



Milford City Hall Council Chambers 201 South Walnut Street Milford DE 19963

CITY COUNCIL AGENDA

Wednesday, January 18, 2023

Per the Limited Public Health Emergency Declaration issued by Governor John Carney on March 1, 2022, and the virtual meeting provisions provided in Senate Bill 94, Milford City Council Meetings and Workshops will be held in the Council Chambers at City Hall. Attendees are welcome to participate virtually as well. Public Comments are encouraged on the agenda items designated with a ®. Virtual attendees may alert the City Clerk that they wish to speak by submitting their name, address, and agenda item via the Zoom Q&A function or by using the Raise Your Hand function during the meeting. Those attending in person may comment when the floor is opened for that purpose.

All written public comments received prior to the meeting will be read into the record.

This meeting is available for viewing by the public by accessing the following link:

<https://zoom.us/j/95859380584>

or

<http://www.cityofmilford.com/553/Watch-Public-Meetings>

Members of the public may also dial in by phone using the following number:

Call 301 715 8592 Webinar ID: 958 5938 0584

WORKSHOP

6:00 P.M.

Broadband/Community WiFi Feasibility Study

SPECIAL MEETING.

Call to Order - Mayor Archie Campbell

Executive Session

Motion to Recess into Executive Session

Personnel-

Pursuant to 29 Del. C. §10004(b)(9) Personnel matters in which the names, competency and abilities of individual employees or students are discussed

Return to Open Session

Potential Vote/Chief of Police Selection/Process

Adjournment

WORKSHOP (continued)
Pedestrian Safety Ordinance
Planning Commission & Council Approval Requirements

ALL SUPPORTING DOCUMENTS MUST BE SUBMITTED TO THE CITY CLERK IN ELECTRONIC FORMAT NO LATER THAN ONE WEEK PRIOR TO MEETING. NO PAPER DOCUMENTS WILL BE ACCEPTED, DISTRIBUTED, OR PRESENTED AT MEETING ONCE PACKET HAS BEEN POSTED ON THE CITY OF MILFORD WEBSITE. ANY MATERIALS UTILIZED DURING THE MEETING SHALL BE FROM THE COUNCIL PACKET AND REFERENCED BY PRESENTER USING AUDIO AND VISUAL MEANS TO ENSURE VIRTUAL PARTICIPATION BY ALL IN ATTENDANCE.

113022 122122

111223 Council Request Personnel Appointment

011823



Broadband Feasibility Study

for

The City of Milford, Delaware

December 2022

Uptown Services, LLC
Dave Stockton & Neil Shaw, Principals

OBJECTIVE: *Identify and evaluate the financial feasibility of a range of options for the City to enhance the availability, affordability, reliability, and capacity of broadband infrastructure for residents and businesses...*

STUDY SCOPE:

1. Local Market Assessment and Product Strategy
2. Analysis of Business Models
3. Wireless Network Strategy
4. Conduct Market Research
5. Pro Forma Financial Analysis
6. Evaluate Financing & Funding Availability

Local Market Assessment & Product Strategy
Internet and Data Services

INCUMBENT RESIDENTIAL INTERNET

- Verizon presents different DSL plans depending upon the proximity of the service address to their Central Office. In conducting availability searches on their website, only a 3M tier was returned.
- Comcast appears to have fully upgraded its HFC plant to DOCSIS3.1 and can offer gig service. However, pricing is steep and a \$30 premium is required to remove the standard data cap.

	Download	Upload	Price	Data Cap?	ACP?	Technology
Verizon	Up to 3M	?	\$40.00 (voice line required)	?	?	DSL
Verizon Fios*	300M 500M 940M	300M 500M 880M	\$49.99 \$69.99 \$89.99	No	Yes	Fiber
Comcast	50M 100M 300M 600M 900M 1.2G 6G	2M 5M 25M 25M 30M 35M ?	<u>Promotion / Paper Billing / Non-Promo</u> \$65.00 \$83.95 \$39.99 / \$49.99 / \$98.95 \$59.99 / \$69.99 / \$103.95 \$69.99 / \$79.99 / \$108.95 \$79.99 / \$89.99 / \$113.95 \$299.95	Yes. Unlimited data is \$30 extra	Yes	Cable Modem (DOCSIS 3.1)
Verizon 5G Home*	Not specified. Best effort at 4G LTE or 5G (if available)		5G Home: \$60.00 5G Home Plus: \$80.00	No	Yes	Cellular 4G LTE or 5G
T-Mobile	Up to 182M	?	\$50.00 (with cellphone plan)	No	?	Cellular 5G

Verizon pricing per verizon.com, Comcast pricing from xfinity.com, all as of Sept. 2022.

*Not available in Milford.

ALTERNATIVE RESIDENTIAL INTERNET

- Bloosurf has deployed fiber in some communities. But availability searches on their websites indicate that only fixed wireless service is available in Milford.
- Starlink is scheduled to become available next year but is expensive.

	Download*	Upload	Price	Data Cap?	Technology
Bloosurf	15M 25M 50M 100M	2M 3M 5M 20M	\$65 \$85 \$120 \$150	No	Fixed Wireless
	100M – 2.5G	100 M - 2.5G	\$80 - \$235	No	Fiber*
Starlink**	250M – 350M	?	\$110.00 <i>(plus \$649 for hardware + shipping)</i>	No	LEO Satellite

Bloosurf pricing per bloosurf.com and bloofiber.com as of Sept. 2022. Starlink pricing per starlink.com as of Oct. 2022.

*Not available in Milford.

**Starlink has announced availability within Milford in 2023.

INCUMBENT COMMERCIAL INTERNET

- Verizon has DSL plans available with varying speeds (determined by distance from their Central Office) but with minimal information available.
- Comcast has standard business Internet plans up to 1.25Gbps, but fees are high and initial promotional discounts taper off during the contract term. They do not use data caps for their commercial service, but equipment fees are expensive.

	Download	Upload	Price	Contract	Equipment Fee	Data Cap?	ACP?	Technology
Verizon	1M – 15M	?	?	Yes, 2 years	\$49/month (wireless router)	?	N/A	DSL
Comcast	50M 100M 250M 500M 1.25G	15M 25M 25M 30M 35M	<u>Year 1 / Year 3</u> \$49.00 / \$49.00 \$69.99 / \$109.99** \$99.99 / \$149.99** \$139.99 / \$194.99** \$199.99 / \$274.99**	No Yes, 3 years Yes, 3 years Yes, 3 years Yes, 3 years	\$19.95/month \$19.95/month \$29.95/month \$29.95/month \$29.95/month	No	N/A	Cable Modem (DOCSIS 3.1)

CenturyLink pricing per centurylink.com as of Sept. 2022. Comcast pricing from xfinity.com as of Sept. 2022.

*Not available in all areas. **Comcast commercial tiers increase in price by \$30 during the contract term.

Potential Business Structures

Overview

Ultimately, the value of a broadband infrastructure project to the community depends upon balancing the tradeoffs between the project costs/risks versus the specific improvements to broadband that can be realized...

Investment Goal: Maximize impact of the infrastructure investment while minimizing financial and operational risk

- ◆ **Value to the community** becomes a function of
 - ◆ Last-mile capacity deployed and available to each end user
 - ◆ End user prices and savings compared to incumbents
 - ◆ Services terms compared to incumbents (e.g. data caps, contract termination fees, etc.)
 - ◆ Support of future uses/applications to serve the community

- ◆ **Minimizing risk** becomes a function of the characteristics/differences between business models
 - ◆ Total investment required and associated debt service levels over time
 - ◆ Predictability and robustness of the anticipated revenue stream
 - ◆ Differences in revenue versus operating expenses (operating cash flow)
 - ◆ Avoiding any need for secondary financing (sufficient minimum cumulative cash over the life of the project)

RANGE OF BUSINESS MODELS

	WHOLESALE		RETAIL	
	Dark Fiber	Public-Public or Public-Private Partnership*	Own & Operate with Operating Partner	Own & Operate
Ownership Role of City	City owns fiber backbone and funds fiber laterals via one-time connection fees	City funds capex for broadband infrastructure (e.g. fiber backbone for wireless backhaul or last-mile connectivity)	City funds capex for broadband infrastructure, working capital, and <u>some</u> operating expenses	City funds capex for broadband infrastructure, working capital, and <u>all</u> operating expenses
Operating Role of City	City constructs & maintains fiber plant (excluding electronics)	Partner is the service provider. City only co-brands & maintains backbone/backhaul infrastructure	City is service provider. Partner provides customer care, help desk, outside plant maintenance/outage response, and network management/administration	City is service provider and provides all operating roles (excluding providing voice service)
Services Offered	Dark fiber transport to CAIs, dark fiber transport to commercial accounts, and local loop ISP wholesale	Standard broadband offerings to the residential and commercial segments.		
Revenue	All revenue retained by City	All revenue retained by the Partner. City compensated with monthly fee per connected end-user.	All revenue retained by City. Partner compensated with monthly fee per connected end-user.	All revenue retained by City

*Commonly abbreviated as PPP or 3P.
1/11/2023

BUSINESS MODEL OPERATING ROLES

Under the wholesale models, the Retail Service Provider (RSP) performs all operating functions downstream from the network backbone demarcation point. Under the Operating Partner model, those functions that can leverage operating partner staffing and expertise are outsourced...

Function	Operational Responsibility	Wholesale 3P	Retail (Partner Operates)	Retail (City Operates)
Network Assets	Backbone and Backhaul Assets	City	City	City
	Network Electronics	RSP		
	Fiber Drop (FTTP only)	RSP		
	Modem/Receiver and Inside Wiring	RSP		
Network Administration	ISP			
Network Admin & Maintenance	Backbone and Backhaul Assets	City	City	
	Electronics	RSP		
	Outage Response	City	ISP	
	Bandwidth	Backbone Interconnection		
Software	OSS/BSS	City		
	OSP Management		City & RSP	
Marketing & Promotion	Advertising, Sales, Branding		RSP or 3 rd Party	
	Community Engagement		City & RSP	
	End User Pricing		RSP	
Customer Operations	Help Desk, Service Calls, Billing	RSP or 3 rd Party	ISP	
	Customer Installs and Disconnects	RSP	City	

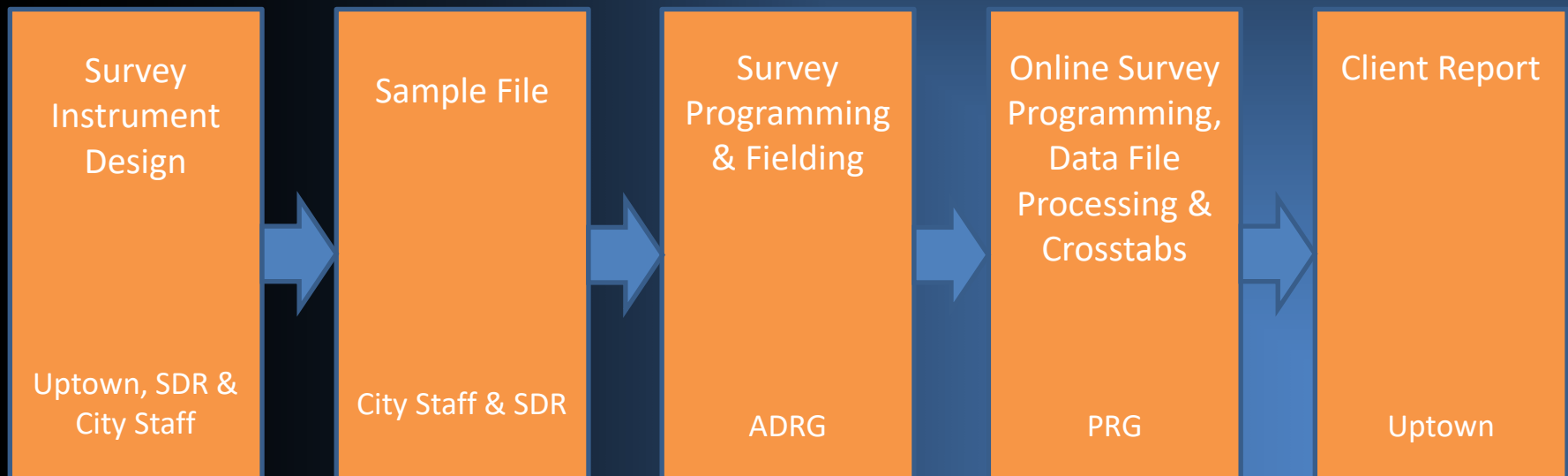
While financial terms vary, typical remuneration structures implemented for municipal broadband system partnerships reflect the following...

Business Model	Dark Fiber	Public-Private Partnership*	Own & Operate with Operating Partner	Own & Operate
Wholesale Fees <i>Paid by Service Provider</i>	MRC per fiber strand per mile. Rates are highly variable and reflect urban (\$150-\$300) vs. rural or long haul (\$10-\$50) Discounts typically apply for multiple strands or public use.	Two Models: A) Premise passed fee (\$6/month) & connected premise fee (\$17/month) - or - B) Connected premises fee only (\$35-40/month) Fees apply whether business or residential connection	Not Applicable	
Outsourcing Fees <i>Paid by Network Owner</i>	Not Applicable		Monthly fee per connected premises (\$10-\$25 depending on term and operating scope)	Not Applicable

*MRC = Monthly Recurring Charge.

Residential Quantitative Survey

- ◆ The quantitative research process utilized both subject matter and functional expertise across multiple contractors by specialty:
 - ◆ **Uptown Services:** Subject expertise and study data needs
 - ◆ **SDR Consulting (Rick Hunter):** Research expert overseeing design and execution (23 years experience with 200k completed research projects)
 - ◆ **American Directions Research Group:** Survey fielding and data collection (7 US-based call centers with capacity to complete 85k person-hours of call interviews per month)
 - ◆ **Prairie Research Group (James Wolken):** Online survey programming, crosstab analysis and production of output banners (25 years experience)

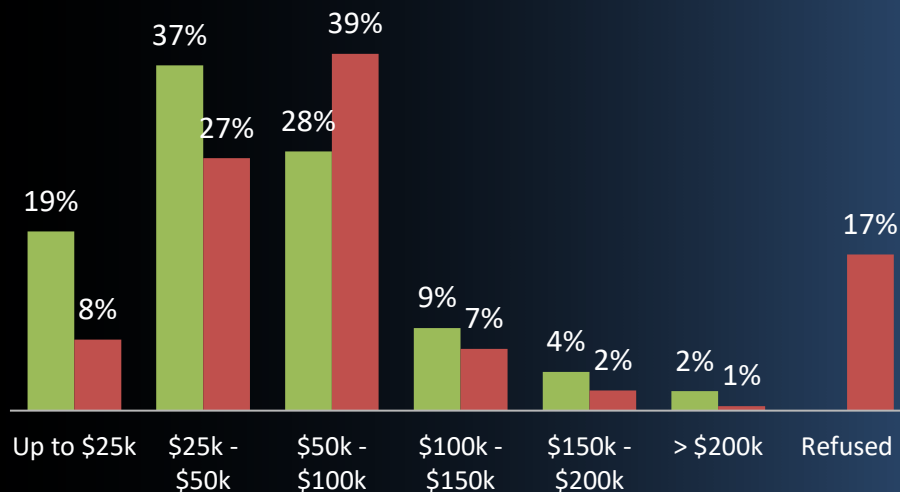


- ◆ Phone and online surveys
 - ❖ Total sample of 682 respondents of universe of $\approx 4,400$ households
 - ❖ 400 via phone survey (list included wireline and wireless numbers)
 - ❖ 282 via online email invitation (email addresses provided by the City)
 - ❖ $\pm 3.4\%$ sample error at 95% confidence interval
 - ❖ List included wireline and wireless numbers
- ◆ Age quotas used to ensure robust sample across all age groups. Results weighted to reflect actual age distribution from 2020 American Community Survey (US Census Bureau) data
- ◆ Respondents screened to ensure
 - ❖ Decision-maker for telecommunications and entertainment services in the home
 - ❖ Reside within city limits
 - ❖ Respondents with immediate family members employed by any of the following were excluded:
 - The City of Milford
 - Comcast
 - Verizon
 - Bloosurf

- Survey results are weighted to reflect the actual age distribution (by age decile) per the 2020 census update
- The income profile of the sample is not dissimilar to the universe of residents

Household Income

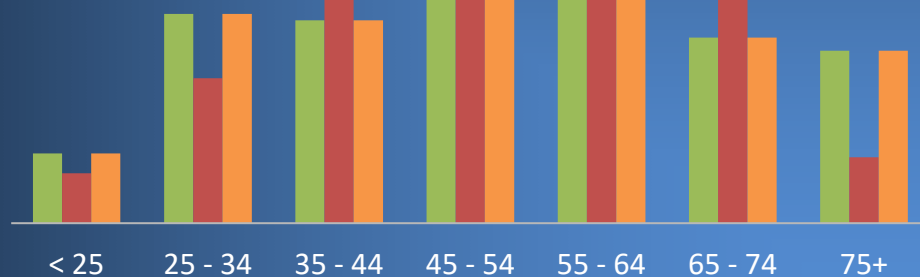
■ Census ■ Sample



1/11/2023

Head of Household Age (Unweighted Sample)

■ Census ■ Raw Sample ■ Weighted



Study conducted by Uptown Services, LLC

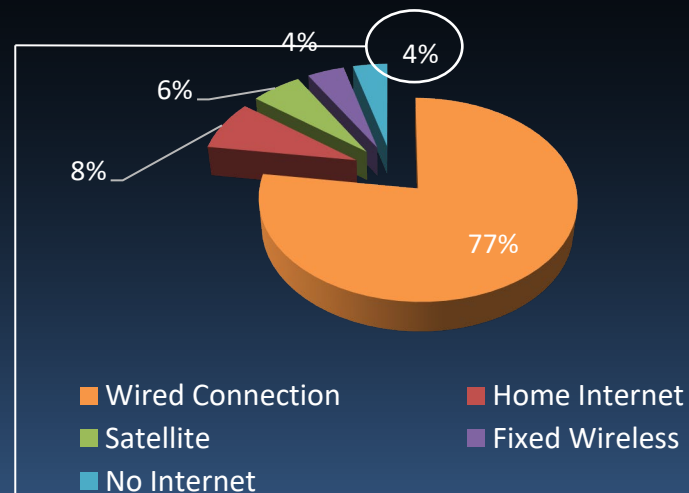
Broadband Quantitative Survey

Current Broadband Services Usage

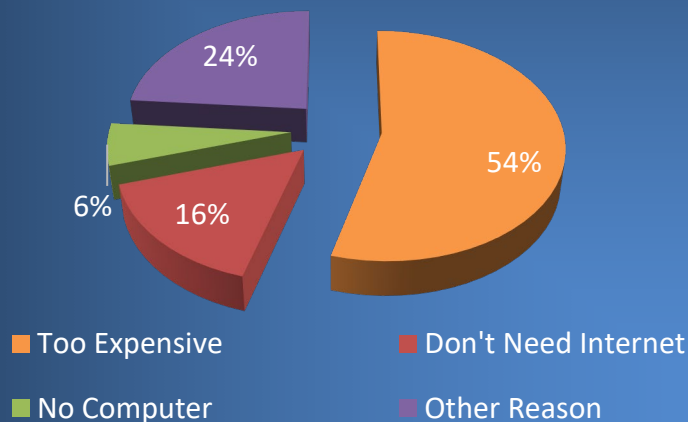
INTERNET SERVICE PURCHASING BEHAVIOR

- ◆ 96% of Milford households subscribe to Internet service at home, with 77% via a wired connection
- ◆ Comcast has 66% market share of the residential broadband market
- ◆ Affordability is the primary reason for lack of an Internet subscription

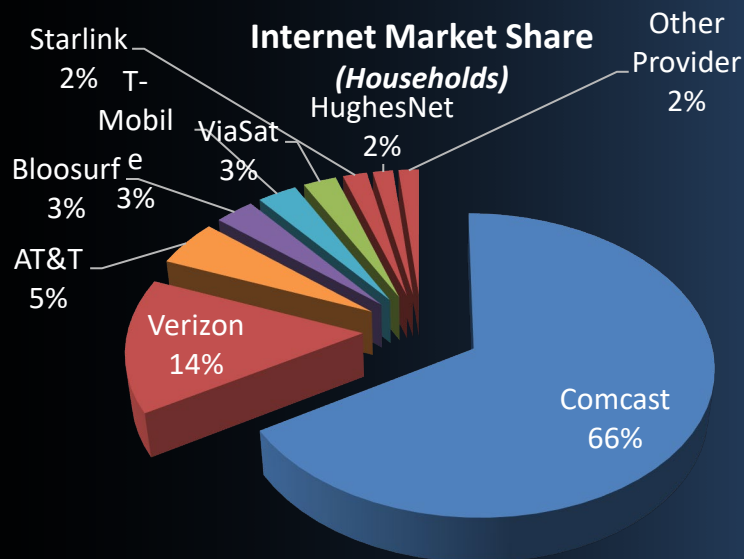
Incidence of Internet Households



Reason for No Internet at Home



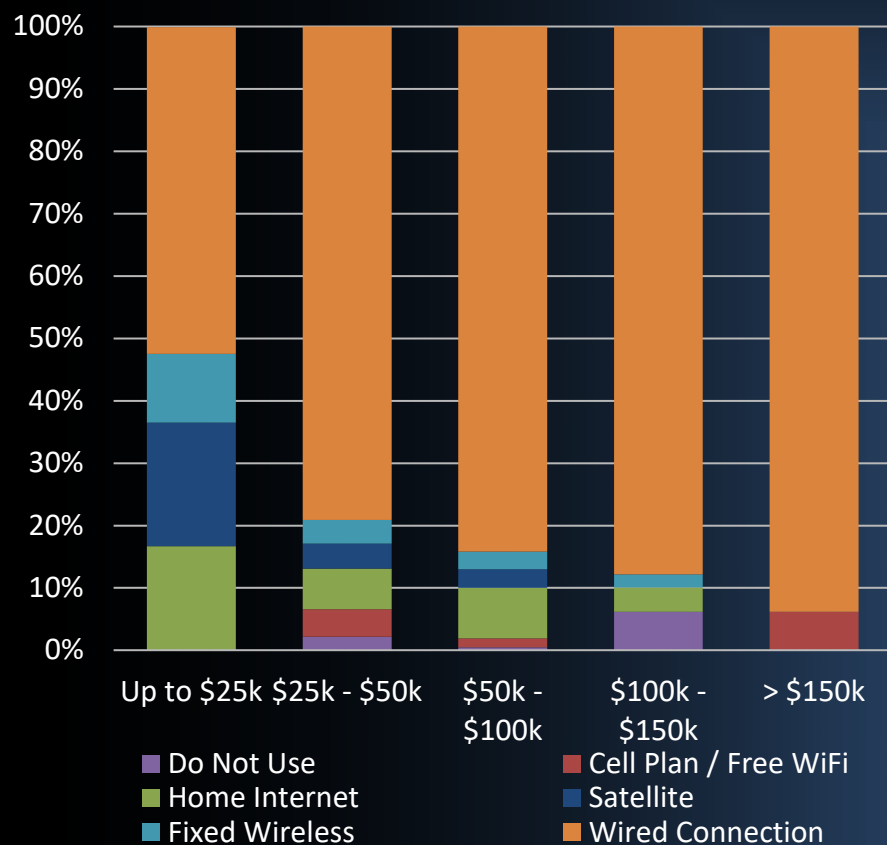
**Internet Market Share
(Households)**



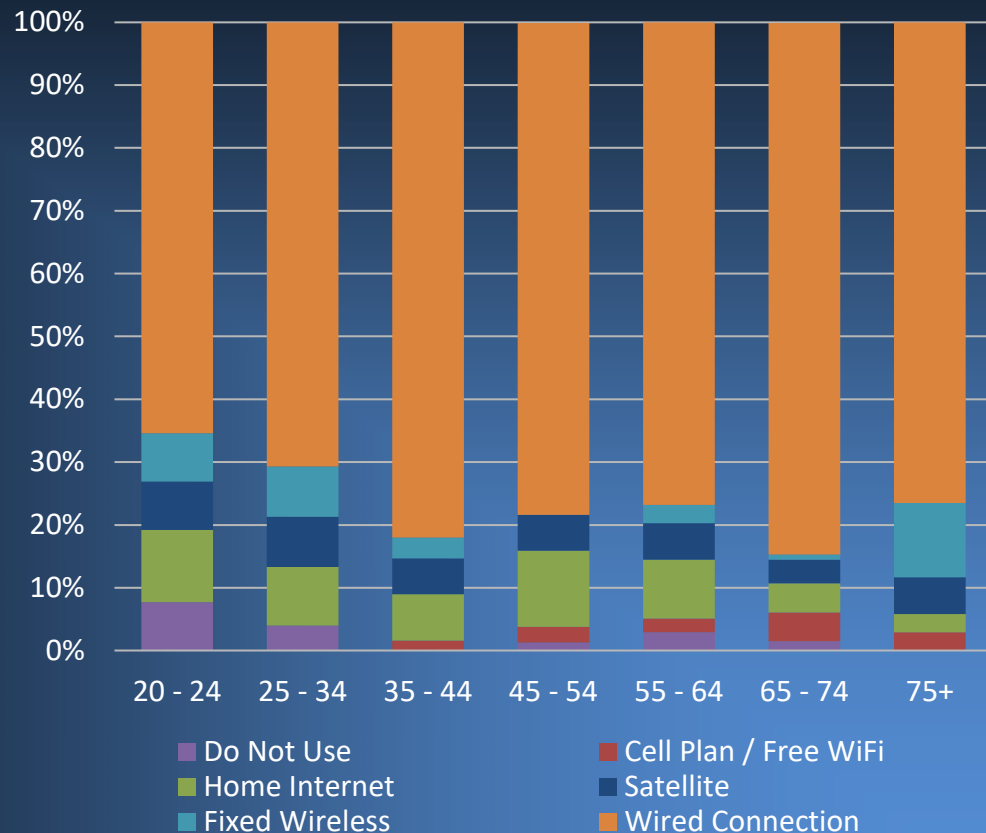
INTERNET ACCESS METHOD DEMOGRAPHICS

- ◆ Lower income households are less likely to have a wired Internet connection
- ◆ Internet access method is not significantly influenced by age

Internet Access Method by Income



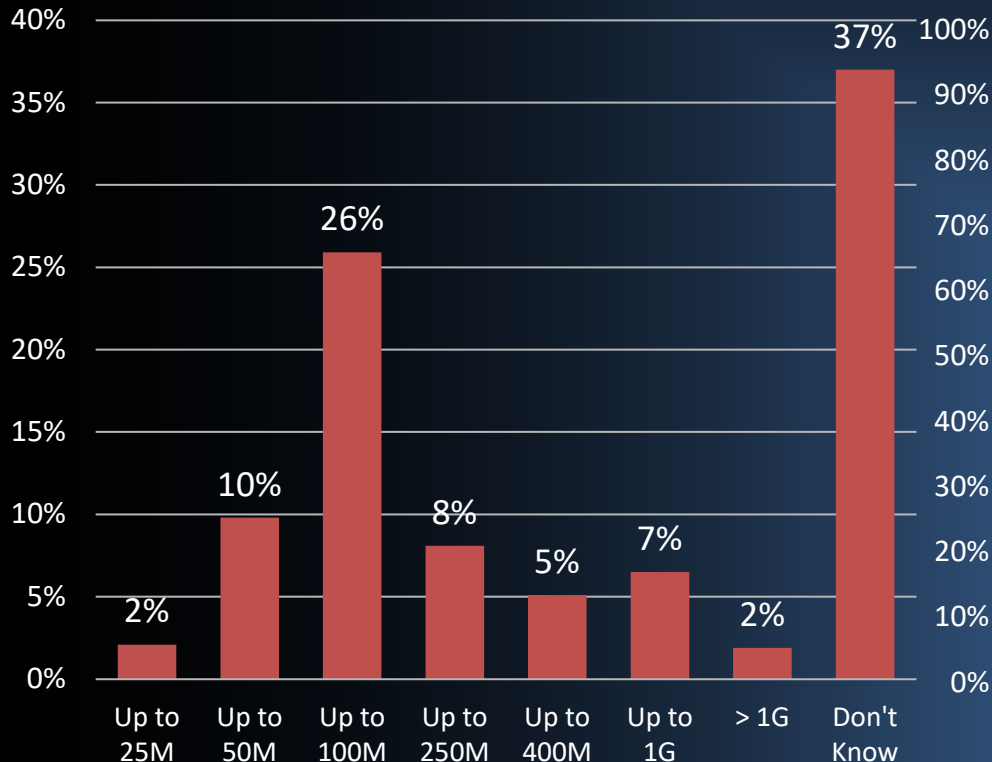
Internet Access Method by Age



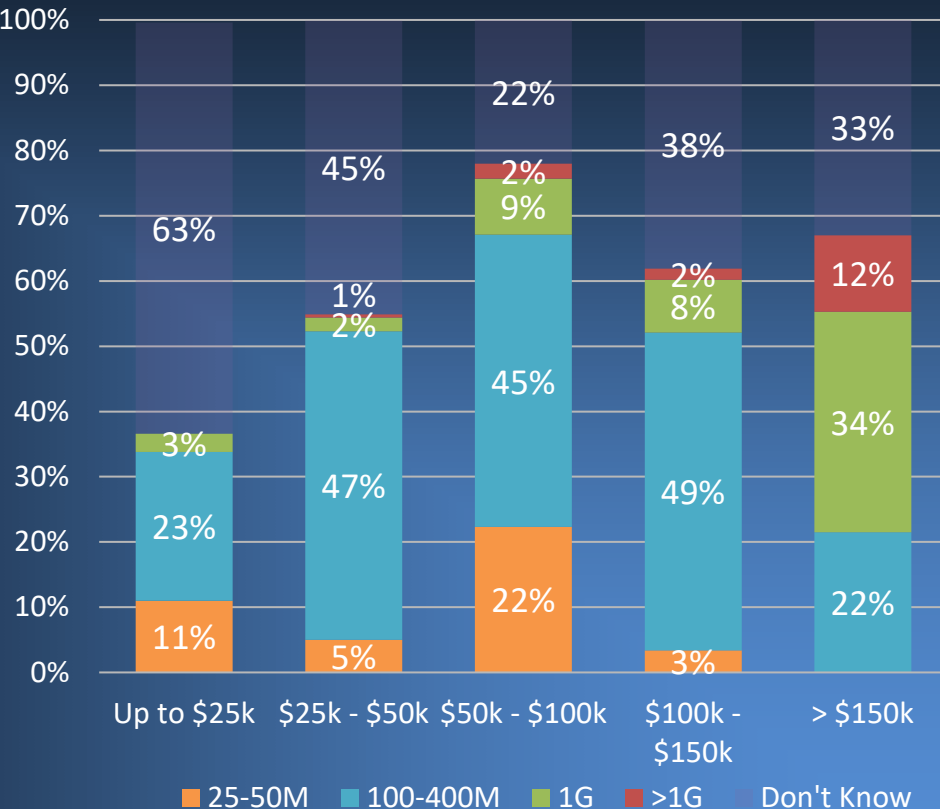
STATED DOWNLOAD SPEED

- ◆ 41% of households do not know what speed they subscribe to
- ◆ 48% of households state they subscribe to > 100M
- ◆ Lower income households are more likely to subscribe to lower capacity Internet tiers

Stated Download Speed

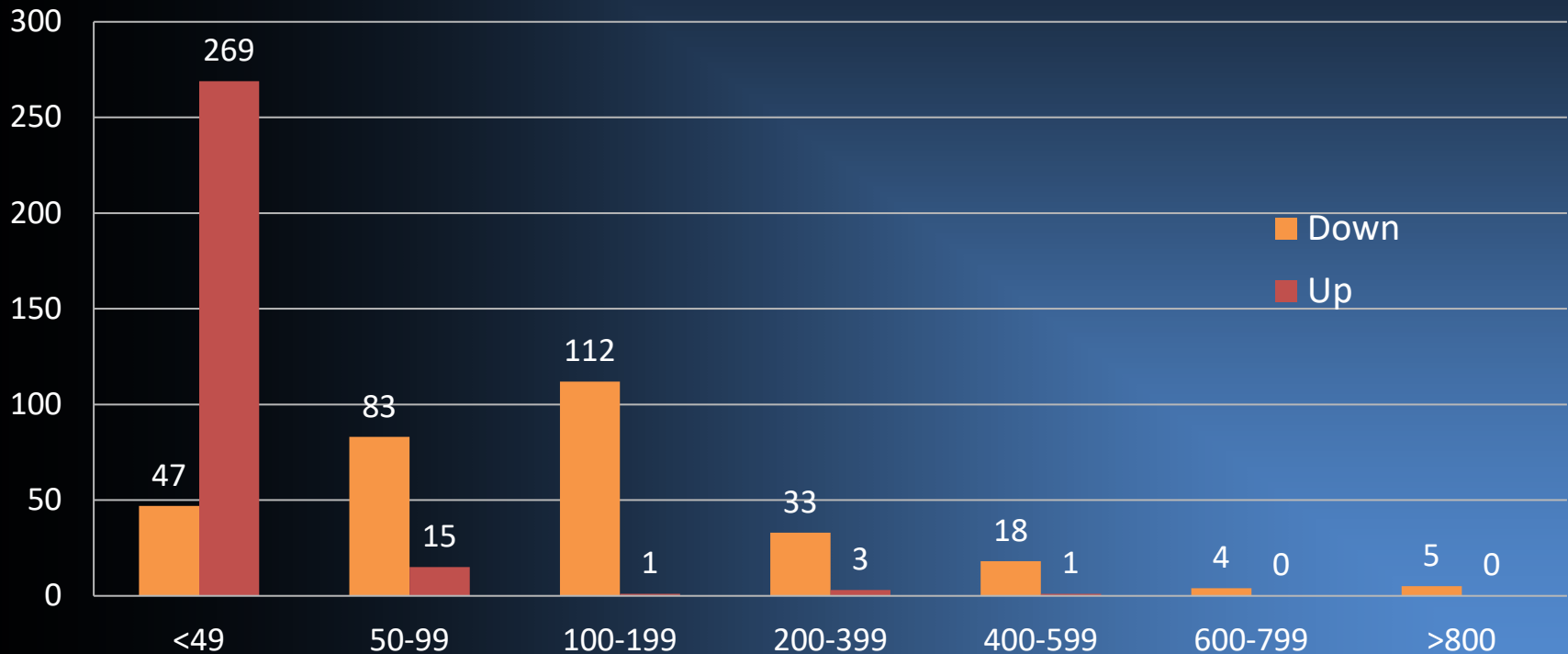


Internet Access Speed by Income



- ◆ Speed test results identify the median download speed as 108Mbps and the median upload speed as 15Mbps.

