a consequence, average category 1 & 2 digital specialty service earnings fall marginally relative to their already extreme base case loss position.

It should also be noted that, under the post-transition scenarios, the ratio of Canadian programming expenditures to total revenues would virtually be cut in half as a result of the increase in average category 1 & 2 digital specialty service revenues. To maintain the base case ratio of Canadian programming expenditures to revenues, Canadian programming services would have to be increased, on average, by roughly \$750,000 per service. However, in view of the continued substantial losses incurred by the category 1 & 2 digital specialty services under both scenarios, increasing Canadian programming expenditures would be extremely difficult if not impossible.

Aggregate economic impacts for all category 1 & 2 digital specialty services combined are summarized in Table 9. Under both scenarios, total revenues increase in total by \$118 million. As well, total operating expenses increase by

\$67 to \$130 million and capital expenditures by \$104 to \$208 million under Scenarios 1 and 2 respectively.

Table 9
ALL CATEGORY 1 & 2 DIGITAL SPECIALTY SERVICES
AGGREGATE ECONOMIC IMPACTS
Digital Migration & Transition to HD Format

(\$ 000)	POST-TRANSITION FRAMEWORK	
	Scenario 1	Scenario 2
REVENUES	117,899	117,899
EXPENSES		
Technical	62,400	117,000
Programming	4,160	13,000
Total	66,560	130,000
CAPITAL EXPENDITURES	104,000	208,000

4.4.3 Impact on Pay/PPV Services

In the case of average pay/PPV services, we only consider the impact of the HD conversion costs. No revenue impacts are assumed to result from the migration of analog services to a fully digital environment.

Table 10 provides a summary of the economic impacts of HD conversion on average pay/PPV service expenses and earnings.

The incremental impacts on average pay/PPV service operating expenses are identical to those of the average analog specialty service -- i.e., total operating expenses increase by \$2.0 million under Scenario 1 and \$4.8 million under Scenario 2. Equivalent impacts also apply in the case of depreciation and interest expenses relative to those of the average analog specialty service. -- i.e., roughly \$0.6 to \$1.1 million, combined, under Scenarios 1 and 2, respectively.

With significantly increased costs and no offsetting revenues, average pay/PPV service earnings decline sharply. Earnings are cut in half under Scenario 1 and are almost eliminated under Scenario 2.

Table 10
CANADIAN PAY & PPV SERVICES
AVERAGE REVENUES AND COSTS
Digital Migration & Transition to HD Format

	BASE CASE (2004)	POST-TRANSITION FRAMEWORK			
		Scenario 1	Difference	Scenario 2	Difference
REVENUE (\$000)					
Cable	14,519	14,519	0	14,519	0
DTH	12,029	12,029	0	12,029	0
Advertising	0	0	0	0	0
Other	23	23	0	23	0
TOTAL	26,571	26,571	0	26,571	0
EXPENSES (\$000)					
Programming	15,735	16,535	800	18,235	2,500
Technical	779	1,979	1,200	3,029	2,250
Other	3,472	3,472	0	3,472	0
TOTAL	19,987	21,986	1,999	24,736	4,749
Operating Income	6,584	4,585	-1,999	1,835	-4,749
Depreciation	317	717	400	1,117	800
PBIT	6,267	3,868	-2,399	718	-5,549
Interest	221	381	160	541	320
Adjustments	-566	-566	0	-566	0
Pre-tax Profit	6,612	4,053	-2,559	743	-5,869
PBIT Margin	24%	15%	-9%	3%	-21%
Pre-tax Profit Margin	25%	15%	-10%	3%	-22%

Aggregate economic impacts for all pay/PPV services combined are summarized in Table 11. Under the two scenarios considered, total operating expenses increase by \$28 to \$67 million and capital expenditures by \$28 to \$56 million under Scenarios 1 and 2 respectively.

Table 11
ALL CANADIAN PAY & PPV SERVICES
AGGREGATE ECONOMIC IMPACTS
Digital Migration & Transition to HD Format

(\$ 000)	POST-TRANSITION FRAMEWORK	
	Scenario 1	Scenario 2
REVENUES	0	0
EXPENSES		
Technical	16,800	31,500
Programming	11,200	35,000
Total	28,000	66,500
CAPITAL EXPENDITURES	28,000	56,000

4.5 Post-Transition Scenario Analysis – Industry-Wide Impacts

The aggregate impacts of digital migration and the conversion to HD on the Canadian pay and specialty services sector as a whole for the two post-transition scenarios are presented in Table 12. The industry wide results reflect the net effect of the revenue losses to analog specialty services and the revenue gains to category 1 & 2 digital specialty services due to digital migration. As well, the results reflect the costs of the conversion from standard definition to HD for analog specialty, digital specialty and pay/PPV services combined.

