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July 24, 2019

Marlene Dortch, Secretary
Federal Communications Commission
445 12th Street S.W.
Washington, D.C. 20554

Re: Implementation of Section 621(a)(1) of the Cable Communications
Policy Act of 1984 as Amended by the Cable Television Consumer
Protection and Competition Act of 1992, MB Docket No. 05-311

Dear Ms. Dortch:

This *ex parte* letter is submitted on behalf of Anne Arundel County, Maryland; The City of Atlanta, Georgia; The City of Bellevue, Washington; Bloomfield Township, Michigan; The City of Brookhaven, Georgia; The City of Boston, Massachusetts; The City of College Park, Maryland; The City of Dallas, Texas; The City of Davis, California; The City of Dubuque, Iowa; The District of Columbia; The County of Fairfax, Virginia; The City of Fontana, California; The City of Gaithersburg, Maryland; The City of Greenbelt, Maryland; Howard County, Maryland; The City of Kirkland, Washington; The City of Laredo, Texas; The City of Laurel, Maryland; Los Angeles County, California; The City of Los Angeles, California; The City of Lincoln, Nebraska; The Marin Telecommunications Agency; Meridian Township, Michigan; The Michigan Chapter of The National Association of Telecommunications Officers & Advisors; The Michigan Coalition To Protect Public Rights-Of-Way; The Michigan Municipal League; The Michigan Township Association; Montgomery County, Maryland; Mt. Hood Cable Regulatory Commission; The City of Ontario, California; The City of Plano, Texas; The City of Portland, Oregon; The Ramsey/Washington Counties Suburban Cable Communications Commission II; The City of Rye, New York; The City of San Jacinto, California; The Sacramento Metropolitan Cable Television Commission; The Village of Scarsdale, New York; The Texas Coalition of Cities For Utility Issues; and The Texas Municipal League.

Attached to this letter are Ernst & Young analyses describing the sector-leading profitability of cable operators in 2013, 2014, and 2015, and a Columbia Telecommunications Corporation report describing the relatively minor role rights-of-way fees and practices play in broadband deployment decisions. These studies, in conjunction with the five economic analyses on similar issues attached to the Reply Comments of Anne Arundel County, et al.,¹ show that fees charged do not affect deployment, with high levels of deployment associated with

¹ Comments of Anne Arundel County, et al., MB Docket No. 05-311, at Exhs. 2-5 (Dec. 14, 2018).
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Marlene Dortch, Secretary
July 24, 2019
Page 2

communities – such as those in Oregon – that charge fees for use of the rights-of-way by providers of cable, telecommunications and information services. The data continue to demonstrate that cable operators' obligations to local governments are not so burdensome as to affect deployment of cable or other services, or to affect adoption; the data support the *ex parte* filing made by NATOA *et. al.* this date. To the extent cable operators wish to deploy additional infrastructure and services, they have the resources available to do so while meeting their commitments to franchising authorities and communities nationwide.

Courtesy copies of this submission will be provided via email to the individuals listed below. Please contact me if you have any questions or concerns regarding this submission.

Respectfully submitted,



Gerard Lavery Lederer
of BEST BEST & KRIEGER LLP

Enclosures

cc:
Michelle Carey
Holly Saurer
Martha Heller
Raelynn Remy
Alexander Sanjenis
Joel Miller
Evan Swarztrauber
Kate Black
Michael Scurato

Spotlight on profitable growth, Vol. VI

Media & Entertainment

2013



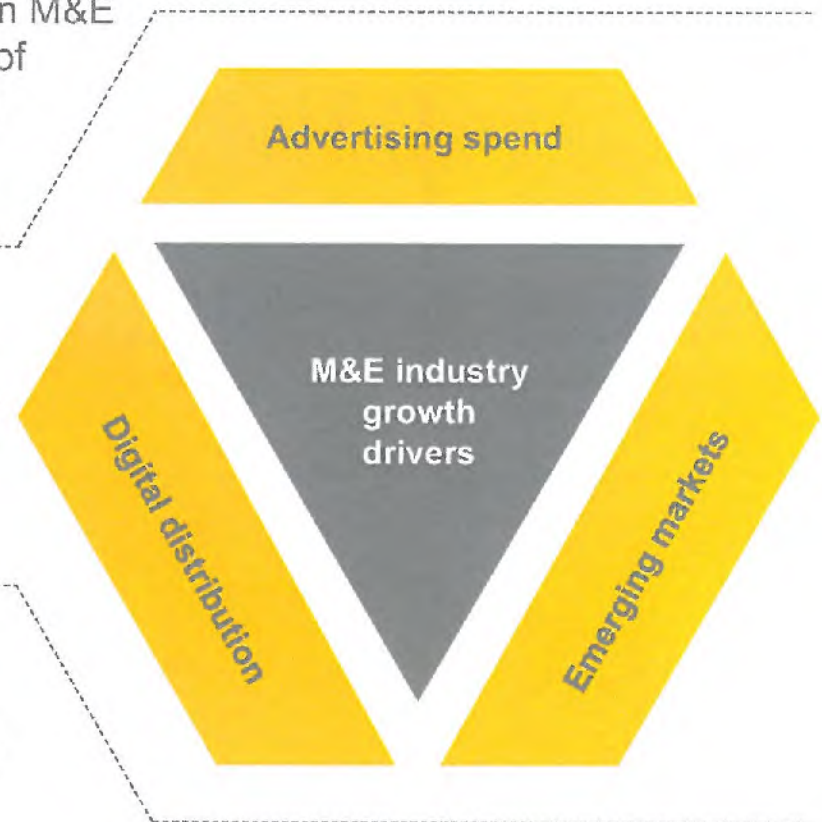
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M&E industry highlights

- ▶ During the period 2009–2013e, the **media and entertainment (M&E) industry outperformed several cross-industry stock market indices in terms of profitability**. The ten M&E sectors measured by EY had an average profit margin of 26%, outperforming indices such as the FTSE 100, the S&P 500 and the Nikkei.

- ▶ M&E industry **earnings before interest, taxes, depreciation and amortization (EBITDA) increased every year** during the period 2009–2013e, unlike other market indices' EBITDA margins.

- ▶ M&E industry's EBITDA margins are expected to grow in 2013, as companies **benefit from increasing digital consumption and maintain cost discipline in their traditional businesses**.



Sector highlights

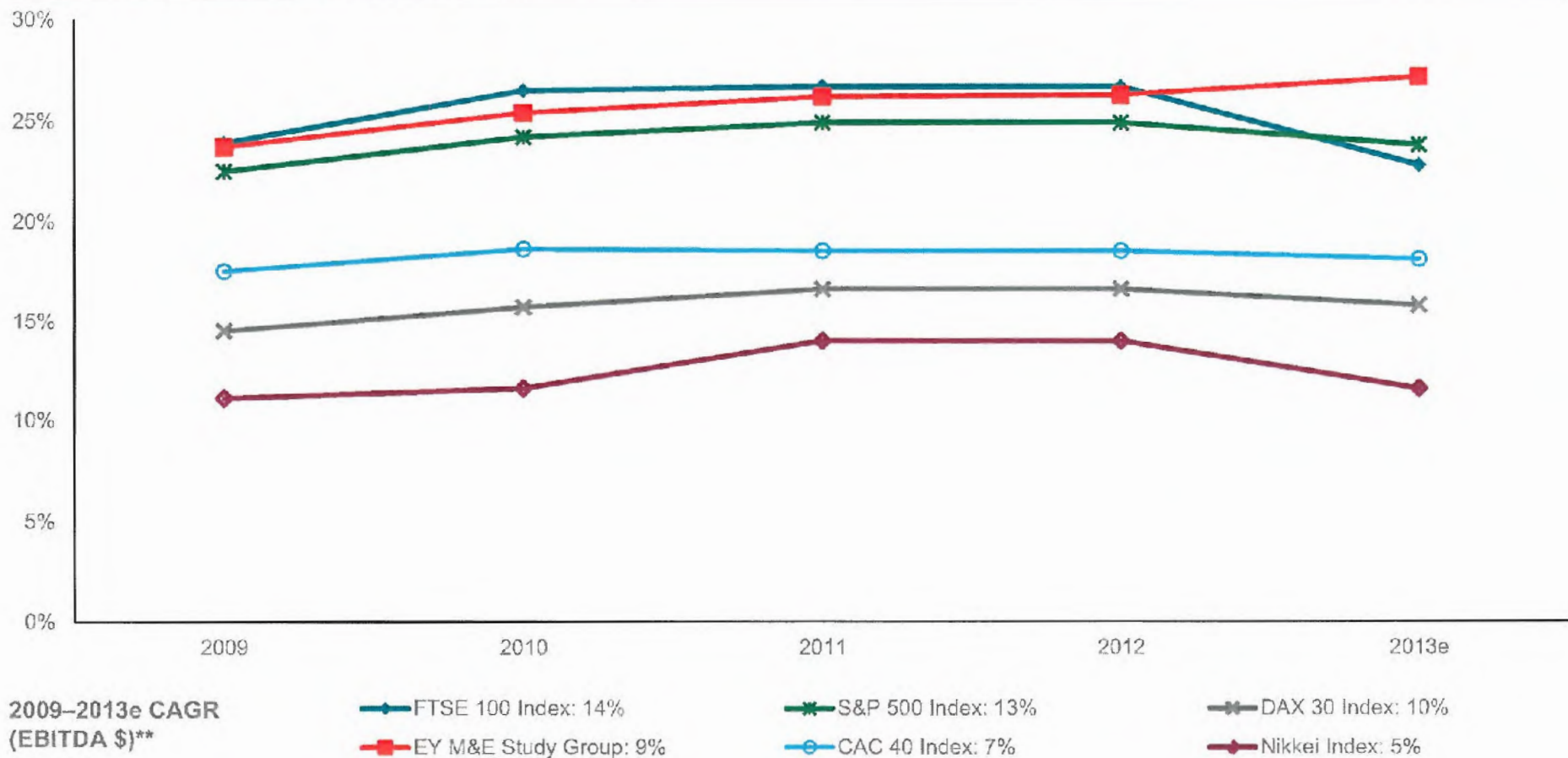
Cable continues its lead in EBITDA margins	<ul style="list-style-type: none"> ▶ Cable operator margins are expected to be around 41% in 2013 — the highest among all the M&E sectors — as a result of continued growth in high-margin data customers. Cable operators incur significant capital expenditures, and, consequently, high depreciation and amortization (D&A). Cable operators continue their lead in profitability, partly because EBITDA excludes D&A charges. ▶ Due to a dual revenue stream of advertising and subscription fees, cable networks is expected to be the sector with the second highest EBITDA margins of 38% by the end of 2013.
Interactive media benefits from rising online ad spend	<ul style="list-style-type: none"> ▶ Interactive media companies are seeing strong growth from increase in online advertising spend, combined with rising revenues from non-advertising sources (subscriptions, premium content and microtransactions). ▶ From 2009 to 2013e, the EBITDA dollars for the sector are expected to grow by a combined annual growth rate (CAGR) of 22%, the highest among all the M&E sectors.
Electronic games continues to benefit from rising users on digital platforms	<ul style="list-style-type: none"> ▶ Social and casual games on digital platforms are driving EBITDA dollar growth of the electronic games sector. ▶ From 2009 to 2013e, electronic game companies' EBITDA dollars are expected to grow at a CAGR of 14%, second only to the interactive media sector.
Conglomerates gain from improving ad spends and greater content consumption	<ul style="list-style-type: none"> ▶ A combination of higher advertising spend, particularly in emerging markets, greater consumption of paid content, spurred by growth in mobile devices, and continuing cost controls is driving the EBITDA dollar performance of conglomerates. Businesses such as cable networks and TV broadcast are driving EBITDA dollar growth. Others, such as publishing and music, are facing structural challenges. ▶ During the period 2009-2013e, conglomerates are expected to grow their EBITDA dollars at a CAGR of 9%.
Satellite TV EBITDA dollar growth steady despite rising programming costs	<ul style="list-style-type: none"> ▶ Continuing cost controls and improving revenues are expected to boost EBITDA dollar growth and lead to relatively steady EBITDA margins in the satellite TV sector, despite rising programming costs. ▶ The sector's EBITDA dollars are expected to grow at a CAGR of 8% during the period 2009 to 2013e.

Sector highlights (continued)

TV broadcasters continue to attract advertisers	<ul style="list-style-type: none">▶ Advertisers still value the ability of TV broadcasters to reach a large audience, despite the continued rise of competing platforms.▶ EBITDA dollars for the TV broadcasting sector are expected to grow by a CAGR of 9% during 2009–2013e.
Film and TV production studios benefit from digital	<ul style="list-style-type: none">▶ Increasing revenues from paid digital platforms such as Amazon, Hulu, Netflix and YouTube channels are driving studios' EBITDA dollar performance. At the same time, studios are cutting down production costs by releasing fewer films.▶ The sector's EBITDA dollars are expected to grow by a CAGR of 11% during the period 2009–2013e.
Content and information services face challenges in traditional media	<ul style="list-style-type: none">▶ Newspapers and magazine companies continue to face headwinds from declining advertisement and subscription revenues. On the other hand, business information services companies are reporting stable revenues and margins.▶ EBITDA dollars for the sector are expected to grow by a CAGR of 2% during the period 2009–2013e.
Music sector witnesses early signs of turnaround	<ul style="list-style-type: none">▶ Growth of licensed digital music services and paid digital downloads are driving the music sector revenue and EBITDA dollar growth. In 2012, global music revenues increased for the first time since 1999.▶ The sector's EBITDA dollars are expected to grow by a CAGR of 1% from 2009 to 2013e.

