The Leverett Municipal Broadband Model

An Overview of Institutional, Contractual and Financial Arrangements

MLP Board of the Town of Leverett, MA

Preface

This material was developed by consultants at DHInfrastructure in cooperation with the Leverett Municipal Light Plant (LMLP) and the Town of Leverett, Massachusetts. The material is meant to inform policymakers and the general public on Leverett's approach, and in particular, to offer information that will help towns considering how best to bring high speed Internet to unserved or underserved populations.

The LMLP is a municipal light plant established under Massachusetts General Law 164 to provide high speed Internet and telephony services to residents, public buildings and businesses in the Town of Leverett. The service is known as "LeverettNet". As a municipal entity, the LMLP serves as the custodian of the network assets, which are in turn owned by the Town. The LMLP is governed by a three member board of un-paid volunteers, each appointed by the Town's Select Board. The LMLP board appoints a Manager to oversee all contracts related to network operations. The LMLP Manager concurrently serves as the Town Administrator. More information on LeverettNet and the LMLP may be found at lmlp.leverettnet.net.

DHInfrastructure LLC is an economic consulting firm that specializes in regulated network infrastructure. DHInfrastructure advises governments, investors, and utilities on matters related to the energy, water, telecommunications and transport industries; applying principles of economics and finance to public policy, regulation, litigation of disputes and infrastructure acquisitions. More information on DHInfrastructure may be found at www.dhinfrastructure.com.

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Contractual Arrangements

Contractual Arrangements

Pre-construction and construction phases

Construction Agreement
Defines MCG's responsibilities for:
- Network design to households
- POP Design
- Drops and ONT installation
- Make-ready oversight
- Network equipment and fiber construction

Town of Leverett/MLP

Select Board

Pole Attachment Agreement
Governs MLP, Verizon, and Eversource's responsibilities for pre-construction inspection and make-ready work for pole attachments