Speed Test Results – Observed Download & Upload Speeds
(*n* = 302)



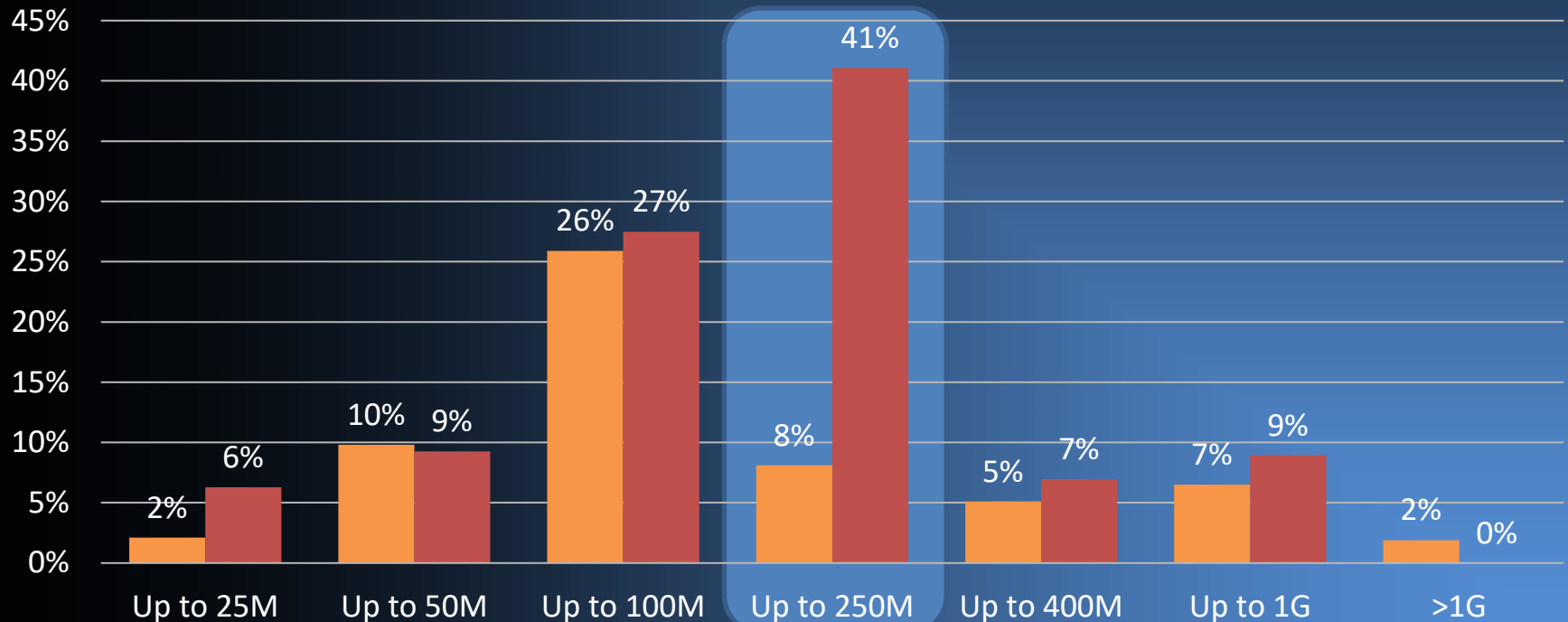
STATED VS OBSERVED DOWNLOAD SPEED

- While the majority households that can state their subscribed speed subscribe to an Internet tier of 100Mbps or less, a significant number of households are receiving actual download speeds of up to 250Mbps...

Stated versus Observed Download Speed

Stated: n = 652 Observed: n = 302

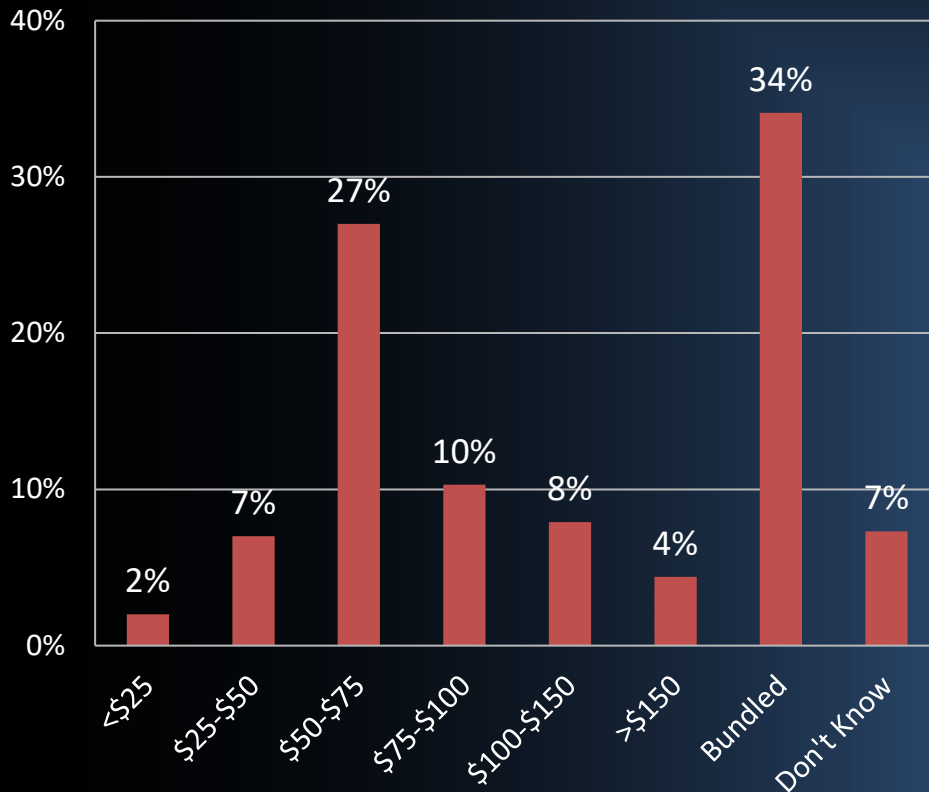
■ Stated ■ Observed



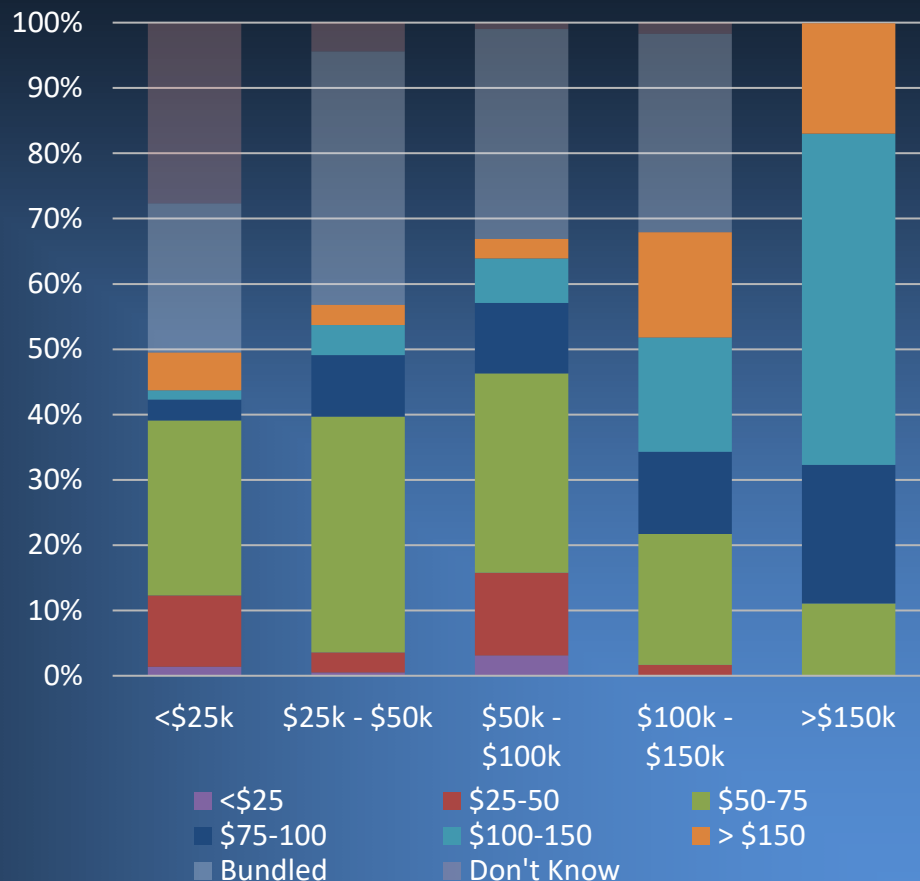
STATED INTERNET SPENDING

- ◆ Monthly spending averages \$78 across all households
- ◆ In general, average spending increases with greater household income

Monthly Internet Spending



Internet Spending by Income

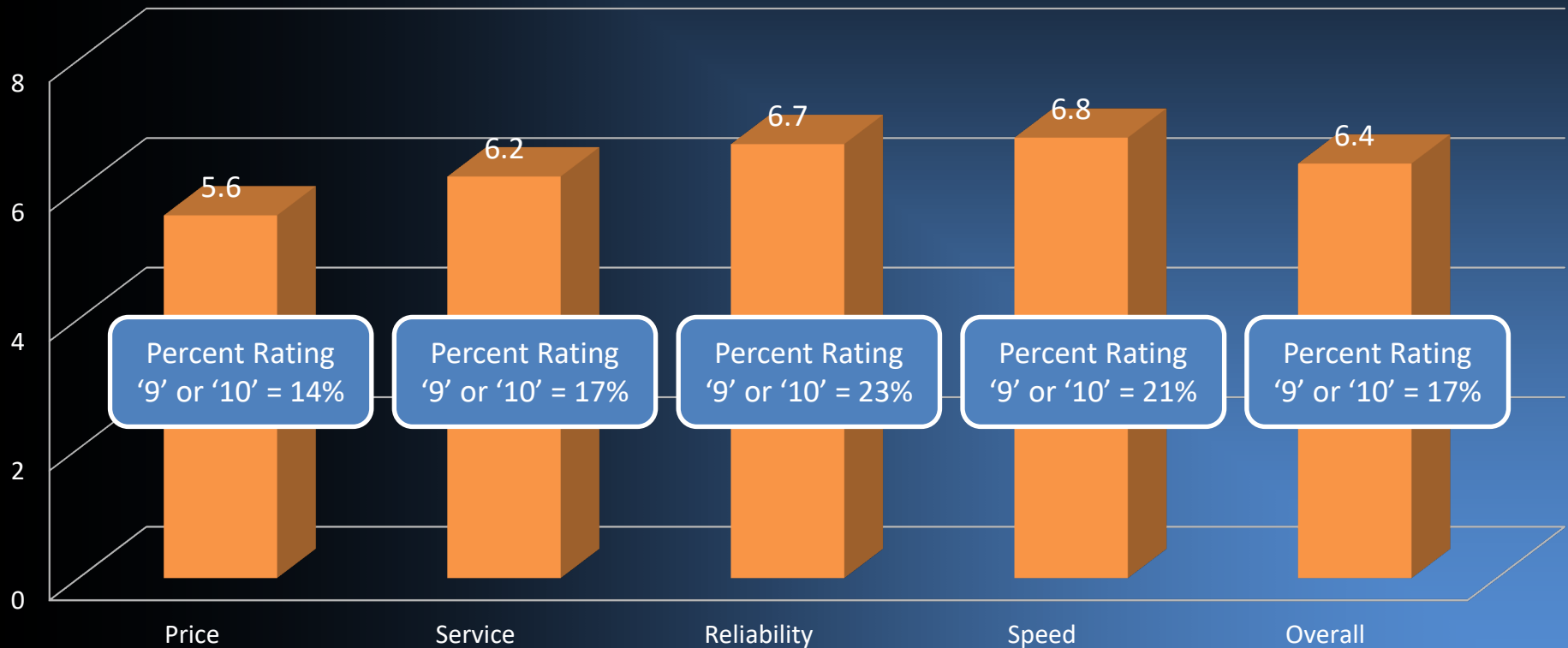


Broadband Quantitative Survey
Satisfaction & Attribute Importance

SATISFACTION WITH SPECIFIC INTERNET ATTRIBUTES

- ◆ Internet satisfaction levels are slightly above average compared to other markets, with price being the service attribute with lowest satisfaction levels.
- ◆ Across all service attributes, the percentage of households that are 'very satisfied' and rating the service a 9 or 10 is low.

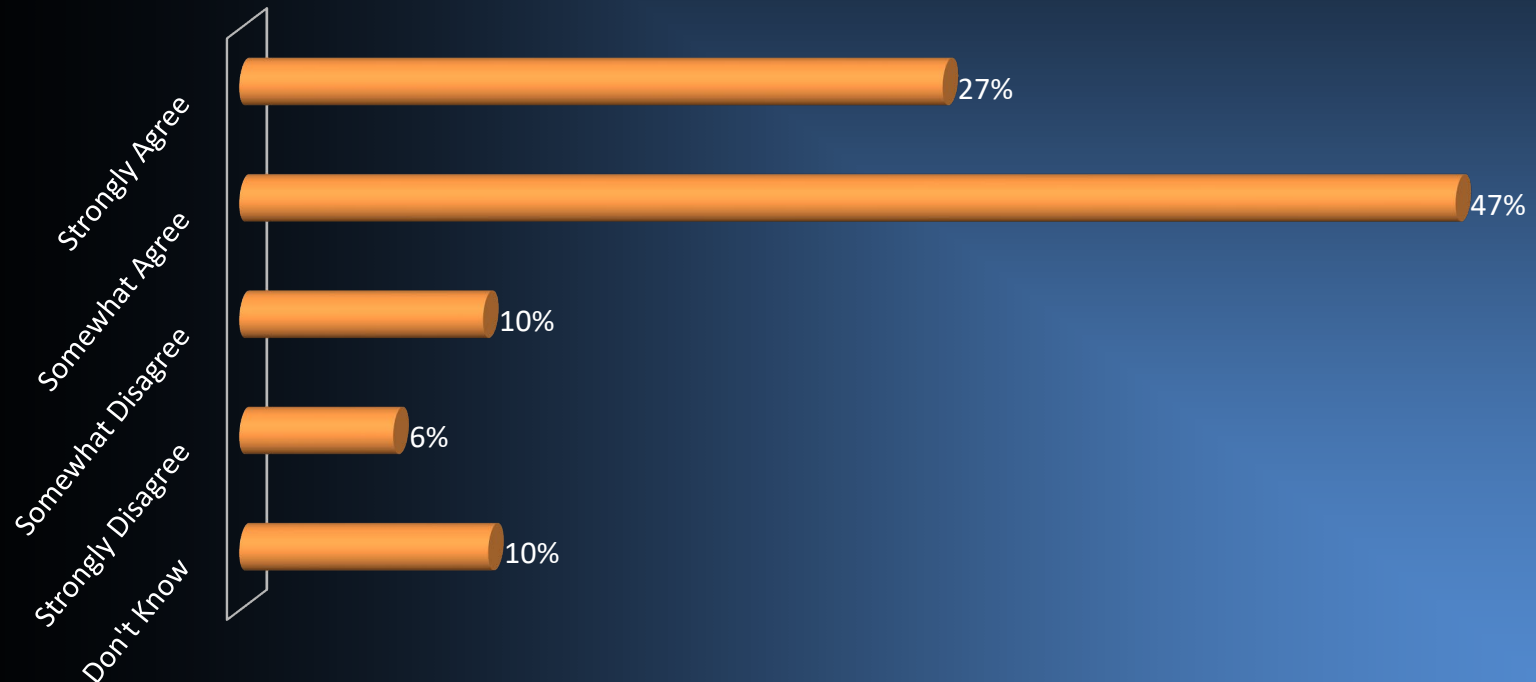
Satisfaction Rating by Internet Attribute
(Mean Rating on a 1-10 Scale)



ACCESS TO SUFFICIENT BROADBAND CAPACITY

- ◆ The vast majority (74%) of Milford households feel that at the present time they have the ability to get the Internet speed that they want

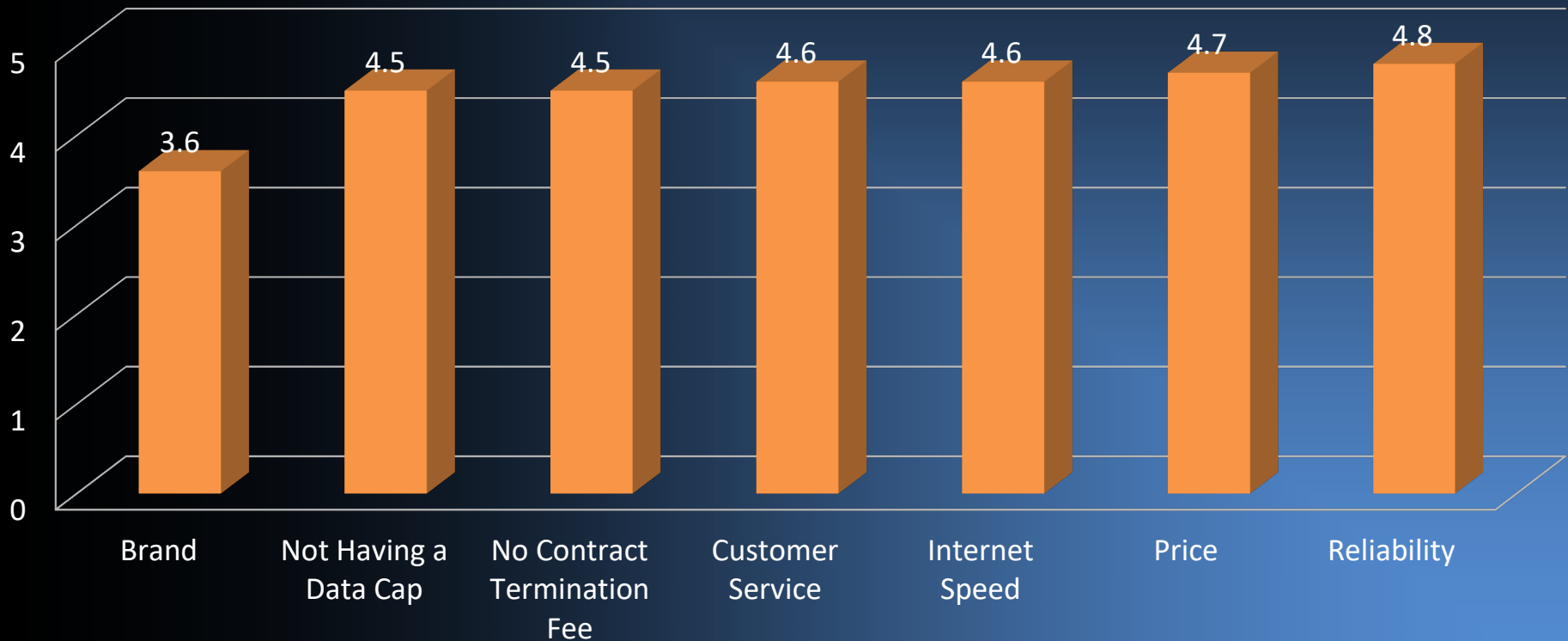
Q11: “To what extent do you agree or disagree with the following statement: I can currently able to get the Internet speed I want for my home?”



ATTRIBUTE IMPORTANCE

- Reliability and price are the most important attributes, with Internet speed and customer service very close in importance as well.
- Provider policies such as termination fees and data caps score high in importance as well...

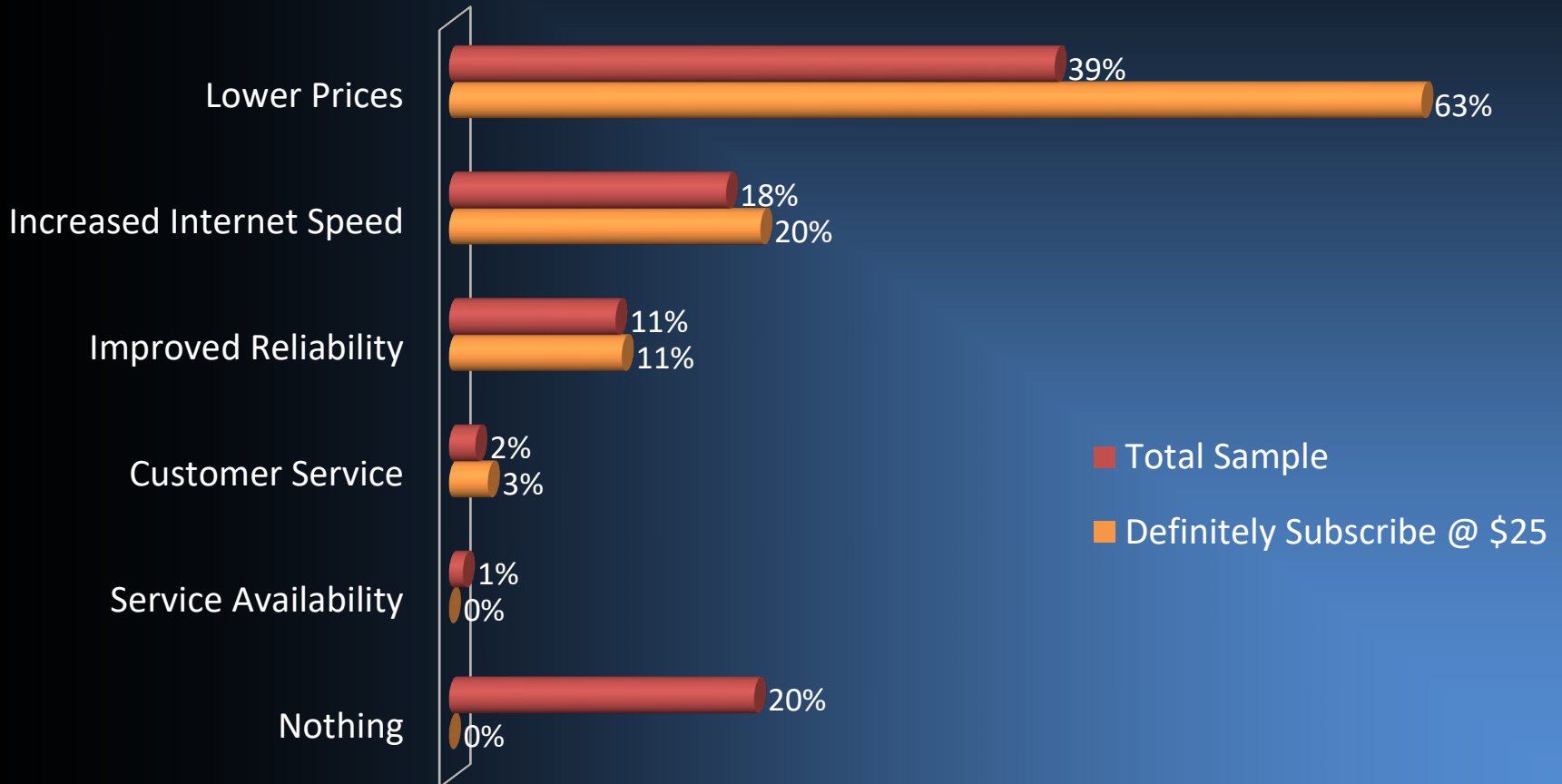
Importance Rating of Select Broadband Service Attributes
(Mean Rating on a 1-5 Scale)



BROADBAND AREAS FOR IMPROVEMENT

Milford residents see increased Internet speed and lower prices as the most important dimension for improving their broadband. Among likely subscribers, the desire for lower prices is even greater...

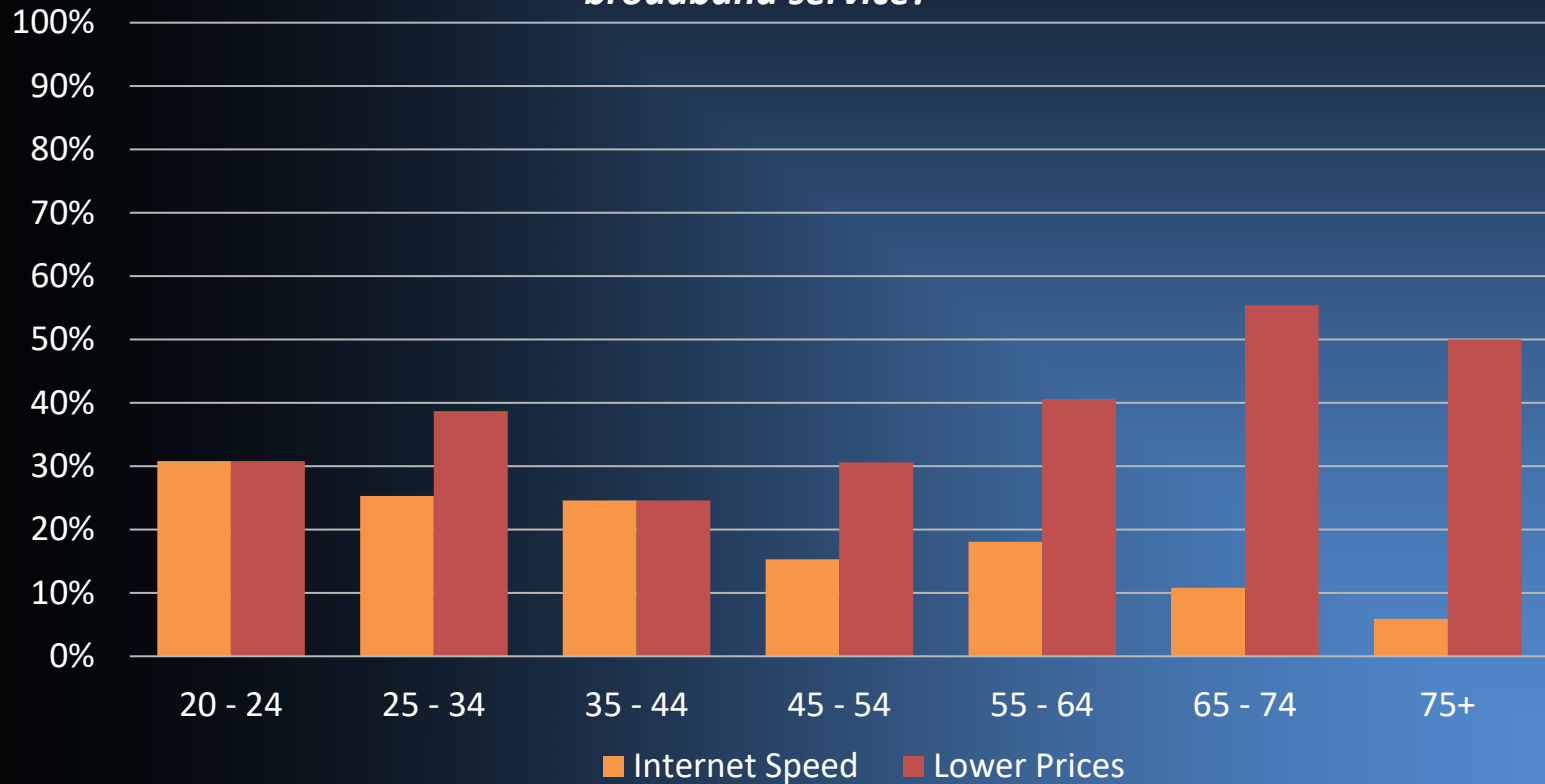
Q25: “What would you like to see most improved with your current broadband service?”



MOST DESIRED IMPROVEMENT BY AGE

- ◆ Younger households place more value on Internet speed improvements
- ◆ Older households (45+) place more value on lower price improvements

Q25: "What would you like to see most improved with your current broadband service?"

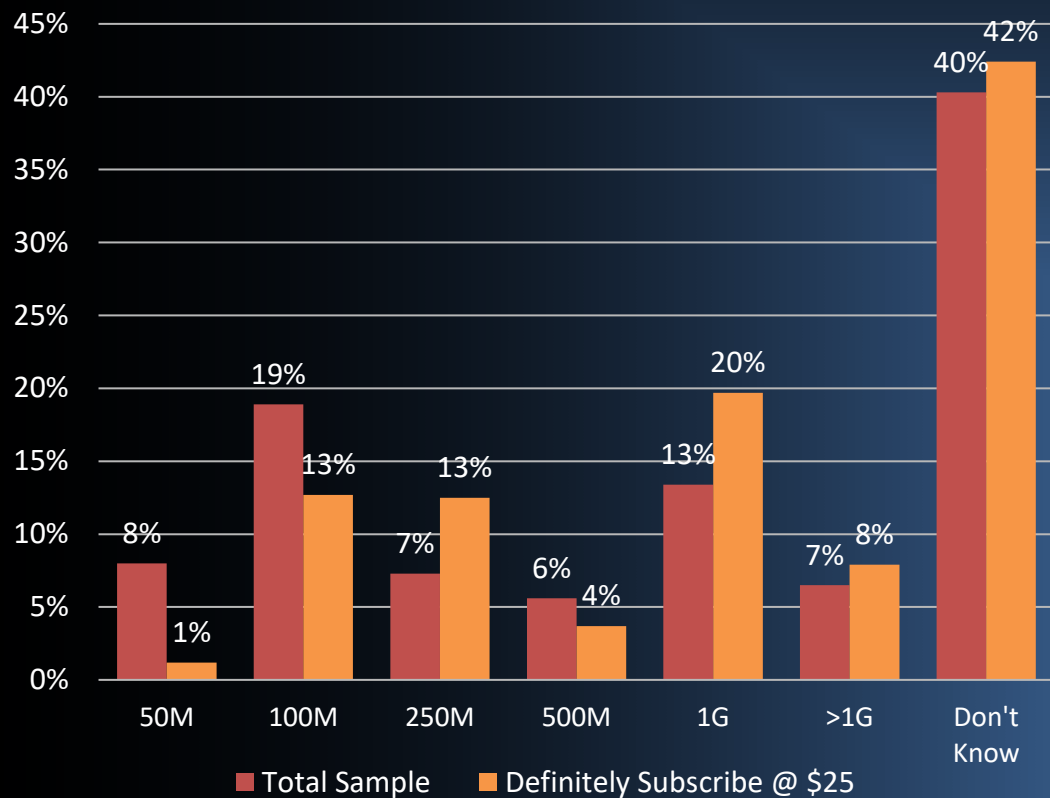


Broadband Quantitative Survey
Digital Aptitude & Remote Working and Learning

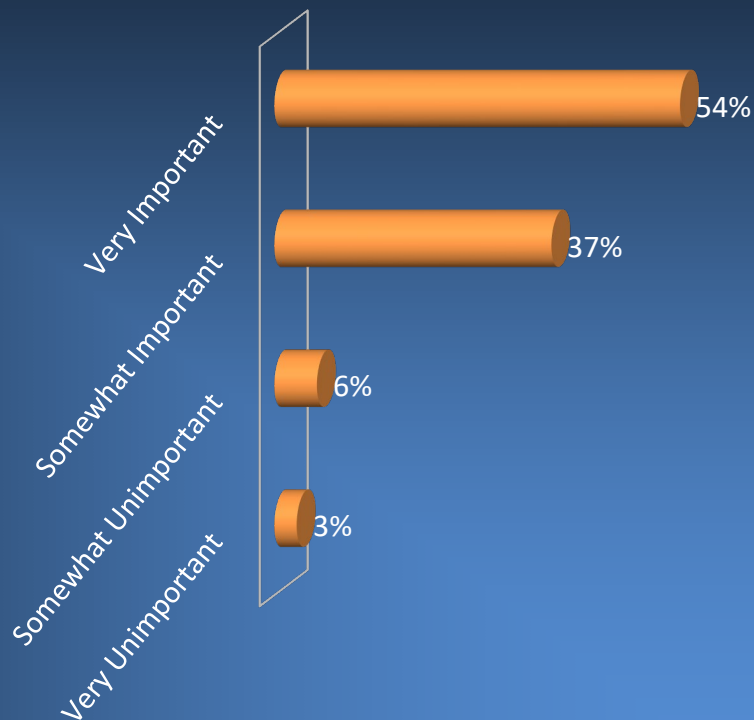
PERCEPTIONS OF INTERNET SPEED

- ◆ 20% of households state their ideal Internet speed would be 1G or higher. This increases to 28% among those who would definitely subscribe at \$25 per month for 200M. However 40% of households cannot state their ideal speed.
- ◆ One in two households perceive the upload speed as very important.

Q12: Ideal Download Speed



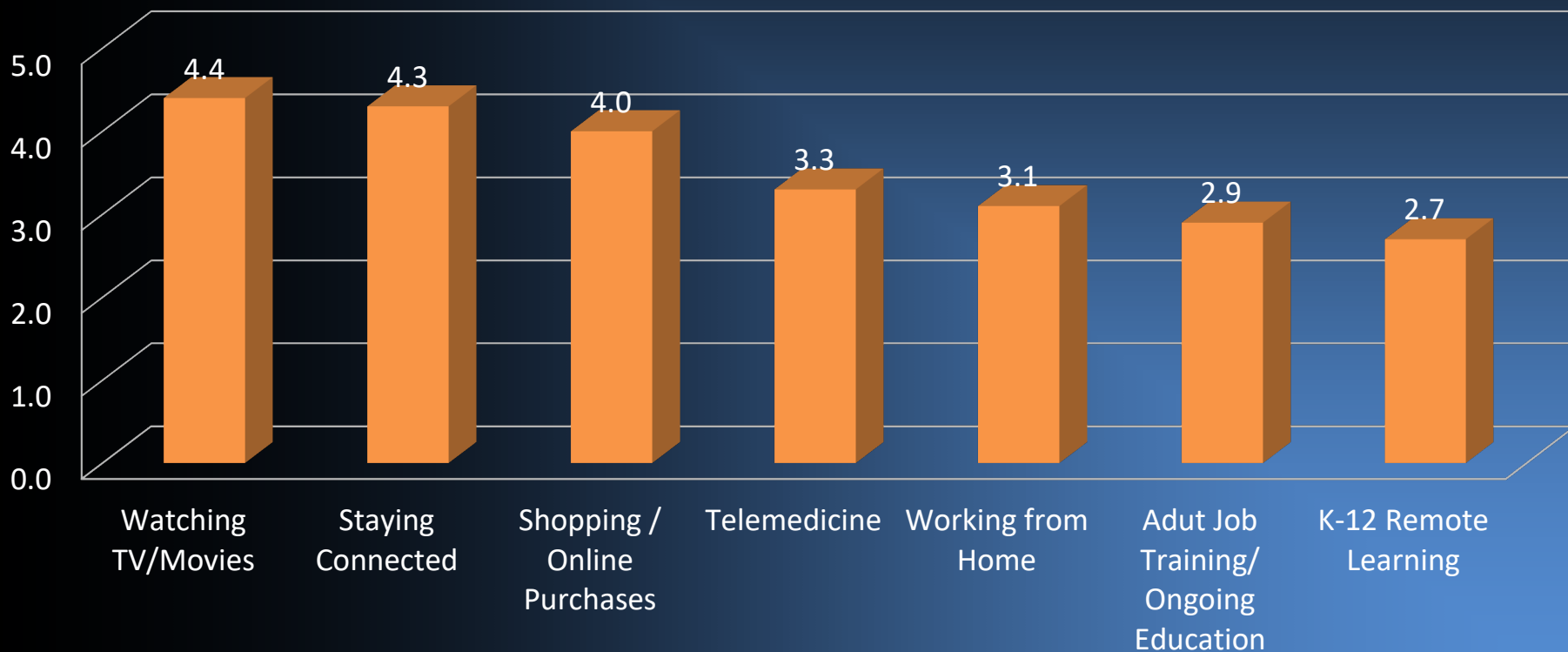
Q13: “How important is the upload speed on your home Internet connection?”



