IN THE SUPERIOR COURT OF THE STATE OF WASHINGTON
IN AND FOR THE COUNTY OF PIERCE

MITCHELL SHOOK, Plaintiff, v. CITY OF TACOMA, Defendant.	NO. 19-2-11760-1 DECLARATION OF MITCHELL SHOOK

I, Mitchell Shook, declare as follows: I am a resident of Tacoma, ratepayer of Tacoma Public Utilities, taxpayer to City of Tacoma, and customer of Click!, the municipal broadband telecommunications system operated by Tacoma Public Utilities. I am an expert in matters related to Click! Network and the ISP industry, with 20 years of experience working with Click! and other open access systems, in my role as Founder and CEO of Advanced Stream, an Internet Service Provider operating on Click! Network. I have personal knowledge of the matters set forth below.

1. Attached hereto as **Exhibit 1** and incorporated herein by this reference is a true and

MITCHELL SHOOK
3626 6TH AVE SUITE C
TACOMA, WA 98406

correct copy of a screen shot of the TPU website as visited on 10-29-19.

2. Attached hereto as **Exhibit 2** and incorporated herein by this reference is a true and correct copies of the Declaration of Surplus Property, first and last pages of the surplus Resolution U-11116 and sample pages from the City's agreement with Buyer to privatize Click!.

3. Attached hereto as **Exhibit 3** and incorporated herein by this reference is a true and correct copy of the meeting notice for Declaration of Surplus Property related to Click! Network.

4. Attached hereto as **Exhibit 4** and incorporated herein by this reference is a true and correct copy of the timeline for the privatization of Click! Network under the Transaction. As taken from the business transaction agreement.

5. Attached hereto as **Exhibit 5** and incorporated herein by this reference is a true and correct copy of a the City of Tacoma Charter, as download from City's website on 10/29/19.

6. Attached hereto as **Exhibit 6** and incorporated herein by this reference is a true and correct copy of pages from the TPU Annual report as downloaded by me from TPU's website.

7. Attached hereto as **Exhibit 7** and incorporated herein by this reference is a true and correct copy of a Click! Annual Report to The City of Tacoma, obtained thru my public disclosure request from Defendant.

8. Attached hereto as **Exhibit 8** and incorporated herein by this reference is a true and correct copy of a pages from the Tacoma Municipal Utility Code downloaded by me from City's website on 10/29/19.

9. Attached hereto as **Exhibit 9** and incorporated herein by this reference is a true and correct copy of a pages from the TPU 2018 annual report and the August 2019 Click! operational summary, with the addition of purple arrows and comments added for emphasis and explanation.

10. Attached hereto as **Exhibit 10** and incorporated herein by this reference is a true and

MITCHELL SHOOK
3626 6TH AVE SUITE C
TACOMA, WA 98406

correct copy of TPU's 1997 Resolution U-33668, along with part of the Telecommunication Study and Business Plan associated with the creation of Click!

11. Attached hereto as **Exhibit 11** and incorporated herein by this reference is a true and correct copy of Ordinance 25930 for creation of telecommunication system.

12. Attached hereto as **Exhibit 12** and incorporated herein by this reference is a true and correct copy of a Court order and brief from 1996 Summary Judgement for creation of telecommunication system.

13. Attached hereto as **Exhibit 13** and incorporated herein by this reference is a true and correct copy of a Court order and brief from 1997 Summary Judgement for creation of telecommunication system

14. Attached hereto as **Exhibit 14** and incorporated herein by this reference is a true and correct copy of City of Tacoma Resolution No. 33668.

15. Attached hereto as **Exhibit 15** and incorporated herein by this reference is a true and correct copy of City's FCC Transparency Disclosure and sample filing of the City's FCC 499, 477 and 471 Filings.

16. Attached hereto as **Exhibit 16** and incorporated herein by this reference is a true and correct copy of the City's 2018 Tax payments for the System, with the addition of purple emphasis and explanation.

17. Attached hereto as **Exhibit 17** and incorporated herein by this reference is a true and correct copy of a Click! Telecommunications System Installation Agreement.

18. Attached hereto as **Exhibit 18** and incorporated herein by this reference is a true and correct copy of a report titled: A Sampling of Municipal Broadband Utilities in the USA Compiled by Mitchell Shook, June 22, 2019.

MITCHELL SHOOK
3626 6TH AVE SUITE C
TACOMA, WA 98406

19. Attached hereto as **Exhibit 19** and incorporated herein by this reference is a true and correct copy of an October 2019 Surplus Property Resolution from City of Duvall.

20. Attached hereto as **Exhibit 20** and incorporated herein by this reference is a true and correct copy of AGO 2003 Attorney General Opinion on City Authority to Operate Telecommunications.

21. Attached hereto as **Exhibit 21** and incorporated herein by this reference is a true and correct copy of a Report from The Executive Office of the President: COMMUNITY-BASED BROADBAND -THE BENEFITS OF COMPETITION AND CHOICE FOR COMMUNITY DEVELOPMENT AND HIGHSPEED INTERNET ACCESS. (January 2015):

22. Attached hereto as **Exhibit 22** and incorporated herein by this reference is a true and correct copy of pages from A Light in Digital Darkness Public Broadband after Tennessee v. FCC. 20 YALE J. L. & TECH. 311 (2018).

23. Attached hereto as **Exhibit 23** and incorporated herein by this reference is a true and correct copy of the United States Department of Agriculture's webpage promoting its "Rural Utilities" program to build and expand broadband networks.

24. Attached hereto as **Exhibit 24** and incorporated herein by this reference is a true and correct copy of pages from Senate Bill 5511. Adopted 04/16/2019, showing new legislation passed and State of Washington's public policy and legislative intent for promoting Broadband showing new legislation that just passed. It demonstrates the State of Washington's public policy and legislative intent for promoting Broadband (including by Public Utilities).

25. Attached hereto as **Exhibit 18** and incorporated herein by this reference is a true and correct copy of screen shots I have recently taken of the City of Tacoma Municipal Code and Purchasing Policy Manual, along with the guidelines for disposing of surplus property as

MITCHELL SHOOK
3626 6TH AVE SUITE C
TACOMA, WA 98406

obtained from the MSRC website.

26. Attached hereto as **Exhibit 26** and incorporated herein by this reference is a true and correct copy of Click! Networks Organizational chart as obtained by my public disclosure request in 2018.

27. Attached hereto as **Exhibit 27** and incorporated herein by this reference is a true and correct copy of pages from the City's slide presentation related to the Transaction as presented at the TPU Board meeting on October 23, 2019.

28. Attached hereto as **Exhibit 28** and incorporated herein by this reference is a true and correct copy of the AGO Opinion I downloaded from the AGO office.

I declare under the penalty of perjury under the laws of the State of Washington that the foregoing in true and correct.

DATED this 29st day of October, 2019, at Tacoma, Washington.

_____

Mitchell Shook

MITCHELL SHOOK
3626 6TH AVE SUITE C
TACOMA, WA 98406

EXHIBIT 1

Tacoma Public Utilities provides services that are vital to our quality of life

About TPU

- Management Team
- Public Utility Board
- Investors
- TPU Publications
- Latest News
- Events

Our Services

- Power
- Water
- Rail
- Click! Cable TV

About Us

Publicly owned since 1893

Largest department in Tacoma City government

Operates entirely from revenues from sale of services, not from taxes

Governed by the Public Utility Board, the members of which appoint the Director of Utilities

Back

Services

Click! Cable TV

Power

Water

Rail

Our Services

Power

Tacoma Power provides electric service to the city of Tacoma, Fircrest, University Place, Fife, parts of Steilacoom, Lakewood, Joint Base Lewis-McChord, and unincorporated Pierce County as far south as Roy.

Water

Tacoma Water provides clean, reliable water to more than 300,000 people throughout Pierce and King counties and is one of the country's oldest municipally owned water systems.

Rail

Tacoma Rail has provided rail transportation and key freight connections for customers in the greater Tacoma area since 1914. We currently serve 65 customers within three operating districts in Pierce, Thurston, and Lewis counties.

Click! Cable Network

Click! Network is an operating section of Tacoma Power and a multi-service broadband telecommunications provider within the electric company's service area.

https://www.clickcabletv.com

CLICK! CABLE TV
TACOMA PUBLIC UTILITIES

253-502-8900 CAN I GET CLICK? MY ACCO

PRODUCTS PLANS ABOUT WHAT'S ON TV CUSTOMER SUPPORT CA

- Cable TV
- Internet
- Business Services

Keeping You Connected

Click!'s Internet Provider partners provide you fast reliable Internet.

INTERNET PLANS

PRODUCTS

Cable TV
Internet
Internet Service Providers
Business Services

Internet Service Providers

Click! operates an Open Access Network, which is a different business model than traditional telecommunications providers. In an open-access network there is a network owner and operator, and multiple retail service providers that deliver services over the network.

Click! Powered Internet Gives You

- **Choice** - choose from one of the two local Internet Service Providers
- **Selection** - package options designed for you, no matter how many devices and TVs you want to connect to stream content or play games
- **Bundles** - Internet and phone bundles to fit your needs
- **Customer Service** - Friendly support from locally owned companies

SELECT A TV & INTERNET BUNDLE ONLINE

Service Providers

Advanced Stream

253-627-8000
www.advancedstream.com
info@advancedstream.com

Rainier Connect

253-683-4100
www.rainierconnect.com
customerservice@rainierconnect.com

About Click!

Company

Click! Network is an operating section of Tacoma Power and a multi-service broadband telecommunications provider within the electric company's service area.

Vision

To be known for excellence in:

- People – professionals committed to the highest level of customer service and satisfaction, who create and maintain a team environment in which trust, respect, honesty and dignity are valued.
- Products and services – specifically designed to meet and exceed our customer needs through innovative uses of technology.
- Performance – a technically superior network designed and maintained to serve both current and future telecommunications needs of Tacoma Power and of Click! Network customers.

Mission

To develop and deliver to all Tacoma Power customers innovative products and services made possible by the convergence of telecommunications and electric technologies.

Ownership

Click! Network is one of the largest municipally-owned telecommunications systems in the country and part of the City of Tacoma's Department of Public Utilities.

CLICK! CABLE TV
TACOMA PUBLIC UTILITIES

253-502-8900 | CAN I GET CLICK? | MY ACCOUNT

PRODUCTS | PLANS | ABOUT | WHAT'S ON TV | CUSTOMER SUPPORT | CART

High Speed Internet, Powered By Click!

Click!'s Internet Service Provider partners provide fast and reliable internet throughout Tacoma and Pierce County. Connect all your devices in every room, with the fast speeds you need.

SELECT INTERNET PLAN

The Choice is Yours

Click! partners with two local Internet Service Providers to connect your internet service. **Advanced Stream** and **Rainier Connect** offer a variety of speed and pricing options to best fit your internet needs and the flexibility to select the right plan for you.

SELECT A PROVIDER

Internet at the Speed of Life

The Click! Network enables speeds up to 100Mbps. With that kind of speed you can quickly and easily download large files and videos, watch movies, or play games, plus connect multiple devices simultaneously, without slowing down.

TEST YOUR INTERNET SPEED

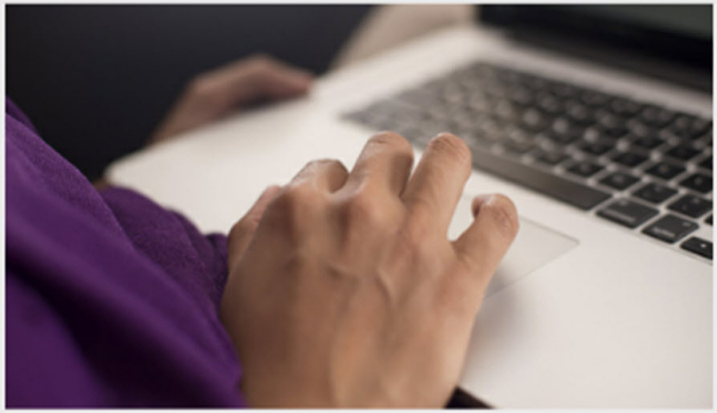


EXHIBIT 2

City of Tacoma
Declaration of Surplus Property (DSP)

To: Purchasing Division **Date:** 10/18/2019
From: Tacoma Power
Contact Name: Tenzin Gyaltsen **Phone:** 502-8763

☒ Declaration of Surplus Personal Property
☐ Declaration of Surplus Real Property
☐ Declaration of Unusable Personal Property[1]

[1] Items that are broken, unusable, have no commercial, salvage, or donation value, and have no special disposal requirements (e.g., hazardous metals), may be disposed by the owning department. Do not submit DSP Form to Purchasing for these items.

Description of Surplus Property

Describe Item or Attach List: See attached A1, A2, A3
Address/Location of Items: _____
Estimated Commercial or Resale Value: See A1, A2, A3 and proposed Agreements with Rainier Connect
Minimum Acceptable Bid: $NA

Fixed Asset # _____
Accounting (for costs/proceeds):
Cost Center: 551000
General Ledger Acct: _____

I hereby certify the asset(s) listed have no further public use or the sale thereof is in the best interests of the City and declare these items as surplus according to sections 1.06.272 through 1.06.278 of the Tacoma Municipal Code. Items may be sold, transferred, donated or otherwise disposed of in accordance with the City's surplus property policies and the Tacoma Municipal Code.

