

Attachment 1



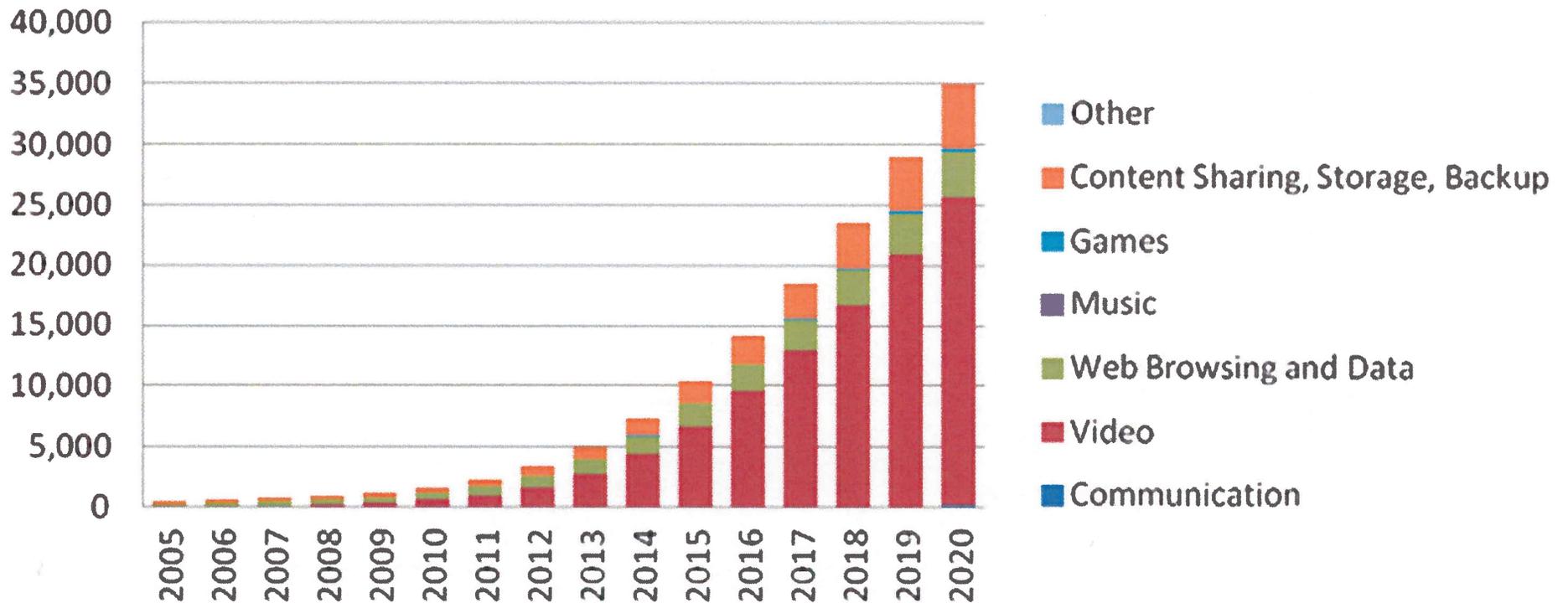
FTTP Feasibility Study
for
The City of Beverly Hills

Updated November 2015

Uptown Services, LLC
Dave Stockton & Neil Shaw, Principals

- ◆ Specialized consulting firm focused on municipal broadband
 - ❖ Formed in 1997 by former broadband and telecom senior managers
 - ❖ Over 70 broadband and smart grid clients ranging from 3,500 to 250,000 households
- ◆ Offer full spectrum of broadband and smart grid related services
 - ❖ Feasibility studies
 - ❖ Engineering & System Design
 - ❖ Implementation
 - ❖ Business plans, operational reviews and strategic planning
- ◆ Demonstrated Expertise
 - ❖ Completed over 40 feasibility studies. Our studies have backed over \$220M in funding to build new fiber networks.
 - ❖ Launched 6 fiber systems as part of the start-up team .
 - ❖ We have either completed or are under contract to design over 1,500 miles of plant and 100,000 passings.
 - ❖ Fee-only firm providing unbiased direction to clients

Monthly Wireline Internet Traffic by Category, PetaBytes



Source: Nokia Solutions and Networks analysis, 2014

Fiber To The Premises

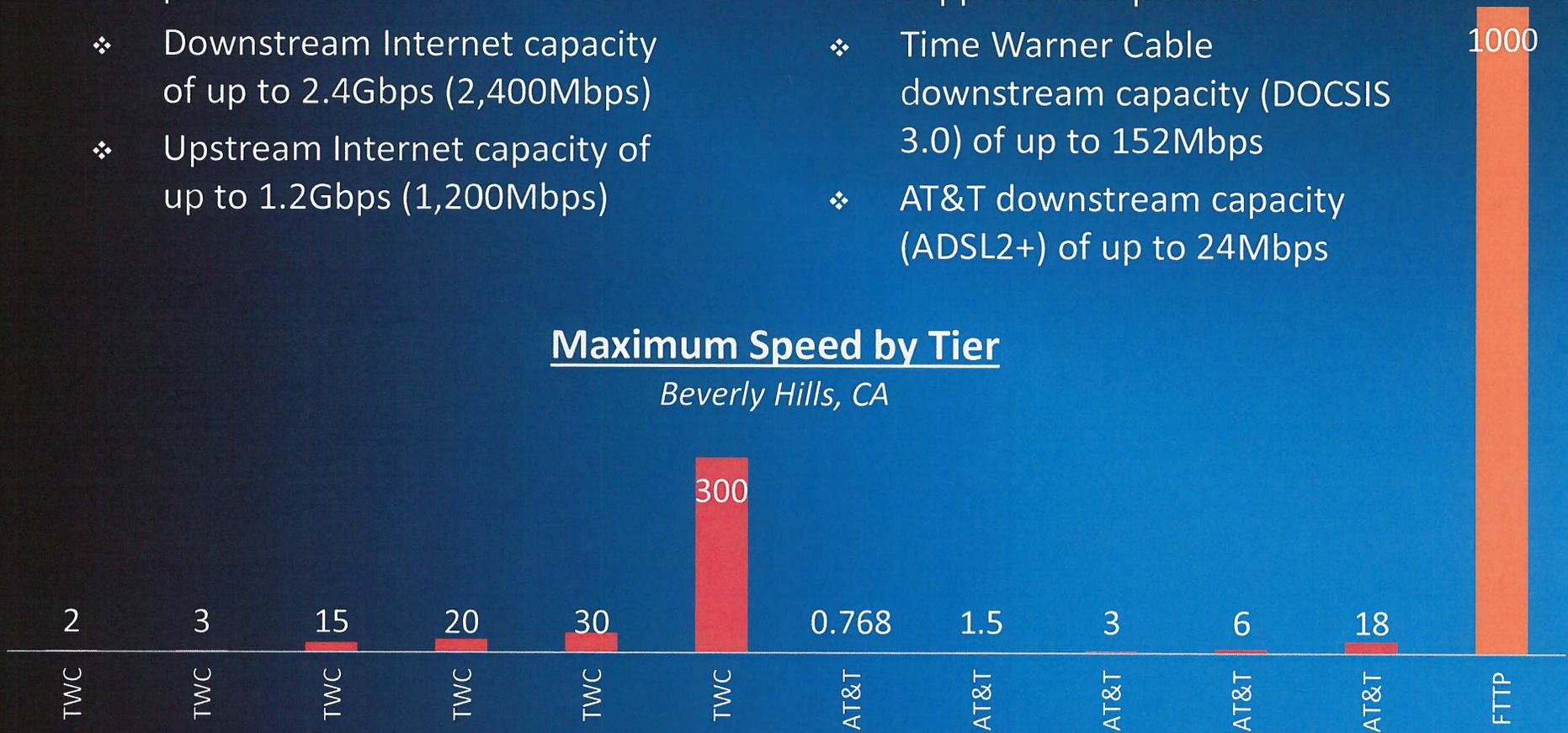
- ❖ 100% fiber network to the premise
- ❖ Downstream Internet capacity of up to 2.4Gbps (2,400Mbps)
- ❖ Upstream Internet capacity of up to 1.2Gbps (1,200Mbps)

Cable Modem & DSL

- ❖ Fiber to the node, then coax or copper to the premise
- ❖ Time Warner Cable downstream capacity (DOCSIS 3.0) of up to 152Mbps
- ❖ AT&T downstream capacity (ADSL2+) of up to 24Mbps

Maximum Speed by Tier

Beverly Hills, CA



- ◆ Determine financial impacts of deploying fiber to the premises (FTTP)
 - ❖ Build baseline financial pro forma
 - ❖ Evaluate sensitivities and alternate scenarios
- ◆ Market Research / Revenue Model
 - ❖ Demand estimates based on results of primary market research
 - ❖ Product, packaging and pricing strategies based on competitive analysis of local market
- ◆ Operating Expense
 - ❖ Combined local costs and Uptown client deployment experience
 - ❖ Cost of goods sold, staffing and SG&A
- ◆ Capital Budget
 - ❖ Capital budget based on sample designs for local neighborhoods
 - ❖ Unit costs based on local construction rates and recent client bid results

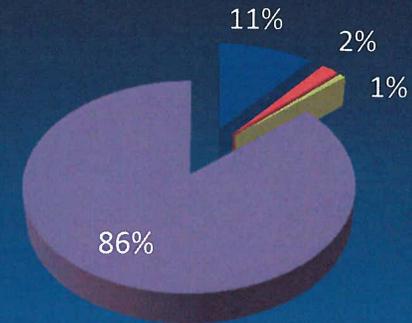
Market Assessment
Current Broadband Services Usage

- ◆ Area of Interest: Universe of \approx 15,000 households (HHs)
 - ❖ Total sample size of 250 respondents
 - ❖ 95% Confidence Interval with \pm 6.15 sample error)
- ◆ Results weighted to reflect Beverly Hills actual age distribution from 2010 Census data.
- ◆ Respondents screened to ensure
 - ❖ Decision-maker for telecommunications and entertainment services in the home
 - ❖ Respondents with immediate family members employed by any of the following were excluded:
 - The City of Beverly Hills
 - AT&T
 - Time Warner Cable

INTERNET SERVICE PURCHASING BEHAVIOR

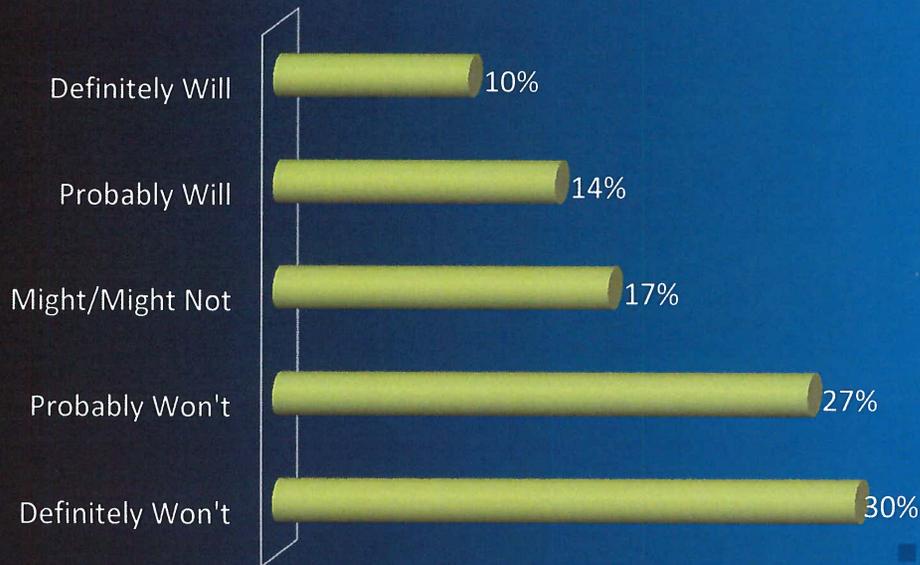
- ◆ 86% of Beverly Hills households use the Internet at home
- ◆ Cable Modem and DSL have the vast majority of market share at 94%

Incidence of Internet Households

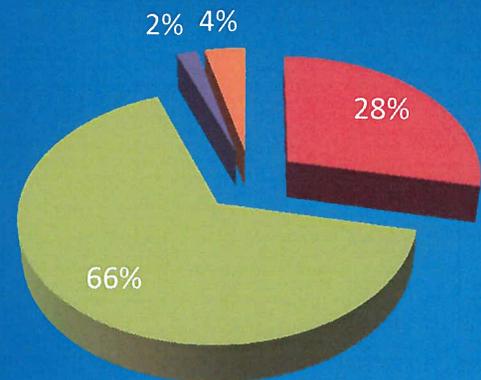


- No PC
- Dial Up
- PC without Internet
- Broadband

Q19: "How likely are you to upgrade your Internet service speed..."



Internet Market Share (Households)

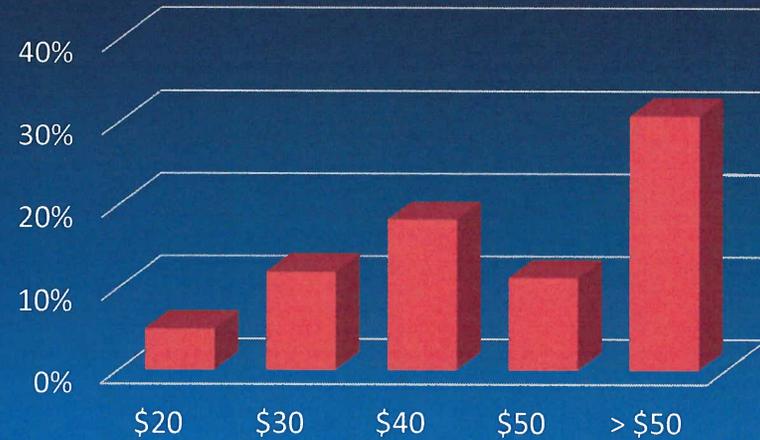


- Dial Up
- DSL
- Cable Modem
- Satellite
- Other

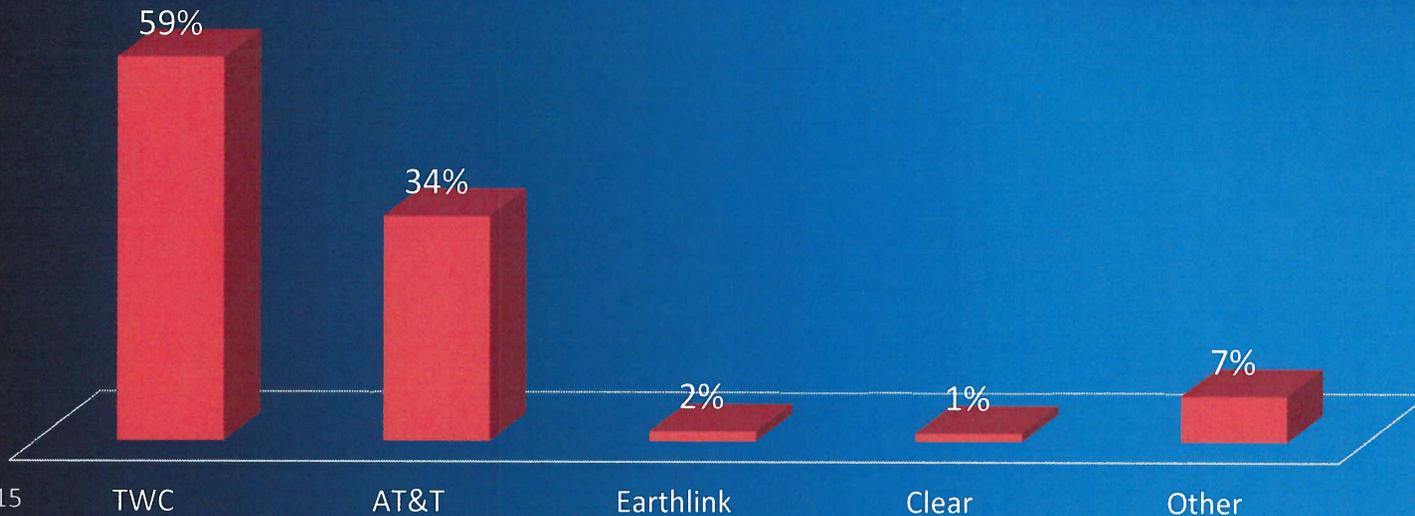
INTERNET SERVICE PURCHASING BEHAVIOR

- ◆ TWC and AT&T are the only two ISPs with material market share in Beverly Hills
- ◆ *Stated* average monthly Internet spend is \$39 per household

Monthly Internet Spend



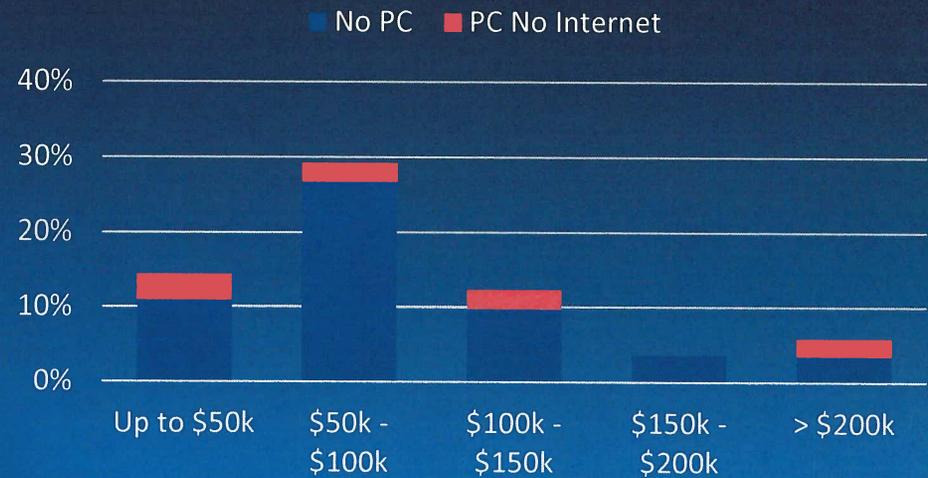
Internet Access Provider



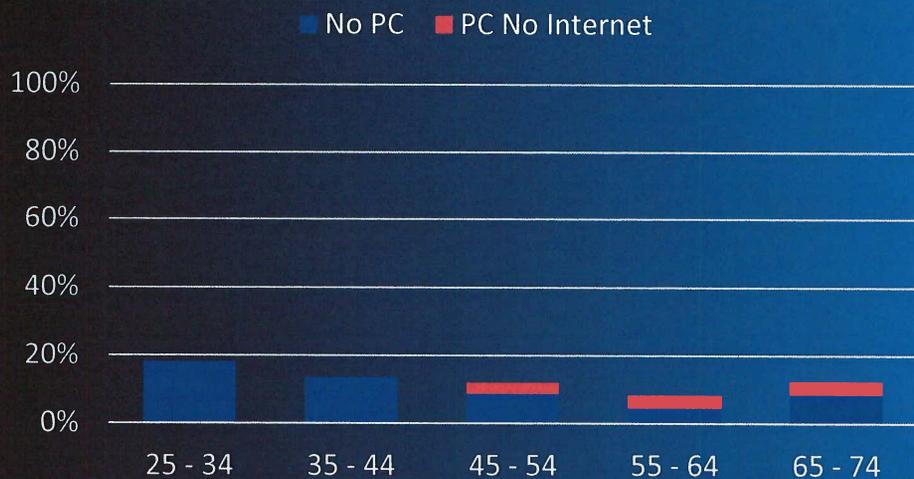
INTERNET USAGE BY HOUSEHOLD DEMOGRAPHIC

- ◆ The presence of a PC and use of Internet in the home drops off at lower income levels (non-pays)
- ◆ Internet usage is prevalent across all age groups

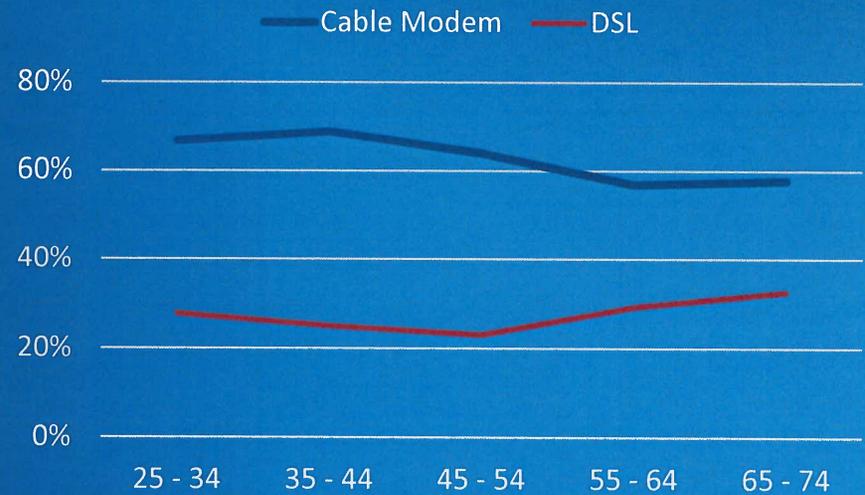
Incidence of No PC/No Internet by Income



Incidence of No PC/No Internet by Age



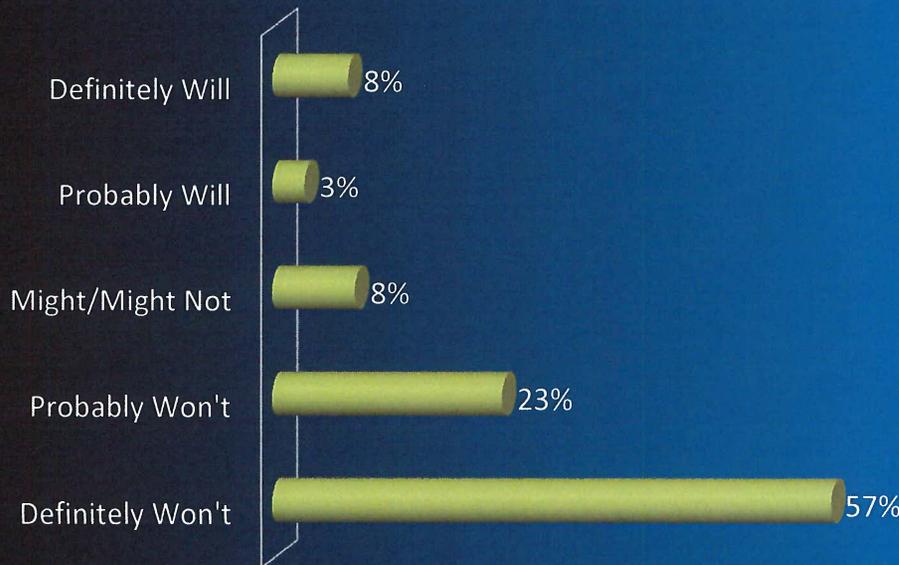
Internet Type by Age



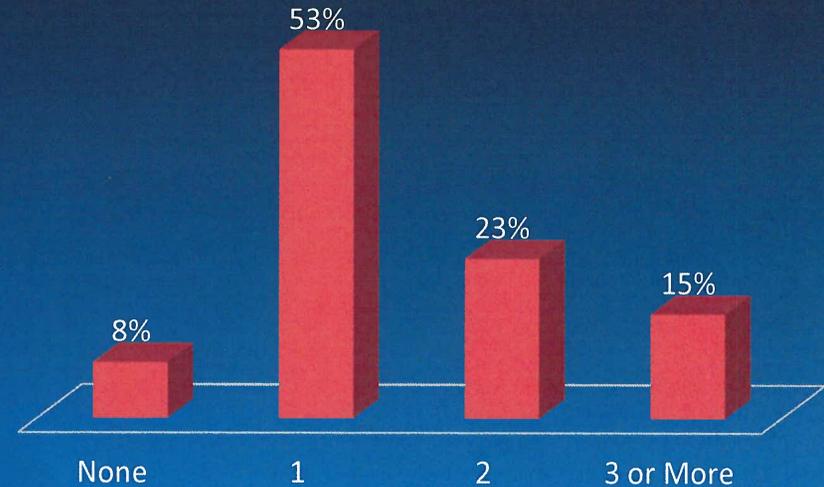
WIRELINE PHONE MARKET SHARE

- ◆ The average number of lines is:
 - ❖ All Households: 1.5
 - ❖ Wireline Households: 1.6
- ◆ Wireless substitution is much lower than the national average
- ◆ A further 7% of wireline phone users will drop for wireless in the next 12 months

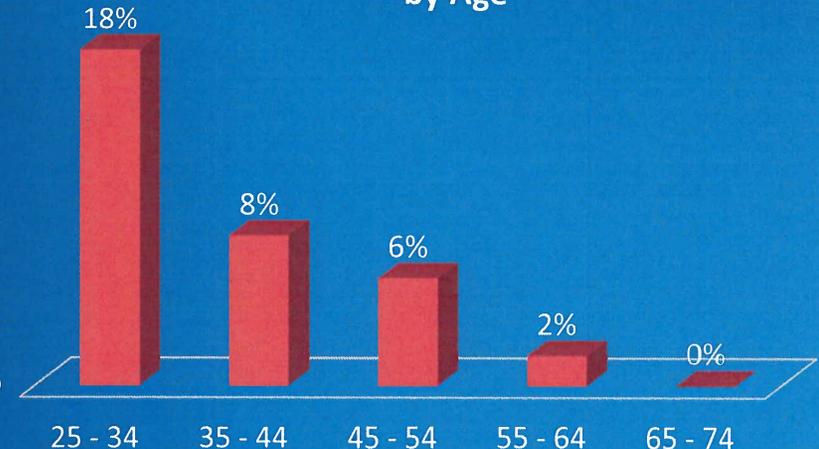
Q13: "How likely are you to disconnect the wired phone line and only use your cell..."