HG&E

MCG

Eversource and Verizon

Homeowners

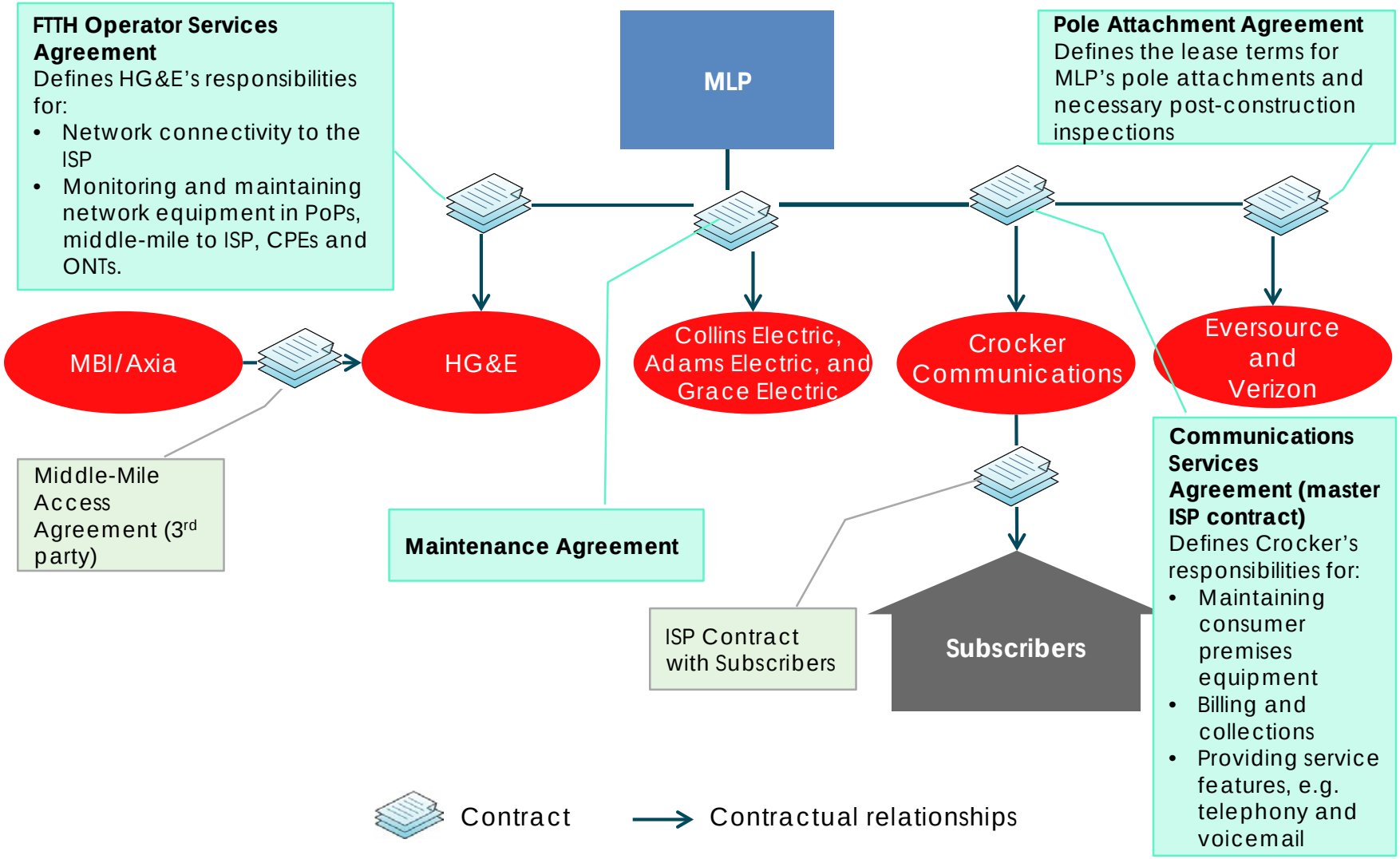
Project Management Services Agreement
Defines HG&E's responsibilities as the project manager ("Clerk-of-the-Works") for the development of LeverettNet including bidding and construction phases

Right of Entry Agreement
Authorizes MLP to install and maintain network equipment on the premises