_____ 10/18/19
Department/Division Head Signature Date

_____
City Manager or Director of Utilities (if over $200,000) Date

DISPOSAL REQUEST
(to be completed by department)

Requested Disposal Method(s):

☐ Intra City Transfer
Name of Department _____
☐ Bid Solicitation (Formal / Informal)
☐ Vehicle Auction (attach vehicle surplus form)
Specify Contract _____
☐ Online Auction Service
(attach online auction surplus form)
☐ Special Advertisement (attach advertisement)
Specify Newspaper _____
☐ Supplemental Mailing List (attach)
☐ Website Posting
☐ Special Disposal Requirements (e.g., environmental, regulatory)
☐ Salvage Services
Specify Contract _____
☐ Donation
☐ 2-Good-2 Toss
☒ Other: **Direct negotiation**
☐ Okay for Disposal: _____

DISPOSAL ACTION
Internal Use Only – Purchasing Division

☐ Formal Bid No. _____
Resolution/Ordinance No. _____
☐ Informal Bid No. _____
☐ Online Auction ☐ Website Posting
☐ Special Advertisement ☐ Supplemental Mailings
☐ Contract Services ☐ Intra-City Transfer
☐ Salvage Services ☐ Donation
☐ Okay for Disposal ☐ 2-Good-2 Toss
Date Advertised/Posted: _____
Sale Amount: $ _____
Sold To: Name _____
Address _____
Donated To: Name _____
Address _____
☐ Hold Harmless Release Received
Recipient is: ☐ Public Agency ☐ Non-Profit serving
☐ General Public ☐ Employee
Accounting, if different from above:
_____

APPROVED:

_____
Procurement and Payables Manager Date

RESOLUTION NO. U-11116

A RESOLUTION relating to Tacoma Power; declaring surplus utility-owned property including certain inventory, equipment and vehicles allocated to the Click! Network together with the Excess Capacity of the Tacoma Power HFC Network, part of which is used by what is commonly referred to as the Click! Network; and authorizing execution of the Click! Business Transaction Agreement by and between Tacoma Power and Mashell, Inc., d/b/a Rainier Connect and Rainier Connect North LLC.

WHEREAS in the mid-1990s, the City of Tacoma, Department of Public Utilities, Light Division (d.b.a. "Tacoma Power") determined that the best option to address the shifting advance in telecommunications in the electric utility industry landscape was to construct a hybrid fiber coaxial ("HFC") telecommunications network ("HFC Network"), and

WHEREAS on July 23, 1996, the Tacoma City Council passed Ordinance No. 25930, approving Tacoma Power's proposal to establish and create the HFC Network as part of Tacoma Power's electric utility infrastructure, allowing Tacoma Power to, among other things, connect its generation, distribution, and transmission assets and support the eventual adoption of smart meters and further, to use the excess capacity of the HFC Network to: (1) sell retail cable television service to Tacoma Power's electric customers, and (2) sell data transport and wholesale internet access services to Internet Service Providers ("ISPs") and others, and

WHEREAS on March 26, 1997, the Board adopted Amended Substitute Resolution U-9258, approving Tacoma Power's proposed business plan to develop a state of the art HFC Network to support enhanced control, reliability,

through a negotiated disposition, is in the best interests of Tacoma Power, Tacoma Public Utilities, and the City; and all applicable competitive bidding requirements are hereby waived.

Sec. 3. Tacoma Power will seek City Council's approval of the Board's declaration herein that the Click! Assets and the Excess Capacity of the HFC Network as described herein are surplus to the needs of Tacoma Public Utilities and a declaration that the same are surplus to the needs of the City of Tacoma.

Sec. 4. The Board finds that disposal of the Click! Assets and the grant of the Indefeasible Right of Use of the Excess Capacity in the HFC Network through a negotiated process with Rainier Connect, pursuant to agreements in substantially the form of EXHIBITS "B" and "C", is in the best interests of Tacoma Power and recommends that the City Council approve agreements that are substantially in the form of EXHIBITS "B" and "C".

Approved as to form and legality:

_____
Chief Deputy City Attorney

_____
Clerk

_____
Chair

_____
Secretary

Adopted_____

CLICK! BUSINESS TRANSACTION AGREEMENT

by and between

CITY OF TACOMA, DEPARTMENT OF PUBLIC UTILITIES, LIGHT DIVISION, D/B/A TACOMA POWER

and

MASHELL, INC., D/B/A RAINIER CONNECT

and

RAINIER CONNECT NORTH, LLC

Dated as of _____, 2019

TABLE OF CONTENTS

Page

ARTICLE I DEFINITIONS AND TERMS 2
Section 1.1 Certain Definitions 2
Section 1.2 Other Interpretive Provisions 5

ARTICLE II TRANSFER OF OPERATIONAL CONTROL OF TACOMA POWER COMMERCIAL SYSTEM AND PURCHASE AND SALE OF RELATED SURPLUS ASSETS 6
Section 2.1 Transfer of Operational Control 6
Section 2.2 Purchase and Sale of Related Surplus Assets 7
Section 2.3 Excluded Assets 8
Section 2.4 Assumption of Liabilities 8
Section 2.5 Excluded Liabilities 8
Section 2.6 Purchase Price. 8
Section 2.7 Allocation of Revenues and Prepaid Expenses. 8
Section 2.8 Deliveries by Rainier. 9
Section 2.9 Deliveries by Tacoma Power 9

ARTICLE III REPRESENTATIONS AND WARRANTIES OF TACOMA POWER 10
Section 3.1 Organization and Qualification 10
Section 3.2 Municipal Authorization. 10
Section 3.3 Non-Contravention 10
Section 3.4 Binding Effect 11
Section 3.5 Assets 11
Section 3.6 Finders' Fees 11
Section 3.7 No Default 11
Section 3.8 Condition of Related Surplus Assets. 11
Section 3.9 No Other Representations or Warranties. 11

ARTICLE IV REPRESENTATIONS AND WARRANTIES OF RAINIER 12
Section 4.1 Organization and Qualification 12
Section 4.2 Corporate Authorization 12
Section 4.3 Consents and Approvals 12
Section 4.4 Non-Contravention 12
Section 4.5 Binding Effect 13
Section 4.6 Finders' Fees 13
Section 4.7 No Default 13
Section 4.8 Acceptance of Surplus Related Assets 13
Section 4.9 No Other Representations or Warranties 13

ARTICLE V COVENANTS 13
Section 5.1 Access and Information 13
Section 5.2 Conduct of Business 13
Section 5.3 Commercially Reasonable Efforts 13

(b) the terms defined in the singular have a comparable meaning when used in the plural, and vice versa;

(c) the terms "Dollars" and "$" mean United States Dollars;

(d) unless the context otherwise requires, references herein to a specific Section, Subsection, Recital, Schedule or Exhibit shall refer, respectively, to Sections, Subsections, Recitals, Schedules or Exhibits of this Agreement;

(e) wherever the word "include," "includes," or "including" is used in this Agreement, it shall be deemed to be followed by the words "without limitation";

(f) references herein to any gender include each other gender;

(g) references herein to any Person include such Person's heirs, executors, personal representatives, administrators, successors and assigns; provided, however, that nothing contained in this clause (g) is intended to authorize any assignment or transfer not otherwise permitted by this Agreement;

(h) references herein to a Person in a particular capacity or capacities exclude such Person in any other capacity;

(i) references herein to any contract or agreement (including this Agreement) mean such contract or agreement as amended, supplemented or modified from time to time in accordance with the terms thereof;

(j) with respect to the determination of any period of time, the word "from" means "from and including" and the words "to" and "until" each means "to but excluding";

(k) references herein to any Law or any license mean such Law or license as amended, modified, codified, reenacted, supplemented or superseded in whole or in part, and in effect from time to time; and

(l) references herein to any Law shall be deemed also to refer to all rules and regulations promulgated thereunder, unless the context requires otherwise.

ARTICLE II
TRANSFER OF OPERATIONAL CONTROL OF TACOMA POWER COMMERCIAL SYSTEM AND PURCHASE AND SALE OF RELATED SURPLUS ASSETS

Section 2.1 Transfer of Operational Control. The Transfer of Operational Control shall take place on the last Business Day of the calendar month in which the conditions set forth in Article VI (other than those conditions that by their nature are to be satisfied at the Transfer of Operational Control but subject to the fulfillment or waiver of those conditions) have been satisfied or waived, unless such conditions have not been so satisfied or waived by the fifth Business Day preceding the last Business Day of such calendar month, in which case the

Transfer of Operational Control shall take place on the last Business Day of the next calendar month or at such other time, date or place as the Parties hereto may mutually agree in writing.

Section 2.2 Purchase and Sale of Related Surplus Assets.

(a) On the terms and subject to the conditions set forth herein, at the Transfer of Operational Control Date, Tacoma Power shall sell, convey, transfer, assign and deliver to Rainier, and Rainier shall purchase from Tacoma Power, the Related Surplus Assets, free and clear of all Encumbrances. The "**Related Surplus Assets**" are comprised of:

(i) All spare customer equipment, and other tangible personal property and assets of Tacoma Power relating to the Click! Business, as set forth on Schedule 2.2(a)(i) (collectively, the "**Equipment**");

(ii) All fiber optic cabling, coaxial cabling, supplies, tools and inventories of Tacoma Power relating to the Click! Business (the "**Inventory**"), as set forth on Schedule 2.2(a)(ii);

(iii) All vehicles of Tacoma Power relating to the Click! Business (the "Vehicles"), as set forth on Schedule 2.2(a)(iii);

(iv) All rights of Tacoma Power under those Contracts listed on Schedule 2.2(a)(iv) (collectively, the "Transferred Contracts");

(v) All Governmental Authorizations listed on Schedule 2.2(a)(v) (the "Transferred Authorizations");

(vi) Click! Business customer deposits and pro-rated customer advanced payments for services;

(vii) Copies of all customer account information and other Click! Business information (the "**Records**") reasonably requested by Rainier; and

(viii) All defenses, claims, deposits, prepayments, refunds, causes of action, credits, warranties (including manufacturer's warranties), rights of recovery, rights of set off and rights of recoupment relating to any right, property or asset included in the Related Surplus Assets, or against any party under the Transferred Contracts.

(b) Updated Asset Schedules. On the tenth (10th) Business Day prior to the Transfer of Operational Control, Tacoma Power shall deliver to Rainier revised Schedules 2.2(a)(i), 2.2(a)(iv) and 2.2(a)(v), which shall set forth lists of assets of the type required to be disclosed thereon and relating to the Click! Business that Tacoma Power owns or has the right to own as of such date, including any assets acquired by Tacoma Power after the date hereof (the "**Updated Asset Schedules**") and a statement indicating the value of the Advanced Customer Payments as defined in Section 2.6(a). No later than five (5) Business Days prior to the Transfer of Operational Control Date, Rainier shall notify Tacoma Power whether it accepts or requires revisions to the Updated Asset Schedules or the statement of Advanced Customer Payments. If Rainier accepts the Updated Asset Schedules and Advanced Customer Payments as delivered by

EXHIBIT P
TRADEMARK LICENSE AGREEMENT

THIS AGREEMENT, effective as of _____, ___ is by and between **City of Tacoma, Department of Public Utilities, Light Division**, a municipal corporation of the state of Washington, ("Licensor") and Rainier Connect North, LLC, a Washington limited liability company ("Licensee"). The parties hereto are hereinafter collectively referred to as the "Parties." Capitalized terms used herein and not defined shall have the meanings assigned to them in the IRU Agreement.

WHEREAS, Licensor is the owner of two (2) Washington state trademarks, one for "Click! Cable TV" and symbol (Washington trademark registration number 53233 under trademark classifications 35 and 38) and one for "Click! Cable TV" (Washington trademark registration number 54077 under trademark classification 41), shown in **Exhibit P1** hereto (collectively the "Marks");

WHEREAS, Licensor has used the Marks in connection with the marketing and operation of its retail and wholesale communications business ("Click! Business") but intends to cease operations and transfer control of the assets related to the Click! Business, including but not limited to the Tacoma Power Commercial System, to Licensee as of the Effective Date of this IRU Agreement;

WHEREAS, Licensee desires to use the Marks in connection with the use of the Tacoma Power Commercial System in the manner and subject to the terms and conditions set forth in this Agreement and the IRU Agreement; and

NOW, THEREFORE, In consideration of the premises and the mutual covenants and agreement of the Parties set forth herein and other good and valuable consideration, the sufficiency of which is hereby mutually acknowledged, the Parties agree as follows:

1. GRANT OF LICENSE. Licensor grants to Licensee an exclusive, royalty-free non-transferable license to use the Marks in connection with the Tacoma Power Commercial System, throughout the Tacoma Power Commercial Service Area depicted in IRU Agreement, Exhibit A1.

2. USE OF THE MARKS. Licensee shall comply with the following requirements when using the Marks:

2.1 The use must be accompanied by the following text:

All rights reserved. [Insert Mark] is a trademark of City of Tacoma.

2.2 The use must comply with the applicable provisions of the guidelines set forth in **Exhibit P2** attached hereto.

3. NO ASSIGNMENT. This license to use the Marks may not be assigned or otherwise transferred by Licensee, under any circumstances, without the prior, express, written

consent of Licensor. Licensor does not grant, and nothing in this Agreement shall be construed as granting, to Licensee the right to license, sublicense, or authorize others to use the Marks.

4. OWNERSHIP.

4.1 Licensee acknowledges that the Marks are valid, are the exclusive property of Licensor, and can lawfully be used only with the express license or consent of Licensor. Licensee shall not at any time do, or cause to be done, any act or thing contesting or in any way impairing or intending to impair the validity of the Marks and/or Licensor's exclusive rights, title, and interest in and to the Marks.

4.2 Licensee shall not register or apply to register the Marks, either alone or in combination with any other word(s) and/or design(s), in any country, state, or jurisdiction. Licensee shall not in any manner represent that it owns the Marks, and Licensee hereby acknowledges that its use of the Marks shall not convey any rights, title, or interest in or to said Marks in Licensee's favor, but that all use of the Marks by Licensee shall inure to the benefit of Licensor.

4.3 Licensee shall be responsible for all costs associated with maintaining the registration of the Marks, including all fees charged by the Washington Secretary of State associated with renewing the Marks. Licensee shall provide copies of all filings and correspondence related to the Marks to Licensor.

5. TERM AND TERMINATION.

5.1 Unless sooner terminated under the provisions of Section 5.2 below, or by mutual agreement of the Parties in writing, this Agreement shall continue so long as the IRU Agreement is in full force and effect. In the event that the IRU Agreement is terminated, by either Party and for any reason, this Agreement shall automatically terminate.

