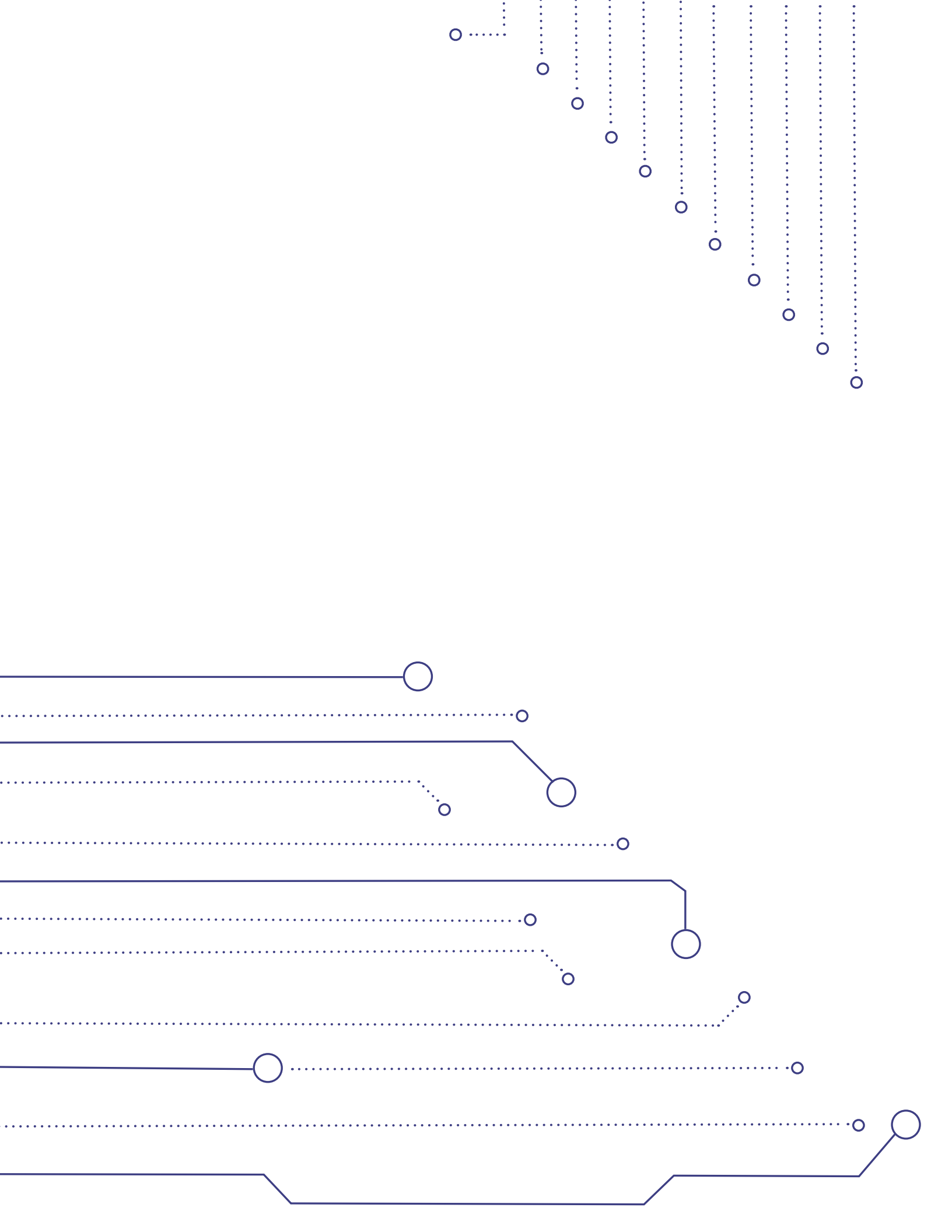
A

APPENDICES

THIS SECTION PROVIDES FURTHER INFORMATION ON THE PROCESSES, COSTS, AND TECHNICAL SPECIFICATIONS REFERENCED IN THE MASTER PLAN. ADDITIONAL BACKGROUND DATA CAN BE FOUND ON NYC OPEN DATA.



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Appendix A: List of Project Stakeholders Interviewed

BROADBAND CITY ASSET TASK FORCE AGENCIES

- Brooklyn Public Library
- Department of Citywide Administrative Services
- Department of Cultural Affairs
- Department of Education
- Department of Environmental Protection
- Department of Information Technology & Telecommunications
- Department of Parks and Recreation
- Department of Sanitation
- Department of Social Services: Department of Homeless Services
- Department of Social Services: Human Resources Administration
- Department of Transportation
- New York City Economic Development Corporation
- New York City Fire Department
- Health and Hospitals
- Mayor's Office of the Chief Technology Officer
- New York City Housing Authority
- New York Public Library
- Office of the Deputy Mayor for Operations
- New York City Police Department
- Queens Public Library

NYC CONNECTED RFI RESPONDENTS

- Altice
- American Tower
- AT&T
- Better-B/Silicon Harlem/Sky Packets
- Bigbelly
- Bridges Inc.
- Charter
- Ciena
- CommHub Mobility
- Conduit Space Recovery Systems
- Consumers Union
- Crown Castle
- CWA-Union
- Digital Equity, Adoption, and Literacy (DEAL) Coalition, on behalf of:
  - Manhattan Borough President
  - Silicon Harlem
  - ScriptEd
  - PowerMyLearning
  - Older Adults Technology Services (OATS)
  - CSNYC
  - Mouse
  - New York Law School
  - The LAMP (Learning About Multimedia Project)
  - The New School
- E-Band Communications
- Foresite Group
- FSA Networks
- GigXero
- Greywale Advisors
- Honest Networks

- JCDecaux
- Mobilitie
- modeXnet
- Neighborly
- Nest Wireless
- Neture
- NYC Mesh
- NYSERNet
- Older Adult Technology Services
- Open Access.net Inc
- Pilot
- Resilient Networks NYC on behalf of:
  - Resilient Communities, New America NYC
  - The Point CDC, Hunts Point, Bronx
  - Fifth Avenue Committee
  - Silicon Harlem
  - Kings Bay Y
  - Rockaway Development and Revitalization Corporation
- Ruckus Networks
- Shale Team
- Siklu Communication
- Sky Packets
- Spot On Networks
- Stealth Communications
- SYNDEO
- T-Mobile
- Telcom Networks
- Ting Fiber
- Transit Wireless
- Verizon
- Wi-Fi Alliance
- WiredScore
- Wireless 20/20
- Xchange Telecom/ Skywire Networks
- Yomura Fiber
- ZenFi Networks

FOCUS GROUP PARTICIPANTS

- Beam Center
- Civic Hall
- Global Action Project
- Green Worker Cooperatives
- The LAMP
- Mayor's Office of the Chief Technology Officer
- Mouse
- New America, Resilient Communities
- New York Law School
- New York On Tech
- Older Adult Technology Services
- Per Scholas
- Power My Learning
- Red Hook Initiative
- Silicon Harlem
- Tech Kids Unlimited

Appendix B: NYC Connected Request for Information

Issued by the Mayor's Office of the Chief Technology Officer for The City of New York on November 14, 2017

Released: November 14, 2017

Responses due: January 19, 2018

PURPOSE

The City of New York (City) issues this Request for Information (RFI) to solicit ideas for potential strategies and partnerships to achieve universal gigabit-class broadband throughout New York City.

The Office of the Chief Technology Officer is currently developing a citywide implementation plan that leverages the best of public and private sources to expand broadband availability and affordability, and to maximize the benefits of competition. The City has the ability to mobilize a suite of City assets and resources across agencies, including but not limited to City streets, rooftops, street poles and organizational resources to facilitate the buildout and sustainability of broadband infrastructure to connect all New Yorkers. The City seeks to understand how public and private cooperation can resolve broadband challenges in New York and what kind of efforts and assets will be required to achieve the City's goals. This RFI is an opportunity for the broadband industry and stakeholders to inform the City's planning to enable delivery of ubiquitous gigabit internet service to all New Yorkers at affordable prices in the near future, without significant disparities among neighborhoods or compromises to individual privacy.

The City has set an ambitious goal that "every resident and business will have access to affordable, reliable, high-speed broadband service everywhere by 2025" (see Section II for details). The City seeks ideas and proposals about how the public and private sectors can work together to support the City's goals for next generation, future-proofed networking to provide reliable and affordable high-speed internet service to all residents, businesses, institutions, and the public realm.

The Chief Technology Officer (CTO) of the City of New York is charged with the implementation of the Mayor's broadband commitment. The CTO will ensure that all New Yorkers can use the internet to participate fully in our City through the benefits of new technologies. This mandate includes the development and delivery of a strategy to achieve universal broadband infrastructure and service, as well as resources to support its adoption and use.

Responses should be submitted online using this form. All questions and requests for additional information concerning this RFI should be submitted via e-mail no later than December 15, 2017, 5:00PM (EST) to connected@cto.nyc.gov.

New York City has a history of being ambitious and forward-thinking in infrastructure, and the City is open to creative solutions that will maximize public benefit and private investment, and provide reliable, high-quality services to meet community needs. Responses to this RFI should describe the respondent's recommended technological and partnership approaches, and how they would contribute to furthering the City's goals. Responses should describe how recommendations can easily and inexpensively scale to provide higher-speed services as demand for bandwidth increases over time.

Responses to this RFI should suggest technological and partnership approaches, and how they would contribute to furthering the City's goals, including (1) the creation of 100,000 good-paying jobs for New Yorkers over the next ten years, and (2) the awarding of at least 30 percent of the dollar amount of City contracts to minority- and women-owned businesses and enterprises by 2021. The City encourages responses to this RFI on an approach or collaboration that could contribute to increased economic opportunity for all New Yorkers and the protection of workers' rights.

The City anticipates that this RFI will be a primary means of industry input before it determines its specific implementation plan for how it will achieve its universal broadband goals. Respondents may elect to respond to any or all questions included in this RFI. Responses to this RFI may inform potential future solicitations related to the City's universal broadband goals.

We welcome responses from all interested entities, including but not limited to:

- Internet Service Providers: Those currently operating in New York City and potential new market entrants, including entities that are not traditional internet service providers but are interested in offering service under innovative business models;
- Investors;
- Construction contractors, equipment vendors, and

operations or maintenance service providers that are interested in working and investing in New York;

- Workers in the broadband construction and internet service industry.

The City anticipates using information gleaned from the responses to shape the direction and form of the City's universal broadband implementation efforts, including forthcoming Requests for Proposals. Participation in this RFI is in no way required for participation in any forthcoming RFP.

THE CITY'S GOALS AND THE CHALLENGE TO BE ADDRESSED

The City's broadband goal is stated in One New York: The Plan for a Strong and Just City:"Every resident and business will have access to affordable, reliable, high-speed broadband service everywhere by 2025." The plan includes five initiatives to achieve the vision:

- Promote competition in the residential and commercial broadband markets;
- Provide high-speed residential internet service for low-income communities currently without service;
- Increase investment in broadband corridors to reach high-growth business districts, with a focus on outer-borough neighborhoods;
- Promote seamless user experience across public networks to create high speed access across the boroughs;
- Explore innovative ways to provide high-speed Internet to homes, businesses, and the public.