In 2013, M&E companies are expected to outperform several leading stock market indices in terms of profitability

EBITDA margin percentage*, 2009–2013e

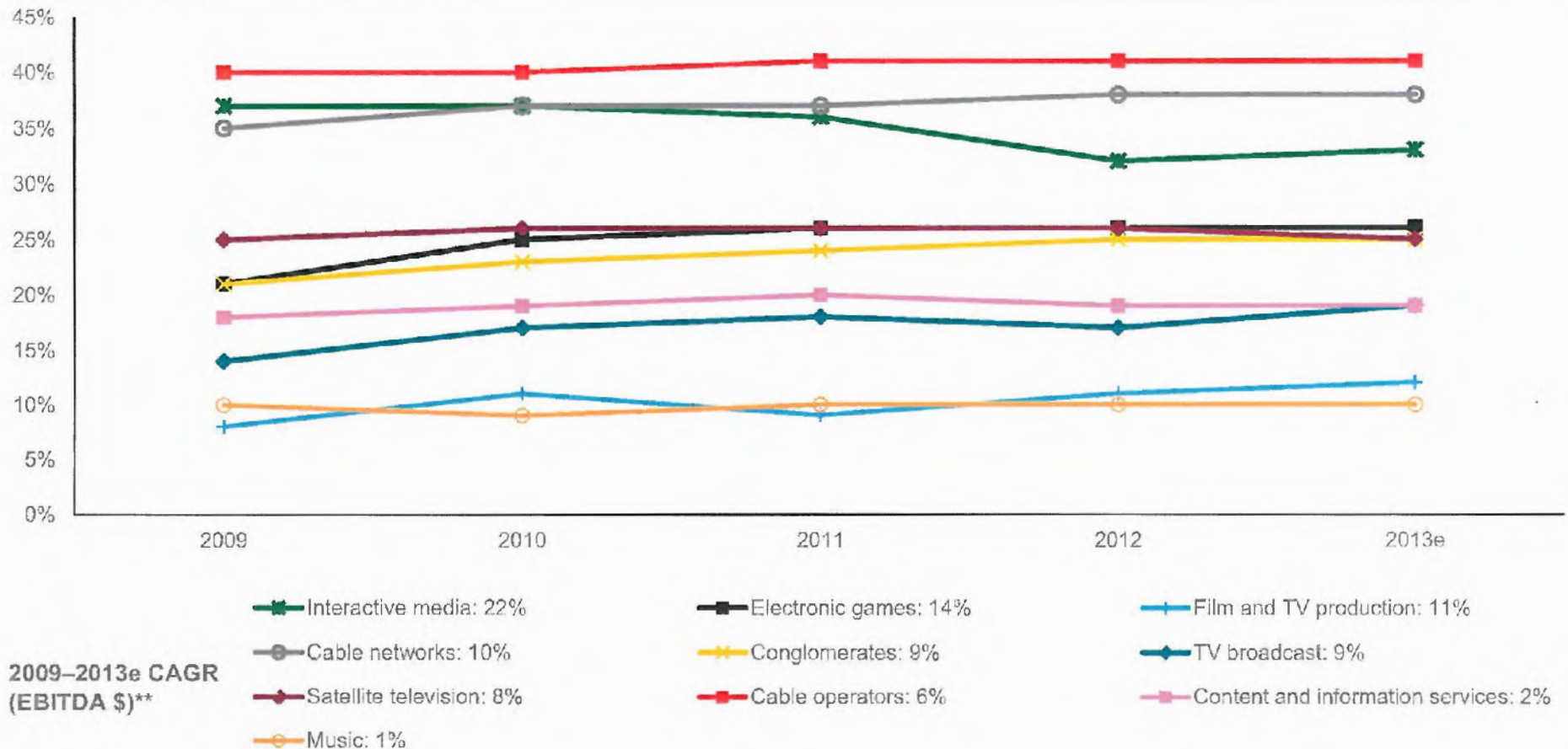


* EBITDA margin percentage is EBITDA dollars divided by revenue dollars.

** 2009–2013e CAGR (EBITDA \$) is the compound annual growth rate of EBITDA dollars.

In 2013, interactive media and cable operators are expected to lead in profitability growth and margins, respectively

EBITDA margin percentage*, 2009–2013e



* EBITDA margin percentage is EBITDA dollars divided by revenue dollars.

** 2009–2013e CAGR (EBITDA \$) is the compound annual growth rate of EBITDA dollars.



Methodology

Study methodology — the study analyzes profitability of global M&E companies

This study examines actual EBITDA within the M&E industry for 2009 to 2012 and estimated EBITDA for 2013. Specifically, this analysis measures and compares EBITDA dollar growth (measured as a CAGR) as well as EBITDA margins.

Key aspects of the analysis

Geographic and sector coverage

- ▶ The study group comprises **97 companies** (see [appendix](#)) globally, covering those headquartered in:
 - ▶ The Americas (44 companies),
 - ▶ Europe (34 companies)
 - ▶ Asia-Pacific/ Africa (19 companies).
- ▶ The analysis looks at **conglomerates and nine sectors of M&E**:
 - ▶ Cable networks
 - ▶ Cable operators
 - ▶ Content and information services
 - ▶ Electronic games
 - ▶ Film and TV production
 - ▶ Interactive media
 - ▶ Music
 - ▶ Satellite operators
 - ▶ TV broadcast

Company selection criteria

- ▶ The study group has been developed based on the following criteria:
 - ▶ Company is publicly traded.
 - ▶ Company's operations are reviewed by an industry analyst, and its results are published in an analyst's report.
 - ▶ For fiscal year 2012, the company had a minimum of US\$1 billion in annual revenues or, in the case of media conglomerates, a minimum of US\$5 billion in annual revenues.

Other important considerations

- ▶ **Data sources:** Ernst & Young's EBITDA perspective is based on secondary research, using publicly available data and analyst reports, as well as Ernst & Young's own analysis.
- ▶ **Inclusion of conglomerates in sector analysis:** In the case of conglomerates, their individual lines of business have been included in the sector analyses. As a result, some conglomerates are represented in more than one sector.



Appendix

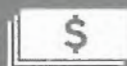
Study definitions and concepts

EBITDA



- ▶ EBITDA refers to the earnings of a company before interest, tax, depreciation and amortization.
- ▶ It is understood that EBITDA is a non-GAAP financial measurement and that companies report EBITDA differently. Nonetheless, it is a widely available metric for comparison purposes. Accordingly, it is used in this analysis as reported by the companies, as well as by research institutions and investment analysts.
- ▶ In most instances, we have used EBITDA amounts. In some rare cases, where companies did not report EBITDA and EBITDA could not be derived, we have used operating income as a proxy for EBITDA.

Currencies



- ▶ All EBITDA dollar CAGRs are calculated in US dollars. Where necessary, revenue and EBITDA provided in other currencies have been converted into US dollars. The conversion ratio was based on the average rate between each currency and US dollars for 2009 to 2012 and a 63-day average for 2013.

GAAP



- ▶ In most cases, financial data was prepared in accordance with US GAAP. Otherwise, the financial data was prepared in accordance with International Financial Reporting Standards or local GAAP and has not been converted to US GAAP.

Conglomerates



- ▶ Conglomerates are considered to be global companies with business activities reported in two or more sectors and leaders who drive innovation across the industry.

Study group companies

Conglomerates

- ▶ CBS Corporation (total company)
- ▶ Comcast Corporation (total company, including NBC-Universal from 2010 to 2013e)
- ▶ Fuji Media Holdings (total company)
- ▶ General Electric Company (NBC-Universal segment for 2009)
- ▶ News Corporation (total company)
- ▶ Sony Corporation (Pictures and Music segments only)
- ▶ Time Warner Inc. (total company)
- ▶ Viacom Inc. (total company)
- ▶ Vivendi S.A. (Canal+, Universal Music Group and Activision Blizzard segments only)
- ▶ The Walt Disney Company (total company)

Cable networks

- ▶ AMC Networks Inc. (total company)
- ▶ CBS Corporation (Cable Networks segment only)
- ▶ Comcast Corporation (Cable Networks segment only)
- ▶ Discovery Communications, Inc. (total company)
- ▶ Liberty Starz (total company, 2009–2010; Networks segment, 2011–2013E)
- ▶ News Corporation (Cable Network Programming segment only)
- ▶ Time Warner Inc. (Cable Networks segment only)
- ▶ Viacom Inc. (Cable Networks segment only)
- ▶ Vivendi S.A. (Canal+ segment only)
- ▶ The Walt Disney Company (Media Networks — cable segment only)
- ▶ Scripps Networks Interactive (Lifestyle media segment only)

Cable operators

- ▶ Cablevision Systems Corporation (Telecommunications segment only)
- ▶ Charter Communications, Inc. (total company)
- ▶ Cogeco Cable Inc. (total company)
- ▶ Comcast Corporation (Cable Communications segment only)
- ▶ Kabel Deutschland (total company)
- ▶ Liberty Global, Inc. (total company)
- ▶ Rogers Communications Inc. (Cable/Telecom/Retail segment only)
- ▶ Shaw Communications Inc. (Cable segment only)
- ▶ Telenet Group Holding NV (total company)
- ▶ Time Warner Cable Inc. (total company)
- ▶ Virgin Media Inc. (total company)
- ▶ Quebecor Inc. (Telecommunications segment only)
- ▶ Ziggo NV (total company)

Electronic games

- ▶ Activision Blizzard, Inc. (total company)
- ▶ DeNA Co., Ltd. (total company)
- ▶ Electronic Arts Inc. (total company)
- ▶ Namco Bandai Holdings Inc. (Contents segment only)
- ▶ NetEase.com Inc. (total company)
- ▶ Nexon Co. Ltd. (total company)
- ▶ Square Enix Holdings Co., Ltd. (total company)
- ▶ Take-Two Interactive Software, Inc. (total company)
- ▶ Ubisoft Entertainment (total company)
- ▶ Zynga Inc. (total company)

Study group companies (continued)

Film and television production

- ▶ Comcast Corporation (NBCU-Film segment only)
- ▶ Lions Gate Entertainment Corp. (total company)
- ▶ News Corporation (Filmed entertainment segment only)
- ▶ Sony Corporation (Pictures segment only)
- ▶ Time Warner Inc. (Film segment only)
- ▶ Viacom Inc. (Entertainment segment only)
- ▶ The Walt Disney Company (Studio entertainment segment only)
- ▶ Village Roadshow (total company)

Interactive media

- ▶ AOL Inc. (total company)
- ▶ Baidu, Inc. (total company)
- ▶ Facebook, Inc (total company)
- ▶ Google Inc. (total company)
- ▶ IAC/InterActiveCorp (total company)
- ▶ LinkedIn Corporation (total company)
- ▶ Microsoft Corporation (online services segment only)
- ▶ Netflix, Inc. (total company)
- ▶ NHN Corporation (total company)
- ▶ Sohu.com Inc. (total company)
- ▶ Tencent Holdings Limited (total company)
- ▶ Yahoo! Inc. (total company)
- ▶ Yahoo Japan Corporation (total company)

Content and information services

- ▶ Arnoldo Mondadori Editore SpA (total company)
- ▶ Axel Springer AG (total company)
- ▶ CBS Corporation (Publishing segment only)
- ▶ Daily Mail and General Trust plc (total company)
- ▶ Fairfax Media Ltd (total company)
- ▶ Gannett Co., Inc. (total Newspapers segment only)
- ▶ GfK AG (total company)
- ▶ Gruppo Editoriale L'Espresso S.P.A. (total company)
- ▶ Informa Plc (total company)
- ▶ Ipsos SA (total company)
- ▶ Lagardère SCA (total company)
- ▶ Mecom Group PLC (total company)
- ▶ Meredith Corporation (National Media segment only)
- ▶ News Corporation (total Publishing segment only)
- ▶ Nielsen BV (total company)
- ▶ Pearson PLC (total company)
- ▶ RCS MediaGroup S.p.A. (total company)
- ▶ Reed Elsevier PLC (total company)
- ▶ Sanoma (total company)
- ▶ Schibsted ASA (total company)
- ▶ The Dun & Bradstreet Corp. (total company)
- ▶ The McGraw-Hill Companies, Inc. (total company)
- ▶ The New York Times Company (total company)

Study group companies (continued)

Content and information services (continued)

- ▶ Thomson Reuters Corporation (total company)
- ▶ Time Warner Inc. (Publishing segment only)
- ▶ Torstar Corporation (total company)
- ▶ Trinity Mirror plc (total company)
- ▶ Wolters Kluwer NV (total company)

Music

- ▶ Live Nation Entertainment, Inc. (total company)
- ▶ Sony Corporation (Music segment only)
- ▶ Vivendi S.A. (Universal Music Group segment only)

Satellite operators

- ▶ British Sky Broadcasting Group plc (total company)
- ▶ The DIRECTV Group, Inc. (DIRECTV US and DIRECTV LA segments only)
- ▶ DISH Network Corporation (total company)
- ▶ Eutelsat Communications S.A. (total company)
- ▶ Naspers Limited (pay TV segment only)
- ▶ News Corporation (Sky Italia segment)
- ▶ SES S.A. (total company)
- ▶ Sky Deutschland AG (total company)
- ▶ SKY Perfect JSAT Holdings Inc. (total company)

Television broadcast

- ▶ Lions Antena 3 de Televisión, S.A. (total company)
- ▶ CBS Corporation (Entertainment and Local Broadcasting segments only)
- ▶ Comcast Corp (NBCU-Broadcast segment only)
- ▶ Grupo Televisa, S.A.B. (total company)
- ▶ ITV plc (total company)
- ▶ Mediaset S.p.A (total company)
- ▶ Métropole Télévision (total company)
- ▶ Modern Times Group MTG AB (total company)
- ▶ News Corporation (television segment only)
- ▶ Nippon Television Network Corporation (total company)
- ▶ ProSiebenSat.1 Media AG (total company)
- ▶ RTL Group S.A. (total company)
- ▶ Télévision Française 1 S.A. — TF1 (total company)
- ▶ Tokyo Broadcasting System Holdings, Inc. (total company)
- ▶ TV Asahi Corporation (total company)
- ▶ The Walt Disney Company (Media Networks — Broadcasting segment only)

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Spotlight on profitable growth

Volume VII

Media & Entertainment

September 2014



Building a better
working world

In 2014, the Media & Entertainment industry is likely to generate the highest EBITDA* margins among leading market indices, driven by the proliferation of digital platforms

- ▶ In 2014, the media and entertainment (M&E) industry is expected to outperform several leading, cross-industry stock market indices in terms of profitability. The 10 M&E sectors tracked by EY are expected to have an average profit margin of 28%, outperforming leading market indices such as the FTSE 100, the S&P 500, the CAC 40 and the Nikkei.
- ▶ M&E industry earnings before interest, taxes, depreciation and amortization (EBITDA) increased every year during the period 2010–2014e, outperforming other market indices' EBITDA margins.
- ▶ The M&E industry's EBITDA margins are expected to grow in 2014, as companies gain scale in content production and distribution, divest underperforming businesses and continue to benefit from the proliferation of digital platforms.



* EBITDA = earnings before interest taxes, depreciation and amortization

Sector highlights

Cable operators maintain their lead in EBITDA margins

- ▶ Cable operator margins are expected to remain at around 41% in 2014 — the highest among all M&E sectors — as a result of continued growth in high-margin data and business-to-business (B2B) services. Cable operators incur significant capital expenditures and, consequently, high depreciation and amortization (D&A). Cable operators maintain their lead in this measure partly because EBITDA excludes D&A charges.
- ▶ During the period from 2010–14e, cable operators are expected to grow their EBITDA dollars at a compound annual growth rate (CAGR) of 6%.

