Broadband Feasibility Study Results

Council Study Session

July 12, 2016

Agenda

- Project overview and desired session outcomes
- Review of broadband feasibility study findings by CTC Technology & Energy
- Dialog and define next steps

Purpose and desired outcomes…

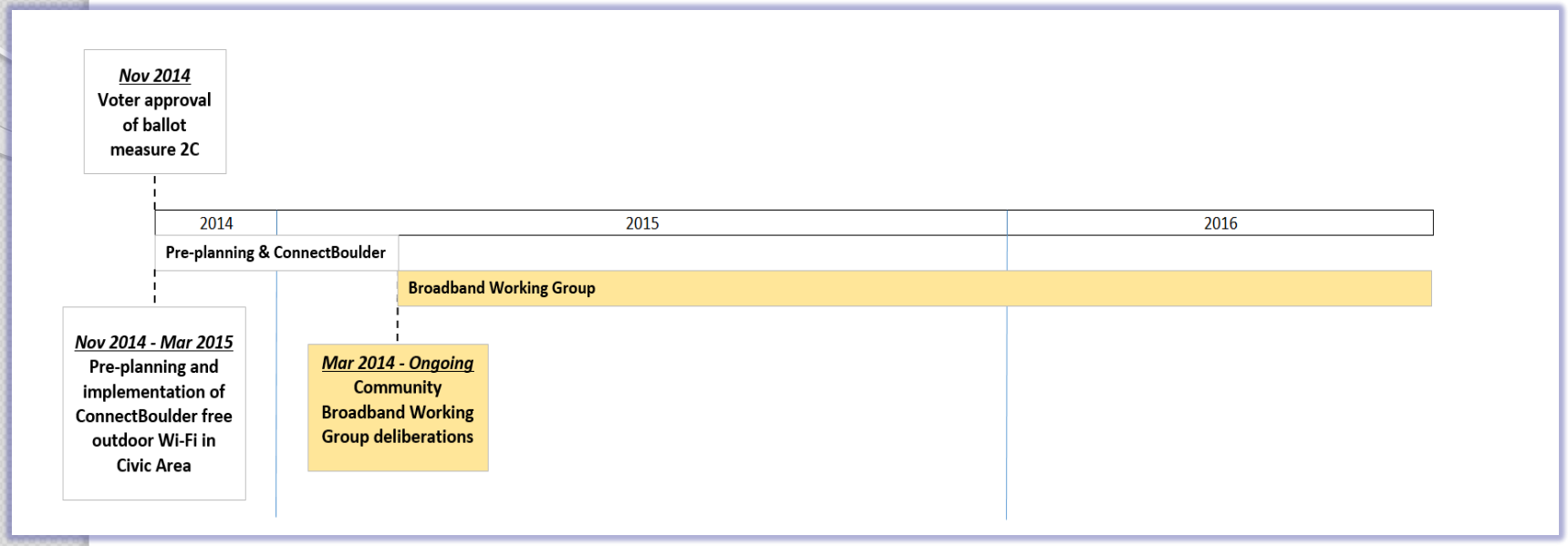
- Feedback on broadband feasibility study findings and recommendations

- Key questions for council:
  - What are Council's broadband policy objectives?
  - Does Council support the staff's recommendation of pursuing a privately owned and operated fiber optic network?