Number of Phone Lines in the Home



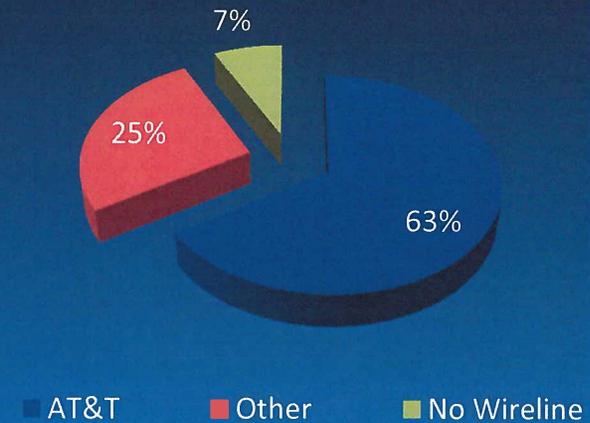
Households Without Wireline Phone Service by Age



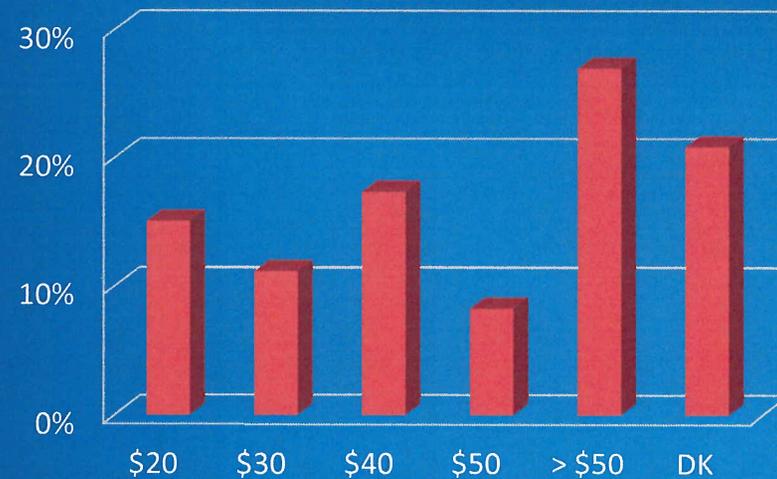
- ◆ AT&T still retains market share leadership of the residential voice market
- ◆ *Stated* residential spending on local phone service averages about \$35 monthly per HH

VOICE SERVICES USAGE

Q9: "Who is your local phone service provider?"



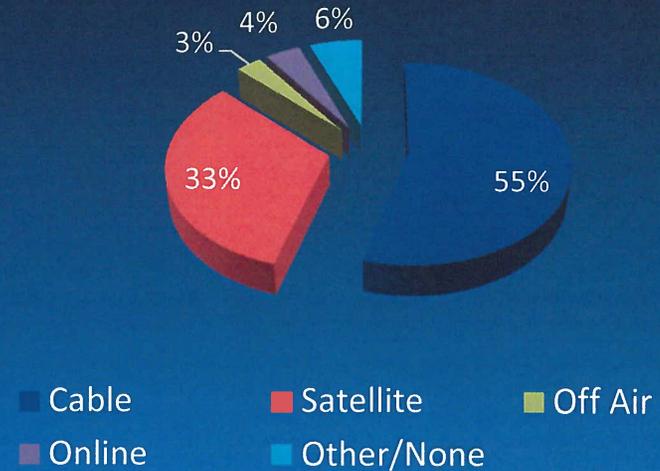
Monthly Local Phone Spending



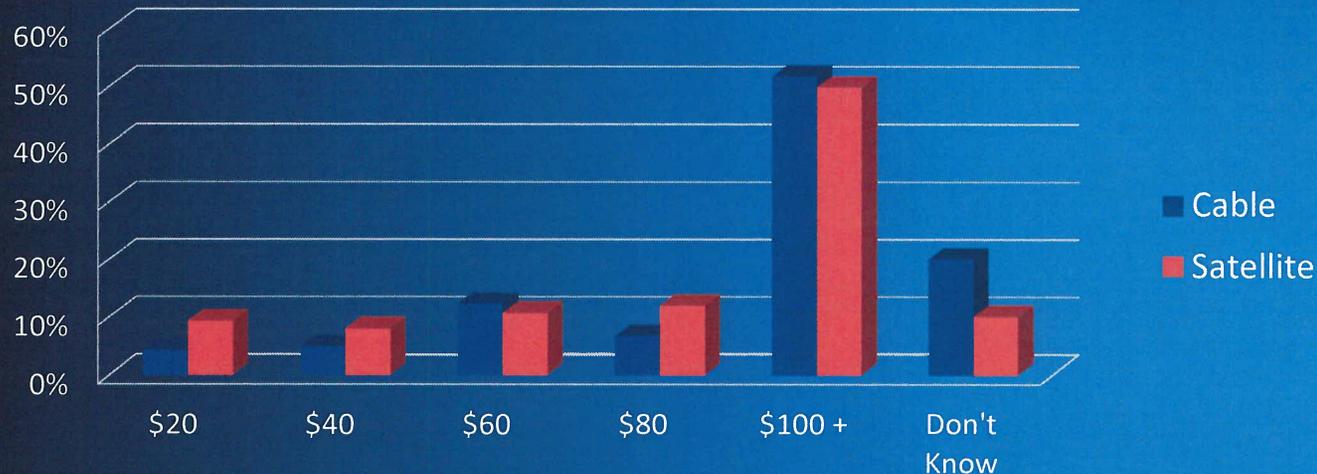
VIDEO SERVICES PURCHASING BEHAVIOR

- ◆ 88% of households use traditional pay TV (cable or satellite dish)
- ◆ In Beverly Hills today, 4% of households are using online video
- ◆ Another 3% are using Off Air reception without supplemental Pay TV service
- ◆ Stated average monthly spend:
 - ❖ Cable: \$67
 - ❖ Satellite: \$71

Q2: "For TV service, do you have..."



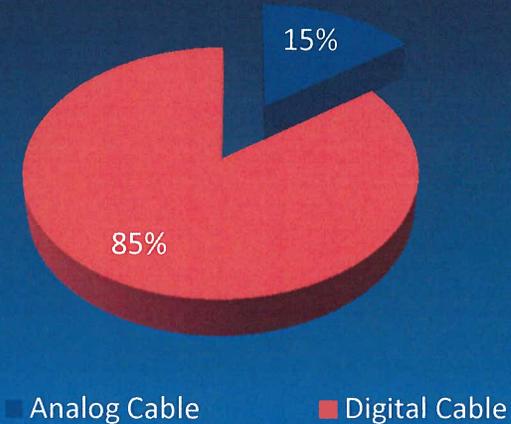
Monthly Pay TV Spend



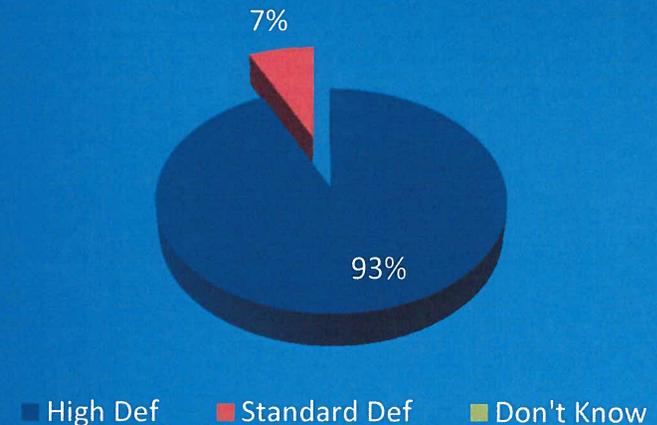
TRADITIONAL VIDEO SERVICES

Q3: "For cable, do you have..."

- ◆ Beverly Hills digital video penetration:
 - ◆ 86% among all Pay TV users
 - ◆ 68% among Cable TV users
- ◆ High definition service is 63% of pay TV users
- ◆ Uptown estimates a further 7% of pay TV users will upgrade to HD in the next 12 months (Q5):
 - ❖ Definitely Will: 2%
 - ❖ Probably Will: 13%
 - ❖ Might/Might Not: 17%



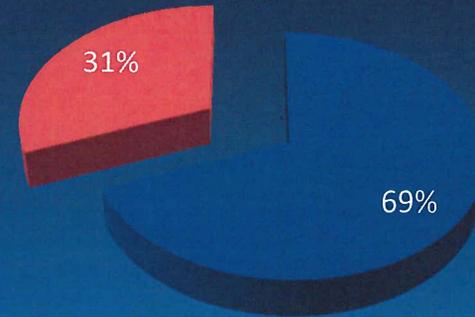
Incidence of High Definition TV
(among all pay TV users)



- ◆ Over-the-Top (OTT) or online TV viewing has recently become a material substitute service for traditional cable TV with a majority of households using OTT
- ◆ Among younger households, up to 9% are using OTT as a substitute service
- ◆ Uptown estimates a further 7% of pay TV users in Beverly Hills will 'cut the cord' in the next 12 months

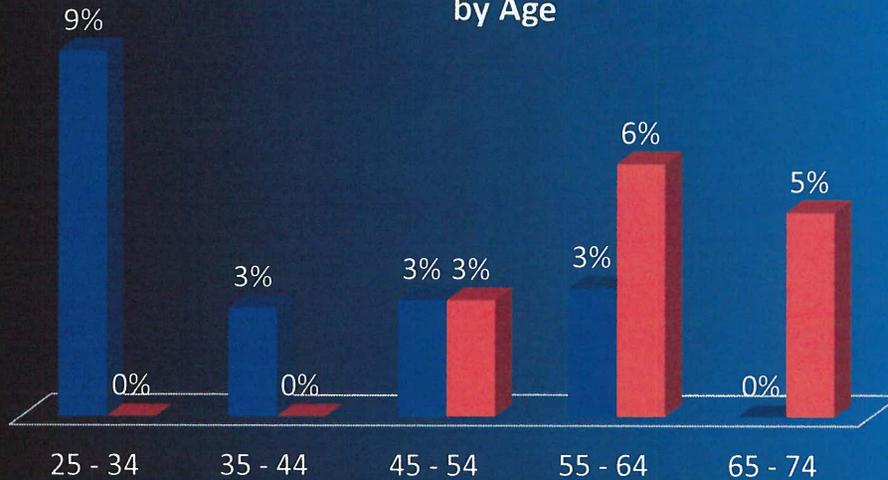
EMERGING VIDEO SERVICES

Q7: "Do you sometimes watch TV online?"



■ Yes ■ No ■ Don't Know

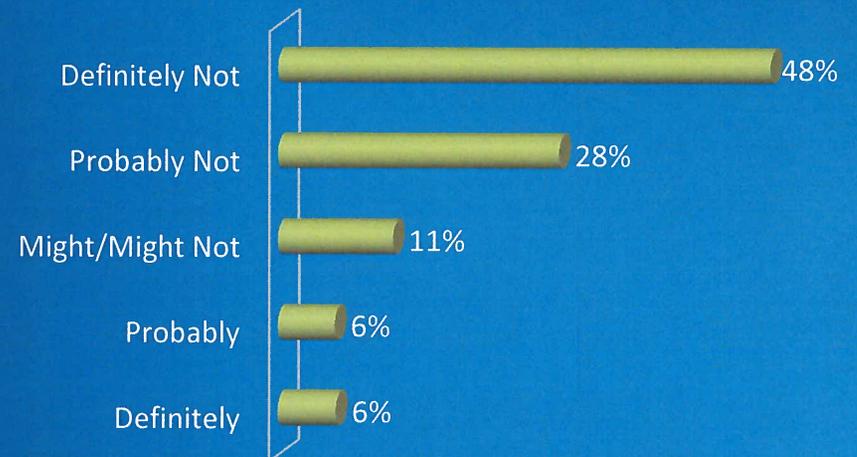
Households Watching TV Online In Place of Pay TV by Age



12/10/2015

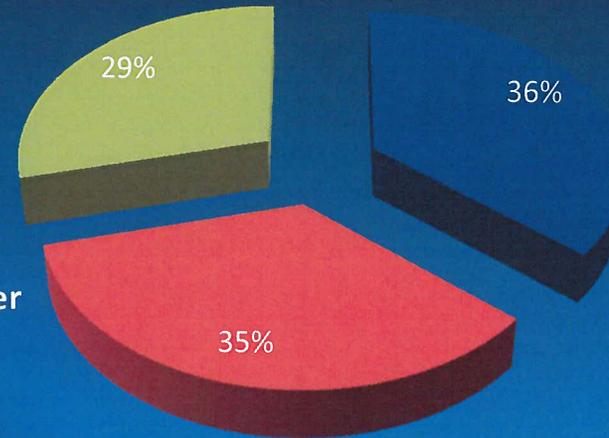
■ Online ■ Off-Air

Likelihood of Cancelling Pay TV for OTT (among all pay TV users)



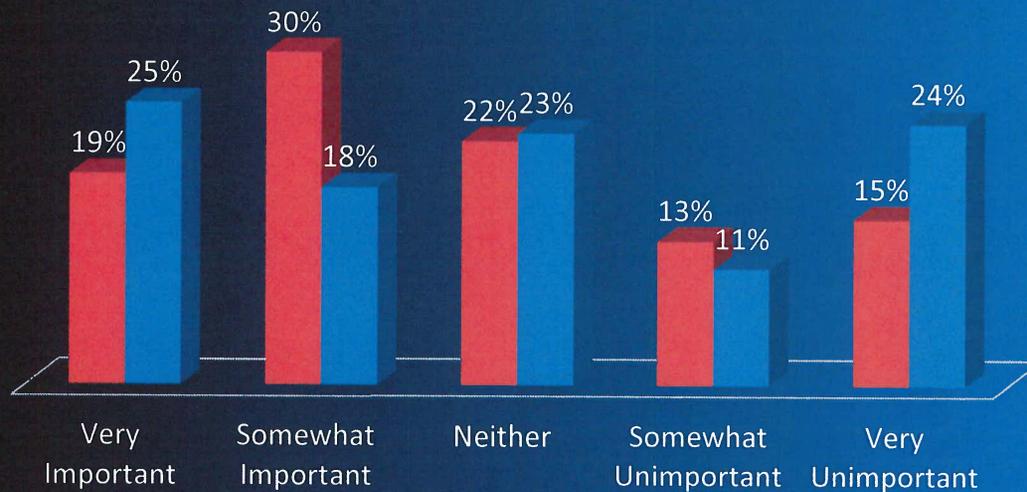
- ◆ Across all households in Beverly Hills, 35% have all 3 services from a single provider
- ◆ Bundling is very important for 1 in 4 households

Incidence of Triple Play Bundle



Importance of Having All 3 Services from a Single Provider
(Among All Respondents)

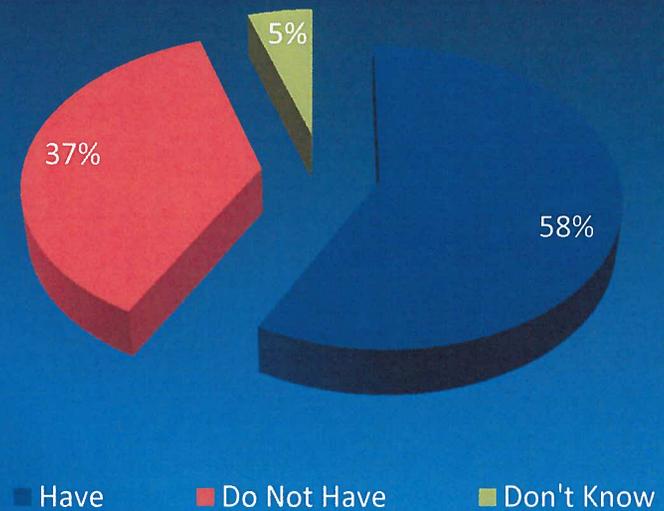
■ Longmont ■ Beverly Hills



■ Have All 3 Services From Multiple Providers
 ■ Have All 3 From Single Provider
 ■ Do Not Have All 3 Services

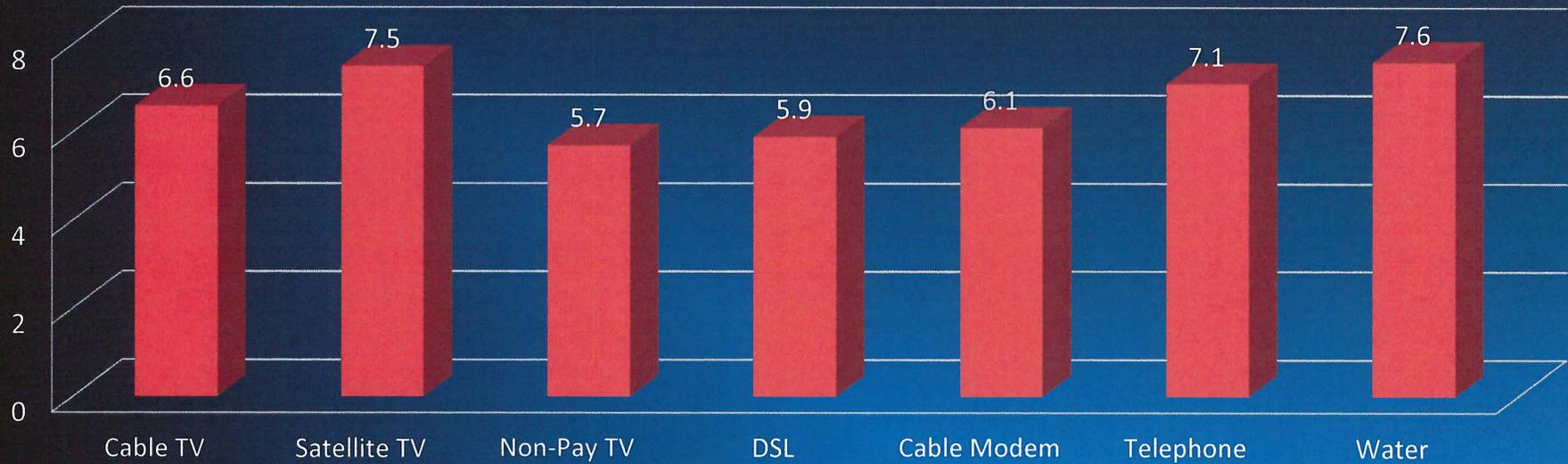
- ◆ There is a 58% incidence of Home Security/Monitoring in Beverly Hills

Incidence of Home Security System

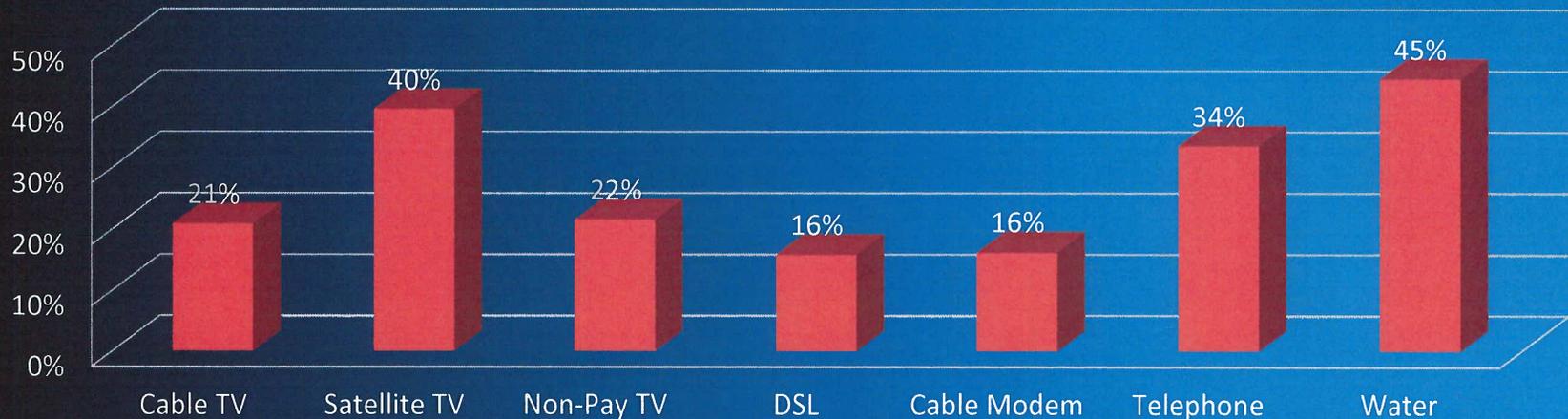


SATISFACTION RATINGS

Satisfaction Rating by Service/Service Provider
(Mean Rating on a 1-10 Scale)