Cable networks continue to see recurring growth in affiliate fees

- ▶ A combination of contractual growth in affiliate fees, international syndication and digital licensing continues to spur EBITDA margin growth for cable networks. The sector is expected to report EBITDA margins of 37% by the end of 2014 — the second highest of all sectors.
- ▶ From 2010–14e, the EBITDA dollars for the sector are expected to grow by a CAGR of 8%.

Interactive media benefits from improvements in ad-targeting technologies

- ▶ Continued innovation in search advertising (e.g., ad targeting based on time, location or device and image-based search results for products) and growth in online video and programmatic advertising, combined with the growth in premium video subscriptions, are driving the EBITDA dollars of interactive media companies.
- ▶ From 2010–14e, the EBITDA dollars for the sector are expected to grow by a CAGR of 19%, the highest among all M&E sectors.

Electronic gaming companies see growth from the rising number of users on digital platforms

- ▶ A combination of the surging popularity of social and casual games on digital devices and the growth of high-margin digital revenue streams (downloadable content, expansion packs and virtual goods) is driving EBITDA dollar growth of the electronic games sector.
- ▶ From 2010–14e, electronic game companies' EBITDA dollars are expected to grow at a CAGR of 13%, second only to the interactive media sector.

Conglomerates see growth from premium content and the divestment of underperforming assets

- ▶ Conglomerates have the ability to spend on premium content, which attracts large audiences across platforms and acts as a barrier to entry for smaller players. This, combined with a growing advertising spend and increased consumption of paid digital content, is driving the EBITDA dollar performance of conglomerates. Conglomerates have divested or spun off underperforming businesses, such as publishing, to focus on more profitable assets, such as cable networks.
- ▶ During the period 2010–14e, conglomerates are expected to grow their EBITDA dollars at a CAGR of 8%.

Sector highlights (continued)

Satellite TV companies face declining profitability due to rising programming costs

- ▶ As subscriber growth slows, satellite TV companies are maintaining cost controls to boost their EBITDA dollars. However, rising programming costs are likely to affect the sector's profitability — EBITDA margins are expected to decline by almost a percentage point between 2013 and 2014e.
- ▶ The sector's EBITDA dollars are expected to grow at a CAGR of 5% during the period from 2010–14e.

Publishing and information services continue to see declines from traditional print

- ▶ Newspaper and magazine companies continue to face the head winds of declining advertising and subscription revenues. Their digital revenues, although growing, still contribute only a small portion of total revenues.
- ▶ On the other hand, business information services companies are reporting stable revenues and margins; they are retiring legacy platforms and investing in technology-driven data and visualization tools to boost EBITDA dollar performance.
- ▶ EBITDA dollars for the sector are expected to grow by a CAGR of 1% during the period from 2010–14e.

TV broadcasters consolidate to generate scale benefits

- ▶ The ability of broadcasters to reach a large (although steadily shrinking) audience continues to be valued by advertisers. Furthermore, consolidation among US broadcasters is expected to help them sustain increases in retransmission fees — a high-margin, recurring revenue stream.
- ▶ EBITDA dollars for the TV broadcasting sector are expected to grow by a CAGR of 7% during 2010–14e.

Film studios invest in TV production to improve margins

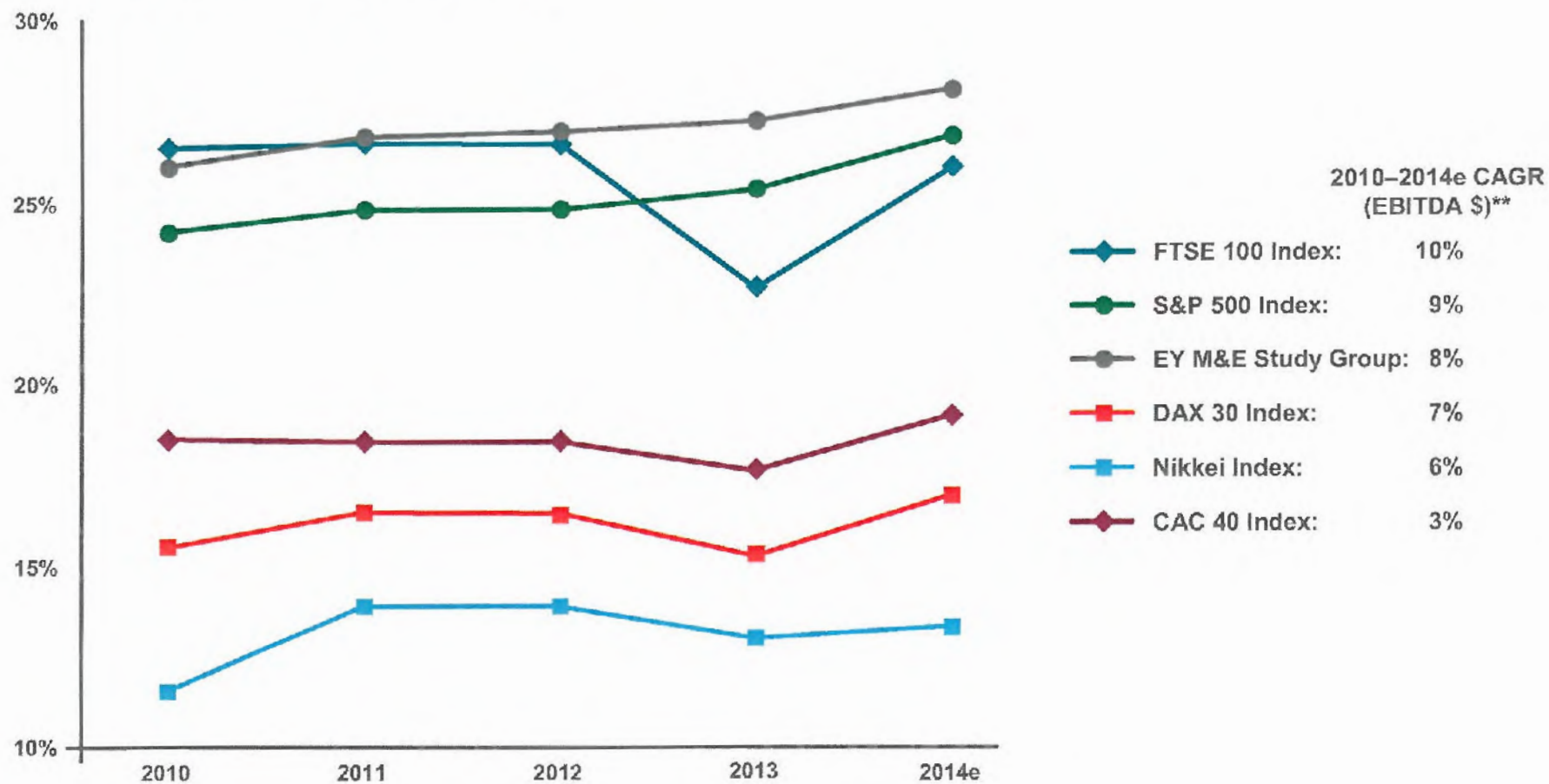
- ▶ Increasing revenues from an array of paid digital platforms is driving studios' EBITDA dollar performance. At the same time, film studios are cutting costs by consolidating their back-end operations, such as information technology (IT) and finance.
- ▶ Going forward, film studios will benefit from increased investments in franchise-based films and higher-margin TV shows. The sector's EBITDA dollars are expected to grow by a CAGR of 4% during the period from 2010–14e.

Music companies see highest EBITDA CAGR in more than six years, driven by growth in licensed digital services

- ▶ The expansion of licensed digital subscription and streaming services, as well as the continued growth in music publishing, is driving positive music sector revenue and EBITDA dollar performance. The sector's EBITDA dollars are expected to grow by a CAGR of 8% — the highest in more than six years — from 2010–14e.
- ▶ Further EBITDA dollar growth will come from rising smartphone and tablet penetration in emerging markets. However, the growth will depend on the availability of bandwidth, a robust payment infrastructure and strong piracy laws.

In 2014, M&E companies are expected to outperform leading stock market indices in terms of profitability

EBITDA margin percentage,* 2010–2014e

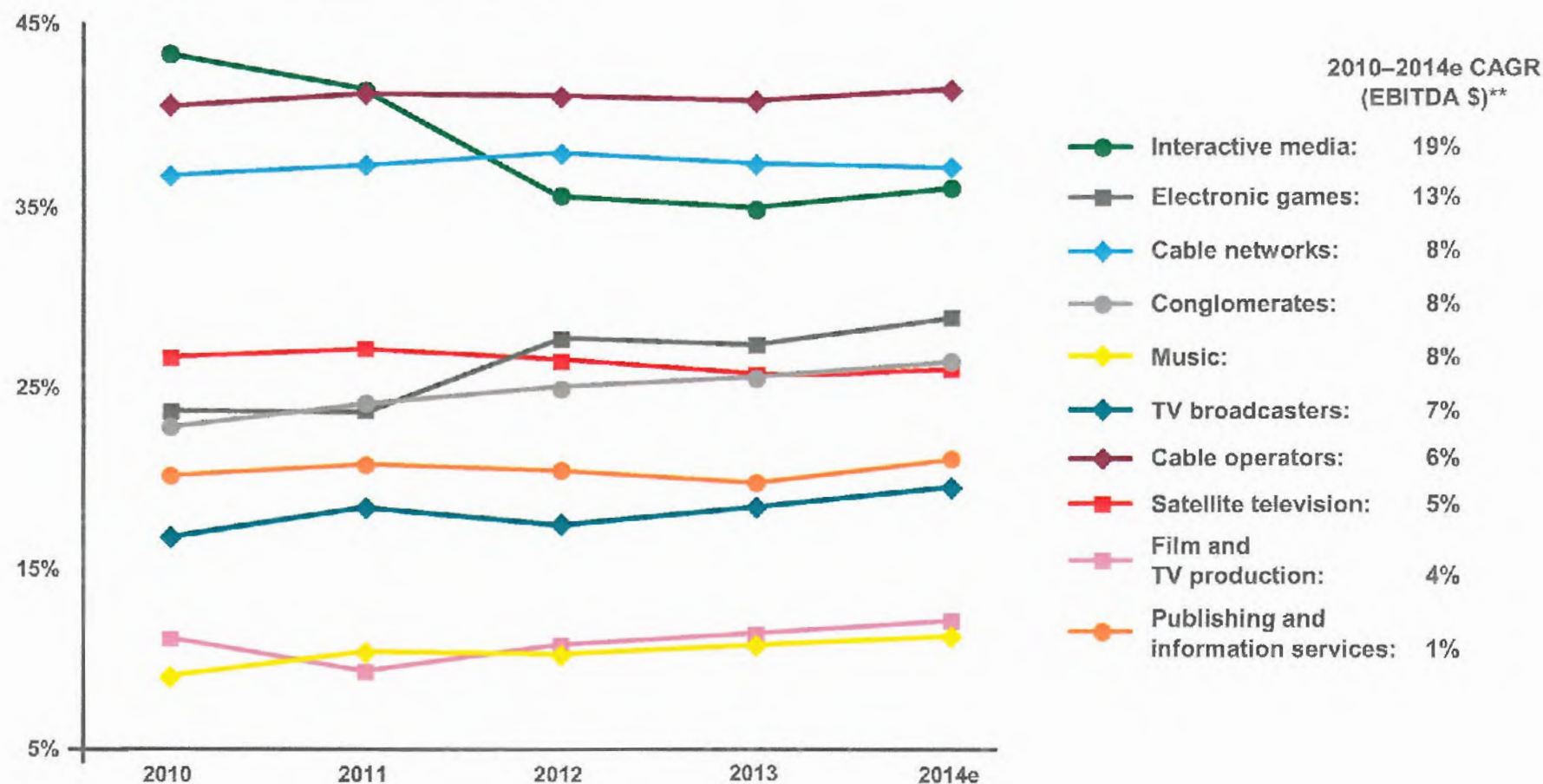


* EBITDA margin percentage is EBITDA dollars divided by revenue dollars.

** 2010–14e CAGR (EBITDA \$) is the compound annual growth rate of EBITDA dollars.

In 2014, interactive media companies are expected to lead in EBITDA dollar growth and cable operators are expected to have the highest margin

EBITDA margin percentage,* 2010–2014e



* EBITDA margin percentage is EBITDA dollars divided by revenue dollars.

** 2010–14e CAGR (EBITDA \$) is the compound annual growth rate of EBITDA dollars.

A hand holding a smartphone at a concert with stage lights in the background.

Methodology

Study methodology — how we analyze the profitability of the global M&E industry

This study examines the actual EBITDA of the M&E industry for 2010 to 2013 and estimated EBITDA for 2014. Specifically, this analysis measures and compares EBITDA dollar growth (measured as a CAGR) as well as EBITDA margins.

Key aspects of the analysis

Geographic and sector coverage

- ▶ The study group comprises **106 companies** (see Appendix) globally, covering those headquartered in:
 - ▶ The Americas (47 companies)
 - ▶ Europe (35 companies)
 - ▶ Asia-Pacific (23 companies)
 - ▶ Africa (1 company)
- ▶ The analysis looks at **conglomerates and nine sectors of M&E**:
 - ▶ Cable networks
 - ▶ Cable operators
 - ▶ Electronic games
 - ▶ Film and TV production
 - ▶ Interactive media
 - ▶ Music
 - ▶ Publishing and information services
 - ▶ Satellite operators
 - ▶ TV broadcasters

Company selection criteria

- ▶ The study group has been developed based on the following criteria:
 - ▶ The company is publicly traded.
 - ▶ The company's operations are reviewed by an industry analyst, and its results are published in an analyst's report.
 - ▶ For fiscal year 2013, the company had a minimum of US\$1 billion in annual revenues or, in the case of media conglomerates, a minimum of US\$5 billion in annual revenues.

Other important considerations

- ▶ **Data sources:** EY's EBITDA perspective is based on secondary research, using publicly available data and analyst reports, as well as EY's own analysis.
- ▶ **Inclusion of conglomerates in sector analysis:** In the case of conglomerates, their individual businesses have been included in the sector analyses. As a result, businesses of some conglomerates are represented in more than one sector.

Appendix



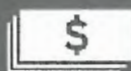
Study definitions and concepts

EBITDA



- ▶ EBITDA refers to the earnings of a company before interest, tax, and depreciation and amortization.
- ▶ It is understood that EBITDA is a non-generally accepted accounting principles (GAAP) financial measurement and that companies report EBITDA differently. Nonetheless, it is a widely available metric for comparison purposes. Accordingly, it is used in this analysis as reported by companies, as well as by research institutions and investment analysts.
- ▶ In some rare cases, where companies in our study group did not report EBITDA and EBITDA could not be derived, we have used operating income as a proxy for EBITDA.