Activity: Pre-planning and ConnectBoulder

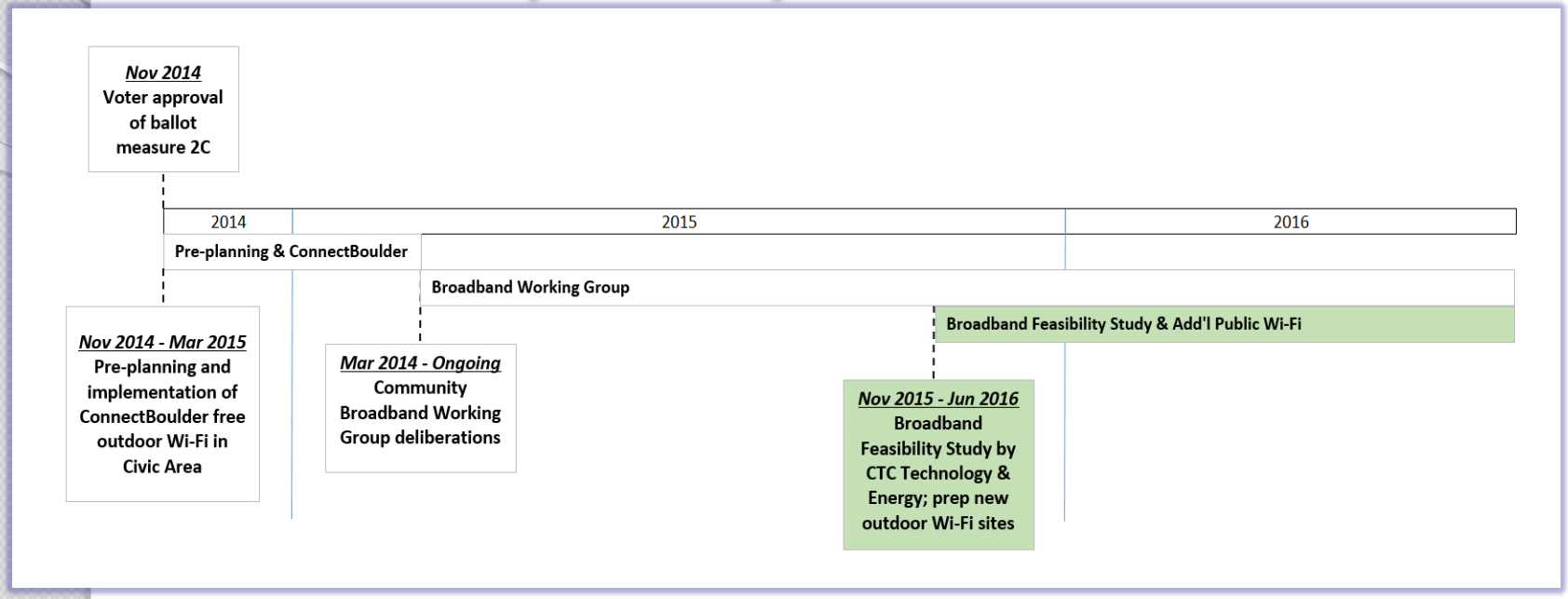
- 100+ miles of city-owned fiber
  - Variable pathways and availability of "dark fiber"
- 2014 passage of Initiative 2C by ~84%
- Community engagement planning and execution
- ConnectBoulder free outdoor Wi-Fi in Civic Area

Activity: Broadband Working Group



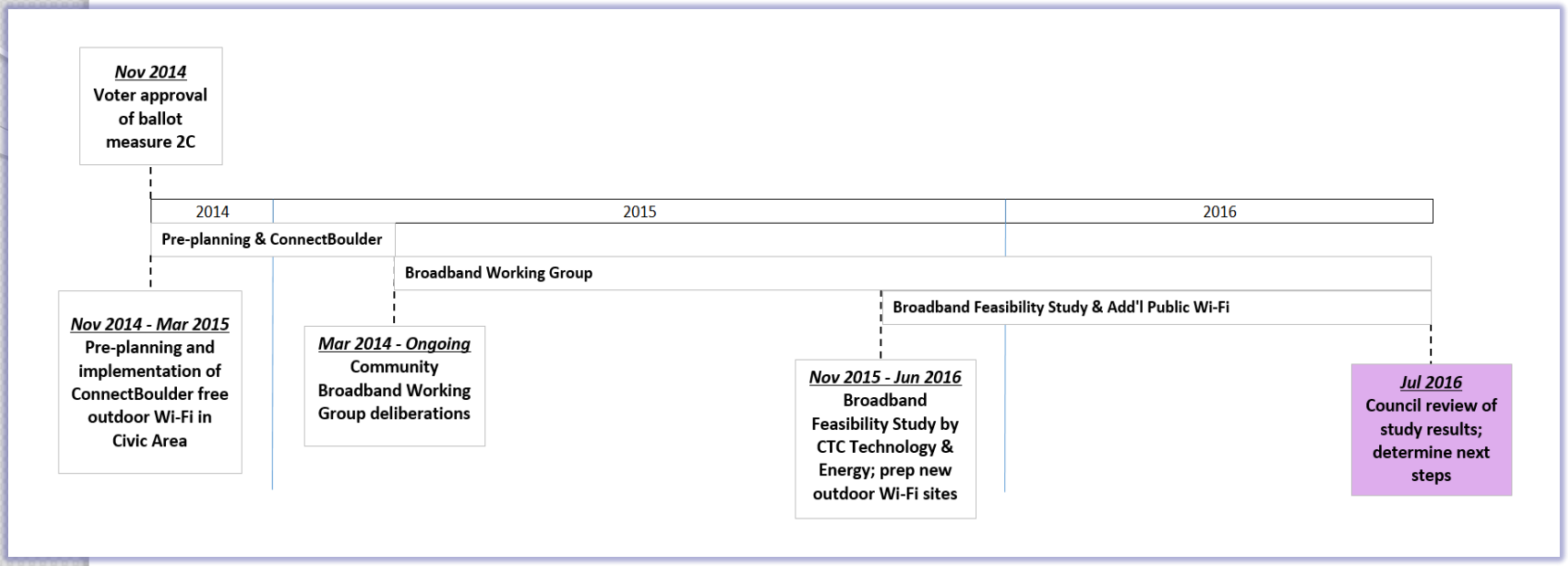
- Community Broadband Working Group
  - Education on broadband landscape and issues
  - Developed draft vision statement
  - Interviews of existing broadband providers
  - Feasibility study RFP process – selection of CTC