5.2 If Licensee fails to comply with any of the provisions of this Agreement, Licensor may terminate this Agreement by express written notice to Licensee; provided, however, that if Licensee, within 60 days after Licensor’s notice, cures or otherwise corrects such violation or noncompliance to Licensor's reasonable satisfaction, said termination notice shall be of no further force or effect and this Agreement shall be reinstated under all the terms and conditions as existed before the notice of termination.

5.3 Upon termination of this Agreement, Licensee shall permanently discontinue all use of the Marks and refrain from using any other service mark, trademark, trade name, corporate name, or any other designation confusingly similar to any one or all of the Marks.

6. INDEMNITY.

6.1 Licensee shall indemnify and defend Licensor against any loss or losses incurred through claims, actions, or lawsuits by third parties against Licensor involving or arising from the use of the Marks by Licensee, and shall hold Licensor harmless for

EXHIBIT 3

SPECIAL MEETING NOTICE

City of Tacoma
Public Utility Board

Wednesday, October 30, 2019
5:30 p.m.
Ground Floor Auditorium
Tacoma Public Utilities
3628 South 35th Street
Tacoma WA 98409

1. Call to Order

2. Roll Call

3. Resolution U-11116 – Authorize Tacoma Power to declare surplus utility-owned property including certain inventory, equipment, and vehicles allocated to the Click! Network together with the excess capacity of the Tacoma Power HFC Network, part of which is used by what is commonly referred to as the Click! Network; and authorize execution of the Click! Business Transaction Agreement by and between Tacoma Power and Mashell, Inc., d/b/a Rainier Connect and Rainier Connect North LLC.

4. Adjournment

Special meeting materials:
https://www.mytpu.org/about-tpu/public-utility-board/2019-agendas-minutes/

Click! information:
https://www.mytpu.org/community-environment/projects/click-network-update/

The City of Tacoma does not discriminate on the basis of disability in any of its programs, activities, or services. To request this information in an alternative format or to request a reasonable accommodation, please contact the TPU Director's Office at 253-502-8201. TTY or speech to speech users please dial 711 to connect to Washington Relay Services.

EXHIBIT 4

ID	Outline Nu	Task Name	Start
0	0	Exhibit A2 - Transition Plan Gantt Chart	4/22/19
97	2	Approved date	11/5/19
98	3	Post-Approval (Pre-Close) Period	11/6/19
99	3.1	[LEGAL] Post-Approval Activities	11/6/19
101	3.1.1.1	City of Tacoma Cable Franchise Agreement Establishment	11/6/19
102	3.1.1.2	Other Cities Franchise Agreement Establishment	2/6/20
103	3.1.2	Contract Assignment and Assumption	11/6/19
110	3.1.3	Regulatory Compliance and Reporting Requirements Definition	11/6/19
114	3.1.4.1	Click! Network Vendor and Supplier notifications	11/6/19
115	3.1.4.2	Click! Network Employees notifications	11/6/19
116	3.1.4.3	Click! Network ISP/MSA notifications	11/6/19
117	3.2	[OPERATIONS] Post-Approval Activities	11/6/19
118	3.2.1	Facilities Access and Security Activities	11/6/19
121	3.2.2	Inventory Asset Transfer	11/6/19
124	3.2.3	Billing Conversion Activities	11/6/19
127	3.2.4	Fullfillment Services Transition	2/20/20
134	3.3	[INFRASTRUCURE] Post-Approval Activities	11/6/19
135	3.3.1	Network Mapping Activities	2/21/20
137	3.3.2	Ancillary Services Contracts	11/6/19
141	3.3.3	Fiber separation activities	11/6/19
150	3.3.4	Network Cut-Over (Interconnection)	1/23/20
152	3.3.5	Infrastructure Contract Administration	11/6/19
155	3.4	[MEDIA & COMMUNICATIONS] Post-Approval Activities	11/6/19
157	3.4.1.1	Rainier Connect Customer Notifications	11/6/19
158	3.4.1.2	Rainier Connect Employee Notifications	11/6/19
160	3.4.2.1	Click! Network Retail Customer notifications	11/6/19
162	3.4.2.3	Click! Network FCC notifications	11/6/19
163	3.4.2.4	Click! Transition General Public Updates	11/6/19
164	3.4.2.5	Click! Transition Ongoing Communications Updates	11/6/19
165	3.5	[FINANCE] Post-Approval Activities	1/29/20
166	3.5.1	A/R & A/P Allocation Determination	1/29/20
169	3.5.2	Asset disposition	2/7/20
171	3.6	[HR] Post-Approval Activities	11/6/19
172	3.6.1	Personnel Activities	11/6/19
174	4	Closing Date	3/6/20
175	5	Post-Close Period	3/6/20

Qtr 3, 20

EXHIBIT 5

responsibilities with reference to the control of animals. Such contract(s) shall provide, among other things, that said society or agency (agencies) shall faithfully operate said pounds, shall pay all expenses in connection therewith, shall receive all licenses, fines, penalties and proceeds of every nature connected therewith, and such other sums as may be legally appropriate therefor, subject only to accounting as provided by law. The Council is further authorized, notwithstanding the provisions hereof, to determine that the City shall operate its own city pounds or detention facility and otherwise regulate and control animals within its corporate limits. Any contract entered into pursuant to the authority hereof shall be subject to cancellation by the City for good cause.

(Amendment approved by vote of the people September 18, 1973)

Administrative Organization[12]

Section 3.11 – Within the framework established by this charter, the administrative service of the City government shall be divided into such offices, departments, and divisions as provided by ordinance upon recommendation of the City Manager. Such ordinance shall be known as the "Administrative Code."

Section 3.12 – The City Council may remove any appointed member of any City board, commission, or board of trustees, for cause, after notice and public hearing, if that member is found to have knowingly violated the oath of office under this charter (Section 6.4) or has committed any acts specified in state law as grounds for the recall and discharge of an elective public officer. The City Council, in its discretion, may allow a hearings examiner to hear such a matter. Recommendation of a hearings examiner shall be subject to review by the City Council. The City Council's final decision shall be based on the evidence in the record. A record of the proceedings shall be made.

(Amendments approved by vote of the people November 2, 2004, and November 4, 2014)

Section 3.13 – There shall be a Landmarks Preservation Commission, composed of members with such powers and duties as are provided by ordinance. The members shall be residents of the City of Tacoma and be appointed and confirmed by the City Council.

(Amendment approved by vote of the people November 4, 2014)

Article IV

PUBLIC UTILITIES[13]

General Powers Respecting Utilities

Section 4.1 – The City shall possess all the powers granted to cities by state law to construct, condemn and purchase, purchase, acquire, add to, maintain, and operate, either within or outside its corporate limits, including, but not by way of limitation, public utilities for supplying water, light, heat, power, transportation, and sewage and refuse collection, treatment, and disposal services or any of them, to the municipality and the inhabitants thereof; and also to sell and deliver any of the utility services above mentioned outside its corporate limits, to the extent permitted by state law.

Power to Acquire and Finance

Section 4.2 – The City may purchase, acquire, or construct any public utility system, or part thereof, or make any additions and betterments thereto or extensions thereof, without submitting the proposition to the voters, provided no general indebtedness is incurred by the City. If such indebtedness is to be incurred, approval by the electors, in the manner provided by state law, shall be required.

---

[12] See TMC Chapter 1.06
[13] See TMC Title 12 - Utilities

Rates

Section 4.3 – The City shall have the power, subject to limitations imposed by state law and this charter, to fix and from time to time, revise such rates and charges as it may deem advisable for supplying such utility services the City may provide. The rates and charges for services to City departments and other public agencies shall not be less than the regular rates and charges fixed for similar services to consumers generally. The rates and charges for services to consumers outside the corporate limits of the city may be greater but shall not be less than the rates and charges for similar service to consumers within the corporate limits of the city.

Diversion of Utility Funds

Section 4.4 – The Council may by ordinance impose upon any of the City-operated utilities for the benefit of the general fund of the City, a reasonable gross earnings tax which shall not be disproportionate to the amount of taxes the utility or utilities would pay if privately owned and operated, and which shall not exceed eight percent; and shall charge to, and cause to be paid by, each such utility, a just and proper proportion of the cost and expenses of all other departments or offices of the City rendering services thereto or in behalf thereof.

Section 4.5 – The revenue of utilities owned and operated by the City shall never be used for any purposes other than the necessary operating expenses thereof, including the aforesaid gross earnings tax, interest on and redemption of the outstanding debt thereof, the making of additions and betterments thereto and extensions thereof, and the reduction of rates and charges for supplying utility services to consumers. The funds of any utility shall not be used to make loans to or purchase the bonds of any other utility, department, or agency of the City.

Disposal of Utility Properties

Section 4.6 – The City shall never sell, lease, or dispose of any utility system, or parts thereof essential to continued effective utility service, unless and until such disposal is approved by a majority vote of the electors voting thereon at a municipal election in the manner provided in this charter and in the laws of this state.

Franchises for Water or Electric Utilities

Section 4.7 – The legislative power of the City is forever prohibited from granting any franchise, right or privilege to sell or supply water or electricity within the City of Tacoma to the City or to any of its inhabitants as long as the City owns a plant or plants for such purposes and is engaged in the public duty of supplying water or electricity; provided, however, this section shall not prohibit issuance of temporary permits authorized by the Council upon the recommendation of the Utility Board of the City of Tacoma for the furnishing of utility service to inhabitants of the City where it is shown that, because of peculiar physical circumstances or conditions, the City cannot reasonably serve said inhabitants.

(Amendment approved by vote of the people September 18, 1973)

The Public Utility Board

Section 4.8 – There is hereby created a Public Utility Board to be composed of five members, appointed by the Mayor and confirmed by the City Council, for five-year terms; provided, that in the appointment of the first Board, on the first day of the month next following the taking of office by the first Council under this charter, one member shall be appointed for a term of one year, one for a term of two years, one for a term of three years, one for a term of four years, and one for a term of five years, and at the expiration of each of the terms so provided for, a successor shall be appointed for a term of five years. Vacancies shall be filled for the unexpired term in the same manner as provided for regular appointments.

(Amendment approved by vote of the people November 2, 2004)

EXHIBIT 6

Construction and Maintenance

Tacoma Power has a number of established preventive and predictive maintenance programs and continues to develop more. For example, the substation predictive maintenance program can identify substation equipment requiring corrective action before a failure occurs through utilization of infrared, oil sample testing, and dissolved gas analysis. Tacoma Power owns and maintains approximately 49,000 power poles. The Pole Replacement program strategy is to test and treat 9% of the poles annually maintaining an 11-year cycle. Tacoma Power also performs tree trimming around its distribution and transmission lines, maintaining two and four year trimming cycles along with programs to replace dangerous trees with utility friendly trees.

Telecommunications Infrastructure

Approximately 1,500 miles of fiber and coaxial cable have been constructed by Tacoma Power in the cities of Tacoma, University Place, Fircrest, Lakewood and Fife, and portions of unincorporated Pierce County, providing Tacoma Power with a state-of-the-art telecommunication system with which supports transmission and distribution operations, advanced metering, and retail and wholesale commercial services. The network currently covers approximately 66% of the households in Tacoma Power's service territory.

The network consists of a hybrid fiber-optic coaxial ("HFC") system, which delivers two-way signals for cable TV, cable modem Internet services, and advanced metering. In addition, SONET ("Synchronous Optical Network") and Gigabit Ethernet technologies are used to support communications across Tacoma Power's transmission and distribution system and to carry out data transport services for commercial customers. The network was designed and constructed to meet high telecommunications standards, containing a redundant backbone and redundant service loops, which seek to ensure uninterrupted signal transport in the event of a network break. A network surveillance system allows Tacoma Power to monitor the system at all times.

Commercial Telecommunication Services. Launched in 1998 under the brand name Click! Network, Tacoma Power provides three commercial telecommunication services to customers of Tacoma Power: retail cable television, wholesale broadband transport and wholesale high-speed Internet over cable modem. Click! Network is one of several providers of telecommunications services in the Tacoma area.

Click! Network is accounted for as part of the Electric System. In 2016 Click! Network's annual revenues were approximately $26.6 million, and annual operating expenses plus gross earnings taxes were approximately $29.7 million.

Cable television is Click! Network's primary retail business. Click! currently has approximately a 15% share of a very competitive local cable television market. Cable TV products available to both residential and business customers include broadcast television, digital and high-definition channels, digital video recording capability, TiVo with access to over-the-top ("OTT") content such as Netflix, Hulu, YouTube and Pandora, TVEverywhere, and a wide variety of video-on-demand services. Video-on-demand services include local programming tied to schools, colleges, local governments and community organizations strengthening Click! Network's brand identity in the communities served.

Under wholesale Master Service Agreements, seven telecommunications carriers provide high capacity last mile data transport circuits to their customers utilizing Click! Network's telecommunications infrastructure. The seven telecommunications carriers provide SONET data services ranging from DS-1 lines to OC-48 lines and customized Metro Ethernet circuits to meet data transport and web access needs of large and small businesses in the Tacoma area.

Also under wholesale Master Service Agreements, two qualified locally based Internet Service Providers ("ISPs") provide high-speed Internet services via cable modems to their customers utilizing Click! Network's telecommunications infrastructure. The ISPs provide a variety of speed packages to meet the needs of the residential

and business consumers in the Tacoma area. As part of the contract, the two ISPs also provide customer service, cable modem installation, customer premise equipment and technical support services to their Internet customers.

Click! ended 2016 with 17,468 cable TV customers, 23,344 wholesale high-speed Internet service customers, and 173 wholesale broadband transport circuits.

Click! also continues to provide the City of Tacoma I-Net services to approximately 190 sites to keep the cost of telecommunications low for many governmental entities.

Click! Network implemented a 12.9% cable TV service rate increase effective March 1, 2017. An additional cable TV rate increase is planned for March 1, 2018. These cable TV rate increases are expected to generate approximately $7.7 million in additional revenue. A major portion of additional revenue will be used to cover increases in programming costs.