Currencies



- ▶ All EBITDA dollar CAGRs are calculated in US dollars. Where necessary, revenue and EBITDA provided in other currencies have been converted into US dollars. The conversion ratio was based on the average rate between each currency and the US dollar for 2010 to 2013 and a 64-day average for 2014.

GAAP



- ▶ In most cases, financial data was prepared in accordance with US GAAP. In instances where financial data was prepared in accordance with International Financial Reporting Standards or local GAAP, this has not been converted to US GAAP.

Conglomerates



- ▶ Conglomerates are considered to be global companies with business activities reported in two or more sectors and leaders who drive innovation across the industry.

Study group companies

Conglomerates

- ▶ CBS Corporation (total company)
- ▶ Comcast Corporation (total company)
- ▶ Fuji Media Holdings (total company)
- ▶ Twenty-First Century Fox Inc. (total company)
- ▶ Sony Corporation (Pictures and Music segments only)
- ▶ Time Warner Inc. (total company)
- ▶ Viacom Inc. (total company)
- ▶ Vivendi S.A. (Canal+ and Universal Music Group segments only)
- ▶ The Walt Disney Company (total company)

Electronic games

- ▶ Activision Blizzard, Inc. (total company)
- ▶ DeNA Co., Ltd. (total company)
- ▶ Electronic Arts Inc. (total company)
- ▶ Gree, Inc. (total company)
- ▶ King Digital Entertainment (total company)
- ▶ Konami Corp. (Digital Gaming segment)
- ▶ Namco Bandai Holdings Inc. (Contents segment only)
- ▶ NetEase.com Inc. (total company)
- ▶ Nexon Co. Ltd. (total company)
- ▶ Sega Sammy Holdings Inc. (Consumer segment)
- ▶ Square Enix Holdings Co., Ltd. (total company)
- ▶ Take-Two Interactive Software, Inc. (total company)
- ▶ Ubisoft Entertainment (total company)

Cable operators

- ▶ Cablevision Systems Corporation (Telecommunications segment only)
- ▶ Charter Communications, Inc. (total company)
- ▶ Cogeco Cable Inc. (total company)
- ▶ Comcast Corporation (Cable Communications segment only)
- ▶ Kabel Deutschland (total company)
- ▶ Liberty Global, Inc. (total company)
- ▶ Numericable Group SA (total company)
- ▶ Rogers Communications Inc. (Cable/Telecom/Retail segment only)
- ▶ Shaw Communications Inc. (Cable segment only)
- ▶ Telenet Group Holding NV (total company)
- ▶ Time Warner Cable Inc. (total company)
- ▶ Virgin Media Inc. (total company for 2010–13 only)
- ▶ Quebecor Inc. (Telecommunications segment only)
- ▶ Ziggo NV (total company)

Cable networks

- ▶ AMC Networks Inc. (total company)
- ▶ CBS Corporation (Cable Networks segment only)
- ▶ Comcast Corporation (Cable Networks segment only)
- ▶ Discovery Communications, Inc. (total company)
- ▶ Scripps Networks Interactive (Lifestyle media segment only)
- ▶ Starz (total company for 2010, Networks segment for 2011–14e)
- ▶ The Walt Disney Company (Media Networks cable segment only)
- ▶ Time Warner Inc. (Cable Networks segment only)
- ▶ Twenty-First Century Fox Inc. (Cable Network Programming segment only)
- ▶ Viacom Inc. (Cable Networks segment only)
- ▶ Vivendi S.A. (Canal+ segment only)

Study group companies (continued)

Film and television production

- ▶ Comcast Corporation (NBCU-Film segment only)
- ▶ Lions Gate Entertainment Corp. (total company)
- ▶ Sony Corporation (Pictures segment only)
- ▶ The Walt Disney Company (Studio Entertainment segment only)
- ▶ Time Warner Inc. (Warner Bros. segment only)
- ▶ Twenty-First Century Fox Inc. (Filmed Entertainment segment only)
- ▶ Viacom Inc. (Entertainment segment only)

Interactive media

- ▶ AOL Inc. (total company)
- ▶ Baidu, Inc. (total company)
- ▶ Facebook, Inc. (total company)
- ▶ Google Inc. (total company)
- ▶ IAC/InterActiveCorp (total company)
- ▶ LinkedIn Corporation (total company)
- ▶ Netflix, Inc. (total company)
- ▶ Naver Corporation (total company)
- ▶ Sohu.com Inc. (total company)
- ▶ Tencent Holdings Limited (total company)
- ▶ Yahoo! Inc. (total company)
- ▶ Yahoo Japan Corporation (total company)

Music

- ▶ Avex Group Holdings Inc. (total company)
- ▶ Live Nation Entertainment, Inc. (total company)
- ▶ Sony Corporation (Music segment only)
- ▶ Vivendi S.A. (Universal Music Group segment only)

Publishing and information services

- ▶ Arnoldo Mondadori Editore SpA (total company)
- ▶ Axel Springer AG (total company)
- ▶ CBS Corporation (Publishing segment only)
- ▶ Daily Mail and General Trust plc (total company)
- ▶ Fairfax Media Ltd. (total company)
- ▶ Gannett Co., Inc. (Total Newspapers segment only)
- ▶ GfK AG (total company)
- ▶ Gruppo Editoriale L'Espresso Spa (total company)
- ▶ Informa Plc (total company)
- ▶ Intuit Inc. (total company)
- ▶ Ipsos SA (total company)
- ▶ Lagardère SCA (total company)
- ▶ Mecom Group plc (total company)
- ▶ Meredith Corporation (National Media segment only)
- ▶ News Corporation (All segments, except Cable Network Programming)
- ▶ Nielsen BV (total company)
- ▶ Pearson plc (total company)
- ▶ RCS MediaGroup S.p.A. (total company)
- ▶ Reed Elsevier PLC (total company)
- ▶ Sanoma (total company)
- ▶ Schibsted ASA (total company)
- ▶ The Dun & Bradstreet Corp. (total company)
- ▶ The McGraw-Hill Companies, Inc. (total company)
- ▶ The New York Times Company (total company)
- ▶ Thomson Reuters Corporation (total company)
- ▶ Time Inc. (total company)
- ▶ Torstar Corporation (total company)
- ▶ Trinity Mirror plc (total company)
- ▶ Verisk Analytics (total company)
- ▶ Wolters Kluwer NV (total company)

Study group companies (continued)

Satellite operators

- ▶ British Sky Broadcasting Group plc (total company)
- ▶ DISH Network Corporation (total company)
- ▶ Eutelsat Communications S.A. (total company)
- ▶ Naspers Limited (pay TV segment only)
- ▶ The DIRECTV Group, Inc.
(DIRECTV US and DIRECTV LA segments only)
- ▶ Twenty-First Century Fox Inc. (Direct Broadcast Satellite Television segment only, includes Sky Deutschland AG, 2013 and 2014e)
- ▶ SES S.A. (total company)
- ▶ Sky Deutschland AG (total company, 2010-2012 only)
- ▶ SKY Perfect JSAT Holdings Inc. (total company)

Television broadcast

- ▶ Atresmedia Corporacion de Medios de Comunicacion (total company)
- ▶ CBS Corporation (Entertainment and Local Broadcasting segments only)
- ▶ Comcast Corp (NBCU-Broadcast segment only)
- ▶ Grupo Televisa, S.A.B. (total company)
- ▶ ITV plc (total company)
- ▶ Mediaset S.p.A (total company)
- ▶ Métropole Télévision (total company)
- ▶ Modern Times Group MTG AB (total company)
- ▶ Nine Entertainment Co. Holdings Ltd. (total company)
- ▶ Nippon Television Network Corporation (total company)
- ▶ ProSiebenSat.1 Media AG (total company)
- ▶ RTL Group S.A. (total company)
- ▶ Sinclair Broadcast (total company)
- ▶ Télévision Française 1 S.A. — TF1 (total company)
- ▶ The Walt Disney Company (Media Networks – Broadcasting segment only)
- ▶ Tokyo Broadcasting System Holdings, Inc. (total company)
- ▶ TV Asahi Corporation (total company)
- ▶ TV Tokyo Holdings (total company)
- ▶ Twenty-First Century Fox Inc. (Television segment only)

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How EY's Global Media & Entertainment Center can help your business

In an industry synonymous with creativity and innovation, the bar for business excellence is set high. You need to embrace new technology, develop new distribution models and satisfy the demands of a voracious and outspoken consumer. At the same time, it's important to manage costs, exceed stakeholder expectations and comply with new regulations. There's always another challenge just around the corner. EY's Global Media & Entertainment Center can help. We bring together a high-performance, worldwide team of media and entertainment professionals with deep technical experience in providing assurance, tax, transaction and advisory services to the industry's leaders. Our network of professionals collaborates and shares knowledge around the world, to provide exceptional client service and leverage our leading market share position to provide you with actionable information, quickly and reliably.

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Spotlight on profitable growth

Volume VIII

Media & Entertainment

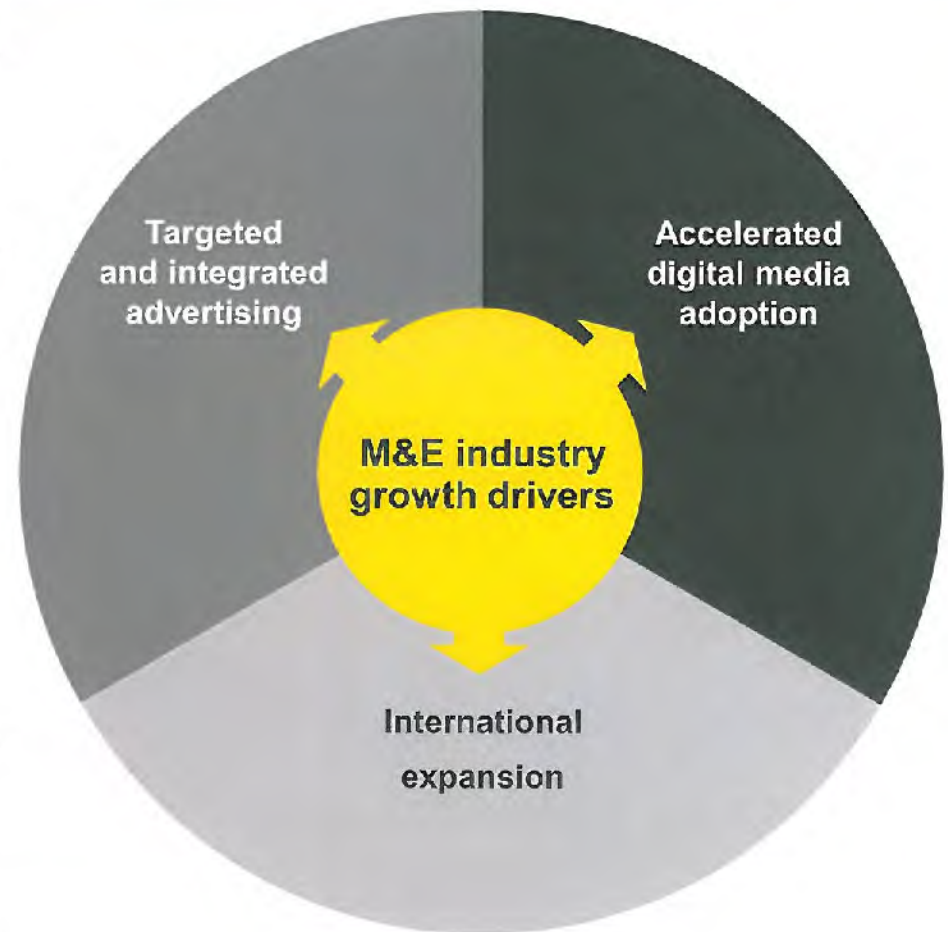
September 2015



Building a better
working world

In 2015, the Media & Entertainment industry is likely to generate one of the best EBITDA margins as compared to the leading market indices, driven by rising digital media adoption

- ▶ In 2015, the **media and entertainment (M&E) industry is expected to outperform several leading, cross-industry stock market indices in terms of profitability.** The 11 M&E sectors tracked by EY are expected to show average earnings before interest, taxes, depreciation and amortization (EBITDA) margin of 28%, outperforming companies on leading market indices such as the FTSE 100, the S&P 500, the Sensex, the CAC 40, the DAX 30, and the Nikkei; and second only to the Hang Seng index.
- ▶ The M&E industry's EBITDA margins are expected to grow in 2015, as companies **prepare to leverage increasing digital media adoption, deliver relevant consumer experiences and continue to expand into emerging markets.**
- ▶ During 2011-2015e, from an EBITDA dollars perspective, **interactive media is the fastest growing M&E sector** at 17%, driven by mobile monetization and expansion into emerging markets. At 14%, the film and TV production sector is the second-fastest growing sector, due to rising international and digital licensing revenues.



Sector highlights

Cable operators continue to lead EBITDA margins

- ▶ Cable operator margins continue to be the highest* among all M&E sectors, buoyed by high-margin data and business-to-business (B2B) services. Despite rising programming costs and increasing competition from over-the-top (OTT) services, margins remain stable as a result of higher ARPU from price increases.
- ▶ Ongoing consolidation to gain scale and diversification into new services, such as the internet of things, is expected to drive future growth. During the period 2011–2015e, cable operators are expected to grow their EBITDA dollars at a compound annual growth rate (CAGR) of 4%.

Cable networks to benefit from digital licensing and affiliate fee increases

- ▶ Digital licensing, contractual growth in affiliate fees and international expansion continue to drive EBITDA dollars for cable networks. At the same time, rising programming costs and declining viewership on linear TV platforms (mainly due to cord cutting or cord shaving), partially offset this growth. Additionally, advertising revenues have been under pressure, further impacting EBITDA.
- ▶ In 2015, cable networks' EBITDA margins are expected to be 36%, the second-highest of all sectors. From 2011–2015e, the EBITDA dollars for the sector are expected to grow by a CAGR of 6%.

Interactive media see growth from mobile monetization and emerging markets expansion

- ▶ Interactive media companies' EBITDA dollars are expected to grow at a CAGR of 17% — the highest among all M&E sectors — spurred by increasing mobile monetization, targeted product launches for emerging markets and continued growth in online video and programmatic advertising.
- ▶ On the other hand, proliferation of lower-priced mobile advertising and a rise in video content costs are likely to result in declining EBITDA margins for the sector. The sector's EBITDA margins are expected to decline from 36% in 2014 to 34% in 2015.

