

# Broadband Update

Council Study Session  
November 12, 2015



# Purpose and desired outcomes...

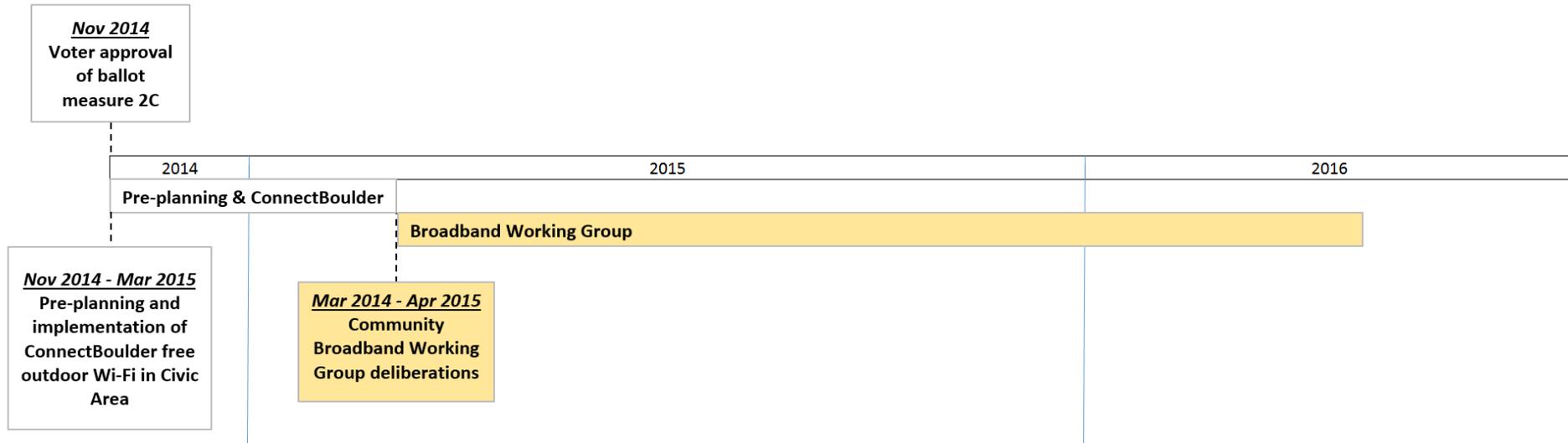
- Overview of broadband activities to-date
- Introduce CTC Technology and Energy
  - Conduct council broadband planning workshop
  - Field questions and obtain feedback
  - Confirm priorities and direction

# Activity: Pre-planning and ConnectBoulder



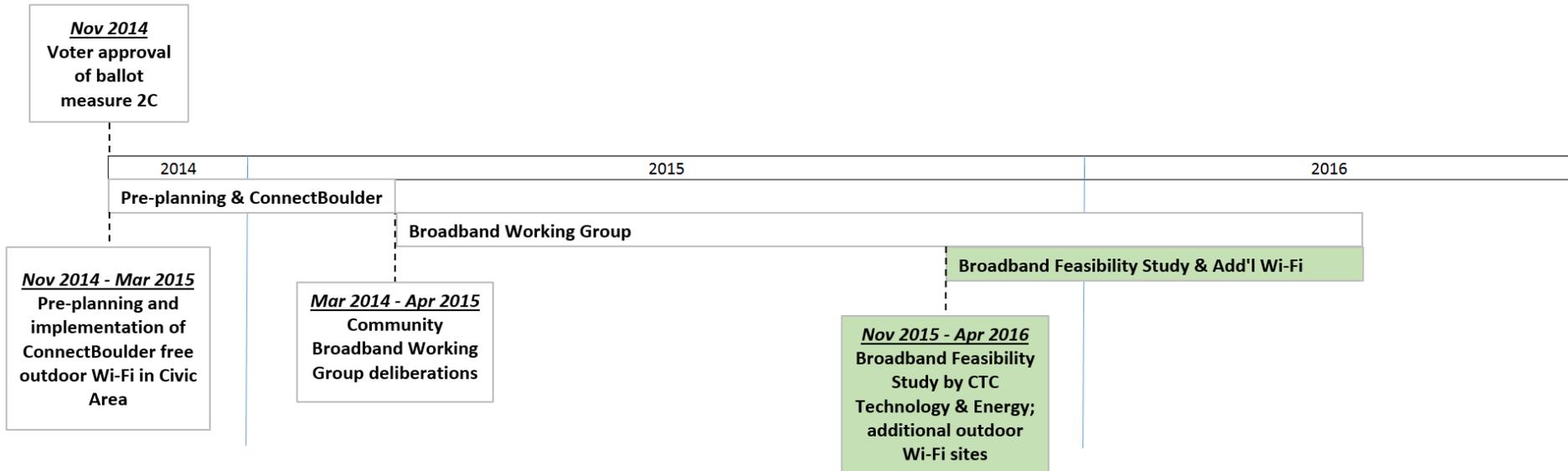
- 100+ miles of city-owned fiber and conduit
  - Variable pathways and availability of “dark fiber”
- 2014 Passage of Initiative 2C by 83%
- Community engagement planning and execution
- ConnectBoulder free outdoor Wi-Fi in Civic Area