IMPORTANCE OF DIGITAL APPLICATIONS

Social connection and entertainment rate higher in importance than work-at-home and online learning applications despite the impacts of COVID-19...

Importance Rating of Select Broadband Applications in the Home
(Mean Rating on a 1-5 Scale)



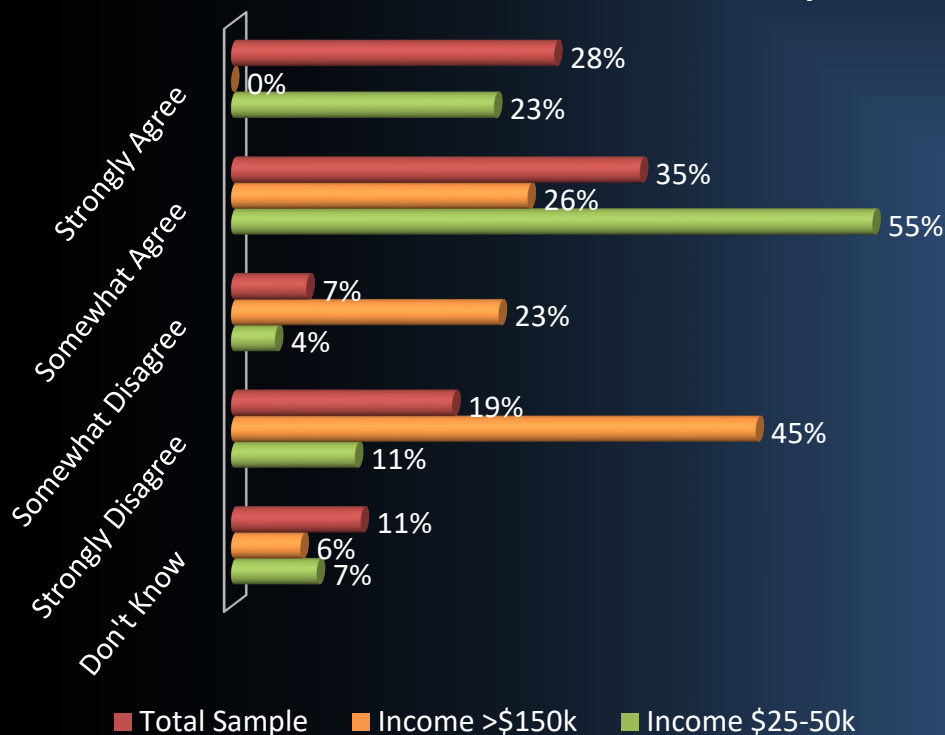
Broadband Quantitative Survey

Affordable Connectivity

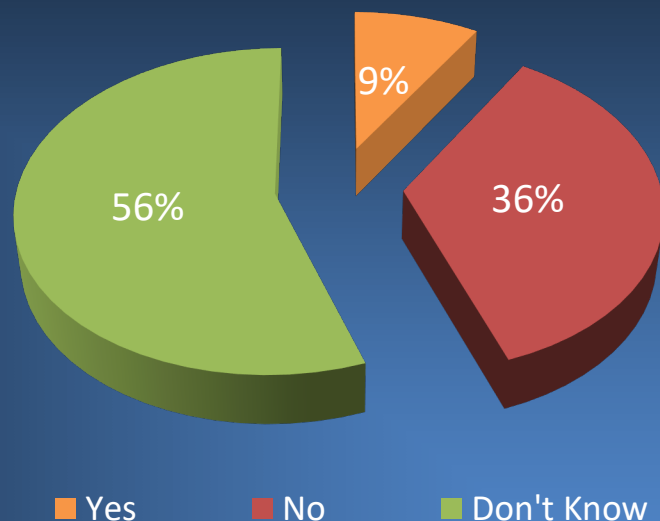
AFFORDABILITY & SUBSIDY AWARENESS

- 63% of households strongly agree or somewhat agree that they are subscribing to a lower Internet tier in order to save money.
- Among households not receiving an income-based subsidy, only 1 in 10 are aware that Comcast and Verizon offer discounted Internet.

Q7: “I subscribe to a lower speed Internet service than I would like to in order to save money?”



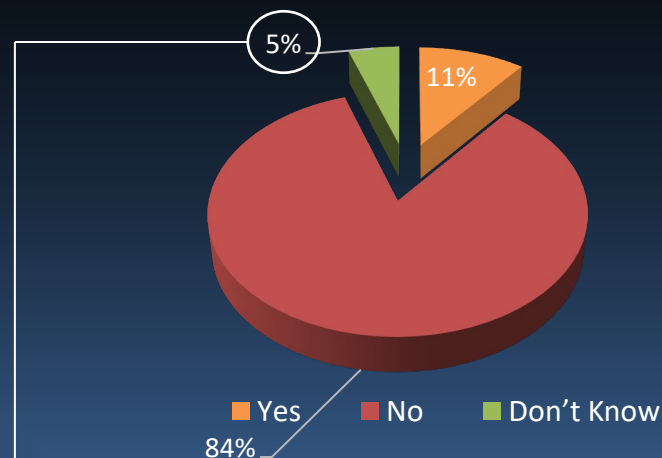
Q9: “Does your Internet provider offer a discounted Internet service for households who qualify due to lower income?”



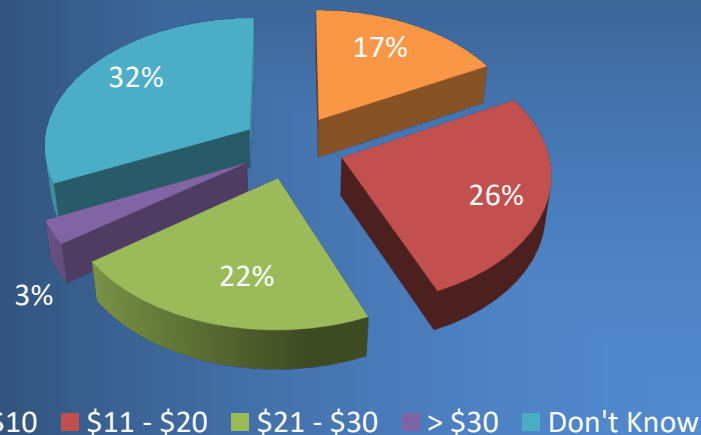
SUBSIDIZED INTERNET PARTICIPATION

- ◆ 11% of Milford households state that they are receiving a subsidized internet service based on their level of household income
- ◆ Among households receiving a discount, the stated level of discount varies. Both Comcast and Verizon participate in the ACP program that reflects a \$30/month discount

Q8: "Is your household receiving an Internet discount based on your income?"



Q10: "What is the amount of the discount?"



AFFORDABLE CONNECTIVITY PROGRAM

The Affordable Connectivity Program (ACP) is a newly funded federal program to subsidize Internet service among low-income households to narrow the digital divide...

Program Overview	• \$14.2B in total funding • Qualifying households receive a \$30 monthly benefit towards Internet service • Connected device reimbursement of \$100 if provider charges between \$10-\$50 for the device • No set end date • Participation qualifies the service provider to receive BEAD grant funding
Household Participation Requirements	• Household income at or below 200% of federal poverty limit (e.g. household size of 3 earning \$44k or less) • Participation in national school lunch program • Participate in the FCC Lifeline program
Service Provider Participation Requirements	• Eligible Telecommunications Carriers (ETCs) offering residential Internet service • Requires FCC approval and USAC election notification • The \$30 discount must be available on all Internet tiers offered by the provider • No credit check and no disconnects for non-pay until 90 days past due

TESTED RESIDENTIAL INTERNET PRICE POINTS

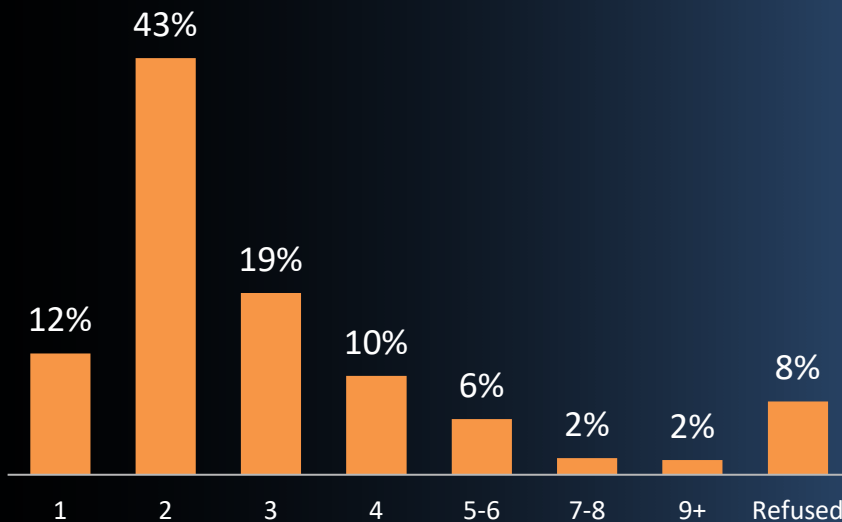
The quantitative survey evaluated household purchase intent taking into consideration a range of strategy options:

- ◆ Price elasticity of demand for 200M Internet tested at Free and \$25/month using a cell design so each participant was presented with one price point
- ◆ ACP-eligible households were presented with 200M Internet for Free (after the \$30 ACP discount)

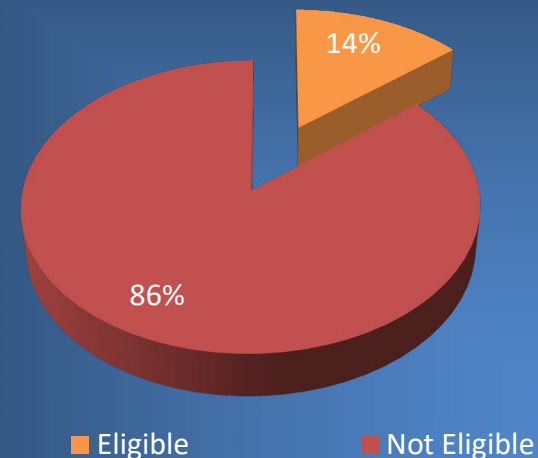
Internet Tier	Monthly Price: Standard	Monthly Price: ACP Eligible
200M	Cell A: Free Cell B: \$25	Cells A & B: Free

- ◆ Based on federal income eligibility limits combined with survey responses regarding household size and income, we estimate that approximately 14%-25% of Milford households qualify for ACP. The survey measurement of 14% eligibility is understated due to lower sample representation of low income households
- ◆ Eligibility set at 200% of Federal Poverty Level:
 - ◆ HH of 1: Income up to \$27,180
 - ◆ HH of 2: Income up to \$36,620
 - ◆ HH of 3: Income up to \$46,060
 - ◆ HH of 4: Income up to \$55,500
 - ◆ HH of >4: Add \$9,440 per person

Household Size
(Survey Data)



ACP Eligibility
(Survey Data)



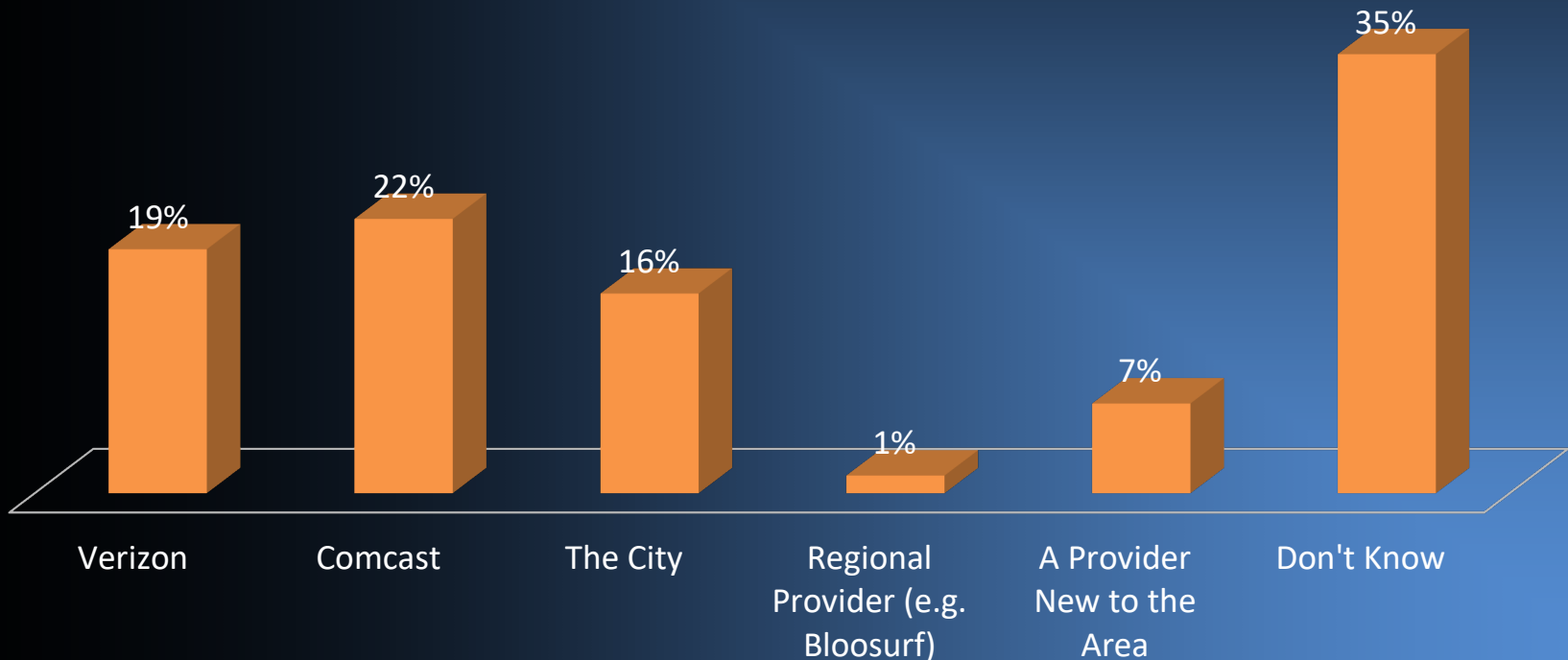
Broadband Quantitative Survey

Broadband Market Potential

PROVIDER PREFERENCE

- ◆ 16% of respondents, when given the choice, would prefer to receive high speed Internet from the City, while 22% of respondents prefer Comcast. Preference for an incumbent provider is higher than we typically observe.

Q24: “Among the following list of potential providers, who would you prefer to receive high-speed Internet service from?”

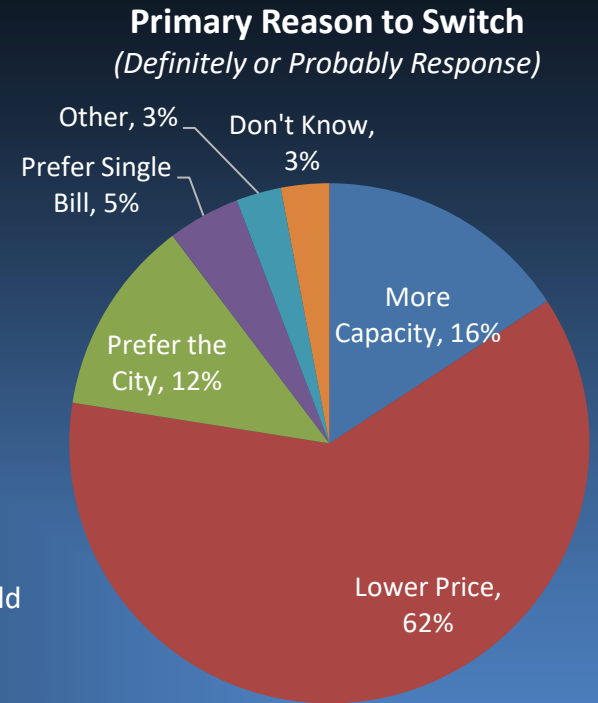
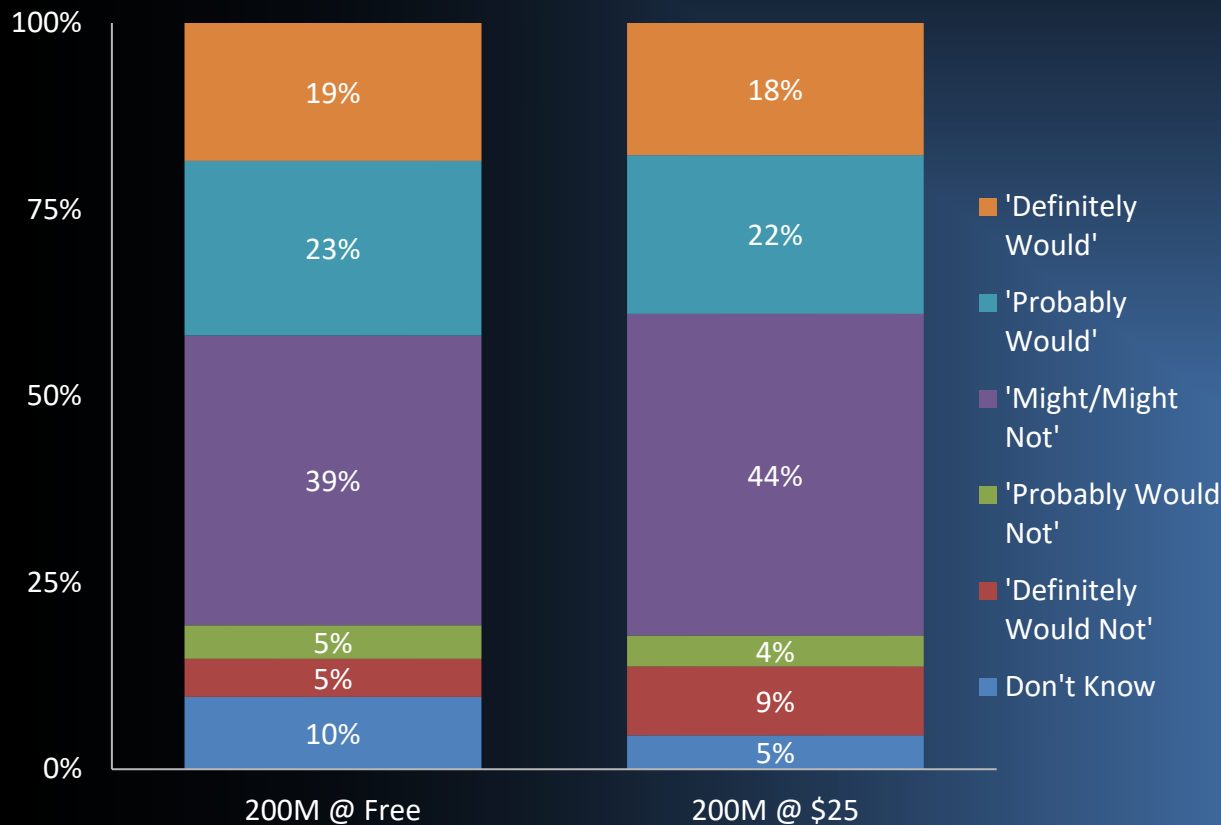


PURCHASE INTENT: ENTIRE SAMPLE

With No Charge for 200M, 42% of respondents indicated they would definitely or probably switch their Internet service to a fiber system installed by the City. This metric drops to 39% at the \$25 price point, which is statistically equivalent to the stated purchase intent at No Charge...

Q21/Q22: Stated purchase intent for:

- Internet at \$0/mo. for 200Mbps
- Internet at \$25/mo. for 200Mbps

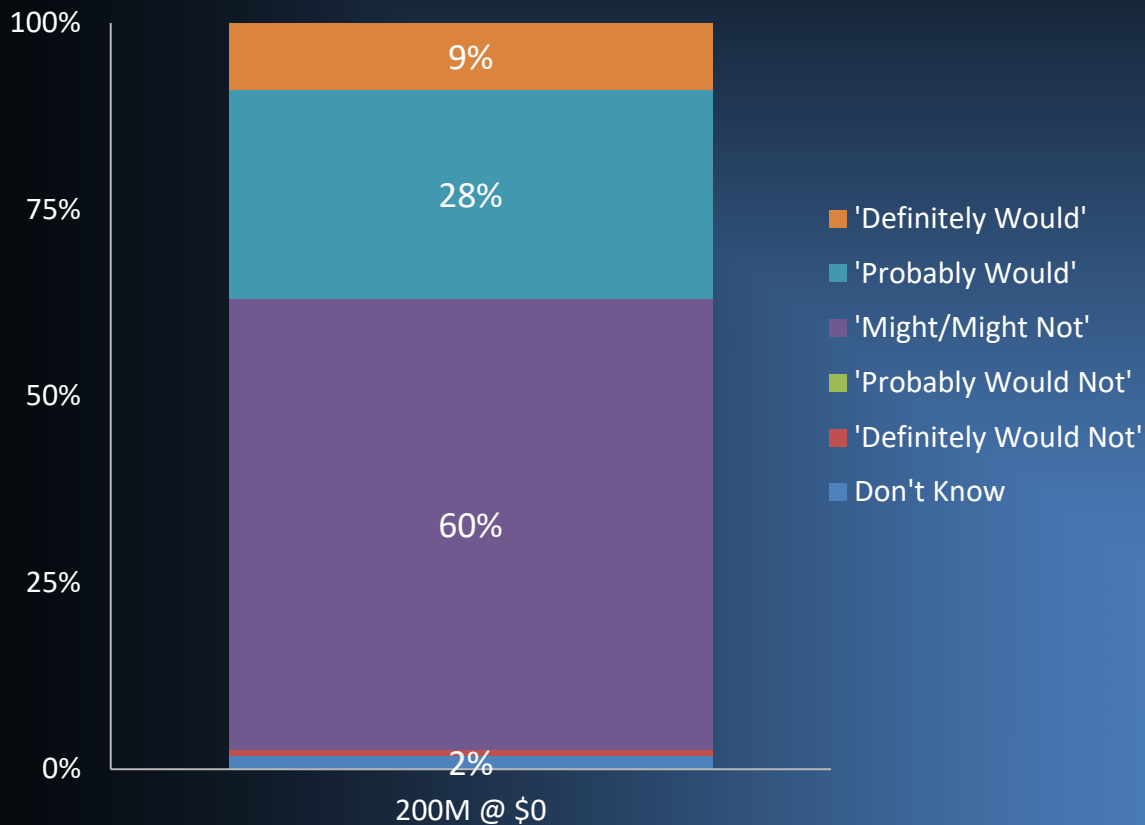


PURCHASE INTENT: ACP ELIGIBLE

37% of respondents likely eligible to participate in the Affordable Connectivity Program indicated they would definitely or probably subscribe at the subsidized rate...

Q28: Stated purchase intent for:

- ACP Eligible Internet at \$0/mo. for 200Mbps



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% = 2.0%

27.7% = Penetration Estimate

Survey Cell	Broadband Service	Forecasted Take Rate
A	200M Internet @ \$0 (All Households)	23.9%
B	200M Internet @ \$25 (All Households)	23.0%
	200M Internet @ \$0 (ACP Eligible Households)	20.7%

SUMMARY OF RESIDENTIAL RESEARCH FINDINGS

Current Demand & Use	• 96% of households use Internet at home with 77% using a wired connection. Comcast is the dominant provider.
Demographic Factors	• Lower household income reduces incidence of a wired Internet connection. • For lower income households that do have Internet, subscribed speeds are lower than higher income households.
Satisfaction	• Overall Internet satisfaction score is 6.4 on a 1-10 scale. The percentage of very satisfied households (rating 9 or 10) is just 17% overall due to dissatisfaction with price and customer service.
Market Gaps	• Improved Internet speed is the predominant need among younger households, while lower prices is the predominant need among older households. • Among households most likely to subscribe the predominant need is lower pricing.
Affordability	• 63% of households currently are under-utilizing Internet capacity due to affordability issues. • We estimate that 14% to 25% of Milford households would be eligible for the ACP program, but only ≈11% are currently participating.
Potential Demand & Use	• There is minimal price elasticity between the two tested price points with a forecasted take rate increase from 23.0% to 23.9% by lowering the 200M price from \$25/month to free. • 20% of households state their ideal Internet speed would be 1G or higher. This increases to 28% among those who would definitely subscribe • Comcast is the preferred provider by 2% of households. The City is preferred by 16%.

Task 3 – Wireless Network Strategy

- ◆ Electric Utility Assets
 - ◆ Over 3,800 primary electric poles
 - ◆ Space should be available at the top of the communications zone
 - ◆ Pole owner is allowed to place fiber cable 30 inches below power
 - ◆ Should significantly reduce pole make ready costs
 - ◆ No availability of spare conduits assumed in underground areas
- ◆ Streetlights
 - ◆ Cobra head arms attached directly to power poles in overhead areas
 - ◆ Shorter decorative streetlights more common in underground service areas
 - ◆ Wireless device mounting options limited on existing decorative streetlights
- ◆ City fiber network
 - ◆ 13.7 mile fiber ring circles the City
 - ◆ Fiber strand capacity assumed to be limited
 - ◆ Fiber storage points along the route unknown
 - ◆ System assumed to be well suited for future broadband backbone

◆ Option 1 – Macrocell Fixed Broadband

- ◆ Platforms based on licensed spectrum have higher power, but require provider provided CPE
- ◆ Unlicensed platforms operate at lower power, but can be compatible with standard Wi-Fi devices
- ◆ Most WISPs struggle to provide speeds greater than 50Mbps
- ◆ Newly introduced platform boasts user radios capable of supporting 800Mbps

◆ Option 2 - Microcell Licensed wireless (“5G”)

- ◆ “5G” technology uses licensed spectrum and fiber fed access points to offer 1Gig service
- ◆ Up to 4Gig speeds possible under ideal conditions and optimal spectrum usage
- ◆ Access points are limited to 1,000 foot radius or less to achieve building and foliage penetration
- ◆ Feeding access points with fiber would virtually result in a “fiber to the curb” buildout

✓ Option 3 – Targeted Microcell Wi-Fi

- ◆ Wi-Fi access points deployed in targeted neighborhoods
- ◆ Fiber gateways serve up to two access points via mesh technology
- ◆ Access points placed within 250 feet of any potential customer location
- ◆ Best effort service with speeds ranging from 100 – 500 Mbps to any standard Wi-Fi device
- ◆ Recommended based on the targeted nature of the broadband need in Milford

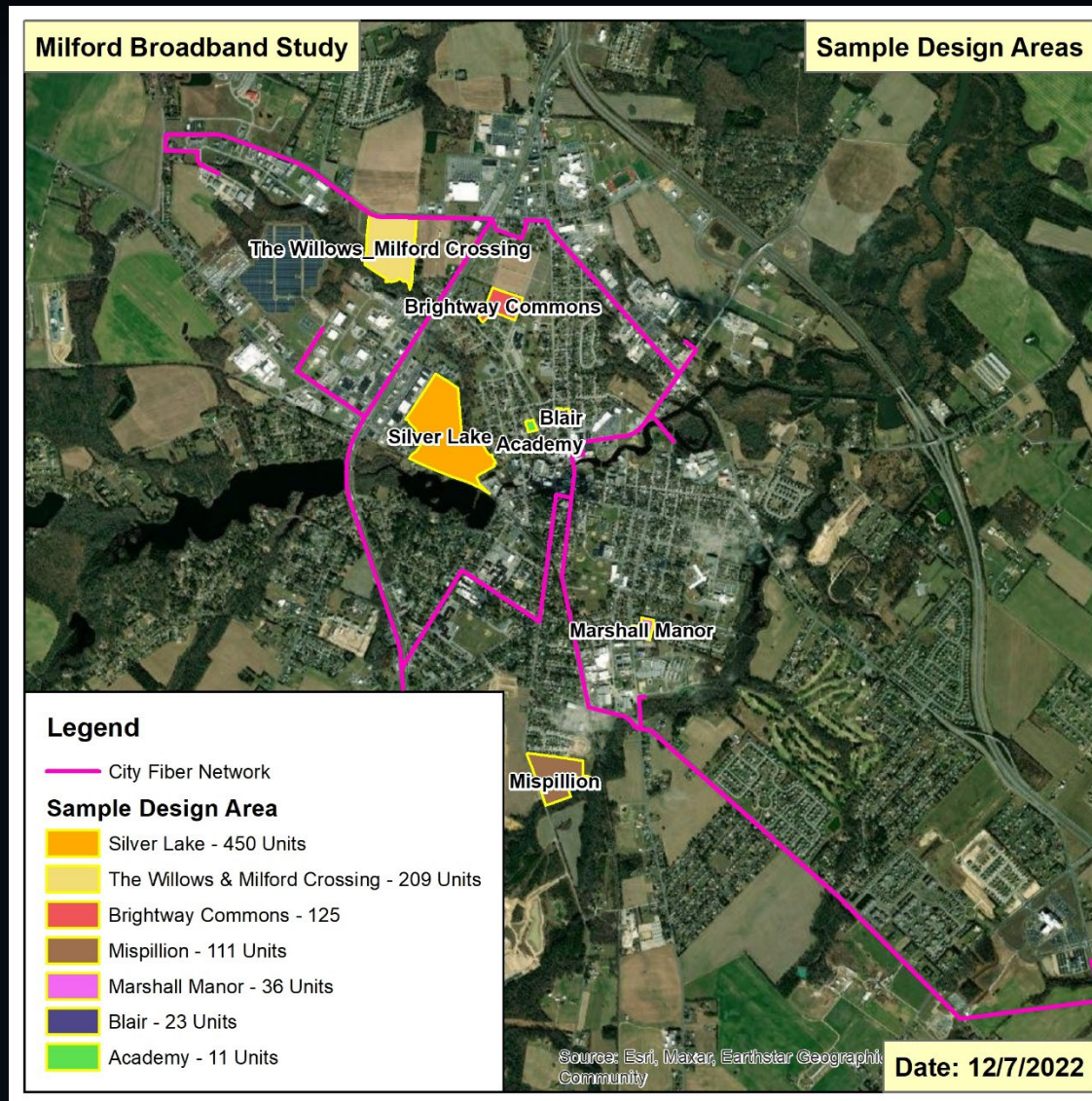
- ◆ **Fiber Gateway**
 - ◆ System designed based on latest Ruckus T750 Access Point
 - ◆ Up to 2.5 Gbps onboard fiber based backhaul capability
 - ◆ Pole or strand mount options
 - ◆ Also serves as Wi-Fi access point
- ◆ **Access Points**
 - ◆ >1.2 Gbps capability in Wi-Fi bands (2.4 GHz and 5.8 GHz)
 - ◆ Mesh technology allows APs to connect to fiber gateway through each other (hops)
 - ◆ Maximum of two hops used to maximize delivered bandwidth in the neighborhood
 - ◆ APs placed within 250 feet of any potential customer
- ◆ **Customer Premises Equipment (CPE)**
 - ◆ Any standard Wi-Fi device will be compatible with the Wi-Fi network
 - ◆ CPE power is usually the limiting factor on how far the user can effectively be located from the AP
- ◆ **Access Point Mounting**
 - ◆ Mount on existing electric poles at the top of the communications zone
 - ◆ Mount on strand where fiber network has been installed
 - ◆ Uptown assumes the need to install new poles for all APs where electric system is underground

Wi-Fi Network Sample Designs

SAMPLE DESIGN COST ASSUMPTIONS

- ◆ **Aerial construction**
 - ◆ \$2.50 per foot for strand placement in communications zone
 - ◆ \$1.50 per foot for lashing each cable to the strand
- ◆ **New underground path creation**
 - ◆ \$20.00 per foot composite for conduit placement (100% boring)
 - ◆ \$2.50 per foot for 2in HDPE conduits
 - ◆ Per structure adder for all vaults
- ◆ **Fiber placement**
 - ◆ \$1.50 per foot labor to install fiber cable in conduit system
 - ◆ Fiber material costs based on recent quote
- ◆ **Technical services**
 - ◆ \$35 per fusion splice
 - ◆ \$15 per fiber pigtail required at fiber gateways
 - ◆ \$500 closure prep for splice points
- ◆ **Wi-Fi Network**
 - ◆ \$5,000 per fiber gateway + \$1,000 installation labor
 - ◆ \$4,000 per access point + \$1,000 installation labor
 - ◆ \$5,025 per Wi-Fi pole (including light fixture) + \$4,000 installation labor

SAMPLE DESIGN AREA OVERVIEW



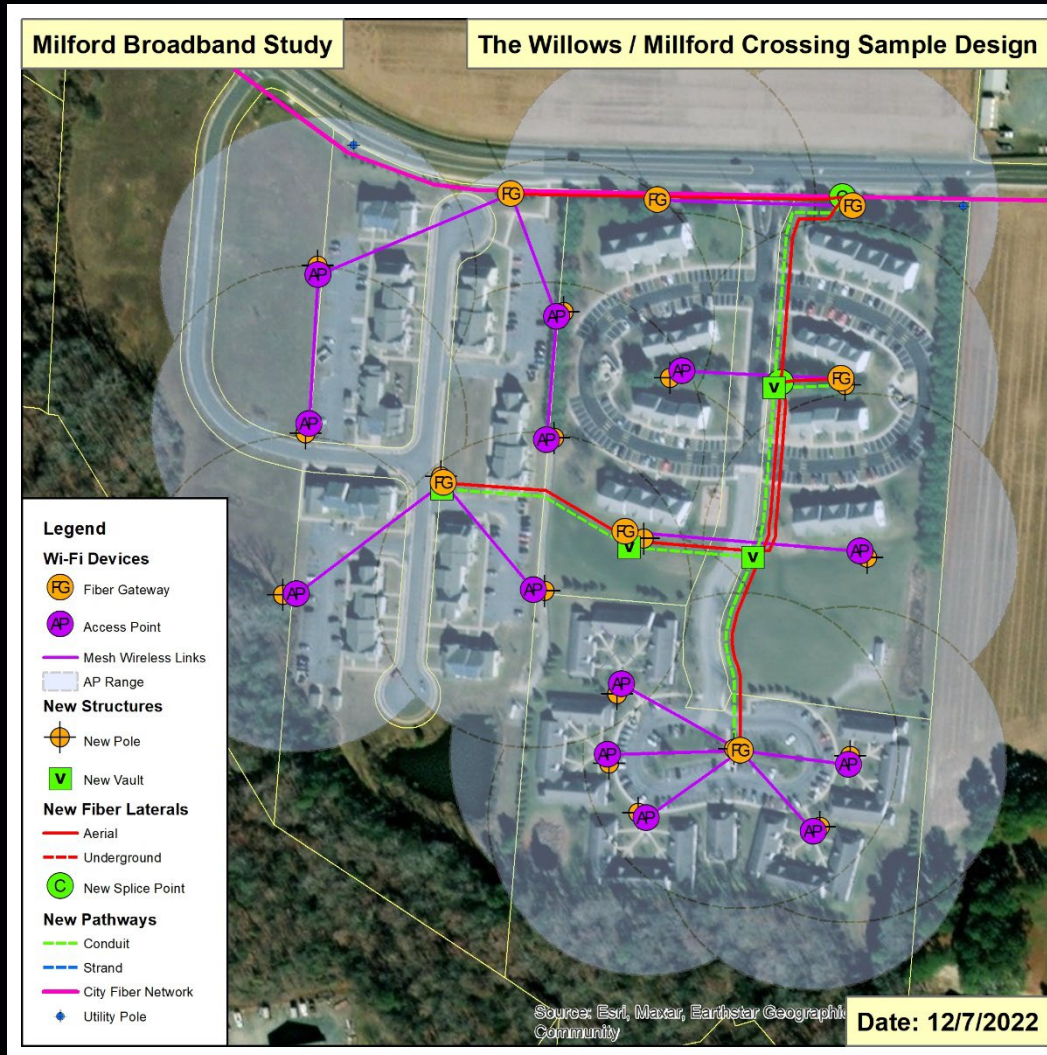
SILVER LAKE SAMPLE DESIGN



Design Metric	Value
New Aerial Plant Miles	0.6
New Underground Plant Miles	0.3
% Aerial	70%
% UG	30%
Passings	450
Passings per Mile of Plant	485
Materials Cost per Passing	\$556
Labor Cost per Passing	\$388
Total Cost per Passing	\$944
Total Materials (no drops)	\$249,975
Total Labor (no drops)	\$174,785
Total Cost	\$424,760

* - Does not include engineering and fixed equipment.