Information services continue transition their service on digital platforms

- ▶ Information services companies are reporting stable revenues and margins as they increase focus on digital subscriptions; they are transitioning from information reference tools to data analytics and visualization-based decision tools to boost EBITDA dollar performance.
- ▶ EBITDA dollars for the sector are expected to grow at 4% CAGR during the period 2011–15e.

*Note: Cable operators incur significant capital expenditures and, consequently, high depreciation and amortization (D&A). Cable operators maintain their lead in profitability partly because EBITDA excludes D&A charges.

Sector highlights

Electronic gaming companies see increase in mobile gamers and use of multiple monetization models

- ▶ A combination of an expanding base of mobile gamers, multiple monetization models (such as subscriptions, micro-transactions, accessory sales and downloadable content), continued engagement of console gamers and focus on core franchises will drive EBITDA dollar growth for the electronic gaming sector.
- ▶ From 2011–2015e, electronic game companies' EBITDA dollars are expected to grow at a CAGR of 7%.

Conglomerates continue to benefit from premium content and growing scale

- ▶ Conglomerates are benefitting from growing value of premium content, increasing scale through international and digital expansion, as well as focus on profitable assets such as cable networks. However, pressure on advertising revenues is impacting EBITDA for those conglomerates that have segments relying on this revenue source.
- ▶ During the period 2011–2015e, conglomerates are expected to grow their EBITDA dollars at a CAGR of 6%.

Satellite TV companies focus on consolidation to drive profitability

- ▶ Amid rising content costs, muted subscriber growth and increasing competition from OTT services, satellite TV companies are consolidating to derive cost synergies and maintain profitability.
- ▶ The sector's EBITDA dollars are expected to grow at a CAGR of 4% during the period from 2011–2015e.

TV broadcasters to benefit from retransmission revenues, digital and international opportunities

- ▶ TV broadcasters' EBITDA has been positively impacted by the industry consolidation in the US and EBITDA dollars are expected to benefit from increases in retransmission fees, as well as growth in digital distribution and international syndication. Similar to other sectors, revenue growth may slow as a result of flatter advertising sales.
- ▶ EBITDA dollars for the TV broadcasting sector are expected to grow by a CAGR of 5% during 2011–2015e.

Sector highlights (continued)

Film studios to see growth from international markets

- ▶ A combination of rising international theatrical revenues, a growing high-margin TV production business and increasing digital and international licensing revenues are driving EBITDA dollar performance for film studios.
- ▶ The sector's EBITDA dollars are expected to grow by a CAGR of 14% during 2011–2015e — the second-highest among all M&E sub-sectors after interactive media.

Consumer publishers' efforts to transition into a multi-platform world are yet to yield significant returns

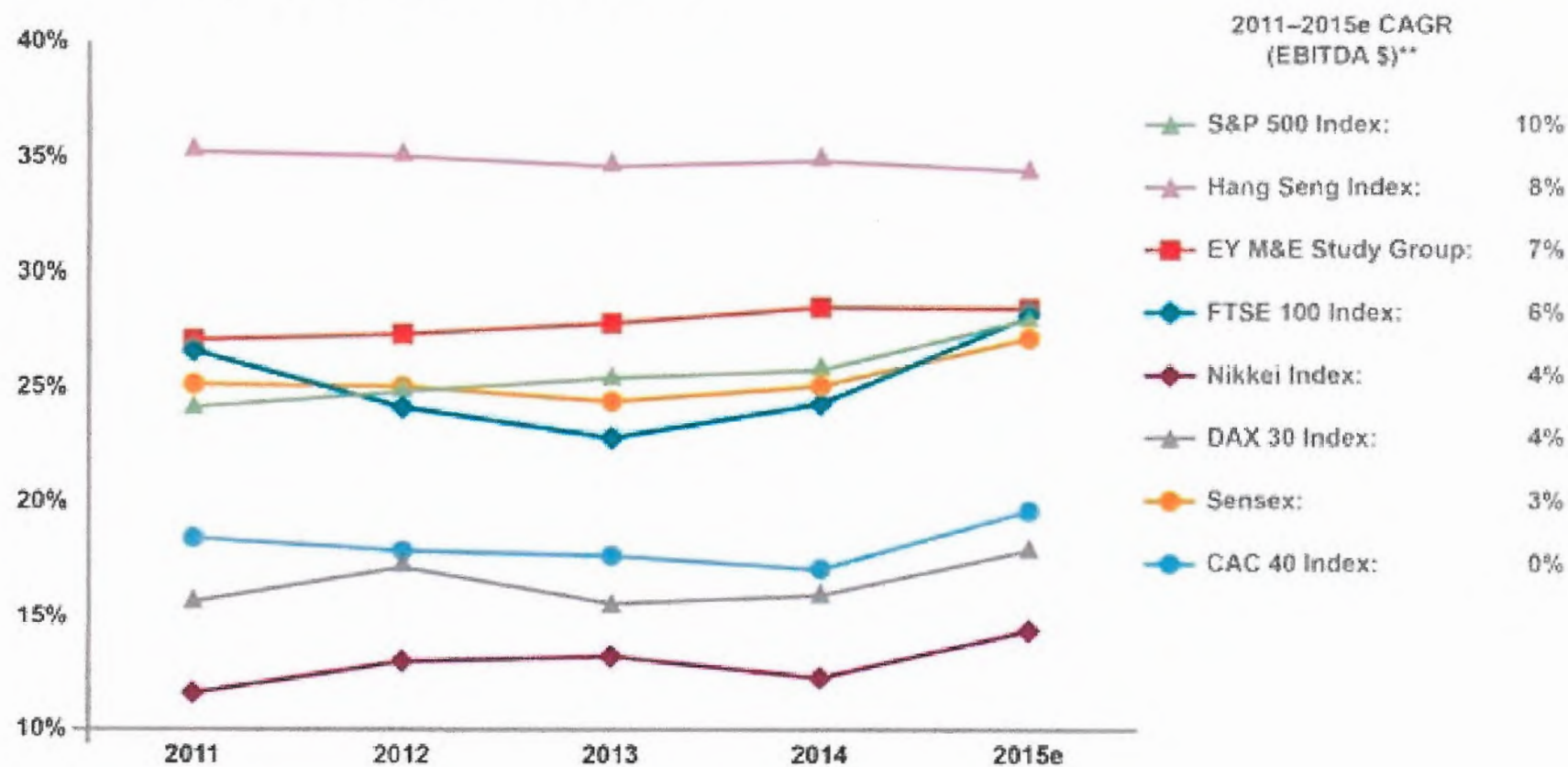
- ▶ Newspaper and magazine companies continue to face structural declines in print. Digital advertising and subscriptions contribute a relatively smaller percentage to EBITDA dollars and are yet to yield significant returns.
- ▶ To protect their margins, publishers are continuing to restructure operations — cutting printing, distribution and editorial costs and reinvesting a part of the resultant savings in digital and marketing operations. EBITDA dollars for the sector are expected to decline by 7% during the period 2011–15e due to increasing competition from digital-only players.

Music companies see digital streaming services drive EBITDA growth

- ▶ Music companies' EBITDA dollars are expected to grow with the expansion of licensed digital streaming services and continued growth in music publishing. The sector's EBITDA margins are gradually rising, from 10% in 2011 to 13% in 2015e.
- ▶ The sector's EBITDA dollars are expected to grow at a CAGR of 9% from 2011–2015e.

In 2015, M&E companies are expected to outperform most of the leading stock market indices in terms of profitability

EBITDA margin percentage,* 2011–2015e

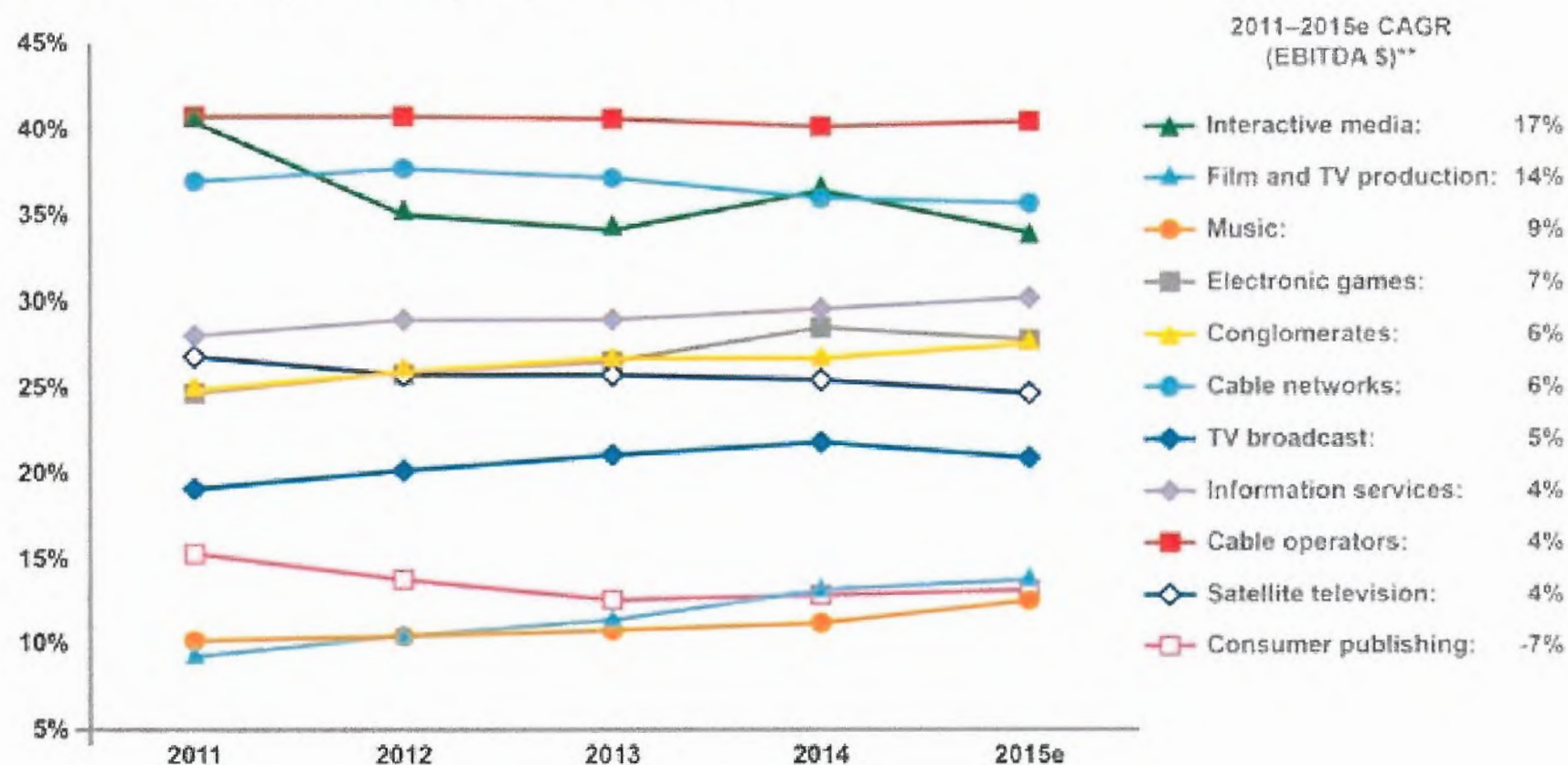


* EBITDA margin percentage is EBITDA dollars divided by revenue dollars.

** 2011–2015e CAGR (EBITDA \$) is the compound annual growth rate of EBITDA dollars.

In 2015, interactive media companies are expected to lead in EBITDA dollar growth and cable operators are expected to have the highest margin

EBITDA margin percentage,* (2011–2015e)



* EBITDA margin percentage is EBITDA dollars divided by revenue dollars.

** 2011–2015e CAGR (EBITDA \$) is the compound annual growth rate of EBITDA dollars.

Methodology

A photograph of a concert or stage performance. In the foreground, a person's hand is holding up a smartphone to take a picture of the stage. The stage is illuminated with bright spotlights, and a performer is visible on stage. The background is dark, and the overall atmosphere is that of a live event.

Study methodology — how we analyze the profitability of the global M&E industry

This study examines the actual EBITDA of the M&E industry for 2011 to 2014 and estimated EBITDA for 2015. Specifically, this analysis measures and compares EBITDA dollar growth (measured as a CAGR) as well as EBITDA margins.

Key aspects of the analysis		
Geographic and sector coverage	Company selection criteria	Other important considerations
<ul style="list-style-type: none">▶ The study group comprises 112 companies (see Appendix) globally, covering those headquartered in:<ul style="list-style-type: none">▶ The Americas (53 companies)▶ Europe (33 companies)▶ Asia-Pacific (25 companies)▶ Africa (1 company)▶ The analysis looks at media conglomerates and ten sectors of M&E:<ul style="list-style-type: none">▶ Cable networks▶ Cable operators▶ Consumer publishing▶ Electronic games▶ Film and TV production▶ Information services▶ Interactive media▶ Music▶ Satellite TV▶ TV broadcast	<ul style="list-style-type: none">▶ The study group has been developed based on the following criteria:<ul style="list-style-type: none">▶ The company is publicly traded.▶ The company's operations are reviewed by an industry analyst, and its results are published in an analyst's report.▶ For fiscal year 2014, the company had a minimum of US\$1 billion in annual revenues or, in the case of media conglomerates, a minimum of US\$5 billion in annual revenues.	<ul style="list-style-type: none">▶ Data sources: EY's EBITDA perspective is based on secondary research, using publicly available data and analyst reports, as well as EY's own analysis.▶ Inclusion of conglomerates in sector analysis: In the case of conglomerates, their individual businesses have been included in the sector analyses. As a result, some conglomerates are represented in more than one sector.

Appendix



Study definitions and concepts

EBITDA



- ▶ EBITDA refers to the earnings of a company before interest, tax, depreciation and amortization.
- ▶ It is understood that EBITDA is a non-generally accepted accounting principles (GAAP) financial measurement and that companies report EBITDA differently. Nonetheless, it is a widely available metric for comparison purposes. Accordingly, it is used in this analysis as reported by companies, as well as by research institutions and investment analysts.
- ▶ In some rare cases, where companies in our study group did not report EBITDA and EBITDA could not be derived, we have used operating income as a proxy for EBITDA.

Currencies



- ▶ All EBITDA dollar CAGRs are calculated in US dollars. Where necessary, revenue and EBITDA provided in other currencies have been converted into US dollars. The conversion ratio was based on the average exchange rate between each currency and the US dollar for 2011, 2012, 2013 and 2014 and a 180-day average for 2015.