# Activity: Broadband Working Group



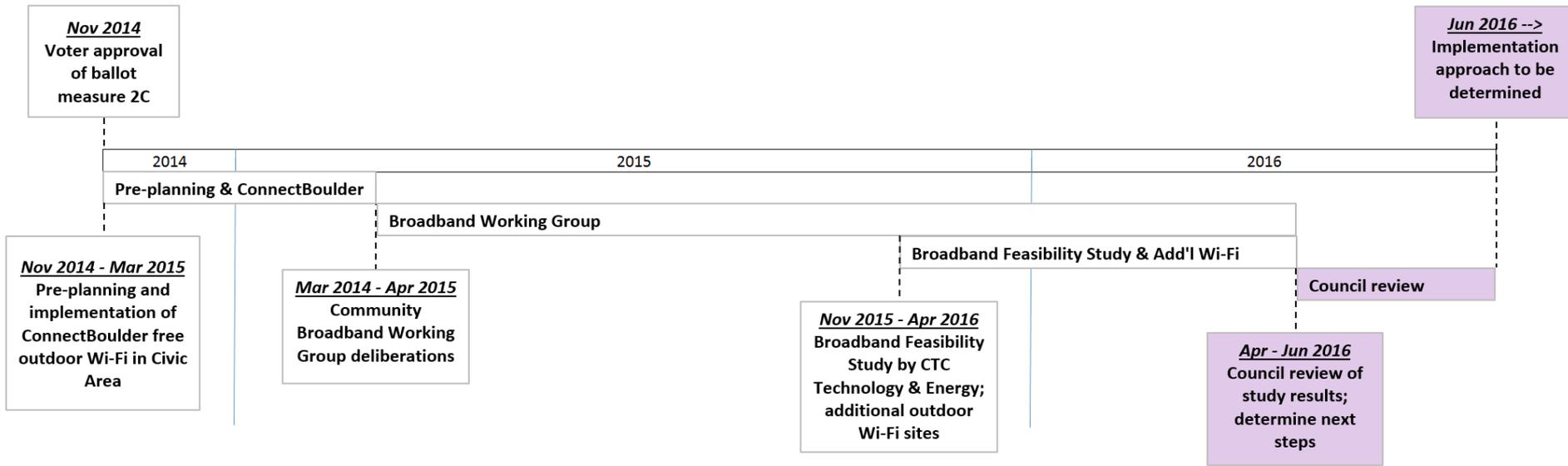
- **Community Broadband Working Group**
  - Education on broadband landscape and issues
  - Developed draft vision statement
  - Interviews of existing broadband providers
  - Feasibility study RFP process

# 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 Res, Scott Carpenter, South Boulder Rec

# 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

# Draft Broadband Vision



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# Introducing CTC Technology and Energy

Seeking understanding of priorities and goals

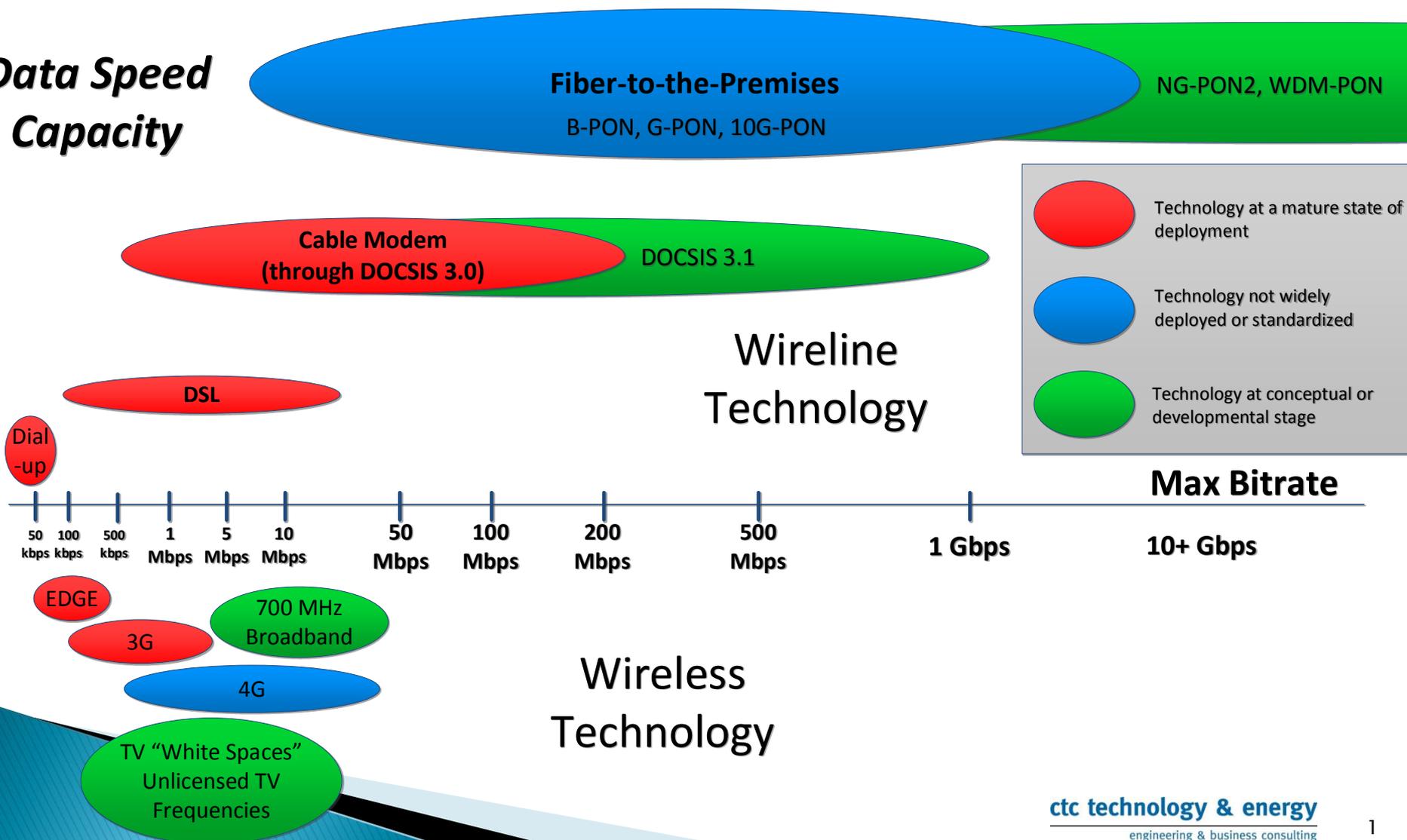
- Balance reward, risk, and control
- Potential priorities include:
  - *Ubiquity*
  - *Consumer choice/competition*
  - *Community competitiveness*
  - *Control over infrastructure*
  - *Control over pricing*
  - *Residential sector*
  - *Small business sector*
  - *High tech sector*

