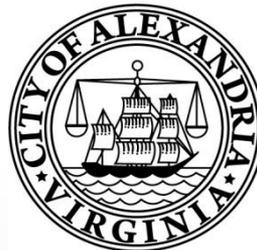


City of Alexandria, Virginia

Alexandria Fiber: I-Net and FTTP



Advantages of City-owned I-Net

- Ownership of network offers several advantages:
 - Future cost stability and certainty
 - Control over network scalability (what connects to our network and when)
 - Modernize level of service (i.e., gigabit service) to ACPS, Library and government buildings
 - Public safety radio network improved reliability
 - Incentivize additional private investment in fiber throughout the community (FTTP)
 - Generate ongoing City revenue stream via excess fiber leases

Cost of Fiber I-Net

Alexandria Fiber Network Cost Component Breakdown

Cost Component	Backbone	City Laterals	ACPS Laterals	Public Safety Radio	Estimated Cost
Engineering and Project Management	\$615,000	\$50,000	\$75,000	\$20,000	\$760,000
Construction	\$5,485,000	\$1,475,000	\$550,000	\$130,000	\$7,640,000
Total	\$6,100,000	\$1,525,000	\$625,000	\$150,000	\$8,400,000

The Numbers

- Estimated total cost of I-Net: \$8.4 million
- 10 year amortized cost: ~\$930k per year (\$1M in year 1 debt service)
- Future lease payments for dark fiber will very likely exceed our debt service costs
 - Current advertised market rates for our level of service (i.e., 2 dark fiber strands) would be in excess of \$4M annually for City and ACPS

Outside Funding Sources

- Possibly several outside funding sources to offset project costs:
 - E-Rate (upfront grant funding \$500k - \$650k) based on eligibility
 - Private leasing agreements or IRUs of extra network capacity to last-mile Internet Service Provider(s)
 - Depending on leasing agreements and tradeoffs, \$500k+ per year is within reason for future year revenues
 - Partnerships with middle mile firms to share in cost of I-Net construction
 - Wireless backhaul and institutional dark fiber industries likely interested
 - Look to leverage other fiber-connected City assets in the future with leasing rights for cellular antenna systems (DAS, etc.)

The Network

- Cost estimate assumes all undergrounded
- Incorporates significant spare conduit and fiber strand capacity
 - Two 2" conduits throughout backbone with 288 strands (upgradeable for another 1,000)
 - Robust enough to provide sufficient future scalability
- Useful life of fiber is ~25 years and conduit is 50+ years; could reinstall new fiber after 25 years for a fraction of initial cost to extend overall network life
- Ability to take full advantage of current City 10 gigabit network equipment
- City investment makes private FTTP much more possible, which in turn supports economic development and the tax base

Gigabit Speeds

Speed comparison for 2 minutes of video downloading

1 Gbps (1000 Mbps) Download Complete



240 Mbps



60 Mbps (Typical current speeds in the City)



15 Mbps



*Based on downloading a full HD movie

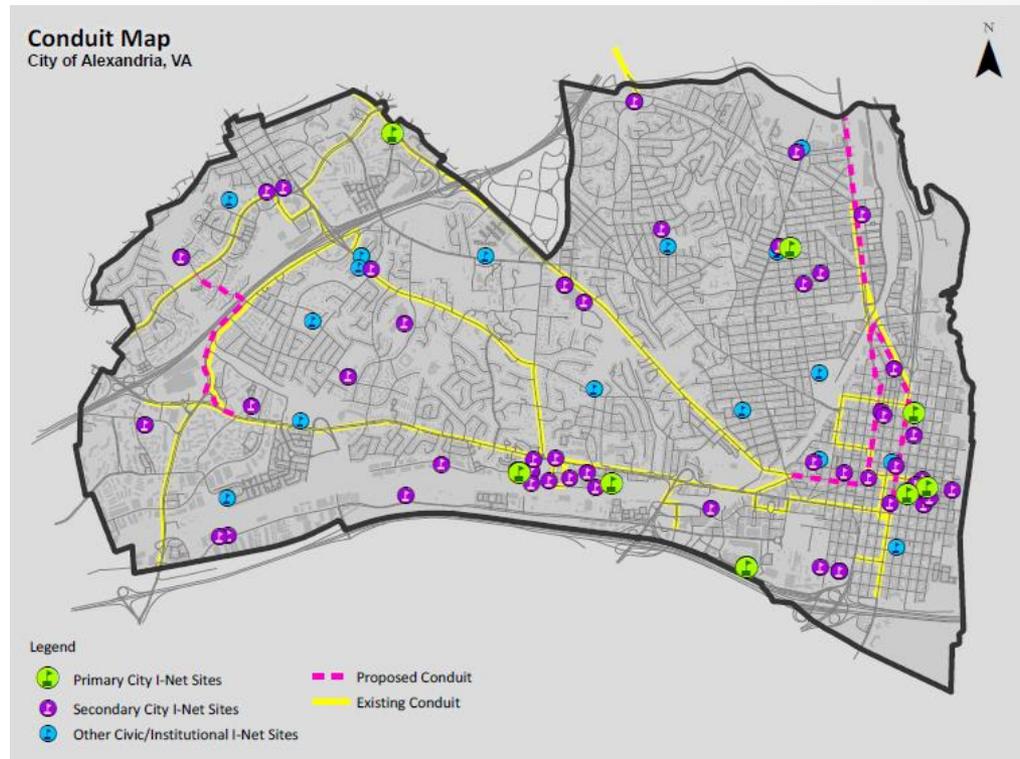
Network Potential

- Why does the current proposal call for 288 strands of fiber?
- Excess fiber provides the bandwidth that allows for a greater number of users to simultaneously experience full high-speed internet
- The more strands of fiber to City and ACPS sites, the higher likelihood of securing gigabit or better internet service for all users



A Prospective Partnership

- Our I-Net's presence in neighborhoods provides an ISP an excellent jumping off point for an FTTP network
- ISP could be a City revenue source by leasing excess dark fiber



Next Steps

- City Council considers project funding in the CIP process (spring 2016)
- If project is funded, then:
 - Procure project engineering services (spring/summer 2016)
 - Issue RFP for construction services (summer 2016; could run parallel to engineering procurement)
 - Begin project construction, once RFP has been completed and funding plan has been approved
- Continue to seek companies interested in building private fiber assets in Alexandria (ongoing)