The CTO has identified the following five principles to guide citywide investments and partnerships in universal broadband: Performance, Affordability, Choice, Equity, and Privacy. The specific parameters of each of these principles will be informed by responses to this RFI and other public process and engagement. The City does not have a preference for a particular broadband technology, architecture, or business model, so long as the solution accords with these principles, meets the City's goals, and is to the greatest extent possible future-proofed.

INFORMATION RESOURCES

The following information and open data is available to inform responses to this RFI, including but not limited to:

- OneNYC, including City policy and previous initiatives
- NYCx, including an active broadband technology challenge for Governors Island
- Data on Wi-Fi hotspot locations
- LinkNYC, including map of locations and franchise agreement for the installation,
  - operations, and maintenance of Links
  - Parks WiFi, including geographic information of Wi-Fi hot spots and providers
- Queensbridge Connected
- NYC Connected Communities, including map of locations of public computer centers and classes in libraries, public housing facilities, senior centers, and community centers
  - NYCHA Digital Van
- Information about New York City's Franchise Process, including current:
  - Cable television franchise agreements Mobile subway station franchise agreements Information services franchise agreements Mobile telecom franchise agreements Microtrenching rules and requirements
- Technical Vendor Resources for current policies, guidelines, and standards applicable to technology projects for the City
- FCC Form 477 Broadband Deployment Data, including available service by speed and by choice to New York City census blocks
- NYC Broadband Data Dig
- Locations of City-Owned and Leased Properties
- Map of public facilities across the city. (Users should filter property type by "City Owned" properties when viewing the map.)
- A map of NYCHA developments in the City

- Locations of City assets: Bus stop shelters Parking meters
  - Automatic public toilets
  - Bike parking shelters
  - Cityrack sidewalk bicycle parking racks
  - CityBench public seating
  - Newsstands
- Mobile Telecommunication Franchise Poletop Installation Locations, including street light poles, traffic light poles, and utility poles
- Department of Buildings Cellular Antenna Filings
- New York City Street Reconstruction 10 Year Capital Plan, containing information about capital street projects funded from fiscal years 2015 to 2025

The Roosevelt Institute and The New School published a case study on Queensbridge Connected:

"Wired: Connecting Equity to a Universal Broadband Strategy." The initiative was also featured in the November 2016 issue of Wired Magazine: "Inside the Battle to Bring Broadband to New York's Public Housing."

REQUEST FOR INFORMATION

The City seeks ideas and information on the following topics related to potential public-private partnerships or collaborations:

A. Respondent Profile

B. Potential Network Architecture

C. Use of City Assets

D. Network Deployment and Construction

E. Business Parameters and Partnership Opportunities

F. Standards, Policies, and Performance Indicators

G. Supporting Files

Respondents may choose to respond to all or only some of the questions in any of these topics. Nonetheless, all respondents should provide a Respondent Profile that identifies the respondent's experience relevant to its responses.

Please note that the text boxes can be expanded to fit your complete answer, and you are not limited to the box as displayed. You can save your progress on this form and return to it by logging back in. You will have the opportunity to upload any supporting files at the end of the form. We will not review your submission until you press "Submit" on the "Review and Submit" page.

Confidential and Proprietary Information

- The Mayor's Office of the Chief Technology Officer (MOCTO) will endeavor to protect from disclosure any confidential and/or proprietary information the Respondent submits to MOCTO pursuant to this RFI in accordance with applicable law, provided that the Respondent shall specifically identify those portions of the response to the RFI that are deemed to be confidential, proprietary information or trade secrets.
- Such information deemed by the Respondent to be confidential and/or proprietary shall be easily separable from the non-confidential/non-proprietary sections of the response to the RFI. Marking the entire response to the RFI as confidential or proprietary will result in the submission being deemed not confidential and/or proprietary and thus not protected from disclosure.
- Respondents should be aware that MOCTO may be required, pursuant to the New York State

Freedom of Information Law ("FOIL") (New York Public Officers Law Section 87 et seq.), to disclose to the public a written response to the RFI or portion thereof. In the event that such disclosure is requested by a third party, MOCTO shall provide notice to the Respondent as far in advance as practicable of any deadline for response and shall consult with the Respondent to evaluate the extent to which such information may be withheld from disclosure under provisions of FOIL. Consistent with the requirements of FOIL, the final determination of whether such information may be withheld from disclosure shall be made by MOCTO. In the event that MOCTO determines that information may not be withheld, MOCTO will attempt to provide the Respondent with timely notice of intent to disclose in order that the Respondent may invoke any rights or remedies to prevent disclosure to which it believes it may be entitled under the law.

Respondent expressly acknowledges and agrees that neither MOCTO nor the City of New York will have any obligation or liability to any Respondent in the event of disclosure of materials designated as confidential or proprietary.

Respondent Profile

Please provide a respondent overview that describes your organization and addresses your organization's qualifications related to your response to this RFI.

Name: .....

Title: .....

Organization name: .....

Street Address: .....

City: .....

State: .....

Zip Code: .....

Country: .....

Phone Number: .....

Email Address: .....

Please provide a short statement describing your organization. Please describe any relevant experience or expertise that has informed your responses:

_____

_____

_____

_____

_____

_____

Potential Network Architecture

The City is willing to consider all ideas and recommended approaches, and welcomes respondents' unique proposals and ideas with regard to potential improvements to the design and construction of citywide broadband networks. The City welcomes suggestions and proposals regarding alternative technologies, including submissions to the current NYCx challenge for Governors Island. The following baseline technical attributes are preferred:

- Capability for 1 gigabit per second (Gbps) to all customers in the near to medium-term, with scalability for greater speeds as needs emerge;
- Backbone fiber strand capacity and physical architecture (e.g., handhole placement, backbone routes, etc.) anticipating service (wired or wireless or both) to all homes and businesses;
- Low latency;
- Backbone topology capable of supporting connections over diverse paths from one or more central hub locations to aggregation points located throughout the City to facilitate versatile, high-availability service offerings;
- In the backbone and elsewhere as appropriate, fiber plant placed in underground conduit (as opposed to direct burial cable) to more readily facilitate repairs and capacity upgrades;
- Active components placed in environmentally hardened City-owned buildings, other facilities, shelters, and/or cabinets equipped with backup power generation and/or batteries, as appropriate, capable of sustaining services in the event of extended power outages;
- Path diversity to critical facilities to maintain continuous service even if one path is broken;
- Construction plans and route selection that are aligned with existing conduit and coincide with planned local public utility, roadway, and related capital improvement projects to reduce cost and minimize disruption where possible.

The City seeks responses to the following questions related to potential citywide network systems and architectures in connection with a public-private collaboration

Use of City Assets

The City encourages respondents to convey their ideas for, and interest in, utilizing City-owned assets or other City resources to accomplish the goals of this RFI.

The City anticipates that the use of publicly-owned assets, such as building rooftops and street light poles, could help achieve the City's broadband goals. The City may consider constructing or augmenting its real assets or staff capacity in furtherance of these goals. The City welcomes responses which include creative uses and business models for City assets.

The City dedicates resources to support plan review, coordination, and inspection services to assure an expeditious and safe approach to construction and installation, and works with the private sector to facilitate competitive access to the public rights of way. These or additional City staff and processes can further facilitate network deployment and operations

The City is also willing to consider additional or alternative contributions it can make to proposed solutions, including potential access to data as authorized by law or policy, access to City expertise, and other tangible or intangible benefits within the City's ability to produce or share. However, user privacy is an important priority for the City, and respondents should indicate how they would protect the rights of New Yorkers to control their sensitive personal data as they access the internet.

See "Joint Statement from Department of Information Technology and Telecommunications Commissioner Anne Roest and Chief Technology Officer Miguel Gamiño on the Repeal of Federal Internet Privacy Protections" (April 5, 2017).

The City seeks responses to the following questions related to the use of City assets:

1. What kinds of City assets would be useful for your proposed solution? Please share your ideas about any of the following, as well as other components for which broadband infrastructure use would advance the City's goals: fiber optics, conduit, points of aggregation, buildings and rooftops, city-owned light poles, other.
2. How could the City best determine the number and location of poles, rooftops, and facilities to prioritize for new broadband infrastructure? Are there particular City buildings, poles, or facilities that would be of greatest use for new broadband infrastructure?
3. For assets like buildings, what conditions, such as an amount of space or existing wiring pathways, would be needed to be available to make the asset useable or most attractive?

4. Would types of rooms in City-owned buildings be valuable to support colocation, interconnection, edge cloud computing or other network functions? If so, please explain in further detail, including what the City might do to facilitate the use of these rooms for these purposes, and what conditions would be necessary.

Network Deployment and Construction

The City seeks responses to the following questions related to potential opportunities to facilitate public-private collaboration network deployment and construction:

1. How should construction be phased or sectioned to achieve the greatest benefit for New Yorkers while progressing towards the overall goal? What areas of the city or major milestones should be prioritized?

2. Are there any particular challenges associated with wireline versus wireless deployment that you see as concerns with regard to your potential participation?

3. What method or methods of building entry would be contemplated in connection with your potential participation in facilitating service to residents of single-family or multi-family buildings and businesses?

4. What other planned infrastructure investments, if any, should the City seek to leverage for this initiative and your potential participation in it? How might the City leverage or maximize coordination with other capital projects?

Business Parameters and Collaboration Opportunities

1. What kind of collaboration might you contemplate with the City of New York? Please share your ideas about how your organization and the City might work together to achieve your organization's goals and the City's goals? What might the respective roles be for you and the City (and other entities, as appropriate) in each of the following areas (please feel free to address other areas in addition)?

    - Design of the network architecture
    - Finance
    - Deployment and construction
    - Maintenance and operations
    - Service delivery and customer support
    - Performance monitoring, data collection and public reporting
    - Policy-setting, such as those concerning privacy and net neutrality
    - Other

2. How might the City consider procuring goods and services to help achieve its policy goals?

3. Please share your ideas to increase workforce preparedness, minority and women contractor participation in the broadband industry, and job creation through collaboration with the City of New York. What are your goals with regard to creation of new jobs in New York City as part of your suggested collaboration? In what manner could worker or workforce development organizations, such as unions, community colleges, and technical certification providers, be meaningfully involved to ensure these are good paying jobs, with strong safety protections and benefits for workers? Please describe any challenges related to access to skilled labor in New York City and any efforts you would propose to address those challenges, including any actions the City might take.

4. Is it important to have the City as an anchor tenant for establishing a viable business model to support industry investments in new infrastructure? Please share your thinking about the role the City could play as an anchor tenant or otherwise.

5. What City collaboration commitments would be important for your potential participation?

Standards, Policies, and Performance Indicators

The City seeks information on the following items as they may apply to a public-private collaboration for broadband in New York City.

1. **Broadband Speeds:** Please share your potential approach through collaboration with the City of New York to addressing the City's goals with regard to broadband speeds and describe how your potential participation might contribute to meeting the City's current definition of broadband (25 megabits per second download / 3 megabits per second upload) and will scale to 1 Gbps and higher over time. Please also discuss upload speeds and whether your vision of how the City could meet its goals entails symmetrical speeds.