# City of Boulder

Council Broadband Planning Workshop  
November 12, 2015

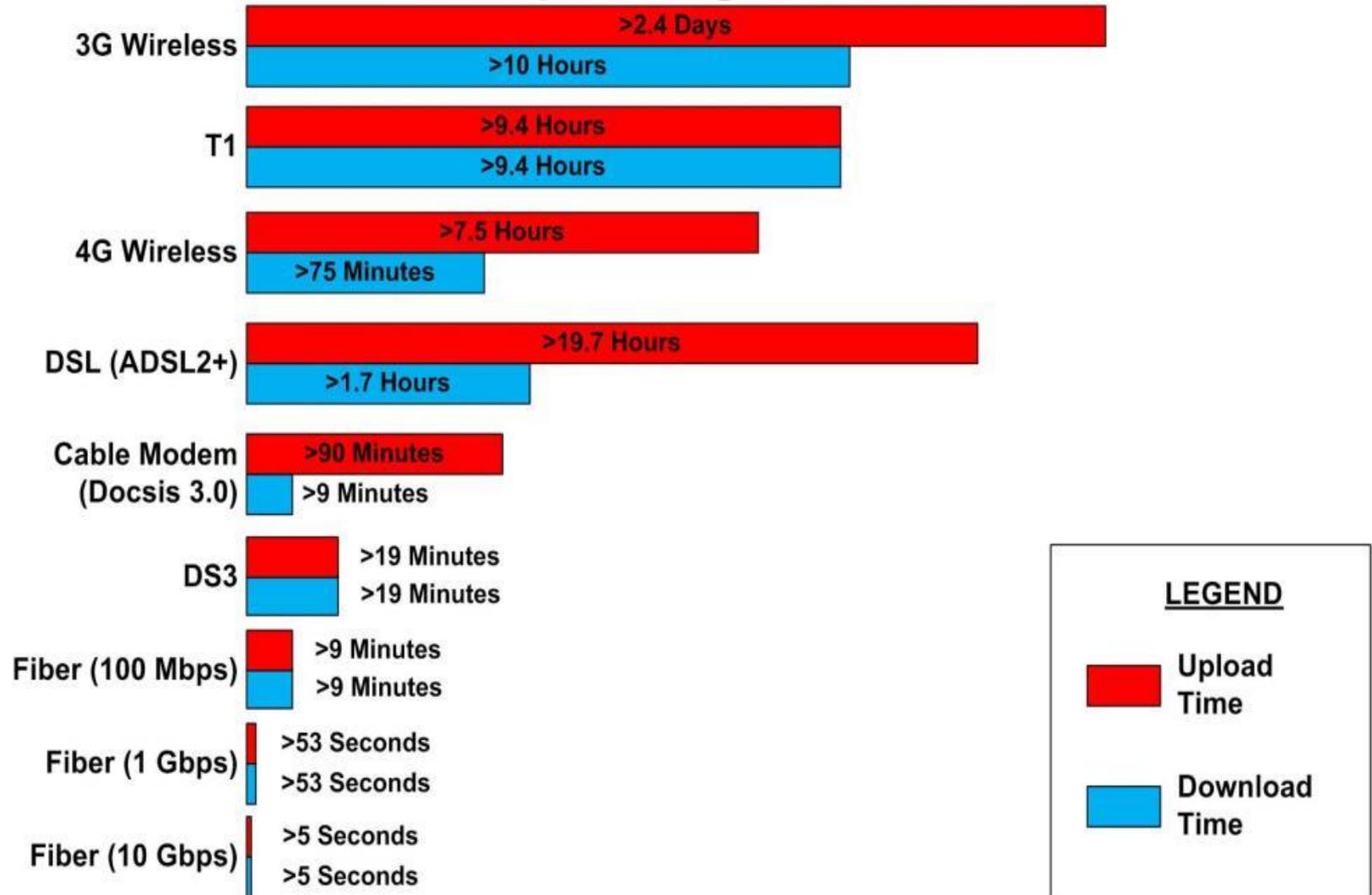
# Technologies and Speeds: *Fiber Ahead of All Others*

**Data Speed  
Capacity**



- Technology at a mature state of deployment
- Technology not widely deployed or standardized
- Technology at conceptual or developmental stage