Satisfaction Rating by Service/Service Provider
(Percent Rating a '9' or '10')



SATISFACTION RATING BENCHMARKS

- ◆ The chart below compares the results of this study with 22 other markets where Uptown has completed similar quantitative research:

Northern Ohio (2)

Washington (state)

North Carolina

Oregon

Southern Ohio

Wisconsin

Kansas (2)

Alabama

Georgia

Oklahoma (2)

New York

Arkansas

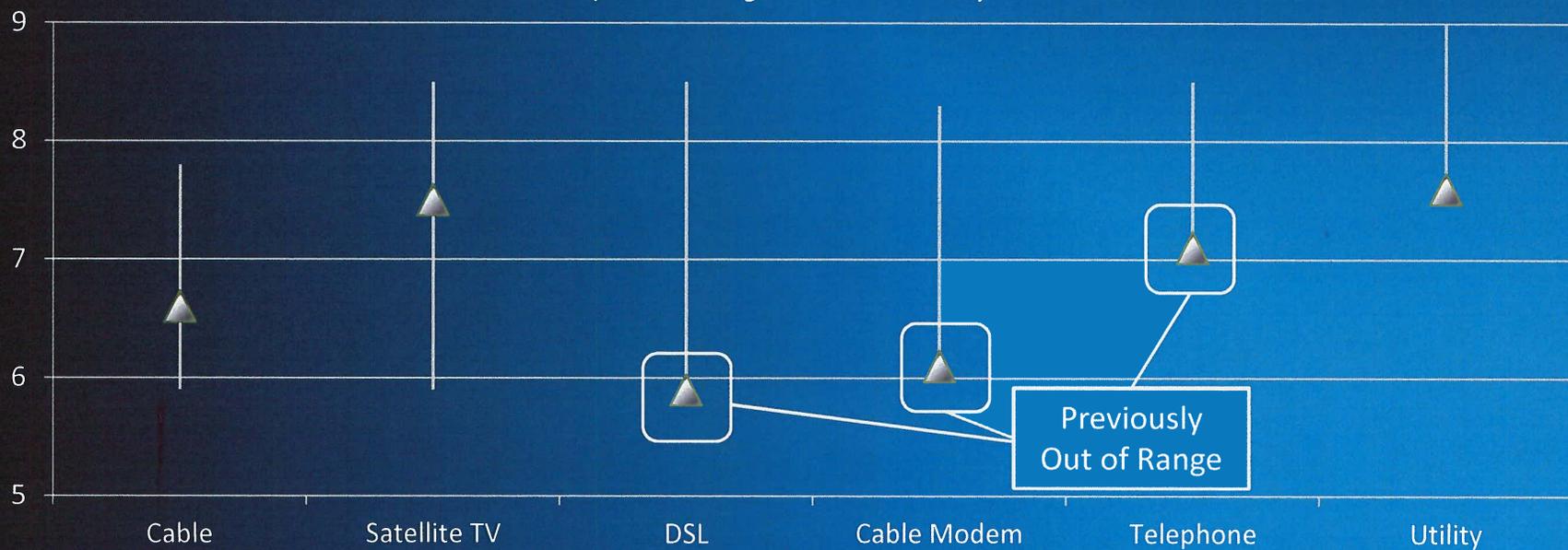
Tennessee (3)

Michigan

Kentucky

Colorado (2)

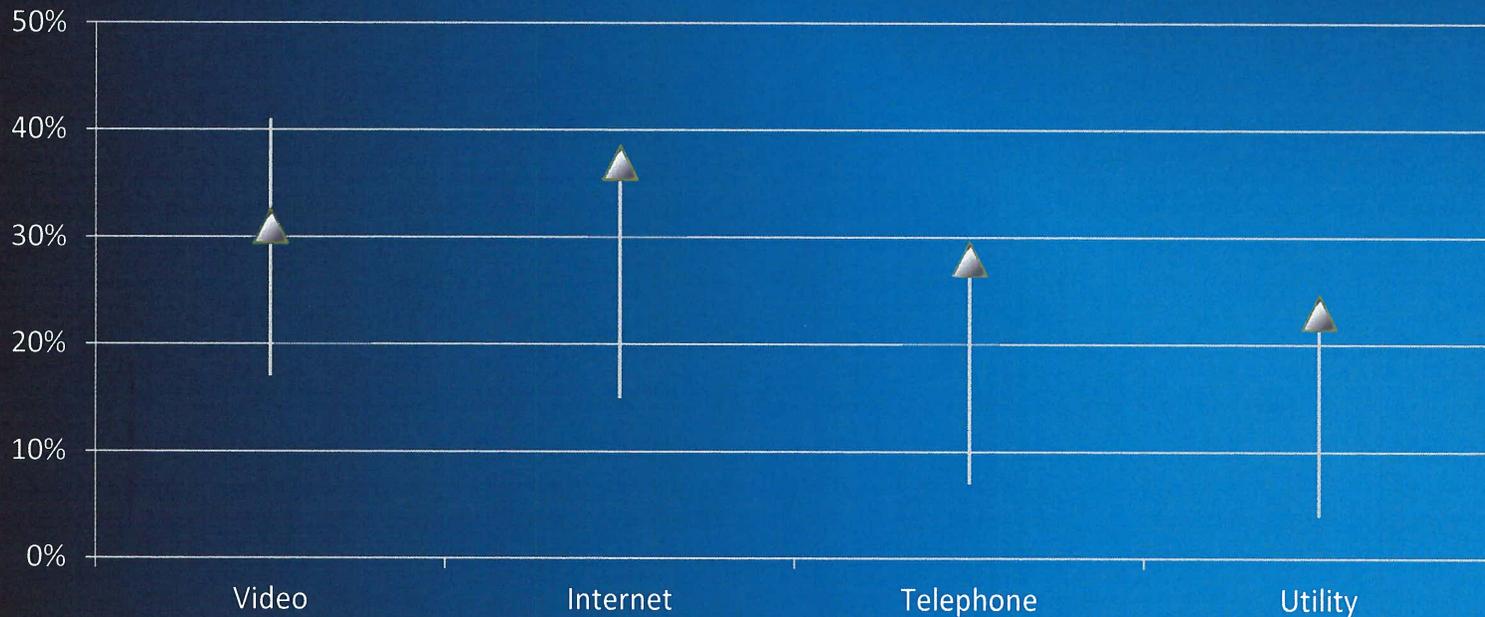
Satisfaction Rating by Service/Service Provider
(Mean Rating on a 1 to 10 Scale)



INCIDENCE OF DISSATISFIED USERS

- ◆ The incidence of dissatisfied consumers (those who rated their satisfaction from 1 to 5 on a scale up to 10)
 - ❖ All TV: 31%
 - ❖ All Internet: 37% (new high)
 - ❖ Telephone: 28% (new high)
 - ❖ Utility: 23% (new high)

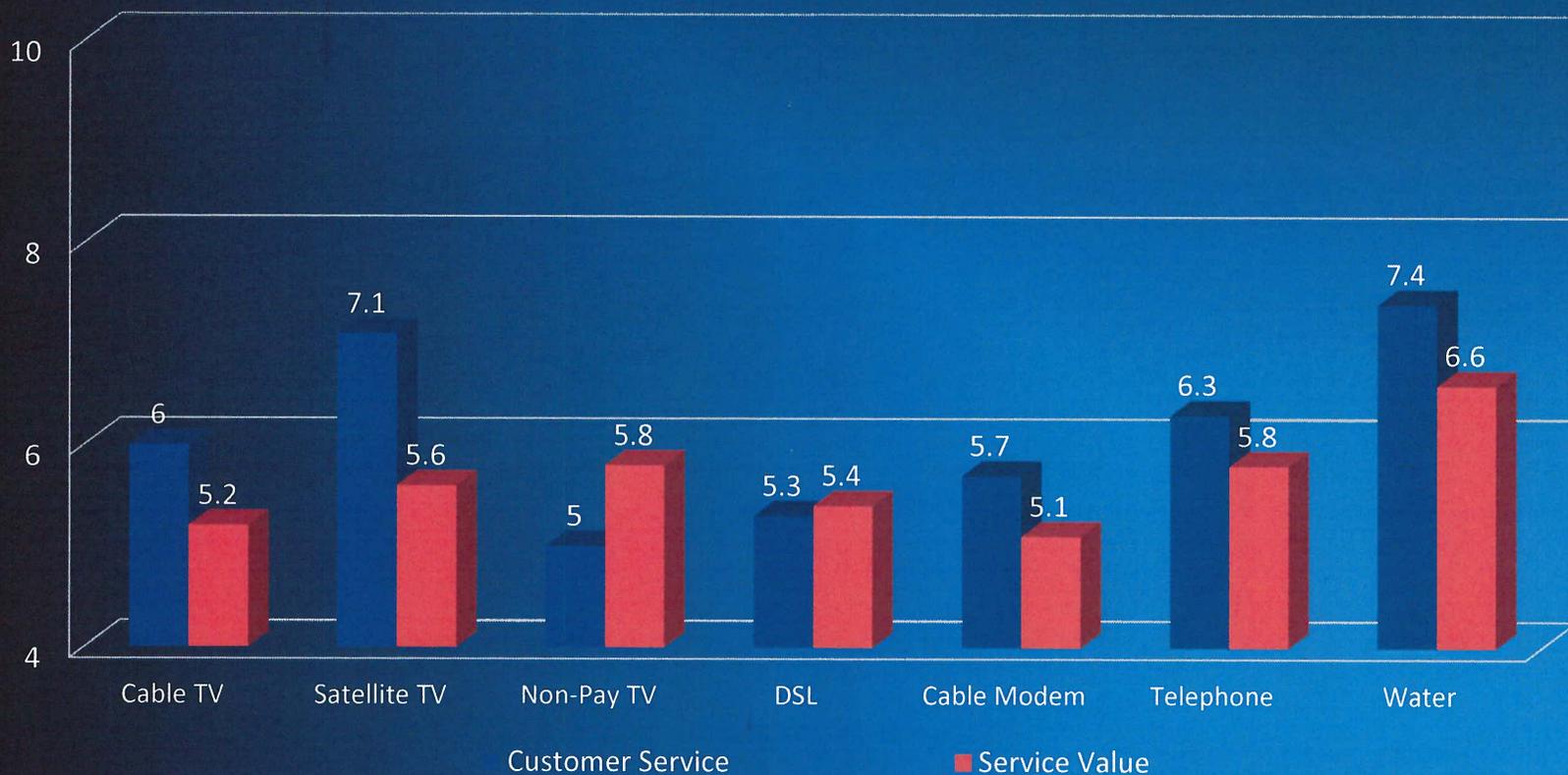
Incidence of Dissatisfied Users by Service
(Percent Rating Between a '1' and '5' on a 1-10 Scale)



INFLUENCERS OF SATISFACTION

- ◆ Across providers, price is the greatest source of service dissatisfaction, but most notably with Pay TV...

Satisfaction Rating by Service/Service Provider
(Mean Rating on a 1-10 Scale)



ATTRIBUTE IMPORTANCE

- While reliability and price are always important, Internet speed has dramatically increased in importance over the last several years. Bundling and Brand are secondary in importance to other attributes...

Importance Rating of Select Broadband Service Attributes
(Mean Rating on a 1-5 Scale)



IMPORTANCE OF DOWNLOAD VS. UPLOAD

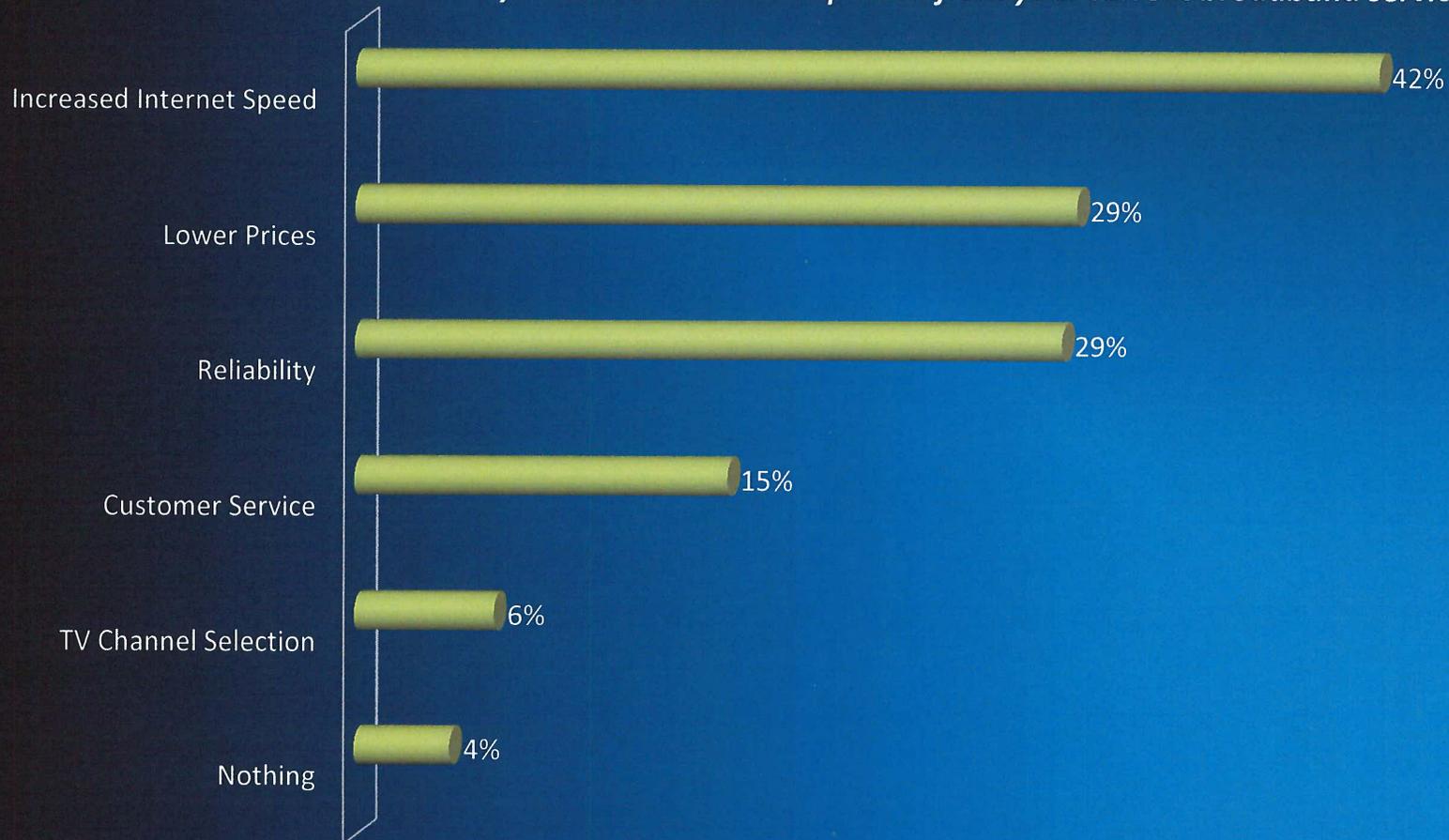
◆ Question 40: “What aspect of Internet speed is most important?”

Importance of Internet Speed on Download vs. Upload



- ◆ Increased Internet speed dominates the wish list for services improvement as Internet speed has gained importance...

Q39: "What would you like to see most improved from your current broadband services?"



BENCHMARKED CUSTOMER NEEDS

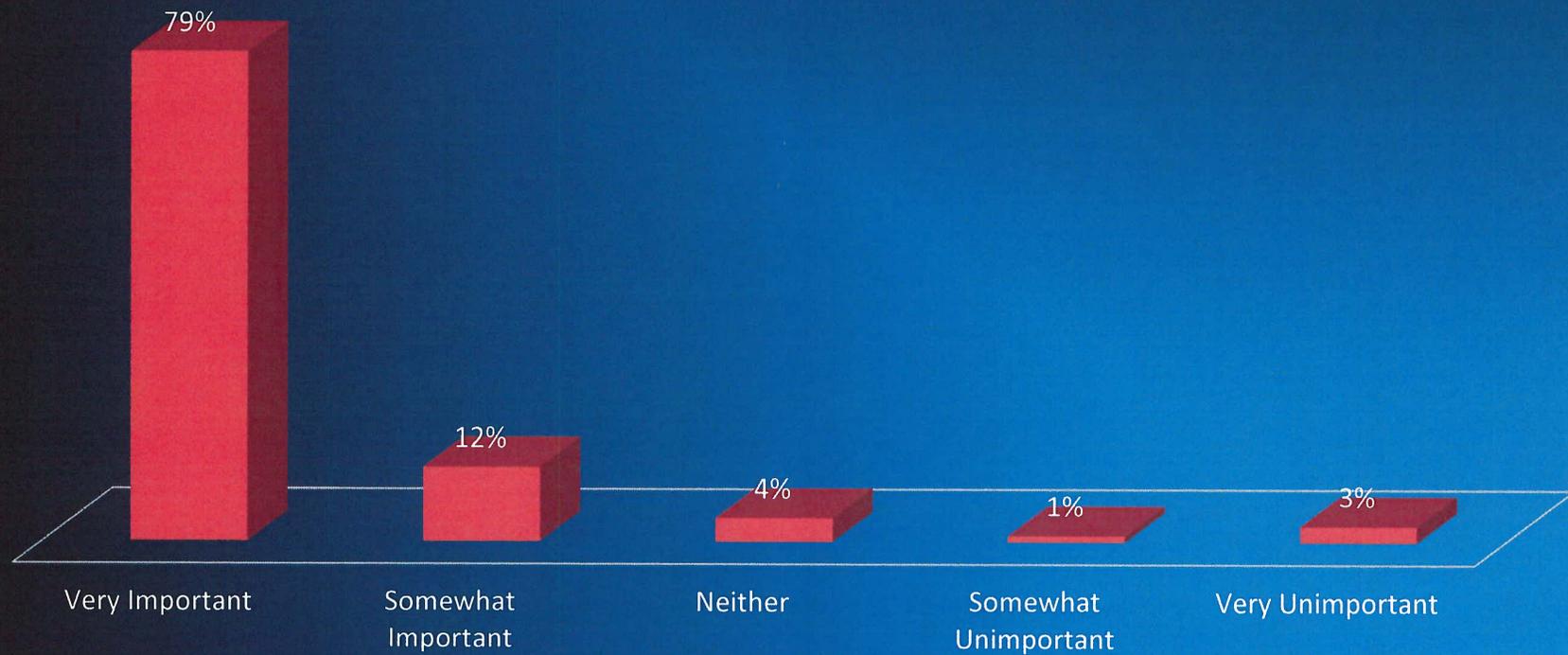
Q39: "What would you like to see most improved from your current broadband services?"



IMPORTANCE OF LOW COST HIGH-SPEED INTERNET

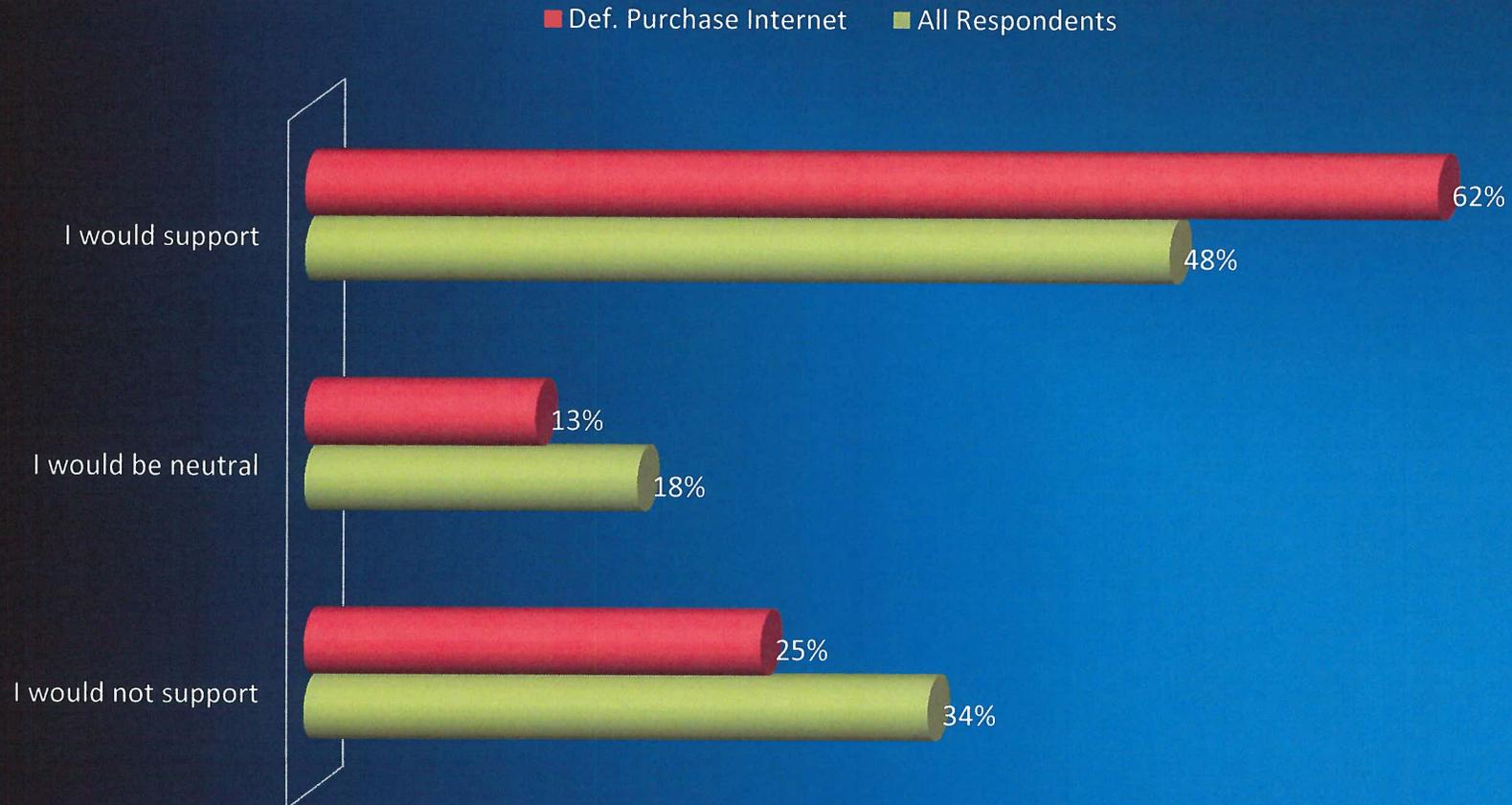
- ◆ Question 37: “In your opinion, is the availability of low-cost, high-speed Internet important to the future local economy?”