2. **Broadband Competition:** Please describe how your potential participation in a collaboration with the City could help address the City's goal of expanded broadband competition here in the City. What level of competition (i.e., number of choices for broadband service) do you recommend be considered sufficient to meet the needs of all New Yorkers?

3. **Affordability:** Please describe how your potential participation in a collaboration with the City would address affordability, particularly in light of the variation in ability to pay among households, and, more generally, how you would suggest that the City support and enhance its affordability goals.

4. **Privacy:** The City places a high priority on protecting the rights of New Yorkers to control their sensitive personal data as they access the internet. Please share your suggestions regarding privacy practices that could be included in your potential participation in the City's pursuit of its policy goals.

5. **Open Internet:** The City is strongly committed to net neutrality and an open internet. Broadband service that meets performance and affordability goals, but fails to provide open, uninhibited access to lawful online content would be inconsistent with the City's goals. Please describe how your potential participation in the City's pursuit of its goals would be consistent with the City's strong commitment to open internet principles.

   Note: Among the practices viewed as inconsistent with such open, uninhibited access are (1) blocking of access to lawful content, applications, services or non-harmful devices; (2) deliberately targeting some lawful internet traffic to be delivered to users more slowly than other traffic; (3) "paid prioritization", i.e., favoring some internet traffic in exchange for consideration of any kind; and (4) prioritizing by internet access providers of the content, applications and services of their own affiliates.

6. **Equity:** How would your potential participation address the City of New York's equity goals? How would it alleviate inequities in distribution of broadband, affordability of broadband, and ease of access to broadband? Please be specific in suggesting means by which your potential participation in a collaboration with the City, and the City's financial and/or other commitments, might achieve equity goals. Please also address how your potential activities might help close the "homework gap," i.e. inequitable distribution and uptake of broadband service with secondary impact on student success.

7. **Public Wi-Fi:** Please share your thoughts related to public Wi-Fi if they are part of your proposed solution.

   a. Would your potential participation in the City's pursuit of its goals include an element of public Wi-Fi? If so, what speed or other technical elements would be involved?

   b. In OneNYC (see Section IV, Information Resources, below), the City established a metric for free public Wi-Fi: the percentage of New Yorkers with access to free public Wi-Fi within 1/8th mile from home. How might your potential participation address this metric?

   c. It what ways can public Wi-Fi provide assurances for security or privacy?

8. **Digital Literacy and Public Computer Centers:** Please share your thoughts related to digital literacy and public computer centers if they are part of your potential participation.

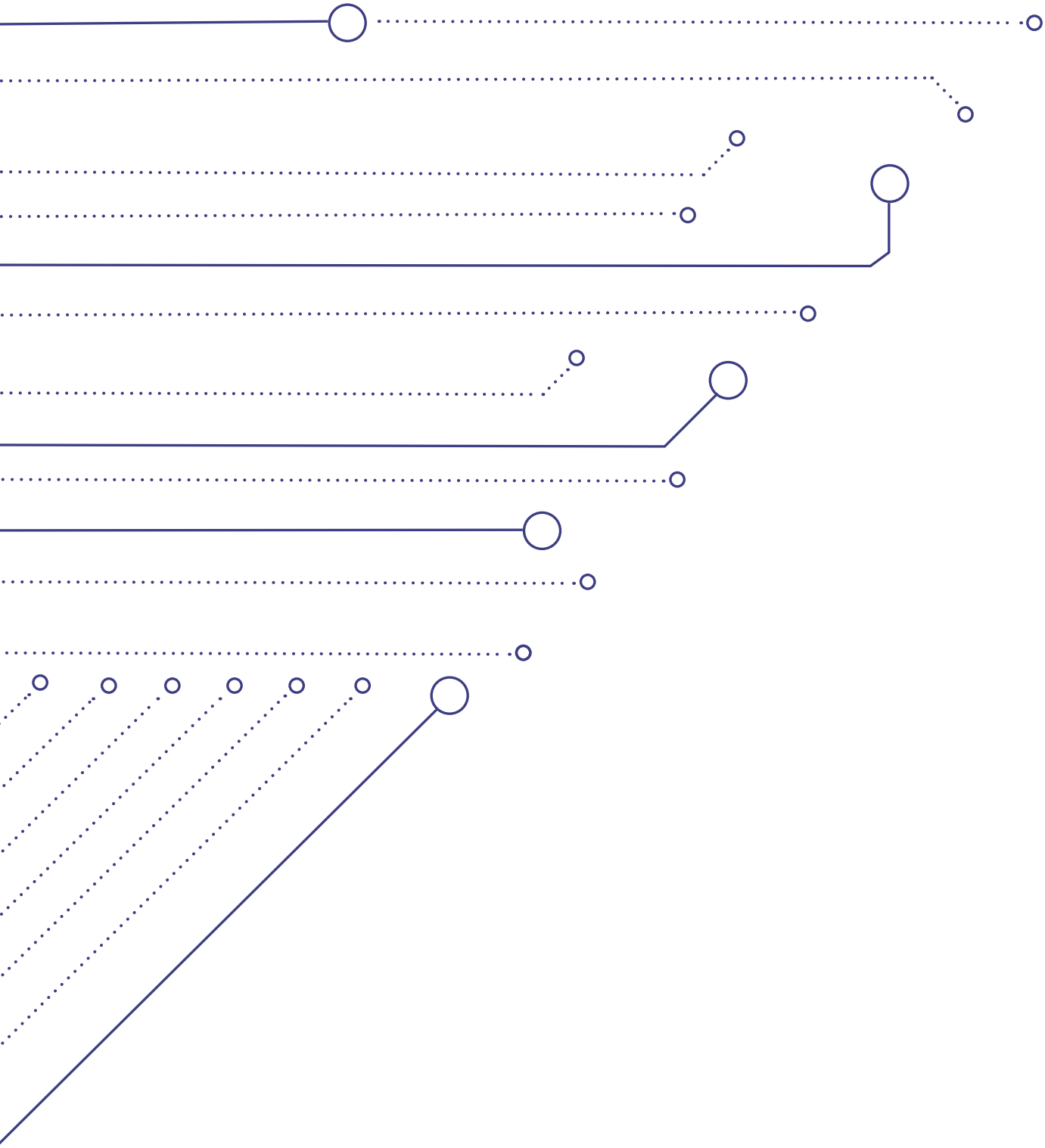
   a. The City prioritizes making available to New Yorkers access to computers, the internet, and digital literacy training. To this end, the City facilitates access to computers with internet access at public locations throughout the City and also supports digital literacy training. Please share your ideas for how your potential activities in a collaboration with the City could support and address these City priorities.

9. **Other**

   a. Are there other considerations or ideas that are not addressed here that you believe the City should take into account? Please share your guidance and suggestions.

Supporting Files

Please upload any supporting files here. This can include diagrams, maps, or other content to help demonstrate solutions.



Appendix C: Residential Broadband Prices and Products

The following residential pricing and product information was compiled from publicly available information on provider websites and from information that was provided to the City between April and September 2019 by ISPs that currently offer broadband service in NYC that responded to the City's Broadband RFI: Verizon, Charter (Spectrum), Altice (Optimum), RCN, Starry, Brooklyn Fiber, Honest, and NYC Mesh Community Network.

RESIDENTIAL PRICING INFORMATION: ALTICE (OPTIMUM)

Source: Altice (Optimum), www.optimum.com

Please find below our current acquisition product pricing for internet only service.

Optimum 200 @ 200 mbps @ $44.99 mo./1 yr.

Optimum 300 @ 300 mbps @ $54.99 mo./1 yr.

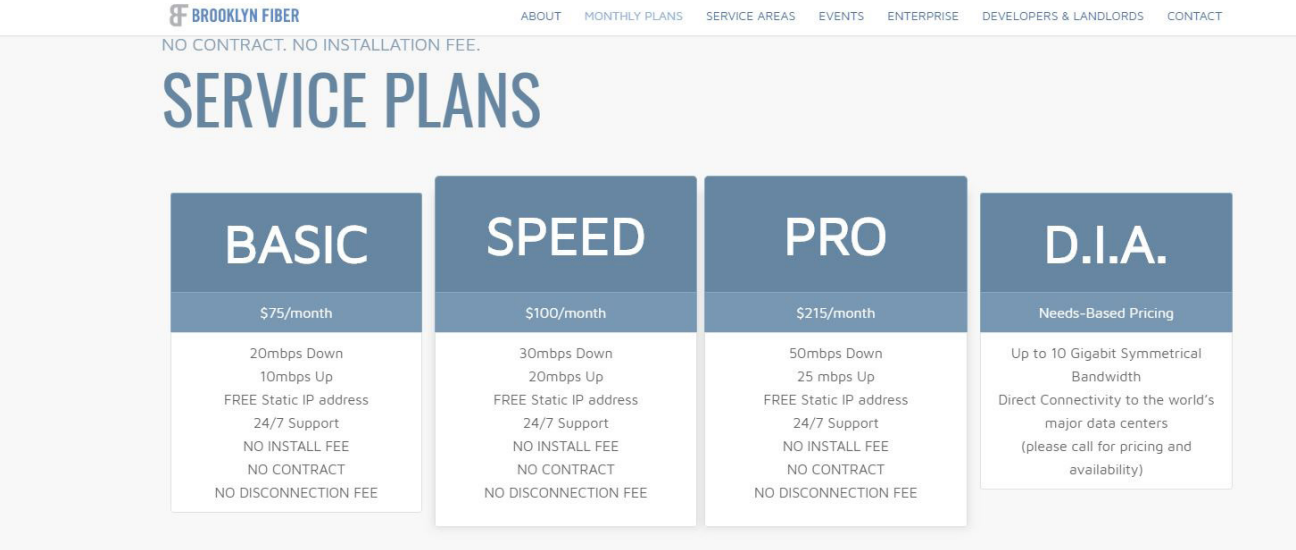
Optimum 400 @ 400 mbps @ $64.99 mo./1 yr.

In addition, we offer a range of acquisition packages, which vary based on video package and speed tier. Phone can be added to the packages below for $5.00. To support the success of today's students and families, Altice USA is pleased to offer Altice Advantage Internet, a low-cost 30 Mbps broadband service priced at $14.99 per month. This offer extends to all households with a child attending New York City public schools in addition to families that qualify for the National School Lunch Program (NSLP) or senior citizens eligible for Supplemental Security Income (SSI). This service is available to new Optimum Internet customers as well as those who have not been an Optimum Internet customer in the prior 60 days.

	VIDEO PRODUCT	INCLUDED SPEED	ACQUISITION RATE (1 YR).
Video/Data 200	Core 200 $64.99	200	$64.99
	Select 200 $74.99	200	$74.99
	Premier 200 $94.99	200	$94.99
Video/Data 300	Core 300 $74.99	300	$74.99
	Select 300 $84.99	300	$84.99
	Premier 300 $104.99	300	$104.99
Video/Data 400	Core 400 $84.99	400	$84.99
	Select 400 $94.99	400	$94.99
	Premier 400 $114.99	400	$114.99

BROOKLYN FIBER SERVICE PLANS

Source: Brooklyn Fiber, www.bkfiber.com



CHARTER OF MANHATTAN INTERNET

Source: Spectrum, www.spectrum.com

Spectrum

Residential Broadband Services and Pricing
For Manhattan, NY, Effective February 2019. All charges exclude applicable taxes, FCC fees, franchise fees and the Broadcast TV Service Charge.