Activity: Feasibility Study and Add'l Wi-Fi



- Complete Broadband Feasibility Study
  - Engineering and business model analysis
  - Issue Request for Information (RFI)
- Implement new, free outdoor Wi-Fi
  - Boulder Reservoir and Scott Carpenter

Activity:
Council Review and Next Steps



- Council review of feasibility study results
- Determine next steps

Draft Broadband Vision

Draft Vision: Gigabit Broadband to Boulder Homes and Businesses
(May 21, 2015)

Our vision is to provide a world-class community telecommunications infrastructure to Boulder for the 21st century and beyond, facilitated by new access to the public's local telecommunications assets. We acknowledge that broadband is a critical service for quality of life, as is the case with roads, water, sewer, and electricity. Every home, business, non-profit organization, government entity, and place of education should have the opportunity to connect affordably, easily, and securely. Boulder's broadband service will be shaped by the values of the community.

We intend to empower our citizens and local businesses to be network economy producers, not just consumers of network information and data services. We realize that doing so requires access to gigabit-class broadband infrastructure to support these needed services and capabilities:

Broadband Infrastructure: Provide the infrastructure to enable every Boulder home, business, visitor, and public or private institution the opportunity to access affordable high speed broadband connections to the Internet, and other networks.

Open Access: Demonstrate, support, and build a non-discriminatory, open-access infrastructure that should, to the maximum extent possible, be open to all users, service providers, content providers, and application providers and be usable via all standard commercial devices.

Competitive Marketplace: Facilitate a local broadband marketplace that is as competitive as reasonably possible.

Compete Globally: Provide stakeholders with the broadband capacity, affordability and local, regional and national connectivity they need to compete successfully in the global marketplace.

We envision significant progress toward an operational network in 1-2 years with commitments from providers, community stakeholders, regional partners, and a shared common vision to make gigabit-class bandwidth available to all residents and workers in Boulder

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Overview of Staff Recommendation

- Pursue a privately owned and operated fiber optic network
  - Negotiate with private sector companies, including three finalists from "fiber-to-the-premises" Request for Information (RFI)
  - Focus on key council broadband policy objectives

Key Factors in Our Recommendations

- "Headwinds" we are facing
  - Competing priorities
    - Capacity to take on such a significant project with current city resources
  - Lack of existing utility
    - No economies-of-scale to leverage
  - Timing
    - Community expectations
    - Competition with other communities
    - Potential loss of private interest

