City of Waterloo, IA
BROADBAND ASSESSMENT AND FEASIBILITY ANALYSIS
JUNE 2022
AGENDA

Project Background
• Project Information
• Timeline
• Backbone Plan
• Fiber to the Home Plan
  • Consumer Survey Results
  • Buildout Concept by Phase

Business Model and Deployment Options for Consideration
• Review Business Models
• Review Supporting Financials
• Project Phasing

Recommendations & Next Steps
Project Background

- Broadband Study
  - Project Kickoff
  - January 2020

- Broadband Study Delivered
  - February 2021

- Fiber Backbone Design Started
  - April 2021

- Fiber FTTP Design Started
  - August 2021

- 100% Design Completion
  - August 2022

Policy
- Participation Only

Infrastructure Provider

Government Services Provider

Lit or Dark Open-Access Provider

Retail Service Provider – Business Only

Retail Service Provider – Business & Residential
Project Background

Project Goals

• Develop a Fiber Backbone to support City municipal operations, including utility operations, traffic, public safety and future Smart City initiatives.

• Develop a Plan to deliver next-generation Fiber to the Premise/Home services enabling high-speed access to every home and business throughout Waterloo.

Project Opportunities

• Utilize one-time ARPA funding to support broadband deployment in select areas of the City where access, affordability and reliability are of concern

• Explore partnership with neighboring municipalities to simplify the deployment of retail services leveraging their core network and content

• Leverage additional funding opportunities, including potential EDA award, and upcoming Infrastructure funding programs
### Project Background

#### Fiber Backbone Plan

<table>
<thead>
<tr>
<th>Backbone Cost Element</th>
<th>Description</th>
<th>Current Cost Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design</td>
<td>Design, Engineering, Permitting Preparation</td>
<td>$922,049</td>
</tr>
<tr>
<td>Construction</td>
<td>UG Construction of Conduit and Fiber</td>
<td>$23,000,000</td>
</tr>
<tr>
<td>Construction Contingency</td>
<td>Contingency</td>
<td>$2,300,000</td>
</tr>
<tr>
<td>CEI and Project Management</td>
<td>Construction Management, Inspections Services</td>
<td>$1,200,000</td>
</tr>
<tr>
<td><strong>Fiber OSP Construction Total:</strong></td>
<td></td>
<td><strong>$27,422,049</strong></td>
</tr>
<tr>
<td>Core/Edge Network Equipment</td>
<td>Core Network Switches/Routers</td>
<td>$500,000</td>
</tr>
<tr>
<td>Site Equipment</td>
<td>Premise CPE, rack, battery backup ($3k per site)</td>
<td>$984,000</td>
</tr>
<tr>
<td>Facilities</td>
<td>Data Center Renovation/Preparation or Pre-Fab</td>
<td>$300,000</td>
</tr>
<tr>
<td>Software</td>
<td>Network Management Software, Fiber Management</td>
<td>$75,000</td>
</tr>
<tr>
<td><strong>Fiber Backbone Project Total:</strong></td>
<td></td>
<td><strong>$29,281,049</strong></td>
</tr>
</tbody>
</table>

- Backbone design was contracted by the City in 2021 and is underway.
- Estimated $1.9M of construction is for costs associated with UG construction of critical/difficult crossings.
Project Background

Fiber to the Premise Plan

Backbone design was contracted by the City in 2021 and is underway.

Estimated $4M of construction includes additional duct for FTTP to be included in the backbone route. Not needed if build is for backbone only.

<table>
<thead>
<tr>
<th>FTTP Cost Element</th>
<th>Description</th>
<th>Current Cost Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Design</strong></td>
<td>Design, Engineering, Permitting Preparation</td>
<td>$3,854,000</td>
</tr>
<tr>
<td><strong>Construction</strong></td>
<td>UG Construction of Conduit and Fiber</td>
<td>$46,250,000</td>
</tr>
<tr>
<td><strong>Backbone FTTH Adder</strong></td>
<td>Additional FTTP conduit included in Backbone segments</td>
<td>$4,000,000</td>
</tr>
<tr>
<td><strong>Contingency</strong></td>
<td>10% Construction Contingency</td>
<td>$5,250,000</td>
</tr>
<tr>
<td><strong>CEI and Project Management</strong></td>
<td>Construction Management, Inspections Services</td>
<td>$2,400,000</td>
</tr>
</tbody>
</table>

Fiber OSP Construction Total: $61,754,000

<table>
<thead>
<tr>
<th>Facilities</th>
<th>Description</th>
<th>Current Cost Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Data Center</strong></td>
<td>Renovation/Preparation or Pre-Fab</td>
<td>$900,000</td>
</tr>
<tr>
<td><strong>General Equipment and Vehicles</strong></td>
<td>General Tools and Equipment</td>
<td>$383,000</td>
</tr>
<tr>
<td><strong>Core Network Equipment, Software, etc.</strong></td>
<td>Hardware, Software and Storage</td>
<td>$4,521,600</td>
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</tbody>
</table>

Fiber Drops to Premises: Based on Estimated Uptakes 35% Single-Family, 35% MDU, 35% Business

Fiber FTTP Project Total: $86,375,200

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Project Background

Consumer Survey

Broadband Survey Overview

2,727 SURVEY PARTICIPANTS

98% HAVE BROADBAND

The top reason why 2% of respondents do not have broadband is because it is too expensive.