Spectrum Standard Service Offerings (month-to-month plan) *

Spectrum Internet 200/10	$65.99
Spectrum Internet 200/10 with WiFi	$70.99
Spectrum Internet Ultra 400/20	$90.99
Spectrum Internet Assist 30/4 **	$14.99
Spectrum Internet Assist 30/4 with WiFi **	$19.99
Everyday Low Price 3/1***	$14.99
Everyday Low Price 3/1 with WiFi***	$20.94
Spectrum Internet Gig	$125.99

Click here for other pricing including promotions and options bundled with other services, like cable television and phone services.

Other Charges and Terms *

Data included with monthly charge	Unlimited
Charges for additional data usage	No Charge
Optional modem or gateway lease - Charter equipment included with service (Customers may use their own modem or gateway - Click here for our policy)	No Charge
Security Suite	No Charge

Standard One-Time-Charges *

Hourly Labor Charge	$49.99
Standard Installation Fee	$49.99
Spectrum Ultra Installation Fee	$49.99
Spectrum Gig Installation Fee	$199.99
Self-Installation	No Charge
WiFi Activation Fee (in addition to installation fee)	$9.99
WiFi Self-Installation (Must be existing video customer in order to qualify for self-installation)	$9.99
Move Transfer of Spectrum Service(s)	$49.99
Change of Service - Special Trip [F]	$49.99
Reconnection Fee	$4.99
Unreturned Equipment Fee	
eMTA/Modem, Phone Modem	$39.00
WiFi Modem/Extender/Router/Gateway	$78.00

* State, Local, Government Taxes and Fees may apply and vary by location. Prices above do not include taxes & fees. Rates my vary for promotional, packages & non standard events or service requests.

Other Services on Network
Information can be found in Network Management Practices Policy.

Performance: Individual experience may vary

Spectrum Internet 200/10	
Typical median download speed	200 Mbps or higher
Typical median upload speed	10 Mbps or

	higher
Typical median latency (in milliseconds)	28.02 ms
Typical median packet loss	0.08%
Spectrum Internet Ultra 400/20	
Typical median download speed	400 Mbps or higher
Typical median upload speed	20 Mbps or higher
Typical median latency (in milliseconds)	28.02 ms
Typical median packet loss	0.08%
Spectrum Internet Assist 30/4 **	
Typical median download speed	30 Mbps or higher
Typical median upload speed	4 Mbps or higher
Typical median latency (in milliseconds)	28.02 ms
Typical median packet loss	0.08%
Everyday Low Price 3/1***	
Typical median download speed	3 Mbps or higher
Typical median upload speed	Up to 1 Mbps
Typical median latency (in milliseconds)	28.02 ms
Typical median packet loss	0.08%
Spectrum Internet Gig	
Typical median download speed	Up to 940 Mbps
Typical median upload speed	35 Mbps or higher
Typical median latency (in milliseconds)	28.02 ms
Typical median packet loss	0.08%

Metrics based upon measurements collected between 7pm – 11 pm from 10/1/2016 through 10/31/2016. Charter uses multiple methods to measure the performance of its products. Data was collected from the SamKnows FCC Measuring Broadband America panel where possible. Tiers that were not included in the Measuring Broadband America panel had data collected from an internal SamKnows panel. Download and upload speed metrics are produced for each individual tier. Latency and packet loss given minimal variation across tiers are based on measurements across all tiers.

Charter Internet customers can check the speed performance of their current Internet connection using the Charter Speed Test on Charter.com or Charter.net, which tests the speed that they are receiving on Charter's network to the end user device. These tests are dependent on a variety of factors, including the customer's home network configuration, modem, and Internet connected devices, and the time of day, and therefore do not reflect the performance of the Charter network only.

Network Management:

- Application Specific Behavior? No, subject to Charter rights under the network management practices policy which prevents harmful or illegal activity.
- Subscriber-triggered network management practices? No, subject to the restrictions and terms of Charter's Acceptable Use Policy and Charter's rights under the network management practices policy which prevents harmful or illegal activity.

Additional information on network management can be found in Charters Residential Internet Acceptable Use Policy ("AUP"), Commercial Internet Acceptable Use Policy, and Network Management Practices Policy.

Privacy Policy:

Charter values our Customers' privacy and will collect, use and otherwise handle your information in accordance with Charter's Privacy Policy.

Complaints or Inquiries:

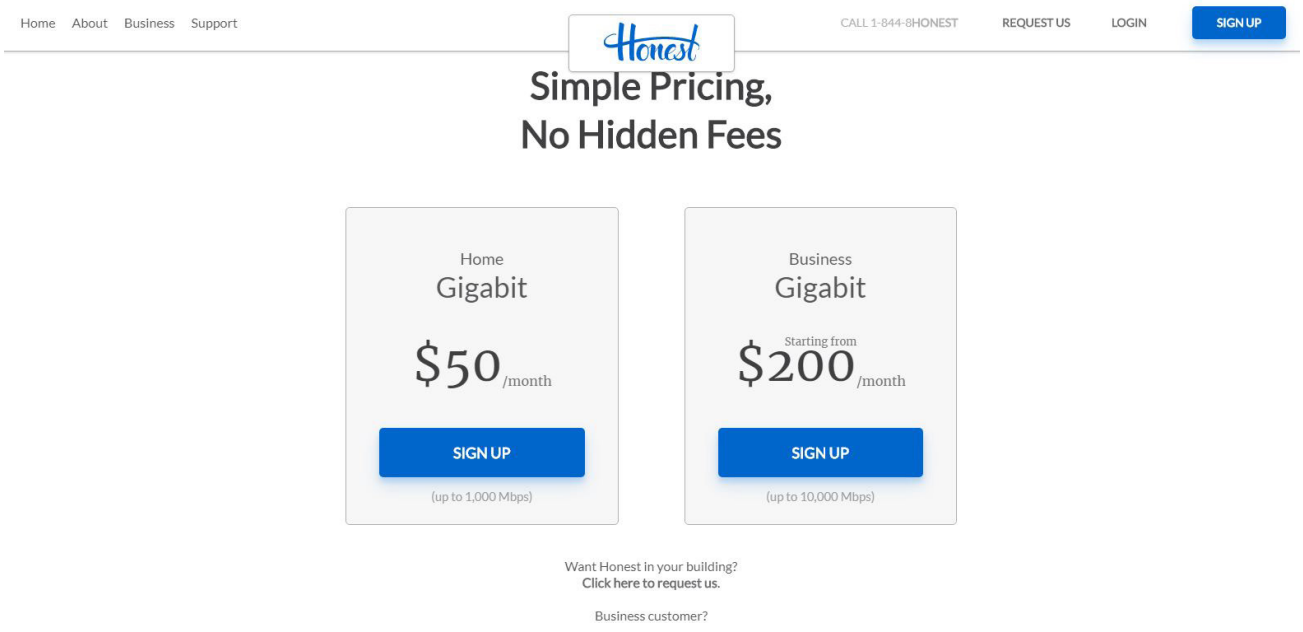
If you have any questions or concerns regarding your Charter Internet service, you may contact Charter customer service by calling 1-888-438-2427 or contact us online at Charter.com. To submit complaints to the FCC, you can contact the FCC by phone at 1-888-225-5322, online at consumercomplaints.fcc.gov or online at www.fcc.gov/guides/getting-broadband.

FCC Resources
Learn more about the terms used on this form and other relevant information at the following FCC's links:
https://www.fcc.gov/general/glossary-telecommunications-terms or
https://www.fcc.gov/consumers/guides/consumer-labels-broadband-services?from=home
©2019 Charter Communications, Inc. Pricing and offers are subject to change; restrictions may apply. Internet not available in all areas. Charter Internet subscribers are required to use an authorized device in order to use the Charter network without interruption and receive optimal service performance. Small percentage of customers will receive lower than advertised speeds. Charter does not guarantee security of data.
** Availability of offer based on eligibility and service address that has been pre-qualified. Click here for additional details.
***Spectrum equipment not included with service. Modem lease available for $10.00 per month.

Serving: Manhattan, NY, Borough of (Southern NYC)
0000/8150/1000/0040 & 0000/8150/1000/0050 & 0000/8150/1000/0060 & 0000/8150/1000/0070 & 0000/8150/1000/0080 & 0000/8150/1000/0090 & 0000/8150/1100/0010 & 0000/8150/1100/0020

HONEST INTERNET SERVICE PRICING

Source: Honest, www.honest.net



NYC MESH COMMUNITY NETWORK RATE CARD

Source: NYCMesh, www.nycmesh.net

NYC Mesh

NYC Mesh Community Network Rate Card

NYC MESH MEMBERSHIP OFFERINGS (MONTH-TO-MONTH PLAN)

NYC Mesh Internet
$20.00 Optional Donation
$50.00 Optional Donation
$100.00 Optional Donation (business)

OTHER CHARGES AND TERMS

Data included with monthly charge: **Unlimited**
Charges for additional data usage: **No Charge**

STANDARD ONE-TIME-CHARGES

Labor Charge $50.00
Self-Installation (DIY) $0.00
WiFi Router + Rooftop Antenna $110.00
* Rates my vary for non standard events or service requests.

PERFORMANCE: INDIVIDUAL EXPERIENCE MAY VARY

Speeds vary due to distance from our main antennas, type of connection (point to point, multipoint, fiber). Wireless connection speeds vary considerably. NYC Mesh uses best-effort for speed and support.

Network Management:

NYC Mesh is a neutral network and does not have any network management practices that are specific to any application or subscriber.

Additional information on network management can be found in NYC Mesh's Network Commons License- nycmesh.net/ncl.pdf

Privacy Policy:

We are a neutral network and do not monitor, collect, store or block any user data or content.