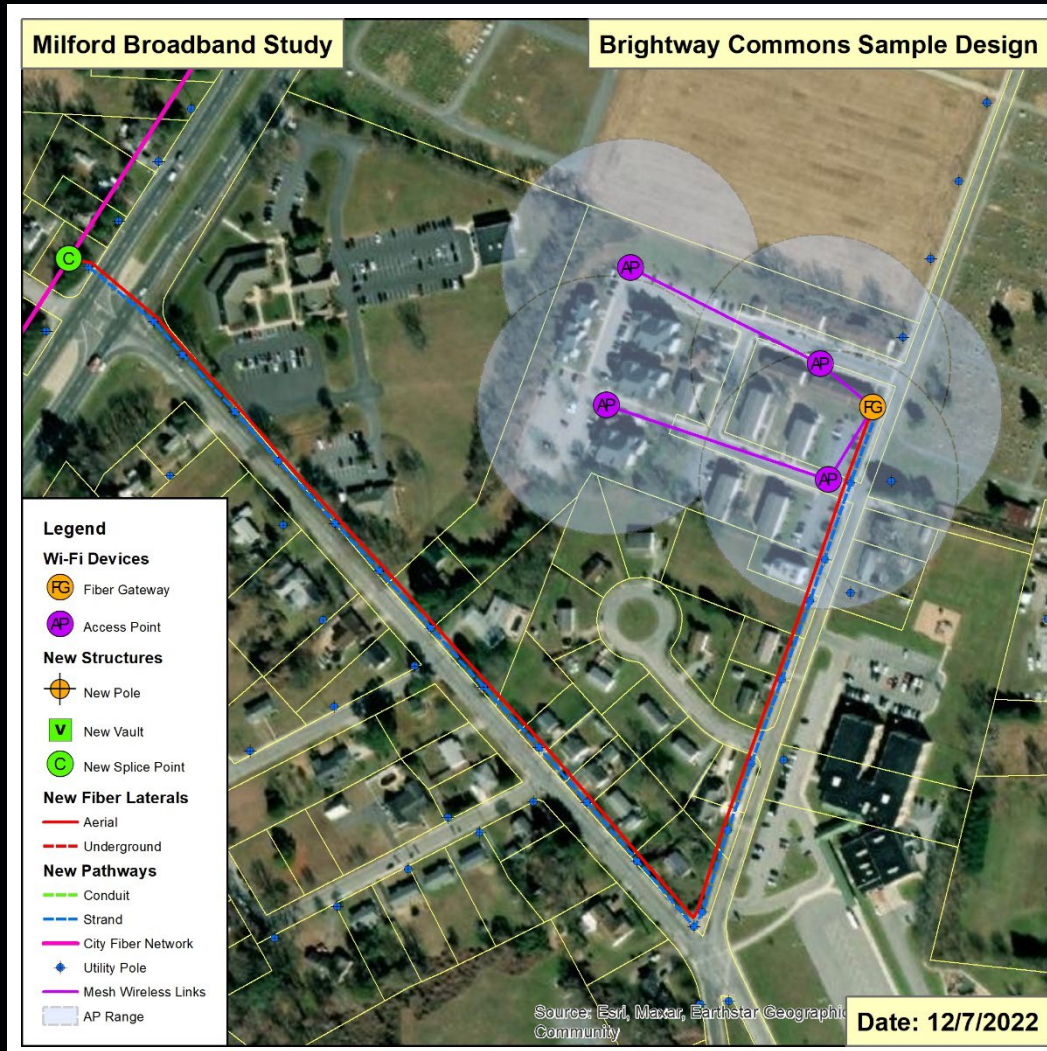
THE WILLOWS / MILFORD CROSSING SAMPLE DESIGN



Design Metric	Value
New Aerial Plant Miles	-
New Underground Plant Miles	0.3
% Aerial	0%
% UG	100%
Passings	209
Passings per Mile of Plant	702
Materials Cost per Passing	\$998
Labor Cost per Passing	\$711
Total Cost per Passing	\$1,710
Total Materials (no drops)	\$208,670
Total Labor (no drops)	\$148,694
Total Cost	\$357,364

* - Does not include engineering and fixed equipment.

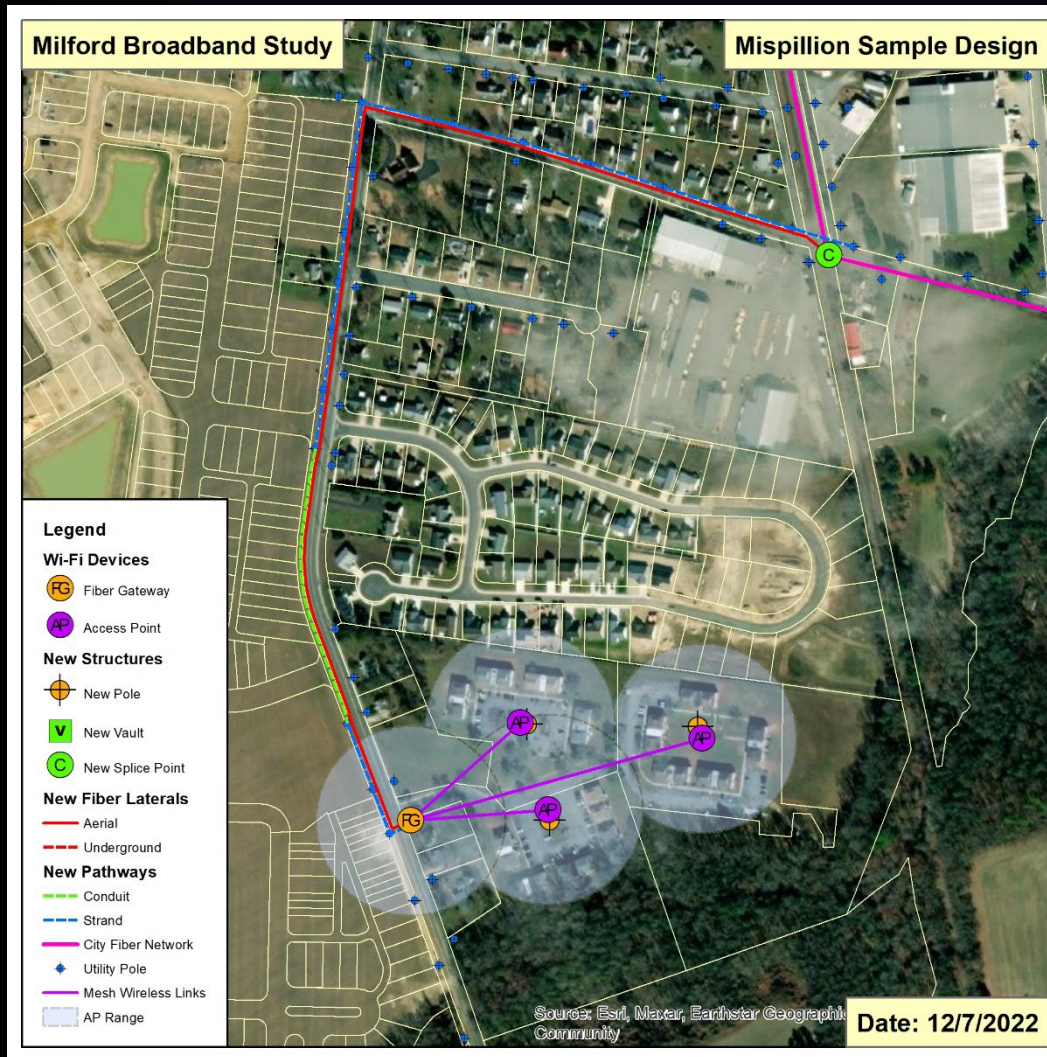
BRIGHTWAY COMMONS SAMPLE DESIGN



Design Metric	Value
New Aerial Plant Miles	0.5
New Underground Plant Miles	-
% Aerial	100%
% UG	0%
Passings	125
Passings per Mile of Plant	236
Materials Cost per Passing	\$262
Labor Cost per Passing	\$171
Total Cost per Passing	\$433
Total Materials (no drops)	\$32,746
Total Labor (no drops)	\$21,348
Total Cost	\$54,094

* - Does not include engineering and fixed equipment.

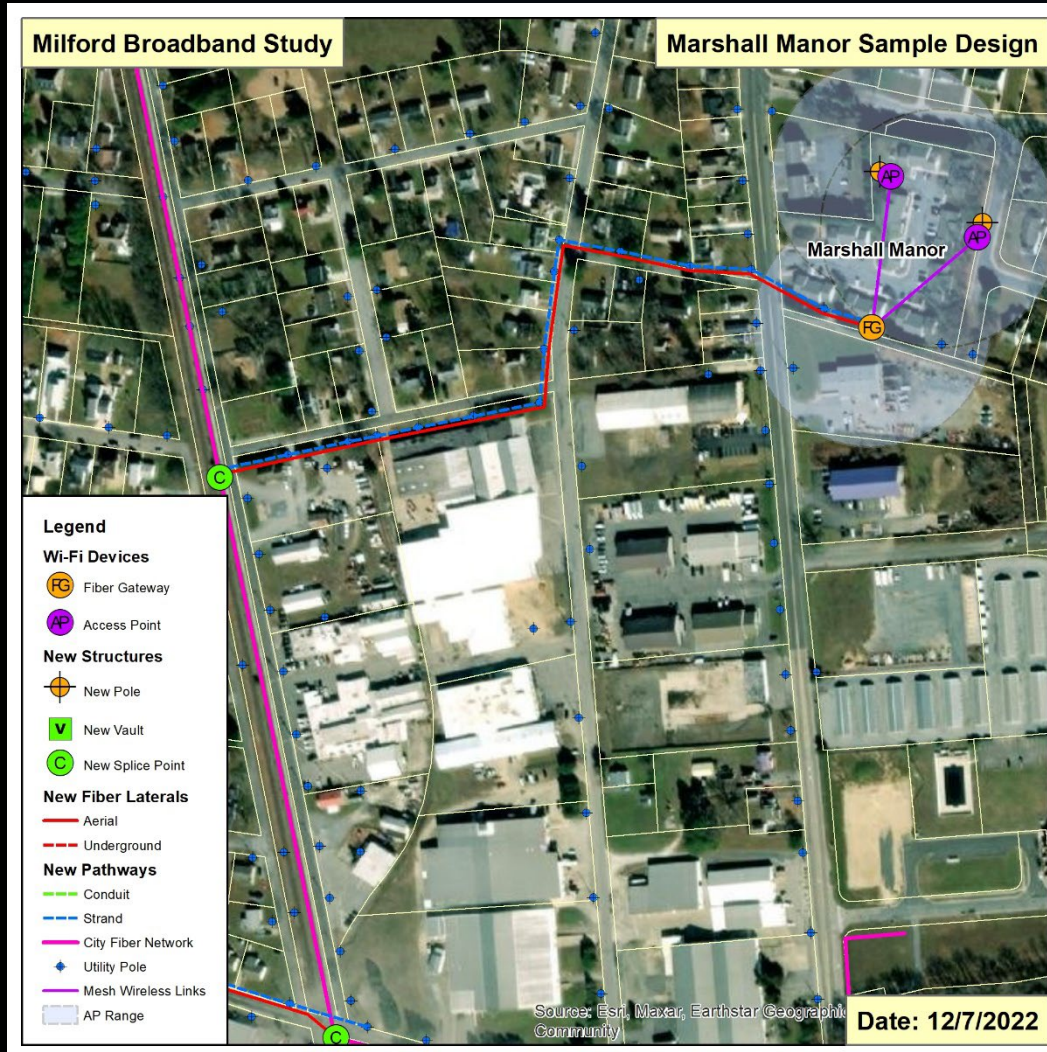
MISPILLION SAMPLE DESIGN



Design Metric	Value
New Aerial Plant Miles	0.5
New Underground Plant Miles	0.1
% Aerial	78%
% UG	22%
Passings	111
Passings per Mile of Plant	172
Materials Cost per Passing	\$446
Labor Cost per Passing	\$500
Total Cost per Passing	\$946
Total Materials (no drops)	\$49,453
Total Labor (no drops)	\$55,539
Total Cost	\$104,992

* - Does not include engineering and fixed equipment.

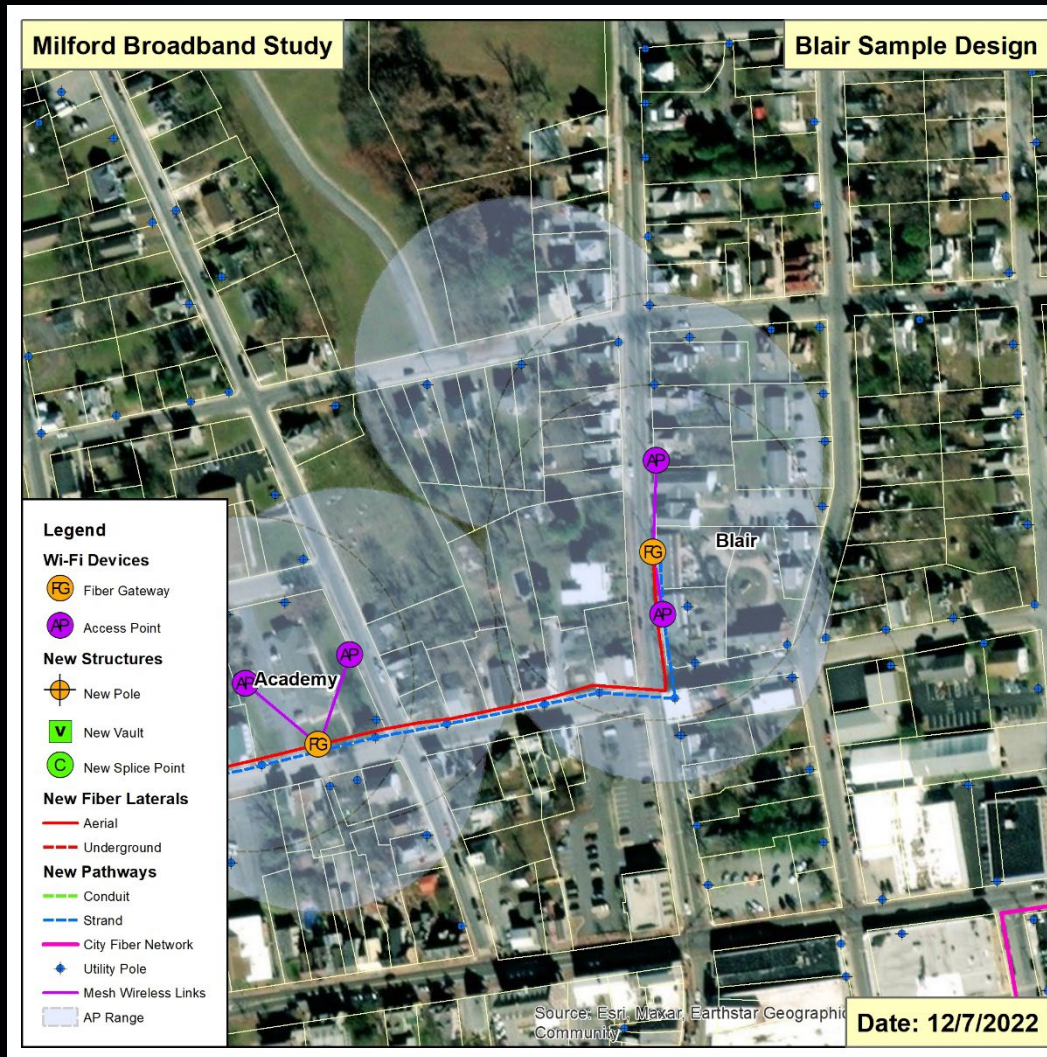
MARSHALL MANOR SAMPLE DESIGN



Design Metric	Value
New Aerial Plant Miles	0.3
New Underground Plant Miles	-
% Aerial	100%
% UG	0%
Passings	36
Passings per Mile of Plant	111
Materials Cost per Passing	\$721
Labor Cost per Passing	\$600
Total Cost per Passing	\$1,321
Total Materials (no drops)	\$25,938
Total Labor (no drops)	\$21,617
Total Cost	\$47,555

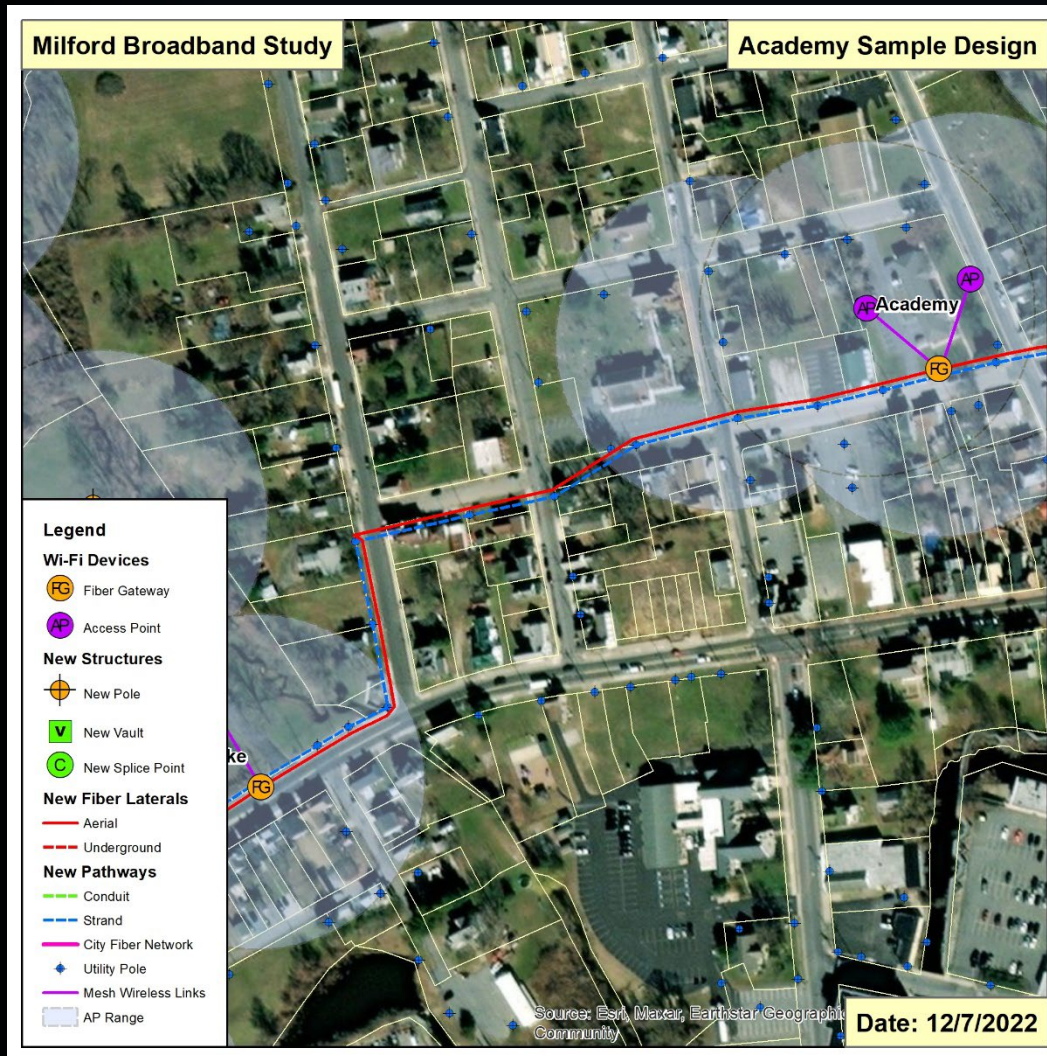
* - Does not include engineering and fixed equipment.

BLAIR SAMPLE DESIGN



Design Metric	Value
New Aerial Plant Miles	0.1
New Underground Plant Miles	-
% Aerial	100%
% UG	0%
Passings	23
Passings per Mile of Plant	161
Materials Cost per Passing	\$702
Labor Cost per Passing	\$321
Total Cost per Passing	\$1,023
Total Materials (no drops)	\$16,153
Total Labor (no drops)	\$7,376
Total Cost	\$23,529

* - Does not include engineering and fixed equipment.



Design Metric	Value
New Aerial Plant Miles	0.3
New Underground Plant Miles	-
% Aerial	100%
% UG	0%
Passings	11
Passings per Mile of Plant	42
Materials Cost per Passing	\$1,617
Labor Cost per Passing	\$1,017
Total Cost per Passing	\$2,634
Total Materials (no drops)	\$17,783
Total Labor (no drops)	\$11,190
Total Cost	\$28,974

* - Does not include engineering and fixed equipment.

OUTSIDE PLANT CAPITAL BUDGET ESTIMATE

Sample Design Area	New OH Miles	New UG Miles	Passings	Passings per New Mile of Plant	Materials per Passing	Labor per Passing	Total per Passing
Silver Lake	0.6	0.3	450	485	\$556	\$388	\$944
The Willows / Milford Crossing	-	0.3	209	702	\$998	\$711	\$1,710
Brightway Commons	0.5	-	125	236	\$262	\$171	\$433
Misphillion	0.5	0.1	111	172	\$446	\$500	\$946
Marshall Manor	0.3	-	36	111	\$721	\$600	\$1,321
Blair	0.1	-	23	161	\$702	\$321	\$1,023
Academy	0.3	-	11	42	\$1,617	\$1,017	\$2,634
Overall	2.4	0.7	965	308	\$623	\$457	\$1,079

- ❖ Last mile OSP capital budget required to pass all target areas = \$1,041,263
- ❖ Does not include capital budget NOC upgrades, switches and network appliances
- ❖ Does not include make ready, engineering and project management costs

Task 5 – Pro Forma Financial Analysis

- ◆ **Milford Owned System Supported by Adding Resources to IT Department**
 - ◆ Current IT staff is down two FTE
 - ◆ Attempts to hire staff have been unsuccessful due to talent pool / compensation expectations
 - ◆ Department is concerned about co-mingling City IT infrastructure with public use
 - ◆ No current rack space or floor space available to collocate new Wi-Fi network equipment
 - ◆ This scenario is not operationally feasible currently due to lack of resources and synergies
- ◆ **Milford Owned System Supported by New City Department**
 - ◆ Main approach for Uptown studies and municipal broadband deployments
 - ◆ New department allows for focused attention by dedicated staff
 - ◆ Stand alone departments require greater scale to support higher overhead (management)
 - ◆ Targeted Wi-Fi not likely to provide the level of cash flow required
- ◆ **Milford Owned System Supported by External Operating Partner (ISP)**
 - ◆ Emerging model for smaller broadband deployments
 - ◆ Milford system can be supported remotely using cloud-based monitoring capabilities
 - ◆ Proposed Wi-Fi network would only have 22 fiber gateways and 41 access points
 - ◆ City would need to provide emergency truck rolls to provide “local hands and a toolbox”
 - ◆ No in home customer service or repair would be assumed for the proposed service level
- ◆ **Third Party Retail Owner / Operator**
 - ◆ Private ISP builds, owns and operates Wi-Fi system
 - ◆ ISP sets price and service levels
 - ◆ Milford may choose to offer dark fiber on existing network

PRIMARY SCENARIO ASSUMPTIONS

Assumptions	New Broadband Department (Baseline)	City Own & Operate w/ Operating Partner
Market Size	965 units in various housing developments throughout Milford	
Wi-Fi Offering	Scenario A - \$25 per month for best effort Wi-Fi (200 - 500 Mbps) @ 23% penetration Scenario B - \$0 for best effort Wi-Fi (200 – 500 Mbps) @ 23.9% penetration	
Internet Bandwidth	Average 3 Mbps per subscriber assumed in the busy period 5 Gbps transport circuit leased initially 25% annual growth initially, slowing to 20% after five years	
City Staffing	(0.25) Director (existing) @ \$95,000 (2) Data Technician @ \$85,000 (2) Customer Service Rep @ \$50,000	(0.25) Director (existing) @ \$95,000
Asset Ownership	Fiber Network – City (existing) Wireless System – City (\$1,041,263) Equipment Site – City (\$75,000) ISP Systems – City (\$100,000)	
Operating Expenses & Responsibilities	Internet Bandwidth – City Fiber Maintenance – City Wireless Maintenance – City ISP System Maintenance – City Customer Service – City Billing – City	Internet Bandwidth – City Fiber Maintenance – City Wireless Maintenance – City / Partner ISP System Maintenance – Partner Customer Service – Partner Billing - City
Revenue Distribution	Retail Revenue Collected – City	Retail Revenue Collected – City Fixed Fee per Month to Partner - \$5,000 Subscriber Fee per Month to Partner - \$12

◆ Multiple Funding Sources Assumed

- ◆ City equity investment - \$1,000,000
- ◆ Long Term Bond – cumulative capital investment over first five years
- ◆ Short Term Loan – cumulative operating losses in first five years
- ◆ Line of Credit – funds negative cash flows starting in year six

◆ Loan Assumptions

- ◆ City equity investment – cash contribution, treated as pure equity @ 0%
- ◆ Long term bond – 4% rate, three years interest only with 20 year term
- ◆ Short term loan – 5% rate, five years interest only with 10 year term
- ◆ Line of credit – 5% rate, balance accumulates without amortization
- ◆ Targeted Wi-Fi not likely to provide the level of cash flow required

◆ Grant Opportunities

- ◆ No grant funding eligibility assumed at this time
- ◆ Limited underserved census blocks according to the FCC 477 data

The Uptown pro forma model identifies key financial metrics that we rely on to evaluate financial feasibility of broadband investment projects (example project outcomes follow)...

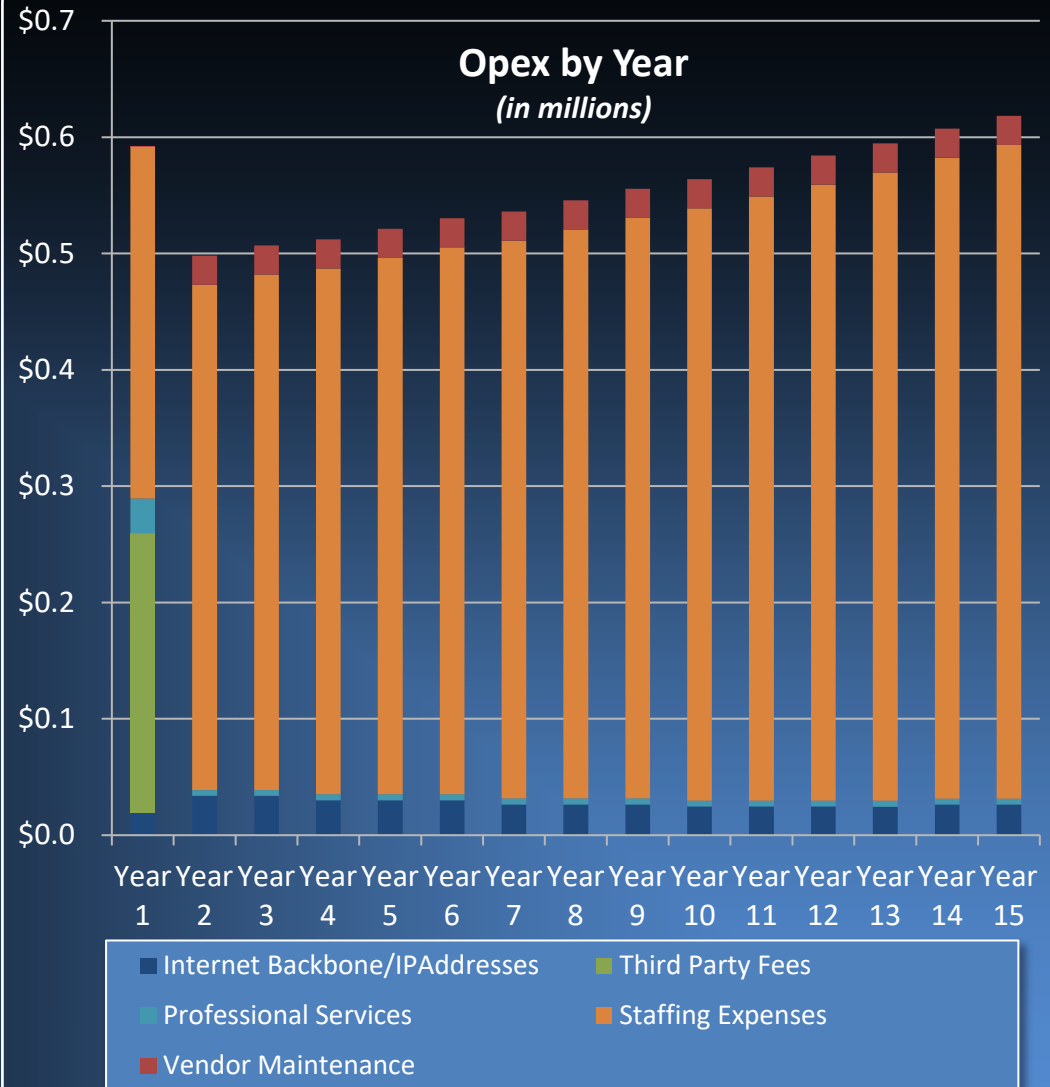
1. Timeframe to positive operating income
 - ◆ Revenue proceeds exceed operating expenses
 - ◆ Typical goal is within 4 years
2. Net Payback Period
 - ◆ Total project revenue proceeds exceed total investment
 - ◆ Typical goal is less than 20 years
3. No Secondary financing
 - ◆ Net cash flow including debt service remains positive over the life of the investment
 - ◆ Pro forma model identifies an inability of the broadband system to self fund
4. Sensitivity Analysis
 - ◆ Reasonable ability to withstand “misses” on key operating or financial metrics
 - ◆ Typically sensitive metrics include construction cost, residential take rates, and interest rate on long term debt

Baseline Scenario Financials

KEY INPUTS

- Bandwidth/IP Addresses *(see slide detail)*
- Staffing *(see slide detail)*
 - 4.3 Full Time Equivalent headcount
 - 2% annual wage increase
 - 45% benefits loading
- Professional Services
 - Implementation: \$120k
 - Legal/Acct: \$30k (Yr1)/\$5k (Yr2+)
- Other Opex
 - ROW Fees: Pole attachment not imputed
 - Vendor maintenance of \$25k/year for OSS/BSS and Wi-Fi electronics

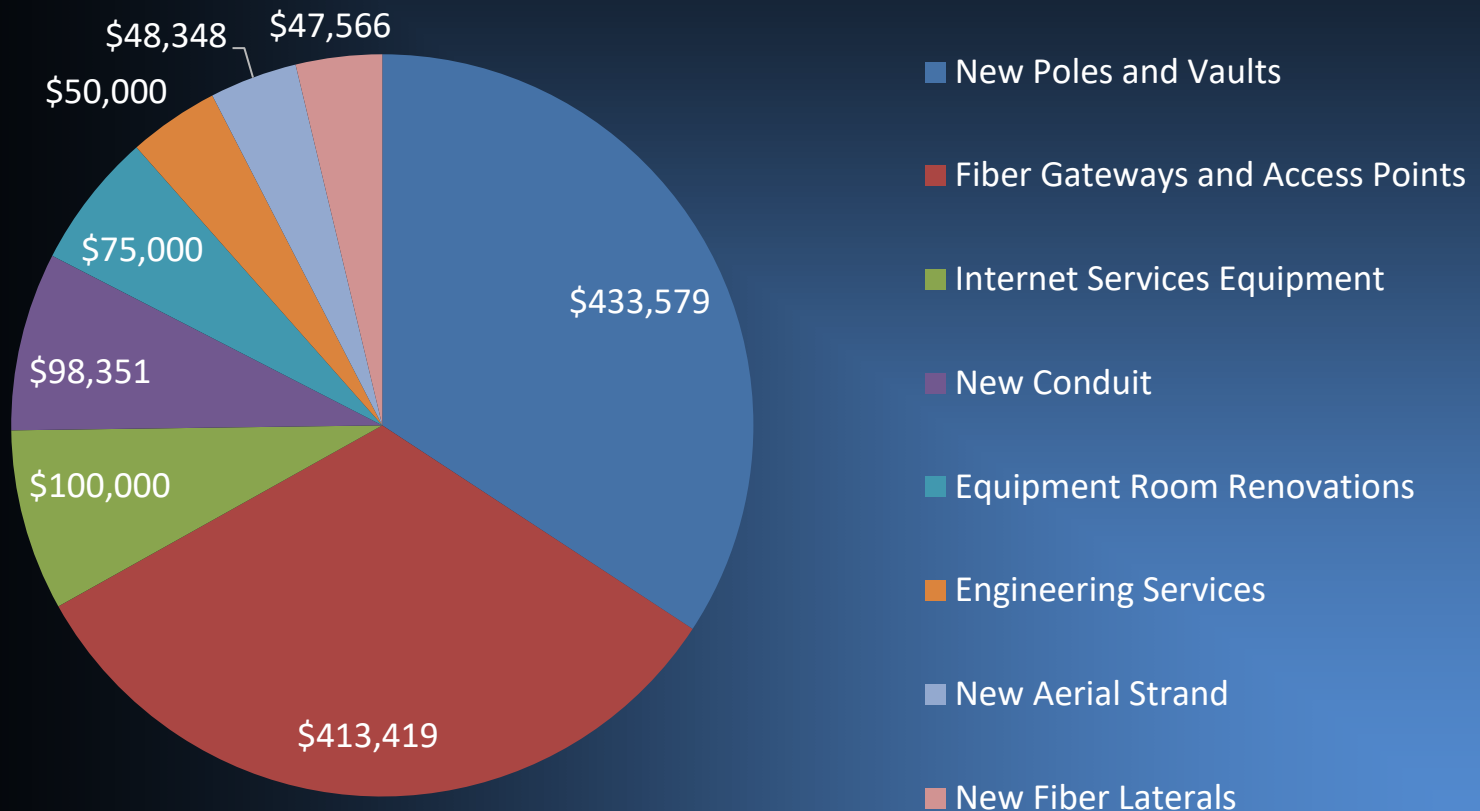
BASELINE OPERATING EXPENSE



BASELINE STARTUP CAPEX BY TYPE

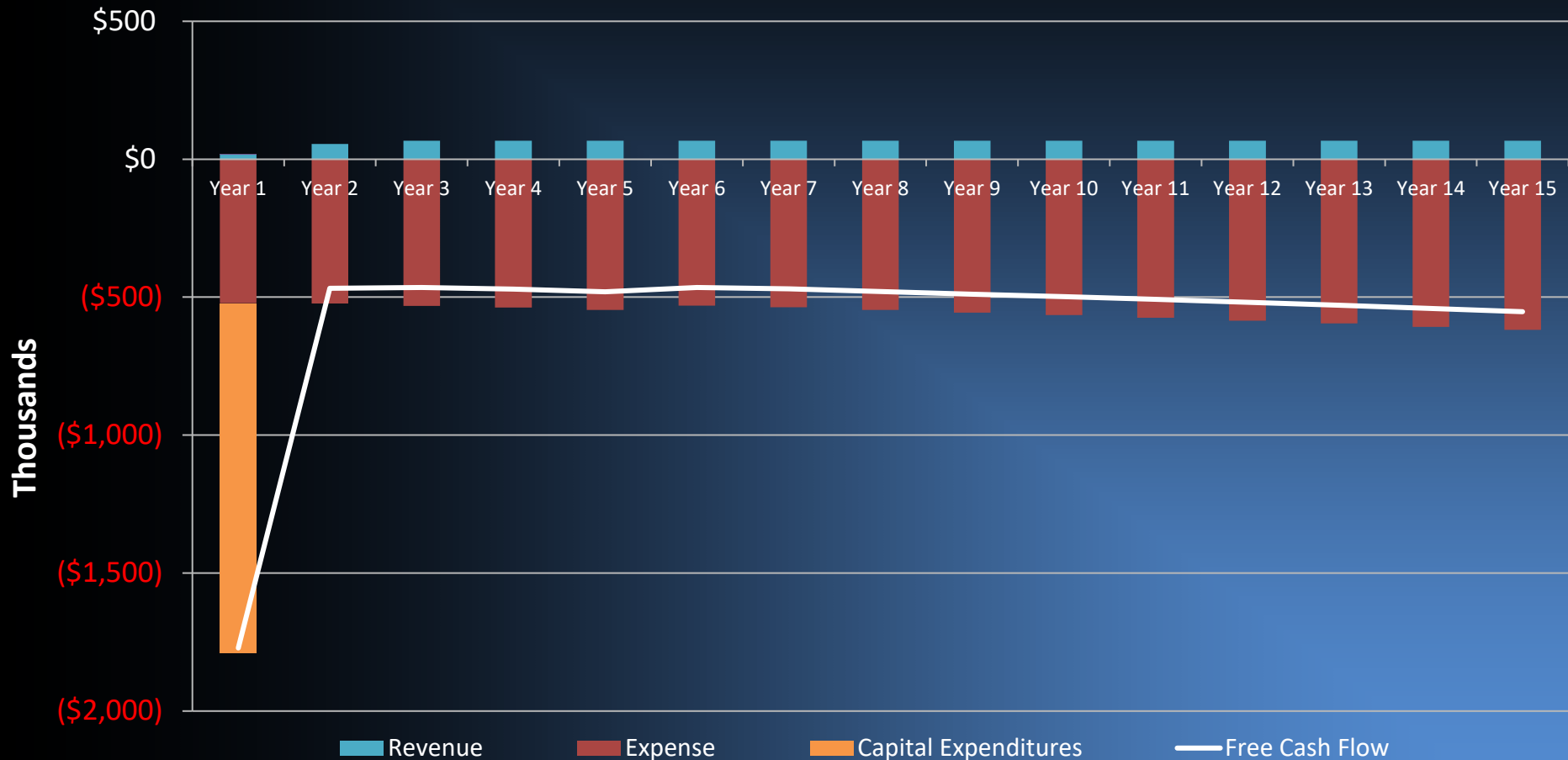
Over 33% of total capital budget goes towards placing new light poles in areas that do not have poles suitable for mounting. The cost to extend the existing fiber ring into target neighborhoods is less than 15% of the total capital budget.