CAPITAL IMPROVEMENT PROGRAM

Tacoma Power has funded its past capital improvement programs from contributions in aid of construction, proceeds of Parity Bonds and subordinate lien revenue bonds, and Revenues of the Electric System. The actual amounts spent during the past five years, together with the sources of funds used, are displayed in the table below.

Historical Sources of Capital Improvement Funds
($000)

Source of Funds	2012	2013	2014	2015	2016
Parity and Subordinate Lien Bond Proceeds	$ 51,730	$ 35,723	$ 58,834	$ 58,003	$ 50,995
Contributions in Aid of Construction[(1)]	4,716	3,735	3,029	4,777	3,293
Cash Reserves	16,643	23,656	21,160	19,301	30,536
Total	$73,089	$63,114	$83,023	$82,081	$84,824

(1) Customer contributions to fund capital projects.
Source: Tacoma Power

Tacoma Power has a long-term goal to finance an average of 50% of its normal capital requirements from net operating revenues with the balance from contributions in aid of construction received from customers and borrowed funds. However, due to varying water conditions, the amount of the capital improvement program, and periodic cash defeasance of outstanding Parity Bonds, the amount actually financed from net operating revenues varies from year to year. From 2012 to 2016, Tacoma Power financed an average of 66% of its capital improvements from borrowed funds. Tacoma Power's policy is to fund major projects with borrowed funds.

the City Council. The Department's budget is presented to the Board for review and approval and then forwarded to the City Council for approval and inclusion in the City's budget. The Board meets twice monthly.

The Department consists of the Light Division ("Tacoma Power"), Water Division ("Tacoma Water"), and Belt Line Railroad Division ("Tacoma Rail"). The Board has supervision and control over most Department business. In the case of budgets, rates, bond issues, and additions and betterments to a utility system and system expansions, actions approved by the Board must also be approved by the City Council.

The Board appoints the Director of Utilities who is the chief executive officer of the Department. The Board must evaluate the performance of the Director annually and reappoint the Director every two years subject to reconfirmation by the City Council with the next reconfirmation scheduled for 2017. The reappointment of the Director has been approved by the Board and is currently pending before the City Council. William A. Gaines will retire from the position, effective December 2, 2017. The Director, with the concurrence of the Board, has the power to appoint division superintendents.

Utility rates and charges are initiated by the Board and adopted by the City Council, and are not subject to review or approval by any other governmental agency. See "ELECTRIC SYSTEM CUSTOMERS, ENERGY SALES, REVENUES AND RATES—Electric Rates."

The City Charter provides that the revenues of utilities owned and operated by the City shall never be used for any purposes other than the necessary operating expenses thereof, including a reasonable gross earnings tax imposed by the City Council for the benefit of the general fund of the City, interest on and redemption of the outstanding debt thereof, the making of additions and betterments thereto and extensions thereof, and the reduction of rates and charges for supplying utility service to consumers. The funds of any utility may not be used to make loans to or purchase the bonds of any other utility, department, or agency of the City. See "FINANCIAL INFORMATION—Taxes Imposed on Tacoma Power."

Tacoma Power - General

Tacoma Power is organized into six business units:

- ***Generation*** operates and maintains Tacoma Power's four hydroelectric generating projects (Cowlitz, Cushman, Nisqually and Wynoochee) and the associated recreational facilities, fish hatcheries and other project lands.

- ***Power Management*** manages, schedules and directs the power supply portfolio which includes Tacoma Power-owned generation and power supply contracts. Power Management markets bulk and ancillary power supply services, performs power trading activities, plans for and acquires conservation resources, and is responsible for compliance with various state, regional and federal regulatory mandates.

- ***Transmission and Distribution*** plans, constructs, operates and maintains the transmission and distribution systems including substations, the underground network system, revenue metering facilities and all overhead transmission and distribution systems.

- ***Rates, Planning and Analysis*** plans for and manages the retail rate process, financial planning activities, operations and capital budget development and monitoring, strategic asset management, construction project management, strategy management, and energy risk management analysis and modeling.

- ***Click! Network*** plans, constructs, operates and maintains a hybrid fiber coaxial ("HFC") telecommunications network that supports the operation of Tacoma Power's electrical transmission and distribution system, provides retail cable TV, and wholesale high-speed Internet and data transport services to resellers.

- ***Utility Technology Services*** ("UTS") addresses existing and emerging technology requirements essential to managing Tacoma Power's computing systems. This includes supporting and enhancing utility system operations, communications, metering, cyber security, relevant smart grid applications, and the information technology strategic planning. UTS unifies the planning, design, deployment and maintenance of operational

2016 SUPERINTENDENT'S REPORT
TACOMA POWER

CLICK!

Financial Status

Click! Network commercial revenues declined from $27.3 million in 2015 to $26.7 million in 2016. The retail cable TV customer base dropped 4.6 percent ending the year with 17,468 active customers, and the Internet cable modem customers served by the three wholesale Internet Service Providers (ISPs) - Advanced Stream, Net-Venture, Inc., and Rainier Connect, grew by .4 percent ending the year with 23,344 active customers. Click! provided 173 broadband transport circuits to Click!'s wholesale service providers allowing them to provide an array of telecommunication services to many businesses in the service area. Additionally, Click! continued to provide the City of Tacoma I-Net services to approximately 190 sites, keeping the cost of telecommunications low for many government entities, and also provided support for just over 15,000 gateway power meter connections.

Cable TV Rate Adjustments

Because a final policymaker decision regarding Click! Network's long term business plan remained outstanding in 2016, no cable television rate increases were implemented. Although Cable television prices continue to remain under market, the postponement of rate adjustments contributed to the decline in revenues.

Channel Additions

During 2016, Click! Network migrated 10 networks from optional service levels to its Broadcast package and migrated Big Ten Network and Sprout from its Sports & Family package to its Click! ON Digital package. Three networks discontinued operations in 2016, Pivot, UWTV, and MundoMax, but TV Tacoma HD was added, bringing the total to 376 video and 65 audio channels. Click! also added a variety of national and local video on demand content for a total offering of over 12,000 hours of content to make the product more competitive. Additionally, Click! added new networks to its Watch TV Everywhere service. Click!'s cable TV customers can now enjoy watching Click! video content from 84 networks on any of their mobile devices with an internet connection.

Website Improvements

Click! Network launched a new website in June 2016. Improvements included streamlined navigation, responsiveness to mobile device screen sizes, enhanced TV listings, and an online shopping cart. Click! cable television products, along with ISP internet packages, are now prominently displayed, enabling the potential customer to select services and submit a self-service order online.

Customer Satisfaction Survey

Customer Satisfaction survey cards were mailed to all new cable TV customers and to all customers who had a service related issue. Click! customer service and technicians representatives received ratings averaging 3.7 and 3.8 respectively on a scale of 1 – 4. In addition, a Customer Satisfaction Survey conducted on Click! Network's behalf by Washington State University's Social & Economic Sciences Research Center (SESRC) showed a mean average overall customer satisfaction score of 8.08 on a 1-10 scale. The results revealed that customers are very satisfied with the services provided by Click! and in particular, recognized the quality of service provided by our Sales and Service Representatives and Service Technicians.

New Tools

Click! purchased the CPAT Flex Digital Leakage Monitoring System to address concerns about interference from cable leakage in the aeronautical and LTE bands. The CPAT Flex Digital Leakage Monitoring System automates the signal leakage detection process freeing up technicians for other tasks. Since the tool is continuously monitoring the network, signal leakage is quickly detected and repaired.

Click! also purchased the CheetahXD software to replace the former Cheetah Lite version. The CheetahXD software helps Click! network technicians manage the HFC network by providing end-to-end visibility across the HFC operations environment, and enables NOC personnel to proactively isolate network problems, trace root causes, assess potential impacts, and prioritize truck rolls by pinpointing fault and performance issues in real-time. With CheetahXD software, HFC network assurance is simplified, operational costs are reduced, and network performance is improved resulting in enhanced customer satisfaction.

Spectrum Reclamation

In 2015, Click! fully converted its system from analog to digital and freed up nineteen (19) 6 MHz channel slots. Since then, 6 of those freed up channels have been added to the bank of downstream Internet channels to meet the growth in customers and Internet usage. Therefore leaving 13 channels available for use.

Network Bandwidth

During 2016, Click! added NETFLIX cache servers to the local network. The addition of these cache servers has reduced bandwidth utilization by as much as 30%. Click! added an additional 10 Gig connection at Downtown South and Downtown North for a total of 30 Gig potential capacity at each location. The Core routers are being upgraded from the Cisco 7600 platform to the Cisco ASR 9912 platform. This will provide the necessary 10 gig ports and throughput to support current and future network growth. The Cable Modem Termination Systems (CMTS) are also being upgraded. The existing Cisco uBR 10000 series CMTSs are going to be replaced with new Cisco cBR-8 CMTSs. The first set of Cisco cBR-8 CMTSs were purchased during 2016. These will support DOCSIS 3.1 Gigabit services and provide higher port and bandwidth capacity for meeting bandwidth demands and subscriber growth.

EXHIBIT 7

MEMORANDUM

TO: Jeff Lueders

FROM: Pam Burgess

DATE: 2/28/2019

SUBJECT: Click! Network 2018 Cable TV Annual Report

CLICK! NETWORK
TACOMA POWER

The following information constitutes Click! Network's 2018 Annual Cable TV Report, as required in Section 9.2 of Ordinance No. 27846. The data is accurate as of yearend 2018.

A. Gross Revenue Report (attached)

B. Summary of activities within the Tacoma city limits:

- Total customers for each general category of service:
  - Broadcast: 11,774
  - Standard: 9,522
  - Digital: 3,233
  - Premium: 2,095
- Number of homes passed: 84,554
- Total miles of cable plant: 912.88
- Miles of overhead plant: approximately 71% = 648.55
- Miles of underground cable plant: approximately 29% = 264.34
- Other system facilities and equipment constructed:

  During 2018, 4,962 radio frequency leaks were detected and resolved, resulting in reduced interference and improved service performance. An annual fly-over test to assess the system's signal leakage in the aeronautical band was performed in March, resulting in a finding that 99.87% of points passed were within the required tolerance of signal egress.

  In 2018, Click! deployed fiber-to-the-premises (FTTP) technology for new plant extension as it is the state of the art technology for modern network architecture and enables reliable and cost efficient delivery of Gigabit internet services. FTTP is currently deployed in The Knolls, a 165 lot subdivision located in University Place. Two multiple dwelling units in Tacoma are currently under construction and being wired for FTTP exclusively. It is anticipated these complexes will be occupant-ready in the 1st quarter of 2019. Internet services delivered over FTTP will be symmetrical with same download and upload speeds ranging from 250 Mbps to 1000 Mbps.

  Several multiple dwelling unit complexes of under 100 units each were wired for Click! service delivery in 2018. One complex of note was Stadium Apartments, a 147-unit complex that is providing internet access directly through a commercial Ethernet connection over the Click! network.

PLANT TOTALS

Fiber Rings

Ring	Footage	Mileage	Count	Unused	Nodes	Jul-14 List of Nodes
Backbone	218,592	41.4	180	55		
NW Ring 1	49,014	9.3	96	28	11	6,7,8,13S1,13S2,14,15S1,15S2,10,5, 43
NW Ring 2	48,658	9.2	96	34	12	2S1,12S2,16S1,16S2,17,18S1,18S2,44,11S1,11S2,3
NW Ring 3	73,151	13.9	108	42	9	23S1,23S2,22,19,20,37,36,24,21
NW Ring 4	83,705	15.9	144	36	16	31S1,31S2,34S1,34S2,38,45,39,46,42,40,41,35,33,32,30,29
NW Ring 5	47,999	9.1	96	22	8	2,28,27,26,25,1S1,1S2,4
5		**98.7**			**56**	
NE Ring 1	110,627	21.0	132	58	10	9,5,4,1,2,3,6,7,8,13
NE Ring 2	46,384	8.8	72	48	0	would be 12
NE Ring 3	54,000	10.2	72	24	2	11,10
NEF Ring 4	62,865	11.9	132	84	7	14,15,16,17,18,19,20
4		**51.9**			**19**	
SE Ring 1	45,842	8.7	96	44	8	17,14,4,2,13,12,15,16
SE Ring 2	66,140	12.5	108	44	8	18,25,20,24,23,22,9,19
SE Ring 3	65,390	12.4	96	44	8	11,8,7,6,1,5,3,10
SEC Ring 4	131,300	24.9	132	92	7	37,36,44,40,45,41,42
SEC Ring 5	83,700	15.9	96	60	7	32,31,35,39,34,33
SEC Ring 6	109,902	20.8	96	58	7	29,26,27,46,28,30,38
Loveland Ring	71,332	13.5		48		
7		**108.6**			**45**	
SW Ring 1	68,546	13.0	132	64	12	6,5,4,3,2,1,7,9,8,11,10,43S1,43S2,SW Annex2
SWU Ring 2	122,000	23.1	132	76	17	23,26,22,21,24,25,19,20,17,18,13,14,16,15,27,28,29
SWL Ring 3	103,600	19.6	132	98	10	
Military Loop SCADA Ring	84,055	15.9	36	24		
4		**71.6**			**39**	
Downtown Network	108,240	20.5	144	Not Counted		
Business Ring DTN	61,248	11.6	36	Not Counted		
Business Ring DTS	34,320	6.5	36	Not Counted		
3		**38.6**				
23			2400	1083		Unused fiber as of June 2012
				0.496		Percentage not used minus uncounted DTWN
Total	**1,950,610**	**369.4**			**159**	**152 w/out split nodes**