Overall, Industry revenues decline by \$80 million given that the revenue losses to analog services exceed the gains made by category 1 & 2 digital specialty services. This is explained by the fact that the advertising revenue gains made by digital specialty services fall well short of the advertising revenue losses to analog services, given the much lower average per subscriber advertising rates currently earned by category 1 & 2 digital specialty services.

Industry wide HD-related operating expense impacts range from \$193 million under Scenario 1 to \$429 million under Scenario 2. Depreciation costs also rise significantly under both scenarios due to incremental HD-related capital costs -- i.e., by \$46 million under Scenario 1 and \$92 million under Scenario 2. Interest costs increase as well -- i.e., by \$18.4 million under Scenario 1 and \$36.8 million under Scenario 2.

Table 12
CANADIAN PAY & SPECIALTY SERVICE INDUSTRY
Digital Migration & Transition to HD Format

	BASE CASE (2004)	POST-TRANSITION FRAMEWORK			
		Scenario 1	Difference	Scenario 2	Difference
REVENUE (\$000)					
Cable	892,172	892,720	548	892,720	548
DTH	428,264	428,264	0	428,264	0
Advertising	707,195	626,209	-80,986	626,209	-80,986
Other	22,874	22,874	0	22,874	0
TOTAL	2,050,504	1,970,067	-80,437	1,970,067	-80,437
EXPENSES (\$000)					
Programming	1,127,880	1,182,440	54,560	1,298,380	170,500
Technical	109,748	247,748	138,000	368,498	258,750
Other	360,880	360,880	0	360,880	0
TOTAL	1,598,508	1,791,068	192,560	2,027,758	429,250
Operating Income	451,996	178,999	-272,997	-57,691	-509,687
Depreciation	33,896	79,896	46,000	125,896	92,000
PBIT	418,100	99,103	-318,997	-183,587	-601,687
Interest	83,879	102,279	18,400	120,679	36,800
Adjustments	-29,787	-29,787	0	-29,787	0
Pre-tax Profit	364,009	26,611	-337,398	-274,479	-638,488
PBIT Margin	20%	5%	-15%	-9%	-30%
Pre-tax Profit Margin	18%	1%	-16%	-14%	-32%

All told, Canadian pay and specialty service industry earnings drop sharply under both post-transition scenarios. Industry earnings, measured in terms of PBIT margin, drop from 18% under the base case to 5% under Scenario 1 and further still to -9% under Scenario 2. A similar picture applies when considering pre-tax profits/losses, which drop from 18% under the base case to 1% under Scenario 1 and to -14% under Scenario 2. Consequently, under the two scenarios considered in this analysis, the combined impacts of digital migration and HD conversion have the effect of either largely eliminating industry profitability under or pushing the industry well into an overall loss position.

4.6 Post-Transition Scenario Analysis – Caveats

There are several caveats that should be borne in mind when considering the estimated economic impacts set out above. These involve the impact of potential set-top box costs, pressures to reduce costs (including Canadian programming expenditures) in response to earnings reductions and, in this same respect, the lack of financial resources to undertake HD upgrades as in the case of many if not most category 1 & 2 digital specialty services.

First, the issue of the potential costs of set-top devices comes up in the context of both the digital migration and HD conversion scenarios. In either case, if subscribers are required to absorb the cost of a digital or HD set-top box directly or indirectly, subscriber expenditures on Canadian pay and specialty services can be expected to decline. In this respect, the economic impact results shown in both post-transition scenarios above would be understated.

Under the digital migration scenario assumptions, for instance, some 6.2 million analog cable subscribers would be migrated over to digital service. If the average monthly rental rate of a digital set-top box were \$5.00 (below typical existing rates), these migrated subscribers would collectively be required to pay roughly \$373 million annually in equipment rental fees (assuming no disconnections). If migrated cable subscribers were required to pay this amount, whether explicitly or implicitly in their monthly cable service charges, expenditures on pay and specialty service would undoubtedly decline.

If, for example, the added cost of a set-top box caused a further 10% reduction in subscriber share levels among cable subscribers for analog specialty services, average analog specialty service revenues would decline by roughly \$5 million over and above the losses described under the post-transition scenarios discussed in the previous sections. At the analog specialty service sub-sector as a whole, this would amount to a further loss of roughly \$240 million. Even at this assumed penetration rate reduction level, the increase set-top box costs would not be fully offset by analog service subscription revenue reductions (although it

should be noted that we have not taken into account the mark-up on wholesale rates applied by the BDU which subscribers would be required to pay).

The cost of rolling out HD set-top boxes could even be greater given that the vast majority of subscribers do not currently subscribe to HD programming services and the cost of HD set-top boxes currently exceed the cost of standard definition digital set-top boxes.