Startup Capex = \$1.3M

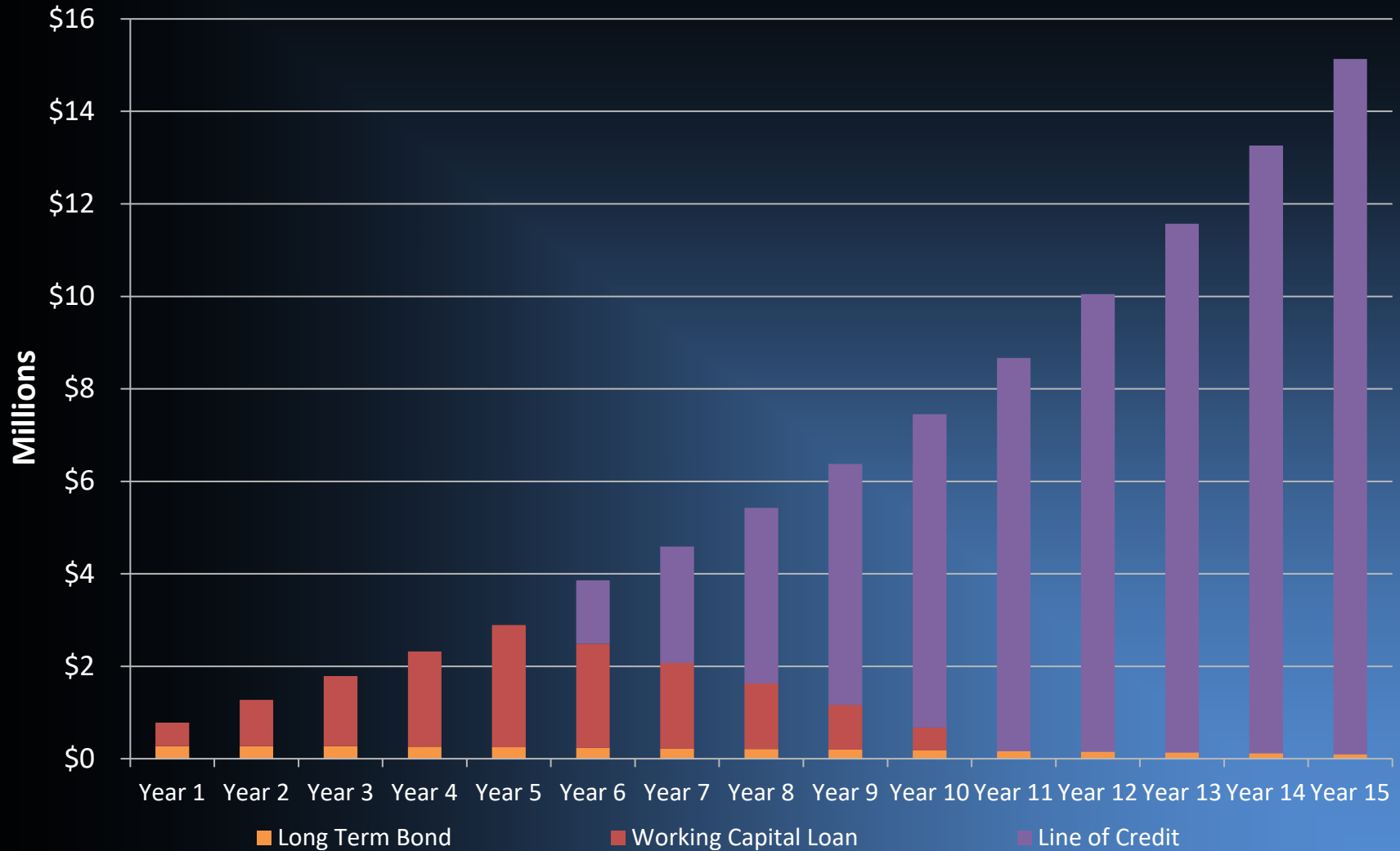


BASELINE FREE CASH FLOW

Free cash flow does not go positive in the first 15 years of the plan, indicating an ongoing need for secondary financing support of the project...

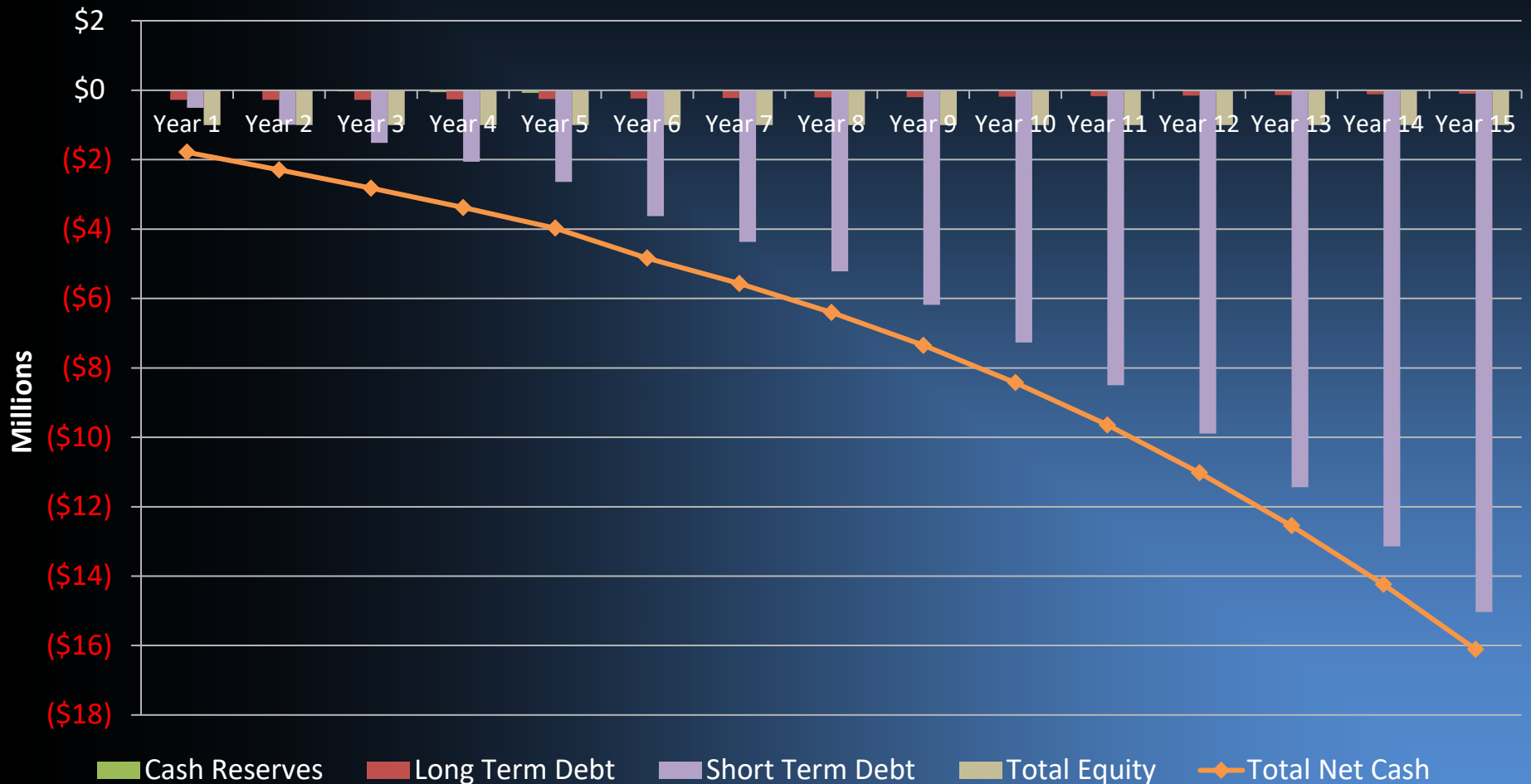


BASELINE TOTAL DEBT



BASELINE NET CASH

The Retail Own & Operate with New City Department model is not financially self-sufficient, and does not achieve net project payback by Year 15 of the pro forma forecast...

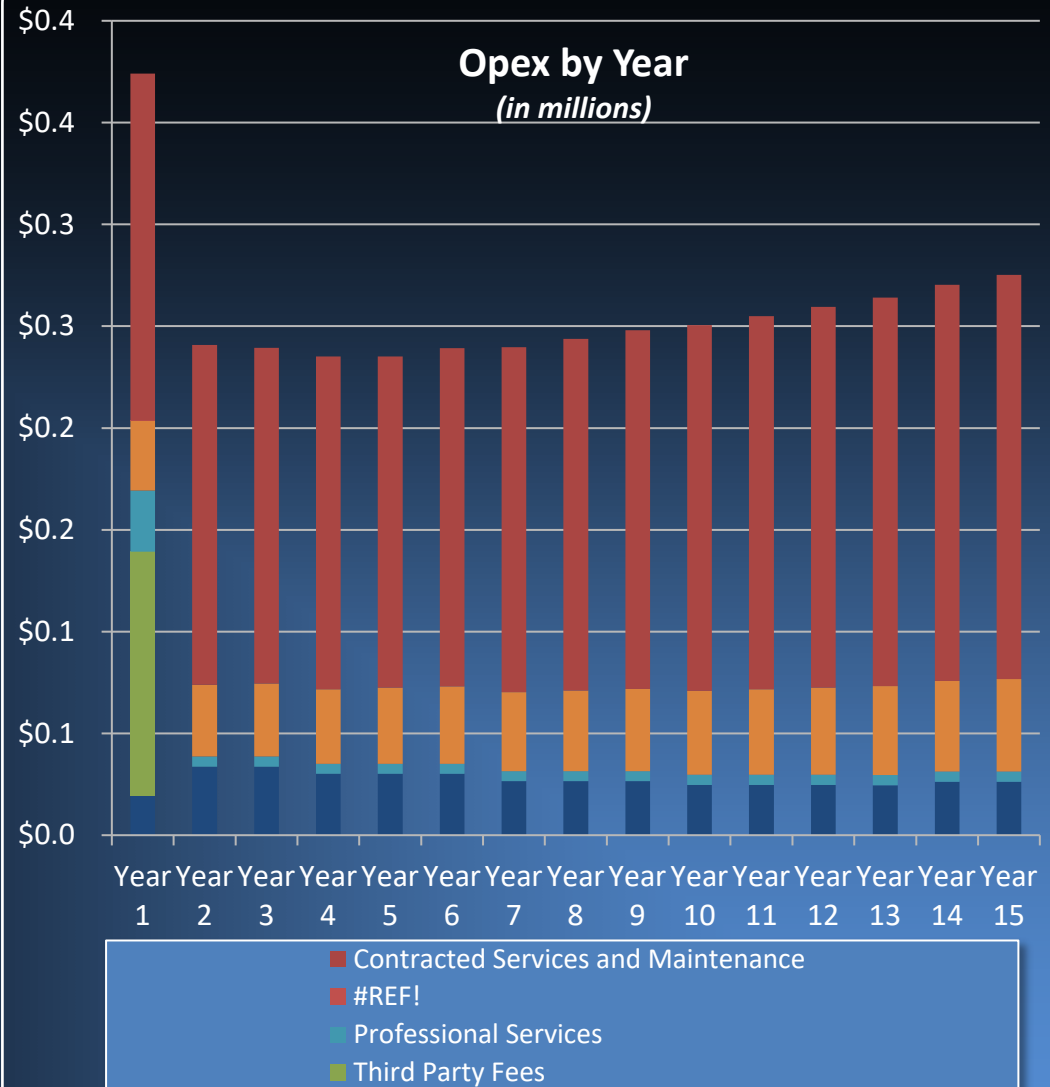


Operating Partner Scenario Financials

KEY INPUTS

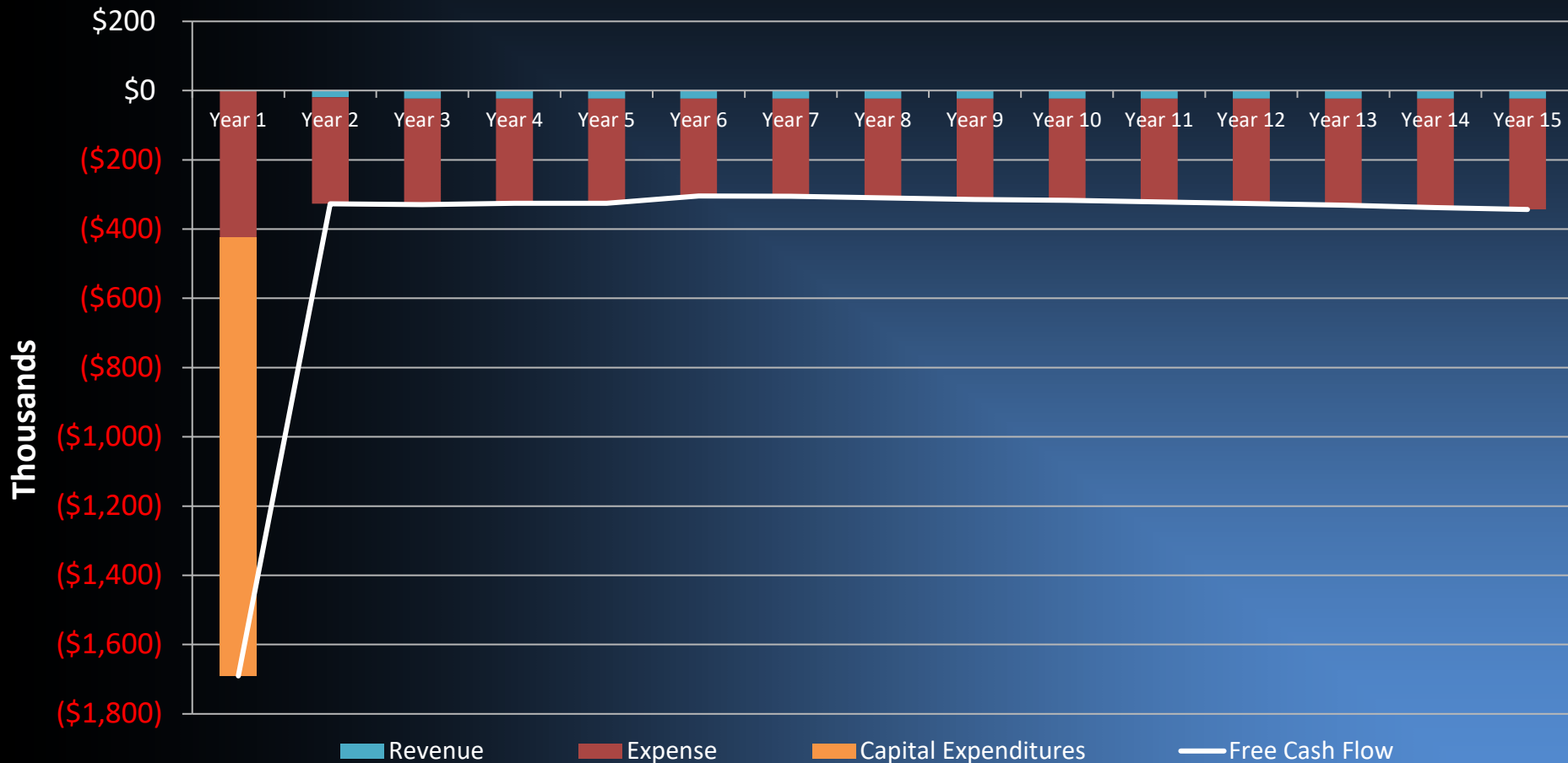
- Bandwidth/IP Addresses (*see slide detail*)
- Staffing (*see slide detail*)
 - 0.3 Full Time Equivalent headcount
 - 2% annual wage increase
 - 45% benefits loading
- Professional Services
 - Implementation: \$120k
 - Legal/Acct: \$30k (Yr1)/\$5k (Yr2+)
- Contracted Services
 - Per month Fixed: \$5,000
 - Monthly per subscriber: \$12
- Other Opex
 - ROW Fees: Pole attachment not imputed
 - Vendor maintenance of \$25k/year for OSS/BSS and Wi-Fi electronics

BASELINE OPERATING EXPENSE

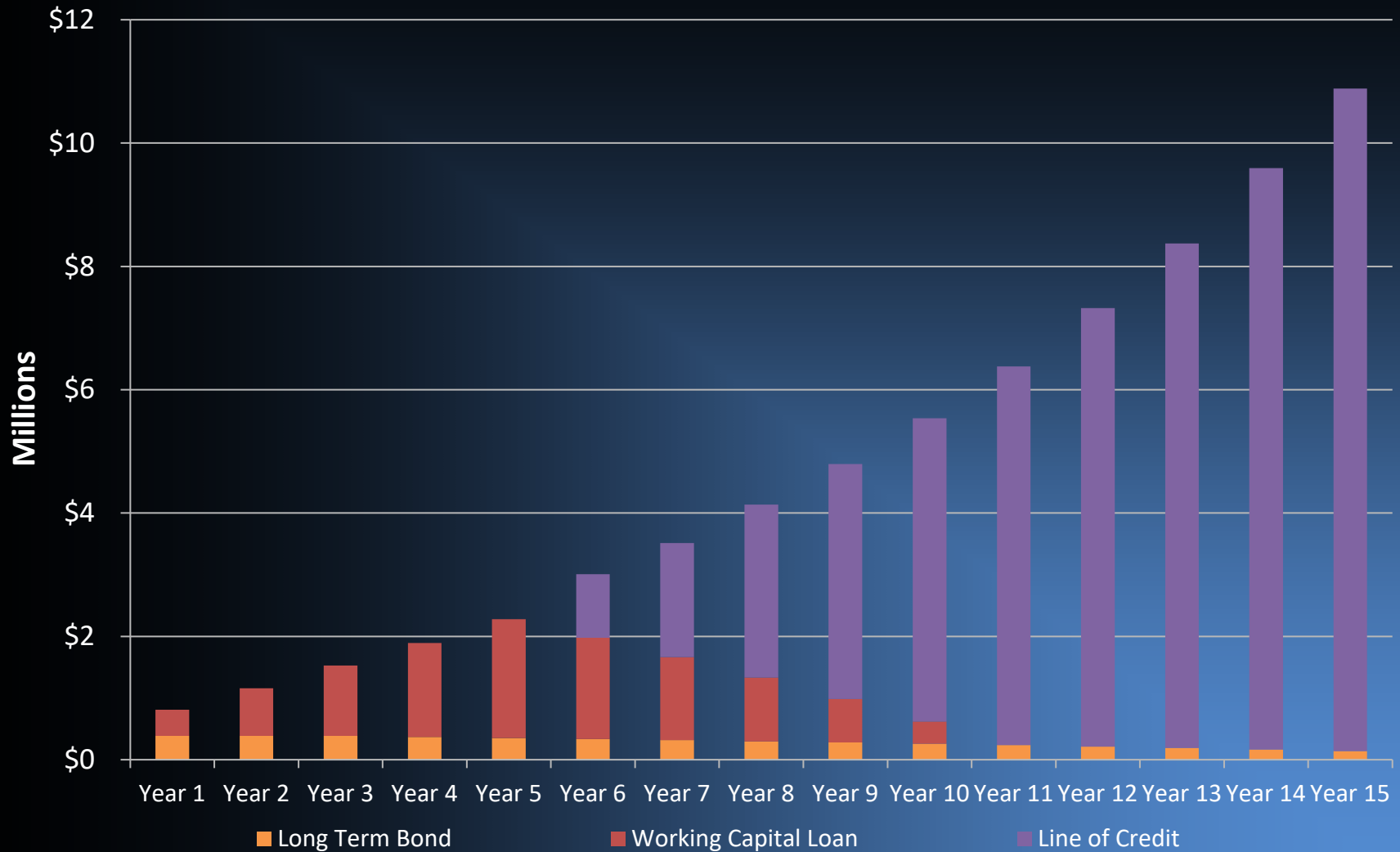


OPERATING PARTNER FREE CASH FLOW

Free cash flow does not go positive in the first 15 years of the plan, indicating an ongoing need for secondary financing support of the project...

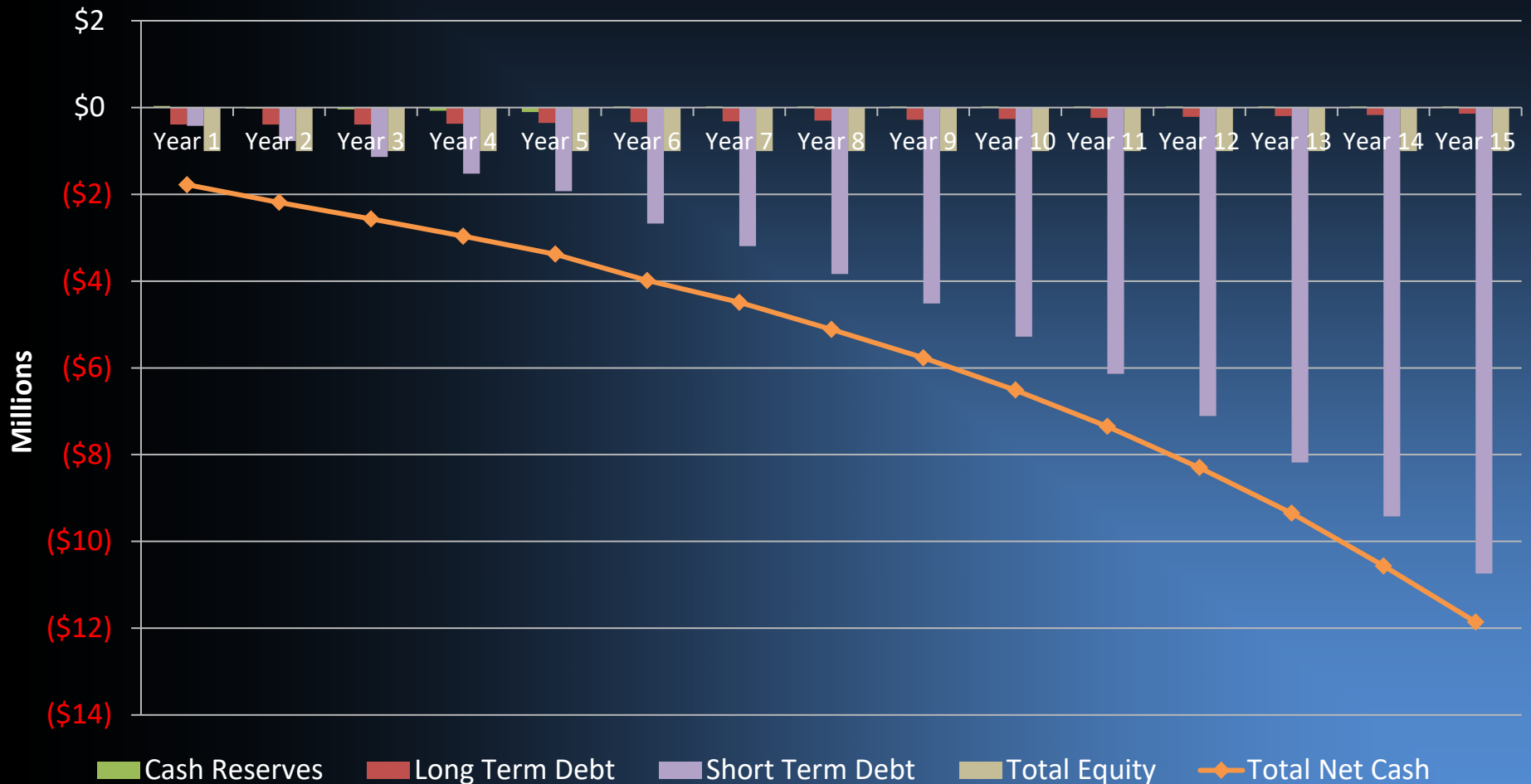


OPERATING PARTNER TOTAL DEBT



OPERATING PARTNER NET CASH

The Retail Own with Operating Partner model is not financially self-sufficient, and does not achieve net project payback by Year 15 of the pro forma forecast...



STUDY CONCLUSIONS AND NEXT STEPS

- ◆ Lacking awareness of affordable broadband services
 - ◆ 63% of households currently are under-utilizing Internet capacity due to affordability issues
 - ◆ 14% to 25% of Milford households would be eligible for the ACP program, but only ~11% are currently participating
- ◆ Facilities based Wi-Fi strategy is not feasible
 - ◆ Initial investment is doable
 - ◆ Ongoing operating losses make the venture unsustainable
 - ◆ Target market is not large enough to support the minimum level of fixed expense
- ◆ Next Steps
 - ◆ Generate more awareness of ACP benefits within the target community
 - ◆ Collaborate with local providers to enhance low-cost Internet availability and awareness
 - ◆ Partner with local schools to gain a better understanding of student needs
 - ◆ Consider limited Wi-Fi in public spaces to enhance availability beyond schools, libraries and community centers



Broadband Feasibility Study

for

The City of Milford, Delaware

December 2022

Uptown Services, LLC
Dave Stockton & Neil Shaw, Principals

OBJECTIVE: *Identify and evaluate the financial feasibility of a range of options for the City to enhance the availability, affordability, reliability, and capacity of broadband infrastructure for residents and businesses...*

STUDY SCOPE:

1. Local Market Assessment and Product Strategy
2. Analysis of Business Models
3. Wireless Network Strategy
4. Conduct Market Research
5. Pro Forma Financial Analysis
6. Evaluate Financing & Funding Availability

Local Market Assessment & Product Strategy
Internet and Data Services

INCUMBENT RESIDENTIAL INTERNET

- Verizon presents different DSL plans depending upon the proximity of the service address to their Central Office. In conducting availability searches on their website, only a 3M tier was returned.
- Comcast appears to have fully upgraded its HFC plant to DOCSIS3.1 and can offer gig service. However, pricing is steep and a \$30 premium is required to remove the standard data cap.

	Download	Upload	Price	Data Cap?	ACP?	Technology
Verizon	Up to 3M	?	\$40.00 (voice line required)	?	?	DSL
Verizon Fios*	300M 500M 940M	300M 500M 880M	\$49.99 \$69.99 \$89.99	No	Yes	Fiber
Comcast	50M 100M 300M 600M 900M 1.2G 6G	2M 5M 25M 25M 30M 35M ?	<u>Promotion / Paper Billing / Non-Promo</u> \$65.00 \$83.95 \$39.99 / \$49.99 / \$98.95 \$59.99 / \$69.99 / \$103.95 \$69.99 / \$79.99 / \$108.95 \$79.99 / \$89.99 / \$113.95 \$299.95	Yes. Unlimited data is \$30 extra	Yes	Cable Modem (DOCSIS 3.1)
Verizon 5G Home*	Not specified. Best effort at 4G LTE or 5G (if available)		5G Home: \$60.00 5G Home Plus: \$80.00	No	Yes	Cellular 4G LTE or 5G
T-Mobile	Up to 182M	?	\$50.00 (<i>with cellphone plan</i>)	No	?	Cellular 5G

Verizon pricing per verizon.com, Comcast pricing from xfinity.com, all as of Sept. 2022.

*Not available in Milford.

ALTERNATIVE RESIDENTIAL INTERNET

- Bloosurf has deployed fiber in some communities. But availability searches on their websites indicate that only fixed wireless service is available in Milford.
- Starlink is scheduled to become available next year but is expensive.

	Download*	Upload	Price	Data Cap?	Technology
Bloosurf	15M 25M 50M 100M	2M 3M 5M 20M	\$65 \$85 \$120 \$150	No	Fixed Wireless
	100M – 2.5G	100 M - 2.5G	\$80 - \$235	No	Fiber*
Starlink**	250M – 350M	?	\$110.00 <i>(plus \$649 for hardware + shipping)</i>	No	LEO Satellite

Bloosurf pricing per bloosurf.com and bloofiber.com as of Sept. 2022. Starlink pricing per starlink.com as of Oct. 2022.

*Not available in Milford.

**Starlink has announced availability within Milford in 2023.

Potential Business Structures

Overview

RANGE OF BUSINESS MODELS

	WHOLESALE		RETAIL	
	Dark Fiber	Public-Public or Public-Private Partnership*	Own & Operate with Operating Partner	Own & Operate
Ownership Role of City	City owns fiber backbone and funds fiber laterals via one-time connection fees	City funds capex for broadband infrastructure (e.g. fiber backbone for wireless backhaul or last-mile connectivity)	City funds capex for broadband infrastructure, working capital, and <u>some</u> operating expenses	City funds capex for broadband infrastructure, working capital, and <u>all</u> operating expenses
Operating Role of City	City constructs & maintains fiber plant (excluding electronics)	Partner is the service provider. City only co-brands & maintains backbone/backhaul infrastructure	City is service provider. Partner provides customer care, help desk, outside plant maintenance/outage response, and network management/administration	City is service provider and provides all operating roles (excluding providing voice service)
Services Offered	Dark fiber transport to CAIs, dark fiber transport to commercial accounts, and local loop ISP wholesale	Standard broadband offerings to the residential and commercial segments.		
Revenue	All revenue retained by City	All revenue retained by the Partner. City compensated with monthly fee per connected end-user.	All revenue retained by City. Partner compensated with monthly fee per connected end-user.	All revenue retained by City

*Commonly abbreviated as PPP or 3P.
1/11/2023

While financial terms vary, typical remuneration structures implemented for municipal broadband system partnerships reflect the following...

Business Model	Dark Fiber	Public-Private Partnership*	Own & Operate with Operating Partner	Own & Operate
Wholesale Fees <i>Paid by Service Provider</i>	MRC per fiber strand per mile. Rates are highly variable and reflect urban (\$150-\$300) vs. rural or long haul (\$10-\$50) Discounts typically apply for multiple strands or public use.	Two Models: A) Premise passed fee (\$6/month) & connected premise fee (\$17/month) - or - B) Connected premises fee only (\$35-40/month) Fees apply whether business or residential connection	Not Applicable	
Outsourcing Fees <i>Paid by Network Owner</i>	Not Applicable		Monthly fee per connected premises (\$10-\$25 depending on term and operating scope)	Not Applicable

*MRC = Monthly Recurring Charge.