Importance of Having Low Cost High-Speed Internet



- ◆ About two-thirds of respondents support or are neutral to paying a monthly \$5 surcharge to help fund the new fiber network...

Q41: "Would you support adding a \$5 monthly fee to your water bill to partially fund the construction and operation of this network for the first 3 years of operation?"

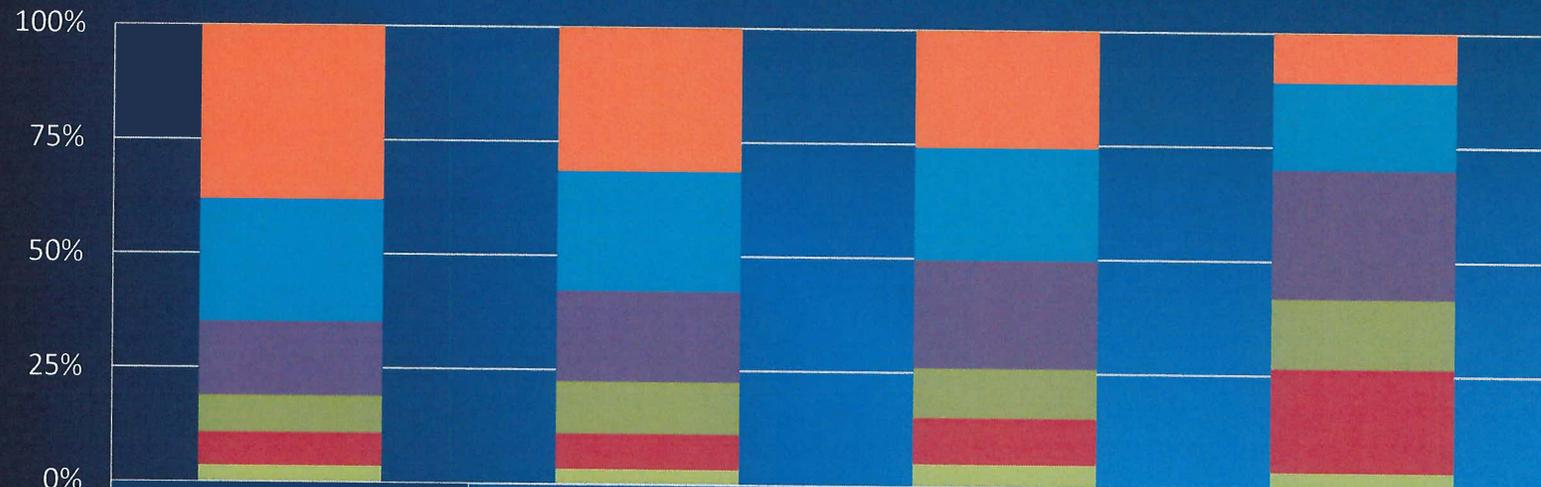


Market Assessment

FTTP Market Potential

- ◆ 65% of respondents indicated they would definitely or probably switch to the FTTP system for Internet service...

Q32-35: "How likely would you be to subscribe to [insert service] if it were 10% less than [insert incumbent provider] charges?"



	Internet	Phone	Video	Home Security
Definitely	38%	32%	26%	11%
Probably	27%	26%	25%	19%
Might/Might Not	16%	20%	24%	28%
Probably Not	8%	11%	11%	15%
Definitely Not	7%	8%	10%	23%
Don't Know	4%	3%	5%	4%

PENETRATION CALCULATIONS

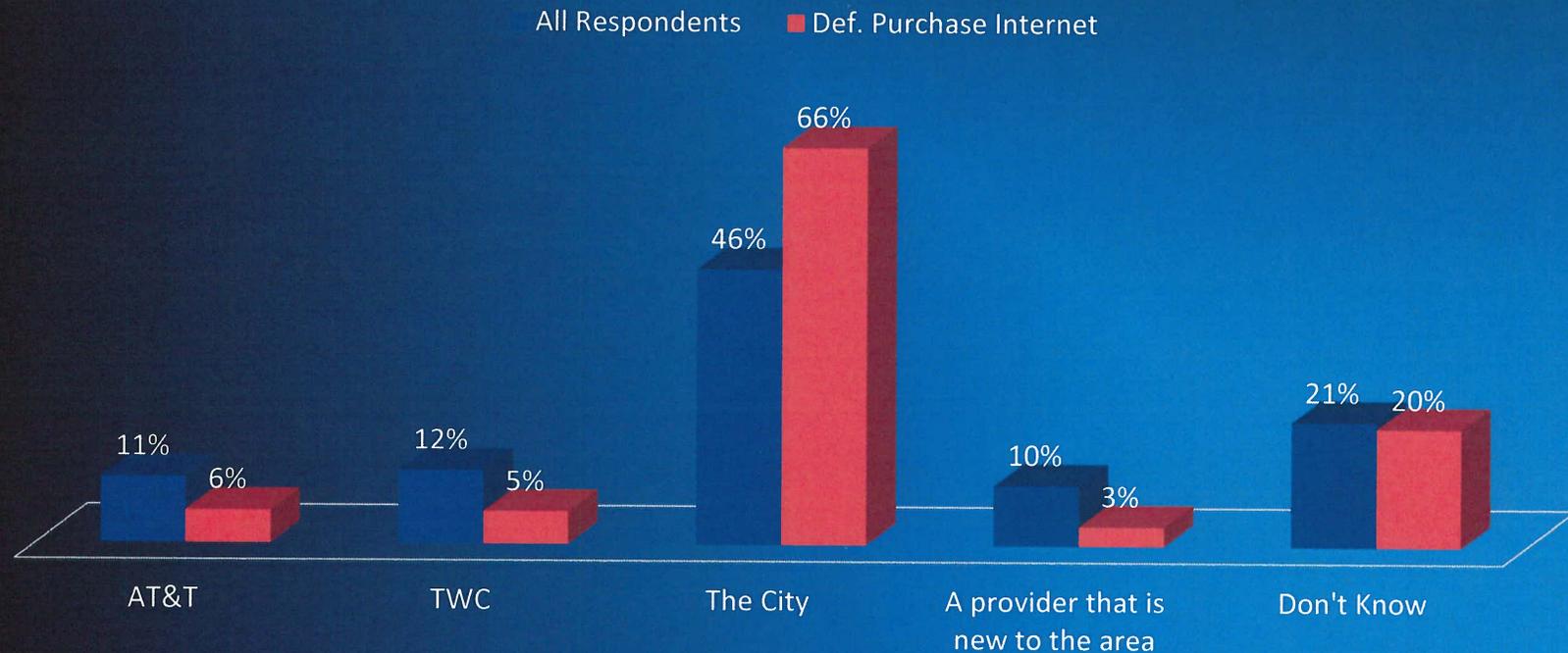
- ◆ Uptown uses a ‘Likert Scale’ with Overstatement Adjustment
 - ❖ Conservative research techniques from the Packaged Goods sector
 - ❖ Clearly specify purchase intent vs. “interest” and removes overstatement bias
- ◆ Example: “How likely would you be to subscribe?”

❖ Definitely Would	21.5%	x 70% =	15.0%	
❖ Probably Would	35.6%	x 30% =	10.7%	
❖ Might/Might Not	20.0%	x 10% =	<u>2.0%</u>	
❖ Probably Would Not	10.4%			27.7% = Penetration Estimate
❖ Definitely Would Not	4.4%			
❖ Don't Know	8.1%			

	Residential	Small Business
Video	27.7%	0%
Internet	36.3%	30%
Telephone	31.9%	25%
Home Security	0 (16.1%)	0%

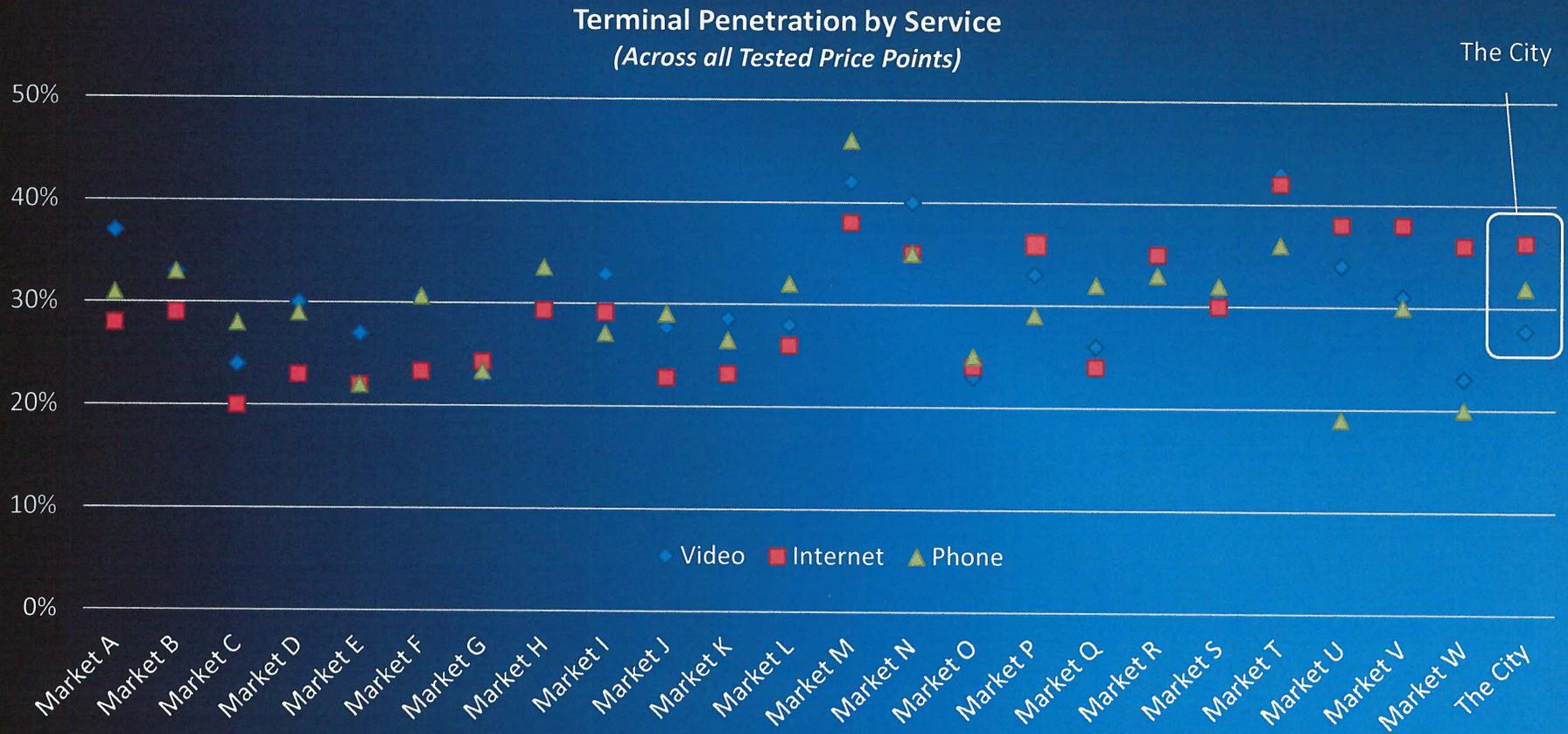
- ◆ The majority of respondents, when given the choice, would prefer to receive high speed Internet from a new service provider...

Q36: *“Among the following list of potential providers, who would you prefer to receive high-speed Internet service from?”*



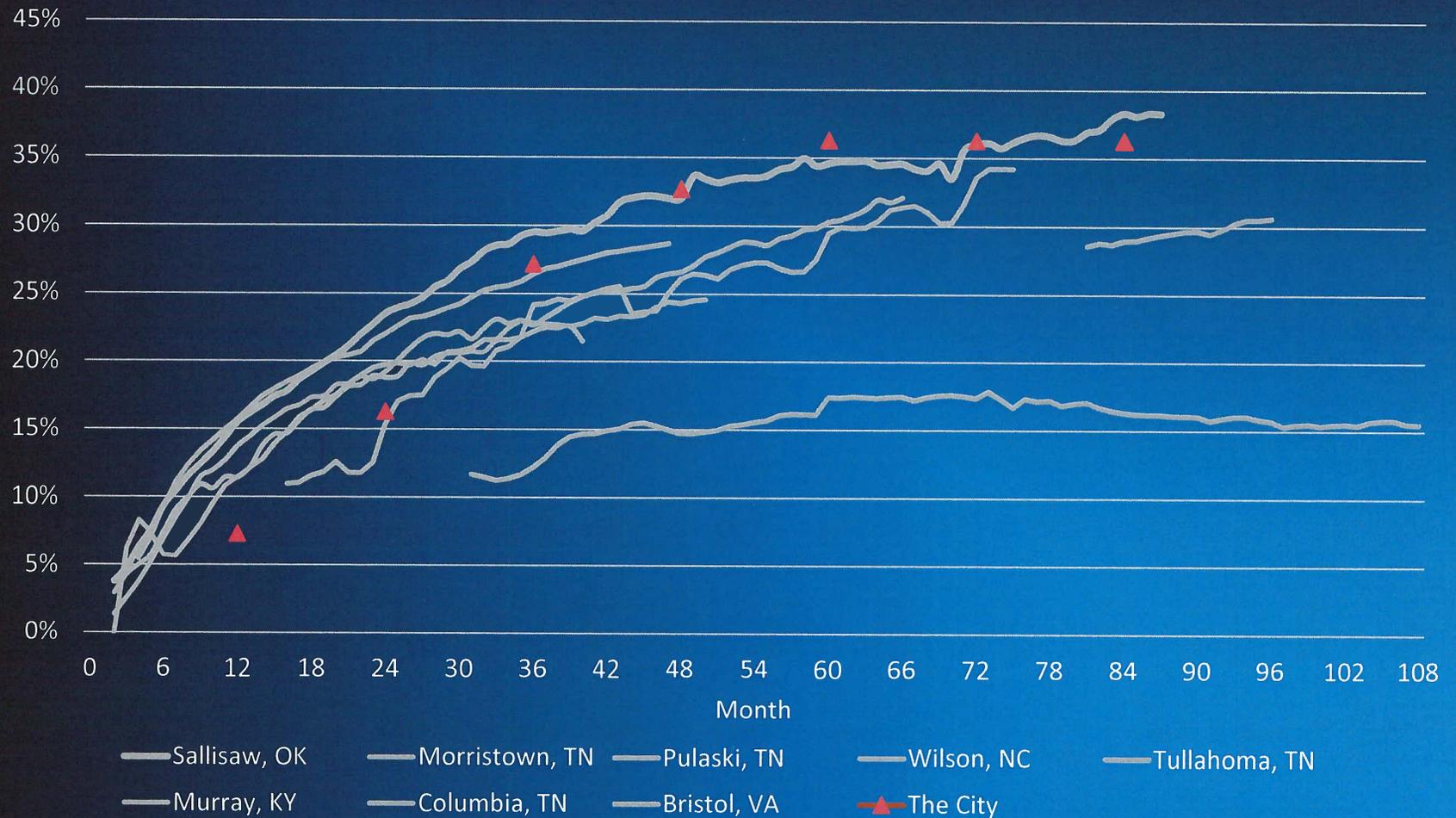
PURCHASE INTENT BENCHMARKING

- ◆ Penetration estimates are strong for all 3 services compared to the other markets for which Uptown has completed quantitative forecasting...



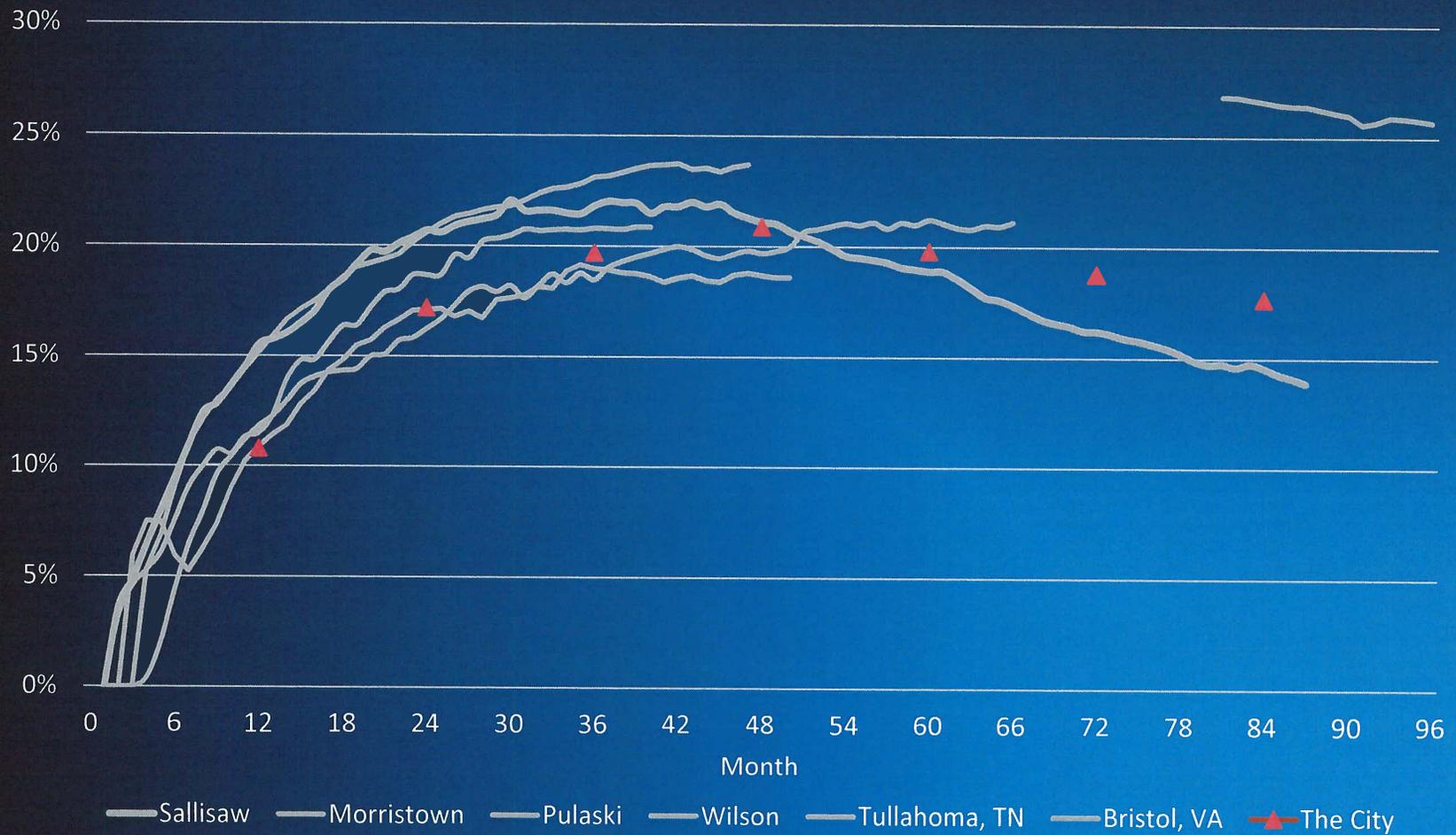
INTERNET PENETRATION OF MUNI OVERBUILDERS

Internet Penetration
(By Month Since Launch)



VOICE PENETRATION OF MUNI OVERBUILDERS

Phone Penetration
(By Month Since Launch)



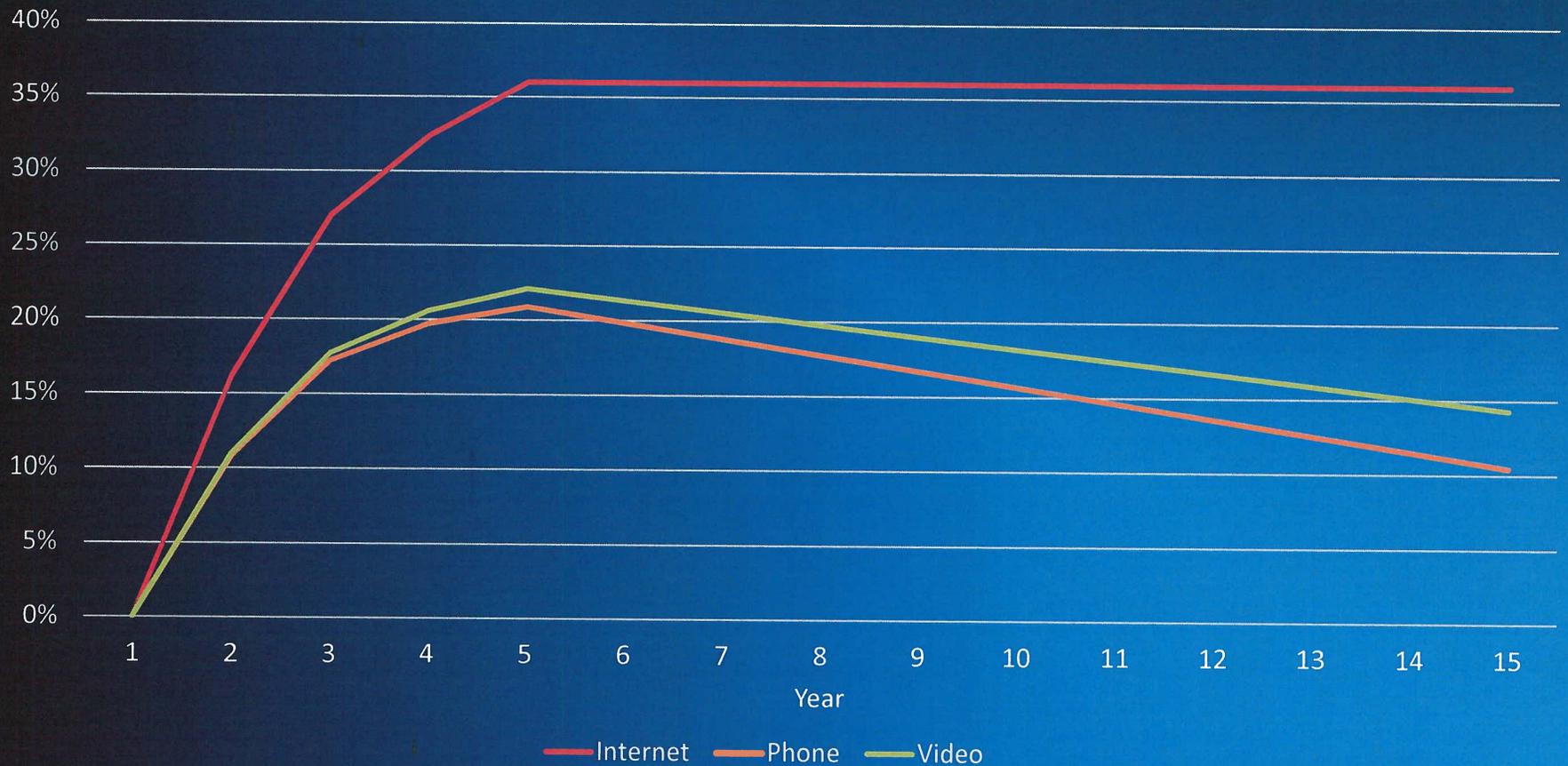
VIDEO PENETRATION OF MUNI OVERBUILDERS

Video Penetration
(By Month Since Launch)



- ◆ Business case projections for voice penetration reflect the quantitative research outcome and reflect ongoing wireless (voice) and OTT (video) substitution within the residential segment...