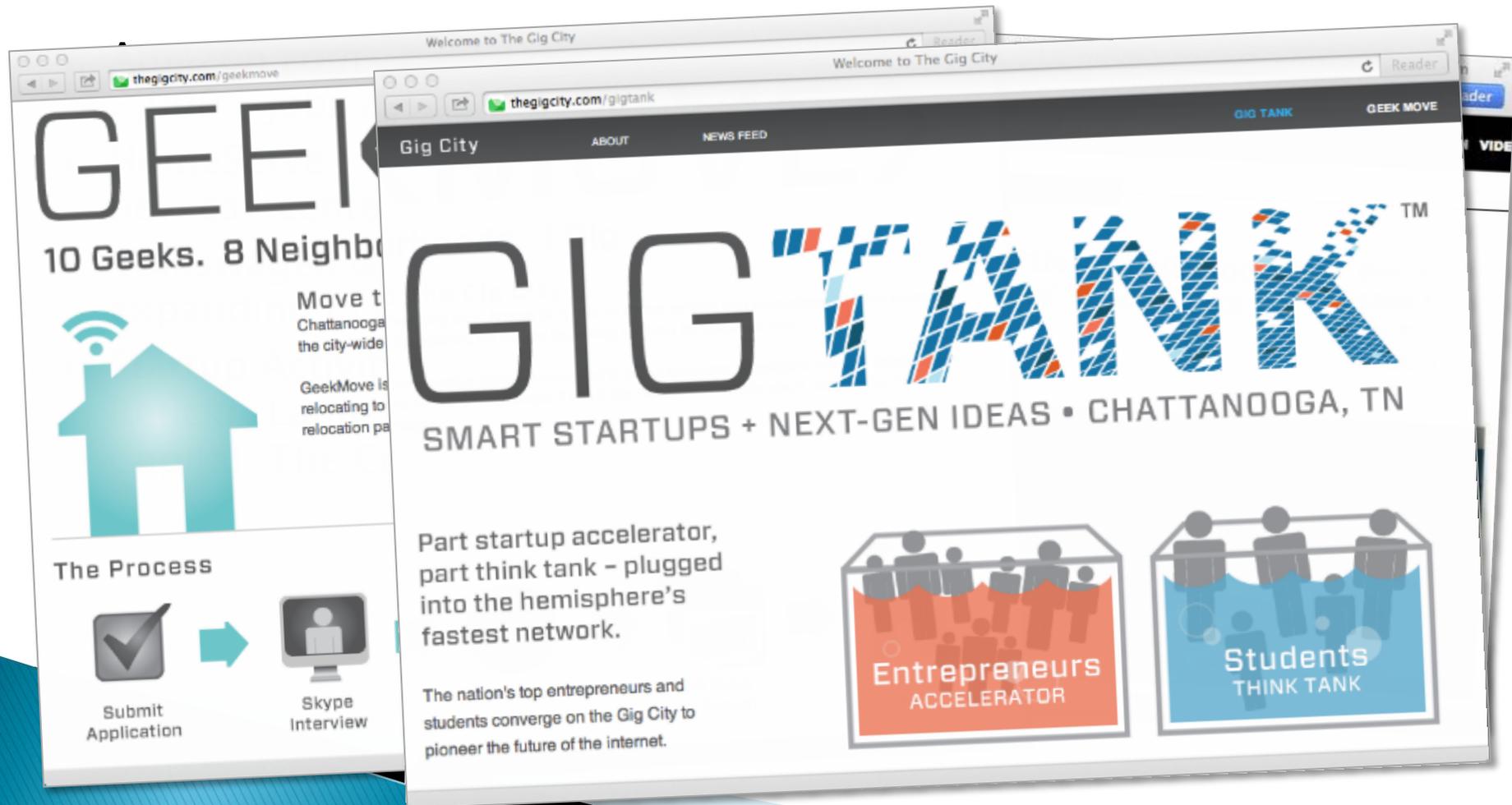
# Minimum Time Required for Downloading and Uploading a 5 GB File