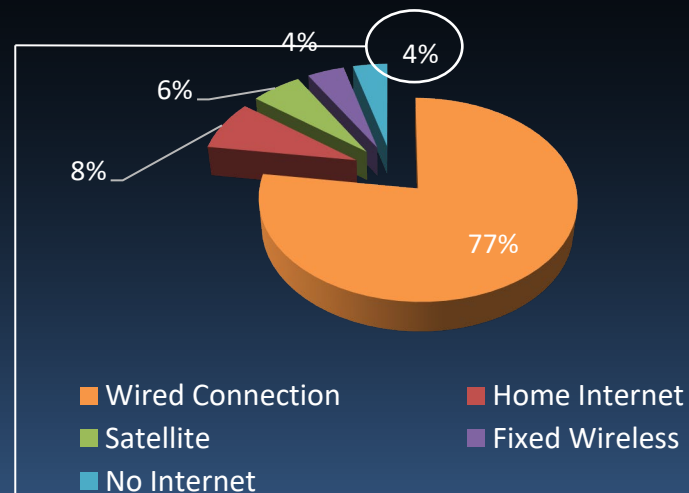
Residential Quantitative Survey

- ◆ Phone and online surveys
 - ❖ Total sample of 682 respondents of universe of $\approx 4,400$ households
 - ❖ 400 via phone survey (list included wireline and wireless numbers)
 - ❖ 282 via online email invitation (email addresses provided by the City)
 - ❖ $\pm 3.4\%$ sample error at 95% confidence interval
 - ❖ List included wireline and wireless numbers
- ◆ Age quotas used to ensure robust sample across all age groups. Results weighted to reflect actual age distribution from 2020 American Community Survey (US Census Bureau) data
- ◆ Respondents screened to ensure
 - ❖ Decision-maker for telecommunications and entertainment services in the home
 - ❖ Reside within city limits
 - ❖ Respondents with immediate family members employed by any of the following were excluded:
 - The City of Milford
 - Comcast
 - Verizon
 - Bloosurf

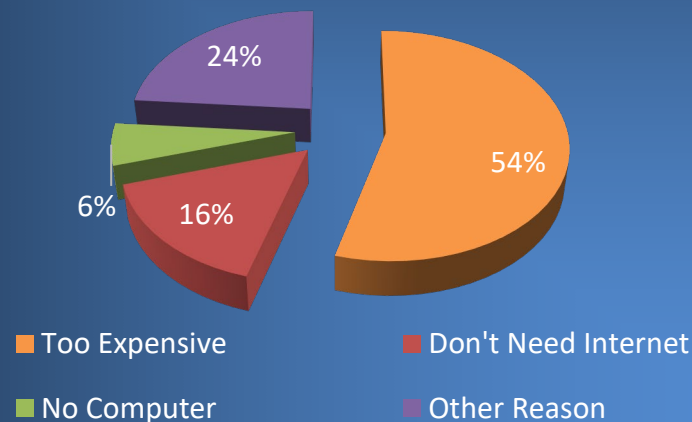
INTERNET SERVICE PURCHASING BEHAVIOR

- ◆ 96% of Milford households subscribe to Internet service at home, with 77% via a wired connection
- ◆ Comcast has 66% market share of the residential broadband market
- ◆ Affordability is the primary reason for lack of an Internet subscription

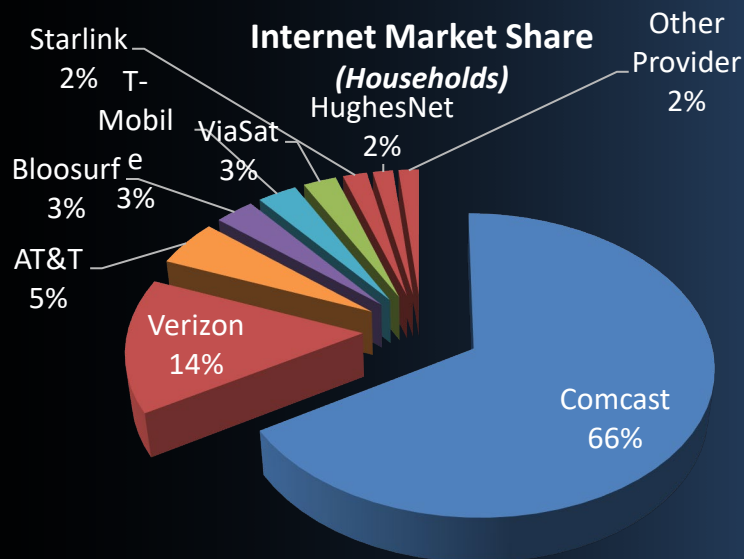
Incidence of Internet Households



Reason for No Internet at Home



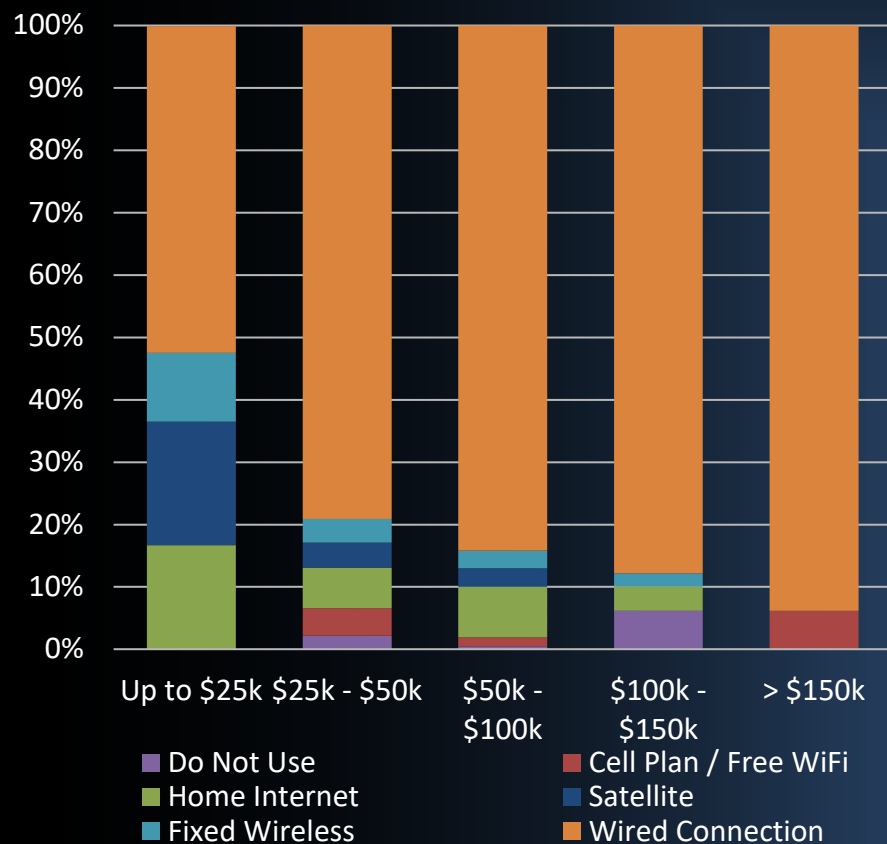
**Internet Market Share
(Households)**



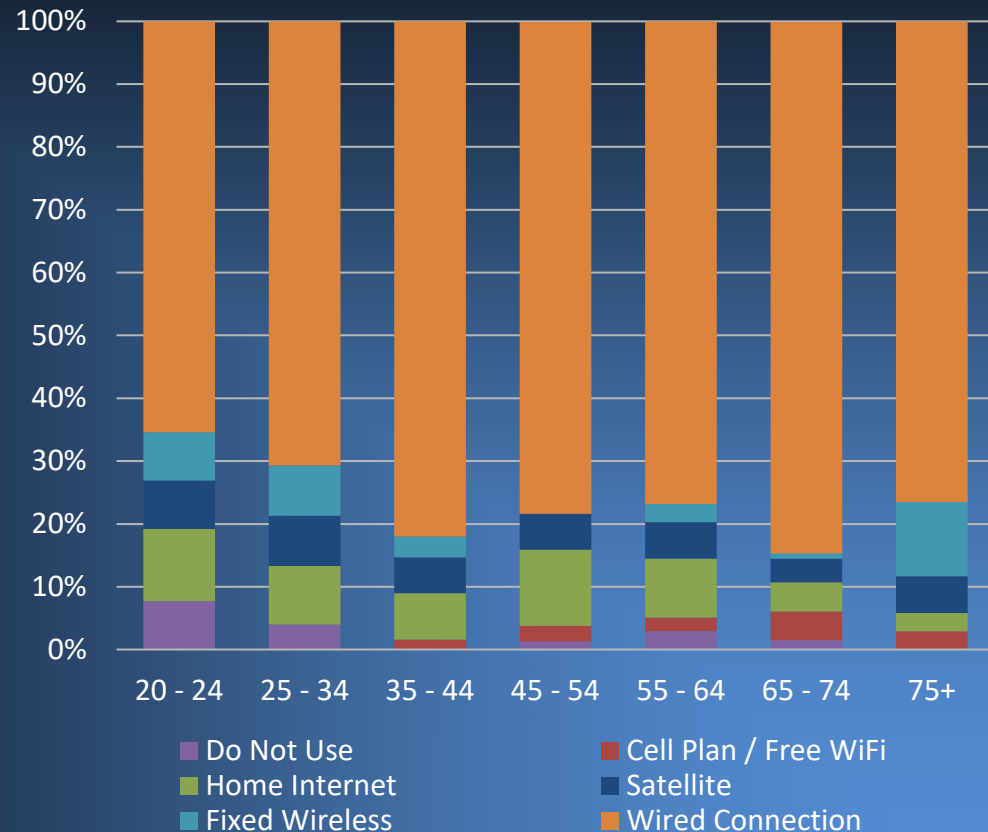
INTERNET ACCESS METHOD DEMOGRAPHICS

- ◆ Lower income households are less likely to have a wired Internet connection
- ◆ Internet access method is not significantly influenced by age

Internet Access Method by Income



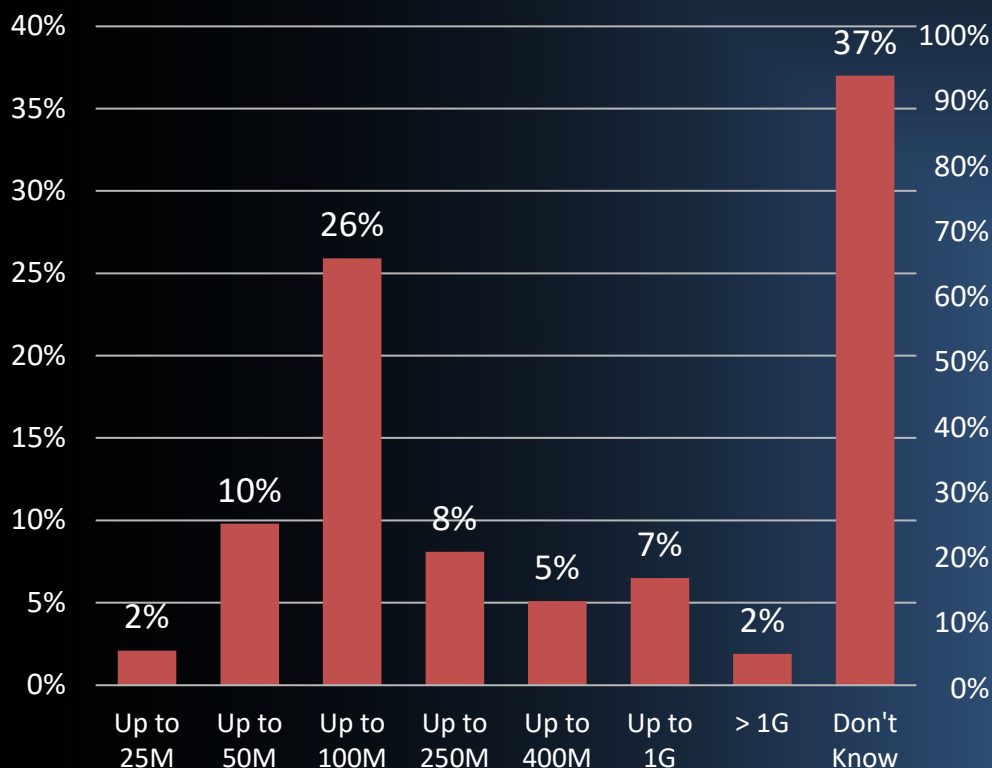
Internet Access Method by Age



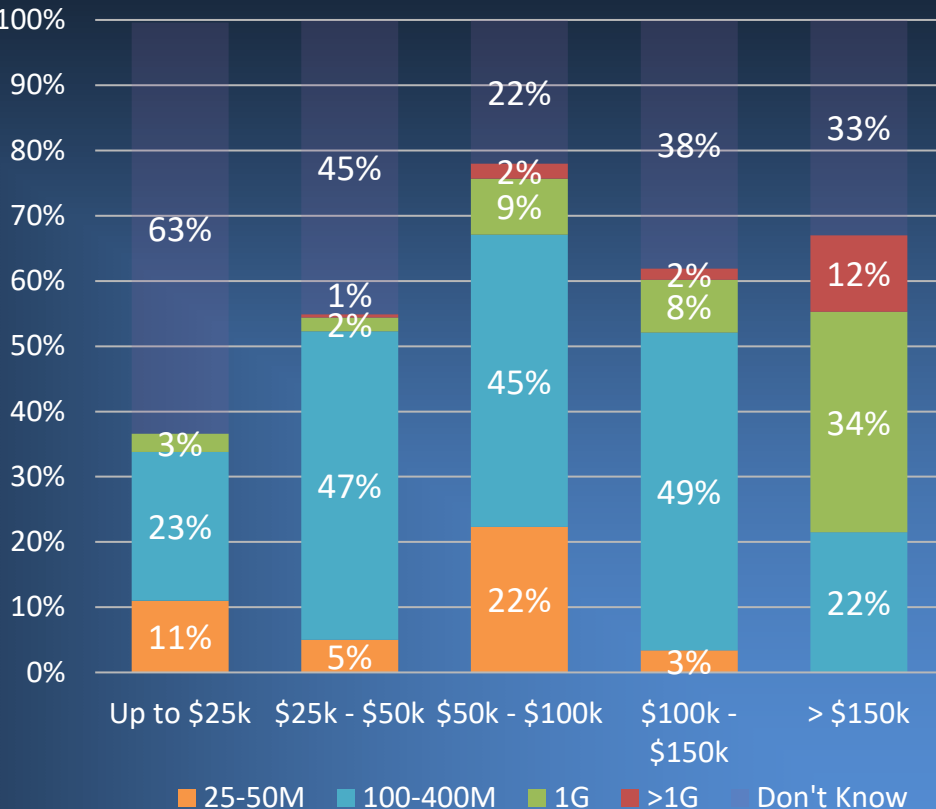
STATED DOWNLOAD SPEED

- ◆ 41% of households do not know what speed they subscribe to
- ◆ 48% of households state they subscribe to > 100M
- ◆ Lower income households are more likely to subscribe to lower capacity Internet tiers

Stated Download Speed



Internet Access Speed by Income



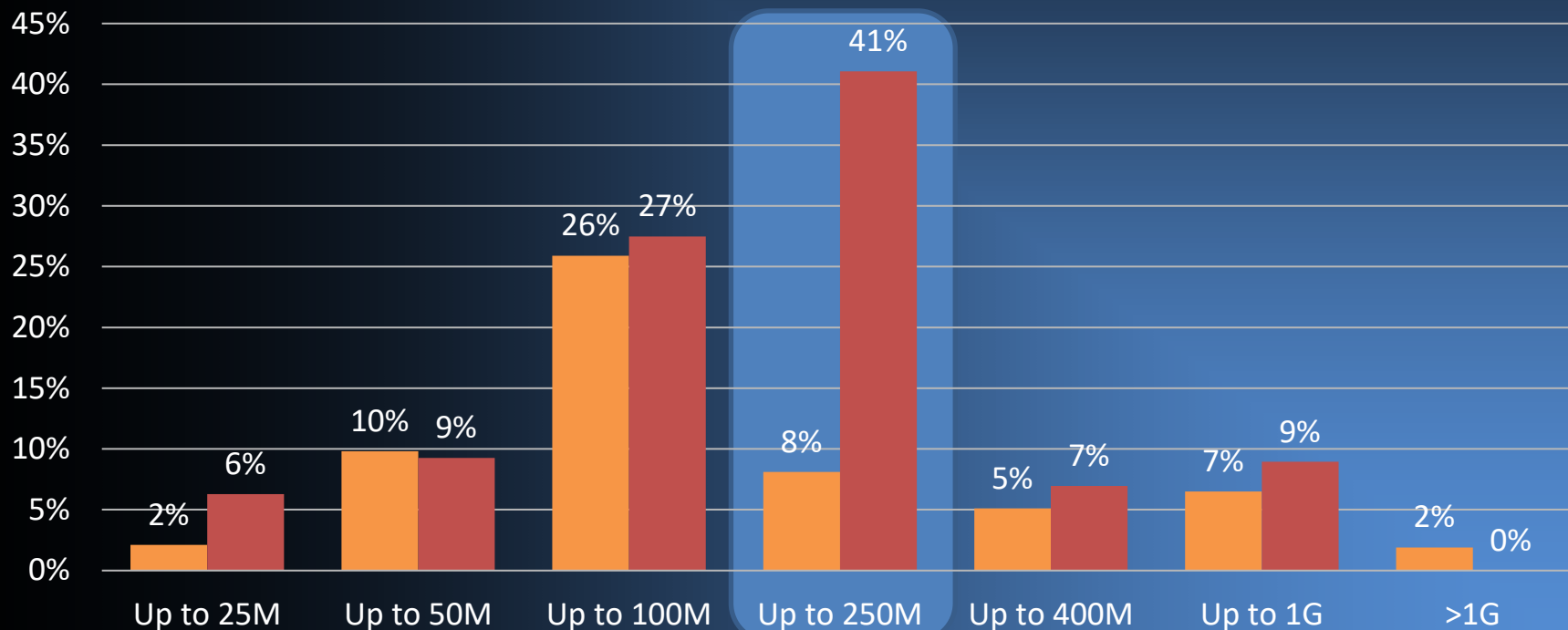
STATED VS OBSERVED DOWNLOAD SPEED

- While the majority households that can state their subscribed speed subscribe to an Internet tier of 100Mbps or less, a significant number of households are receiving actual download speeds of up to 250Mbps...

Stated versus Observed Download Speed

Stated: n = 652 Observed: n = 302

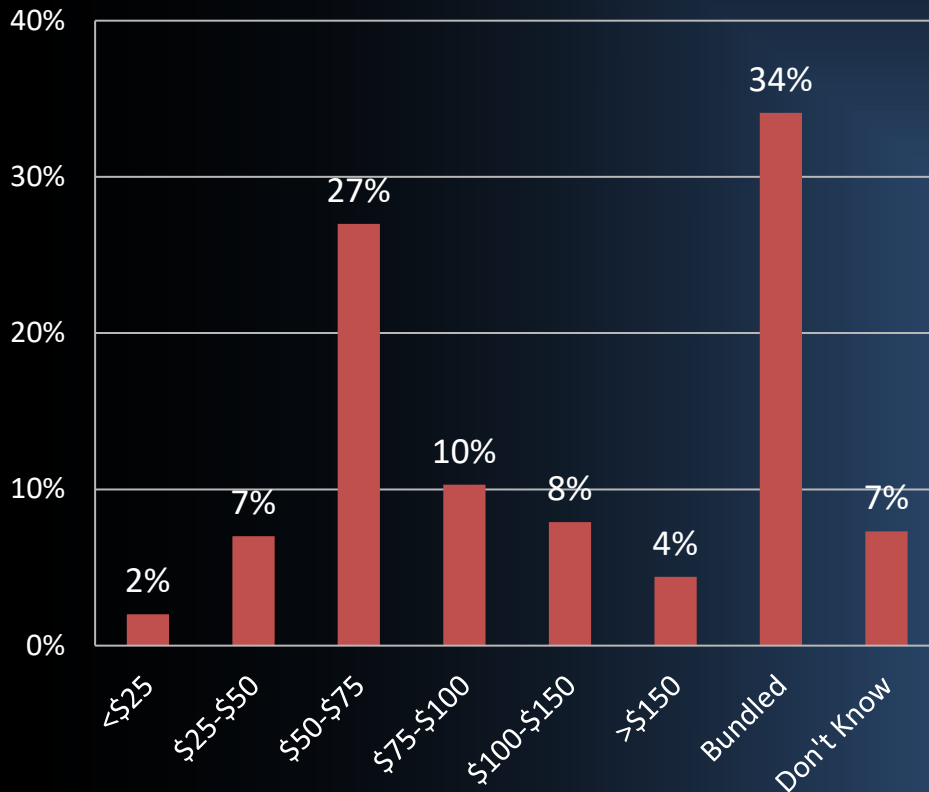
■ Stated ■ Observed



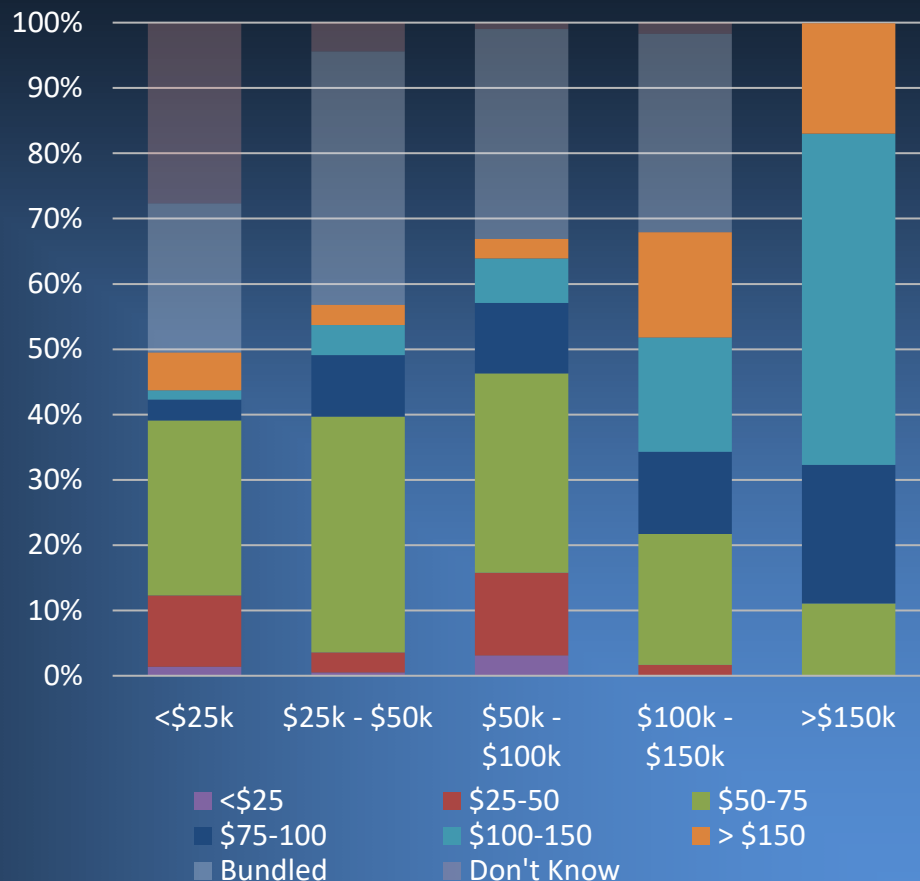
STATED INTERNET SPENDING

- ◆ Monthly spending averages \$78 across all households
- ◆ In general, average spending increases with greater household income

Monthly Internet Spending



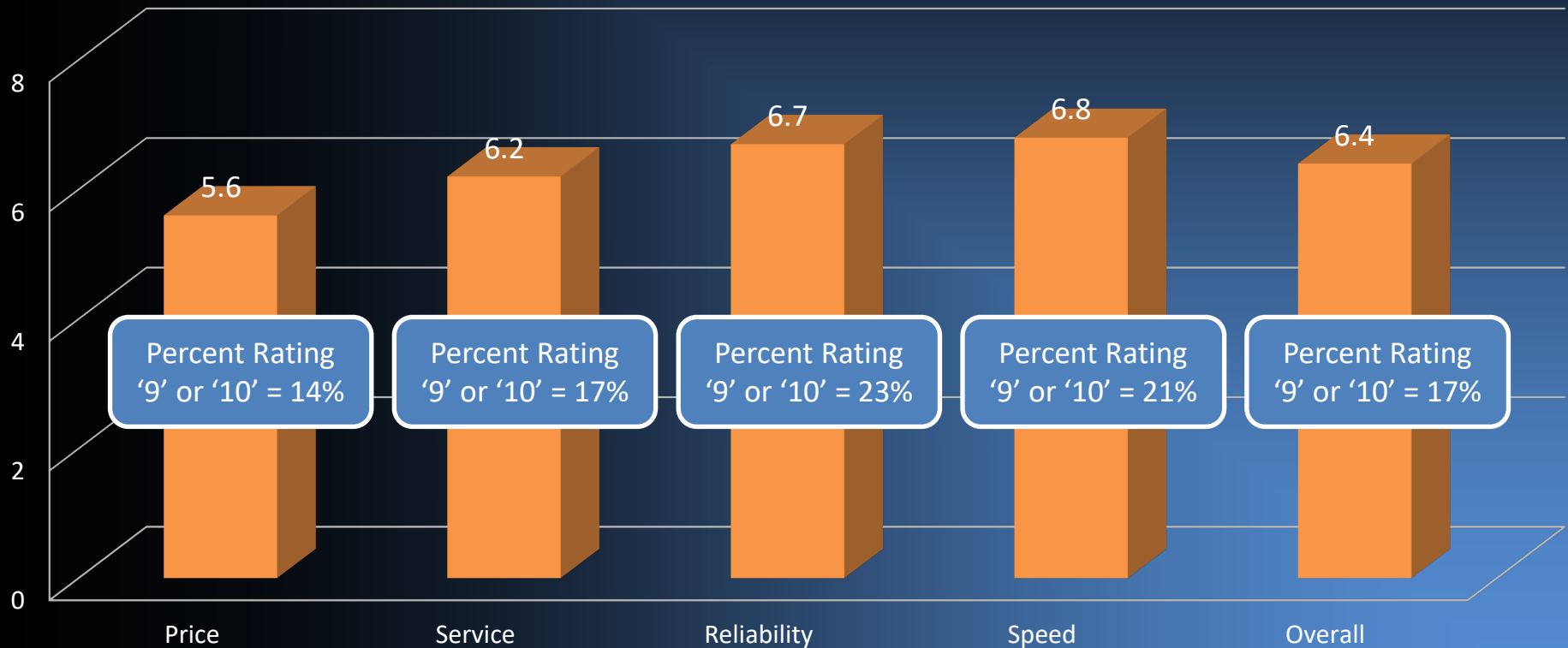
Internet Spending by Income



SATISFACTION WITH SPECIFIC INTERNET ATTRIBUTES

- ◆ Internet satisfaction levels are slightly above average compared to other markets, with price being the service attribute with lowest satisfaction levels.
- ◆ Across all service attributes, the percentage of households that are 'very satisfied' and rating the service a 9 or 10 is low.

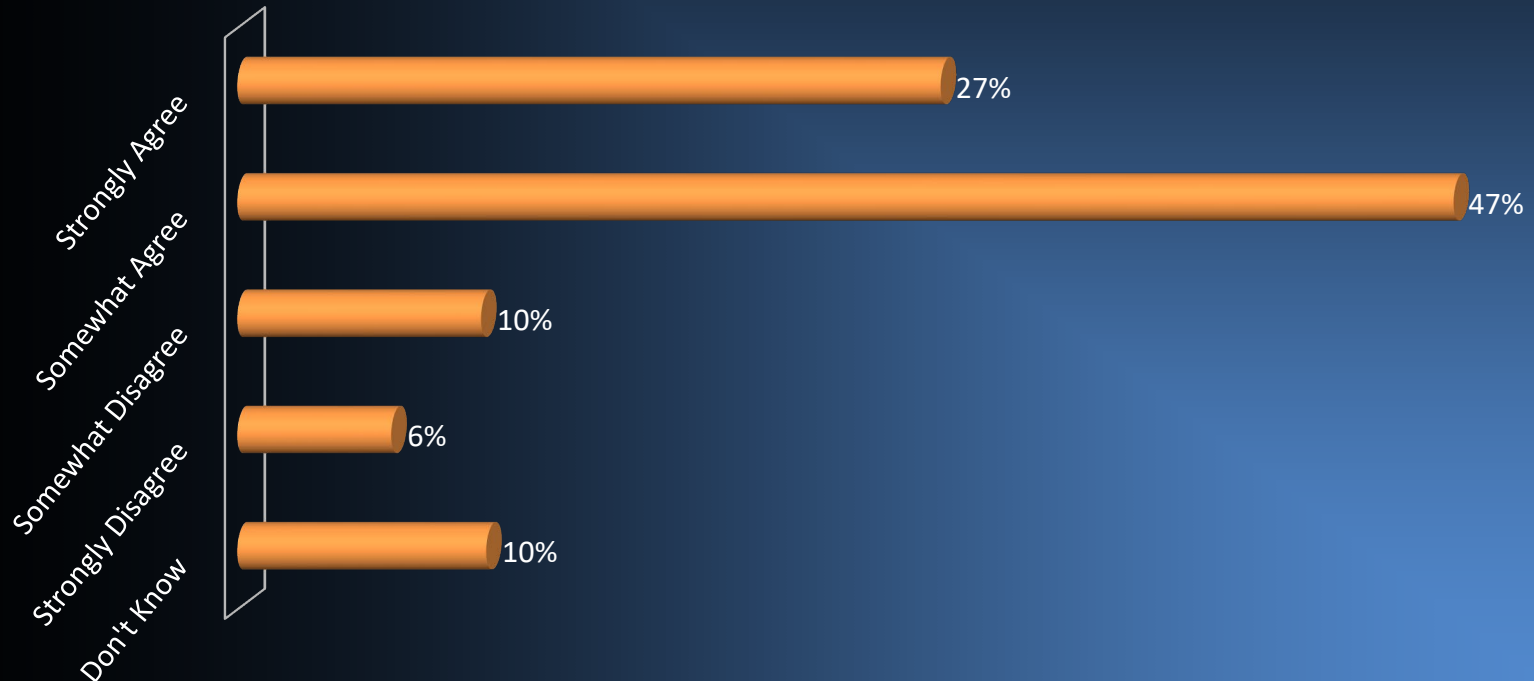
Satisfaction Rating by Internet Attribute
(Mean Rating on a 1-10 Scale)



ACCESS TO SUFFICIENT BROADBAND CAPACITY

- ◆ The vast majority (74%) of Milford households feel that at the present time they have the ability to get the Internet speed that they want

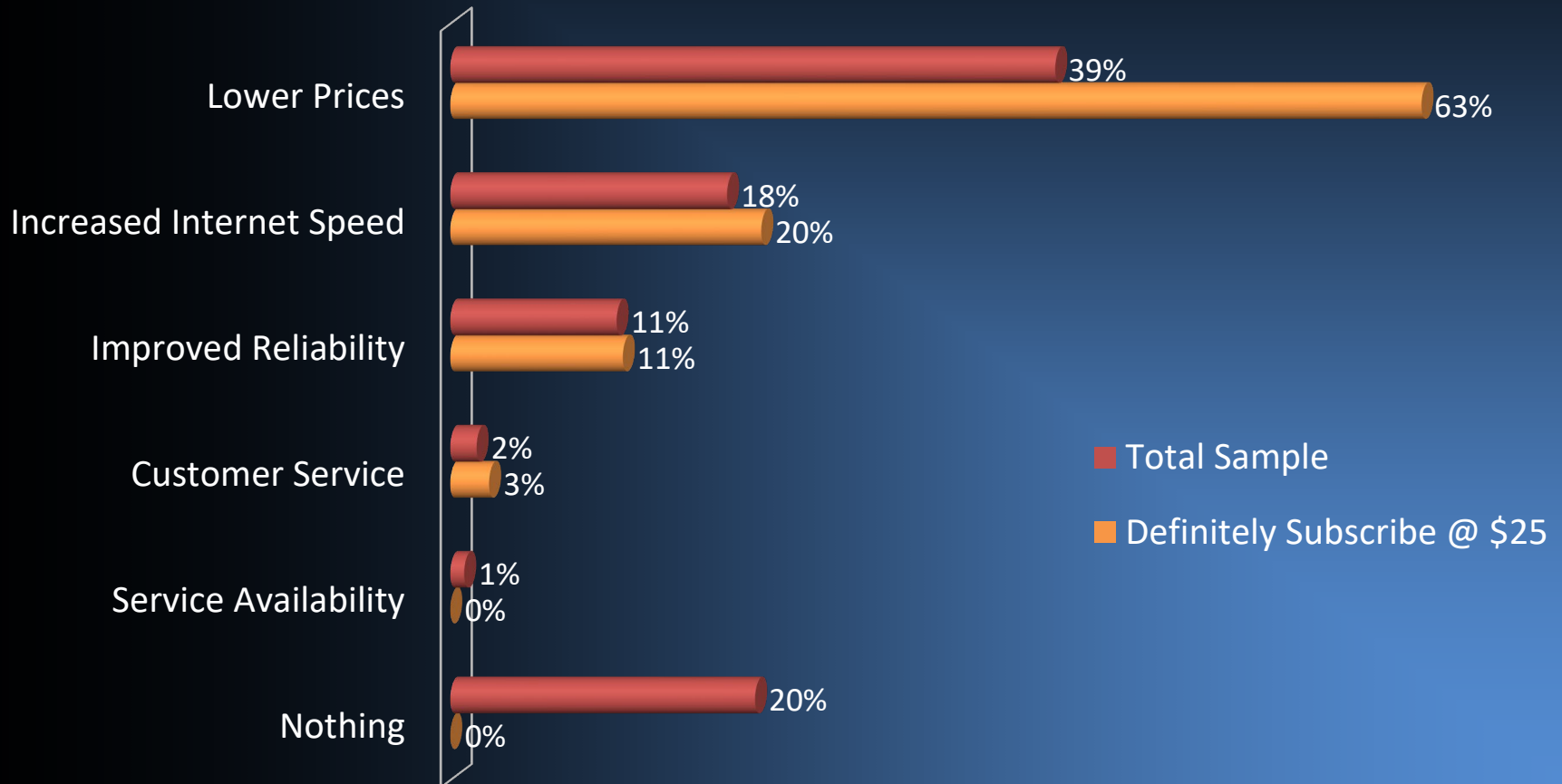
Q11: “To what extent do you agree or disagree with the following statement: I can currently able to get the Internet speed I want for my home?”



BROADBAND AREAS FOR IMPROVEMENT

Milford residents see increased Internet speed and lower prices as the most important dimension for improving their broadband. Among likely subscribers, the desire for lower prices is even greater...