GAAP



- ▶ In most cases, financial data was prepared in accordance with US GAAP. In instances where financial data was prepared in accordance with International Financial Reporting Standards or local GAAP, this has not been converted to US GAAP.

Conglomerates



- ▶ Conglomerates are considered to be global companies with business activities reported in two or more sectors and leaders who drive innovation across the industry.

Study group companies

Conglomerates

- ▶ BCE Inc. (Bell Media, Bell Aliant and Bell Wireline segments only)
- ▶ CBS Corporation (total company)
- ▶ Comcast Corporation (total company)
- ▶ Fuji Media Holdings, Inc. (total company)
- ▶ Sony Corporation (Pictures and Music segments only)
- ▶ The Walt Disney Company (total company)
- ▶ Time Warner Inc. (total company)
- ▶ Twenty-First Century Fox, Inc. (total company)
- ▶ Viacom, Inc. (total company)
- ▶ Vivendi S.A. (Canal+ and Universal Music Group segments only)

Electronic games

- ▶ Activision Blizzard, Inc. (total company)
- ▶ Bandai Namco Holdings Inc. (Contents segment only)
- ▶ DeNA Co., Ltd. (total company)
- ▶ Electronic Arts Inc. (total company)
- ▶ Gree, Inc. (total company)
- ▶ King Digital Entertainment (total company)
- ▶ Konami Corp. (Digital Entertainment segment only)
- ▶ NetEase.com Inc. (total company)
- ▶ Nexon Co., Ltd. (total company)
- ▶ Sega Sammy Holdings Inc. (Consumer segment only)
- ▶ Square Enix Holdings Co., Ltd. (total company)
- ▶ Take-Two Interactive Software, Inc. (total company)
- ▶ Ubisoft Entertainment (total company)

Cable operators

- ▶ Cablevision Systems Corporation (Cable segment only)
- ▶ Charter Communications, Inc. (total company)
- ▶ CJ HelloVision Co., Ltd. (total company)
- ▶ Cogeco Cable Inc. (total company)
- ▶ Comcast Corporation (Cable Communications segment only)
- ▶ Kabel Deutschland (total company)
- ▶ Liberty Global, Inc. (total company)
- ▶ Quebecor Inc. (Telecommunications segment only)
- ▶ Rogers Communications Inc. (Cable and Business Solutions segments only)
- ▶ Shaw Communications Inc. (Cable and Satellite segment only)
- ▶ Time Warner Cable Inc. (total company)
- ▶ Virgin Media Inc. (total company for 2011–2013 only)
- ▶ Ziggo N.V. (total company for 2011–2014 only)

Cable networks

- ▶ AMC Networks Inc. (total company)
- ▶ CBS Corporation (Cable Networks segment only)
- ▶ Comcast Corporation (Cable Networks segment only)
- ▶ Discovery Communications, Inc. (total company)
- ▶ Scripps Networks Interactive (Lifestyle media segment only)
- ▶ Starz (Networks segment only)
- ▶ The Walt Disney Company (Media Networks – cable segment only)
- ▶ Time Warner Inc. (Cable Networks segment only)
- ▶ Twenty-First Century Fox, Inc. (Cable Network Programming segment only)
- ▶ Viacom, Inc. (Cable Networks segment only)
- ▶ Vivendi S.A. (Canal+ segment only)

Study group companies (continued)

Film and TV production

- ▶ Comcast Corporation (NBCU-Film segment only)
- ▶ Entertainment One Ltd. (total company)
- ▶ Lions Gate Entertainment Corp. (total company)
- ▶ Sony Corporation (Pictures segment only)
- ▶ The Walt Disney Company (Studio Entertainment segment only)
- ▶ Time Warner Inc. (Warner Bros. segment only)
- ▶ Twenty-First Century Fox, Inc. (Filmed Entertainment segment only)
- ▶ Viacom, Inc. (Entertainment segment only)

Interactive media

- ▶ AOL Inc. (total company)
- ▶ Baidu, Inc. (total company)
- ▶ CyberAgent, Inc. (Internet Advertising Business and Ameba Business segments only)
- ▶ Facebook, Inc. (total company)
- ▶ TEGNA, Inc. (Digital segment only)
- ▶ Google Inc. (total company)
- ▶ IAC/InterActiveCorp (total company)
- ▶ LinkedIn Corporation (total company)
- ▶ Netflix, Inc. (total company)
- ▶ Naver Corporation (total company)
- ▶ Sohu.com Inc. (total company)
- ▶ Tencent Holdings Limited (total company)
- ▶ Twitter, Inc. (total company)
- ▶ Yandex N.V. (total company)
- ▶ Yahoo! Inc. (total company)
- ▶ Yahoo Japan Corporation (total company)

Consumer publishing

- ▶ Arnoldo Mondadori Editore SpA (total company)
- ▶ Axel Springer AG (total company)
- ▶ CBS Corporation (Publishing segment only)
- ▶ Daily Mail and General Trust plc (total company)
- ▶ Fairfax Media Ltd. (total company)
- ▶ Gannett Co., Inc. (Publishing segment only - 2011-2013; Total company - 2014-2015F)
- ▶ Lagardère SCA (total company)
- ▶ Meredith Corporation (National Media segment only)
- ▶ News Corporation (all segments, except Cable Network Programming)
- ▶ Pearson plc (total company)
- ▶ RCS MediaGroup S.p.A. (total company)
- ▶ Sanoma (total company)
- ▶ Schibsted ASA (total company)
- ▶ The New York Times Company (total company)
- ▶ Time Inc. (total company)
- ▶ Torstar Corporation (total company)
- ▶ Tribune Publishing Company (total company)
- ▶ Trinity Mirror plc (total company)

Information services

- ▶ GfK AG (total company)
- ▶ IHS Inc. (total company)
- ▶ Informa Plc (total company)
- ▶ Intuit Inc (total company)
- ▶ Ipsos SA (total company)
- ▶ Nielsen NV (total company)
- ▶ RELX Group (total company)

Study group companies (continued)

Information services (continued)

- ▶ The Dun & Bradstreet Corp. (total company)
- ▶ The McGraw-Hill Companies, Inc. (total company)
- ▶ Thomson Reuters Corporation (total company)
- ▶ Verisk Analytics (total company)
- ▶ Wolters Kluwer NV (total company)

Music

- ▶ Live Nation Entertainment, Inc. (total company)
- ▶ Sony Corporation (Music segment only)
- ▶ Vivendi S.A. (Universal Music Group segment only)

Satellite TV

- ▶ DISH Network Corporation (total company)
- ▶ Eutelsat Communications S.A. (total company)
- ▶ Naspers Limited (Pay TV segment only)
- ▶ SES S.A. (total company)
- ▶ Sky Deutschland AG (total company, 2011–2012 only)
- ▶ SKY Perfect JSAT Holdings Inc. (total company)
- ▶ Sky plc (total company)
- ▶ The DIRECTV Group, Inc. (DIRECTV US and DIRECTV LA segments only)
- ▶ Twenty-First Century Fox, Inc. (Direct Broadcast Satellite Television segment only)

TV broadcast

- ▶ Atresmedia Corporacion de Medios de Comunicacion (total company)
- ▶ CBS Corporation (Entertainment and Local Broadcasting segments only)
- ▶ Comcast Corporation (NBCU-Broadcast segment only)
- ▶ TEGNA, Inc. (Broadcasting segment only)
- ▶ Grupo Televisa, S.A.B. (total company)
- ▶ ITV plc (total company)
- ▶ Mediaset S.p.A. (total company)
- ▶ Métropole Télévision S.A. (total company)
- ▶ Modern Times Group MTG AB (total company)
- ▶ Nine Entertainment Co. Holdings Ltd. (total company)
- ▶ Nippon Television Network Corporation (total company)
- ▶ ProSiebenSat.1 Media AG (total company)
- ▶ RTL Group S.A. (total company)
- ▶ Seven West Media (Television segment only)
- ▶ Sinclair Broadcast (total company)
- ▶ Television Française 1 S.A. — TF1 (total company)
- ▶ The Walt Disney Company (Media Networks — Broadcasting segment only)
- ▶ Tokyo Broadcasting System Holdings, Inc. (total company)
- ▶ Tribune Media Co. (Television and Entertainment segments — 2013–2015E; Broadcasting segment — 2011–2012)
- ▶ TV Asahi Corporation (total company)
- ▶ TV Tokyo Holdings (total company)
- ▶ Twenty-First Century Fox (Television segment only)

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**An Engineering Analysis of Public Rights-of-Way Processes
in the Context of Wireline Network Design and Construction**

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Prepared by Columbia Telecommunications Corporation

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1 Introduction: Public rights-of-way processes represent a minor matter relative to the full effort required for broadband deployment

This report describes, from an engineering standpoint, the permitting process in the context of wireline broadband outside plant design and construction process. The observations in this report are based on Columbia Telecommunications Corporation (CTC) staff-members' decades of expert work building out and overseeing build-out of communications infrastructure across the United States.¹

The report concludes that accommodating permitting and other local government requirements in public rights-of-way is a relatively small part of the cost and time required for design and construction of outside plant for a communications network. The National Broadband Plan asserts that "[t]he cost of deploying a broadband network depends significantly on the costs that service providers incur to access conduits, ducts, poles and rights-of-way on public and private lands. Collectively, the expense of obtaining permits and leasing pole attachments and rights-of-way can amount to 20 percent of the cost of fiber optic deployment..." This statement – assuming it is accurate - conflates permitting and very different activities associated with obtaining access to utility poles and conduit. Fees charged by local governments in connection with the *deployment* of broadband are a very small portion of the cost of fiber deployment, and certainly nothing close to 20 percent of deployment costs.

As discussed in this paper, the outside plant design and construction process, broadly speaking, involves the work from the time a network engineer receives instructions to construct a particular type of line in a particular community through the time the line is actually built. This is, of course, only a part of the work involved in the overall design of a network. Generally speaking, outside plant design and construction occurs at a point when overall network design and marketing principles are already in place. The decision as to *what* and *whether* to build involves additional time and cost. And of course, with broadband systems, the physical plant "design and construction" are only part of effort required to provide services. The design, installation, and integration of electronics and software add significantly to cost, and affect whether, when and where a company will build a system, and how it will stage construction. In our experience, it is other factors, rather than details within the outside plant and construction process, that drive deployment, and the time required for deployment.

¹ CTC provides technology engineering and business planning consulting services for public sector and non-profit clients nationwide and abroad. Since 1983, CTC has assisted hundreds of public and nonprofit entities to analyze technology needs and strategies, plan and design broadband systems, and work with the private sector to meet local broadband and technology needs. This report was prepared by CTC's Director of Engineering, Andrew Afflerbach, Ph.D., P.E., who has 15 years of experience designing and evaluating fiber network design, with the support of CTC's outside plant engineers, who, among them, hold more than 100 years of experience designing and building outside plant for both telephone and cable companies.

In our experience with the communications industry and engineering broadband networks, public rights-of-way acquisition costs represent – in those communities that assess them – a remarkably minor factor in the larger analysis of outside plant design and construction processes and expenses—a cost of a few percent of construction (and thus an even smaller percentage of the total cost associated with planning and implementing a communications network).

Labor and material capital costs for outside plant and construction range from \$25,000 to \$250,000 per mile, depending on the service area and the type of construction used. In our experience, build-out costs are primarily a function of local labor rates, materials pricing as of the date of construction/integration, the complexity of the terrain, real estate acquisition, whether the construction will be aerial or underground, and the make ready process. By comparison, local permitting fees are a small amount of these costs. Operational costs (depending on the nature of the services provided by the broadband facility) are dominated by programming, Internet backhaul, outside plant maintenance, customer service, and billing.

Nor does the permitting process significantly delay deployment. While every project is different, for aerial construction, it is almost always the case that the majority of time in outside plant design and construction is in fact the make-ready process—coordinating with the pole owner and existing utilities to prepare utility poles for attachment, as described in Section 2.

Where local government rights-of-way permitting time is a significant part of the overall outside plant design and construction process in a typical mixed aerial/underground construction project, it will typically be where special reports, inspections, or approvals are required before a permit may issue—and most of these additional reports, inspections, or approvals are based on state and federal requirements. Special permits or other authorizations are required for crossing railroads, waterways or environmentally sensitive areas, or where federal funding mandates environmental assessments, for example. The time required to obtain the necessary approvals from federal environmental officials that are conditions to the issuance of a permit can double or triple total construction time for a particular project. However, it is very difficult to eliminate the requirement for additional time without harming property, creating significant risks to public safety, to the environment, or to other utilities and critical transportation systems.

To some degree, the impact on construction projects can be mitigated by proper planning, routing, and staging by the owner of the communications network. For example, in our experience, if the network deployers (or their contractors) make an effort to stage the filing of permit applications rather than filing hundreds at one time, the processing burden on the locality is spread over a reasonable period of time. In our experience, localities are very willing

to work with deployers to establish timetables and processes for reasonable submission – and reasonable review – of permit applications.

In many localities, local permitting processes and fees do not exist. Either as a matter of local or state policy, many localities—particularly those in rural areas—impose little or no process or fee on use of the public rights-of-way. In addition, in some areas, localities are not engaged in rights-of-way permitting.²

In our experience, it is in the most unserved and underserved rural areas where local fees are most minimal or non-existent; for example, traffic control in these areas requires less coordination. Thus, the absence of a process or fees does not, in our experience, encourage the deployment of services—providing further support for our conclusion that the consideration is simply not a relevant factor.

However, we have found that a well-managed process of local oversight of network construction often adds value and plays an essential, enabling role in key processes related to construction of broadband networks, including:

1. Reducing hits and cuts to other utilities located in the rights-of-way—for example, in Anne Arundel County and Howard County Maryland, the local governments intervened to improve quality control and remove contractors when Verizon Communications' construction of FiOS caused massive rights-of-way disruption and damage to existing cable and telecommunications utilities and made the project owners accountable for improving their practices and paying for their damages.
2. Enforcing codes which in turn make the finished construction safer and reduce its aesthetic impact—for example, many local governments monitor electrical and safety code in the rights-of-way and require entities in the rights-of-way to fix safety violations such as improper clearances, relocate enclosures in dangerous locations, and repairing damaged infrastructure.
3. Reducing disruption to roadways and economic activity through coordination of joint builds and enforcement of restoration requirements—for example, notifying service providers and coordinating the “open trench” installation of communications conduit in rights-of-way when road or utility construction is taking place.
4. Providing Geographic Information System (GIS) mapping. One of the significant contributions of many local jurisdictions is the availability of GIS base maps. If these are

² For example, in many parts of Virginia, rights-of-way including neighborhood streets are managed by the Virginia Department of Transportation; permitting is all done by the state. However, this is simply a consolidation of major and minor rights-of-way under one roof; a full permitting process still exists.

not available from the jurisdictions they must be purchased commercially or generated by the communications provider itself.