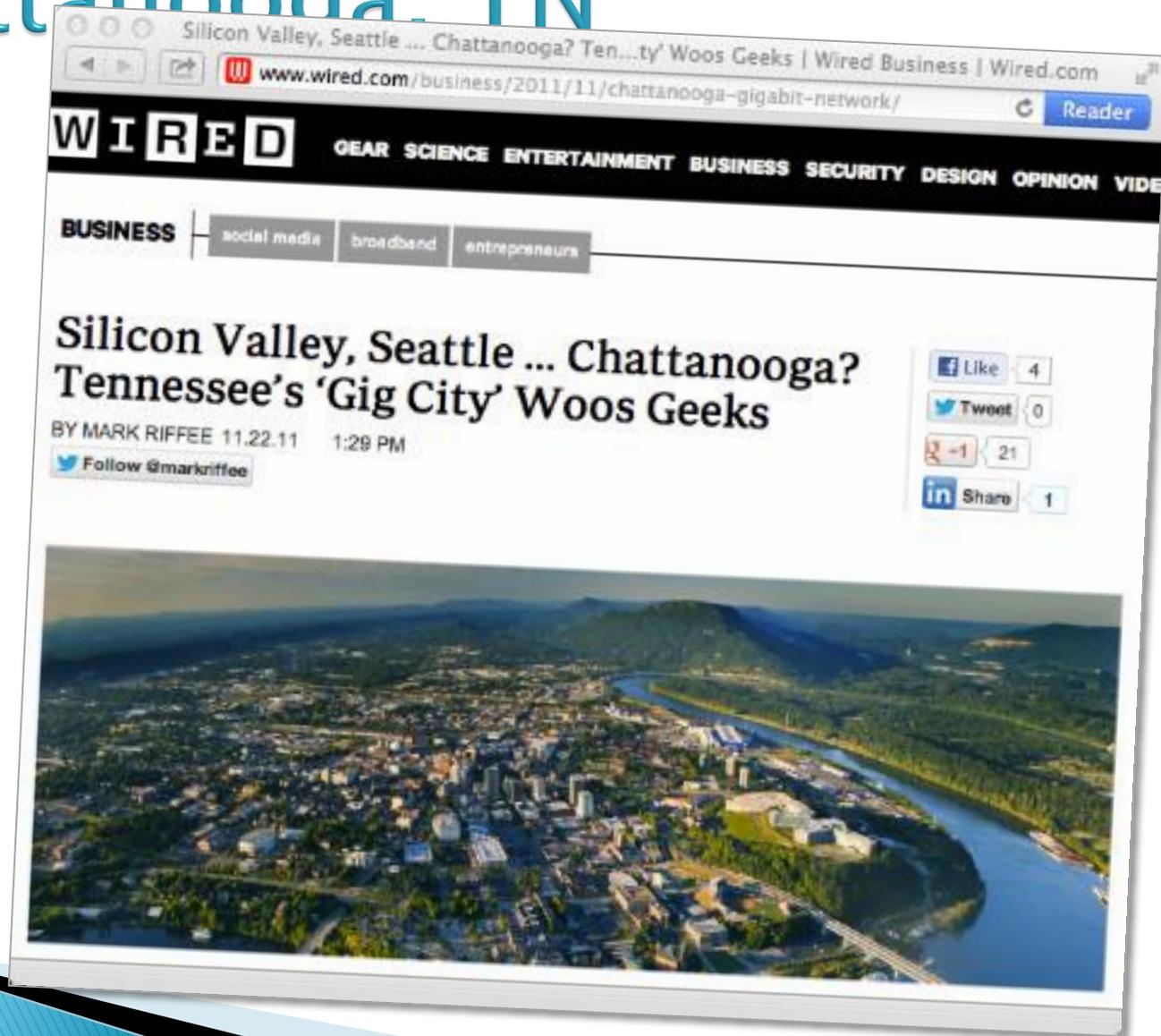
# Benefits to pioneering gig cities

- ▶ Documented increase in home values and rental rates
- ▶ Only a handful of gig cities to date, all of which have had extensive press coverage and host international visitors
- ▶ Bond rating improvements?  
Fitch cited fiber as one reason for increasing rating of Kansas City, KS
- ▶ Documented impact in attracting and retaining businesses, workers, and graduating students (anecdotal thus far given early stage)

# Chattanooga, TN



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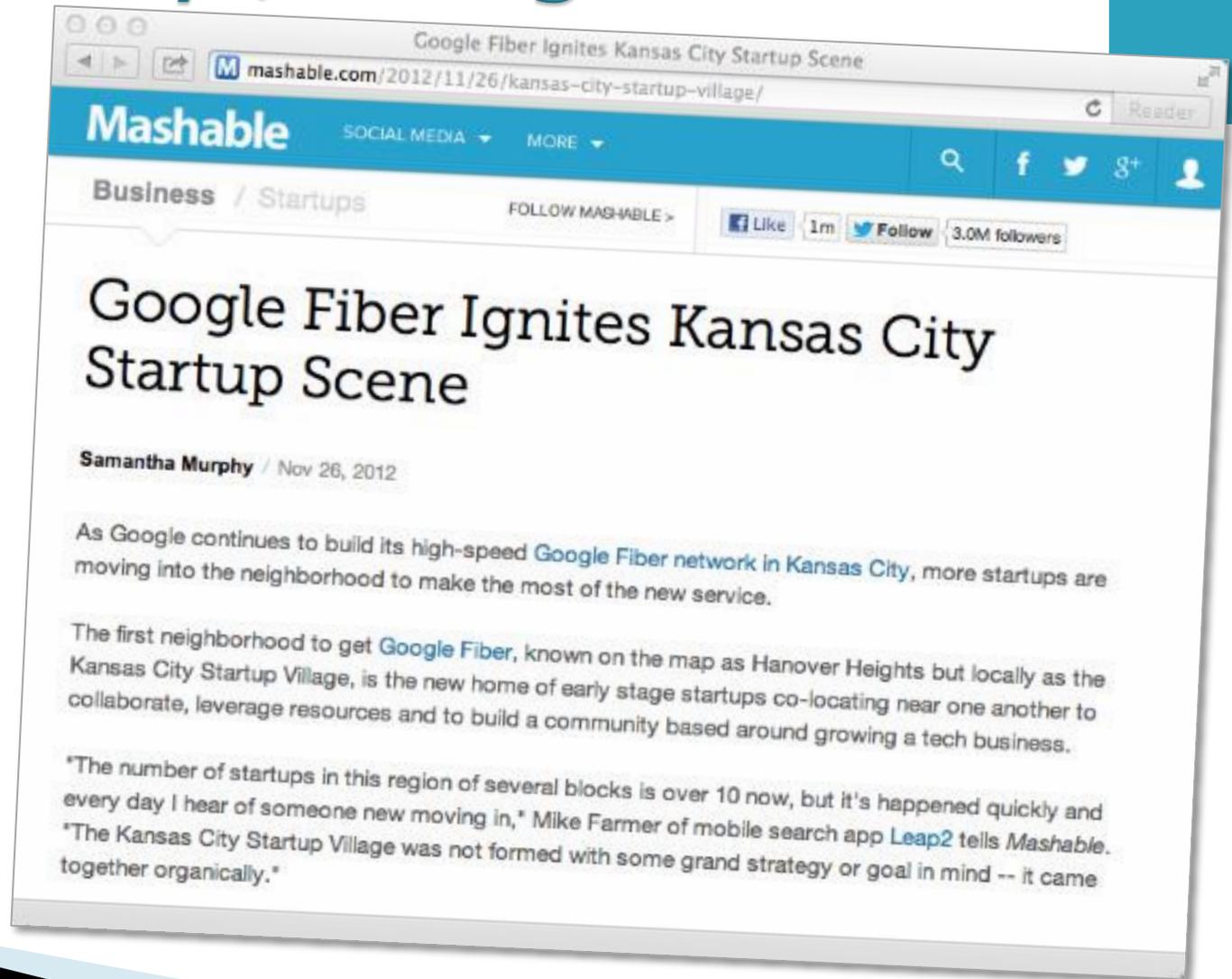


# Wilson, NC

- ▶ Retain existing businesses
  - BB&T—
  - Pharmaceutical companies--
  - Manufacturers --
- ▶ New high tech businesses
  - Exodus FX--



# Kansas City / Google Fiber



# Framework for Understanding Options

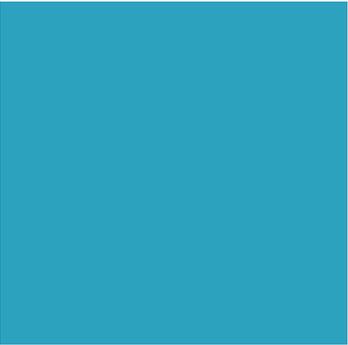
## Balance risk, benefit, and control

- ▶ Municipal broadband
- ▶ Incumbent upgrade
- ▶ Partnerships
  - Model 1: Private risk & investment
  - Model 2: Public risk & private execution
  - Model 3: Shared risk, investment