Coax & Homes

Franchise	Homes	Footage	Mileage	Hms/Mi	Sq Miles
Tacoma	91,344	4,634,584	877.76	104.1	62.34
University Place	13,098	803,336	152.15	86.1	8.56
Fircrest	2,739	182,817	34.62	79.1	1.57
Lakewood	8,428	530,971	100.56	83.8	14.72
Fife	2,983	283,498	58.48	51.0	5.83
P.C.N.	15,075	1,516,617	174.43	86.4	130.6
Plant Ext. 2009	2,602	89,865	17.02		
Plant Ext. 2010	361	39,547	7.49		
Plant Ext. 11-12	634	28,512	5.40		
Plant Ext. 13-14	1,198	26,030	4.93		
Plant Ext. 15-16					
Plant Ext. 17-18					
Plant Ext. 19-20					
Total Ext.	**138,462**	**8,135,777**	**1432.85**		
Plant Rtrmt 11-12		15,559	2.95		
Plant Rtrmt 13-14		22,811	4.32		
Plant Rtrmt 15-16					
Plant Rtrmt 17-18					
Plant Rtrmt 19-20					
Total Rtrmt	**-**	**38,370**	**7.27**		
Fiber Plant with no coax			29.4		
	138,462	**8,097,407**	**1,426**		

EXHIBIT 8

TITLE 12

Utilities

TITLE 12
UTILITIES

Chapters:

Chapter 12.01 Utility Charges 5
Chapter 12.02 Franchises 9
Chapter 12.04 Collection of Charges by Agents 13
Chapter 12.05 Electric Energy – Other Utilities 15
Chapter 12.06 Electric Energy – Regulations and Rates 17
Chapter 12.06A Eletrical Code 41
Chapter 12.07 Electric Energy – Interchange of Surplus Power 55
Chapter 12.08 Wastewater and Surface Water Management – Regulation and Rates 57
Chapter 12.09 Solid Waste, Recycling, and Hazardous Waste 113
Chapter 12.10 Water – Regulations and Rates 145
Chapter 12.11 *Expired* 167
Chapter 12.12 *Repealed* 168
Chapter 12.13 CLICK! Network Cable TV Products 169

EXHIBIT 9

CITY OF TACOMA, WASHINGTON
DEPARTMENT OF PUBLIC UTILITIES
TACOMA POWER

STATEMENTS OF REVENUES, EXPENSES AND CHANGES IN NET POSITION

	YEAR ENDED DECEMBER 31,	
	2018	2017 (As Restated)
OPERATING REVENUES		
Sales of Electric Energy	$411,393,120	$401,631,506
Other Operating Revenue	18,539,960	18,192,038
Click! Network Operating Revenue	25,358,403	26,519,861
Total Operating Revenue	455,291,483	446,343,405
OPERATING EXPENSES		
Operations		
Purchased and Interchanged Power	134,618,445	135,822,340
Generation	16,241,304	23,118,677
Transmission	29,394,316	27,562,757
Distribution	15,781,781	19,675,524
Other	20,140,445	20,077,132
Maintenance	31,200,935	30,074,370
Telecommunications Expense	22,791,699	25,309,470
Administrative and General	43,716,689	43,377,927
Depreciation	53,869,012	57,231,313
Taxes	21,486,970	20,755,847
Total Operating Expenses	389,241,596	403,005,357
Net Operating Income	66,049,887	43,338,048
NON-OPERATING REVENUES (EXPENSES)		
Interest Income	3,719,705	2,251,477
Contribution to Family Need	(100,000)	(100,000)
Other	1,776,333	(1,534,389)
Interest on Long-Term Debt (Net of AFUDC)	(18,834,946)	(18,209,650)
Amortization of Debt Premium	1,615,670	4,132,856
Total Non-Operating Expenses	(11,823,238)	(13,459,706)
Net Income Before Capital Contributions and Transfers	54,226,649	29,878,342
Capital Contributions		
Cash	8,771,749	8,806,311
Donated Fixed Assets	618,713	149,323
BABs and CREBs Interest Subsidies	3,824,135	3,687,700
Transfers		
City of Tacoma Gross Earnings Tax	(34,384,956)	(34,141,875)
CHANGE IN NET POSITION	33,056,290	8,379,801
TOTAL NET POSITION - BEGINNING OF YEAR	830,375,494	821,995,693
TOTAL NET POSITION - END OF YEAR	$863,431,784	$830,375,494

The accompanying notes are an integral part of these financial statements.

NOTE 1 OPERATIONS

OPERATIONS OF TACOMA POWER - The Light Division, doing business as Tacoma Power (Tacoma Power or the Division), is a division of the City of Tacoma, Washington (the City), Department of Public Utilities (the Department) and is included as an enterprise fund in the Comprehensive Annual Financial Report (CAFR) of the City. The Department consists of Tacoma Power, Tacoma Water and Tacoma Rail and is governed by a five-member Public Utility Board (the Board) appointed by the City Council. Certain matters relating to utility operations, such as system expansion, issuance of bonds and setting of utility rates and charges, are initiated and executed by the Board, but also require formal City Council approval. Tacoma Power owns and operates the City's electrical generation and distribution facilities and telecommunication infrastructure. Tacoma Power serves approximately 178,000 of retail customers and has 813 employees. Tacoma Power is organized into six business units: Generation, Power Management, Transmission and Distribution, Rates, Planning and Analysis, Click! Network, and Utility Technology Services.

GENERATION operates four hydroelectric generating projects (Cowlitz, Cushman, Nisqually and Wynoochee) and the associated recreational facilities, fish hatcheries and other project lands.

POWER MANAGEMENT manages the power supply portfolio, markets bulk and ancillary power supply services, schedules and dispatches division-owned generation and contract power supplies and performs power trading and risk management activities. Revenues and the cost of electric power purchases vary from year to year depending on the electric wholesale power market, which is affected by several factors including the availability of water for hydroelectric generation, marginal fuel prices and the demand for power in other areas of the country.

TRANSMISSION AND DISTRIBUTION plans, constructs, operates and maintains the transmission and distribution systems including substations, the underground network system, supervisory control and data acquisition (SCADA) systems, revenue metering facilities and all overhead transmission and distribution systems. Electricity use by retail customers varies from year to year primarily because of weather conditions, customer growth, the economy in Tacoma Power’s service area, conservation efforts, appliance efficiency and other technology.

RATES, PLANNING AND ANALYSIS plans for and manages the retail rate process, financial planning, analysis and modeling, budget strategies, the capital program and risk management.

CLICK! NETWORK plans, constructs, operates and maintains a hybrid fiber coaxial (HFC) telecommunications network that supports the operation of Tacoma Power's electrical transmission and distribution system, provides retail cable TV and wholesale high-speed Internet services to residential and business customers, and data transport services to retail customers.

UTILITY TECHNOLOGY SERVICES (UTS) maintains communication networks, operational and informational technology systems, and related equipment and infrastructure to optimize utility operations and improve reliability and service quality. This includes a Project Management Office that establishes and leads Tacoma Public Utilities Information Systems project governance process and implements project portfolio management tools. UTS is responsible for all matters related to Tacoma Power’s compliance with North American Electric Reliability Corporation (NERC) Reliability Standards, maintains overall responsibility for the NERC Reliability Standards and manages Tacoma Power’s Internal Reliability and Compliance Project.

City of Tacoma, Washington
Department of Public Utilities
Click! Network Commercial Operations
Operational Summary (Unaudited)
August 31, 2019

Click! Profits August 2019

	August 2019
TELECOMMUNICATIONS REVENUE	
CATV	$1,321,714
Broadband	80,005
ISP	691,833
Interdepartmental	23,360
Total Operating Revenue	2,116,912
TELECOMMUNICATIONS EXPENSE-COMMERCIAL	
Administration & Sales Expense	
Salaries & Wages Expense	141,401
General Expense	49,697
Contract Services	1,025,090
IS & Intergovernmental Services	123,892
Fleet Services	229
Capitalized A & G Expense	(764)
Total Admin & Sales Expense	1,339,545
Operations & Maintenance Expense	
Salaries & Wages Expense	231,993
General Expense	15,845
Contract Services	42,825
IS & Intergovernmental Services	4,705
Fleet Services	19,923
New Connect Capital	(7,923)
Total Oper & Maint Expense	307,368
Total Telecommunications Expense	1,646,913
Net Revenues (Expenses) Before Taxes and Depreciation and Amortization	469,999
Taxes	287,487
Depreciation and Amortization	142,442
	429,929
NET OPERATING REVENUES (EXPENSES)	$40,070

Click! Pays 7.5% Utility Tax On ISP Sales

Includes Over $100K in "Assessments"

Taxes Include $52K "Utility Tax" on ISP Broadband Sales. A 7.5% Illegal Tax

Paid off $142K in Depreciation

PROFIT

EXHIBIT 10

SUBSTITUTE

RESOLUTION NO. 33668

WHEREAS the City of Tacoma, Department of Public Utilities, Light Division desires to: (1) develop a state-of-the art fiber optic system to support enhanced electric system control, reliability and efficiency; (2) develop capability to meet the expanding telecommunications requirements in an evolving competitive electric market, the most critical of which is real-time, two-way interactive communications with individual energy consumers, (3) create greater revenue diversification through new business lines (i.e. internet transport, cable TV, etc.), (4) enhance traditional products and services, and (5) maximize return on Light Division assets, and

WHEREAS these desired capabilities can be provided with a broad band telecommunications system for all of the Light Division's service area, and

WHEREAS a broad band telecommunications system will have available capacity for future City Light Division needs and will also have the capacity to provide telecommunications services for data transport, high speed internet access, full cable television service, and other uses, and

WHEREAS the Light Division has retained consultants to review and analyze the feasibility of a broad band telecommunications system for the Light Division's service area, and a business plan has been prepared for this purpose (copies are on file with the Clerk), and

WHEREAS the cost of constructing, installing and commencing to operate a broad band telecommunications system will be approximately $65 million dollars, but the benefits to the Light Division, the City and the Light Division customers are projected to exceed and justify the initial cost, and

WHEREAS the City Council and Public Utility Board will continue to be involved in the future decision-making on this proposal including construction contracts and debt financing approvals, quarterly reviews on-the project direction during the startup period, approval of agreements for use of City rights-of-way for telecommunications purposes which agreements will (to the extent required by law or City Council) treat the Light Division substantially similar to other franchises that the City grants for similar businesses, and

WHEREAS the City Council hereby finds and determines that the Light Division's proposal for a broad band telecommunications system is in the best interests of the City, will serve a public purpose, and should be approved and implemented; Now, therefore,

BE IT RESOLVED BY THE COUNCIL OF THE CITY OF TACOMA:

That the Council hereby finds and determines that the City Light Division's broad band telecommunications proposal is in the best interests of the City, will serve a public purpose and that the said Business Plan is sufficient and adequate, therefore, the Council hereby approves the Light Division's proposal including the Business Plan and the Department of Public Utilities, Light Division is hereby authorized to proceed to implement said proposal for a broad band telecommunications system, and

That the proposed broad band telecommunications system shall be owned, operated and controlled by the City of Tacoma Department of Public Utilities Light Division with the Public Utility Board providing oversight and approval of business and third party agreements, as appropriate under the City Charter, Tacoma Municipal Code and other applicable laws, and the City Council shall continue to be involved in the major policy decisions including

construction contracts, rate setting policies, debt financings, the public rights-of-way use for telecommunications agreements and quarterly reviews.

Adopted APR 08 1997

Mayor

Attest: City Clerk

Approved as to form & legality:

Assistant City Attorney

Requested by Public Utility
Board Resolution No. U-9258

599c

Tacoma

REQUEST FOR ORDINANCE OR RESOLUTION

CITY CLERK USE

Request #: 6256

Ordinance #:

Resolution #: 33668

1. Date: ***March 20, 1997***

Requesting Department/Division/Program	Sponsored By	Phone/Extension
2. ***Tacoma Public Utilities/Light Division***		
Contact Person (for questions):		Phone/Extension
3. Steven J. Klein		502-8203

4. Preparation of Resolution is requested for the City Council meeting of Tuesday April 8, 1997

5. Summary Title/Recommendation: (A concise sentence, as it will appear on the Council Agenda)

   Authorize the development of a broad band telecommunications network to improve electric utility service and improve the telecommunications infrastructure available to the community. This would include the business plan for a broad band telecommunications system and the implementation of the telecommunications system.

6. Background Information/General Discussion: (Why is this request necessary? Are there legal requirements? What are the viable alternatives? Who has been involved in the process?)

   The Light Division has undertaken an extensive telecommunications study that includes market research, telecommunications industry analysis, an examination of the regulatory environment and research on similar activities in other municipalities. It is projected that the cost for the construction and installation of this system will be approximately $55 million to construct, plus more than $10 million for startup operations. However, the Light Division believes that the overall benefits to the City, the Light Division and its customers will exceed the projected costs.

   In addition to the benefits to the Light Division that the system would deliver through improved communication abilities, the system will also have the ability to transport data, provide high speed Internet access and deliver full cable television service.

7. Financial Impact: (Future impact on the budget.)

8. List all material available as backup information for the request and indicate where filed:

Source Documents/Backup Material	Location of Document
Letter to the Public Utility Board and City Council from Mark Crisson dated March 20, 1997	Attached

RECEIVED
97 MAR 27 AM 11:37
CITY CLERK'S OFFICE

9. Funding Source: (Enter amount of funding from each source)

Fund Number & Name:	State $	City $	Other $	Total Amount

If an expenditure, is it budgeted? ☐ Yes ☐ No Where? Org # Acct #

10. ~~Department Director~~/Utility Division Approval	Approved as to Availability of Funds Director of Finance	~~City Manager~~/Director Utilities Approval
Steven J. Klein		Lydia Stevenson

46

Tacoma Public Utilities

Mark Crisson
Director

3628 South 35th Street
P.O. Box 11007
Tacoma, WA 98411-0007

Divisions
Light
Water
Belt Line

March 20, 1997

To the Chairman and Members of the Public Utility Board and
To the Mayor and Members of the City Council

RESOLUTION NO. U- 9258

RECOMMENDATION

The Light Division requests approval by the Public Utility Board and the City Council to develop a broad band telecommunications network as described in the Light Division Telecommunication Study. This action authorizes project implementation and the initiation of design and contract specifications. The Light Division will bring subsequent requests for construction contract and debt issuance approval to the Public Utility Board and City Council as the project progresses. Both policy bodies will also be periodically advised of project status during the development process.