Support:

https://www.nycmesh.net/support

FCC Resources

Learn more about the terms used on this form and other relevant information at the following FCC's links:
* https://www.fcc.gov/general/glossary-telecommunications-terms *
https://www.fcc.gov/consumers/guides/consumer-labels-broadband-services?from=home

Mambership available: New York Metropolitan Area

RCN NETWORK RATE CARD

Source: RCN, www.rcn.com

Phone

Unlimited Calling Plan (Includes Local, Regional & Long Distance Calling and 5 Calling Features: Basic Voicemail, Caller ID Deluxe, Call Waiting, Call Waiting ID Deluxe and Three-Way Calling	$45.00
Additional Lines	$25.00

Directory Listings (Not applicable fax and computer lines)

Single Listing	Included
Each Additional Listing	$2.50
Non-Directory Listed Service	$1.95
Non-Published Service	$2.50

Domestic Directory Assistance (per call)

Local/Intralata Directory Assistance	$1.25
National Directory Assistance	$1.25
Reverse Directory Assistance	$1.25
Directory Assistance Call Completion	$0.35
Directory Assistance Surcharge	$1.75
International Directory Assistance	$7.94
International Calling [7]	Varies

Phone Features (per use)

Anonymous Call Rejection	$3.50
Call Block	$5.60
Call Forward Variable	$3.60
Call Return	$5.40
Call Waiting	Free
Call Waiting ID Deluxe (with Call Waiting and Caller ID)	Free
Call Waiting Fax Ring	Free
Call Waiting Deactivation	Free
Caller ID Blocking	Free
Caller ID Deluxe	Free
Call Trace	$3.50
Distinctive Ring 1	$4.90
Distinctive Ring 2	$7.00
Priority Call	$4.30
Repeat Call	$4.30
Selective Call Acceptance	$3.50
Select Call Forward	$3.80
Speed Dial 8	$3.50
Speed Dial 30	$3.55
Three Way Calling	Free
Ultra Call Forward	$7.00
Voice Mail – Basic	Free
Voice Mail – Family	$10.00
Voice Mail – Value	$7.00

Installation Fees & Other Charges

Account Activation Fee	$9.99
Installation (Digital TV, Phone or Internet) [8]	$49.95
Prewired Additional Outlet (After first 4)	$14.95
Unwired Additional Outlet	$35.00
New Jack Installation	$35.00
Custom Installation / Wiring /Repair (Per 30 Minutes) [9]	$35.00
Technician Visit [12]	$54.95
Relocate Outlet	$35.00
Upgrade (Trip Required)	$49.95
Downgrade	$5.00
Additional Converter Box Request	$14.95
Customer Equipment Hook-Up (TiVo, DVD, VCR)	$14.95
Home Service – Customer Education	$49.95
Seasonal Disconnect / Reconnect (per line of business)	$4.95/mo
Transfer of Service (not including Tech visits)	Free
Static IP Activation	$25.00
Home Networking (1st Computer or device) [10]	Free
Home Networking (per 2nd, 3rd and 4th Computer or Device) [10]	$14.95
Wire Maintenance (Monthly)	$4.95
Non-Pay Reconnect	$35.00
Returned Check Fee	$25.00
Payment by Phone Convenience Fee (Via Automated Response Unit)	$4.50
Payment by Phone Convenience Fee (Via Representative)	$6.95
Payment by Web Convenience Fee (Via rcn.com)	$1.00
Late Fee – Video Services (on a delinquent balance of $10 or more)	$8.00
Late Fee – Internet Service	$9.00
Late Fee – Phone Service (on a delinquent balance of $5 or more)	1.50%
Auto-pay Denial Fee	$10.00
Broadcast TV Surcharge	$11.86
Sports Surcharge	$20.28
Cable Entertainment Networks Surcharge	$12.10
New York Municipal Construction Surcharge	$3.49
Unreturned Equipment	Actual Replacement Cost
Network Access and Maintenance fee	$3.17

(1) RCN (Limited Basic/Signature Digital) Cable TV service needed to access other levels of service. Digital converter box or Cable Card required. Prices noted do not include monthly price for Digital converter box unless otherwise noted. Includes On Demand, Interactive Program Guide and music channels. Availability of certain On Demand content may depend on subscription to another service.

(2) Must subscribe to Premiere Total or Premiere Sports tier to purchase NFL Red Zone. A subscription to NFL network is also required.

(3) To receive HD features and benefits, an HD television, HD converter remote control and other equipment is required. An HD-capable TV set with component, HDMI or DVI inputs that supports 1080i and meets RCN specifications for DVR service required. Advertised channels/stations may provide some non-HD programming. HD programming is limited to the programming provided to RCN in HD format by the content provider.

(4) All RCN TiVo services/products require RCN Internet service. Availability of third-party content subject to change and certain fees may apply. TiVo boxes must be broadband connected to perform multi-room viewing. Not all programs may be transferred using the multi-room viewing feature due to the use of copy protection mechanisms under the FCC's encoding rules (47 C.F. R. 76.1904). TiVo and the TiVo logo are trademarks or registered trademarks of TiVo Inc. and its subsidiaries worldwide. All other marks are property of their respective owners.

(5) Includes Interactive Program Guide, 45 music channels, certain digital channels, multiple screens of premium service(s) subscribed to separately, access to Pay-Per-View and RCN On Demand.

(6) Modem rental is only required if subscriber does not own a cable modem. RCN does not currently support customer owned DOCSIS 3.1 modems used for 1 Gig service.

(7) Please visit www.rcn.com for country-specific usage rates.

(8) Additional fees may apply for unwired installation. Unwired installation refers to installs up to 125 feet from existing RCN plant, primary outlet only; does not include wall fishing.

(9) Custom work includes, but is not limited to, wall fishing, extensive drop ceiling work; basement, crawlspace, attic work; removal or replacement of fixtures; relocation of drops; installation of customer owned equipment, such as home theaters, DVR and High Definition TV equipment.

(10) Home networking service available for up to 4 computers and/or other computer related devices, such as gaming consoles and printers. RCN certified home networking device required.

(11) Each standard home networking installation must be within 150 feet of the RCN certified Home Networking Device and includes installation of modem/router, software, PC cards or USB adapters, computer set-up and file sharing.

(12) After initial installation, a $54.95 fee may apply for additional technician visits to the home and may be in addition to other one-time charges.

(13) $9.95 per month includes 1 base eero and 1 beacon eero. Each additional eero beacon is $5.00 per month.

A Broadcast TV surcharge of $11.86 is applicable to all RCN cable packages with Basic Digital TV tier and higher and a Sports surcharge of $20.28 is applicable to all RCN Cable packages with Signature Digital TV Tier and/or Sports packages/tier. An Entertainment Network surcharges of $12.10 is applicable to all Signature Digital TV tier and/or Premiere Tier and or Premiere Movies and Entertainment and/or Premiere News and Information and /or Premiere Children and Family. Network Access and Maintenance Fee of $3.17 is applicable to all RCN accounts subscribing to Internet service.

Internet download speeds are not guaranteed and may vary based on device, connection, & other factors outside of RCN's control. Certain equipment may be required to receive 1 Gigabit speeds and may vary due to conditions outside of network control, including customer location. All speeds not available in all areas.

*Rates effective February 2019. Not all channels, features and services are available in all areas; check for availability in your area. Some restrictions may apply. Applicable taxes, franchise fees or other surcharges may apply and are not included in the price. Services and pricing are subject to change. Services are subject to terms and conditions of RCN's subscriber agreements, online policies, and other applicable terms and conditions. Programming, channel location and packaging subject to change. All RCN prices listed are monthly, recurring charges unless otherwise indicated, excluding onetime fees such as installation, administrative, On DEMAND and/or Pay-Per-View charges. Internet speeds vary and are not guaranteed. Additional charges may apply for custom or nonstandard installation. Cable TV: A digital converter is required. Phone: Regional calling area and LATA boundaries may apply. All sales subject to credit check and may require pre-payment of service or a deposit. Leased equipment must be returned to RCN if service is canceled. See our online disclosures at rcn.com for information about services offered in your area. The names, images, and logos of featured programs are the property of their respective owners. ©2019 RCN Telecom Services (New York), LLC. All rights reserved.

*Not available for new customers.

1.800.RING.RCN | rcn.com

Digital TV

Limited Basic [1]	$32.50
Signature [1]	$99.76

Premium Movie Channels

HBO	$21.95
Showtime/The Movie Channel	$16.95
Cinemax	$11.95
Starz	$12.95
HBO/Cinemax	$21.95

Premiere Packages

Premiere Total (Includes all 4 packs)	$22.99
Premiere Sports	$12.99
Premiere News & Information	$7.99
Premiere Children & Family	$7.99
Premiere Movies & Entertainment	$12.99

Sports Packages

NFL Red Zone (one-time fee) [2]	$59.99
Fox Soccer Plus	$14.95
MLB Extra Innings	Varies
NBA League Pass	Varies
NHL Center Ice	Varies

High Definition Package

HD Expanded Tier [3]	$9.99

On Demand

New Release – HD	$5.99
New Release	$4.99
Library Movie	$2.99
Double Feature	$4.99
Adult Programming	Varies
Events	Varies
Titles in Spanish	$1.99 – $3.99

Subscription On Demand

Eros Now	$9.95
Filipino On Demand	$7.95
here! On Demand	$8.95
Too Much for TV On Demand	$17.99
DOG TV	$4.99

International Programming

Arabic

ART (Arab Radio & Television)	$12.95

Bengali

NTV	$14.95
ATN News	$7.95
Channel 24	$7.95
Desh	$7.95
ATN	$7.95
Boishak India	$7.95
Complete Bengali Pack	$19.99

Chinese

CCTV-4 (China Central Television-4)	$11.95
CTI Zhong Tian	$11.95
CCTV-4 / CTI Zhong Tian	$11.95

Filipino

TFC (The Filipino Channel)	$11.95
GMA Pinoy TV	$12.95
GMA Life TV	$9.95
GMA Pinoy TV / TFC	$19.95
GMA Pinoy TV / GMA Life TV / TFC	$29.95
GMA Pinoy TV / TFC / Filipino On Demand	$29.95
GMA Pinoy TV / GMA Life TV / TFC / Filipino On Demand	$35.95
Mabuhay Pack	$27.95

French

TV5 MONDE	$9.95

Greek

ANTENNA Satellite	$14.95
MEGA Cosmos	$11.95
ANTENNA Satellite / MEGA Cosmos	$25.95
New Greek TV	$14.95
Alpha	$4.95
4E	$4.95
RIK	$4.95
Complete Greek Pack	$39.99

Italian

RAITALIA	$9.95

Japanese

TV Japan	$24.95

Korean

MBC (Munhwa Broadcasting Corporation)	$12.95
tvk24	$12.95
MBC / tvk24	$19.95

Pan-Asian

MYX (Music Video Channel)	$4.95

Polish

TVN24	$14.95
ITVN	$14.95

Portuguese

RTP1 (Radio e Televisao de Portugal)	$9.95
TV Globo Internacional	$19.99
PFC	$19.95
PFC / TV Globo	$29.95

Punjabi

TV 84	$4.95
Channel Punjab	$4.95
Punjab TV	$4.95
Complete Punjabi Pack	$7.95

Russian

Elite Pack	$24.99
Prestige Pack	$24.99
RTVI	$9.95
Channel One Russia	$14.95
RTN (Russian Television Network of America)	$15.95
NTV	$15.95
Channel One Russia / RTVI / NTV America	$24.99
Channel One Russia / RTN / one other Russian channel	$24.99

South Asian

Aapka COLORS	$14.95
SBTN	$12.95
ITV Gold (India TV Gold)	$9.95
Sahara Filmy	$11.95
SONY TV	$14.95
TV Asia	$14.95
Zee TV	$14.95
ITV Gold / Zee TV	$19.95
TV Asia / Zee TV	$24.95
TV Asia / ITV Gold	$17.95
Sona Pack (Sony TV, Zee TV, Aapka Colors, ITV Gold, TV Asia)	$ 37.99
Sona Pack Plus (All of Sona Pack + Sahara Filmy, Eros Now)	$ 45.99
Chandi Pack (Zee TV, Aapka Colors, Sony TV)	$ 26.99
Chandi Pack Plus (Zee TV, Eros Now, Aapka Colors, ITV Gold, TV Asia)	$ 32.99