Service Penetration
(By Year Since Launch)



- ◆ Recognized importance of bandwidth – including symmetrical
- ◆ Much lower wireless substitution rate than national levels
- ◆ Very high rates of dissatisfaction with incumbent providers
- ◆ Strong purchase intent, especially for Internet and Voice
- ◆ Bundling is much higher at 35% (20% in Longmont)
- ◆ Willingness to contribute to funding of the fiber network
- ◆ Preference is for a new provider vs. the City

Services Strategy &
Competitive Assessment



INCUMBENT RESIDENTIAL INTERNET PRICING

	Download	Upload	Price	Technology
TWC	2M	1M	\$15.99	Cable Modem (DOCSIS 3.0)
	3M	1M	\$47.99	
	15M	1M	\$57.99	
	20M	2M	\$67.99	
	30M	5M	\$77.99	
	300M	20M	\$107.99	
AT&T	Up to 768K		\$33.00	DSL
	Up to 1.5M		\$41.00	
	Up to 3M		\$46.00	
	Up to 6M		\$51.00	
	Up to 18M		\$61.00	
WildBlue	12M (10G Cap)	3M	\$49.99	Satellite
	12M (15G Cap)	3M	\$79.99	
	12M (25G Cap)	3M	\$129.99	

Time Warner Cable prices per Services Rates brochure effective September 2014 for Beverly Hills. AT&T rates per att.com effective November 2014. WildBlue rates per wildblue.com effective November 2014.

BH RESIDENTIAL INTERNET PRICING

- ◆ Time Warner Cable has the majority market share and is the competitive benchmark. Target discount level is a minimum of 10%...

BH Download / Upload	BH Price	TWC Download / Upload	TWC Price	BH Discount
25M / 25M	\$39.95	3M / 1M	\$47.99	20%
25M / 25M	\$39.95	20M / 2M	\$67.99	41%
1G / 1G	\$99.95	20M / 4M	-	-
1G / 1G Charter Member	\$49.95	50M / 10M	-	-
Wireless ONT	\$10.00			

Note: Prices reflect providers single-service Internet rate card pricing.

RESIDENTIAL INTERNET VALUE

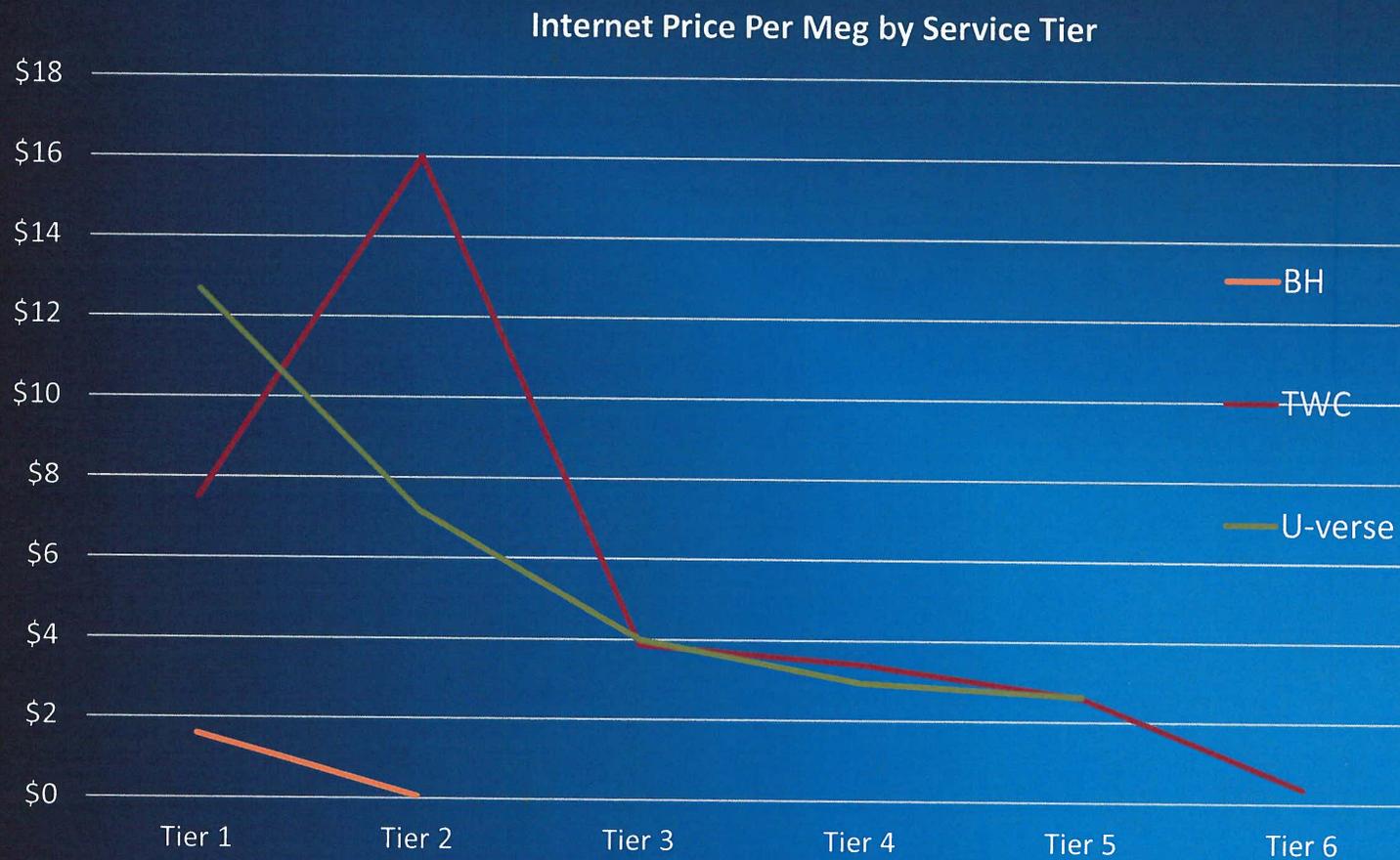
- Current providers are pricing from \$.36-\$27 per Meg for typical residential Internet service. Uptown believes the City could provide retail service as low as \$.05 per Meg...

Internet Downstream Throughput and Price per Mbps
(Incumbents and Proposed BH Tiers)



INTERNET VALUE AMONG COMPETITORS

Lower penetration and greater dispersion at higher tiers is reflective of a lack of value being provided at the entry level tiers...





INCUMBENT COMMERCIAL INTERNET PRICING

	Download	Upload	Price	Technology
TWC	10M	1M	\$99.99	Cable Modem (DOCSIS 3.0)
	12M	1.5M	\$139.99	
	15M	2M	\$189.99	
	35M	5M	\$299.99	
	50M	5M	\$349.99	
	75M	5M	\$452.99	
	100M	5M	\$518.99	
	100M	10M	\$529.99	
	200M	20M	\$599.99	
	300M	20M	\$649.99	
AT&T	Up to 6M (DSL)		\$40.00	DSL & FTTC
	Up to 12M (FTTC)		\$40.00	
	Up to 18M (FTTC)	-	\$70.00	
	Up to 24M (FTTC)		\$80.00	

Time Warner Cable prices per mystery shopping call in November 2014 for Beverly Hills office location. AT&T rates per att.com effective November 2014.



BH COMMERCIAL INTERNET PRICING

BH Download / Upload	BH Price	TWC Download / Upload	TWC Price	BH Discount
20M / 5M	\$59.95	15M / 2M	\$189.99	68%
50M / 10M	\$124.95	50M / 5M	\$349.99	64%
100M / 20M	\$199.95	100 / 10M	\$529.99	62%
250M / 50M	\$399.95	300M / 20M	\$649.99	38%
500M / 250M	\$599.95	-	-	-
1G / 500M	\$799.95	-	-	-

Note: Prices reflect providers single-service Internet rate card pricing.

COMMERCIAL INTERNET VALUE

- ◆ Current providers are pricing from just under \$2 to \$10 per Meg for commercial Internet service. Uptown believes the City could provide retail service below \$1 per Meg...

Internet Downstream Throughput and Price per Mbps
(Incumbents and Proposed LPC Tiers)



Function	Operational Responsibility	BH	CLEC
Capital	Local Loop and Premises NIU	✓	
	Fiber MUX, Transport, and Switch		✓
Interconnect	LNP, Operator Services, PSAP, IC Agreements		✓
Marketing & Sales	Advertising, Sales	✓	
	Brand, Pricing	✓	✓
Provisioning	Work Order Creation	✓	
	Bell Processes		✓
	Switch Provisioning		✓
Billing	Customer Install	✓	
	Bill Fulfillment	✓	
Internet	Call Detail Record (LD), Taxes & Fees		✓
	Backbone Interconnection		✓



RESIDENTIAL VOICE SERVICES

		AT&T	TWC	BH
Packages	Complete Choice Basic <i>(Caller ID & Call Waiting)</i>	\$24.00	\$24.99	-
	Complete Choice Enhanced <i>(11 calling features)</i>	\$28.00	\$43.99 State	\$25.00 ¹
	Unlimited Local & LD	\$35.00	\$44.99	\$28.00 ¹
Access Lines	Additional Line	\$15.00	\$19.99	\$25.00 ¹
Long Distance	Voice 200 (then 7¢/min.)	\$25.00		-
Calling Features	Caller ID, Call Waiting, etc.	Varies	\$3.95 Voicemail	-

¹ Additional \$6.50 Subscriber Line Charge is billed and retained by the City.



COMMERCIAL VOICE EXCHANGE SERVICES (PER LINE)

	Service	AT&T	TWC	BH
Access	Access Line	Monthly: \$60	-	-
Line & Feature Packages	Access Line & Feature Package	Monthly: \$60 / \$40 ¹ 1 Year: \$45/ \$34 3 Year: \$43/ \$32	-	-
	Access Line and Caller ID	Monthly: \$55/ \$35 ² 1 Year: \$40/ \$29 3 Year: \$38/ \$27	-	-
Line, Features, & Unlimited LD			\$34.99 1 st Line \$29.99 Addl. Lines	Monthly: \$34.95 2 Year: \$32.95 3 Year: \$29.95
Long Distance	Unlimited Domestic	\$20 (\$15 for Business Choice Subscribers)	-	-
	Per Minute Plans (BOT)	\$.04 - \$.05 /min. (Varies by package minutes)	-	-

¹ AT&T CompleteChoice Option A with Caller ID, 3 Way Calling, and CF. ² AT&T CompleteChoice Option B with Caller ID.



COMMERCIAL VOICE NETWORK SERVICES

	Service	AT&T	BH <i>(3 Year Contract Required)</i>
PBX	Analog Trunk (RG 3)	Tariff: \$65	Per Channel (1-8): \$27.95 Per Channel (9+): \$24.95
ISDN	Primary Rate Interface Access / Per B Channel (23B+D)	Monthly: \$180 / \$95 1 Year: \$135 / \$55 2 Year: \$130 / \$53 4 Year: \$120 / \$50	Per ISDN Line: \$100 Per 'B' Channel: \$24.95

		BH Retail	Wholesale Rate	BH Share	Dispersion	SLC	ARPU
Residential	Unlimited local & LD	\$28.00	\$10.00	\$18.00	100%	\$6.50	\$24.50
Commercial (Unl. LD)	Business Package (Monthly)	\$34.95	\$12.00	\$22.95	40%		-
	Business Package (2 Year)	\$32.95	\$12.00	\$20.95	20%		-
	Business Package (3 Year)	\$29.95	\$12.00	\$17.95	40%		-
	Total Commercial					\$6.50	\$27.05



BH PROPOSED BUNDLES

		<i>Video + Internet</i>	<i>Internet + Voice</i>	<i>Video + Internet + Voice</i>
Residential	Services	Expanded Basic 1G Internet	1G Internet Unlimited Local/LD	Expanded Basic 1G Internet Unlimited Local/LD
	Rate Card	\$119.90	\$77.95	\$147.90
	Discount	-	-	(\$8.00)
	Bundle Price	\$119.90	\$77.95	\$139.90



DIRECTV VIDEO PACKAGES

Package	Programming Tier	Package Features	Price (Year 1)	Price (Year 2)	Price (Year 3+)
Entertainment	Expanded Basic	140 channels 1 HD/DVR	\$29.99	\$34.99	\$54.99
Choice	Digital Basic	150 channels 1 HD/DVR	\$34.99	\$43.99	\$63.99
Choice Xtra	Digital Basic Sports Tier	210 channels 1 multi-room HD/DVR NFL Sunday Ticket	\$39.99	\$48.99	\$68.99
Choice Ultimate	Digital Basic Sports Tier 1 Premium	225 channels 1 multi-room HD/DVR NFL Sunday Ticket Some premium channels	\$44.99	\$54.99	\$74.99
Premier	Digital Basic Sports Tier 4 Premiums	285 channels 1 multi-room HD/DVR NFL Sunday Ticket All premium channels Specialty sports channels	\$89.99	\$99.99	\$119.99



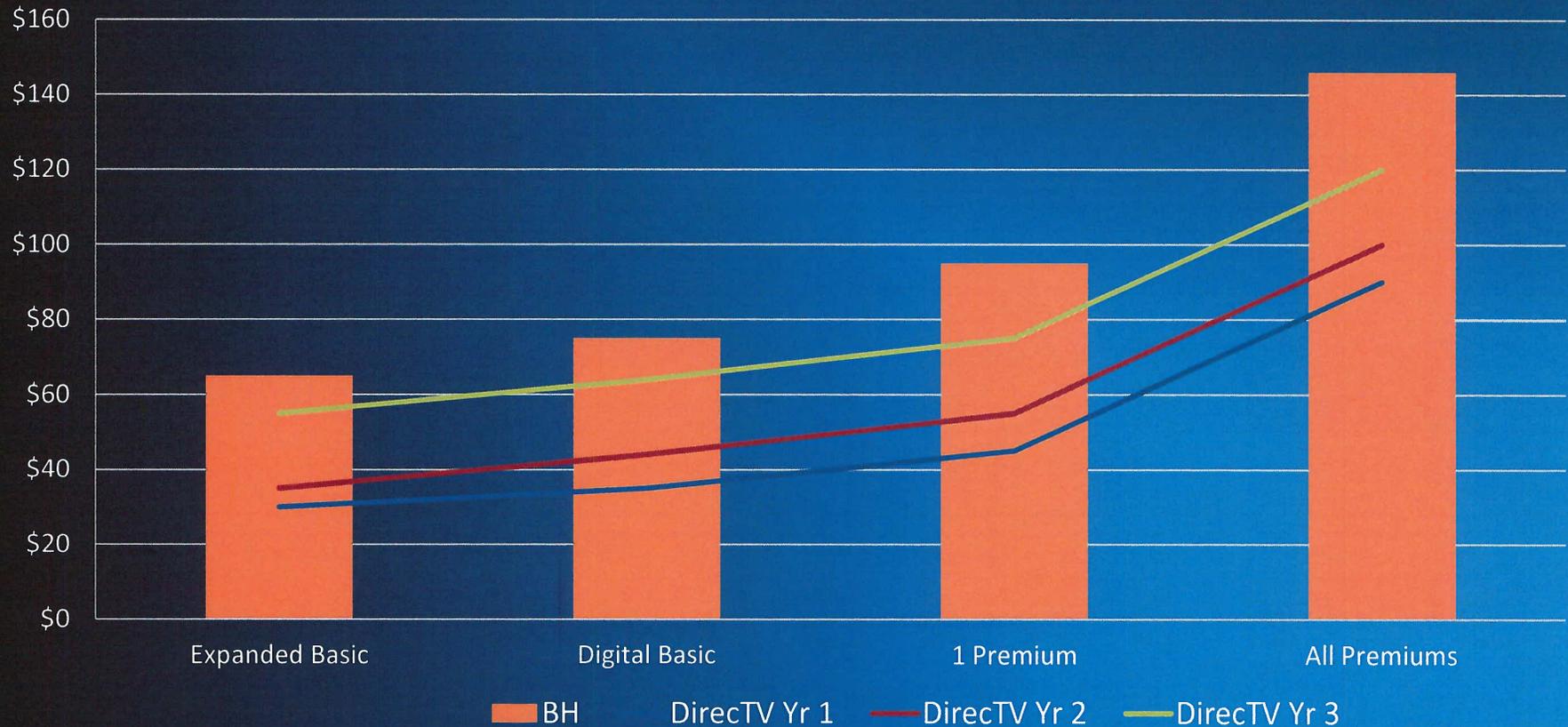
VIDEO COMPETITION

<i>Service Package</i>	<i>BH</i>	<i>TWC</i>	<i>U-verse</i>	<i>Discount to TWC</i>
Basic	\$24.95	\$30.25		17%
Essential TV (LB+40)	-	\$57.74		-
Expanded Basic	\$64.95	\$78.24		17%
Digital Basic	\$74.95	\$84.49	Not Available (Reselling DirecTV)	11%
Digital Tiers	\$8.00 each	\$8.00 each		
Premiums	\$20.00 each	\$15.00 each		
DB + 2 Premiums \$2 discount	\$112.95			
DB + 3 Premiums \$5 discount	\$129.95			
DB + 4 Premiums \$9 discount	\$145.95			
Primary /Addl. STB Fee HD/DVR	\$9.95 / \$9.95	\$11.25 / \$12.75		
DVR Fee/Whole Home DVR	\$10.00	\$12.99/\$19.99		

PRICE COMPARISON: DIRECTV

- ◆ TWC has the majority of video market share in Beverly Hills and should be the pricing benchmark. Competing with DirecTV on price is not recommended...

Price Comparison Between BH and DirecTV
(BH Rates and DirecTV Rates)

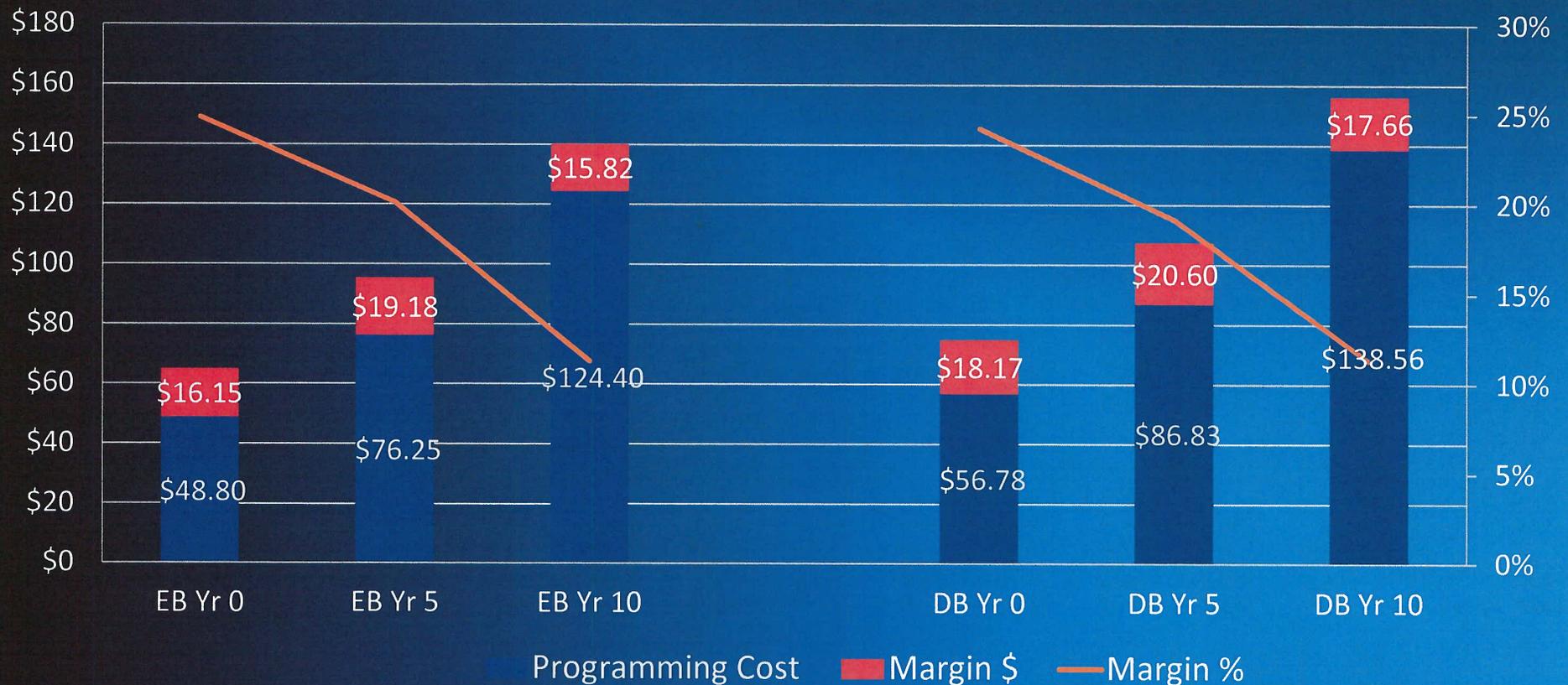


- ◆ Essentially three sources for an operator to contract for programming
 - ❖ NCTC (National Cable Television Cooperative)
 - ❖ Direct deals
 - ❖ Other Content Aggregators (NRTC, NTTC, etc.)
- ◆ The NCTC has resolved its conditional membership moratorium on overbuilders and is the best contracting source for NCTC programmers (approximately 70% of the lineup). Direct deals are used to secure remaining non-NCTC content.
- ◆ Broadcast channels now require cash 'consideration' in granting retransmission consent and are also included in the cost metrics.
- ◆ Baseline financials will use NCTC supplemented by direct deals. Retransmission consent cash will also be included.