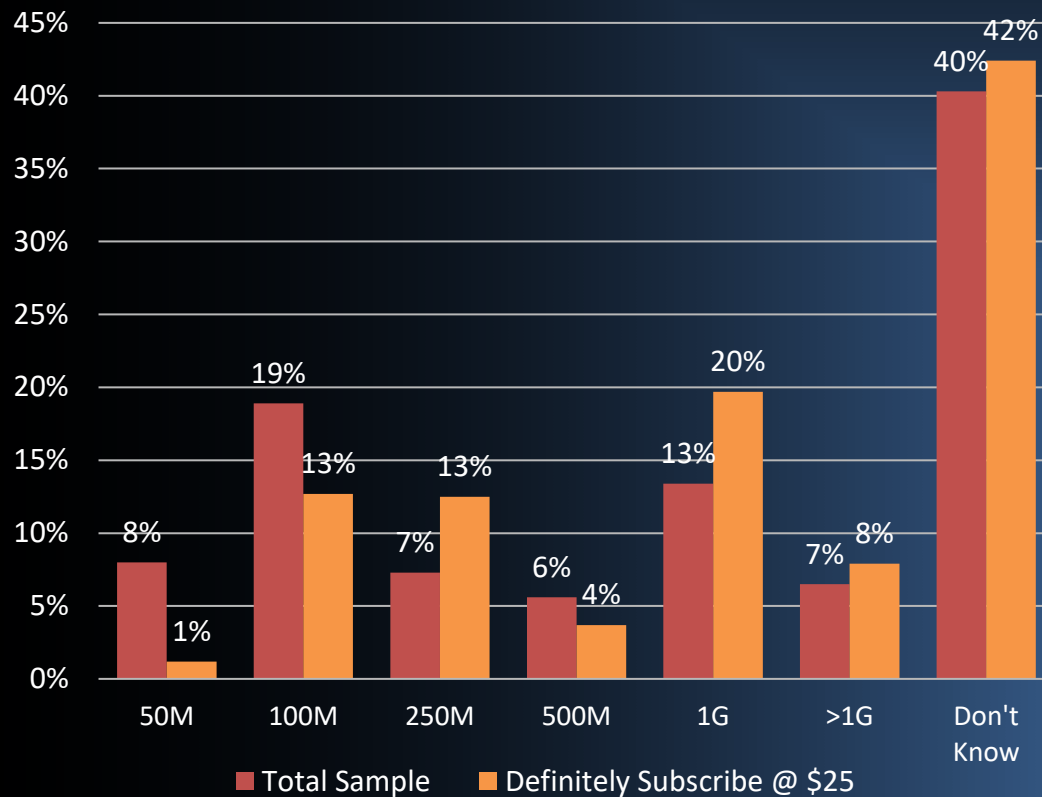
Q25: “What would you like to see most improved with your current broadband service?”



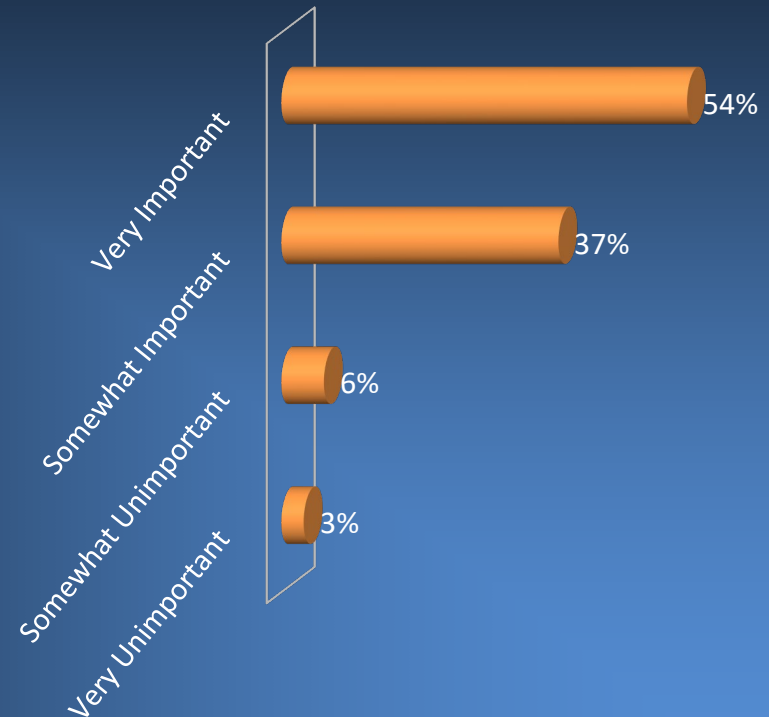
PERCEPTIONS OF INTERNET SPEED

- ◆ 20% of households state their ideal Internet speed would be 1G or higher. This increases to 28% among those who would definitely subscribe at \$25 per month for 200M. However 40% of households cannot state their ideal speed.
- ◆ One in two households perceive the upload speed as very important.

Q12: Ideal Download Speed



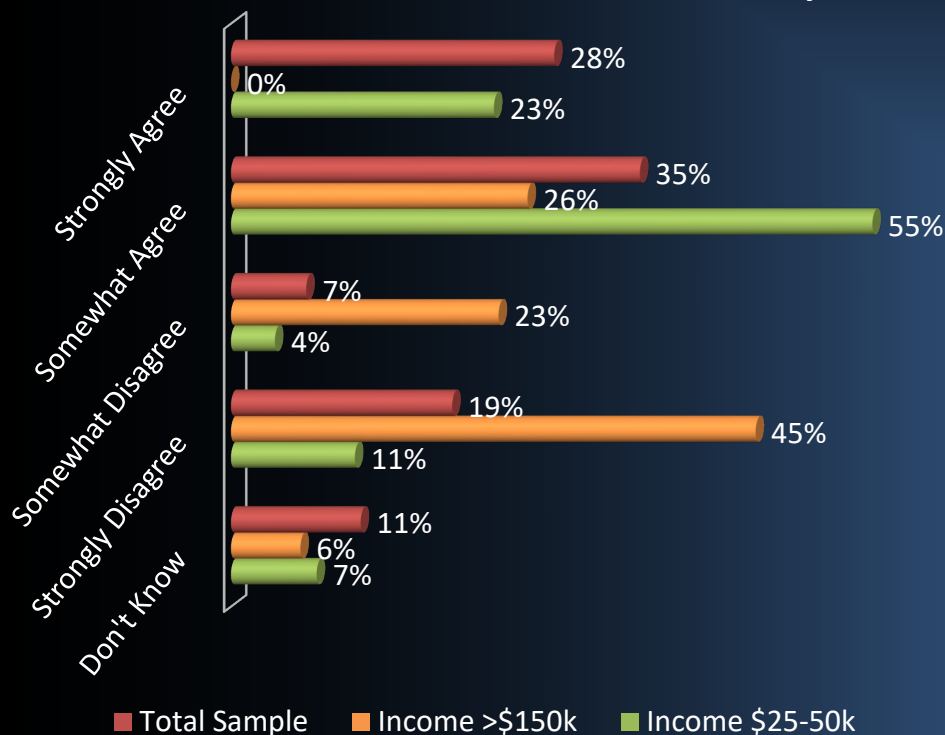
Q13: “How important is the upload speed on your home Internet connection?”



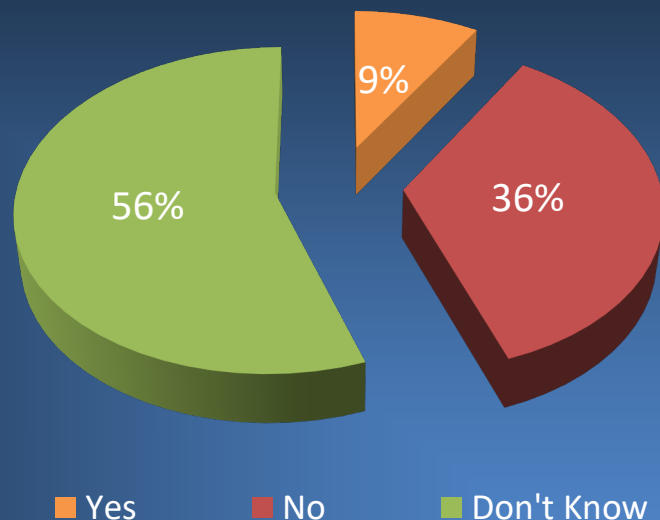
AFFORDABILITY & SUBSIDY AWARENESS

- 63% of households strongly agree or somewhat agree that they are subscribing to a lower Internet tier in order to save money.
- Among households not receiving an income-based subsidy, only 1 in 10 are aware that Comcast and Verizon offer discounted Internet.

Q7: “I subscribe to a lower speed Internet service than I would like to in order to save money?”



Q9: “Does your Internet provider offer a discounted Internet service for households who qualify due to lower income?”



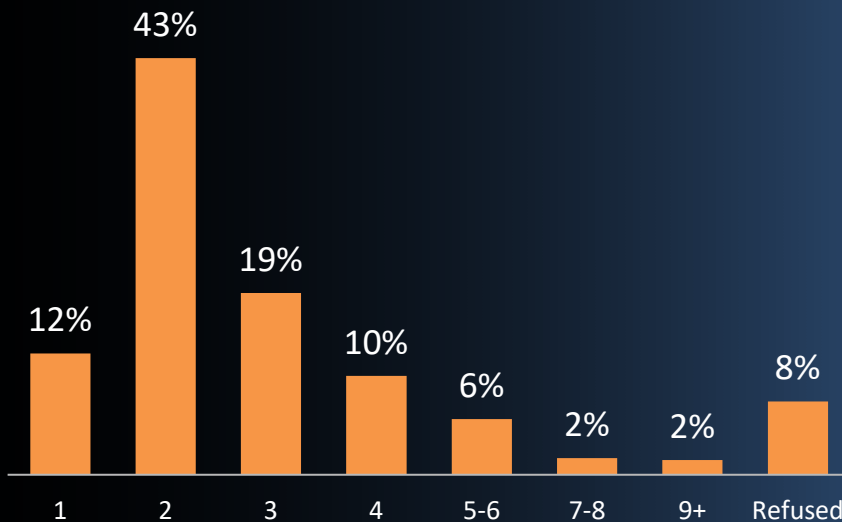
AFFORDABLE CONNECTIVITY PROGRAM

The Affordable Connectivity Program (ACP) is a newly funded federal program to subsidize Internet service among low-income households to narrow the digital divide...

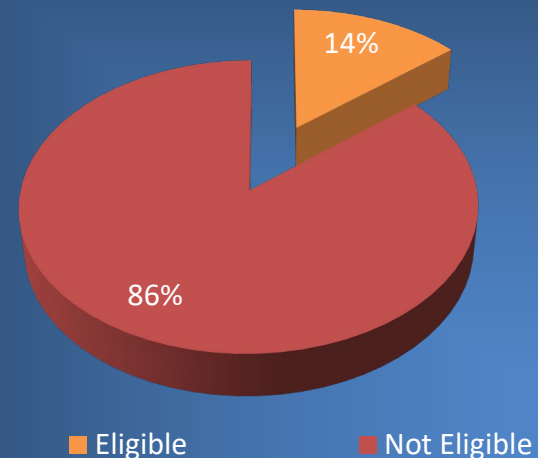
Program Overview	• \$14.2B in total funding • Qualifying households receive a \$30 monthly benefit towards Internet service • Connected device reimbursement of \$100 if provider charges between \$10-\$50 for the device • No set end date • Participation qualifies the service provider to receive BEAD grant funding
Household Participation Requirements	• Household income at or below 200% of federal poverty limit (e.g. household size of 3 earning \$44k or less) • Participation in national school lunch program • Participate in the FCC Lifeline program
Service Provider Participation Requirements	• Eligible Telecommunications Carriers (ETCs) offering residential Internet service • Requires FCC approval and USAC election notification • The \$30 discount must be available on all Internet tiers offered by the provider • No credit check and no disconnects for non-pay until 90 days past due

- ◆ Based on federal income eligibility limits combined with survey responses regarding household size and income, we estimate that approximately 14%-25% of Milford households qualify for ACP. The survey measurement of 14% eligibility is understated due to lower sample representation of low income households
- ◆ Eligibility set at 200% of Federal Poverty Level:
 - ◆ HH of 1: Income up to \$27,180
 - ◆ HH of 2: Income up to \$36,620
 - ◆ HH of 3: Income up to \$46,060
 - ◆ HH of 4: Income up to \$55,500
 - ◆ HH of >4: Add \$9,440 per person

Household Size
(Survey Data)



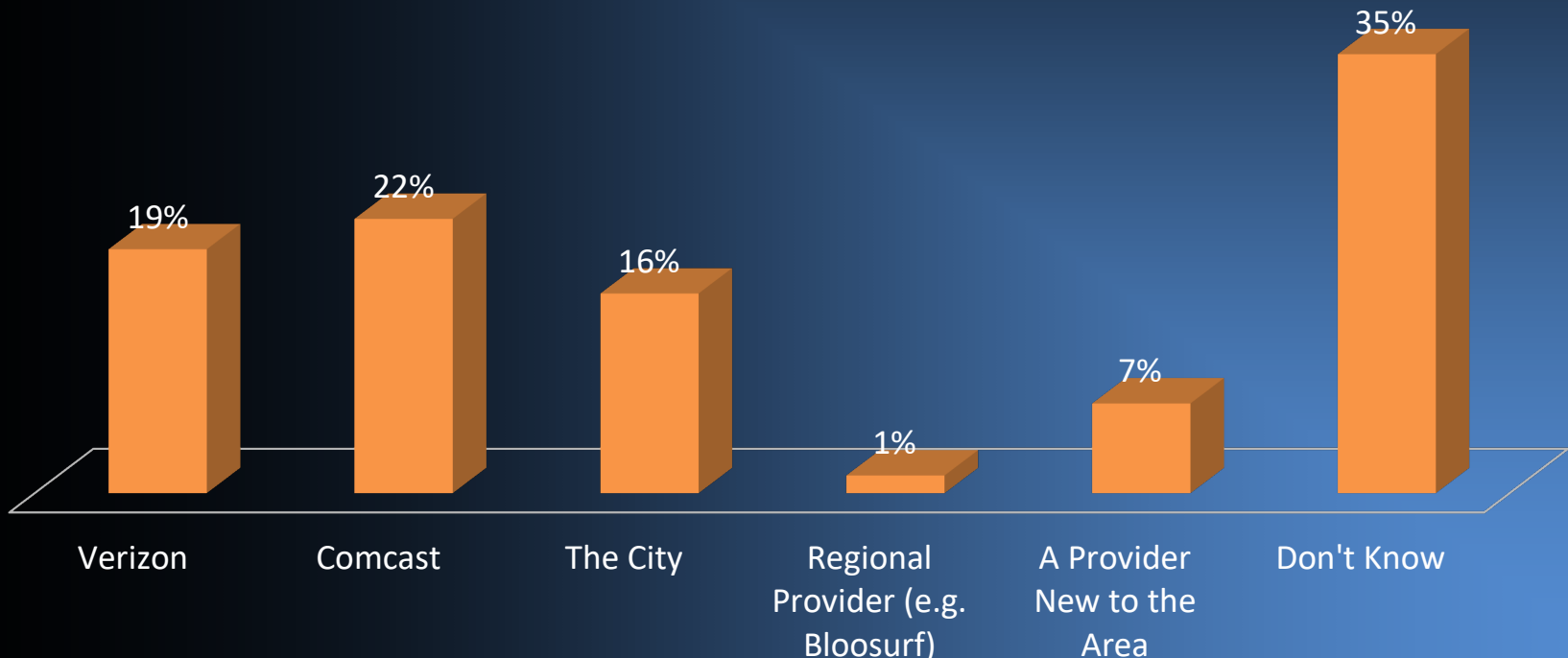
ACP Eligibility
(Survey Data)



PROVIDER PREFERENCE

- ◆ 16% of respondents, when given the choice, would prefer to receive high speed Internet from the City, while 22% of respondents prefer Comcast. Preference for an incumbent provider is higher than we typically observe.

Q24: “Among the following list of potential providers, who would you prefer to receive high-speed Internet service from?”

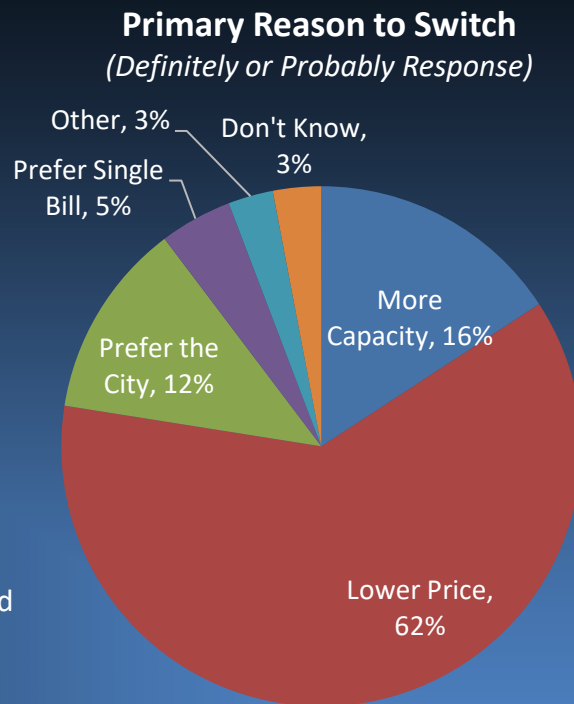
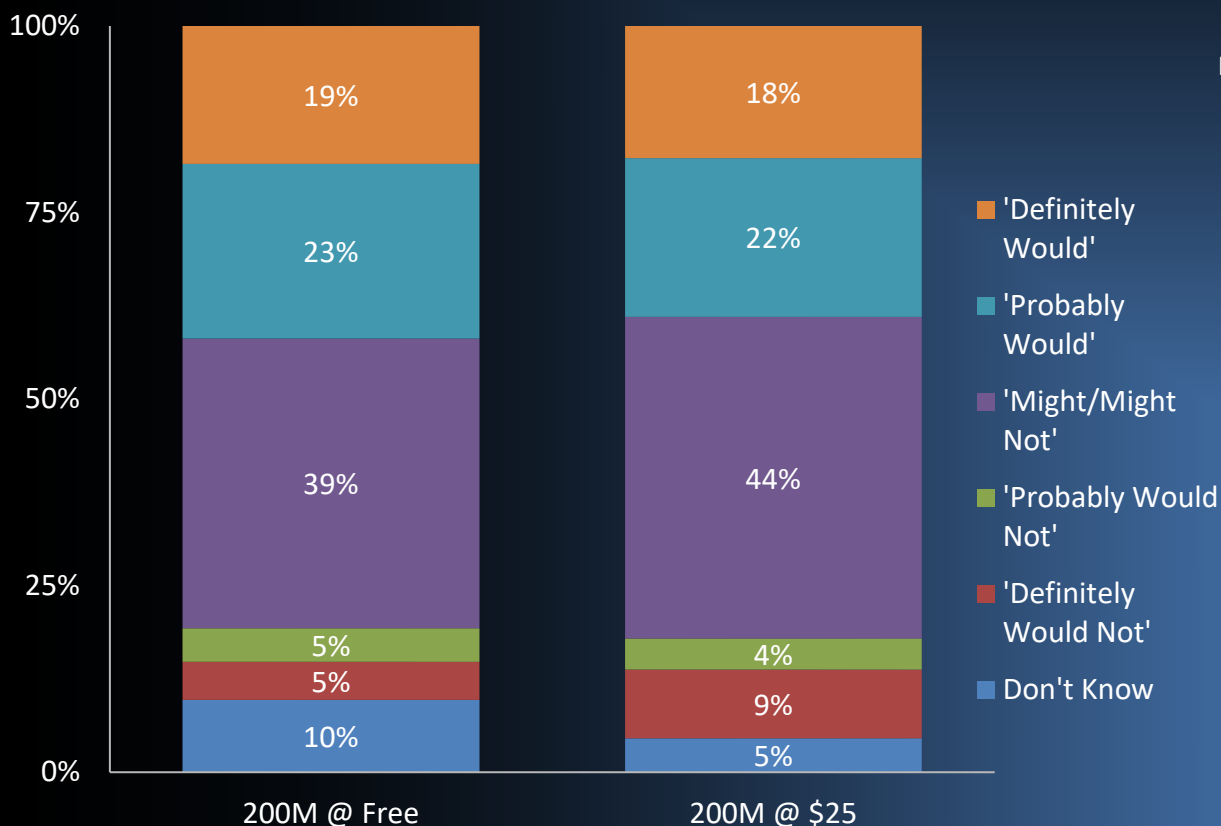


PURCHASE INTENT: ENTIRE SAMPLE

With No Charge for 200M, 42% of respondents indicated they would definitely or probably switch their Internet service to a fiber system installed by the City. This metric drops to 39% at the \$25 price point, which is statistically equivalent to the stated purchase intent at No Charge...

Q21/Q22: Stated purchase intent for:

- Internet at \$0/mo. for 200Mbps
- Internet at \$25/mo. for 200Mbps



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% = 2.0%

27.7% = Penetration Estimate

Survey Cell	Broadband Service	Forecasted Take Rate
A	200M Internet @ \$0 (All Households)	23.9%
B	200M Internet @ \$25 (All Households)	23.0%
	200M Internet @ \$0 (ACP Eligible Households)	20.7%

Task 3 – Wireless Network Strategy

- ◆ Electric Utility Assets
 - ◆ Over 3,800 primary electric poles
 - ◆ Space should be available at the top of the communications zone
 - ◆ Pole owner is allowed to place fiber cable 30 inches below power
 - ◆ Should significantly reduce pole make ready costs
 - ◆ No availability of spare conduits assumed in underground areas
- ◆ Streetlights
 - ◆ Cobra head arms attached directly to power poles in overhead areas
 - ◆ Shorter decorative streetlights more common in underground service areas
 - ◆ Wireless device mounting options limited on existing decorative streetlights
- ◆ City fiber network
 - ◆ 13.7 mile fiber ring circles the City
 - ◆ Fiber strand capacity assumed to be limited
 - ◆ Fiber storage points along the route unknown
 - ◆ System assumed to be well suited for future broadband backbone

❖ Option 1 – Macrocell Fixed Broadband

- ❖ Platforms based on licensed spectrum have higher power, but require provider provided CPE
- ❖ Unlicensed platforms operate at lower power, but can be compatible with standard Wi-Fi devices
- ❖ Most WISPs struggle to provide speeds greater than 50Mbps
- ❖ Newly introduced platform boasts user radios capable of supporting 800Mbps

❖ Option 2 - Microcell Licensed wireless (“5G”)

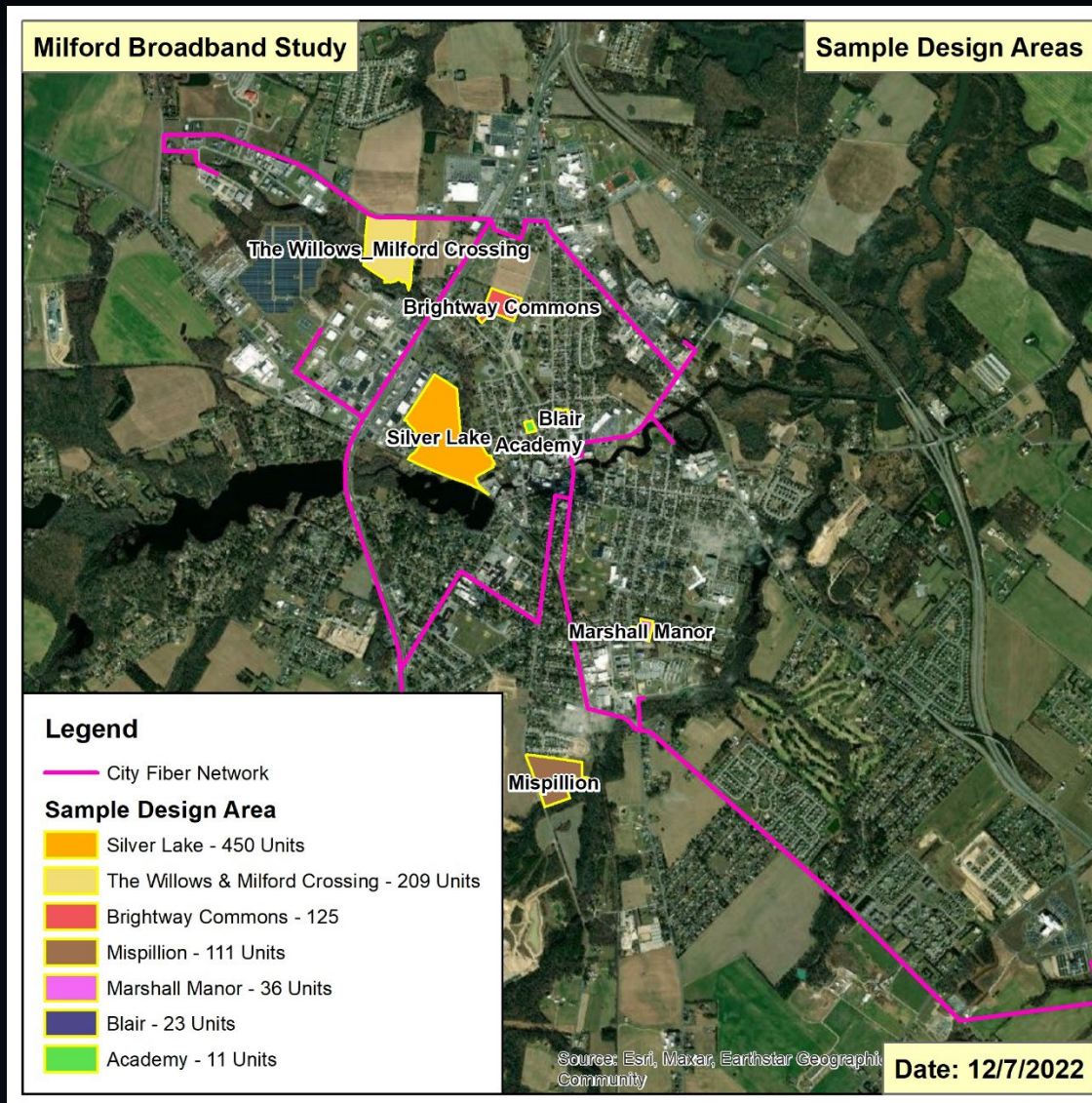
- ❖ “5G” technology uses licensed spectrum and fiber fed access points to offer 1Gig service
- ❖ Up to 4Gig speeds possible under ideal conditions and optimal spectrum usage
- ❖ Access points are limited to 1,000 foot radius or less to achieve building and foliage penetration
- ❖ Feeding access points with fiber would virtually result in a “fiber to the curb” buildout

✓ Option 3 – Targeted Microcell Wi-Fi

- ❖ Wi-Fi access points deployed in targeted neighborhoods
- ❖ Fiber gateways serve up to two access points via mesh technology
- ❖ Access points placed within 250 feet of any potential customer location
- ❖ Best effort service with speeds ranging from 100 – 500 Mbps to any standard Wi-Fi device
- ❖ Recommended based on the targeted nature of the broadband need in Milford

Wi-Fi Network Sample Designs

SAMPLE DESIGN AREA OVERVIEW



SILVER LAKE SAMPLE DESIGN



Design Metric	Value
New Aerial Plant Miles	0.6
New Underground Plant Miles	0.3
% Aerial	70%
% UG	30%
Passings	450
Passings per Mile of Plant	485
Materials Cost per Passing	\$556
Labor Cost per Passing	\$388
Total Cost per Passing	\$944
Total Materials (no drops)	\$249,975
Total Labor (no drops)	\$174,785
Total Cost	\$424,760

* - Does not include engineering and fixed equipment.

THE WILLOWS / MILFORD CROSSING SAMPLE DESIGN



Design Metric	Value
New Aerial Plant Miles	-
New Underground Plant Miles	0.3
% Aerial	0%
% UG	100%
Passings	209
Passings per Mile of Plant	702
Materials Cost per Passing	\$998
Labor Cost per Passing	\$711
Total Cost per Passing	\$1,710
Total Materials (no drops)	\$208,670
Total Labor (no drops)	\$148,694
Total Cost	\$357,364

* - Does not include engineering and fixed equipment.

OUTSIDE PLANT CAPITAL BUDGET ESTIMATE

Sample Design Area	New OH Miles	New UG Miles	Passings	Passings per New Mile of Plant	Materials per Passing	Labor per Passing	Total per Passing
Silver Lake	0.6	0.3	450	485	\$556	\$388	\$944
The Willows / Milford Crossing	-	0.3	209	702	\$998	\$711	\$1,710
Brightway Commons	0.5	-	125	236	\$262	\$171	\$433
Misphillion	0.5	0.1	111	172	\$446	\$500	\$946
Marshall Manor	0.3	-	36	111	\$721	\$600	\$1,321
Blair	0.1	-	23	161	\$702	\$321	\$1,023
Academy	0.3	-	11	42	\$1,617	\$1,017	\$2,634
Overall	2.4	0.7	965	308	\$623	\$457	\$1,079

- ❖ Last mile OSP capital budget required to pass all target areas = \$1,041,263
- ❖ Does not include capital budget NOC upgrades, switches and network appliances
- ❖ Does not include make ready, engineering and project management costs

Task 5 – Pro Forma Financial Analysis

- ◆ **Milford Owned System Supported by Adding Resources to IT Department**
 - ◆ Current IT staff is down two FTE
 - ◆ Attempts to hire staff have been unsuccessful due to talent pool / compensation expectations
 - ◆ Department is concerned about co-mingling City IT infrastructure with public use
 - ◆ No current rack space or floor space available to collocate new Wi-Fi network equipment
 - ◆ This scenario is not operationally feasible currently due to lack of resources and synergies
- ◆ **Milford Owned System Supported by New City Department**
 - ◆ Main approach for Uptown studies and municipal broadband deployments
 - ◆ New department allows for focused attention by dedicated staff
 - ◆ Stand alone departments require greater scale to support higher overhead (management)
 - ◆ Targeted Wi-Fi not likely to provide the level of cash flow required
- ◆ **Milford Owned System Supported by External Operating Partner (ISP)**
 - ◆ Emerging model for smaller broadband deployments
 - ◆ Milford system can be supported remotely using cloud-based monitoring capabilities
 - ◆ Proposed Wi-Fi network would only have 22 fiber gateways and 41 access points
 - ◆ City would need to provide emergency truck rolls to provide “local hands and a toolbox”
 - ◆ No in home customer service or repair would be assumed for the proposed service level
- ◆ **Third Party Retail Owner / Operator**
 - ◆ Private ISP builds, owns and operates Wi-Fi system
 - ◆ ISP sets price and service levels
 - ◆ Milford may choose to offer dark fiber on existing network

The Uptown pro forma model identifies key financial metrics that we rely on to evaluate financial feasibility of broadband investment projects (example project outcomes follow)...