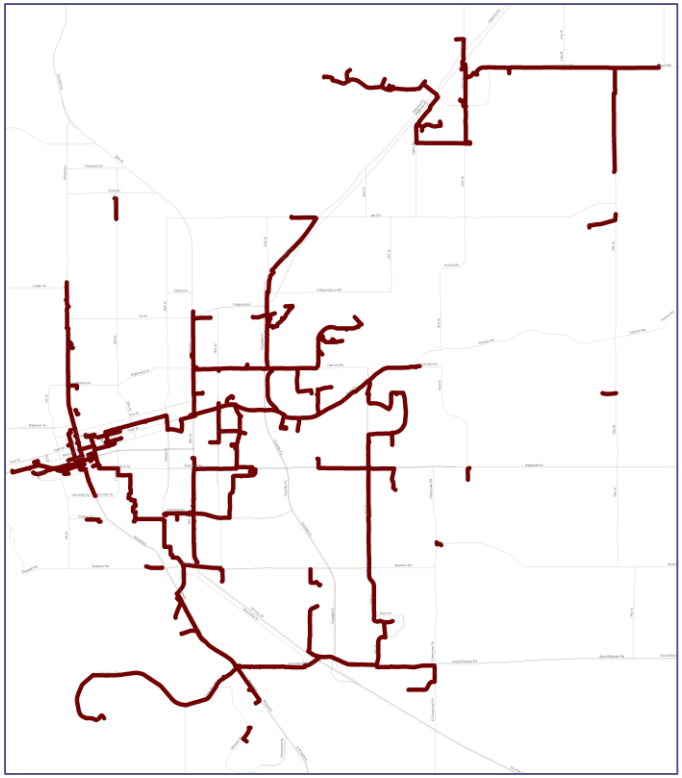
Key Factors in Our Recommendations

- "Tailwinds" we are facing
  - Boulder is an exceptional broadband market
  - Significant private interest with capital and capacity
  - Shift of risk to private provider
  - Expedited rollout; more immediate results
    - Opportunities to accelerate Smart City vision

City Network and Smart City Vision

- The City currently owns extensive network facilities including over 50 miles of telecommunications conduit
- These facilities support a variety of governmental functions
- Smart City includes monitoring, metering and control of utility, transportation and public safety systems.
- Some of the conduit facilities might be leveraged to support the broadband initiative
- The broadband initiative provides an opportunity to secure additional network facilities and/or services
- Recommended to be discussed during negotiations

Existing City Telecommunication Conduit



Broadband Feasibility Study Results

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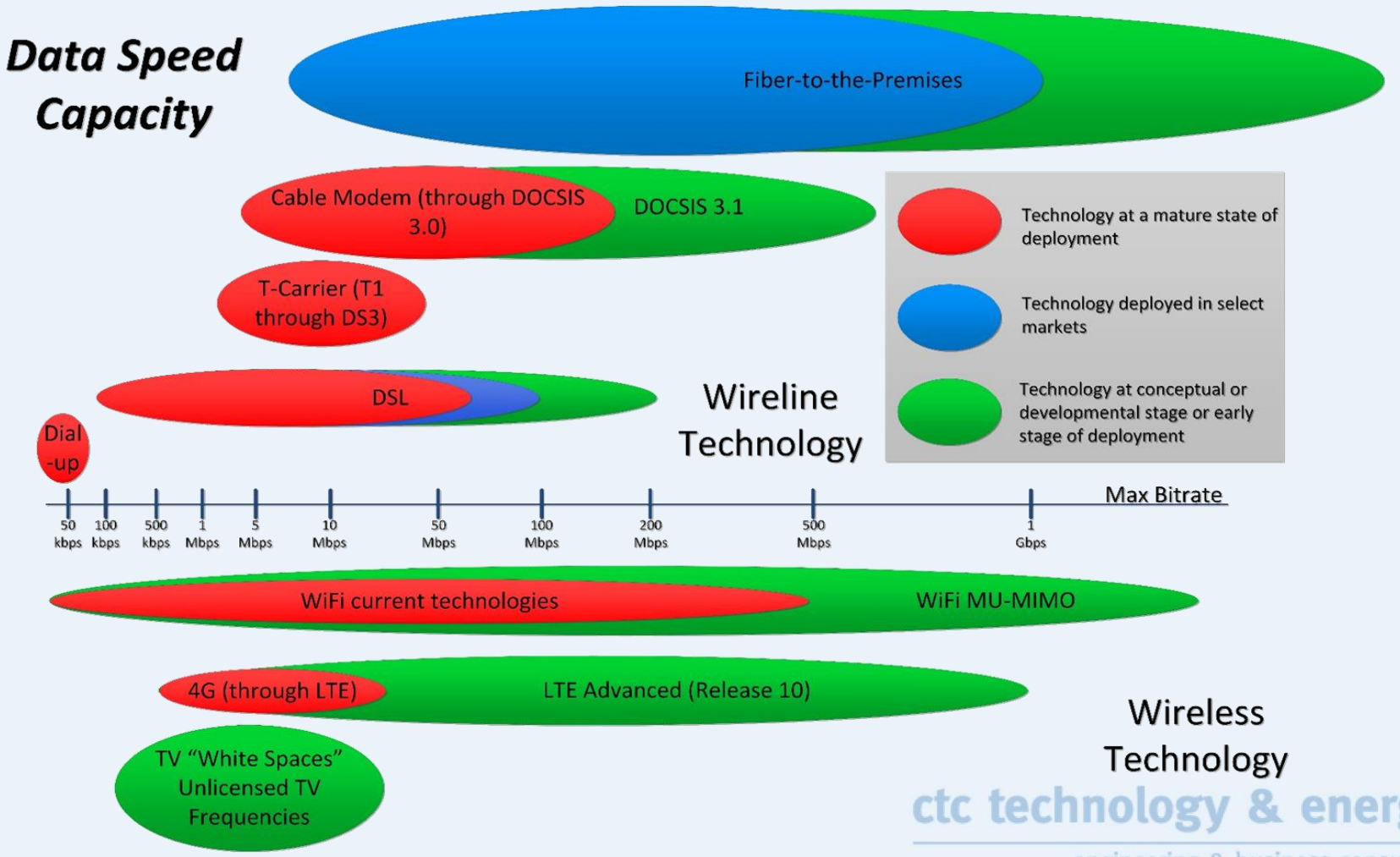
Building Fiber-to-the-Premises in Boulder: The City's Current Options