During this time, 83% of Waterloo’s citizens said that their needs for broadband access have increased.

Providers in Waterloo

- MEDIACOM
- CENTURYLINK
- CFU
- T-MOBILE
- RISE BROADBAND
- HUGHESNET
- VIASAT
- OTHERS

Median Speed

- 75.26 Mbps
- 22.42 Mbps

Average Price Per Expected Download Speed

$92.11 / 25 Mbps
$88.74 / 100 Mbps
$108.78 / 1 Gbps
$3.68 / Mbps
$0.89 / Mbps
$0.11 / Mbps

Frequency of Broadband Use per Residential Activity

- Personal Research: Daily 53%, Weekly 32%, Monthly 14%, Infrequently 29%
- Telecommute: Daily 34%, Weekly 11%, Monthly 13%, Infrequently 42%
- Telehealth: Daily 8%, Weekly 13%, Monthly 51%
- Home Business: Daily 25%, Weekly 8%, Monthly 63%
- School: Daily 53%, Weekly 30%, Monthly 7%, Infrequently 29%

How often does your internet slow down?

- Daily: 25%
- Weekly: 28%
- Monthly: 20%
- Infrequently: 29%

56% of the citizens experience a noticeably slow internet multiple times a week to daily.

Most citizens consider speed, price, reliability and provider’s reputation and support to be of critical importance to them.

Over half of them are dissatisfied with the price and provider support they are currently receiving.
Project Background

Determining Priority Areas

- Route Distance
- Avg. Cost Per Foot
- Surveys by LCP
- HHP Counts
- Avg. Cost per HHP
- Download and Upload Speeds
- Total LCP Cost
- HUD Low/Mod
- 100/20 Speeds
**Project Background**

**Buildout Concept by Phase with OSP Costs**

<table>
<thead>
<tr>
<th>Phase</th>
<th>HHP</th>
<th>Cost</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase 1</td>
<td>10,970</td>
<td>$14.71 M</td>
<td>Green</td>
</tr>
<tr>
<td>Phase 2</td>
<td>9,326</td>
<td>$16.40 M</td>
<td>Yellow</td>
</tr>
<tr>
<td>Phase 3</td>
<td>8,897</td>
<td>$16.60 M</td>
<td>Red</td>
</tr>
</tbody>
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### Phase 1
- **HHP:** 10,970
- **Cost:** $14.71 M
- **Color:** Green

### Phase 2
- **HHP:** 9,326
- **Cost:** $14.60 M
- **Color:** Yellow

### Phase 3
- **HHP:** 8,897
- **Cost:** $16.60 M
- **Color:** Red
**Business Model Review**

### Retail Provider
- City’s muni/revenue bond and broadband services revenue - funded network, only connecting paying residential and/or business subscribers
  - Full City Control
  - 100% City Revenue
  - Supports Local Waterloo Community
  - Utilize City’s Strong Brand & Image
  - City & Utility Operations
  - Legal Authority
  - Partnership with neighboring cities for core services
- Bond/Finance Entire Cost (Including Working Capital)
- Construction, Management & Operations
- Additional Staffing Required
- Competition (Marketing & Customer Service)
- Technological Risks - Uncertainties

### Open Access
- Competitively select retail ISPs to partially fund network build out, connecting paying residential and/or business subscribers
  - Reduces Operational Risk
  - Facilitates Cost Sharing and Competition
  - Expands High Speed Broadband City coverage
- Less City Control
- Loss of Revenue Opportunity
- Possible Operating Cost
- Unsure of Partner’s CAPEX contribution
- Unsure of Partner’s service coverage
- Partner Market Failure/Abandonment
- Legal Risks
Key Decisions and Direction

What Business Model does the City Council Prefer?
1. Retail Model deployed under WCU to provide full retail services
2. Open-access conduit and dark fiber system
3. Build backbone, and wait and see of FTTP/FTTH

How should the City fund this project?
• ARPA allocations
• Bond/Finance – General Obligation or Telecom Revenue
• State and/or Federal Grants

If GO Bond financing is preferred, there is a mid-July deadline for referendum language
### Recommendations & Next Steps

**Finalize Design**  
**August 2022**
- PE Stamps
- Final Engineers Estimates
- Complete Design Package

**Procurement of Construction and Materials**  
**August 2022**
- Release RFP for Fiber OSP Construction
- Release RFP for Materials
- Issue Contracts
- Procure facilities and begin renovations
- Procure network equipment, software and services

**Procurement of Project Components**  
**January 2023**

**Finalize Agreements for Services**  
**January 2023**
QUESTIONS?

June 20, 2022