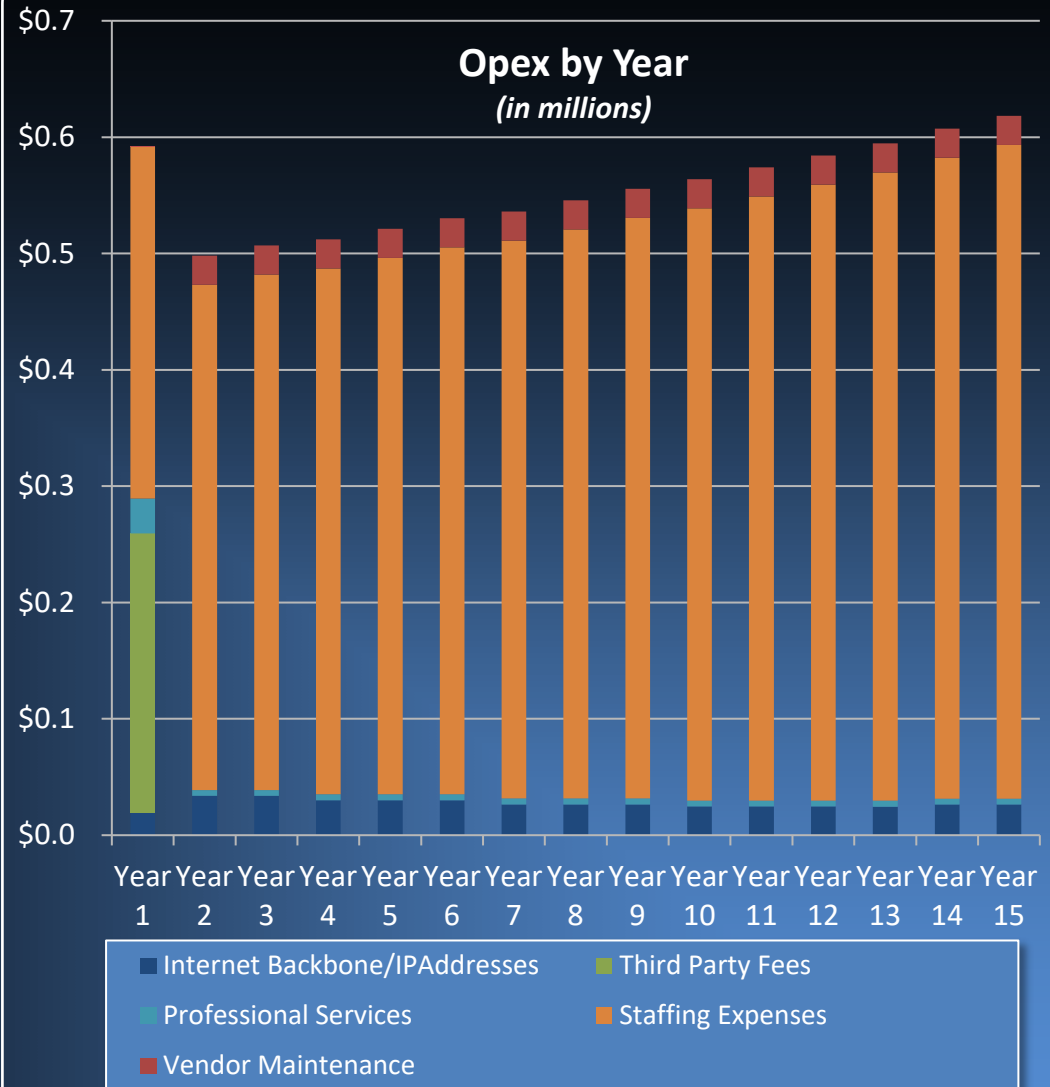
1. Timeframe to positive operating income
 - ◆ Revenue proceeds exceed operating expenses
 - ◆ Typical goal is within 4 years
2. Net Payback Period
 - ◆ Total project revenue proceeds exceed total investment
 - ◆ Typical goal is less than 20 years
3. No Secondary financing
 - ◆ Net cash flow including debt service remains positive over the life of the investment
 - ◆ Pro forma model identifies an inability of the broadband system to self fund
4. Sensitivity Analysis
 - ◆ Reasonable ability to withstand “misses” on key operating or financial metrics
 - ◆ Typically sensitive metrics include construction cost, residential take rates, and interest rate on long term debt

Baseline Scenario Financials

KEY INPUTS

- Bandwidth/IP Addresses (*see slide detail*)
- Staffing (*see slide detail*)
 - 4.3 Full Time Equivalent headcount
 - 2% annual wage increase
 - 45% benefits loading
- Professional Services
 - Implementation: \$120k
 - Legal/Acct: \$30k (Yr1)/\$5k (Yr2+)
- Other Opex
 - ROW Fees: Pole attachment not imputed
 - Vendor maintenance of \$25k/year for OSS/BSS and Wi-Fi electronics

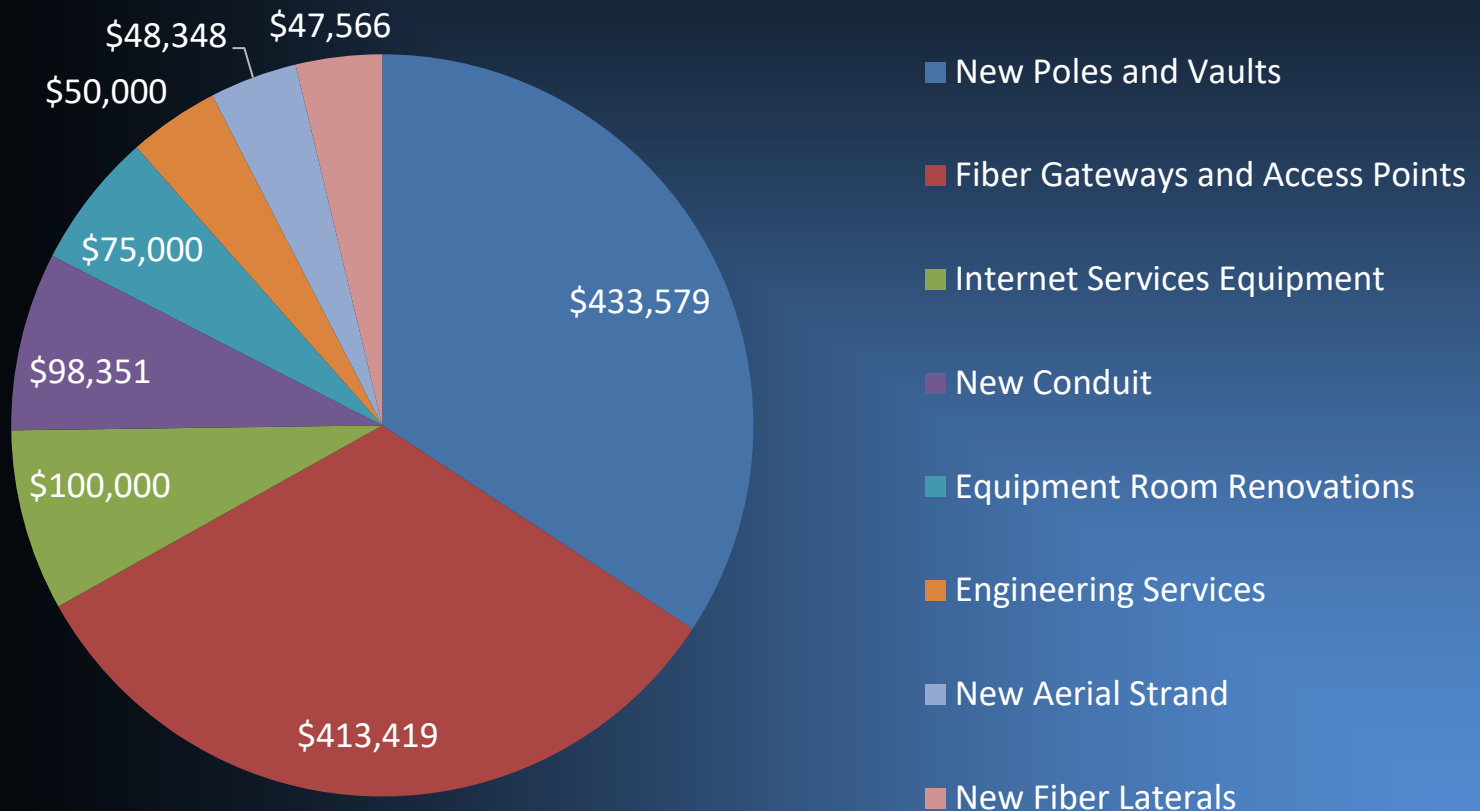
BASELINE OPERATING EXPENSE



BASELINE STARTUP CAPEX BY TYPE

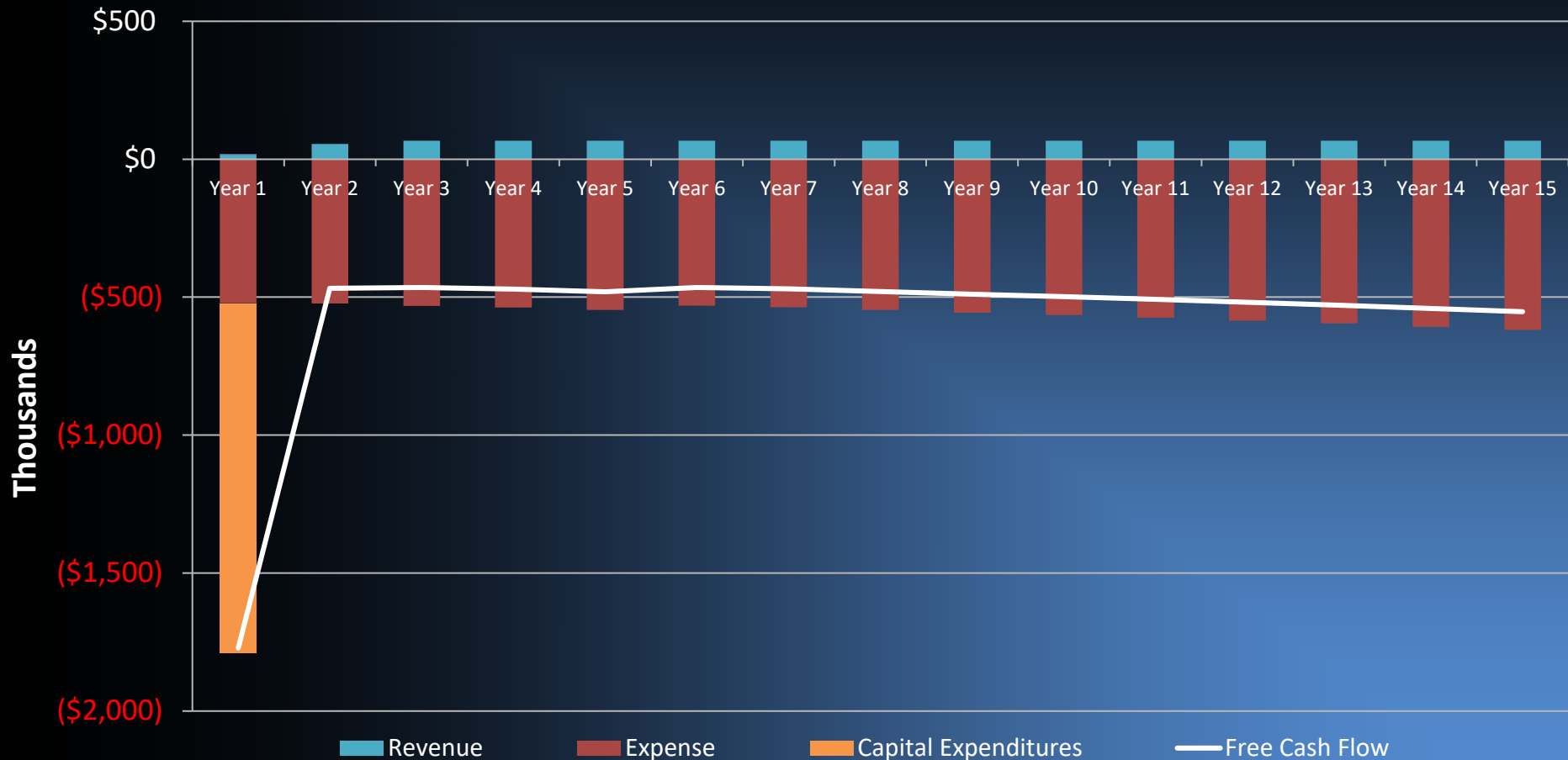
Over 33% of total capital budget goes towards placing new light poles in areas that do not have poles suitable for mounting. The cost to extend the existing fiber ring into target neighborhoods is less than 15% of the total capital budget.

Startup Capex = \$1.3M

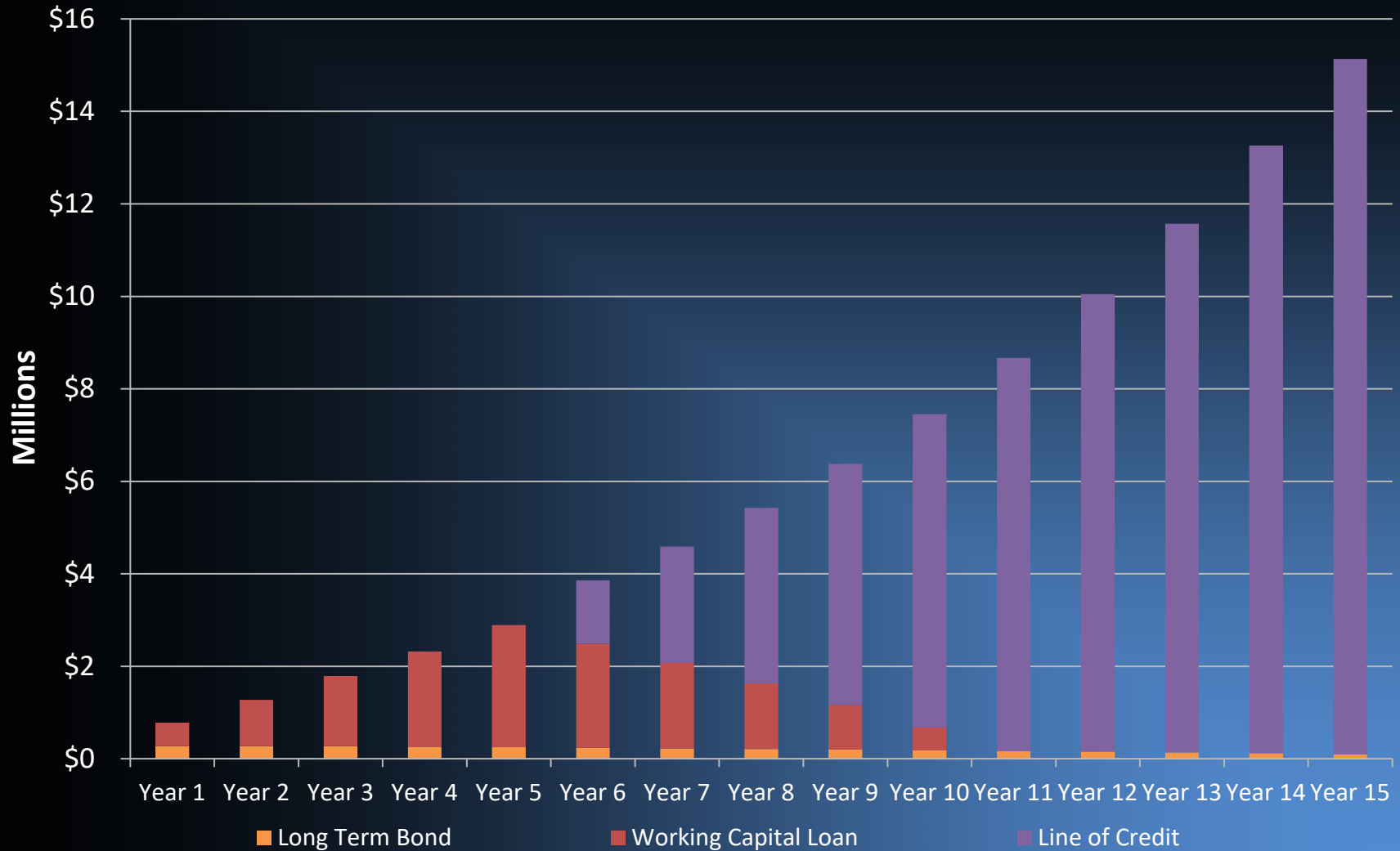


BASELINE FREE CASH FLOW

Free cash flow does not go positive in the first 15 years of the plan, indicating an ongoing need for secondary financing support of the project...

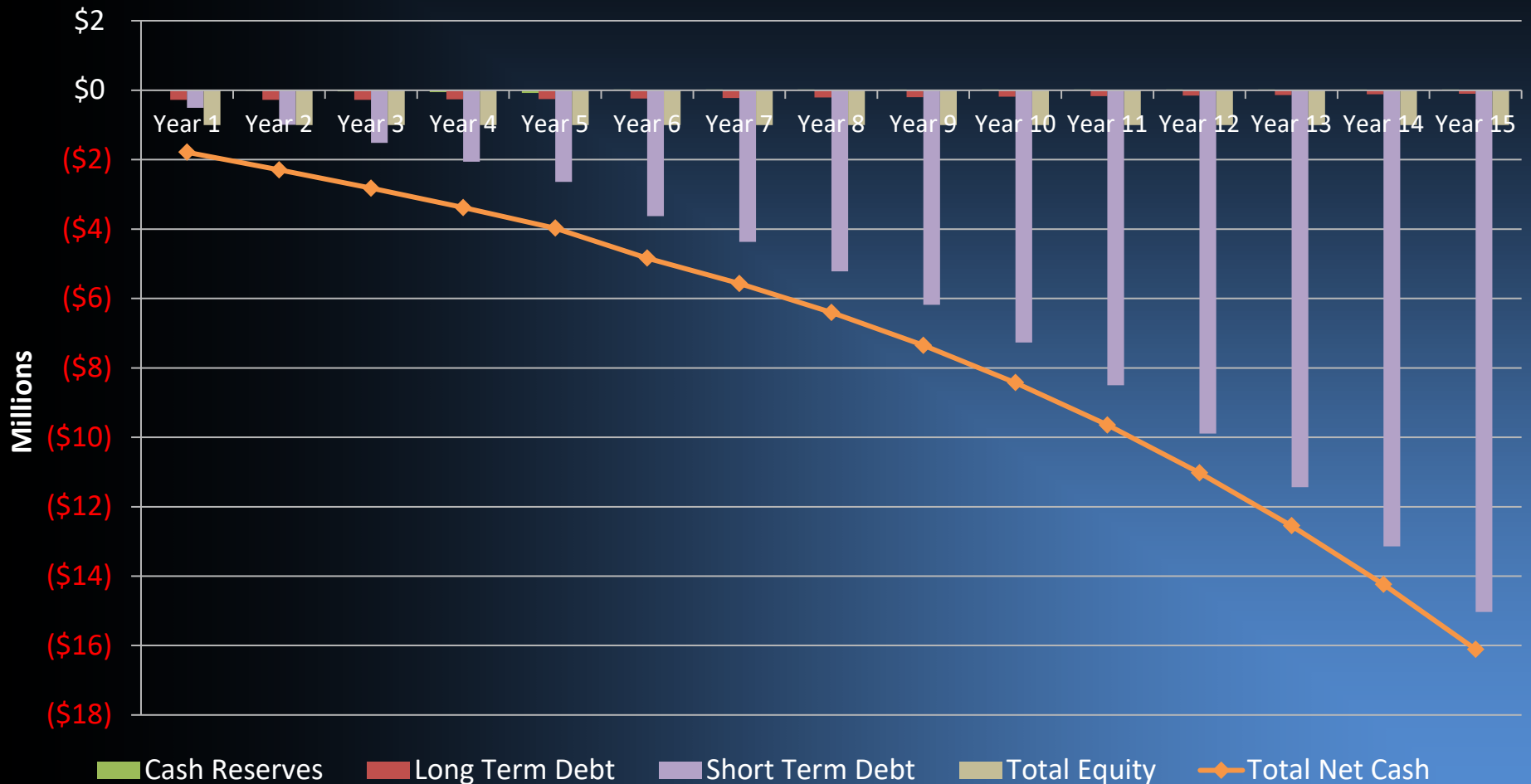


BASELINE TOTAL DEBT



BASELINE NET CASH

The Retail Own & Operate with New City Department model is not financially self-sufficient, and does not achieve net project payback by Year 15 of the pro forma forecast...

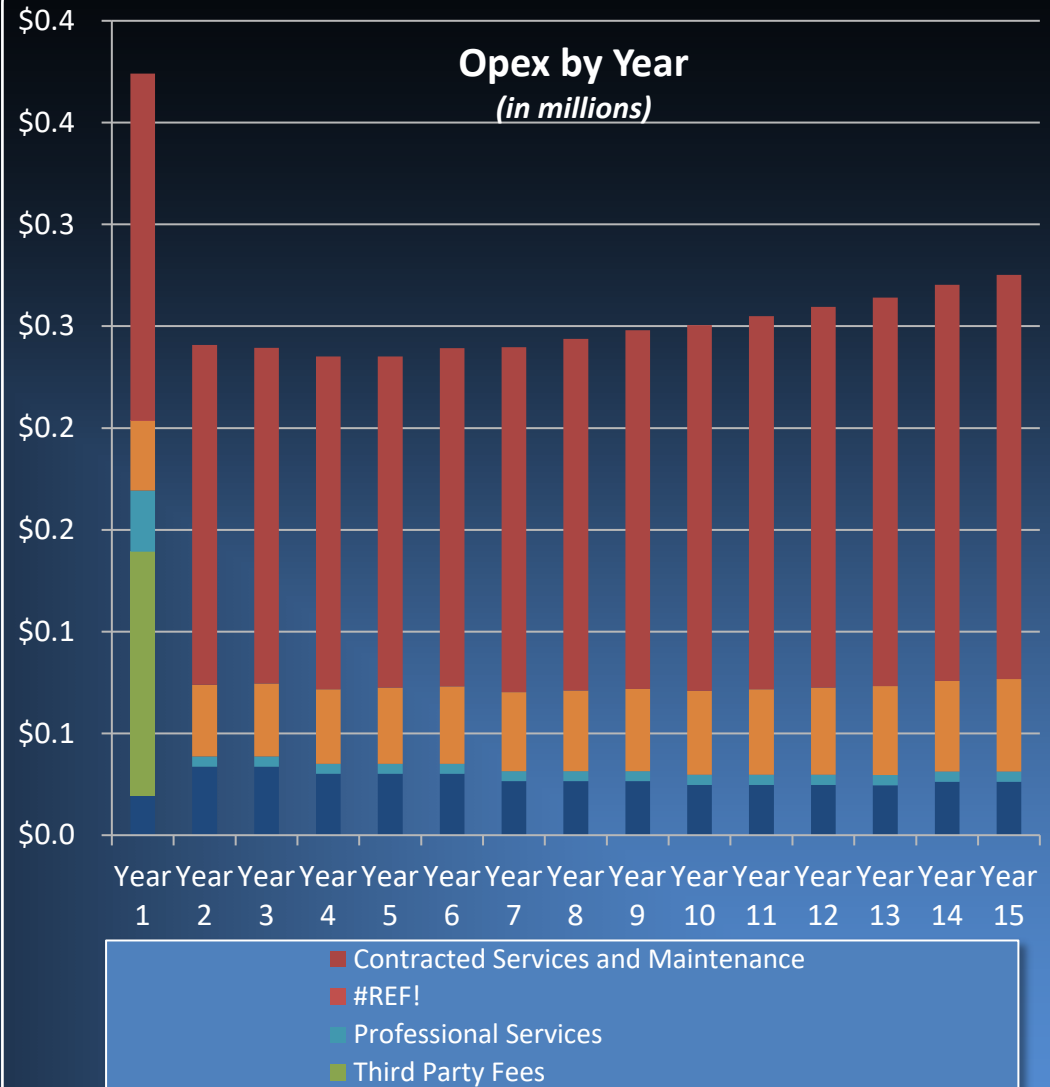


Operating Partner Scenario Financials

KEY INPUTS

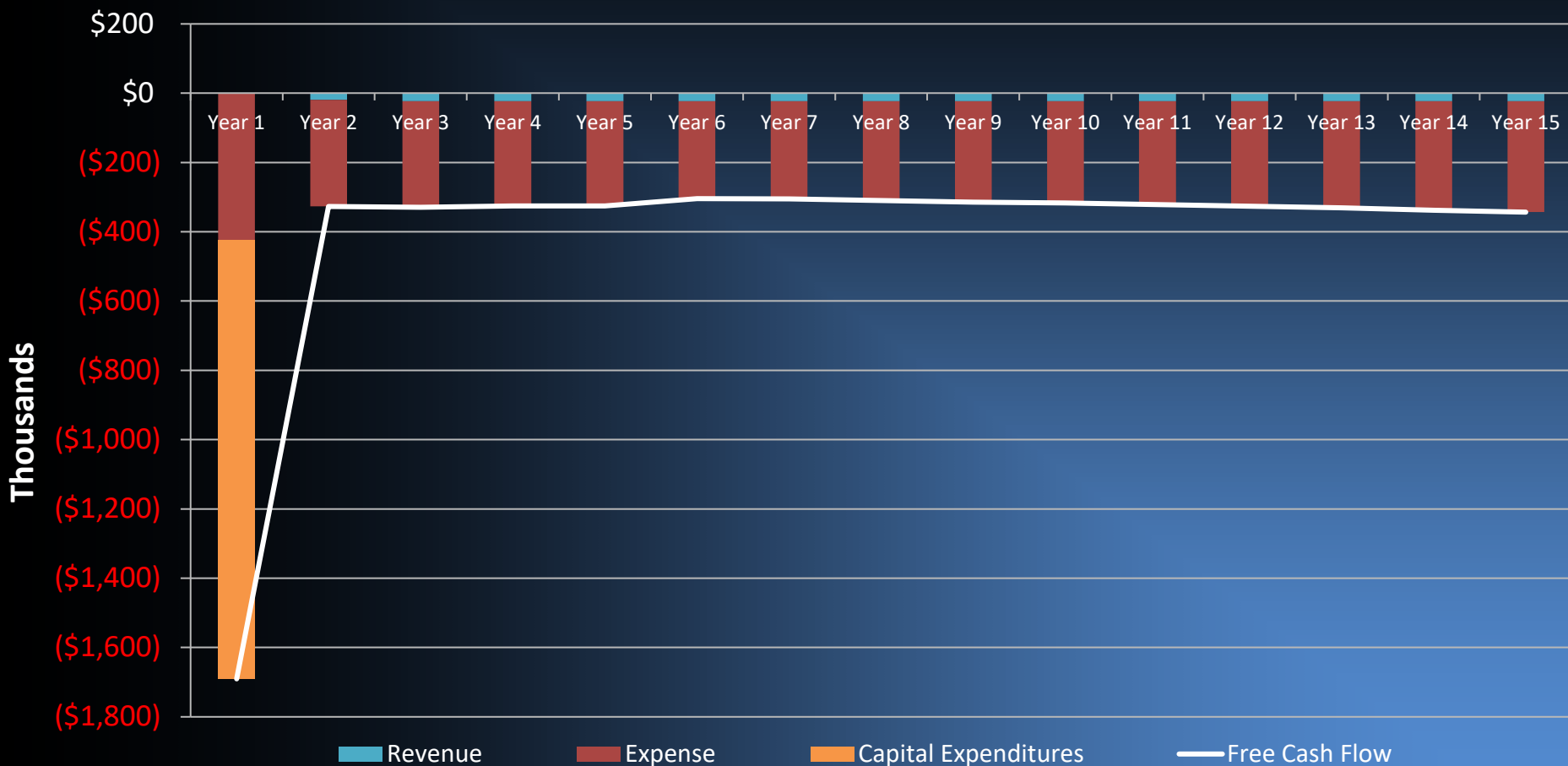
- Bandwidth/IP Addresses *(see slide detail)*
- Staffing *(see slide detail)*
 - 0.3 Full Time Equivalent headcount
 - 2% annual wage increase
 - 45% benefits loading
- Professional Services
 - Implementation: \$120k
 - Legal/Acct: \$30k (Yr1)/\$5k (Yr2+)
- Contracted Services
 - Per month Fixed: \$5,000
 - Monthly per subscriber: \$12
- Other Opex
 - ROW Fees: Pole attachment not imputed
 - Vendor maintenance of \$25k/year for OSS/BSS and Wi-Fi electronics

BASELINE OPERATING EXPENSE

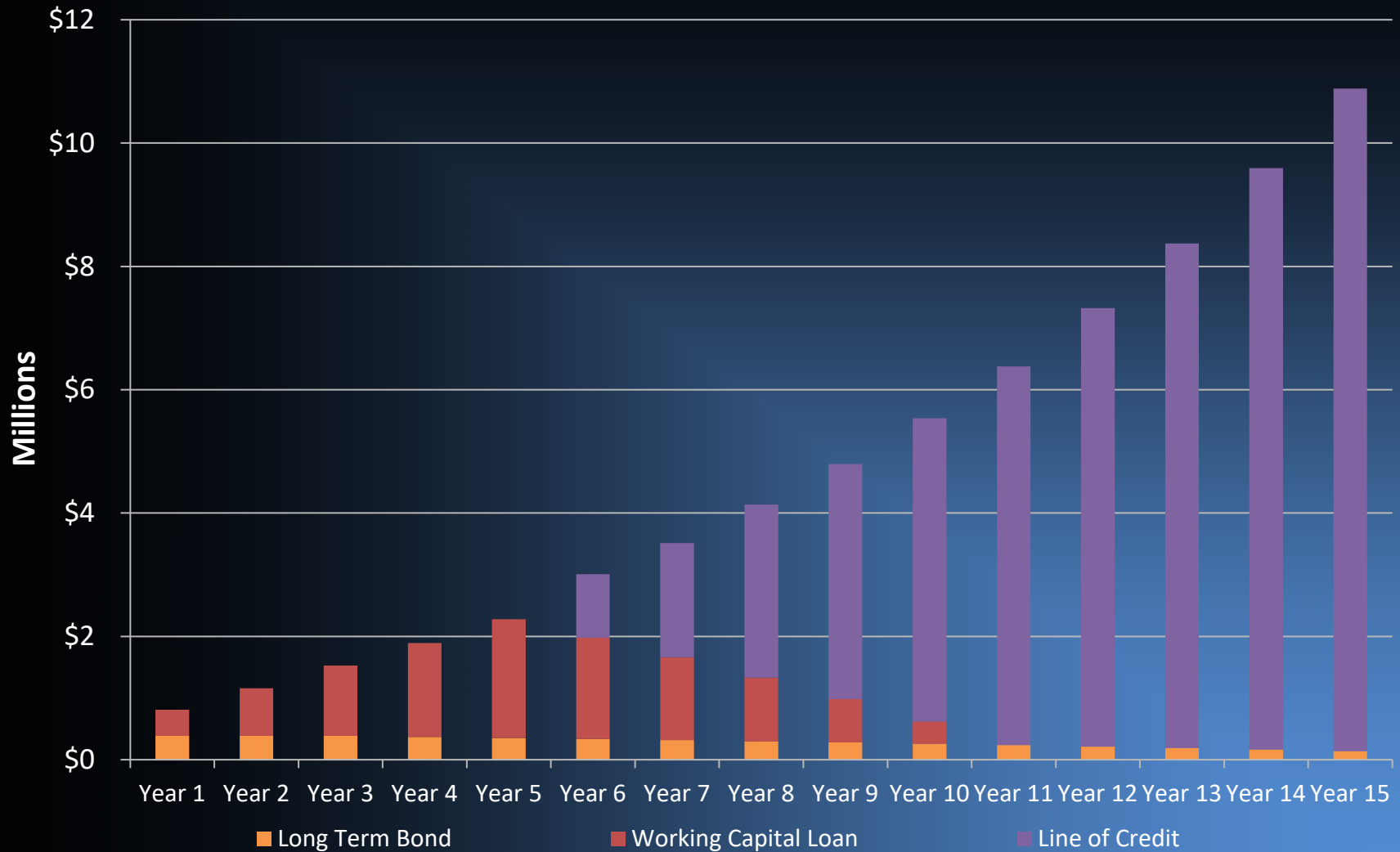


OPERATING PARTNER FREE CASH FLOW

Free cash flow does not go positive in the first 15 years of the plan, indicating an ongoing need for secondary financing support of the project...

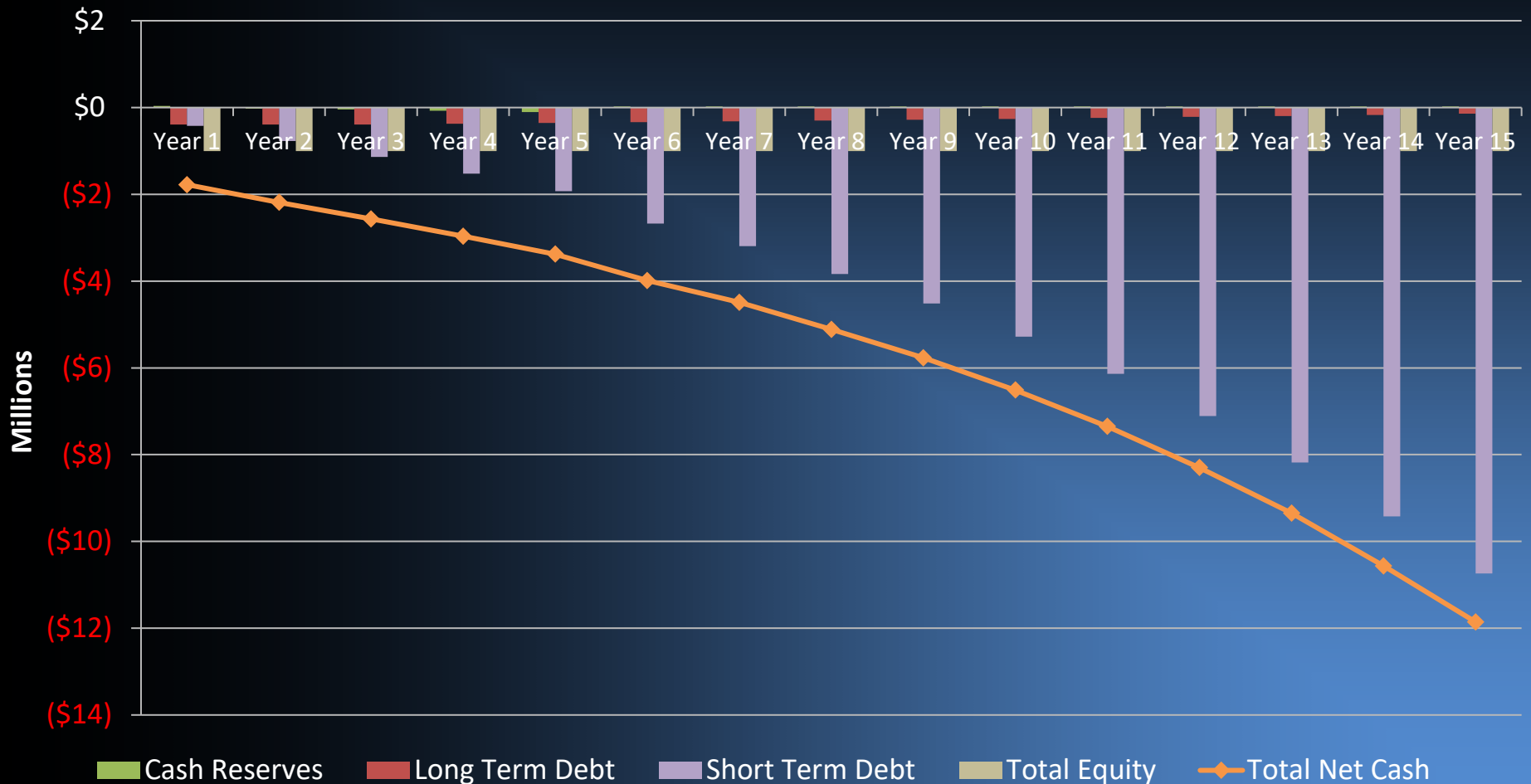


OPERATING PARTNER TOTAL DEBT



OPERATING PARTNER NET CASH

The Retail Own with Operating Partner model is not financially self-sufficient, and does not achieve net project payback by Year 15 of the pro forma forecast...



STUDY CONCLUSIONS AND NEXT STEPS

- ◆ The affordability of Internet service is an issue for many households
 - ◆ Among households without an Internet subscription, 54% state the reason is lack of affordability
 - ◆ 63% of households currently are under-utilizing Internet capacity due to affordability issues
 - ◆ Only 9% of households are aware of the ACP subsidized Internet program
 - ◆ 14% to 25% of Milford households would be eligible for the ACP program, but only ≈11% are currently participating

- ◆ Facilities based Wi-Fi strategy is not feasible
 - ◆ Initial investment is doable
 - ◆ Ongoing operating losses make the venture unsustainable
 - ◆ Target market is not large enough to support the minimum level of fixed expense

- ◆ Next Steps
 - ◆ Generate more awareness of ACP benefits within the target community
 - ◆ Collaborate with local providers to enhance low-cost Internet availability and awareness
 - ◆ Partner with local schools to gain a better understanding of student needs
 - ◆ Consider limited Wi-Fi in public spaces to enhance availability beyond schools, libraries and community centers



Land Use Application Approval Requirements

Planning Department

January 18, 2023



Types of Land Use Applications

- ▶ Minor Subdivision
- ▶ Annexation
- ▶ Change of Zone
- ▶ Permitted Use Site Plan
- ▶ Conditional Use Site Plan
- ▶ Conditional Use
- ▶ Planned Unit Development
- ▶ Major Subdivision



Approval Requirements

- ▶ Minor Subdivision, Lot Line Adjustment, Lot Consolidation

- ▶ Reviewed Administratively

OK

- ▶ Annexation

- ▶ Annexation Committee - Public Meeting
 - ▶ Planning Commission - Public Hearing
 - ▶ City Council - Public Hearing

OK

- ▶ Change of Zone

- ▶ Planning Commission - Public Hearing
 - ▶ City Council - Public Hearing

OK



Approval Requirements (cont.)

▶ Permitted Use Site Plan

- ▶ Preliminary Plan - Planning Commission - Public Meeting
- ▶ *A by-right site plan cannot be denied if all code requirements are met.*
- ▶ Final Plan - Reviewed Administratively

OK

▶ Conditional Use Site Plan

- ▶ Preliminary Plan - Planning Commission - Public Hearing
- ▶ Preliminary Plan - City Council - Public Hearing
- ▶ Final Site Plan - Reviewed Administratively

▶ Conditional Use

- ▶ Planning Commission - Public Hearing
- ▶ City Council - Public Hearing

Consider
Revising?



Approval Requirements (cont.)

- ▶ Planned Unit Development
 - ▶ Preliminary Plan - Planning Commission - Public Hearing
 - ▶ Preliminary Plan - City Council - Public Hearing
 - ▶ Final Plan - Planning Commission - Public Hearing
 - ▶ Final Plan - City Council - Public Hearing

**Consider
Revising?**



Approval Requirements (cont.)

- ▶ Major Subdivision

- ▶ Preliminary Plan - Planning Commission - Public Hearing

- ▶ Preliminary Plan - City Council - Public Hearing

- ▶ Final Plan - Planning Commission - Public Hearing

- ▶ Final Plan - City Council - Public Hearing

Consider
Revising?

- ▶ *A by-right major subdivision cannot be denied if all code requirements are met.*



Question for City Council

- ▶ Do we want to modify the land use approval requirements to allow the Planning Commission to have the final determination for Conditional Use, Conditional Use Site Plan, Major Subdivision and Planned Unit Development applications?



Next Steps

- ▶ The Planning Commission will meet over the next few months to review Chapter 230 Zoning and Chapter 200 Subdivision of Land, primarily focusing on the following;
 - ▶ Land Use Application Review and Approval Process.
 - ▶ Permitted and Conditional Uses within each zoning category.
 - ▶ Reduction of the number of Conditional Uses within each zoning district by making some uses permitted with specific conditions to be met.