# Framework for Understanding Options

Balance risk, benefit, and control

- ▶ **Municipal broadband**
- ▶ Incumbent upgrade
- ▶ Partnerships
  - Model 1: Private risk & investment
  - Model 2: Public risk & private execution
  - Model 3: Shared risk, investment



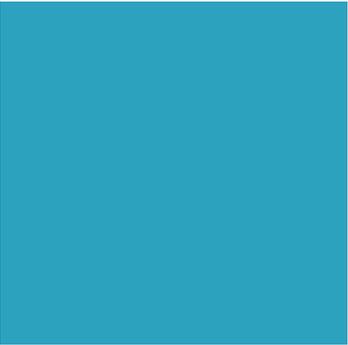
# Municipal Model

- ▶ Risk, reward, and control all at maximum
  - ▶ Established strategies
  - ▶ Electric utility confers huge benefits
  - ▶ Key case studies
    - Wilson, NC
    - Lafayette, LA
    - Chattanooga, TN
    - Longmont, CO
- 

# Framework for Understanding Options

Balance risk, benefit, and control

- ▶ Municipal broadband
- ▶ **Incumbent upgrade**
- ▶ Partnerships
  - Model 1: Private risk & investment
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# Incumbent Upgrade

- ▶ Largely catalyzed by prospect of competition (100% overlap with Google Fiber builds)
  - ▶ Easy upgrade path for Comcast—will deliver solid speed and good competition for FTTP
  - ▶ CenturyLink upgrade path more challenging, requires significant investment
- 

# Framework for Understanding Options

Balance risk, benefit, and control

- ▶ Municipal broadband
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- ▶ **Partnerships**
  - **Model 1: Private risk & investment**
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# Model 1: Private risk, public facilitation

- ▶ City facilitates private investment
  - Leading private entity is Google Fiber
  - Strong interest by smaller companies
- ▶ Reduced risk, no control, potential benefit
- ▶ Facilitation can expand to tax benefits, other economic development incentives
- ▶ Beware entities seeking benefits without offering investment

# Model 1 strategy: grow your assets

## *Access to Key Assets*

- ✓ **Lease public assets such as fiber, conduit, and real estate**
  - Lease middle-mile fiber
  - Lease fiber in hard-to-reach areas
  - Increase existing fiber capacity if insufficient fiber exists
- ✓ **Facilitate underground construction**
  - Develop a “dig-once” policy
  - Maintain future-proof conduit specifications
  - Enable all parties to take advantage of “dig-once”
  - Place conduit banks in congested areas
- ✓ **Facilitate aerial construction through access to utility poles**
  - Facilitate make-ready process to streamline pole access
  - Eliminate the need for make-ready
- ✓ **Facilitate in-building access for wireline infrastructure**
  - Ensure availability of conduit from street to building
  - Ensure installation of in-building pathways and cabling

# Model 1 strategy: make data available

## *Information Access*

- ✓ **Make data available wherever possible**
  - Make GIS data sets available
- ✓ **Document and publish data regarding available conduit, fiber, and other assets**
  - Document your fiber assets
  - Document your conduit assets

# Model 1 strategy: maximize process

## *Process Efficiency*

- ✓ **Build broadband into planning and staffing of all relevant agencies**
- ✓ **Streamline and publicize procedures and timeframes for permitting and inspections**
- ✓ **Allow network operators to contract pre-approved third-party inspectors to speed processes and reduce local burdens**

# Model 1 case study: Raleigh/Durham region

- ▶ Offer of existing city fiber
- ▶ Attention to processes
- ▶ Regional collaboration
- ▶ RFP led to agreements with AT&T
- ▶ Area within Google footprint; our analysis is that cities' engagement was helpful data point



# Model 1 case study: Mesa AZ

- Concern about impact of fiber construction on ROW, city costs
- Long-term strategy to build assets
- Focus on four target economic development areas
- Apple silicon manufacturing lab

# Model 1 case study: Holly Springs, NC

- Town built robust rings for internal services
- Engineered to enable FTTP in future
- Highly efficient processes, alignment
- Fiber lease agreement with Ting; Ting will build to homes & businesses