July 2016

City of Boulder

Comparison of Technologies



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City-Identified Goals

- Enable emergence of world class fiber-to-the-premises network
- Ensure ubiquity/service to all in community
- Enable consumer choice, competition (possibly through “open access” to the network)
- Maximize City’s long-term control or influence
- Partner with private sector if possible

What We Did

- Engaged stakeholders and analyzed market, including small businesses and residents
- Developed cost model to build fiber optics to all homes and businesses
- Built financial model to understand potential risk, sensitivities
- Undertook RFI process to seek and evaluate private investment/partnering interest

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What We Learned: Boulder is a market primed for broadband competition

- Boulder is a uniquely desirable market, but the existing market has not served it well
  - Boulder residents and small/medium businesses are deeply frustrated with their existing broadband options, particularly with regard to reliability and customer service
- The large business market is relatively well-served; residential and small/medium business markets lag other communities
- Investment and competition are required in residential and small/medium business markets

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What We Learned: Boulder faces an enviable set of options

- Boulder has an enviable set of choices: private investment only or partner with private sector
- Multiple companies show preliminary interest in investing in Boulder
  - Private capital seeking investment opportunity in fiber-to-the-premises (for now)
  - Testament to the attractiveness of this market

What we learned: Boulder is a costly place to build broadband

- Outside plant
  - Ubiquitous fiber construction = $70-90M to "pass" all premises
  - Annual maintenance = $1-1.3M
  - Fiber "drops" to connect homes/businesses = $12M (assumes 35% take-rate)
- Electronics and operations
  - Equipment to "light" network = $20M
  - All operating costs for operating network, service provision, content fees, customer service, etc.

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Low Estimate: Total Capital Costs

Cost Component	Total Estimated Cost
Backbone Outside Plant Construction Costs	$71,200,000
Network Electronic Costs	7,300,000
FTTP Service Drops and Laterals	11,600,000
Customer Premises Equipment and Installation	12,300,000
Total Estimated Cost:	**$102,400,000**

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The City's Options

1. Private investment: private risk, City facilitation
2. Shared investment: City fiber, private operations

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Option 1: Private Investment

- City facilitates, enables private investment
- Quickest
- Meets many of the City's policy goals (i.e., competition)
- No financial risk
- No control and limited influence
  - City could not determine pricing
  - Likely changes of ownership (and business model) over time would be outside City control

Received 3 Tentative Proposals

- Caveats:
  - Limited diligence thus far from proposers (i.e., around costs)
  - Very new development in market
  - Boulder would be large market for all three
- Axia
- Allo
- Ting