BACKGROUND

In preparation for this request, the Light Division has undertaken an extensive telecommunications study that includes market research, telecommunications industry analysis, an examination of the regulatory environment, and research on similar activities in other municipalities. Staff has made presentations to neighborhood councils, chambers of commerce, local economic development groups, the Tacoma Port Commission, and the Tacoma Public School Board. Two joint Public Utility Board/City Council study sessions were held. A public hearing on the proposed telecommunications system was held by the Public Utility Board on March 12, 1997, and another public hearing was held by the City Council on March 18, 1997. Information summarizing the Telecommunications study and our recommendations was made available at the presentations and public hearings.

The Light Division estimates the cost of this telecommunications system will be approximately $55 million dollars for construction and installation, plus more than $10 million dollars for startup operations. The business plan indicates excellent financial potential even under conservative revenue and market penetration assumptions. We recognize the plan's projections are no guarantee of success, but we think the project risks are manageable and justified given the project benefits. These benefits include:

- Improves electric service by enabling distribution system automation, market access, and real-time, interactive communication with customers

- Provides better telecommunications and cable television service sooner and cheaper than other providers will deliver

- Significantly enhances regional economic development and quality of life by creating state-of-the-art telecommunications infrastructure and providing it to all businesses and residences throughout the community

- Creates opportunities for public private partnerships in the wholesale leasing of system capacity to retail telecommunications service providers

- Provides additional revenue to the Light Division and General Government through expansion of the market for telecommunications services

SUMMARY

The proposed telecommunications system will strengthen the Light Division's competitive position in the electric power industry through the provision of enhanced electric and telecommunication services to *all* Light Division customers. This system will serve a public purpose and is in the best interests of the City.

Very truly yours,

Mark Crisson
Director of Utilities

RESOLUTION NO. SUBSTITUTE U-9258

WHEREAS the City of Tacoma, Department of Public Utilities, Light Division desires to: (1) develop a state-of-the-art fiber optic technology to support enhanced electric system control, reliability and efficiency; (2) develop capability to meet the expanding telecommunications requirements in an evolving competitive electric market, the most critical of which is real-time, two-way interactive communications with individual energy consumers, (3) create greater revenue diversification through new business lines (i.e. internet transport, cable TV, etc.), (4) enhance traditional products and service, and (5) maximize return on Light Division assets, and

WHEREAS these desired capabilities can be provided with a broad band telecommunications system for all of the Light Division's service area, and

WHEREAS a broad band telecommunications system will have available capacity for future Light Division needs and will also have the capacity to provide Telecommunications services for data transport, high speed internet access, full cable television service, and other uses, and

WHEREAS the Light Division has retained consultants to review and analyze the feasibility of a broad band telecommunications systems for the Light Division's service area, and a business plan has been prepared for this purpose (copies are on file with the Clerk), and

WHEREAS the cost of constructing, installing and commencing to operate a broad band telecommunications system will be approximately $65 million dollars, but the benefits to the Light Division, the City and the Light Division customers are projected to exceed and justify the initial cost, and

WHEREAS the City Council and Public Utility Board will continue to be involved in the future decision-making on this proposal including construction contracts, and debt financing approvals, quarterly reviews on the project direction during the startup period, approval of agreements for use of City rights-of-way for telecommunications purposes which agreements will (to the extent required by law) treat the Light Division substantially similar to other franchises that the City grants for similar businesses, and

WHEREAS the Public Utility Board hereby finds and determines that the Light Division's proposal for a broad band telecommunications system is in the best interests of the City, will serve as a public purpose, and should be approved and implemented; Now, therefore,

BE IT RESOLVED BY THE PUBLIC UTILITY BOARD OF THE CITY OF TACOMA:

That the Board hereby approves the Light Division's proposal including the Business Plan for a broad band telecommunications system, and the Board recommends that the City Council approve a resolution to authorize the Light Division to proceed to implement said proposal for a broad band telecommunications system, and the Board recommends that the City Council continue to be involved in the major policy decisions including construction contracts, debt financings, the public rights-of-way use agreements for telecommunications and quarterly reviews.

Approved as to form & legality:

_____
Chairman

_____
Chief Assistant City Attorney

_____
Secretary

_____
Clerk

Adopted_____

THE TELECOMMUNICATIONS INDUSTRY

SUMMARY

The world of telecommunications is complex. Technology, companies, regulations, and communities are all involved. Some would say that telecommunications is too complex for most people to understand, much less make decisions about. Upon closer examination, this appears to be a false premise. Telecommunications is complex, not because any of the pieces is impossible to understand but because there are so many pieces. Fortunately, just like any childhood puzzle, this puzzle can be put together by anyone willing to take the time to examine the pieces and explore how they fit together. This document is designed to bring the pieces together in one place to allow them to be more easily examined and explored.

The first section begins with an exploration of the technologies that are shaping the world of telecommunications today and the latest technological developments that may affect the future of telecommunications.

The telecommunications companies section examines some of the key players in telecommunications, the business models they have historically operated under, the technologies that they are employing, and both their announced and demonstrated strategies. Perhaps more than the latest technology, the companies that provide telecommunications products will influence the services that our communities are likely to see.

The next section discusses the evolving regulatory construct that telecommunications companies operate under. International, Federal, State, and local regulations all affect the provision of telecommunications services and it is in this area, perhaps even more so than in technology, that the greatest changes are taking place.

The overview of the broader telecommunications environment concludes with a review of what is taking place in selected cities around the United States of America with regards to telecommunications and the local forces in each of those communities that are influencing the direction that each community takes.

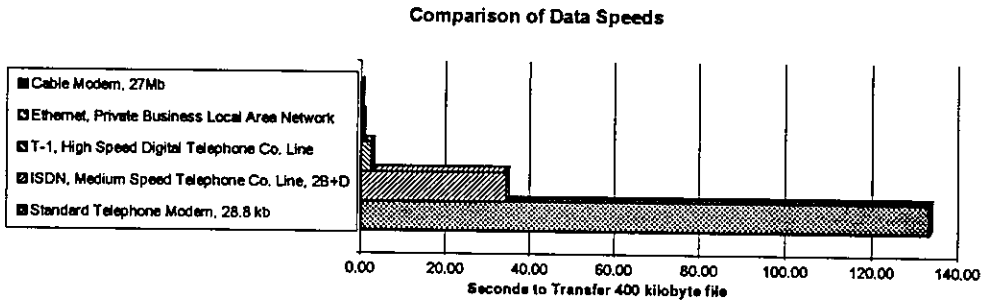
TECHNOLOGY OVERVIEW

The five keys for evaluating telecommunications technologies are:

Speed
Bandwidth
Direction
Security
Integrity

Speed

The speed of a communications path is measured in bits per second. A bit is a 1 or 0, the basic form of digital data. Speed is the measurement of the flow rate of data. The speed of a communications path or circuit must match the needs of the application, or patience of the users. A voice conversation can be carried on a 64,000 bits per second (64 kbps) line. Businesses lease circuits between buildings or cities to tie their computer Local Area Networks together using 1.5 million bits per second (1.5 Mbps) lines. Within businesses, Local Area Networks connect desktop computers using 10 Mbps lines. Businesses build private networks exclusively for their computers carrying 100 Mbps. Long distance companies operate major ties between cities carrying thousands of voice conversations at 2.4 billion bits per second (2.4 Gbps).

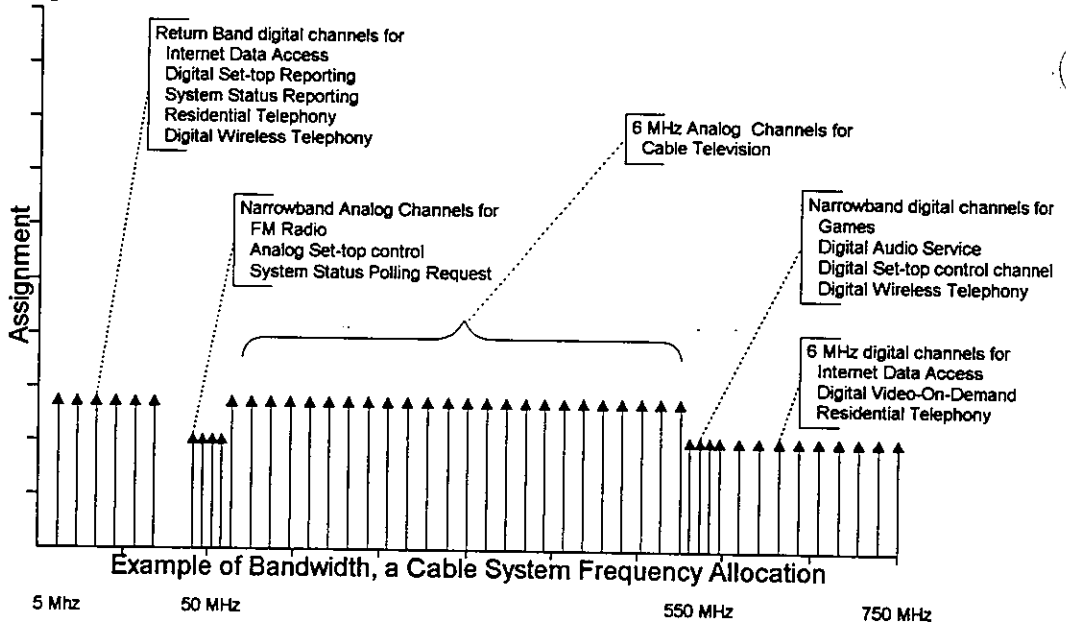


Bandwidth

Bandwidth measures the radio spectrum available to transmit information. It is measured in Hertz (Hz), or cycles per second. A communications path is often referred to as either a circuit or a channel depending on its use. Each individual channel uses some of the available bandwidth. The total bandwidth of the transmission circuit cannot be exceeded. In the design of a typical broadband hybrid fiber optic coaxial (HFC) system, there is 750 MHz of bandwidth available and channels are assigned in 6 MHz increments. Users of each 6 MHz channel can pack as much information into that channel and operate at as high a speed as they can afford. They can not carry any information outside of their assigned channel's bandwidth since that information would interfere with the use of adjacent channels.

New products have developed to make effective use of bandwidth for transmitting digital information. The speed of signals in a bandwidth has been improved to as high as 8 bits per hertz, from 1 bit per hertz in 1970. Data compression removes unnecessary data without affecting meaning, with ratios now as high as 100 to 1.

Example of Bandwidth



Direction — Single or Bi ?

The direction of the flow of information must match the application that the information supports. Television signals are broadcast one-way to all users. Telephone conversations are two-way, carrying the same amount of information in each direction all the time. Because the same amount of information flows in each direction, telephone conversations are said to be symmetrical. Data network connections to homes are expected to be two-way. However, many people in the computer data networking industry believe that the majority of the information will be flowing to homes with relatively little information returning. The ratio of downstream to upstream information is perhaps 10 to 1, decreasing as symetrical applications such as telephone and videoconferencing grow on the Internet.

Connections that send different amounts of information depending on direction are referred to as asymmetrical. Business communications are typically symmetrical since they are primarily made up of telephone conversations, which are symmetrical, and the peer-to-peer transmission of data between offices, which are also symmetrical. Two-way telecommunications systems capable of transmitting and receiving information at the same time are known as "full duplex systems."

Security

Loss of security from eavesdropping on voice or data communications can pose risks for businesses and individuals. As a result, systems offering voice and data privacy have been developed. Some business applications require high security communications to protect the value of their information. Security can be enhanced by:

- Encryption: scrambling the information to make it unintelligible.
- Physical Control: keeping circuits within a controlled area
- Security Monitoring: checking circuits for evidence of security breaches
- Access Control: requiring users to provide passwords when signing onto networks

Radio signals are easy to monitor. Communication that takes place over the public radio spectrum can be monitored. Scrambling, digital encoding and encryption can be used to build in security, but they add cost and complexity to systems and slow the transmission of information.

Copper cables can be penetrated, allowing circuits to be mechanically tapped. This type of intrusion is difficult to detect automatically.

Coaxial systems send the same signal to many customers and create multiple unauthorized monitoring opportunities. The best security measures are the same as for the public radio spectrum — scrambling, digital encoding, and encryption.

Optical fibers can be monitored for intrusion. Signal levels can be checked to detect escaped light resulting from an intrusion. Even so, signals can be made more secure with scrambling or encryption.

Integrity

Errors can occur when transmitting information. A person can often separate the voice of a single speaker from a noisy background but noise makes it difficult to understand all of the words spoken. Similarly, noise can cause errors in computers conducting data transactions. Noise-free communication circuits encourage efficient communications and eliminate time and effort spent correcting errors. Errors in digital communications are measured in Bit Error Rates (BER). Most computer networks require circuits providing a BER of better than 1 errored bit in 1 million bits.

The following sections briefly describe telecommunications systems in use:

Wireless Systems
Wired systems
Cable TV
Basic Telephone Systems
Business Office Communications
Internet and
Power System Communications

Wireless Systems

Wireless communications are carried by radio waves through the atmosphere. The radio spectrum is divided, managed and allocated by the Federal Communications Commission (FCC). Many industries, including television broadcasters, AM and FM radio broadcasters, mobile radio users, satellite up links and downlinks, and the military use the public radio spectrum. Industries are allocated specific frequencies for use. Frequencies are re-used in different geographic areas by limiting transmitter power and range. The higher the frequency of a signal, the more it tends to lose signal strength as it travels through the atmosphere. Higher frequency radio signals also tend to follow line of sight paths and can often be blocked by hills and other similar obstructions. New allocations of frequencies tend to be in bandwidths of 30 MHz or less and use higher frequencies that were previously unallocated. For two-way transmission, two frequency bands are used.