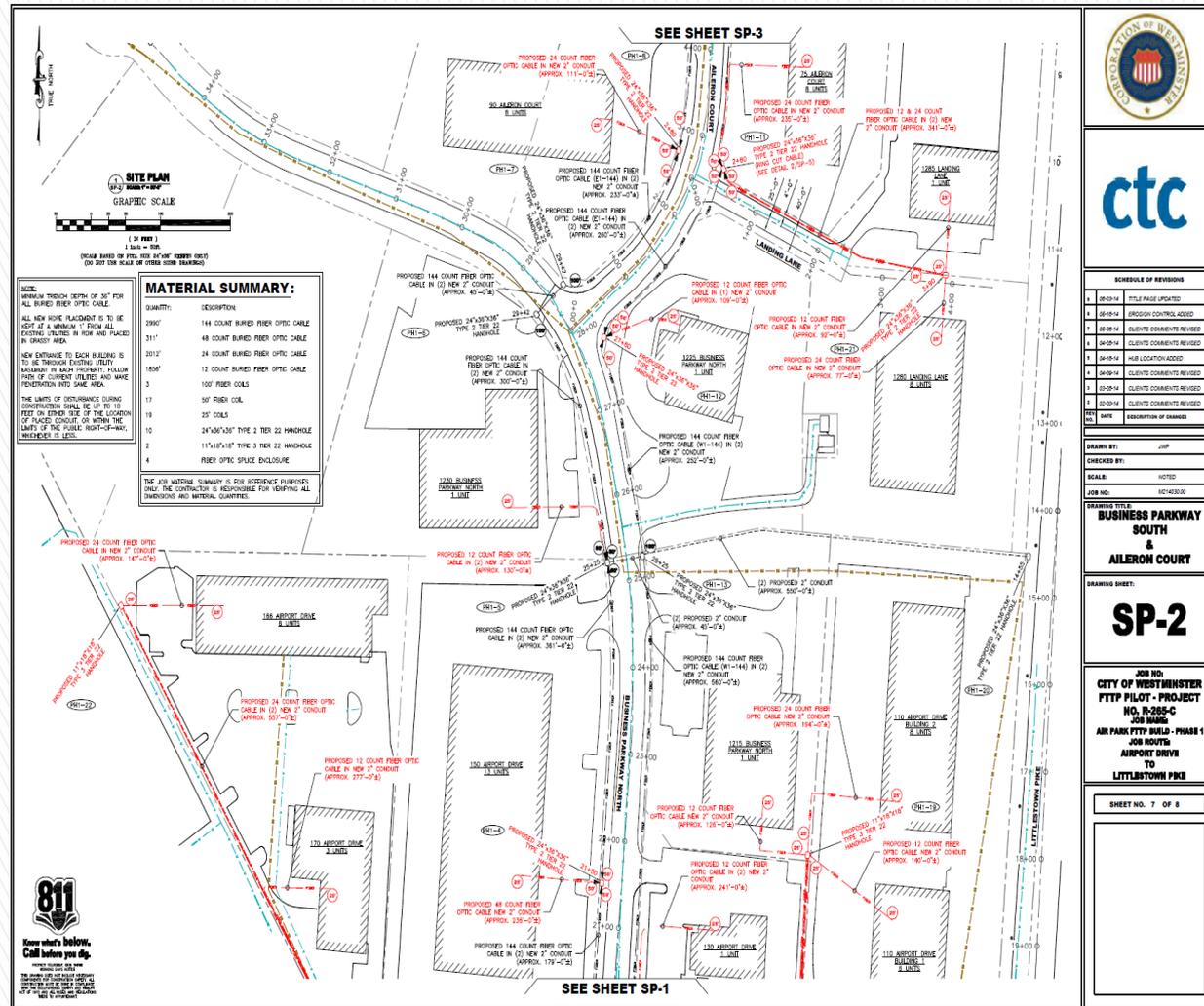
# Model 1 case study: Howard Cty MD, Arlington Cty VA, Pleasant Prairie WI

Deploy fiber strategically, with focus on key economic development targets

Connect to Internet peering point (could be local meet point)

Locality to build & own, lease to private partners on open access basis

Pricing designed to attract ISPs and non-traditional users such as building owners



**SCHEDULE OF REVISIONS**

NO.	DATE	DESCRIPTION OF CHANGE
1	08/20/14	TITLE PAGE UPDATED
2	08/20/14	DESIGN CONTROL ADDED
3	08/20/14	CLIENT COMMENTS REVISION
4	08/20/14	CLIENT COMMENTS REVISION
5	08/20/14	ASB LOCATION ADDED
6	08/20/14	CLIENT COMMENTS REVISION
7	08/20/14	CLIENT COMMENTS REVISION
8	08/20/14	CLIENT COMMENTS REVISION
9	08/20/14	CLIENT COMMENTS REVISION
10	08/20/14	CLIENT COMMENTS REVISION

**DRAWN BY:** JWP  
**CHECKED BY:**  
**SCALE:** NOTED  
**JOB NO.:** 161483.00

**DRAWING TITLE:** BUSINESS PARKWAY SOUTH & AILERON COURT

**DRAWING SHEET:** SP-2

**JOB NO.:** 161483.00  
**CITY OF WASHINGTON**  
**PTTP PILOT - PROJECT NO. 16-265-C**  
**JOB NAME:** AIR PARK PTTP BUILD - PHASE 1  
**JOB ROUTE:** AIRPORT DRIVE TO LITTLETON PKW

**SHEET NO. 7 OF 8**

# Framework for Understanding Options

Balance risk, benefit, and control

- ▶ Municipal broadband
- ▶ Incumbent upgrade
- ▶ **Partnerships**
  - Model 1: Private risk & investment
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# Model 2: Public risk with private execution

- ▶ Variation on traditional municipal ownership
  - All risk, benefit, and full control
- ▶ Emerging innovation makes use of the traditional P3 structure used in Europe and increasingly in US
  - Leverages private sector strengths
- ▶ First time applied to broadband in US
- ▶ Guaranteed revenue stream to private partner
  - Financial risk
  - Political risk

# Model 2 case study: Utopia

- ▶ Macquarie Capital team—very viable partner team
- ▶ Midst of complex process with range of Utopia member communities
- ▶ Turn-key private financing, deployment, operations, and revenue-sharing
- ▶ Guaranteed public funding in the form of a utility fee to all residents
  - In some communities, will not be a politically viable model (this has been true with some in Utah)
  - In others, can be strong model for buildout

# Framework for Understanding Options

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# Model 3: Shared Risk

- ▶ Extraordinary opportunity for innovation
- ▶ Plays to strengths of both parties
- ▶ From the standpoint of a locality, risk is shared but 100% of benefit realized
  - Public benefit does not show up on financial statements
  - Private partner gets financial benefit

# Model 3 case study: Urbana/Champaign IL

- ▶ Deal gives access to cities' fiber in return for **binding** commitments, meeting 3 key goals:

1. Fiber at gigabit speeds
2. Open access – ongoing commitment to wholesale service
3. No cherry-picking – all neighborhoods have equal opportunity to get service if presales reach 50%