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Axia

- Calgary company
- Solid experience
- Likely acquisition by private equity
  - New, significant capital
- Have suggested willingness to:
  - Build on ubiquitous basis (based on 40% interest)
  - Offer open access to competitors (competition possible but not guaranteed)
  - Axia offers data service only; competitors can bundle voice and video

Allo

- Nebraska company
- Primarily in smaller markets
  - Building now in Lincoln
  - Particularly interested in university towns, Colorado
- Recent acquisition by Nelnet
  - Backed by significant capital
  - Question re customer service as operations merge with student loan servicing company
- Have suggested willingness to:
  - Build on ubiquitous basis
- Potential willingness to wholesale services

Ting Internet

- Toronto company, division of TUCOWS
  - Second largest domain name host in world
  - Fast growth in mobile market
- Publicly traded on NASDAQ
  - Access to sufficient capital
- Expanding into FTTP in handful of markets
  - Particularly interested in university communities
- Singular customer service
- Have suggested willingness to build on ubiquitous basis
- Unwilling to lease to competitors

Case studies: private investment

- Charlottesville, VA: Ting
- Lincoln, NE: Allo
- Range of small Canadian towns in Alberta: Axia

- All involve private investment with no public capital
- Lincoln has leased conduit to Allo for long lease period
- All are in deployment phase, with some premises activated

Option 2: Shared Risk and Investment

- City's role is in financing, building, and maintaining fiber infrastructure
  - Akin to public works
- Long-term control over core infrastructure, including opportunity to lease to multiple entities
  - Caveat: limited (if any) control over business model, pricing, operations, change of ownership, etc.

Partnership parameters

- City role: “passive” infrastructure
  - Build fiber optics and/or conduit to “pass” all premises
  - Build fiber “drops” to connect homes/businesses
  - Build “huts” on public property for carrier electronics
  - Maintain fiber and huts
- Partner role: “active” infrastructure, services
  - Responsible for all active electronics
  - Responsible for all elements of operations, service provision, content delivery, sales and marketing, billing and collections, customer service, etc.

Cost parameters

- City costs
  - Ubiquitous fiber construction = $70-90M to "pass" all
  - Fiber "drops" to connect customers = $20-80M
  - Annual maintenance = $1-1.3M
- Partner costs
  - Long-term lease fee to City
  - Equipment to "light" network = $10M
  - All operating costs for operating network, service provision, content fees, customer service, etc.

Ting Internet

- Proposed to lease City-owned fiber in long-term
- Willing to negotiate terms that would potentially cover most City costs (debt service, maintenance)
- Open access
  - City able to lease fiber to other entities
  - Ting willing in other markets to wholesale service to competitors

Case study: Westminster, MD

City will own fiber and huts only; lease to Ting Internet

- Non-exclusive—City can lease to other
- Ting committed to “open access” after two years
- Shared financing, market risk
  - Ting pays City per no. of premises passed + no. of customers
  - Ting backstops 50% of debt
  - Ting payments have potential to cover all City costs based on marketing success

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Case study: Huntsville, AL

- Google Fiber will lease fiber to be built by Huntsville
- Google to offer service wherever fiber built
  - Residential and SMB only
  - Google does not serve large businesses
- Non-exclusive--other carriers can lease and compete
- Economics not easily replicable in higher cost environment, without public utility
  - Based on Huntsville rate sheet, Google fees cover less than 50% of likely Boulder costs

Comparison of Options

Objective	Private investment	City fiber investment with private lessee
Ubiquity	Likely	Yes
City financial risk	Unlikely, depending on the company and model	Yes
City control	Limited depending on negotiations	In long-term, but not over day-to-day operations or business model
New competition	Yes	Yes
Potential for competition among providers on network	Possible, depending on the provider	Potential, but not guaranteed (i.e., unlikely in short to medium term)

Suggestions for Negotiations

1. Commitment to ubiquitous deployment
2. Potential to enable and spur new competition through open access or other means
3. Commitment to digital inclusion and to provide digital inclusion products or support
4. Projected timeline for deployment
5. Offer of right of first refusal to the City in the event of sale or transfer
6. Financial stability and capitalization
7. Willingness to work with the City on matters related to city network and Smart City vision

Broadband Feasibility Study

Questions?

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