Several new wireless systems are planned or under construction. Personal Communications Services (PCS) are described later in this section. The Ricochet Network, under construction by Metricom, is a wireless data network of small data packet transmitters mounted on streetlights and utility poles. Using six radios per square mile, the service obtains a speed roughly the same as a standard modem on a telephone line, but allows users to be mobile. Ricochet is marketed at users of computers, laptops, and pagers. Satellite services used for data transmission to homes are described later in this section.

Wireless networks are the easiest and least expensive networks to construct for services requiring low bandwidths. Many developing countries are building their first telephone networks using wireless cellular technology because copper telephone cable is more expensive to install and maintain.

Wireless systems usually rely on wired infrastructure to complete circuits. Wireless transmitters and receivers are linked to regional controlling switches with high-speed digital lines. Microwave connections are occasionally used for these point-to-point links. Most data and telephone traffic eventually is carried on high-speed land cables.

Wired Systems

Wired systems use cable to carry the signals that provide most telephone, data and cable television services. Information is carried only in the cable, so no radio spectrum licenses are required. Cable is shielded to prevent interference from wireless systems. Different cable types have different capacities or bandwidth and are capable of carrying varying speeds and amounts of information. Wired systems reduce costs by re-using cables and common central electronics for as many services as possible. Systems can be designed so that signals can travel both downstream and upstream on the same wire. While telephone cables typically have a pair of thin copper wires for each phone serviced, cable television uses a single coaxial cable (one center conductor inside one tubular metallic shield), which carries multiple frequencies to many homes. This allows a single service to use only one frequency band and only one wire yet still be received by many customers.

Fiber Optics Optical fibers carry photons of light; metallic wires carry electrons. Light can travel much farther in an optical fiber than electrons can travel in metal wire before a signal is lost. Light is also immune to interference from electromagnetic waves, common from many sources, including radio transmitters. Since optical fibers cannot carry electrons, highly reliable communications in high voltage areas are possible. Light in optical fibers is a superior medium for communications in cases where long distance, high speed and/or high bandwidth are necessary.

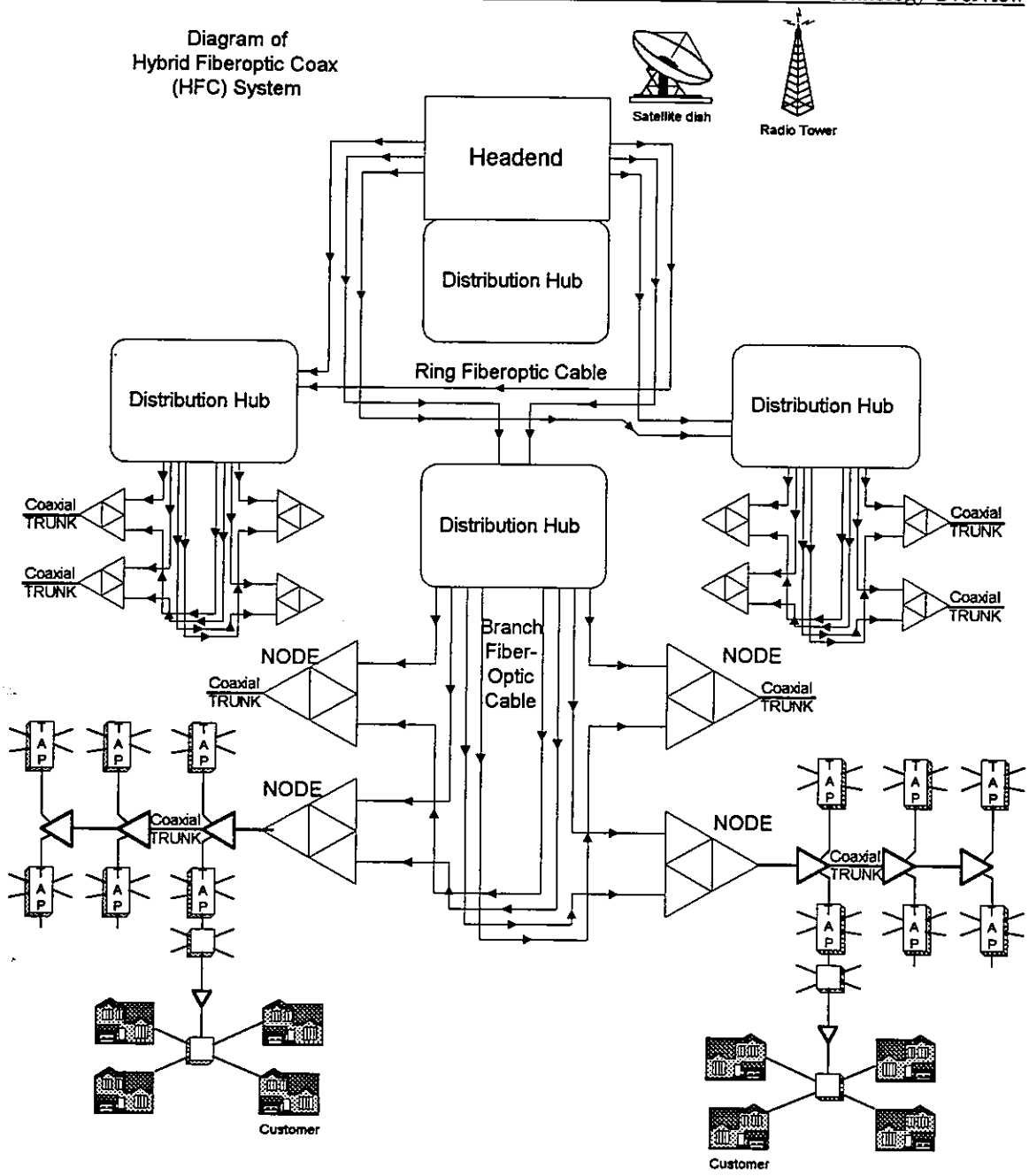
Fiber optics in cable TV Cable television companies began widespread installation of fiber technology into the trunk of the cable architecture about four years ago. This immediately improved signal quality and lowered maintenance costs. Since then, the cable industry has installed "fiber trunk and feeder" architecture in many markets. Fiber is now installed all the way to the feeder in most new construction. This allows system operators to re-use frequencies (or channels) by segmenting an existing system into individual serving areas composed of 500 to 2,000 homes. The resulting hybrid fiber coaxial cable networks are capable of delivering a variety of high-bandwidth, interactive services.

HFC vs. FTTH If replacing copper coaxial cable trunks with optical fiber improves the signal quality and reduces maintenance, why not replace all coaxial cable with fiber optics to each customer? Some people are expecting that communications services will be delivered all the way to the home on an optical fiber pair, or fiber-to-the-home (FTTH).

Unfortunately, fiber optics to each customer would be prohibitively expensive. This is not because the fiber optic cable is much more expensive than coaxial cable. It is because the optical electronics required to convert the light carried by the fiber onto electrical signals understood by televisions, computers and phones are fairly expensive. These residential devices all currently connect directly to copper cable, but not optical fibers. A single coaxial cable has the capacity to meet the telecommunications needs of 500 or more homes.

While it can be cost-effective to have a single optical to coaxial node serving 500 homes, it has not yet been shown to be cost effective to equip each of the 500 homes with new optical-electronic nodes and optical cable drops. Maintenance and operation alone of the fiber optic cable to each home would be expensive and would be a wider-bandwidth duplication of the existing telephone infrastructure, which is twisted-pair copper wire dedicated from the central office (CO) to each home. It has proven to be very costly to maintain and operate even telephone dedicated paths to each home.

Communications technology is applying fiber optics where appropriate, such as long cable lengths of ultra-high quality signaling or in electrically noisy environments.



Digital Television

Most new TV sets are cable-ready, meaning their channel selectors are able to tune in standard frequencies for 80 to 120 analog channels. When TV programs are transmitted digitally, existing television sets will not be able to receive them without additional electronics. A set-top converter, with its own channel selector will be necessary.

Going digital The telephone network is gradually becoming digital because digital transmission is high-quality, low-cost and fast. Phones in customers' home are among the last analog devices in the network. Integrated Services Digital Network (ISDN) was invented to bring digital service to homes. As home services become digital, the quality and variety of services the telephone network can deliver increases. ISDN enables many new services, including enhanced displays on your phone, two conversations on the same line, and data speeds two to four times faster than possible with a common analog 28.8 kbps computer modem.

Business Office Communications

Businesses that have 20 or more telephone lines in use at one time, or that link computer centers to other computers and to Local Area Networks (LANs) in other buildings or cities, use digital circuits. Digital circuits allow businesses to reduce costs by consolidating voice traffic and to create high speed computer links that are impossible to create using "standard" phone lines. Businesses lease digital circuits to the central office, which can carry either switched telephone traffic or dedicated computer traffic. The basic unit of high speed digital circuits is T-1 service, which is a 1.5 megabits per second, two-way circuit, equal in bandwidth to 24 simultaneous voice conversations. The T-1 circuit can be connected to a business telephone switch for grouping telephone conversations at lower cost and higher quality than individual telephone lines. The T-1 circuit can also be connected to a computer "bridge" or "router." For this use the traffic is no longer switched and the T-1 circuit must be dedicated through the central offices to another business in a point-to-point assignment. This is referred to as a "nailed up" circuit. "Frame relay" is a data service that transfers computer data packets among nailed-up circuits that have been assigned exclusively to frame relay.

Internet

The Internet has emerged as an essential tool for consumers and businesses, providing a variety of entertainment, research, and commercial services. While the Internet remains primarily an informational and entertainment resource, it is also a forum for electronic commerce with orders for goods and services taken on-line and paid for via credit cards or new Internet currencies. As security techniques become more sophisticated and accepted by the public, the Internet may surpass all public markets ever conceived.

The core of the Internet are the Internet Service Providers (ISPs) that own or lease long distance data circuits and manage interconnected data networks on them. Users connect to ISPs using their computer and local telephone circuits. A point-and-click graphical user interface makes access to the services on the WorldWide Web very easy.

Web sites are computers accessible from the Internet containing interesting information or providing services for users. There are now many thousands of Web sites and several million Internet users. Applications on the Internet defy description, as they are rapidly growing and changing to meet the needs of users and business. The Internet, and more specifically the Web, has the potential to be an alternative delivery mechanism for most media today, including music, video, games, news, mail, telephone, advertising, catalog sales, shopping, library, encyclopedia, and software delivery. New applications send ever larger quantities of data between users and depend on high-speed data connections between the users.

Cellular Phone Systems

Cellular phones operate in a licensed radio band at 800 MHz. Radio towers serving these phones are called cell sites. There can be many cell sites per 5-mile radius. Frequencies are re-used among cell sites. A cellular phone notifies the closest cell site that it is there and can take calls. Even though a cellular phone moves from cell to cell, calls can continue by being "handed-off" or passed from cell-to-cell.

Standards Two carriers serve each region. Cellular carriers received radio licenses in a lottery, with one assigned to the local telephone system company in each region. At first, the simplest form of radio transmission, analog frequency modulation (FM), was used. As cellular service gained in popularity, many cell sites became saturated with traffic. More cell sites were added to allow re-use of the cellular frequencies more often. Recently, most carriers have adopted digital transmission standards that allow many callers to use the same frequencies in the same cell at the same time — up to 64 callers per frequency and cell. There are two main standards of digital modulation: Time Division Multiple Access (TDMA) and Code Division Multiple Access (CDMA). These standards are mutually exclusive and new digital cellular phones are built to carry one of the digital standards and the old analog standard.

In addition to mobile voice telephone service, cellular carriers are able to carry computer traffic to mobile computer users. By using modems on the analog system, or by leasing continuous access by the megabyte of use, mobile computer users can keep in contact with company computers for dispatch, customer information, e-mail, etc. The speed of service is about the same as on analog telephone or ISDN lines.

Overview

TELECOMMUNICATIONS COMPANIES

In the years following the breakup of AT&T in 1984, telecommunications companies were essentially divided into local telephone service providers , long distance service providers, and cable companies. Regional Bell Operating Companies such as US WEST and Ameritech were limited to providing only local telephone services. Firms like AT&T, Sprint, and MCI were restricted to supplying long distance services while cable companies largely focused on delivery of cable television. The Telecommunications Act of 1996 has done much to hasten the elimination of this separation by permitting these different companies to participate in each others' traditional markets. Many who watch the industry believe this removal of barriers will result in competition while others point to increasing company consolidation.

In order to make informed business decisions regarding telecommunications it is vital to identify the key players and review their reactions to changing environments. The section that follows is an overview of each of the major telecommunications industries, including a quick analysis of a few key companies that have the potential to affect the greater Tacoma area.

Tele-Communications, Inc. (TCI)

Tele-Communciations, Inc. (TCI) is the largest cable TV provider in the United States. TCI has nearly $2 billion in revenues, an operating cash flow of $533 million, 14 million subscribers in the United States and approximately 32,000 employees.

TCI's size and great influence in the cable TV industry was achieved through its push for growth, acquiring more and more cable systems, and increasing its subscriber base and revenues. In 1996 alone, the cable operator added more than 2.4 million subscribers[34]. However, this acquisition strategy has left the company in a relatively poor financial position. TCI has more than $14 billion in debt — roughly $1,000 of debt per subscriber. TCI faces elevated expenses due to its entry into new services, and is attempting to resolve its money crunch by raising rates, cutting capital expenditures, and eliminating 2,500 jobs.

These cutbacks reveal a change in TCI's telecommunications strategy. The company's properties consist mainly of one-way, coaxial cable systems operating at 350 MHz using 20-year-old technology. The company has announced that upgrades to these systems will be deferred, and the focus instead will shift to the deployment of digital set-top boxes. These boxes will deliver more channels using a new compression technology, but will not allow deployment of advanced telecommunications services such as high speed, two-way Internet access or telephony.