Second, absorbing the cost of the conversion to HD programming format places significant pressure on industry earnings under the first post-transition scenario and even more so under the second scenario. In order to justify moving to HD format, operating costs would need to be reduced given that there appears to be little hope at this time of generating additional revenues from transitioning to HD format. One area where cost could potentially be cut is in the area of Canadian programming expenditures. Reductions in this respect are limited by existing Canadian programming obligations; however, some services may be forced to seek reductions in their percentage commitments in order to restore an acceptable level of profitability.

Lastly, it appears that some pay and specialty services would simply not have the financial resources to convert to HD format. This is particularly evident in the case of category 1 & 2 digital specialty services given the fact that they are yet to breakeven since their launch over three years ago. The same may also be true in the case of some analog specialty services. Given the nature of some specialty programming services, it is possible that they may choose to simply upgrade to a standard definition wide-screen format to avoid or delay incurring the costs of converting to HD format.

To provide an estimate of likely economic impacts associated with such a scenario, we re-estimated industry-wide impacts of digital migration and HD conversion under the assumption that category 1 & 2 digital specialty services do not convert to HD format. It should be noted that while we could have considered an alternative scenario in this respect where a mix of analog and digital were assumed not to upgrade to HD at this time, we have chosen to focus purely on category 1 & 2 digital specialty services in this scenario to simplify the analysis.

Table 13 provides a summary of the revised industry-wide economic impact results.

Table 13
CANADIAN PAY & SPECIALTY SERVICE INDUSTRY
Digital Migration & Transition to HD Format
Assuming Category 1 & 2 Digital Specialty Service do not Transition to HD

	BASE CASE (2004)	POST-TRANSITION FRAMEWORK			
		Scenario 1	Difference	Scenario 2	Difference
REVENUE (\$000)					
Cable	892,172	892,720	548	892,720	548
DTH	428,264	428,264	0	428,264	0
Advertising	707,195	626,209	-80,986	626,209	-80,986
Other	22,874	22,874	0	22,874	0
TOTAL	2,050,504	1,970,067	-80,437	1,970,067	-80,437
EXPENSES (\$000)					
Programming	1,127,880	1,178,280	50,400	1,285,380	157,500
Technical	109,748	185,348	75,600	251,498	141,750
Other	360,880	360,880	0	360,880	0
TOTAL	1,598,508	1,724,508	126,000	1,897,758	299,250
Operating Income	451,996	245,559	-206,437	72,309	-379,687
Depreciation	33,896	59,096	25,200	84,296	50,400
PBIT	418,100	186,463	-231,637	-11,987	-430,087
Interest	83,879	93,959	10,080	104,039	20,160
Adjustments	-29,787	-29,787	0	-29,787	0
Pre-tax Profit	364,009	122,291	-241,718	-86,239	-450,248
PBIT Margin	20%	9%	-11%	-1%	-21%
Pre-tax Profit Margin	18%	6%	-12%	-4%	-22%

Under this alternative partial HD conversion scenario, there is no change in the industry wide revenue losses associated with digital migration. However, the industry-wide HD cost impacts are mitigated significantly since we are now assuming that all 52 category 1 & 2 digital specialty services do not upgrade to HD format.

Even still, industry wide earnings drop considerably under both scenarios. Under the first scenario, the industry PBIT margin drops to 9% and under the second scenario it falls below zero, to -1%. A similar pattern is observed in the case of the industry's pre-tax profit margin. It drops to 6% under the first scenario and to a loss position of -4% under the second scenario. Consequently, even under this partial HD conversion scenario Canadian pay and specialty service earnings are reduced significantly.

Had one or more analog specialty services been substituted for category 1 & 2 digital services in this alternative scenario, the decline in industry-wide earnings, under both scenarios, would have been mitigated somewhat given the much larger incremental HD-related programming expenditures incurred by analog versus digital services.

5.0 Conclusions

In sum, our analysis reveals that the combined impact of digital migration and the transition to high definition results in a significant decline in revenues for analog services, offset in part by gains made by category 1 & 2 digital services, and a substantial increase in costs for all pay and specialty services. Consequently, industry earnings are reduced significantly if not eliminated altogether.

While the study does not attempt to model all of the possible reactions that services may undertake in response to this financial pressure, we note that while technical and distribution costs tend to be largely fixed under the scenarios modeled, overall programming spending is variable. Therefore, not only would absolute programming spending commitments fall since they are a percentage of revenue (i.e., by up to \$83 million annually in the case of analog specialty services), but in some cases services may be forced to seek reductions in their percentage commitments in order to restore an acceptable level of profitability.

In addition, the fact that potential costs for set-top boxes have not been included in the analysis is an important caveat that suggests that our estimated economic impacts on the Canadian pay and specialty industry may be understated.