2 Understanding broadband network design processes and costs

Outside plant design and construction includes a number of elements. To illustrate the point, consider a five-mile extension of an existing network. For outside construction to proceed, there should be a project plan that encompasses:

- Field surveys
- Route design
- Make-ready
- Construction drawings
- Permitting and licensing (state and local, as well as special permits for river or rail crossing or environmentally sensitive areas)
- Plans for necessarily equipment, materials and labor, and for integrating the extension with the existing network.

To determine the appropriate routing for a project, engineers obtain GIS information from the relevant jurisdictions, if available and study the maps, including details of roadways, railroads, major highways, street centerlines, “hydro lines” (i.e., creeks, streams, rivers), and “hydro areas” (i.e., wetlands, bodies of water). GIS maps must also be developed, overlaying these features with proposed fiber routes, future fiber routes, future locations, and current locations.

The engineers then conduct a full walk-out of the route and complete site surveys of all proposed customer fiber locations. This is needed to complete the design and preliminarily assess permit needs and initiate the permitting process.

A significant portion of the time expended on a fiber design project must be dedicated to the measuring and drawing of aerial and underground routes and facilities (i.e., the creation of field notes) and the conversion of those field notes to a widely-used format such as AutoCAD or MicroStation.

During the route survey, the engineers must note existing pole lines and potential construction barriers, including obstructions, permitting concerns, and possible improvements. For aerial portions of the route, for example, this would include measurement of span distances and the aerial clearances of electric facilities, and recording details including:

- Pole numbers
- Electrical facilities
- Clearance over roads and bridges
- Span distances
- Guys and anchors

For underground portions of the route, engineers must measure the green space available within the rights-of-way for placement of conduit, and record details including:

- Storm drains
- Edge of pavement
- Water and sewer lines
- Street lights
- Required test pits
- Slack storage
- Splice cases
- Pedestals
- Vaults
- Required hardware

Project drawings would include additional details such as:

- Running line of fiber
- Road names
- Railroads and crossings
- Bridges
- Fixed markers/significant landmarks (e.g., fire hydrants, valves, poles)
- Environmental protected areas (e.g. wetlands, bodies of water)
- Flood plains
- Easements
- Rights-of-way
- Any applicable public utilities or assets
- Any applicable private utilities or assets
- Termination points
- Fiber entry and installation, as applicable

Engineers would then complete a base map, a strand map (for aerial portions, based on make-ready or “stick” drawings), and a design drawing with construction detail.

First, however, pole attachment licenses are needed for aerial routes from the pole owners. Make-ready work, the tasks associated with preparing utility poles for attachment, constitutes the single largest portion of the design effort. The pole attachment must be coordinated with all utilities and communications infrastructure owners that are attached to the existing poles. To secure these licenses, engineers will submit the appropriate pole attachment permits to the pole owners, typically commercial power and/or telecommunications companies. Engineers will determine who owns the pole, whether there is joint ownership, and what work the utility or communications company needs to complete to attach fiber to the poles. A single pole application can include from one to 200 poles. Engineers from all utility companies on the poles conduct a joint walkout and identify how to relocate utilities to accommodate the applicant.

The applicant company typically pays for the relocation. In addition to the cost, there is often considerable delay in this process, both in scheduling the walkout and in performing the relocation.

“Engineering work documents” (EWDs) are produced in the final stage of the design process. These documents include a bill of materials, proof of permit issuance, and all required engineered drawings and design specifications. Such EWDs are typically overseen by a licensed Professional Engineer. If the construction vendor were to subsequently create a redline (i.e., deviation from the original design and the “as built” design), the EWDs would have to be updated to reflect those changes. In the event obstructions are discovered during project implementation, additional changes must be made and drawn in CAD or MicroStation.

Rights-of-way and encroachment permits (issued by the county/city and/or the state authorities) are standard and are required for every route. Once the make-ready and EWDs are complete, the route is finalized and the permitting package is submitted. Again, a typical five-mile segment will require one additional day for preparation of the permitting package (beyond the work required for preparation of the EWDs). If the issuing entity identifies any concerns or mistakes in its initial review of a permit application, the reviewer will typically return the plans, send an e-mail about the issue, or call the engineer or project coordinator of the constructing applicant entity to discuss the concern. If an application or portion of an application is returned, the applicant entity must review any potential changes and then make corrections and send a revised application (if necessary), or simply e-mail or call the permit reviewer to provide the requested information.

In our experience, the total outside plant design and construction process for a five-mile segment, if properly staged and planned, can be completed in approximately 100 days.³ This includes 65 days for make-ready activities with the pole owners and other utilities.

³ Since design and construction of the various portions will take place in parallel, a large-scale project need not require many multiples of 100 days; this is simply the amount of time it takes a particular portion to go from beginning to end.

3 Understanding broadband network construction processes and costs

Outside plant design and construction is an expensive and multi-faceted process, of which obtaining rights-of-way permits is one relatively modest component. While actual costs may vary by project and geography, it is possible to make rough estimates for a “typical” project. A brief summary of these varied costs and some of the variables that determine their magnitude follows:

Labor

Labor represents the largest share of construction costs—approximately 50 to 80 percent. Materials costs (like the quantity of fiber strands and cables) are a secondary consideration.

All other expenses are dwarfed by labor costs. It is widely recognized that “[l]abor is the biggest expenditure in a FTTH network build-out”⁴ or any wireline network build-out.

Of course, labor costs are highly variable. These costs tend to be highest in urban/suburban and affluent areas. Significantly, labor costs (and, therefore, broadband construction costs) are almost universally far lower in rural areas where broadband deployment is least robust.

Labor costs are frequently the single largest line item in a broadband construction project, and the scale of the costs – though always high – will vary geographically depending on local wage structures and union requirements, if any.

For instance, contract labor costs for a recent fiber deployment in rural Tennessee were priced at nearly \$20,000 a mile. In our recent experience, in a major metropolitan area, the cost of labor would be far higher, closer to \$100,000 per mile, depending on the type of construction (aerial/underground) and the amount of restoration required. This is due to the higher hourly cost of labor, the greater need for make-ready (in the case of aerial construction), the expertise needed for directional boring in heavily congested environments (in the case of underground construction), and the effort needed to restore paved and built-up areas.

Materials

The cost of materials at any one time can greatly influence deployment patterns as well as investment timing. Materials, both for outside plant and for network electronics, represent an enormous part of any build-out budget. With respect to outside plant, materials range from optical fiber to conduits to outside enclosures; on the electronics side, the materials will include the electronics to “light” and operate the fiber and provision services.

⁴ Ashley Phillips, Nov. 2006, Broadband Properties, “Best Practices: Building a Fiber Network in a Rural Community,” at 23 (http://www.broadbandproperties.com/2006issues/nov06issues/eatel_nov.pdf).

Material costs can dramatically impact investment decisions because they represent a constantly changing variable. Network electronics, like IT hardware, constantly decrease in price as the technologies are adopted and age—and simultaneously increase in capacity. They also require refreshment and replacement over time. Cable plant represents a somewhat more stable item with respect to price, though costs in this area also change over time and are subject to fluctuation; the recent earthquake in Japan, for example, took offline a number of fiber manufacturers, leading to a global shortage of fiber at a time of break-neck build-out in Asia (and BTOP/BIP-related build-out in the US), and thus driving up prices for the fiber still available.

Using the same rural Tennessee community described above, the outside plant material cost for a fiber-to-the-home deployment was priced at over \$10,000 per mile. In metropolitan areas, the cost is similar.

Real estate acquisition

In some circumstances, construction must take place on private property. When this occurs, the broadband operator is forced either to purchase the property outright or obtain an easement from the property owner.

Mobilization of contractors

Considerable time and expense is required to initiate construction. Even with a completed design, the network builder must develop detailed specifications, find and maintain a pool of contractors, issue bid documents, review bids, select contractors, order materials, and oversee the contractors. The added expense of contractor management is usually borne by the entity managing the network build—and indirectly through costs reflected in the rates of the building contractor.

Aerial versus underground

A large-scale fiber network will typically include a mixture of aerial and underground construction, generally based on the prevailing type of utilities in the build area. While aerial construction may be cheaper, it is also more vulnerable to extreme weather, particularly in wooded areas and areas with frequent ice and high winds. These factors can increase long-term maintenance costs for aerial construction and may make underground construction a more attractive option in some areas.

Aerial construction is typically cheaper than underground. This is particularly true when existing utility poles are not crowded, and when the network builder has ownership of the utility poles (e.g., in the case of construction by power and utility companies). Actual costs vary dependent

upon equipment, the particular contractor, and design specifications. In the best case, aerial construction can be completed for \$25,000 per mile including labor and materials. This cost will increase, however, when poles are crowded or when a third-party utility pole owner charges high rates for access. Under such scenarios, costs for aerial construction can reach \$100,000 or more per mile (which might prompt consideration of alternative routes or underground construction).

As in all broadband projects, labor represents the largest component of aerial-construction expenses (up to 80 percent). Labor is needed to install the supporting strand, lash fiber optic cable to the strand, splice the fiber optic cable, place the distribution center, and activate testing of the plant. These costs may increase to reflect additional make-ready work, which must be performed to relocate existing aerial attachments (i.e., other fiber, telephone, and cable) or to extend or replace utility poles to ensure compliance with code requirements for minimum clearance. Incremental aerial construction material costs include the fiber cable, splice enclosures, fiber taps for individual subscriber drop connections, strand, and attachment hardware.

Underground construction costs likewise vary significantly depending upon the construction methodology and ground surface. While material costs for underground construction are comparable or only marginally more expensive than aerial construction, labor costs are significantly higher with this approach. In areas where restoration is not important and long continuous runs are possible (e.g., unimproved rural areas on the side of interstate roads), “plowing” the fiber into the ground is a relatively inexpensive option. This approach can cost as little as \$70,000 per mile. In more developed areas, however, directional boring is likely necessary. This approach is less destructive to the rights-of-way and requires less restoration, but is substantially more expensive. In fact, costs for boring range from \$90,000 to \$400,000 per mile. Boring also limits the amount of cable and conduit that can be built.

Terrain and topography

The U.S. Government Accountability Office’s (GAO) seminal paper on broadband deployment identifies a correlation between terrain and broadband deployment decisions. Constructing infrastructure is more expensive in mountainous and forested areas, owing to the difficulty in placing poles or underground utilities in rocky areas and the difficulty in accessing the areas. Broadband is relatively easier and thus more economical in flat, open terrain. Mountainous or rolling terrain and forests can also present a deployment obstacle for broadband technologies that require an unobstructed pathway to transmit radio signals from towers or antennas.⁵ Geography and terrain “are almost certainly working through service provision cost,” reporting

⁵US GAO-06-426 at 19.

that “an increase in vertical rise or ruggedness is associated with a decline in broadband deployment.”⁶

Make ready

As discussed above, before aerial pole construction can begin, the existing utilities frequently must be moved on the poles, and poles may need to be modified. The utility make-ready may be performed by the existing utilities, by the pole owner, or by the jurisdiction’s construction contractor, as decided by all parties as part of a walk-out survey. The make-ready work to be performed by the utilities includes raising, lowering, guying, and re-tensioning of existing aerial cables.

In the event that network construction is aerial, there is an absolute requirement to prepare the poles for new facilities, a multi-party process that may require extensive reengineering of pole facilities and pole replacement. In urban and suburban areas in particular, crowded poles turn make ready into a time-consuming and costly matter for an entity seeking to attach for the first time.

Ability to use existing infrastructure

Costs may be reduced where existing cable infrastructure and pathways are available. Some communications providers have excess fiber strands. Fiber count in cables ranges from 6 to 24 near residences and individual businesses, to more than 1,000 on backbone routes. The cost of a 6-count fiber cable is \$2,000 per mile, while an 864-count cable is \$50,000 per mile, implying a marginal cost of approximately \$50 per fiber per mile. Actual costs for fiber purchase or lease are typically far higher, however, as prices reflect market costs and depend on fiber availability in the project corridor.

Utility pole attachments can be loaded with multiple fiber cables in a process called overlash. Overlashing enables a network provider to attach to utility poles without taking up more space. Overlashing requires the permission of the entity being attached and is limited to the loading capacity of the attachment. Where overlashing is available, make-ready costs can be eliminated and construction costs can be reduced to approximately \$13,000 to \$20,000 per mile.

⁶ Kenneth Hamm, “Diagnosing the Disconnected: Where and Why Is Broadband Unavailable in the U.S.?” preliminary paper presented to the 2006 Telecommunications Policy Research Conference, August 2006, at 19 (“MODIS land cover types 3 and 6 seem to encourage broadband availability relative to a built-up urban land cover baseline. MODIS land cover type 15 seems to reduce broadband deployment”). Dr. Hamm found that hilliness might be “more advantageous than flat or smoothly rising or falling terrain.”

Some entities (utilities, service providers, governments) have conduit available for purchase, lease, or trade. Pulling cables through available conduit costs \$20,000 to \$50,000 per mile, instead of \$90,000 to \$400,000 for new construction.

Redundancy and survivability

The specific requirements of the network (e.g., public safety grade, mission criticality, cost of outages) will determine the physical and electronic architecture of the network. For availability above 99 percent (i.e., fewer than eight hours of downtime per year), a building will generally need two redundant physical paths from the network to its location, along with an electronic infrastructure to accommodate failure of a fiber route or an electronic component, and backup power of sufficient duration. The network will also need to provide a 24-hour network operations center, a fiber repair crew, intrusion detection, and backup management and recovery facilities. Of course, there is a cost associated with these reliability features.

Ideally, physical redundancy needs will be reflected in the initial project design. In a network designed with redundancy in mind, each portion of the network is constructed as part of a ring, allowing for economical yet reliable construction. Conversely, construction costs are dramatically increased (typically doubling), when redundancy is prioritized after initial construction. In such cases, a custom cable pathway is often required.

State and Local Government Rights-of-Way Permitting

The costs and techniques used to perform and charge for rights-of-way permitting vary but the fees almost always make up a very small part of the project budget-- at most a few percentage points on the projects on which we've worked.⁷ And, as discussed earlier, some authorities do not charge fees, waive fees under certain circumstances, or assess a bulk fee for a project.

⁷ Fees may be higher or lower as a percentage of total costs depending in part on the nature of the work that is performed and its impact, and the manner in which particular local fee structures operate. To illustrate one example, one suburban Maryland community charges permitting fees to cover its costs for oversight and coordination of the rights-of-way. The fees are \$0.50 per foot for underground directional boring construction, \$2.00 for street crossings, and \$0.20 per foot for aerial pole attachment, and \$300 per application. The point here is that the fees are generally a small part of total outside plant and construction cost.