Contract → Contractual relationships

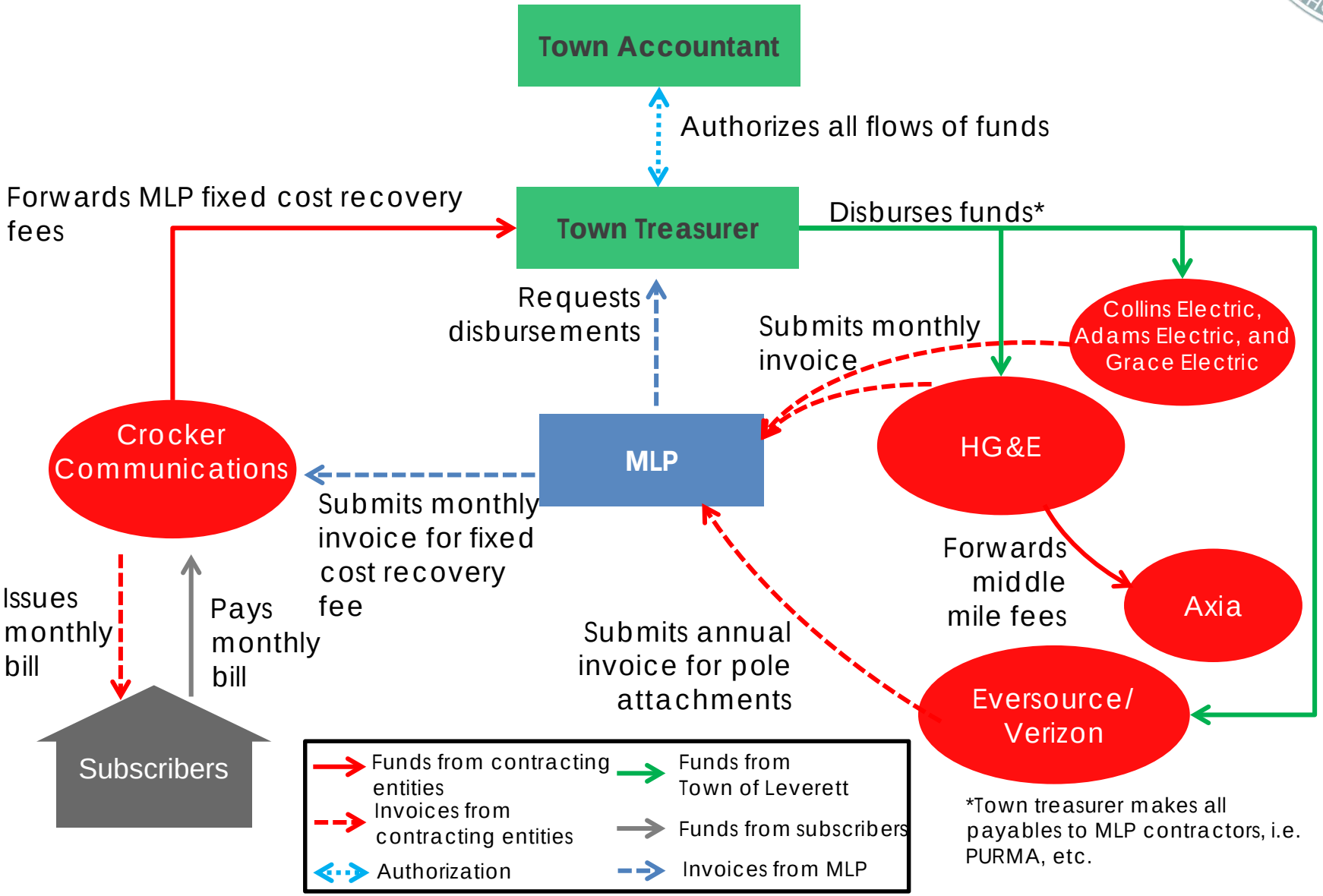
Contractual Arrangements

Operations

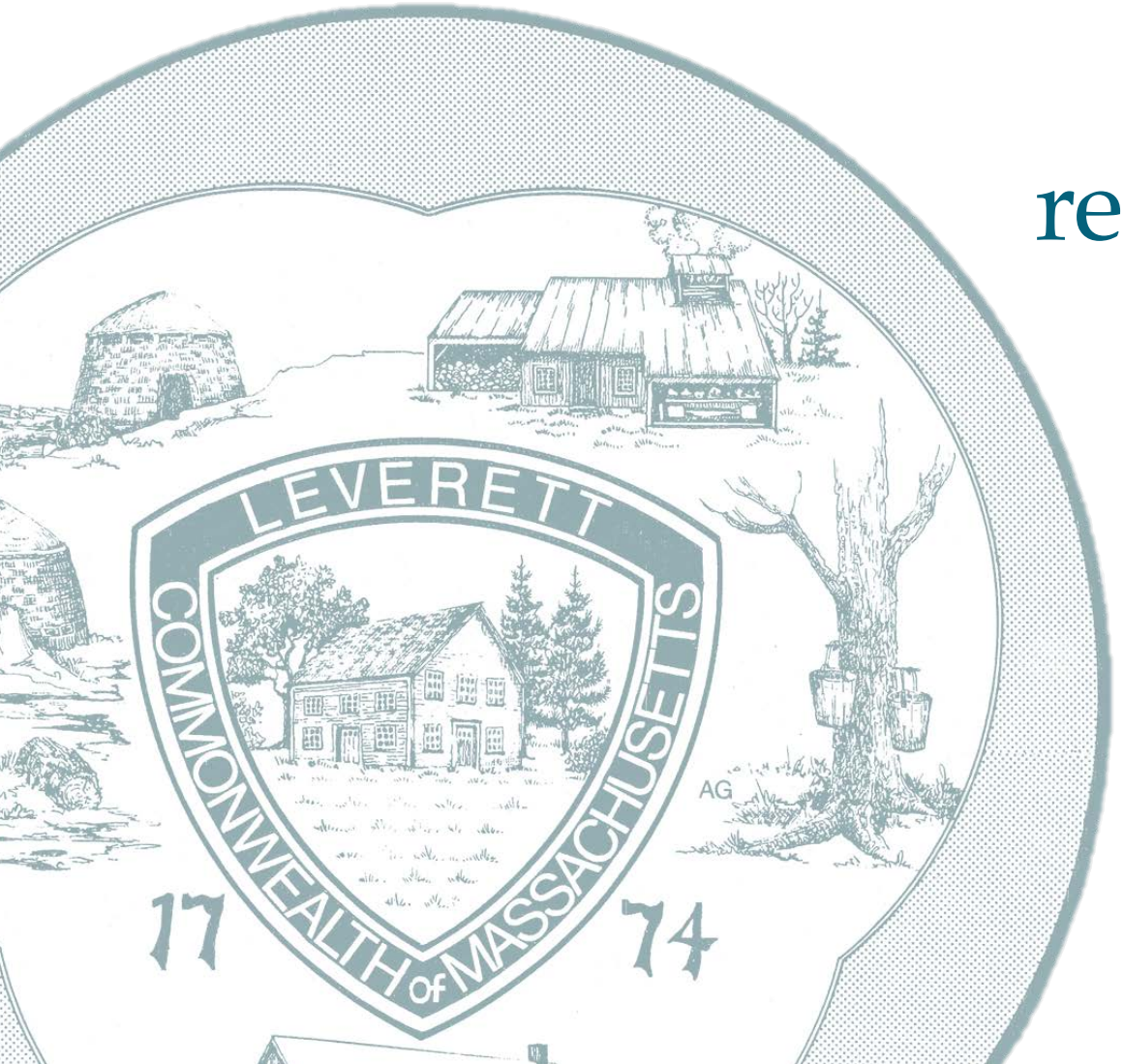


Contractual Arrangements

Operational flow of funds

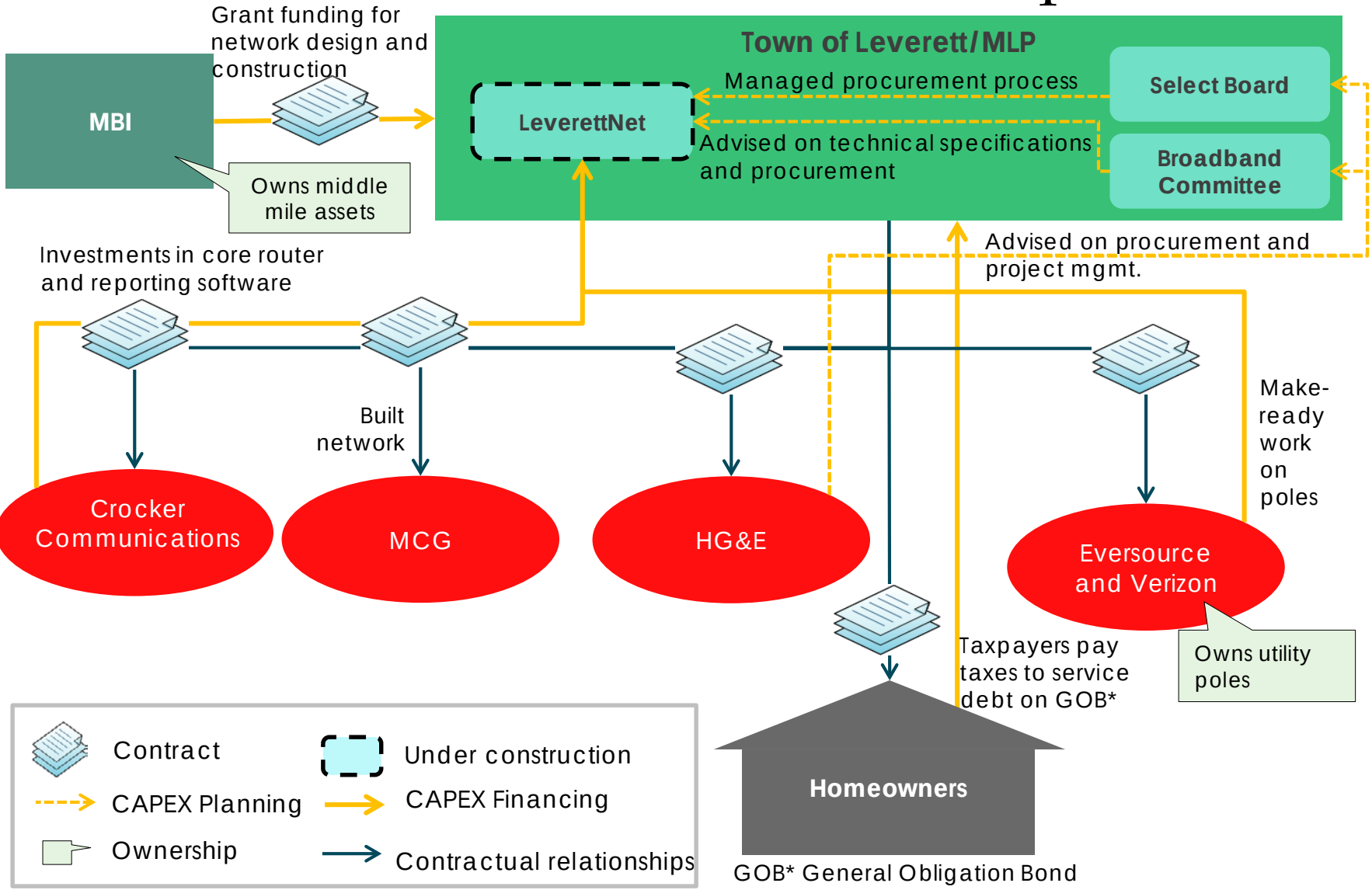


Allocation of responsibilities



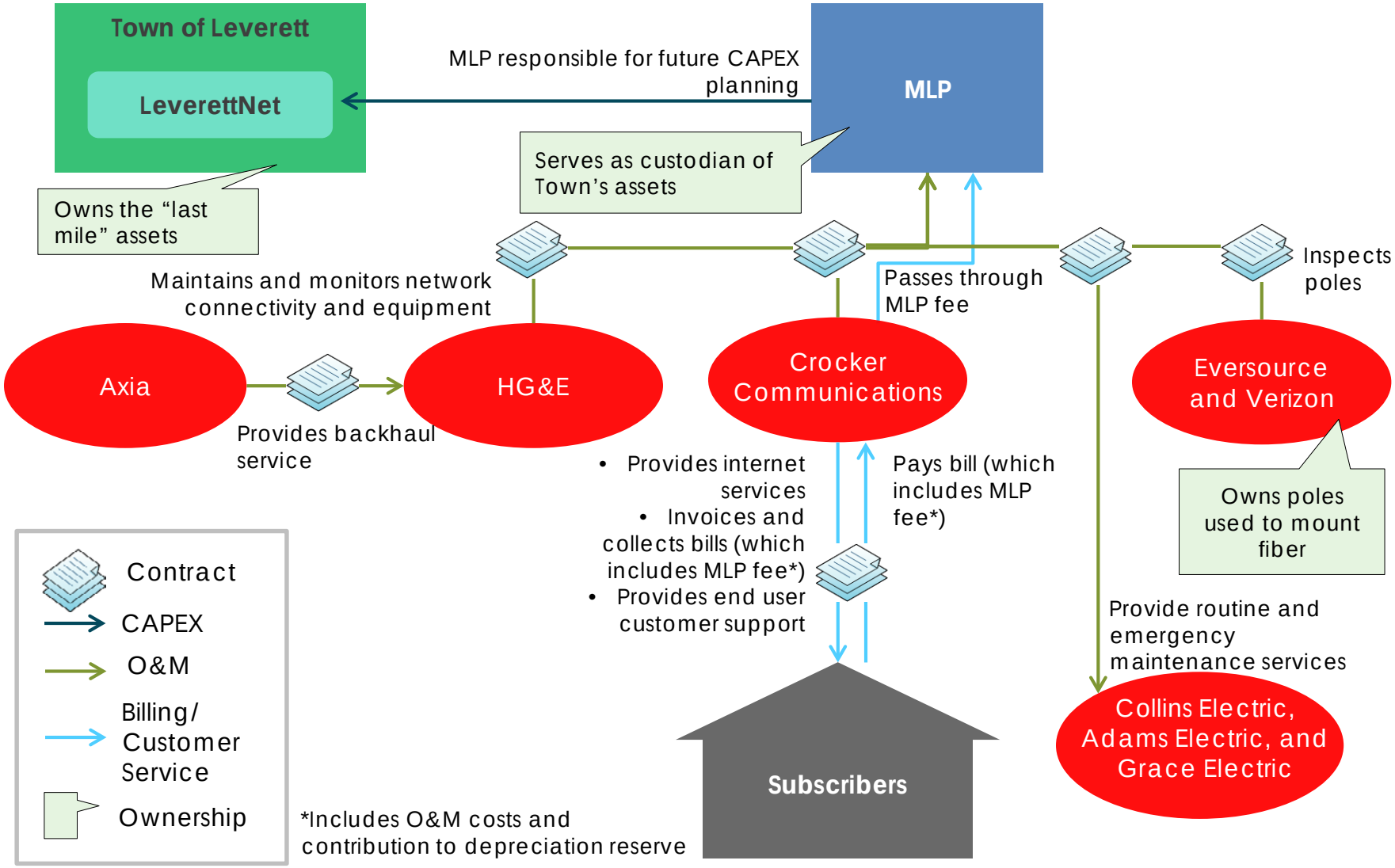
Allocation of Responsibilities

Pre-construction and construction phases



Allocation of Responsibilities

Operations



Allocation of Responsibilities

Function	Role(s) of Entities
Ownership of Assets	▪ **Town of Leverett** owns the "last mile" assets. ▪ **MLP** serves as the custodian of the Town's assets. It may borrow against the revenue stream from assets, but is restricted by MGL 164 in its ability to sell or dispose of the assets. ▪ **MBI** owns the middle mile assets which run to Town "anchor institutions"; MLP connects to middle mile at one location. There are two PoPs, one connected to the other, and one connected to the middle mile. ▪ **Verizon and Eversource** own poles used to mount fiber. MLP is licensed by the utilities to use the poles under a lease agreement.
CAPEX Planning	▪ **Town of Leverett** managed the procurement of LeverettNet. It issued IFBs and RFPs and managed the bid process for network design and construction. ▪ **HG&E** was hired to advise on procurement and project management. ▪ **MLP** will be responsible for future CAPEX planning.
CAPEX Financing	▪ **Town of Leverett** taxpayers pay taxes to service debt on general obligation bond. ▪ **MBI** provided grant funding for network design, construction, and startup. ▪ **Subscribers** through monthly fees pay O&M expenses, which include contribution to a depreciation reserve. ▪ **Crocker Communications** made investments in core router and reporting software before commencing operations.