Spanish

MiVisión Lite	$13.00
MiVisión Pack	$17.95
MiVisión Plus	$23.95
El Paquetón	$17.50
Mi Cine	$5.50
Mi Musica	$5.50

Urdu

Filmazia	$4.95
Dawn	$4.95
APlus	$4.95
ATV	$4.95
Metro-One	$4.95
Complete Urdu Pack	$9.95

Internet

High-Speed Internet

Downloads up to 5 Mbps / Uploads up to 512 Kbps*	$54.00
Downloads up to 10 Mbps / Uploads up to 2 Mbps*	$70.00
Downloads up to 25 Mbps / Uploads up to 4 Kbps	$82.00
Downloads up to 50 Mbps / Uploads up to 10 Mbps	$99.99
Downloads up to 75 Mbps / 110 Mbps / 155 Mbps Uploads up to 15 Mbps	$149.99
Downloads up to 330 Mbps / Uploads up to 20 Mbps	$249.99
500 Mbps	$89.99
1 GIG	$149.99
Home WiFi Service [8]	$5.50
Modem [6]	$10.50
1 Gig Modem [6]	$15.00
Static IP	$19.95
Enhanced Whole Home WiFi [13]	$9.95
Additional Whole Home WiFi beacons [13]	$5.00

Internet Security

McAfee PC Security

Triple Play Bundle Customers	Free
Non Triple Play Bundle Customers	$3.95

McAfee Total Protection

Triple Play Bundle Customers	$5.95
Non Triple Play Bundle Customers	$7.95

Equipment

TiVo 2-Tuner [4]	$23.00
TiVo 4-Tuner	$29.00
TiVo 6-Tuner [4]	$40.99
MoCA Bridge	$3.99
Additional TiVo Preview Converters [4]	$13.00
TiVo Wireless Adapter Rental	$2.00
DVR Converter [5]	$22.00
HD Converter	$13.00
Standard Converter [5]	$13.00
Cable Card	$2.00
TiVo Mini	$13.00

Why RCN?
In a word, quality.

1.800.RING.RCN | rcn.com

STARRY INTERNET PRICING

Source: Starry, www.starry.com

STARRY

Contact Us

Starry Support > Starry Internet > Starry Internet Service

Search help center

How much does Starry Internet cost?

Starry Internet is $50 per month (no hidden taxes or fees!). We only have one plan - and it's fast: 200 Mbps. Starry Internet also includes a Starry Station along with 24/7 access to our team of Starry Experts.

Tags: Price

Was this article helpful? 0 out of 0 found this helpful

Have more questions? Contact a Starry Expert

Related articles

Does Starry Internet come with a router and modem?

When will Starry Internet service be available? How do I sign up?

Will bad weather like rain, snow, or fog affect my Starry Internet connection?

How does Starry Internet service work?

Can I use an Apple TV, Chromecast, Roku, or a Smart TV with Starry?

Source: Verizon, www.verizon.com

Residential Pricing: Verizon Fios

Fios Internet Plans

No one delivers entertainment to your home like Fios because Fios is a 100% fiber-optic network. Pick a speed that is perfect for exactly what you do online.

Better browsing	Better streaming	Better everything
200 Mbps	**400 Mbps**	**Up to 940/880 Mbps** Fios Gigabit Connection
1-Year Price Guarantee	**2-Year Price Guarantee**	**3-Year Price Guarantee**
$39.99/mo w/AutoPay + taxes, equip. charges & other fees.	**$59.99**/mo w/AutoPay + taxes, equip. charges & other fees.	**$79.99**/mo w/AutoPay + taxes & other fees.

New Customer Pricing
Valid as of 4/19/2019 on Verizon.com. Subject to change. Set-up & other fees, taxes, equip. charges & terms may apply. Auto Pay (ACH or bank debit card only) & paper-free billing required, or +$10/mo without. Fios avail. in select areas. Actual speeds may vary.

Speed Profile
If an address is eligible for Gigabit Connection, the other two speed options are 200/200 Mbps and 400/400 Mbps. If address is not eligible for Gigabit Connection, additional speeds are available.

Router
A customer may provide own router for Fios Internet standalone service. Customer may opt to pay $12 monthly recurring lease or $199.99 one-time purchase price.

verizon

Appendix D: Internet Service Provider Privacy Policies

The following table includes links to the privacy policies of ISPs that currently offer broadband service in NYC or responded to the City's Broadband RFI. This information was compiled from publicly available information on provider websites and from information that was provided to the City in April – September 2019.

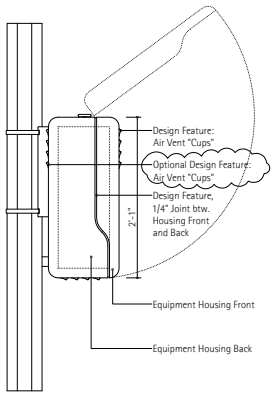
INTERNET SERVICE PROVIDER (ISP) NAME	LINK TO PRIVACY POLICY
Altice - Optimum	https://www.optimum.net/pages/PrivacyExisting.html
Charter - Spectrum	https://www.spectrum.com/policies/privacy-policy.html
Honest	https://www.honest.net/privacy-policy
NYC Mesh	https://www.nycmesh.net/privacy-policy
RCN	https://www.rcn.com/hub/about-rcn/policies-and-disclaimers/privacy-policy/
Starry	https://starry.com/legal/internet-privacy
Verizon - Fios	https://www.verizon.com/about/privacy/privacy-policy-summary

Appendix E: Design Specifications for Approved Standard Attachment Installations

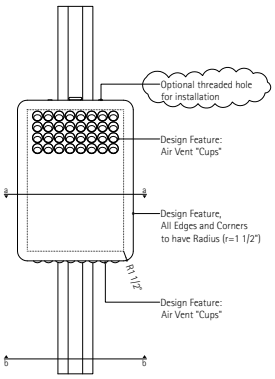
Source: NYC Department of Information Technology and Telecommunications

The City has approved a standard pole attachment box in two distinct designs: one is 35” high by 15.5” wide by 9” deep; the other is 25” high by 18” wide by 11” deep. Each includes an antenna up to 60” high with a 2” diameter. This appendix shows the design specifications of approved standard pole attachment installations.

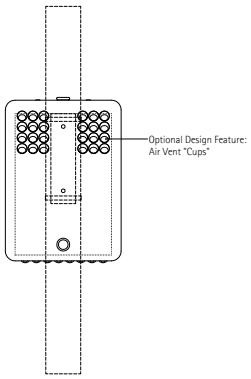
1 Side Elevation



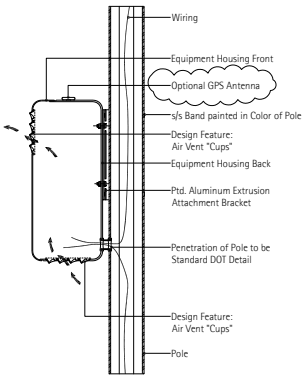
2 Front Elevation



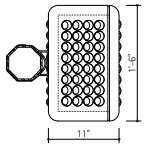
3 Back Elevation (only Box Shown)



4 Section c-c



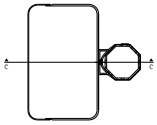
5 Section b-b



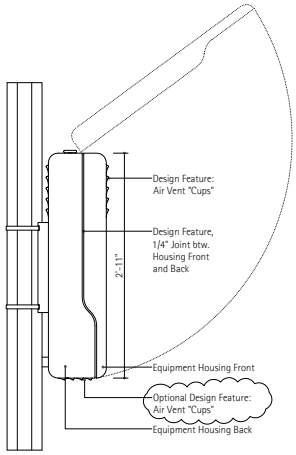
6 Not Used

7 Not Used

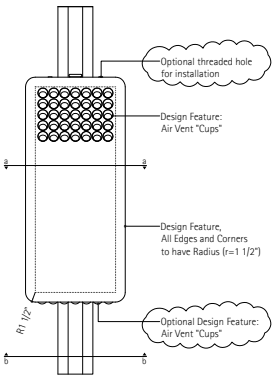
8 Section a-a



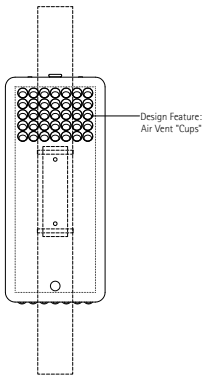
1 Side Elevation



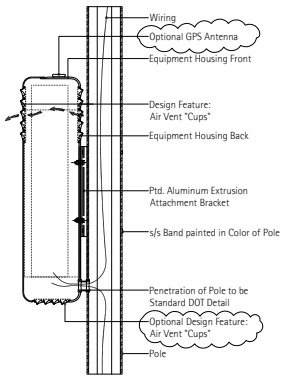
2 Front Elevation



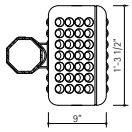
3 Back Elevation (only Box Shown)



4 Section c-c



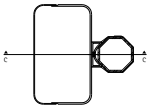
5 Section b-b



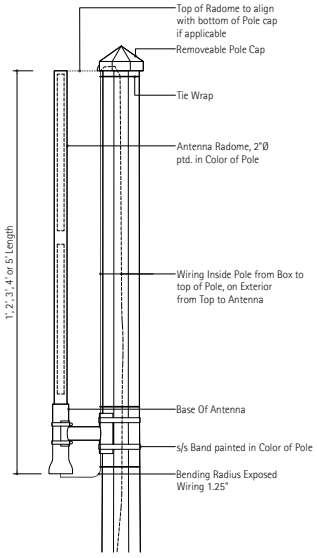
6 Not Used

7 Not Used

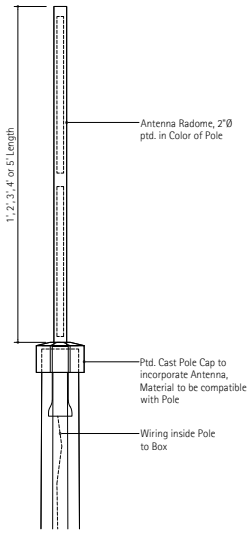
8 Section a-a



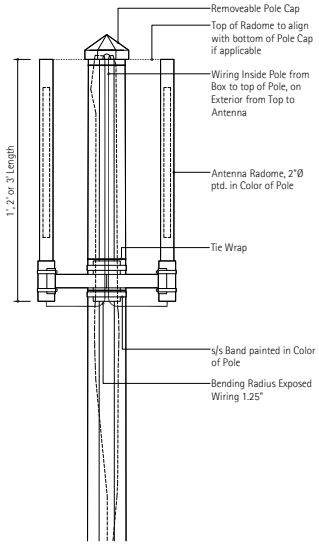
1 Preferred Single Antenna Scheme Off-Centered, Elevation



2 Preferred Single Antenna Scheme Centered, Elevation



3 Alternative Double Antenna Scheme, Wishbone, Elevation



4 Specifications for all Components of System

1. All Areas And Materials Associated With Installation Of Wireless System And Exposed To View To Be Spray Painted With Same Color As Pole Equipment Is Attached To. For Additional Specification Please Refer To Franchise Agreement

2. All Box Materials Surfaces To Have Appropriate Thickness To Guarantee Flat Appearance Of Housing

3. No Exposed Fasteners On Boxes And Antenna

4. No Exposed Locks On Equipment Housing. Access To Be Incorporated With Vent Openings

5. Box Surfaces Exposed To View To Be Free Of Blemishes, Smooth Finish, No Orange Peel Effect

6. All Antennas To Be Housed In Max. 2"Ø Radome, Ptd. In Pole Color

7. No Drilling Into Poles Except For One Hole For Wiring Purposes Of Equipment Box. Coordinate With Dot.

8. All Equipment Design/ Attachment Designs To Be Approved By Structural Engineer

9. Shopdrawings Prepared By Franchisee Or Franchisee's Equipment Manufacturer Subject To Approval By Architect.

10. Equipment Manufacturer To Provide Mock-up(s) Of Equipment To Architect For Approval.

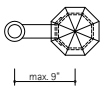
11. For Additional Specifications Please Refer To Franchise Agreement

12. Exposed wiring max. Ø 0.55", fastened to pole with tie-wrap, painted to match pole color. Max. width 3/16", Keep number of ties to minimum! Use right angle connectors if necessary to reduce visual impact of wiring.