VIDEO GROSS MARGIN

- ◆ The pro forma includes programming cost increases and pricing increases of 6% and 8% annually respectively. Despite this, video gross margin will continue to substantially deteriorate over time...

Price and Programming Cost by Video Package
(Proposed City Video Services in Years 0, 5, and 10)



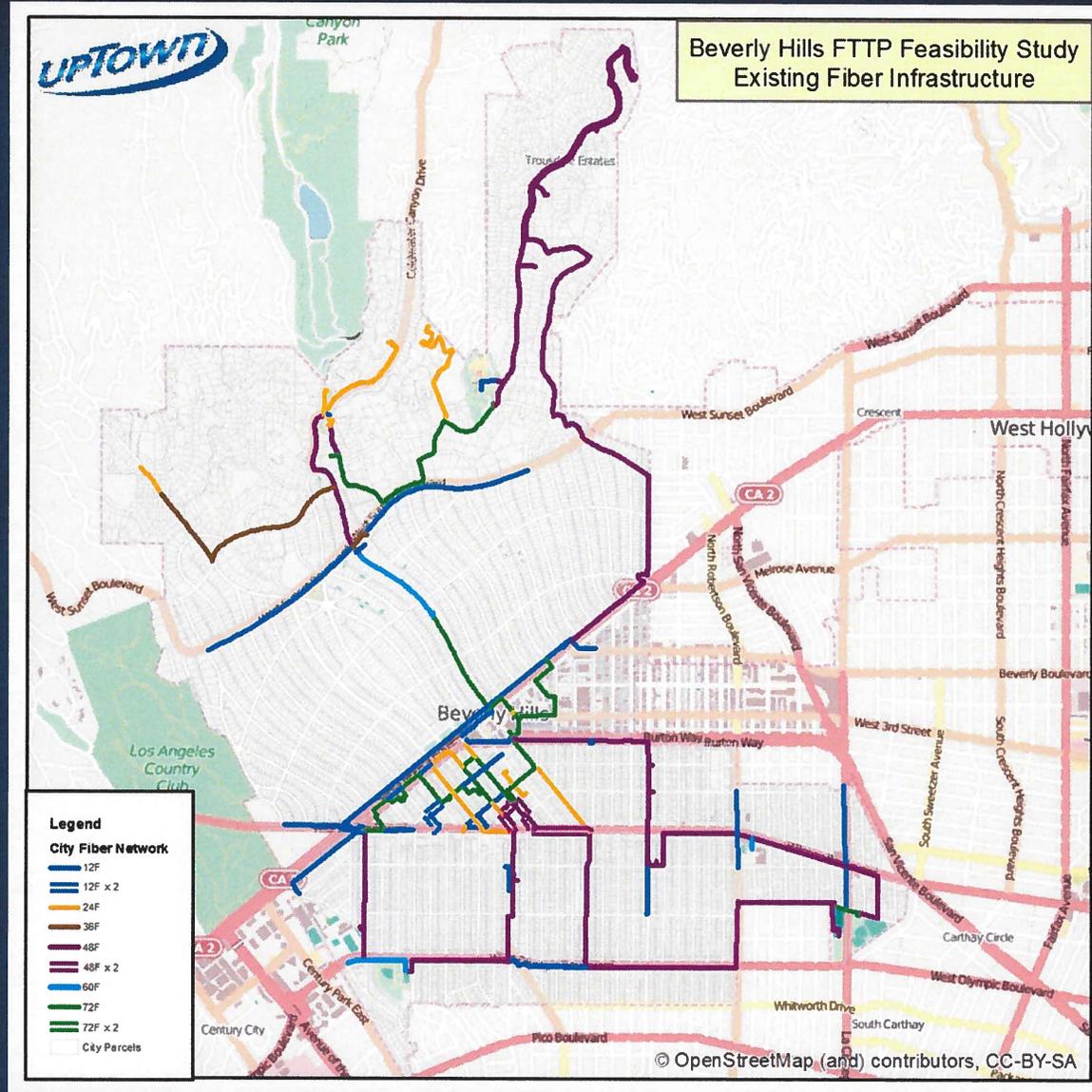
Technology Strategy

- ▣ Why FTTP?
 - Gold standard for local broadband services distribution
 - Technology is far superior to any other option now and in the future
- ▣ Gigabit Passive Optical Network assumed for new network
 - 2.4 Gbps down / 1.2 Gbps up
 - GPON commercially available from multiple suppliers
 - Mature technology with millions of units shipped
- ▣ GPON architecture using distributed split
 - 1:4 and 1:8 splitters deployed in distributed split network
 - Each 1:4 splitter (primary) connects to four 1:8 splitters (secondary)
 - Eliminates splitter cabinets and reduces splicing and fiber counts
 - System reach is 20 km from GPON equipment (OLT) location
- ▣ FTTP outside plant comprises the largest capital cost

EXISTING COMMUNICATIONS INFRASTRUCTURE

- ▣ Fiber Backbone
 - Approximately 27 miles of conduit throughout the city
 - Connects to most key City facilities
 - Fiber cable sizes are relatively small (< 96 fiber cables)
 - Primary value is the spare innerduct available for new cable
- ▣ Core Network
 - Moving to Juniper MLX10 Routers operating at Layer 2
 - 10G ring connecting 11 City owned sites
 - Two Layer 2 switches at each site to support multiple sub-rings
- ▣ Internet connectivity
 - Routes through Metro Ethernet to 600 West 7th
 - Internet connection through XO (1Gig)
- ▣ Applicability to FTTP
 - Spare conduit can be used to interconnect FTTP equipment sites
 - New MLX10s could be used to support future FTTP requirements

CITY FIBER OPTIC INFRASTRUCTURE



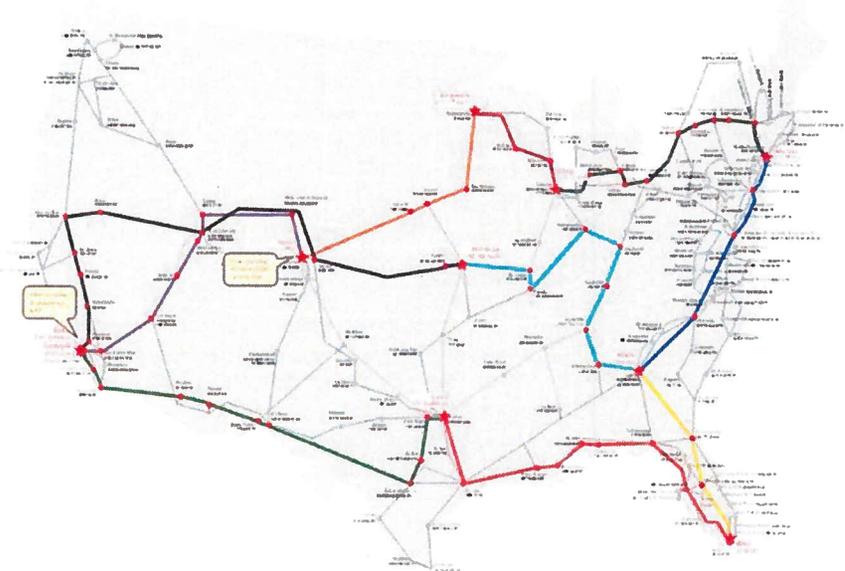
Video Options

FIBER NETWORK



Architecture

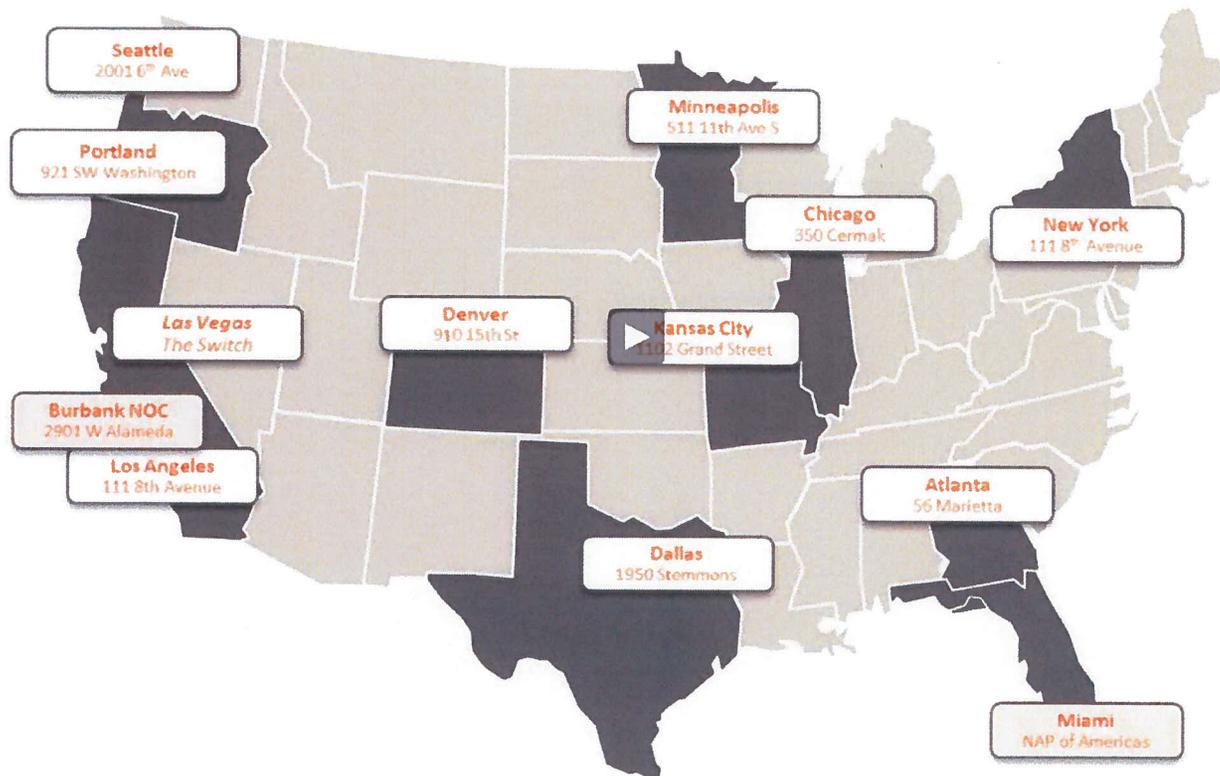
- Dedicated 10 Gig Waves (Level-3)
- Vubiquity owned/managed switched
- Multi-ring architecture
- Unique fiber paths into each Co-Lo
- Co-Lo at primary meet-me point
- GigE and 10 Gig Interconnect Support



Vubiquity Confidential. This document is intended solely for



FIBER NETWORK



Vubiquity Confidential. This document is intended solely for





SOURCING VIDEO: VIDEO FEED

A recently launched national linear cable feed backbone can now provide terrestrial delivery of most cable channels to video distributors. This can replace the vast majority of the headend investment.

	<i>Own Headend</i>	<i>Vubiquity LiveVU</i>
Content Delivery & Reception	Direct Feed via satellite (linears) and tower reception (off-air)	Direct Feed via 10G terrestrial fiber network (linears) and tower reception (off-air)
Buildings & Land	Tower site and 2,000 sq. ft. room with desk space for 12 FTEs (\$250k)	Tower Site and 2 racks with desk space for 12 FTEs (\$100k)
Opex Requirements	Utilities & Insurance: \$75k Software Annual Maintenance: \$100k	Utilities & Insurance: \$25k Software Annual Maintenance: \$100k Transport Fee: \$1.75/Sub/Month Annual Maintenance: \$2500 Leased transport circuit to LiveVU's LA POP (111 8 th Ave.): \$8k/Month
Fixed Capital Requirements	Video Processing & Equipment: \$1.3M Off-Air Tower & Antennae: \$150k Powering: \$300k Project Management/Integration: \$200k Middleware/CAS Licensing: \$820k (10k subs)	Gateway & Professional Services: \$20k Video Processing & Equipment: \$145k Off-Air Tower & Antennae: \$150k Powering: \$100k Project Management/Integration: \$40k Middleware/CAS Licensing: \$300k initial + \$74/sub
Variable Capital Requirements	Set Top Boxes: HD=\$100 HD/DVR=\$225	

VIDEO STRATEGY NET CASH OUTCOMES



- ◆ Bundling video will not materially improve Internet or voice revenues. Consequently the 'No Video' case does not adjust other service revenues downward
- ◆ There are no financial advantages to building a video headend. Only an imported video feed should be considered if video is offered. For the terrestrial feed, LiveVU is a very cost-effective source.
- ◆ Staffing costs are minimally affected. FTE staff levels reflect coverage, however customer service is greatly simplified/streamlined without video
- ◆ The investment payback period for offering video is 9 years
- ◆ Due to the high incidence of Triple Play subscription in Beverly Hills, Uptown recommends that video service be offered via the FTTP system

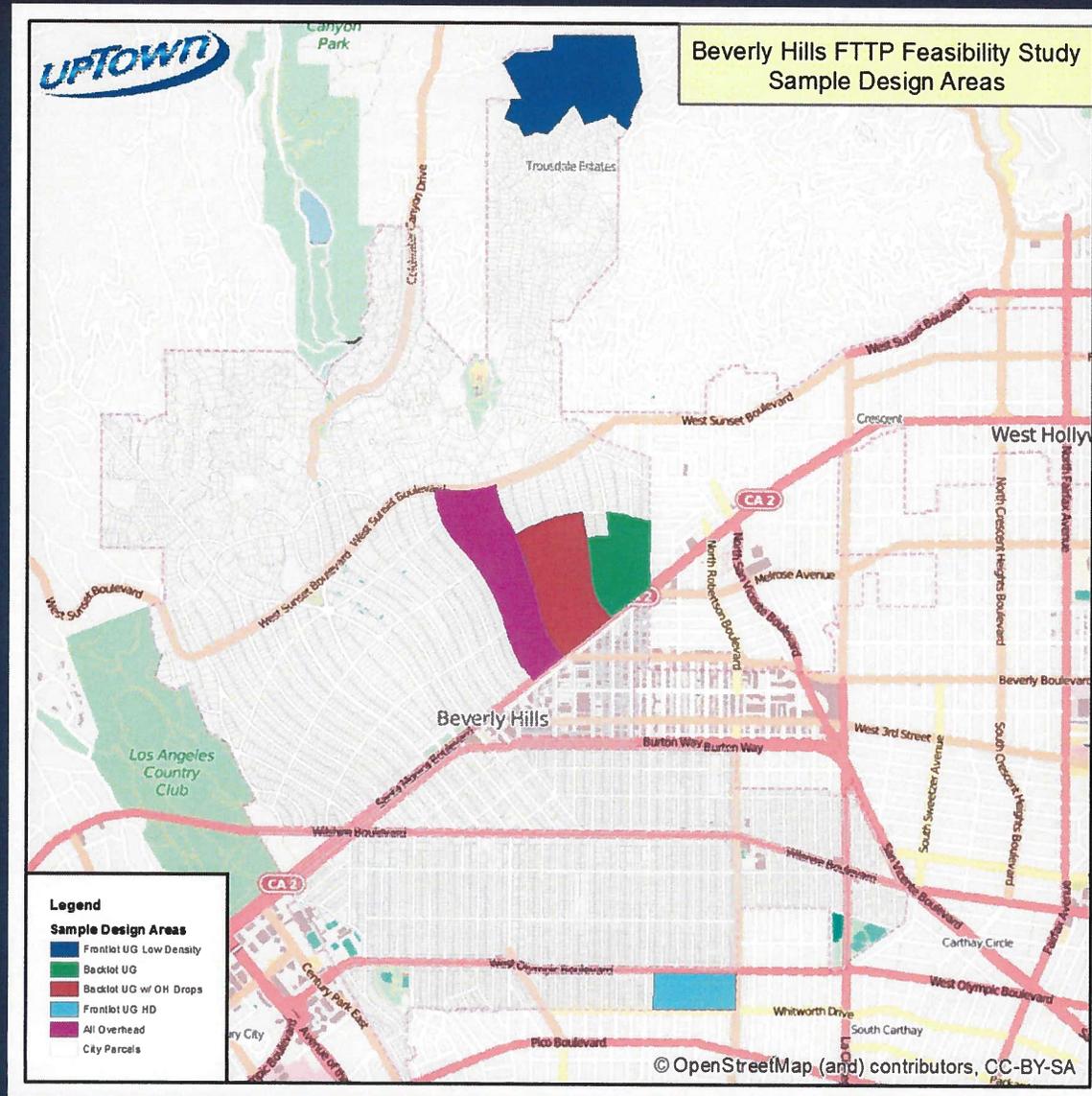
Sample Designs



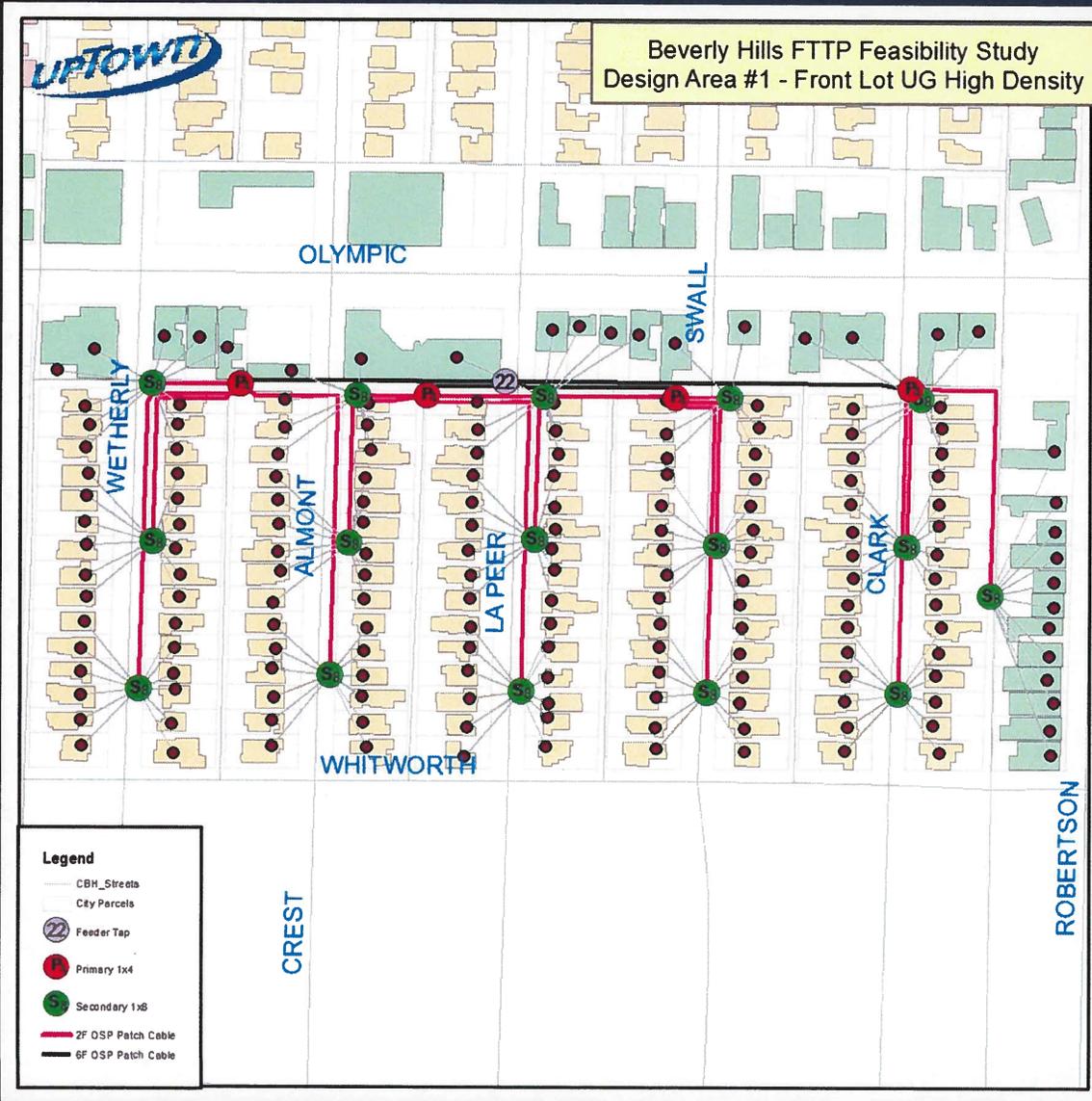
UPTOWN CAPITAL BUDGETING APPROACH

- ▣ Capital budget accuracy is critical
 - Funding estimates need to be close to what will actually be used
 - Unexpended bond amounts can cause arbitrage issues
 - Underfunding raises credibility issues with investors in latter rounds
- ▣ Uptown draws on many sources for each capital budget
 - Local contractor labor rate survey
 - Actual bid results from our latest FTTP implementations
 - Our role as the engineering firm for five other FTTP systems
 - Ongoing pilot projects and studies for other clients
- ▣ Sample designs are primary source for each study
 - Uptown selected representative areas
 - Five neighborhood designs completed including 794 passings
 - Single family home neighborhoods
 - Front vs. back lot, high vs. low density and aerial vs. underground
- ▣ Uptown used conservative assumptions for this process

SAMPLE DESIGN AREA OVERVIEW



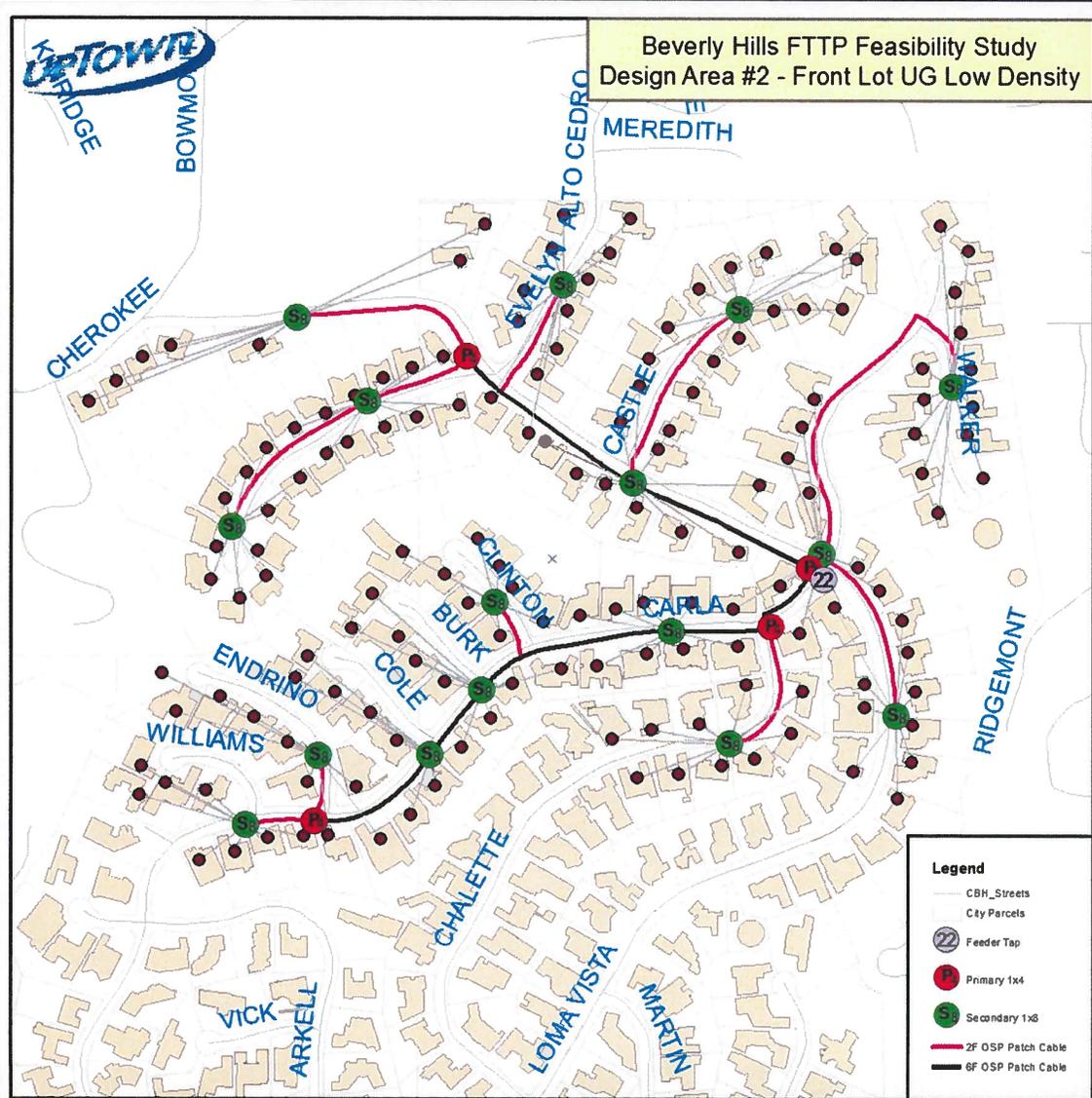
AREA #1 - FRONT LOT UNDERGROUND HIGH DENSITY



Design Metric	Value
Aerial Plant Miles	0.0
Underground Plant Miles	1.3
% Aerial	0%
% UG	100%
Passings	180
Passings per Mile of Plant	139
Materials Cost per Passing	\$131
Labor Cost per Passing	\$1,029
Total Cost per Passing	\$1,160
Total Materials (no drops)	\$23,528
Total Labor (no drops)	\$185,225
Total Cost	\$208,753

* - Does not include engineering, fixed equipment, subscriber capital and installation costs.

