Cambridge MA Broadband Task Force Meeting

March 2, 2016
Today’s Agenda

• Opening Remarks/Comments (10 minutes)
• Upcoming Steps in the Task Force Process (15 minutes)
• Presentation and discussion on:
  • Operating Models (40 minutes)
  • Funding and Financing Strategies (15 minutes)
  • Capital Cost Strategies (20 minutes)
• Public Comment
Expected Upcoming Steps In Task Force Process

- Mid-March: Draft Full Report and Recommendations from Tilson to Task Force
- Late March: Written Task Force Comments on Draft
- Mid-April: Task Force Meeting to Discuss Differing Comments
- Late April: Revised Final Report and Recommendation from Tilson
- Mid-May: Task Force Meeting to Discuss Task Force Recommendations to the City
Major Report Headings

• Goals
• Existing Broadband Services
• Community Outreach Summary & Survey Results
• The Gap Between Current State and Goals
• Business Models
  • Capital Cost Strategies
  • Operating Models
  • Funding and Financing Models
• Sample Fiber Designs and High-Level Capital Cost Estimates
• Operating Expenses
• Case Studies and Lessons Learned
• Regulatory & Public Policy Analysis
• Conclusions, Recommendations and Potential Next Steps
OPERATING MODELS
Three Broad Categories / Approaches

- Own and operate it yourself
- Own it and have a private partner / contractor operate it
- Anchor a privately owned and operated network.
## Operating Responsibilities—Public or Private

<table>
<thead>
<tr>
<th>Physical maintenance</th>
<th>Targeted Network</th>
<th>Partial Network</th>
<th>Full Network</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Smaller network, less to maintain, still may require rapid-response capability</td>
<td>May be larger, but “dark” network; still requires rapid-response capability</td>
<td>Greatest level of maintenance; both glass and electronics</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Marketing and customer acquisition</th>
<th>Targeted Network</th>
<th>Partial Network</th>
<th>Full Network</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limited user base; customers may even be captive</td>
<td>Small number of wholesale, institutional, and enterprise users</td>
<td>Essential to have in most cases</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Billing</th>
<th>Targeted Network</th>
<th>Partial Network</th>
<th>Full Network</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small number of users to bill; billing may be aggregated</td>
<td>Small number of users, relatively simple billing</td>
<td>Large volume of bills; many have many types of services</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Customer service and technical support</th>
<th>Targeted Network</th>
<th>Partial Network</th>
<th>Full Network</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smaller number of users; closer to internal helpdesk</td>
<td>“Dark” network, less to trouble-shoot; must be able to handle interconnection requests</td>
<td>Large number of customers to support; many may not be technically sophisticated</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Network management and monitoring</th>
<th>Targeted Network</th>
<th>Partial Network</th>
<th>Full Network</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smaller number of users; closer to internal network management</td>
<td>“Dark” network requires little active management</td>
<td>Requires active, continual monitoring capability</td>
<td></td>
</tr>
</tbody>
</table>
## Operating Model Responsibilities

<table>
<thead>
<tr>
<th>Ownership</th>
<th>Who operates facilities</th>
<th>Who takes operating risk</th>
<th>Who gets revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>City Operator</td>
<td>City</td>
<td>City</td>
<td>City</td>
</tr>
<tr>
<td>Private Operator on Municipal Network</td>
<td>City and (and possibly Private Partner)</td>
<td>Private Partner (and possibly City)</td>
<td>Private Partner (and possibly City)</td>
</tr>
<tr>
<td>Private Owner; City is Anchor</td>
<td>Private Partner</td>
<td>Private Partner (and possibly City)</td>
<td>Private Partner (and possibly City)</td>
</tr>
</tbody>
</table>
Operating Model Examples

- Municipally owned and operated
  - Chattanooga, TN
  - Lafayette, LA
  - Burlington, VT
  - Utopia, UT
  - Santa Monica, CA
- Municipally owned, partner operated
  - Leverett, MA
  - Westminster, MD
- Privately Owned and Operated Network; City is Anchor User
  - South Portland, ME
### Local Control and Risk

<table>
<thead>
<tr>
<th></th>
<th>Municipally Owned and Operated</th>
<th>Publicly Owned Network Operated by Private Partner</th>
<th>Privately Owned and Operated Network; City is Anchor User</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Local Control</strong></td>
<td>Green</td>
<td>Yellow</td>
<td>Red</td>
</tr>
<tr>
<td><strong>Operating &amp; Execution Risk Undertaken by the City</strong></td>
<td>Red</td>
<td>Yellow</td>
<td>Green</td>
</tr>
</tbody>
</table>
## Operating Models: Major Types of Risk