13. Two threaded holes at top of box for temporary eyebolts during installation are acceptable, max.Ø 5/8" dimensions. To be coordinated w/ architect.

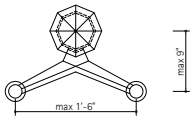
14. GPS antenna at top of box is acceptable, max.Ø 5/8" x 1" dimensions. To be coordinated w/ architect.

5 Preferred Single Antenna Scheme Off-Centered, Plan



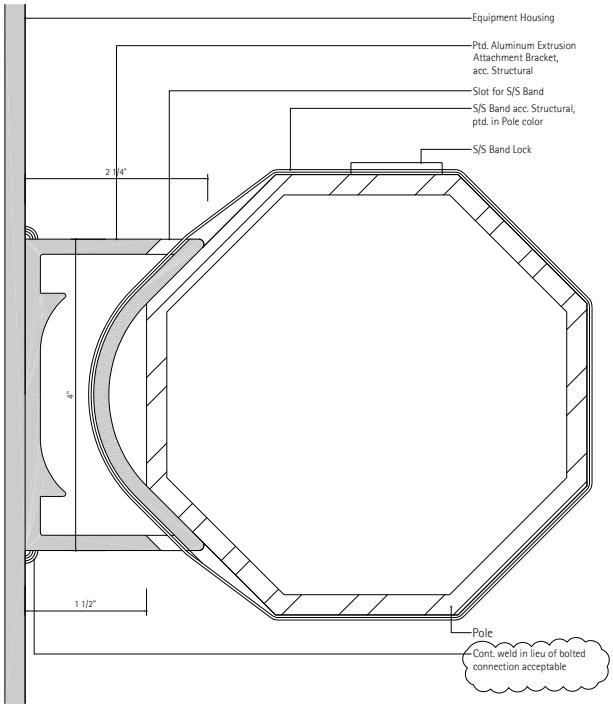
6 Preferred Single Antenna Scheme Centered, Plan

7 Alternative Double Antenna Scheme, Wishbone, Plan

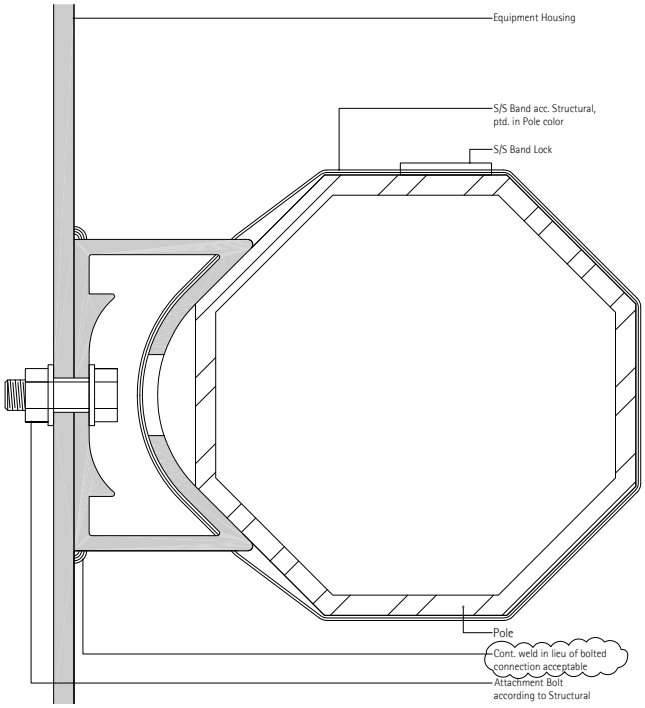


8 Not Used

1 Plan Section through Pole at Stainless Steel Band



2 Plan Section through pole at Box Attachment Bolt



Appendix F: Proposed Worker Safety Reporting Requirement

Note: This appendix is Appendix H of the proposed Mobile Telecommunications Franchise Agreement, available at https://www1.nyc.gov/assets/mocs/downloads/pdf/FCRC_2020/January%202020%20Special%20Meeting%20Documents%20Websites.pdf.

1.1 The Company shall, on an annual basis, compile and transmit to DoITT a report describing the safety conditions regarding workers performing installation, maintenance, and other related work pursuant to this Agreement ("relevant work"), including at a minimum the following information. The information provided in this report shall not be labeled as confidential or proprietary information.

(a) A list of all companies employing the workers performing the relevant work pursuant to this Agreement for the prior year, including the Company itself, or another company or companies ("contracted companies");

(b) A description of the relationship between the Company and contracted companies, including whether the Company and contracted companies have a direct contractual relationship or whether work is subcontracted through another entity or entities, and if so, a description of such other entity or entities;

(c) Copies of all policies and procedures maintained by the Company and contracted companies related to safety standards for the relevant work, including, but not limited to, description of safety training requirements, copies of training materials, and description of any personal protective equipment required, provided that if policies and procedures have previously been provided pursuant to this Agreement, only revisions to such policies and procedures or new policies and procedures must be submitted after the date of original submittal;

(d) For the Company and each of the contracted companies, a description of each job title performing relevant work and a list of any certifications or licenses required of each job title;

(e) For the Company and each of the contracted companies, the total number of workers performing relevant work, disaggregated by job title, and for each job title, the number of workers with required certifications and licenses, along with a statement of whether each worker has required experience and training;

(f) A certification that the Company and contracted companies maintain workers' compensation insurance to the fullest extent required by applicable federal, New York States, and New York City law;

(g) Documentation evidencing that the Company and any contracted company performing relevant work in the prior year, and any contracted company with which the Company intends to work with in the following year, are registered to do business in New York and properly licensed for the work to be conducted;

(h) To the extent permitted by law and policy of relevant investigatory agency, for the Company and each contracted company the Company has worked with in the prior year, the number and a description of any open investigations against the Company or contracted company for violations of the Occupational Safety and Health Act, the National Labor Relations Act, the Fair Labor Standards Act, Title VII of the Civil Rights Act of 1964, and New York Labor and Employment Laws, and a list of findings against the contracted company for violations of the Occupational Safety and Health Act, the National Labor Relations Act, the Fair Labor Standards Act, Title VII of the Civil Rights Act of 1964, and New York Labor and Employment Laws within the last two years;

(i) For the Company and each contracted company performing relevant work with in the prior year, a description of whether or not workers are required to or requested to execute arbitration agreements with the contracted company or Company, and if so, a copy of the arbitration agreements;

(j) For the company and each contracted company performing relevant work in the prior year, a list of all arbitration matters involving safety issues and copies of all resolutions, including formal resolutions through an arbitrator's decision or informal resolutions through settlement agreement.

Appendix G: Potential Roles in Broadband Industry

This analysis is based on industry statements of planned activities combined with projections of future staff needs using localized knowledge of the number of staff hours required for each task and function. For this analysis, HR&A collaborated with CTC Technology and Energy, the Digital Equity Laboratory at The New School, Baller Stokes & Lide, Hunter Roberts Construction Group, and Stantec. This analysis of direct job creation in the broadband industry is separate from the analysis of indirect job creation included in *The New York City Internet Master Plan, Section 2: The Economic Impact of Universal Broadband.*

The broadband sector in New York City is expected to require nearly 17,000 job-years* of employment over the next decade, assuming moderate growth and expansion of existing service, and more than twice that number under more aggressive growth conditions that industry providers have announced. The majority of new jobs are required in the construction and installation phases of implementation, with relatively limited number of ongoing maintenance and operations positions needed over the number that exists today.

It is important to note that while job growth projections under current conditions would generate improvements in broadband service, these improvements would not be significant enough to result in universal broadband that provides equitable levels of service across the city, eliminates cost barriers, increases customer choice of broadband providers, or safeguards personal data.

FACTORS AFFECTING JOB GROWTH IN THE BROADBAND INDUSTRY

- **Market cycles.** Service providers are likely to respond to fluctuations in local market demand by curtailing new investment and scaling back the expansion of services, projections of which are precluded by the unknown depth and duration of future market cycles. A potential countervailing force during periods of contraction could be the provision of publicly-supported broadband service, with City investment helping the industry grow and putting people to work through slower times in the economy.

- **Competitive pressures.** Should greater competition be introduced into the local market, the magnitude of industry growth and timing of job creation may accelerate beyond these job growth projections. Competitive pressures could drive more rapid expansion in fiber footprints, equipment cycles, and speeds among existing and emerging providers. Conversely, deregulation of broadband by the federal government and company mergers and consolidations may slow growth in competition and associated investment.

ESTIMATED JOB-YEARS*, 2018-2027

	LOW-GROWTH SCENARIO			HIGH-GROWTH SCENARIO		
	Wireline	Wireless	Total	Wireline	Wireless	Total
Task/Phase						
Engineering	220	470	690	430	4,740	5,170
Construction	10,760	780	11,540	19,750	890	20,640
Installation	3,820	650	4,470	4,490	7,040	11,530
Maintenance	60	-	60	160	390	550
Network operations	-	-	-	-	180	180
Total	**14,860**	**1,900**	**16,760**	**24,830**	**13,240**	**38,070**

*One job-year reflects one worker employed full-time for one year. A worker employed for two years would be represented as two job-years.

Source: Consult analysis based on industry statements.