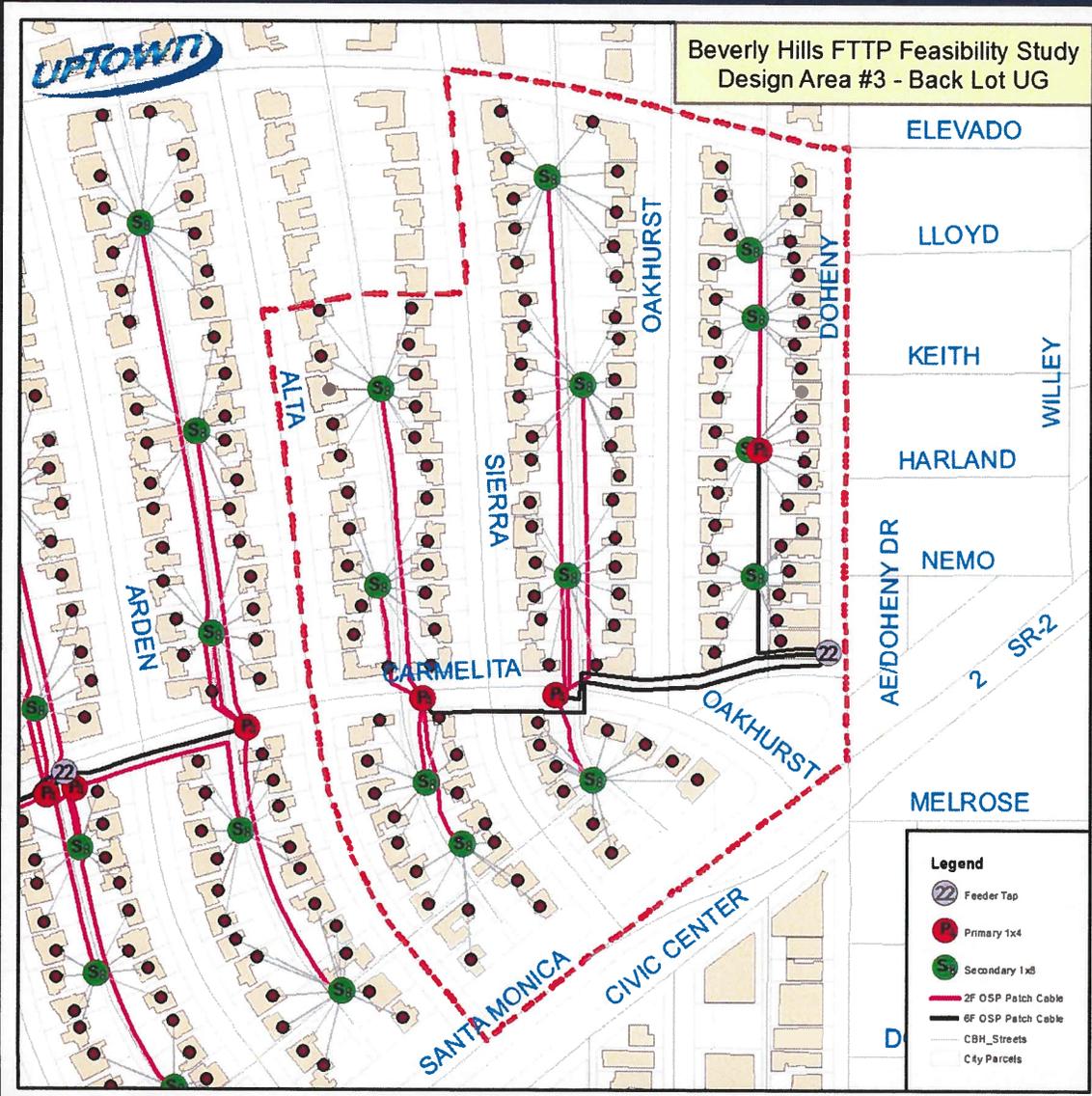
AREA #2 - FRONT LOT UNDERGROUND LOW DENSITY



Design Metric	Value
Aerial Plant Miles	0.0
Underground Plant Miles	2.9
% Aerial	0%
% UG	100%
Passings	155
Passings per Mile of Plant	53
Materials Cost per Passing	\$226
Labor Cost per Passing	\$2,588
Total Cost per Passing	\$2,813
Total Materials (no drops)	\$34,988
Total Labor (no drops)	\$401,087
Total Cost	\$436,075

* - Does not include engineering, fixed equipment, subscriber capital and installation costs.

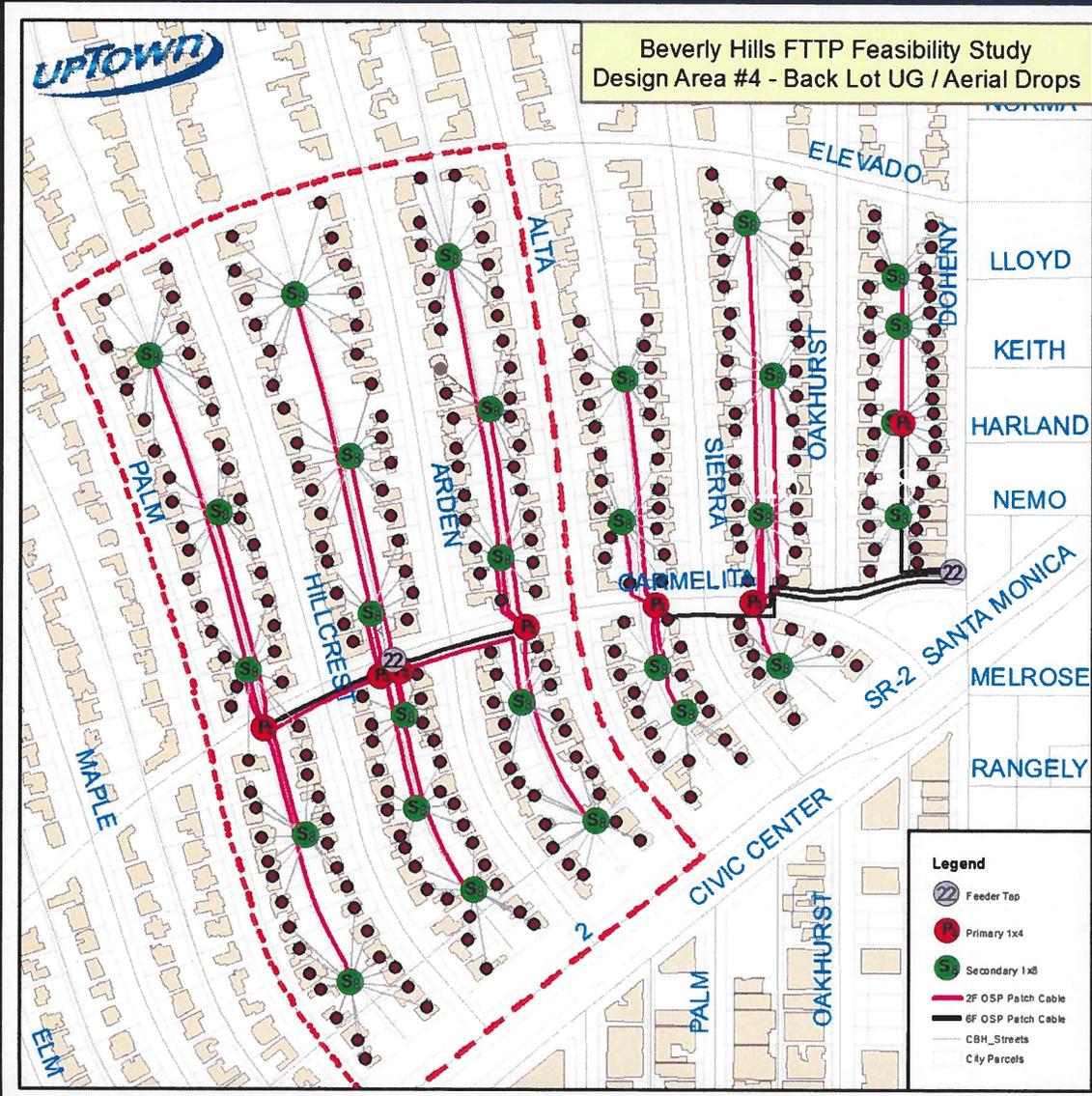
AREA #3 – BACK LOT ALL UNDERGROUND (UG)



Design Metric	Value
Aerial Plant Miles	0.0
Underground Plant Miles	1.5
% Aerial	0%
% UG	100%
Passings	120
Passings per Mile of Plant	81
Materials Cost per Passing	\$176
Labor Cost per Passing	\$3,304
Total Cost per Passing	\$3,480
Total Materials (no drops)	\$21,125
Total Labor (no drops)	\$396,425
Total Cost	\$417,550

* - Does not include engineering, fixed equipment, subscriber capital and installation costs.

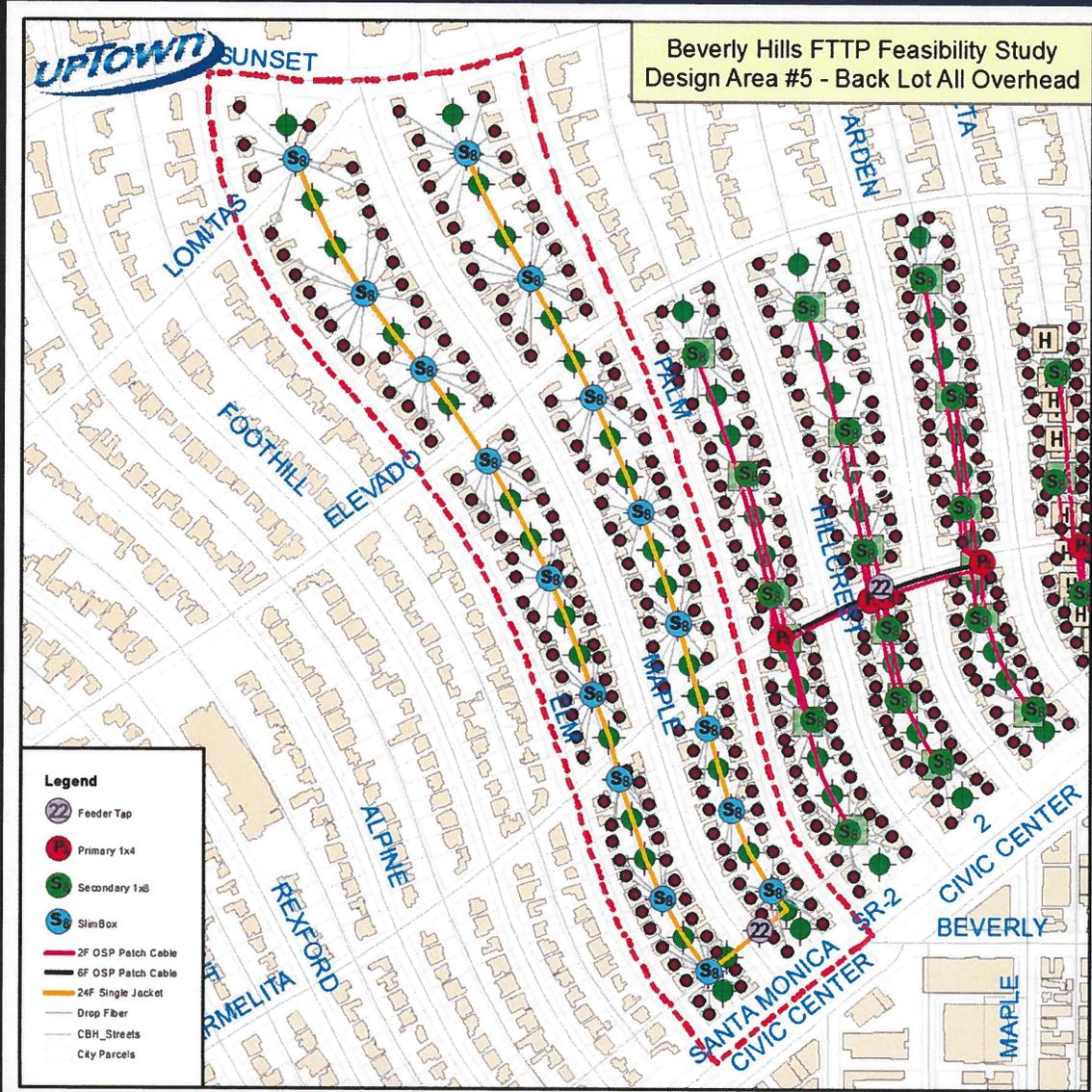
AREA #4 – BACK LOT UG FEEDER WITH AERIAL DROPS



Design Metric	Value
Aerial Plant Miles	0.0
Underground Plant Miles	1.4
% Aerial	0%
% UG	100%
Passings	174
Passings per Mile of Plant	123
Materials Cost per Passing	\$129
Labor Cost per Passing	\$2,245
Total Cost per Passing	\$2,374
Total Materials (no drops)	\$22,369
Total Labor (no drops)	\$390,632
Total Cost	\$413,001

* - Does not include engineering, fixed equipment, subscriber capital and installation costs.

AREA #5 – AERIAL FEEDER WITH AERIAL DROPS



Design Metric	Value
Aerial Plant Miles	1.5
Underground Plant Miles	0.0
% Aerial	100%
% UG	0%
Passings	165
Passings per Mile of Plant	111
Materials Cost per Passing	\$94
Labor Cost per Passing	\$229
Total Cost per Passing	\$322
Total Materials (no drops)	\$15,448
Total Labor (no drops)	\$37,755
Total Cost	\$53,202

* - Does not include engineering, fixed equipment, subscriber capital and installation costs.



SERVICE AREA CHARACTERIZATION

Dwelling Type	Buildings			Percent of Total Buildings		
	Overhead Service	Underground Service	Total Buildings	Overhead Service	Underground Service	Total Buildings
Single Family	4,063	1,653	5,716	53%	21%	74%
MDU	1,225	77	1,302	16%	1%	17%
Commercial	444	232	676	6%	3%	9%
Mixed Use	-	4	4	0%	0%	0%
Total	5,732	1,966	7,698	74%	26%	100%

Dwelling Type	Dwellings (Estimate)			Percent of Total Dwellings		
	Overhead Service	Underground Service	Total Buildings	Overhead Service	Underground Service	Total Buildings
Single Family	4,063	1,653	5,716	25%	10%	35%
MDU	8,735	549	9,284	53%	3%	56%
Commercial	985	515	1,500	6%	3%	9%
Total	13,783	2,717	16,500	84%	16%	100%



SAMPLE DESIGN SUMMARY

Sample Design Area	OH Miles	UG Miles	Passings	Passings per Mile	Weight	Materials per Passing	Labor per Passing	Total per Passing
#1 - Front Lot High Density	0.0	1.3	180	139	0%	\$131	\$1,029	\$1,160
#4 - Back Lot with Aerial Drops	0.0	1.4	174	123	0%	\$129	\$1,195	\$1,324
#3 - Back Lot All UG	0.0	1.5	120	81	0%	\$176	\$1,714	\$1,890
#2 - Front Lot Low Density	0.0	2.9	155	53	10%	\$226	\$2,588	\$2,813
#5 - All Overhead	1.5	0.0	165	111	25%	\$94	\$229	\$322
MDU Overhead	0.0	0.0	-	-	53%	\$47	\$114	\$161
MDU UG	0.0	0.0	-	-	3%	\$176	\$1,714	\$1,890
Commercial Overhead	0.0	0.0	-	-	6%	\$94	\$229	\$322
Commercial UG	0.0	0.0	-	-	3%	\$352	\$3,429	\$3,781
Weighted Average / Total	1.5	7.1	794		100%	\$93	\$554	\$647

* - MDU and commercial sample designs not completed.

Outside Plant Costs	Weighted Average Per Passing	Key Construction Costs
Materials	\$93	❖ Aerial fiber placement - \$3.38 per sheath foot
Labor	\$554	❖ Directional boring in landscaped areas - \$24.50 per foot
Total	\$647	❖ Directional boring in asphalt or concrete areas - \$48.00 per foot
Contingency @ 30%*	\$200	❖ Pulling fiber in conduit - \$1.00 per sheath foot
Total	≈ \$850	❖ Splicing - \$30 per splice

* - Contingency based on unknowns related to servings each dwelling a large number of multi-tenant buildings

Financial Feasibility Analysis

FTTP Business Case

- ◆ COGS (previous slides)
- ◆ Staffing (detail next slides)
- ◆ Marketing & Sales
 - ◆ Based on template campaign budget for Years 1-5 (launch campaigns budgeted at \$250k annually) and then 1% of annual revenue thereafter
- ◆ Billing
 - ◆ 80% of residential and 50% of commercial customers are paperless billing in Year 1 with monthly cost of \$.75 each.
- ◆ Professional Services/Pole Attachment
 - ◆ Legal and accounting is \$30k in Year 1. Ongoing legal of \$5k annually.
 - ◆ Pole attachment of \$20 per pole/year
- ◆ Annual Maintenance
 - ◆ Averages 15% annually for OSS/BSS, video middleware, and conditional access system. FTTP electronics is \$25k annually.



FTE LEVELS: MANAGEMENT EMPLOYEES

- ◆ Dedicated 'Broadband' Positions
 - ◆ NOC Manager
 - ◆ Marketing/PR Coordinator
 - ◆ MDU Account Manager
 - ◆ Commercial Account Rep
 - ◆ Headend Technician
 - ◆ Data Technician
 - ◆ Field Ops Supervisor

- ◆ Positions funded at City wage scale midpoints and 50% benefits loading

- ◆ Non-dedicated management staffing indirect costs not allocated to Broadband (incremental cash view)



FTE LEVELS: DEDICATED FRONTLINE EMPLOYEES

- ◆ Customer / Technical Service Representatives (CSRs/TSRs)
 - ◆ CSRs handle inbound/office sales, order entry and first tier support
 - ◆ TSRs handle all second tier customer support, dispatch and service provisioning
 - ◆ Staffed at 1 FTE per 2k accounts growing to 4k by Year 5, but with minimum of 3 FTE each for CSR and TSR positions to ensure phone coverage
- ◆ Install Technicians
 - ◆ Installs are 2-phase with pre-install followed by separate premise install
 - ◆ Pre-Installs completed by contractor at fixed rate (100% Years 1-3 and 50% Year 4) and then insourced
 - ◆ Each Install Tech can complete 3/day growing to 4/day by Year 5
- ◆ Service Technicians
 - ◆ Service techs fix subscriber problems
 - ◆ FTE based on the number of truck rolls related to service and churn
- ◆ Maintenance Technicians
 - ◆ Network techs maintain the fiber system from the backbone to the network access point. Network tech is most senior tech in the line crew
 - ◆ 1 per 1,000 plant miles



INCREMENTAL BROADBAND FTE REQUIRED

- ◆ CSR and TSR headcount levels are driven by phone coverage and scheduling needs versus customer demand...