Allocation of Responsibilities

Function	Role of Entities
Operations	▪ **HG&E** maintains and monitors network connectivity and equipment under a 5-year operating contract with the MLP. ▪ **Axia NGNetworks USA** provides backhaul service under a contract with HG&E. ▪ **Crocker Communications** provides internet and telephone services to the subscribers. ▪ **Verizon and Eversource** periodically inspect leased utility poles.
Maintenance	▪ **MLP** contracts for maintenance with Collins Electric, Adams Electric and Grace Electric.
Billing and collections	▪ **Crocker Communications** invoices and collects bill payments from subscribers. Pays MLP fee to MLP's account with Town of Leverett Treasurer. MLP fee covers O&M, which includes a contribution to a depreciation reserve account.
Customer Service	▪ **Crocker Communications** handles end-user customer support. ▪ **Collins Electric** handles network service calls up to ONT on subscriber premise. ▪ **Adams Electric** and **Grace Electric** handle service calls at the residence, including the ONT.
Regulation	▪ **MA Department for Public Utilities** reviews annual reports submitted by MLP. ▪ **MLP** sets prices for end-user services as established by MGL 164.

Financial Arrangements

Overview of Costs

Estimated Annual Cash Cost (2016)

Cost Category	Cost		Revenue
Project-related costs*	Debt Service on General Obligation Bond** ($175,000)/year		Leverett Taxpayers $175,000/year
+	+		
Operating & Maintenance Costs	Insurance, pole rentals, labor, electricity, etc. ($343,600)/year		MLP Fee from LeverettNet Customers*** ($343,600)
Total Annual Cash Cost	$518,600/year	=	$518,600/year

*Includes other project costs, such as make ready costs, and police details. See slides on Project-related costs for more details.

**The annual interest rate on the bond, and hence debt service, vary from year to year, between 2% and 4%.

***The MLP fee is a separate charge billed by the ISP, Crocker Communications, and transferred to the LMLP. The fee is set to recover network operation and maintenance costs, as determined by the LMLP.

Cost of Service

Project-related Costs and Funding

Costs

- Preliminary Design Cost ($40,000)
- +
- Construction & related costs ($3,645,049)
- +
- Other start-up costs ($48,685)

Funding (before bonding)

- MBI Grant in 2011 $40,000
- +
- MBI Grant in March 2015 $27,700
- +
- Revenue Anticipation Notes

Funding (after bonding)

- MBI Grants July-Sept 2015 $738,300*

Funding (total)

- MBI Grants $806,000
- +
- Pre-subscription revenue $26,817
- +
- General Obligation Bond $2,900,917

Total Project Costs ($3,733,734)

Total Funding $3,733,734

*An additional $100,000 was reserved by MBI as a holdback and has not yet been disbursed. This funding will be applied to reduce the Town's debt service on the municipal bond, in accordance with the terms of the Leverett Town Meeting bond authorization vote.

Cost of Service

Total Project Costs

Expense Item	Amount
Preliminary design (G4S)	$40,000
Construction (MCG)	$2,592,593
Contract with HG&E	$207,000
Application fee to Eversource	$66,150
Application fee to Verizon	$20,521
Additional pay to Verizon	$6,313
Application fee to National Grid	$2,239
Verizon Conduit search	$1,029
Modular Building construction	$264,360
Make ready costs	$327,577
Police details	$107,000
Bond	$8,400
Other insurance	$400
Advertising	$628
Legal	$20,060
Grants consultant	$6,500
Miscellaneous – postage	$469
Printing costs	$2,353
POP Electricity	$1,364
Auditor	$1,800
UTC membership	$500
Tree work	$6,250
Website	$807
Fire extinguishers at PoPs	$736
Other start-up costs	$48,685
Total committed or spent	**$3,733,734**

Cost of Service

Budgeted Operating and Maintenance Costs

Expense Item	Cost ($)
Depreciation of fiber plant*	90,000
Depreciation of electronics*	52,000
PURMA dues	1,200
Insurance	23,400
Bond fee for poles	4,200
Pole rental	18,000
Accountant	3,000
Bookkeeper, Manager, Town Treasurer	5,000
Routine maintenance	32,000
Network operator	82,800
Legal	10,000
POP electricity	5,000
Contingency**	17,000
Total OPEX	**343,600**

*MGL Chap 164 Sec. 57 requires that the MLP collect revenue to cover depreciation and deposit the revenue in a separate fund used only for asset renewals.