- ▶ Partner with strong customer service, local presence, strong financials

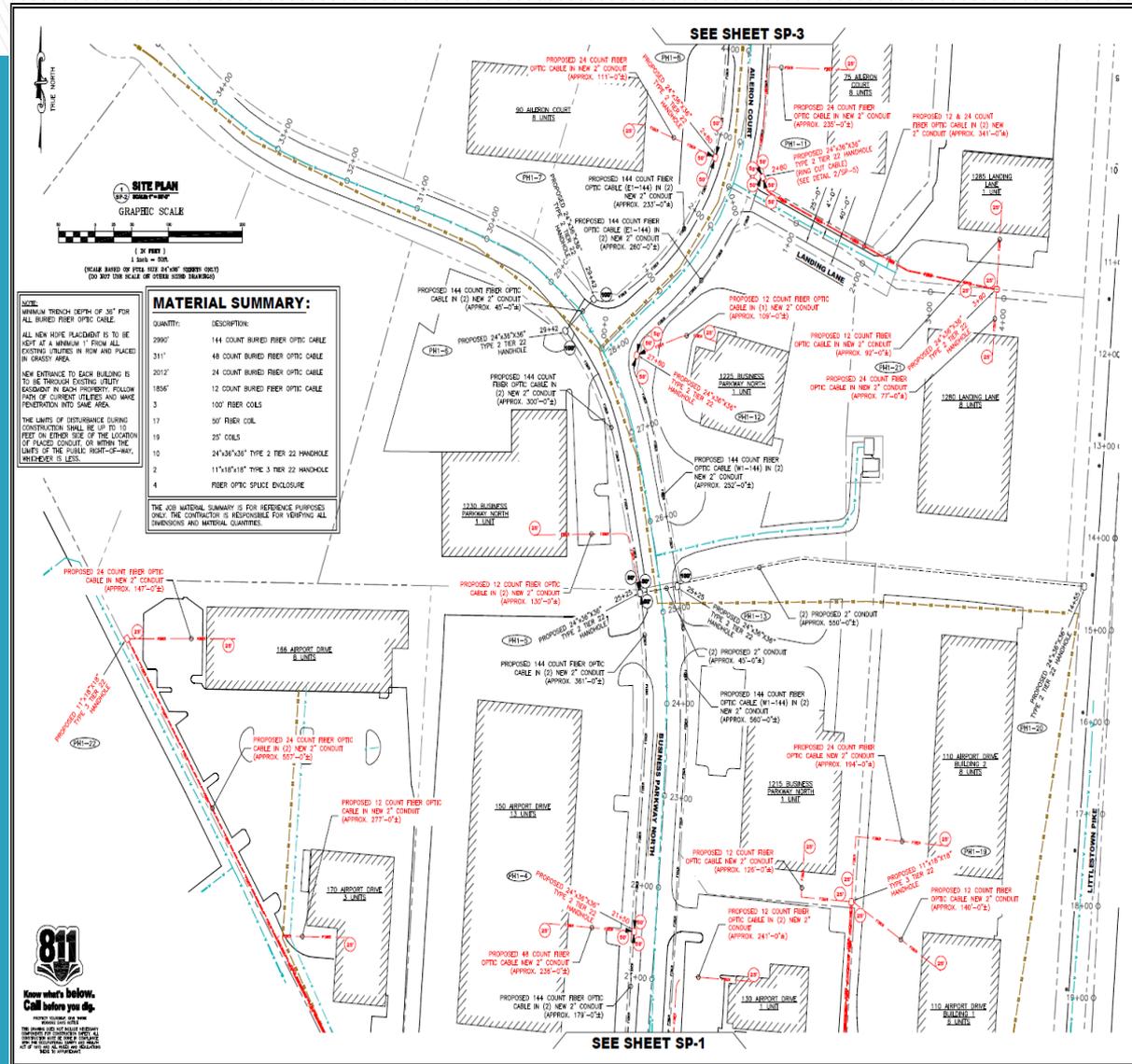


# Model 3 case study: Westminster MD

City near DC,  
Baltimore

City will own  
fiber only;  
lease to  
partner to  
operate on  
open access  
basis

Ting Internet  
selected as  
partner



ctc

SCHEDULE OF REVISIONS

NO.	DATE	DESCRIPTION OF CHANGES
1	08-18-14	TITLE PAGE UPDATED
2	08-18-14	EROSION CONTROL ADDED
3	08-28-14	CLIENT COMMENTS REVISED
4	08-28-14	CLIENT COMMENTS REVISED
5	08-28-14	FIELD LOCATION ADDED
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DRAWN BY: JWP  
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JOB NO:  
**CITY OF WESTMINSTER  
FTTP PILOT - PROJECT  
NO. R-285-C**  
JOB NAME:  
**AIR PARK FTTP BUILD - PHASE 1**  
JOB ROUTE:  
**AIRPORT DRIVE  
TO  
LITTLESTONE PARK**

SHEET NO. 7 OF 8

**MATERIAL SUMMARY:**

QUANTITY:	DESCRIPTION:
2999'	144 COUNT BURIED FIBER OPTIC CABLE
331'	48 COUNT BURIED FIBER OPTIC CABLE
2012'	24 COUNT BURIED FIBER OPTIC CABLE
1856'	12 COUNT BURIED FIBER OPTIC CABLE
3	100' FIBER COILS
19	50' FIBER COILS
17	25' COILS
10	24"x36"x30" TYPE 2 TIER 22 HANDHOLE
2	11"x10"x18" TYPE 3 TIER 22 HANDHOLE
4	FIBER OPTIC SPLICE ENCLOSURE

THE JOB MATERIAL SUMMARY IS FOR REFERENCE PURPOSES ONLY. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL DIMENSIONS AND MATERIAL QUANTITIES.



# Seeking understanding of priorities and goals

- ▶ Balance reward, risk, and control
- ▶ Potential priorities include:
  - *Ubiquity*
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