<table>
<thead>
<tr>
<th>Municipally Owned and Operated</th>
<th>Private Operator on Municipal Network</th>
<th>Privately Owned and Operated Network; City is Anchor User</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Municipality’s capacity to execute on a commercial venture &lt;br&gt; • Financial risk from competition</td>
<td>• Performance by the selected partner &lt;br&gt; • Financial risk from lack of success of the private partner (depending on terms of agreement)</td>
<td>• Performance of selected partner &lt;br&gt; • Financial risk from lack of success of the private partner (depending on terms of agreement) &lt;br&gt; • Long-term alignment of interests</td>
</tr>
</tbody>
</table>
## How Operating Models Address Other Task Force Goals

<table>
<thead>
<tr>
<th></th>
<th>Municipally Owned and Operated</th>
<th>Publicly Owned Network Operated by Private Partner</th>
<th>Privately Owned and Operated Network; City is Anchor User</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Affordability &amp; Equity</strong></td>
<td>Direct City control over services, prices, and build-out</td>
<td>Contract terms on services and prices, City direction or control of build-out</td>
<td>Contract terms on services prices, and build-out</td>
</tr>
<tr>
<td><strong>Supporting Small Business</strong></td>
<td>Direct City control over services, prices, and build-out</td>
<td>Contract terms on services and prices, City direction or control of build-out</td>
<td>Contract terms on services prices, and build-out</td>
</tr>
</tbody>
</table>
| **Innovation & Excellence**   | Direct City control over level of service offered and integration of broadband into public service delivery | • Private innovation in the use of the network and services delivered.  
• Contract terms on the level of service offered  
• Reservation of capacity for integration of broadband into public service delivery | |
| **Choice & Competition**      | • Any operating model should provide at least one more competitive choice.  
• Even more choice depends more on whether network is operated on a closed or open basis. | | |
FUNDING AND FINANCING STRATEGIES
Common Funding Sources and Financing Models

**Funding**
- User fees
- Re-directed municipal telecom expenditures
- Special or enterprise funds
- Grants
- Taxes

**Financing**
- Pay-as-you-go
- Revenue borrowing
- General obligation borrowing
- Private financing with City as “anchor user” in a long-term contract
Some Funding Strategies Examples

• Leverett
  • Taxes
  • User fees

• Santa Monica
  • Re-directed municipal telecom expenditures
  • User fees

• Chattanooga
  • Enterprise funds
  • User fees
  • Grants
Some Financing Strategy Examples

• Leverett
  • General obligation borrowing

• Santa Monica
  • Pay-as-you-go

• Burlington
  • Revenue borrowing
NETWORK DESIGNS/ CAPITAL COST STRATEGIES
“Small” Targeted Network Design
“Medium” Partial Network Design

Proposed Cambridge Fiber Network - Dark Fiber Option

Legend
- Dark Fiber Route
“Large” Full Network Design

Proposed Cambridge Fiber Network - Full Build

Legend
- Phase 3 288 Lateral
- Phase 3 144F
- Phase 3 FTTH 96F
- Neighborhoods

TILSON
## Alignment of Goals and Capital Cost Strategies

<table>
<thead>
<tr>
<th></th>
<th>Full Build</th>
<th>Partial Build (Dark Fiber Only)</th>
<th>Targeted Build (CHA Properties Only)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Affordability &amp; Equity</strong></td>
<td>Green</td>
<td>Yellow</td>
<td>Yellow</td>
</tr>
<tr>
<td><strong>Choice &amp; Competition</strong></td>
<td>Yellow</td>
<td>Green</td>
<td>Green</td>
</tr>
<tr>
<td><strong>Supports Small Business</strong></td>
<td>Green</td>
<td>Yellow</td>
<td>Red</td>
</tr>
<tr>
<td><strong>Innovation &amp; Excellence</strong></td>
<td>Yellow</td>
<td>Green</td>
<td>Red</td>
</tr>
<tr>
<td><strong>Local Control</strong></td>
<td>Green</td>
<td>Yellow</td>
<td>Green</td>
</tr>
<tr>
<td><strong>Capital Cost</strong></td>
<td>Highest</td>
<td>Lower</td>
<td>Lowest</td>
</tr>
</tbody>
</table>

The table compares different capital cost strategies with their alignment across various goals.

- **Full Build** provides the highest level of support for several goals, including Affordability & Equity, Choice & Competition, Innovation & Excellence, Local Control, and Capital Cost.
- **Partial Build (Dark Fiber Only)** offers a middle ground with moderate benefits across most goals.
- **Targeted Build (CHA Properties Only)** focuses on local control, with the highest cost implications.

---

**Note:** The colors represent the level of alignment: Green indicates high alignment, Yellow indicates moderate alignment, and Red indicates low alignment.