Jobs Related to Broadband Expanison

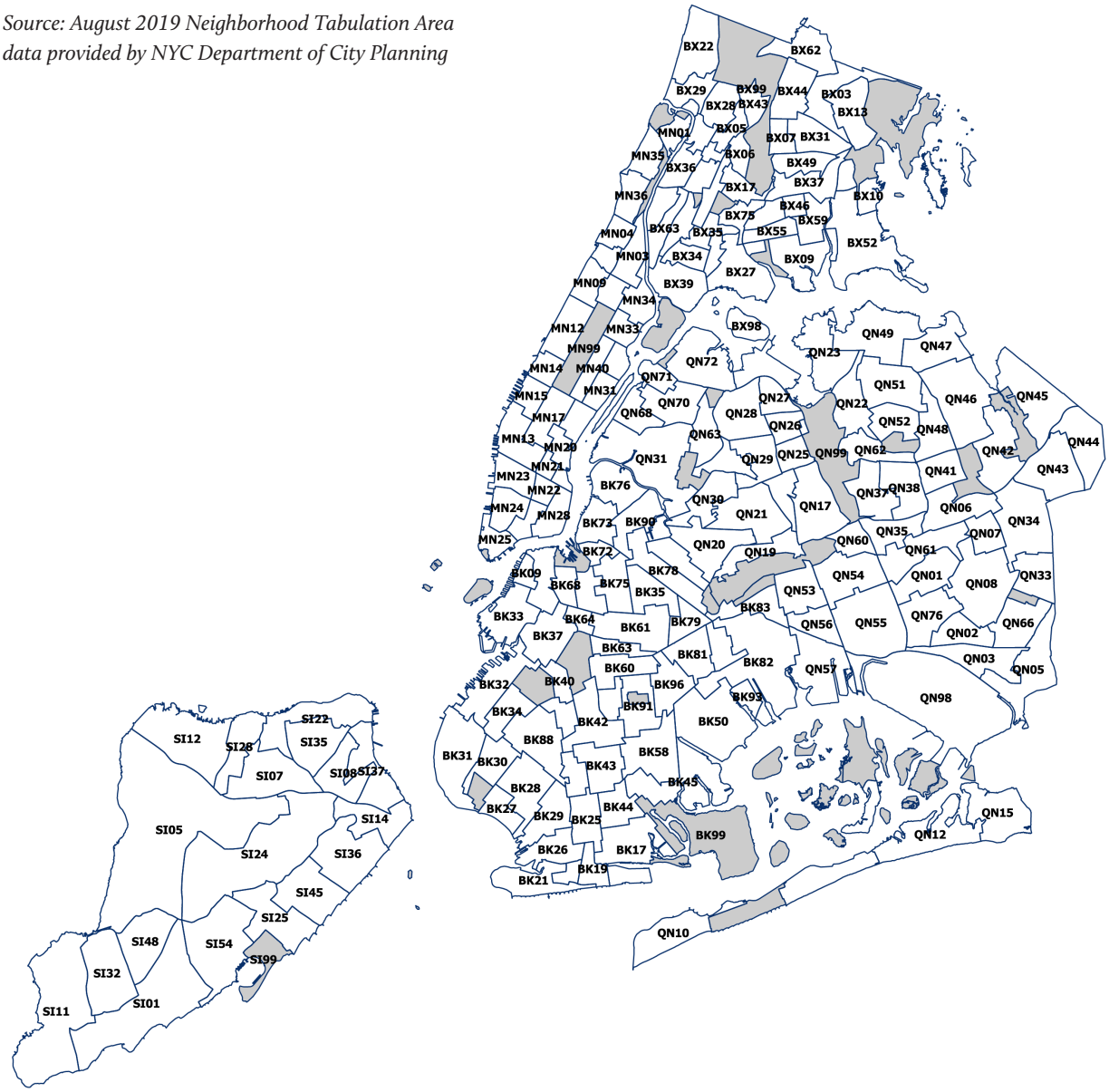
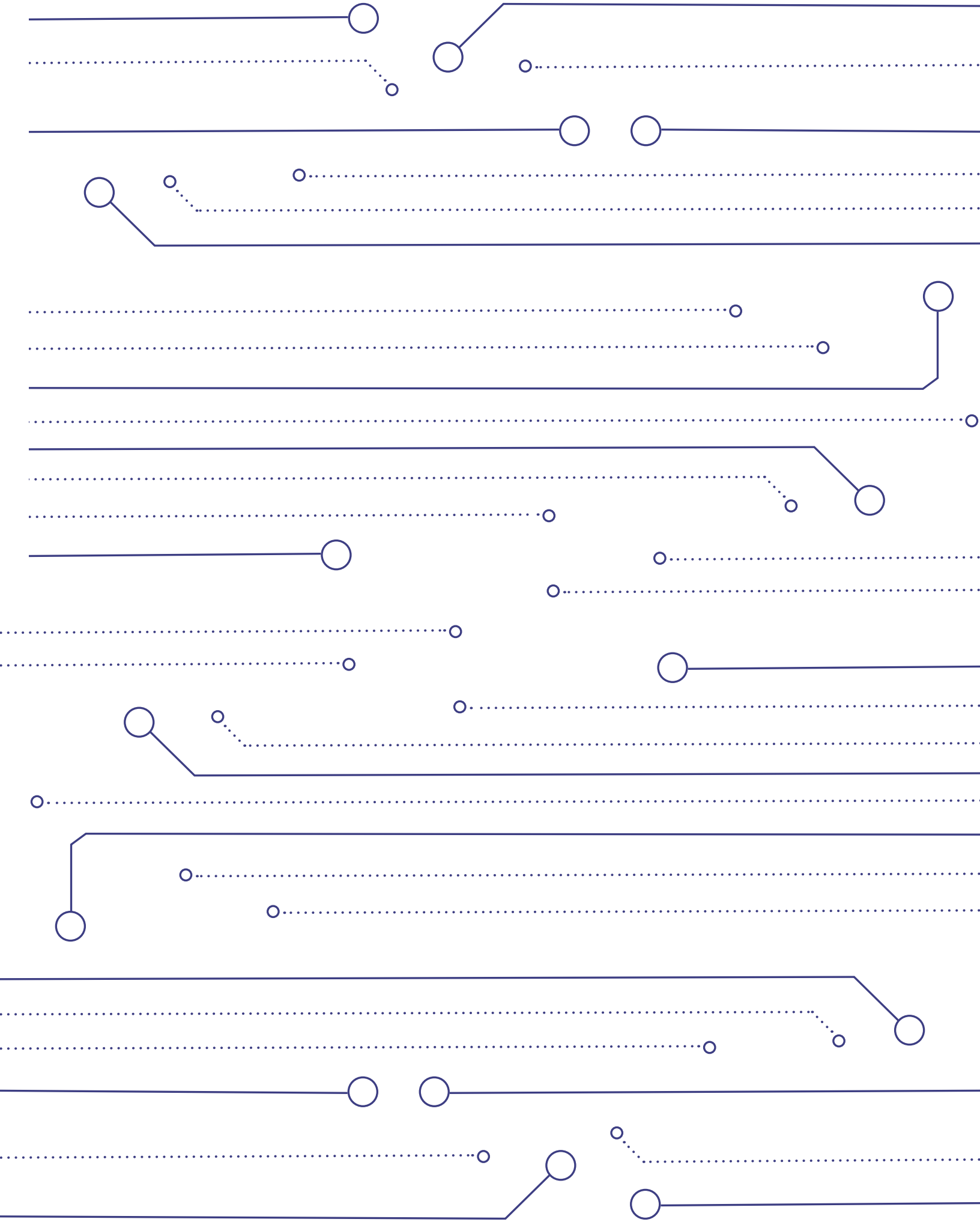
Source: Bureau of Labor Statistics (BLS) North American Industry Classification System (NAICS); interviews with industry representatives

CAPITAL BUILDOUT			OPERATION AND MAINTENANCE		ADOPTION
Engineering	Construction	Installation	Maintenance	Network Operations	Outreach/Public Awareness
"Survey Mapping Technicians $40k+ per year HS Diploma"	"Cable Line Installers and Repairers, Cable Splicers $60k+ per year HS Diploma"	Telecomm Equipment Installers and Repairers, Switchboard Wirers$50k+ per year Post-Secondary Non Degree	"Telecommunications Equipment Installers and Repairers, Switchboard Wirers $50k+ per year Post-Scondary Non Degree"	"Customer Service Representatives $30k+ per year HS Diploma"	"Library Technicians and Assistants $29k+ per year Post-Secondary Certificate"
"Electrical Drafters $50k+ per year Associate's Degree"	"Construction Equipment Operators $40k+ per year HS Diploma"		"Network and Computer Systems Administrators Network Coordinators, Network Diagnostic Support Specialists, Computer Support Specialists Network Security Administrators, Network Security Analysts, Network Support Coordinators, Network Support Technicians, Network Systems Administrators, Network Systems Coordinators, Network Technicians $80k+ per year Bachelor's Degree"	"Billing or Financial Clerks, Bill Account Collectors $38k+ per year HS Diploma"	"Librarians $50k+ per year Master's Degree"
"Purchasing Managers, Buyers, and Purchasing Agents $60k+ per year Bachelor's Degree"	"Construction Laborers and helpers and house wirer helpers $30k+ per year Non Degree"		"Network Support Technicians $50k+ per year Associate's or Bachelor's Degree"	"Computer Support Specialists $50k+ per year Associate's or Bachelor's Degree"	"Teachers and Adult Literacy Teachers $40k+ per year Bachelor's Degree"
"Procurement Technicians/ Cost Estimators $60k+ per year Bachelor's Degree"				Network and Computer Systems Administrators $80k+ per year Bachelor's Degree	"Career and Technical Education Teachers $50k+ per year Bachelor's Degree"
Surveyors $60k+ per year Bachelor's Degree				"Database Administrators $85k+ per year Bachelor's Degree"	"School, Career and Technical Counselors $50k+ per year Master's Degree"
"Electrical and Electronic Engineers $90k+ per year Entry Level/ Bachelor's"	"Electricians, Electrician Apprentice $50k+ per year HS Diploma"			"Information Security Analysts $90k+ per year Bachelor's Degree"	"Instructional Coordinators $60k + per year Master's Degree"
"Computer Network Engineers and Architects $100k+ per year Bachelor's Degree + Related Experience"				"Computer Hardware Engineers $115k+ per year Bachelor's Degree"	"Marketing, Copy Writers, Analysts, Strategists $60k+ per year Bachelor's Degree"
"Computer Hardware Engineers/Designers $115k+ per year Bachelor's Degree"					"Advertising, Promotions, and Marketing Managers $120k+ per year Bachelor's Degree"
"Engineering Design Managers $130k+ per year Bachelor's Degree"					

Notes

- The tech industry is evolving so quickly (e.g. 5G wireless buildout) that BLS and New York Department of Labor classifications cannot keep up with demand for the kinds of new skills required. This list is extensive though not exhaustive.

Appendix H: Neighborhood Tabulation Area (NTA) Map

Neighborhood Tabulation Areas (NTAs) were created by the NYC Department of City Planning to project populations at a small area level. NTAs are aggregations of whole census tracts from the 2010 Census that are subsets of New York City's 55 Public Use Microdata Areas (PUMAs). NTA data is available on NYC Open Data at https://opendata.cityofnewyork.us/data/.

Source: August 2019 Neighborhood Tabulation Area data provided by NYC Department of City Planning