4 The National Broadband Plan overstates the expense of public rights-of-way access by conflating it with processes for accessing private property

The National Broadband Plan asserts that “[t]he cost of deploying a broadband network depends significantly on the costs that service providers incur to access conduits, ducts, poles and rights-of-way on public and private lands. Collectively, the expense of obtaining permits and leasing pole attachments and rights-of-way can amount to 20% of the cost of fiber optic deployment.”⁸ This statement’s imprecision creates misleading impressions by combining several different processes and expenses and providing the “collective” 20 percent figure. It is essential to differentiate local government rights-of-way processes and costs from the other efforts and costs that are incurred in securing access to facilities in the rights-of-way—and that are entirely unrelated to the cost of securing access to public property and entirely outside the control of local authorities.

In fact, as shown above, rights-of-way processes and fees associated with deployment – outside plant and construction - represent a relatively small component of this suite of expenses.

Indeed, the National Broadband Plan itself acknowledges the relatively large effort and costs associated with pole attachments and make ready. The Plan notes that rental rates for pole attachments are large and variable, ranging from \$4.54 per month per household passed to \$12.96 in rural areas. This expense is substantially larger in rural areas “where there often are more poles per mile than households.”⁹ The Plan likewise notes that make ready represents a sizable expense, highlighting comments by FiberNet, which reports that the make ready process for a project in West Virginia averaged \$4,200 per mile and took 182 days to complete.¹⁰ The Plan does not provide comparable data on rights-of-way processes and fees.¹¹

By combining these expenses into a single measure, the Plan makes itself vulnerable to misunderstanding. For instance, a recent Politico article declares, “In its National Broadband

⁸ Connecting America: The National Broadband Plan, at 109 (available online at <http://download.broadband.gov/plan/national-broadband-plan.pdf>) Citing: Omnibus Broadband Initiative, The Broadband Availability Gap (forthcoming); See Letter from Thomas Jones, Counsel to FiberNet, to Marlene H. Dortch, Sec., FCC GN Docket No. 09-51, WC Docket No. 07-245 (Sept. 16, 2009) (FiberNet Sept. 16, 2009 *Ex Parte*) at 20 (noting average cost for access to physical infrastructure of \$4,611-\$6,487 per mile); *Comment Sought on Cost Estimates for Connecting Anchor Institutions to Fiber – NBP Public Notice #12*, GN Docket Nos. 09-47, 09-51, 09-137, Public Notice, 24 FCC Rcd 12510 (2009) (NBP PN #12) App. A (Gates Foundation estimate of \$10,500-\$21,120 per mile for fiber optic deployment); see also Letter from Charles B. Stockdale, Fibertech, to Marlene H. Dortch, Secretary, FCC, GN Docket. Nos. 09-47, 09-51, 09-136 (Oct. 28, 2009) at 1-2 (estimating costs ranging from \$3,000-\$42,000 per mile) (other citations omitted).

⁹ Connecting America: The National Broadband Plan, at 110.

¹⁰ Connecting America: The National Broadband Plan, at 111.

¹¹ See Connecting America: The National Broadband Plan, at 113 (asserting that broadband service providers claim that rights-of-way fees “increase the cost and slow the pace of broadband network deployment” and highlighting the variability of rights-of-way fees across jurisdictions, but providing no fee data).

Plan, the commission estimates that *pole attachments* amount to 20 percent of the total cost of deploying fiber-optic cable.”¹² This misstatement has likewise been reiterated by various bloggers, who state that, “The FCC estimates that that pole attachment fees are about 20 percent of the total cost of deploying fiber optic cable needed for broadband networks.”¹³ And the 20 percent figure has taken on a life of its own—even without attribution to the Plan. For example, some sources claim that rights-of-way access alone constitutes 20 percent of construction costs: “The expense of construction and rights-of-way permits for laying fiber often amounts to 20 percent of the cost of building fiber routes for networks.”¹⁴ And yet, as shown above, in some places there is no fee at all (and yet no build-out) and in other areas, the fee is dramatically lower.

To be sure, many localities charge ongoing fees for use or occupancy of the rights-of-way. But these costs are part of the ongoing expenses of system operation, not part of the *deployment* costs.

¹²Brooks Boliek, April 7, 2011, Politico, “FCC aims to lower power-pole fees” (available online at <http://www.politico.com/news/stories/0411/52665.html#ixzz1Oe1vMPjz>).

¹³Fiber to the Whatever, “FCC believes lower pole fees will lead to wider broadband deployments,” April 7, 2011 (emphasis added) (available at <http://fibertothewhatever.com/wp/news/fcc-believes-lower-pole-fees-will-lead-to-wider-broadband-deployments>); see also FierceTelecom, Ethernut, “FCC believes lower pole fees will lead to wider broadband deployments,” April 9, 2011(available at <http://www.ethernut.net/tag/utilities/>)

¹⁴ <http://riaco-op.net/493652-Optical-Wireless-Solutions-Based-on-Free-Space-Optical-FSO.html>, April 9, 2011.

5 Deployment decisions flow from analysis of a wide range of construction and operating costs, of which public rights-of-way access is a relatively minor matter

A commercial broadband deployment decision comes down to a complex comparison of known costs versus expected revenue, a classic return on investment calculation. While it is difficult to isolate the factors that lead to so complex an investment,¹⁵ it is hardly insightful to note that private broadband investment dollars flow to those areas where potential return on investment is highest and the business case for investment is strongest. This ROI analysis is based on a cost versus revenue ratio that calculates where the investor's dollars are best spent.

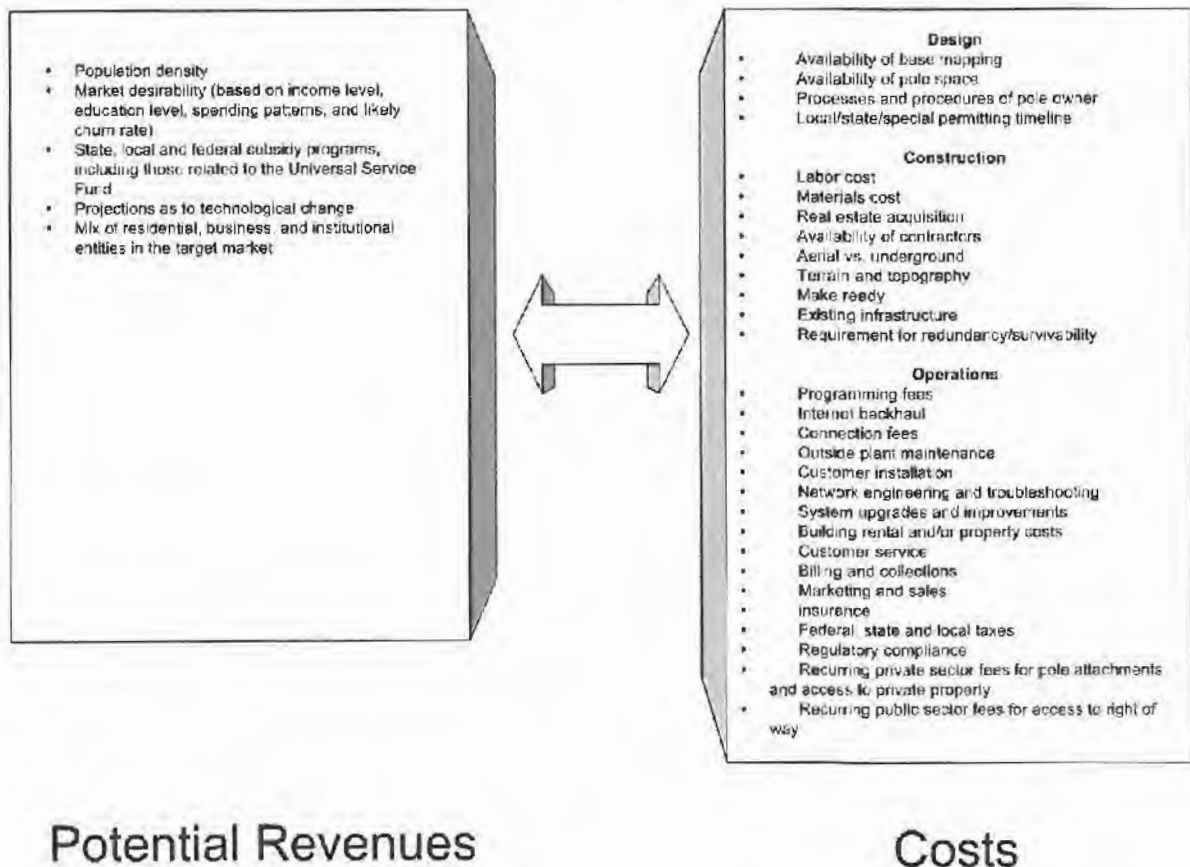
In our experience observing the various sectors of the communications industry, as well as working on public and non-profit broadband projects in the United States and abroad, there exist a wide range of substantial cost and revenue factors that determine investment patterns with respect to construction or upgrade of communications infrastructure. In simplified form, that list can include (on the cost side):

- A full range of costs of design, including those described in Section 2
- A full range of costs of construction, including those described in Section 3
- A full range of costs of operations

These are summarized in Figure 1.

¹⁵ Analogous to rights-of-way fees in this regard is the relatively small tax levied by some states on Internet access. Economists at the University of Tennessee found "no empirical evidence that Internet access rates are lower in states that have levied a tax on Internet access, all else equal." Nor did they find a difference in broadband deployment between those states. Donald Bruce, John Deskins, and William F. Fox, "Has Internet Access Taxation Affected Internet Use?" *Public Finance Review*, volume 32, No. 2, 2004.

Figure 1 – Return on Investment is Modeled Based on Potential Revenues and Costs



Based on our experience observing broadband communications build-out patterns since the advent of the broadband cable platform in the 1970s, changes to either permitting fees or to ongoing fees for access to rights-of-way access are unlikely to change the ratio enough to encourage investment where it is otherwise unfavorable. This is especially true in a rural area such that it would become more desirable for investment relative to more densely populated areas where per premises build-out costs are lower and per capita revenue projections are higher.

In our experience, the fundamental dynamic of broadband build-out is that wireline build-out is capital intensive and investment dollars flow to areas where projected returns are greatest because demand is highest and most concentrated. Rights-of-way fees do not change that fundamental dynamic. In fact, it is our observation that carrier deployment investment decisions are made centrally and that the carriers' operating entities in various localities and regions are competing with each other for investment dollar allocations. As a result, even where the economics of rural build-out could be marginally improved (though elimination or

reduction of a cost of doing business), investment patterns do not change because the fundamental economics do not change. We have never observed a build-out scenario where reduced marginal costs such as rights-of-way diverted to a rural or underserved area funds that were allocated for build-out in more populous areas.

This observation is supported by independently-evaluated data. The U.S. Government Accountability Office attributes broadband deployment decisions to a diverse collection of factors relating to “both the cost to deploy and operate a broadband network and the expected demand for broadband service.”¹⁶ Indeed, a company “will deploy broadband service in an area only if the company believes that such a deployment will be profitable.”¹⁷

As the Center on Budget and Policy Priorities has explained in the context of a related proceeding:

Where to make broadband available, and when, are fundamental strategic decisions for telephone, cable TV, and wireless access providers that affect billions of dollars in annual investment spending. These decisions are largely being driven by the income levels of potential customers. They are also strongly influenced by the enormous cost differences incurred in deploying Internet access infrastructure to sparsely populated rural areas, as compared to crowded urban neighborhoods dominated by multifamily buildings or suburban subdivisions in which single-family homes predominate. There is no evidence at all to suggest that these decisions have been influenced to the slightest degree by the presence or absence of existing state and local access taxes.¹⁸

Indeed, according to GAO, “the decision to deploy broadband service is a function of:

- The population in the area
- The population density in the area
- The percentage of the population residing in an urban area
- The per capita income in the area
- The educational attainment of the population in the area
- The population teleworking in the area
- The age of the population in the area
- The distance to a metropolitan area with a population of 250,000 or more

¹⁵US GAO, GAO-06-426, May 2006, Telecommunications: Broadband Deployment Is Extensive throughout the United States, but It Is Difficult to Assess the Extent of Deployment Gaps in Rural Areas,” at 4 (<http://www.gao.gov/new.items/d06426.pdf>).

¹⁷ *Ibid.*, 46.

¹⁸ Michael Mazerov, “The Internet Tax Freedom Act and the Digital Divide,” Center on Budget and Policy Priorities, Sept. 26, 2007, at 6 (<http://www.cbpp.org/files/9-11-07sfp.pdf>) (while this paper assesses the impact of taxation for Internet services, we contend that rights-of-way access fees represent a similar modest cost relative to the cited factors influencing deployment).

- Whether the state in which the area is located imposed a tax on Internet access”¹⁹

Frankly, in our experience, there is almost nothing that any local government can do to encourage carrier build-out of advanced networks where the carrier does not already have a compelling business interest and business plan to achieve the same goal. In fact, we have, with and on behalf of many of our local government clients, approached carriers to request enhanced build-out and to inquire as to how the locality can facilitate and enable such build-out (the effort to request and sometimes plead for carrier investment is almost a universal first step before any locality investigates potential public broadband projects). In both rural and urban areas, the responses have uniformly been negative—even where localities commit to eliminating regulation and fees, we have not seen carriers commit to new investment. In addition, we hear carriers frequently inform the locality that existing facilities adequately meet consumer and business needs, and that no additional investment is necessary.

¹⁹ Ibid, 46-47.

6 Conclusion

Local permitting processes and fees have very small impact on the broadband design and deployment process, in the experience of CTC engineers and analysts, participating in and observing wireline broadband deployment across the United States over two decades. In fact, the permitting process and local government coordination can help and facilitate deployment. When it is done effectively, it protects the integrity of existing infrastructure and provides opportunities for joint trench construction and other economies of scale.

The optimal way to facilitate and smooth the permitting process is for carriers to work with localities to prepare for, anticipate, and stage the permitting process. Carriers can help themselves through reasonable collaborative practices such as joint advance planning of the application process, reasonable staging of application filing (rather than filing large numbers all at once and expecting government staff to process them overnight), and filing of complete and accurate applications.

It is our experience that localities are highly motivated to facilitate and incentivize broadband build-out, and that they are willing to use the permitting and other processes to enable and smooth the deployment process as much as possible. Broadband acceleration can best be achieved if carriers undertake a similarly collaborative, constructive engagement with localities.