**MGL Chap 164 Sec. 58 allows recovery of a return of up to 8% of the cost of the plant. Leverett has instead opted to recover an amount equal to roughly 3% of operating costs, as a contingency (well below the 8% allowed return on assets).

Next Steps

Follow-on Work

Forthcoming analysis of the Leverett Model

This collection of slides is the first of several outputs intended to describe and analyze various aspects of the approach Leverett used to build, finance and operate its municipal broadband network.

DHInfrastructure will work with the LMLP to produce additional outputs that support Leverett's commitment to be helpful to other communities, and to speak to questions the LMLP has been responding to in recent months. Possible future outputs include analysis of:

- risk allocation and incentives in the LeverettNet contractual arrangements
- the Leverett model as a public-private partnership (PPP)
- LeverettNet's financing structure, as compared to other options
- LeverettNet network usage/behavior for consideration of bandwidth allocation and performance tuning

Appendix

Glossary of Acronyms & Abbreviations

Acroynm/Abbreviation	Meaning
CAPEX	Capital Expenditure
CPE	Customer Premises Equipment
GOB	General Obligation Bond
HG&E	Holyoke Gas & Electric
IFB	Invitation for Bid
ISP	Internet Service Provider
LMLP	Leverett Municipal Light Plant
MA	Massachusetts
MBI	Massachusetts Broadband Institute
MCG	Millennium Communications Group, Inc.
MGL	Massachusetts General Law
MLP	Municipal Light Plant
O&M	Operations and Maintenance
ONT	Optical Network Terminal
OPEX	Operating Expenditure
PoP	Point-of-Presence
PPP	Public-Private Partnership
PURMA	Public Utilities Risk Management Association
RFP	Request for Proposals

Background and Demographics

The LMLP makes this report available for use by persons and organizations interested in municipal broadband, particularly in projects aimed at meeting rural broadband needs. LeverettNet is one model of how a small, rural town tackled the problem of providing 21st century telecommunications infrastructure to its residents, businesses, and municipal departments.

The Town of Leverett, population 1,800, is located in Franklin County, Massachusetts, between the Towns of Amherst, Montague, Sunderland, Wendell, and Shutesbury. An elected three-member SelectBoard oversees Leverett government, along with several other elected and appointed officials. The Town has approximately 43 miles of roads. The 2012 median income was $36,503 (MassDOR). Leverett has a diverse, rich cultural history, ranging from early industrial corridors along rivers and streams to the first Peace Pagoda in the country, to large tracts of forestland. Approximately 53% of the land in town is classified under M.G.L. Chapter 61 for forest, agriculture, or recreation protection.

In August 2015, Leverett completed LeverettNet, a "last-mile" town-wide Fiber-Optic-to-the-Home (FTTH) broadband network. LeverettNet is owned by the Town and operated under the telecom authority of the Leverett Municipal Light Plant (LMLP), which contracts with third parties for Network Operator, Internet Services Provider, and maintenance functions.

LeverettNet provides symmetrical 1-Gigabit-per-second (1Gbps) Active Ethernet connectivity between each subscriber location and the Internet Point of Presence. LeverettNet connects from the Point of Presence to the Internet Service Provider at 2-Gigabits-per-second, via the Massachusetts Broadband Institute "middle mile" network, a project of the Massachusetts Technology Collaborative.