Position Title	Midpoint	Year1	Year2	Year3	Year4	Year5
NOC Manager	\$150k	1.0	1.0	1.0	1.0	1.0
Marketing /PR Mgr.	\$90k	0.5	1.0	1.0	1.0	1.0
MDU Account Rep	\$90k		1.0	1.0	1.0	1.0
Comm. Acct Rep	\$90k		1.0	1.0	1.0	1.0
Headend Tech	\$110k	0.5	1.0	1.0	1.0	1.0
Data Tech	\$110k	0.5	1.0	1.0	1.0	1.0
CSRs	\$61k		3.0	3.0	3.0	3.0
TSRs	\$75k		3.0	3.0	3.0	3.0
Install Techs	\$57k		2.0	3.0	3.0	2.0
Maintenance Techs	\$70k		1.0	1.0	1.0	1.0
Service Techs	\$57k		1.0	1.0	1.0	1.0
Total Headcount		2.5	16.0	17.0	17.0	16.0

- ◆ FTTP Network Construction
 - ◆ Outside Plant: \$17.9M
 - ◆ Make ready construction: \$2.3M
 - ◆ Ring enhancement to leased circuit meet point: \$60k
- ◆ Land & Building
 - ◆ Floor space for equipment & FTEs: existing space is sufficient
- ◆ Software
 - ◆ OSS/BSS: \$300k
 - ◆ Fiber Management & Network Management: \$250k
 - ◆ Middleware/CAS (video only): \$820k
- ◆ Professional Services
 - ◆ Implementation support: \$360k

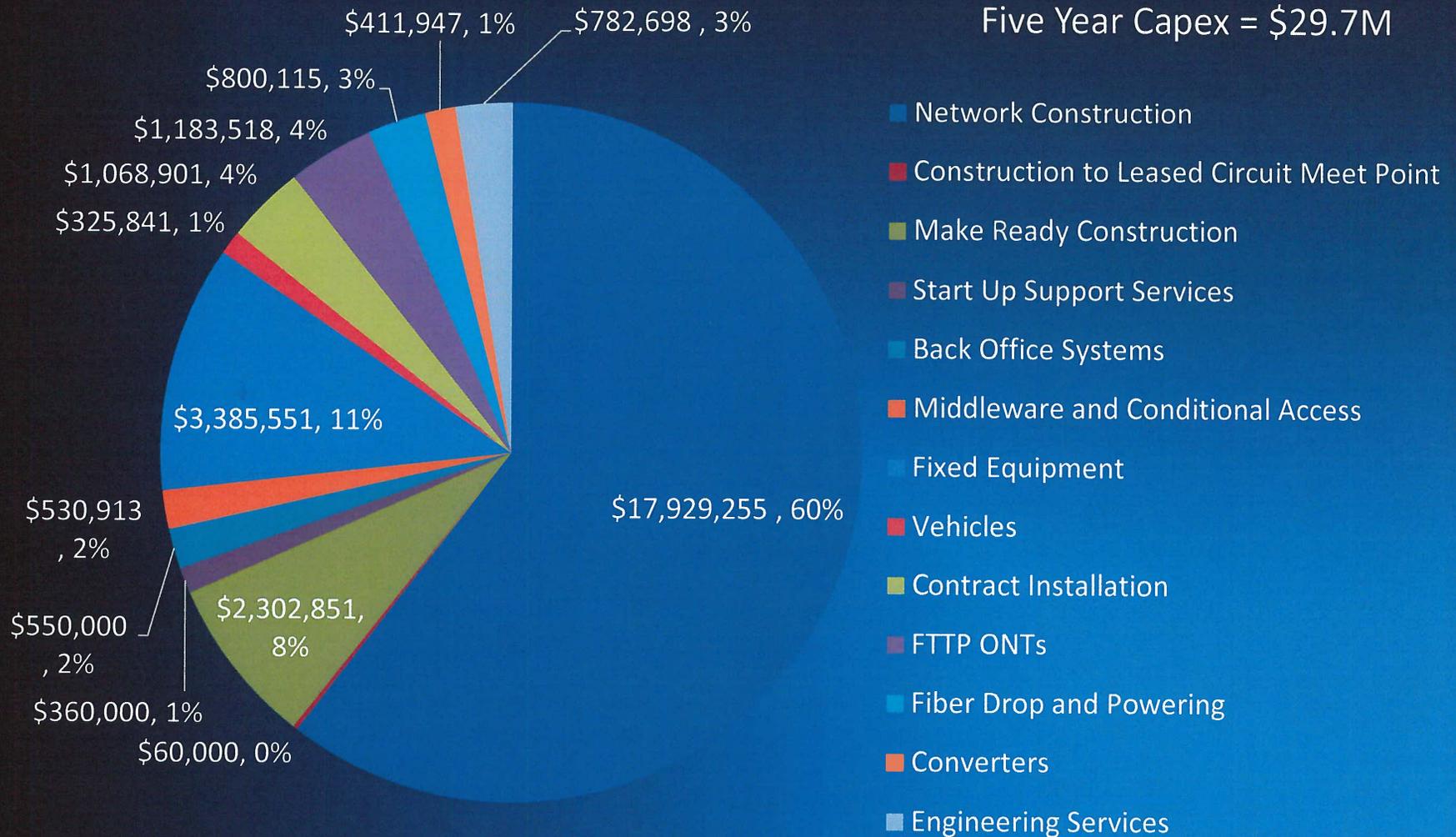
- ◆ Fixed Equipment
 - ◆ Backbone electronics and core HE switch: \$600k
 - ◆ Video HE system: \$455k
 - ◆ Internet systems back office: \$125k
 - ◆ Field Tech Equipment/Tools: \$198k
- ◆ Vehicles
 - ◆ Bucket trucks (non-insulated): \$180k (2 at \$90k/ea.)
 - ◆ Service vans: \$140k (3 at \$45k/ea.)
- ◆ Contract Labor
 - ◆ Pre-Installs: \$1.1M (first 3 years at \$200/ea.)
- ◆ Year 7 & 10 Network Upgrades
 - ◆ Year 7 ONT upgrade: \$275k (\$40/ea.)
 - ◆ Year 10 Network electronics upgrade: \$1.5M (\$75/premise passed)

- ◆ ONT's
 - ◆ Non-WiFi: \$620k for years 1-4 (\$140/ea.)
 - ◆ WiFi 80211.ac: \$425k for years 1-4 (\$240/ea.)
- ◆ Fiber drop and ONT powering
 - ◆ Fiber drop and connectors: \$485k for years 1-4 (\$75/ea.)
 - ◆ Power cord and UPS: \$230k for years 1-4
- ◆ Set Top Boxes
 - ◆ HD and HD/DVR set tops: \$370k for years 1-4 (\$100/ea. and \$225/ea. respectively)
- ◆ Engineering and Integration
 - ◆ Walk out: \$84k
 - ◆ Make ready engineering: \$84k
 - ◆ FTTP design: \$493k
 - ◆ Headend design and integration: \$30k

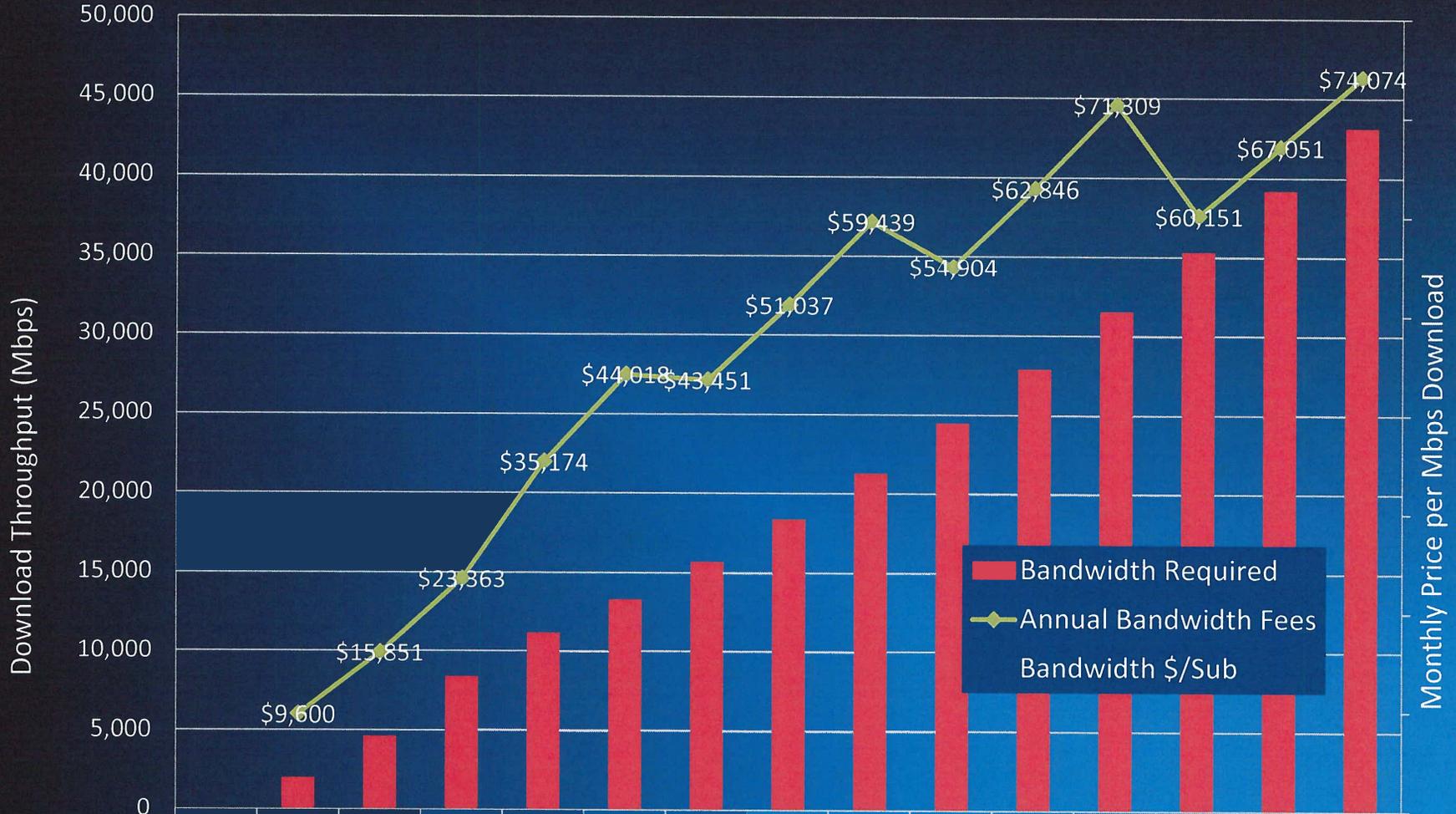
- ◆ Long term financing
 - ◆ One round of financing in Year 2
 - ◆ Three years interest only
 - ◆ 12 years of level payments
 - ◆ 2.0% issuance, \$0 reserve requirement
 - ◆ Interest rate – 4%
- ◆ Short term financing
 - ◆ Provides for cash needs not covered by long term financing
 - ◆ Balance accumulates over first five years
 - ◆ Level payments begin in year six over ten year payment plan
 - ◆ Interest rate – 2% (matches cash reserve interest rate)
- ◆ Start-up period included as Year 1 of the business case
 - ◆ No revenues assumed during first year of the plan
 - ◆ Technical trial underway at the end of the first year with 100 testers
- ◆ Other assumptions
 - ◆ Bad debt = 3% of gross revenues
 - ◆ Overhead loading of 50%
 - ◆ 2% interest on cash reserves
 - ◆ Discount rate = 5% for present value calculations
 - ◆ 10 billable months in year2

BASELINE CAPEX – 1ST FIVE YEARS

Five Year Capex = \$29.7M



BANDWIDTH FORECAST



	Yr1	Yr2	Yr3	Yr4	Yr5	Yr6	Yr7	Yr8	Yr9	Yr10	Yr11	Yr12	Yr13	Yr14	Yr15
Bandwidth Required		2,000	4,605	8,375	11,16	13,28	15,68	18,34	21,28	24,47	27,89	31,52	35,30	39,19	43,11
Annual Bandwidth Fees		\$9,600	\$15,85	\$23,36	\$35,17	\$44,01	\$43,45	\$51,03	\$59,43	\$54,90	\$62,84	\$71,30	\$60,15	\$67,05	\$74,07
Bandwidth \$/Sub		\$1.98	\$0.63	\$0.48	\$0.57	\$0.68	\$0.67	\$0.79	\$0.92	\$0.85	\$0.97	\$1.10	\$0.93	\$1.03	\$1.14

TRIPLE PLAY SCENARIO PRO FORMA RESULTS

Outcome	Triple Play \$10M Equity LiveVU Video
City Long Term Loan	\$10,000,000
Long Term Debt (Bond Issue)	\$17,322,190
Short Term Loan (Working Capital)	\$4,398,812
Total Funding (First Five Years)	\$31,721,002
Cash Flow w/ Debt Service - Year15	\$1,603,217
Cash Reserves - Year15	\$13,061,437
Total Outstanding Debt - Year15	\$1,774,728
Total Outstanding Equity - Year15	(\$10,000,000)
Net Cash - Year15	\$1,286,709
Operating Income w/o Debt Service - Year15	\$3,940,267
Project Break Even	15 Years

- ◆ **Internet Only**

- ◆ Revenues of \$9.0M (residential) and \$9.3M (commercial) over Years 1-15

- ◆ **Internet and Voice**

- ◆ Adds voice net revenues of \$9.0M (residential) and \$9.3M (commercial) over Years 1-15
- ◆ No fixed capital savings since all fixed investment has been made by the CLEC
- ◆ No opex savings since wholesale rate is per subscriber and operating activities are not incremental to adding voice to Internet

- ◆ **Internet, Voice, and Video**

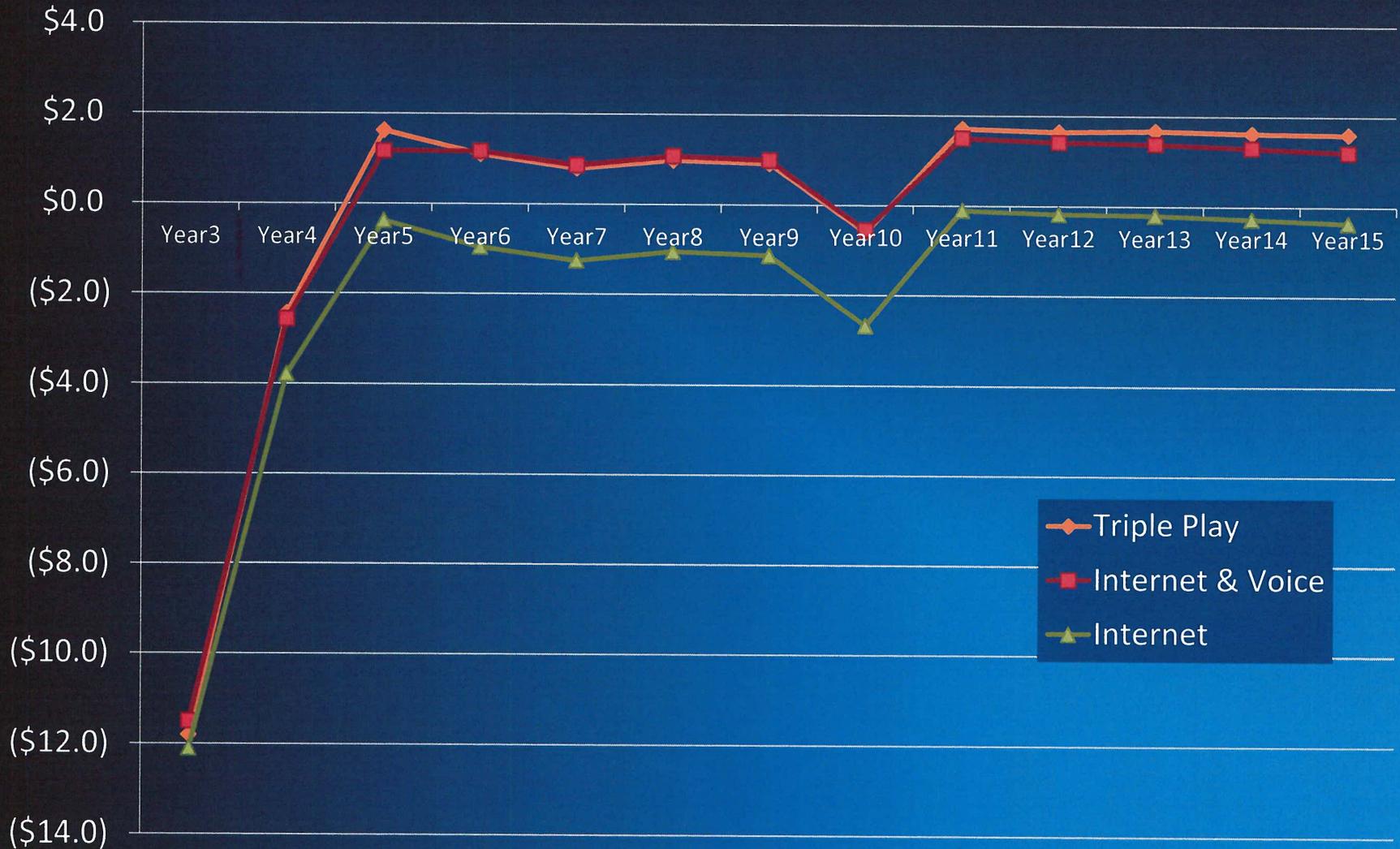
- ◆ Adds video revenues and associated programming fees
- ◆ Adds video hubsite and installation (\$485k)
- ◆ Adds 1 FTE for Headend Technician (\$110k unloaded)
- ◆ Adds NCTC membership fee (\$15k)
- ◆ Adds Vubiquity annual transport fees (varies by sub count)
- ◆ Adds 2nd transport circuit dedicated to linear video stream feed (\$2500 annually)
- ◆ Adds set top box capital for HD and HD/DVR set tops: \$370k for years 1-4 (\$100/ea. and \$225/ea. respectively)
- ◆ Adds middleware and conditional access software (\$300k)
- ◆ Adds special construction of fiber plant to Vubiquity meet point (\$60k)



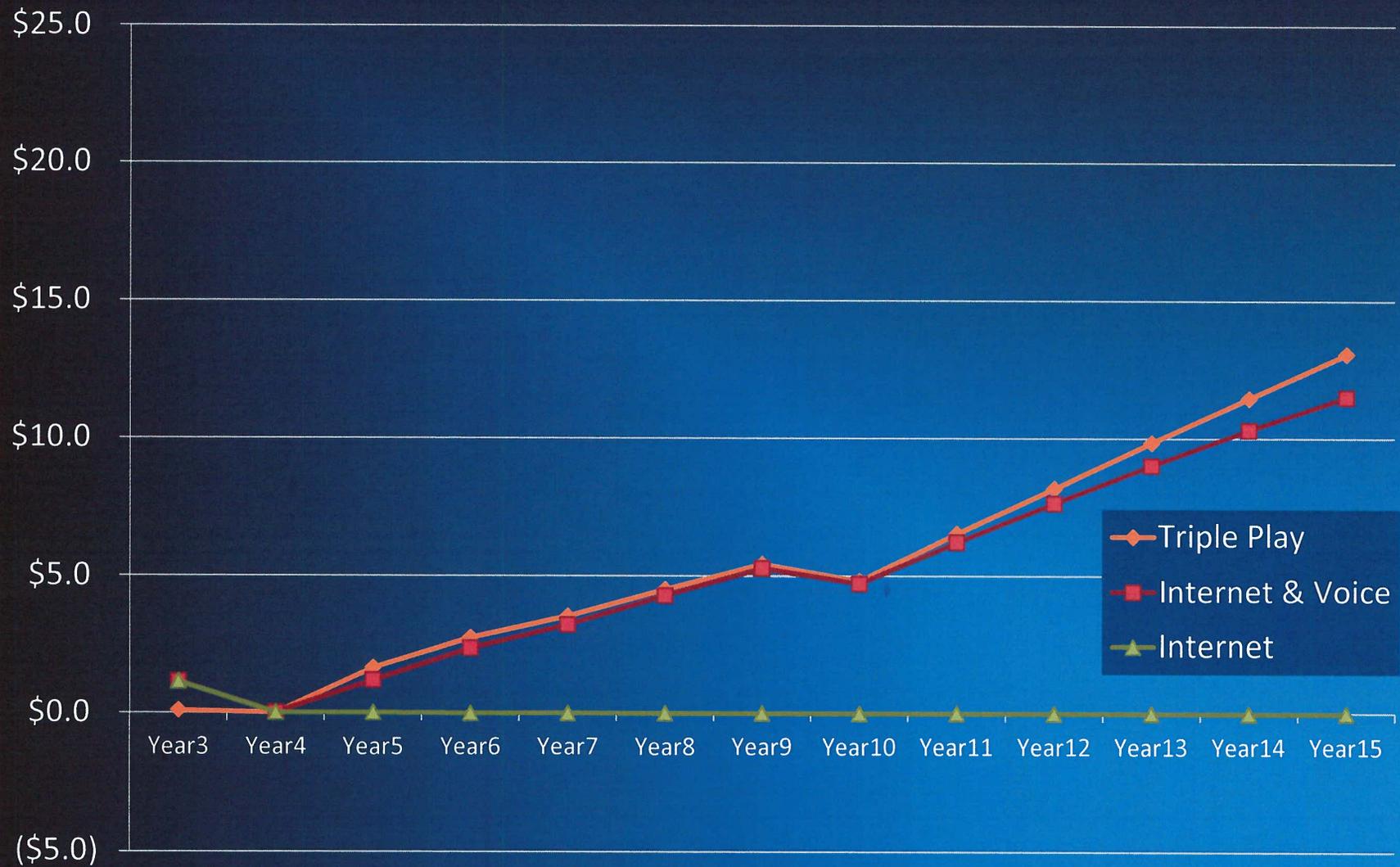
ALTERNATIVE SERVICE MIX PRO FORMA RESULTS

Outcome	Internet	Internet Voice	Internet Voice Video
City Long Term Loan	\$10,000,000	\$10,000,000	\$10,000,000
Long Term Debt (Bond Issue)	\$16,893,309	\$16,986,681	\$17,322,190
Short Term Loan (Working Capital)	\$13,759,249	\$3,172,850	\$4,398,812
Total Funding (First Five Years)	\$40,652,558	\$30,159,531	\$31,721,002
Cumulative Revenues – Years 1-15	\$57M	\$75M	\$143M
Cash Flow w/ Debt Service - Year15	(\$366,439)	\$1,200,660	\$1,603,217
Cash Reserves - Year15	-	\$11,497,932	\$13,061,437
Total Outstanding Debt - Year15	\$10,952,938	\$1,740,354	\$1,774,728
Net Cash - Year15	(\$20,960,035)	(\$242,421)	\$1,286,709
Operating Income w/o Debt Service - Year15	\$1,794,768	\$3,029,335	\$3,940,267
Project Break Even	> 15 Years	> 15 Years	15 Years

CASH FLOW WITH DEBT SERVICE (\$M)



CASH RESERVES (\$M)



NET CASH (\$M)



Summary & Recommendations

CONCLUSIONS AND RECOMMENDATIONS

- ◆ Recommended strategy is the City serving as retailer of Video, Internet and voice service (via CLEC partner)
- ◆ An alternative service mix strategy of Internet and Voice is viable as well. Offering Internet only is not viable.
- ◆ Funding of \$32M is required
 - ◆ Single bond issue totaling \$17.5M to cover forecasted \$17.322M requirement
 - ◆ City equity contribution of \$10M
 - ◆ Short term working capital financing of \$4.5M to cover forecasted \$4.399M requirement
- ◆ The project is financially viable
 - ◆ Project achieves positive cash flow in Year 4
 - ◆ Project is net cash positive in 15 years