Before refocusing on cable TV, TCI was attempting to gain a foothold in other markets besides traditional cable TV service. A commercial telephone network was launched in Hartford, Connecticut, with two other cities scheduled for the service in Illinois and California under the name PeopleLink. The company also has a large stake in the Digital Broadcast Satellite market. In 1994, TCI joined five other cable operators to form Primestar Partners. This DBS service now reaches more than 1.1 million subscribers, and contributed $200 million to TCI in 1995, with revenues expected to double in 1996. Personal Communications Services are another market TCI has entered. Sprint Spectrum was created by a partnership between Sprint, TCI, Comcast, and Cox Cable. The partnership has licenses to provide Personal Communications Service in 33 Major Trading Areas with a total population of 190 million.

Following the explosive growth of the Internet, TCI set up an on-line service with the help of Microsoft called @Home. The @Home Network provides Internet service to a customer's personal computer through cable lines. Customers receive 24-hour unlimited access to the Internet, a high-speed cable modem, e-mail, Netscape Web browser and community content for $39.95 a month. This service is currently available in limited areas of California, Connecticut, Florida, Illinois, and Maryland.

Overview

REGULATORY ENVIRONMENT

Federal regulation has been streamlined under the 1996 Telecommunications Act. State laws that in the past could have limited access to certain markets have been federally pre-empted or limited. The regulatory environment has greatly improved the ability to enter the telecommunications market. However, some regulatory hurdles remain.

Many provisions of the Telecommunications Act of 1996 direct the Federal Communications Commission (FCC) to come up with regulations that will open local telecommunications markets to competition and remove barriers to entry. These provisions were written in broad strokes, leaving the FCC to fill in the details. In 1997, the FCC must implement the Act's crucial universal service sections, which will determine how telecommunications companies guarantee phone service to poor and rural areas. In addition, the Act requires all telecommunications carriers to interconnect directly or indirectly with the facilities and equipment of other carriers.

The Regional Bell Operating Companies (RBOCs) and local exchange carriers contend that the FCC has already gone to far, providing discounts for competitors that would undermine their entrenched businesses[1].

Given the enormous financial interests at stake, many industry interests are not willing to wait for all the details before taking action. As a result, deals are being negotiated that in some cases, are between former competitors.

One thing is clear, municipally owned electric utilities, electric cooperatives and other utilities may enter the communications business *without* obtaining FCC certification or any other prior FCC approval. State requirements vary, but cannot limit utility participation in telecommunications ventures[2].

This section provides an overview of pertinent Federal laws and regulations related to telecommunications as well as a summary of state legal and regulatory issues that must be considered before entering the telecommunications market.

REGULATORY ENVIRONMENT

The Communications Act of 1934, The 1992 Cable Act and The Telecommunications Act of 1996

The Communications Act of 1934

Though Congress has amended the Communications Act of 1934 several times since its enactment, today's high-tech communications companies are regulated to some extent by statutory language from the 19th century. When the Act of 1934 was adopted, the telegraph was the principle means of electrical communication, mass media meant AM radio, and telephones were considered luxuries. Considering the many new communications technologies that have emerged, the Communications Act has proven a versatile, evolving statute.

The Communications Act of 1934 was first amended in 1992 to reform the monopolistic practices of the cable industry. The Act was again amended when the Telecommunications Act of 1996 was signed into law. This Act of 1996 is regarded as landmark legislation and its implications will be discussed later in this section.

The Act of 1934 and its amendments are divided into three major regulatory subdivisions: **common carrier, radio,** and **cable television.** From a regulatory perspective, every form of electronic communication must fit into one of these statutory subdivisions or fall completely outside the scope of the Act. How a new form of communication is regulated depends in part on how it works and how its purveyors choose to have it regulated.[3] From a regulatory view, a communications service usually fits into two basic categories:

1. Who is offering the service?
2. How is the service being transmitted?

Who is offering the service? The answer starts with a definition of "**common carrier**" as one who serves all potential users without favoring one over another. The customers of a common carrier transmit information of their own design and choosing[4]. On the other hand, private carriers do not allow customers to transmit information of their own design and choosing.

How is the service being transmitted? Does it move through a wire or through the air (wireless)?[5] From a regulatory point of view, the result is a two-by-two matrix:[6]

	Common Carrier (Telecommunications Service Provider)	**Non-Common Carrier**
Wired	Telephone (land line)	Cable TV
Wireless	Cellular Telephone	Utility Radio Dispatch System

When a new service approaches the market, it must fit into one of the four boxes. Because the rules in one box may be more advantageous to a particular firm, an operator in one box may try to relocate to another box.

Though the fundamentals remain basically the same, the regulatory aspects of each box can, and do change. For example, the two amendments to the Communications Act of 1934 have had a profound affect on various communications industries.

Cable Television Consumer Protection and Competition Act of 1992

By 1984, Congress had basically deregulated the cable television industry. The 1984 amendments prompted expansion of cable television service throughout the country. Though millions gained access to cable access, customer complaints about escalating rates and poor quality of service attracted Congressional attention. Television stations argued that cable operators must carry their broadcast channels and then argued that operators "stole" their signals by re-transmitting them without paying for them. The Courts resolved this issue by ruling that cable systems were not obligated to carry local TV signals, but if they did, they must pay for the right.

Over time, the cable industry became increasingly concentrated: a relatively small group of executives controlled programming, production and distribution. In effect, cable had become a monopoly and exercised monopolistic power[7]. After several unsuccessful attempts to enact reform, Congress passed the Cable Television Consumer Protection and Competition Act of 1992, commonly referred to as the 1992 Cable Act.

The 1992 Cable Act empowered the FCC to regulate cable rates and service. The FCC responded with thousands of pages of rules, forms, and interpretive decisions that addressed the cable business in minute detail. These rules were adopted in 1993, and are still being fine-tuned in 1997[8].

In summary, the 1992 Cable Act sought to re-regulate an industry that had begun as an adjunct of broadcast TV and had evolved into an independent, distinct and powerful medium of communications[9].

Telecommunications Act of 1996

On February 8, 1996, President Clinton signed into law the Telecommunications Act of 1996 (P.L. 1040104) the most significant and far-reaching amendment to the 1934 Communications Act.

Unlike the 1992 Cable Act, the basic thrust of the 1996 Act is **deregulatory**. Its intent was to eliminate barriers to entry and spur competition. A number of provisions to the 1996 Act will also have a great effect on companies deciding to enter the telecommunications business. For example, if a company decided to provide a "telecommunications service" it would be subject to certain **common carrier** regulations including:

- **Interconnection** The Act of 1996 requires all telecommunications carriers to interconnect directly or indirectly with the facilities and equipment of other carriers.

- **Universal Service** The Act of 1996 requires that all interstate telecommunications service providers contribute, on an equitable and non-discriminatory basis, to a universal service fund. The 1996 Act codifies, for the first time in the history of the regulation of communications, the concept of "universal service." Universal service is generally understood to mean basic telephone service for all Americans at affordable prices.

Some of the major **deregulatory** aspects Act 1996 include:

- The FCC is empowered to refrain from applying or enforcing any communications statute or rule against any telecommunications carrier or service, or class of telecommunications carriers or services. For this to happen, the FCC must first determine that enforcement is unnecessary to ensure that charges or practices are just and reasonable or to protect consumer interest, and is consistent with the public interest.

- The FCC's tariff filing and review process are streamlined.

- The FCC is authorized to exempt individual carriers from complying with the requirements of Section 214. Under Section 214 of the 1996 Communications Act all carriers are required to seek and obtain FCC approval before building or extending a telecommunications linehead.

The 1996 Act defines "telecommunications service" as:

> *The offering of telecommunications for a fee directly to the public, or to such classes of users as to be effectively available to the public, regardless of the facilities used*

Interstate Access Charges
In January of 1997, the FCC adopted a Notice of Proposed Rulemaking to reform its system of interstate access charges to make that system compatible with the pro-competitive deregulatory framework established by the 1996 Act. Two possible approaches have been outlined for addressing reform. The first approach is a market-based approach under which the FCC would rely on potential and actual competition from new facilities-based providers and entrants purchasing unbundled network elements to drive down prices. The second approach is a prescriptive one under which the FCC would specify the nature and timing of changes to the existing rate levels. In addition, the Commission tentatively concluded that information service providers should not be subject to interstate access charges as currently constituted.

Local Exchange Telephone Service
The 1996 Act eliminates the consent decree that governed the breakup of AT&T. The 1996 Act opens up the local telephone market to new competitors, including long-distance carriers, cable operators and electric utilities. Local exchange telephone service is regulated by state public service commissions and long distance is the FCC's domain.

Long Distance Telephone Service
The 1996 Act allows Regional Bell Operating Companies (RBOCs) to provide long distance service to customers in their local exchange service areas once they have opened the local exchange market to competitors. They may immediately enter the long distance telephone market outside their local exchange service areas. The RBOC's may also provide telecommunications equipment and manufacture customer equipment.

Video Programming Services by Telephone Companies
The 1996 Act repeals the statutory ban against telephone companies becoming cable television operators. (Several courts had already ruled this ban unconstitutional.) However, the new law prohibits telephone companies from buying existing cable systems in their home areas - and vice versa, except in certain rural markets and in other limited circumstances[10]. Telephone companies now have four video entry options, each of which has different regulatory consequence and structure, and each of which is treated differently for payment of cable television franchise fees.

The four video options are:

1. Over a radio based system in which case it is regulated under Title III of the Communications Act and not as a cable operator. (A radio based system cannot be charged a cable television franchise fee.)

2. As a common carrier subject to Title II. (A common carrier cannot be charged a franchise fee.)

3. As a cable television operator. (A cable television system can be charged a cable television franchise fee.)

4. As an "open video system" operator subject to limited regulation. An open video system operator must make channel capacity available to unaffiliated programmers without discrimination. Though an open video system operator cannot be charged a cable television franchise fee, it may be required to pay fees based on gross revenues in lieu of franchise fees; it may also have to pay other state and local fees.

Though designed to promote video competition by telephone companies, these video entry options are not limited to telephony companies. Open video systems are of particular interest to companies that are experiencing difficulty obtaining franchises as a result of the long relationship between franchise authorities and incumbent cable television operators. A number of electric utilities are considering becoming open video system operators.

Overview of Players

Congress

Congress passes laws, such as the Communications Act, and exercises oversight of executive agencies that carry out those laws. Congress does this by gathering information, holding hearings, conducting investigations, passing resolutions, and expressing opinions about a wide variety of matters.

The House Commerce Committee and Senate Commerce Committee are the primary committees that investigate and recommend communications policy.

The Federal Communications Commission (FCC)

The Federal Communications Commission (FCC) is charged with implementing the Telecommunications Act of 1996. The FCC is a board of commissioners appointed by the President of the United States under the authority of the Communications Act of 1934, having the power to

regulate radio, telephone, cable television and all other interstate communication systems.

The FCC exercises its jurisdiction over communications matters through regulations that fall into two broad categories:

1. Regulations Congress expressly directed the FCC to adopt to carry out specific provisions of the Communications Act.

2. Regulations the FCC generated to further its actions in pursuit of the public interest.

Before adopting a rule, the FCC, like most Federal agencies, must initiate a formal rule-making procedure that entails publishing the proposed regulations and soliciting public comments. The FCC fleshes out the particulars of a Congressional enactment through its rule-making process. Interested parties try to alter or temper statutory provisions while the agency is drafting and revising its proposed regulations. If resulting regulations are not to their liking, they may challenge them in court.

The FCC cannot arbitrarily waive any provision of the law. However, the agency may initiate, or consider a request for, waiving rules and regulations based on just cause. By arbitrating individual cases, the FCC establishes precedents for dealing with similar issues. The FCC can also adopt policy statements to deal with situations that are likely to recur. Though less formal rule-making, this method still requires the FCC to explain any variation or deviation from the policy.

On August 8, 1996, the FCC issued its First Report and Order implementing the local competition provisions of the 1996 Act. The Order sets forth the basic regulatory framework for competition in telecommunications. Disputes over various provisions have resulted in court challenges and delayed its implementation. The FCC has also commenced additional rule making to address issues related to state and local authority, pole attachments and access to public rights-of-way.

Courts

The role of the courts is to determine the legality, particularly the constitutionality, of provisions of the Communications Act and actions by the FCC. When telecommunications issues come before the courts, it is usually because a party appeals an FCC decision or policy. The United States District Court of Appeals for the District of Columbia hears the majority of FCC cases.

State Public Utility Commissions

Public utility commissions regulate investor owned electric, gas, water and telephone utilities. They regulate telephone rates as well as terms and conditions of service of local exchange carriers. State commissions often coordinate their activities with the FCC by participating in joint activities, such as the federal-state board currently reviewing the concept of universal service (covered earlier in this section).

Washington Utilities and Transportation Commission (WUTC) Requirements

To do business as a telecommunications company in Washington state, a company must register with the Washington State Utilities and Transportation Commission (WUTC). An applicant must demonstrate its financial and technical competency and provide its proposed tariff package. An attorney usually prepares the necessary documents, with the approval process generally taking 30 days. If a company shows that it is subject to effective competition, it can avoid many of the regulations on rates and services that apply to monopoly providers. According to Tony Cooke, spokesperson for the WUTC, a municipally owned utility is not subject to state rate regulation for the provision of voice and data service, nor is it subject to regulation if it acts as a transport provider or "carrier's carrier" per chapter 80.04.500 of the RCW (Application to Municipal Utilities). This same non-regulation applies to both voice and data transmission. Whether a municipal utility builds a competing network or re-sells another company's service, rate issues are handled at the local level.

City Councils and Municipal Legislative Bodies

State and local authorities have some jurisdiction over telecommunications, but it varies depending on the industry and issues involved. The federal government exercises little jurisdiction over fiber-optic cables. However, if the system meets the definition of a "cable television system," then it will be regulated as a cable television system. If the system operates as a common carrier, it is subject to regulation as a common carrier.

Cities have traditionally exercised jurisdiction over public rights-of-way, most prominently in franchising cable television operators. The 1996 Act grants local authorities primary jurisdiction over basic cable television rates in the absence of effective competition. In addition, the 1996 Act specifically affirmed local jurisdiction over wireless mobile services such as cellular telephones. However, the 1996 Act also limited local jurisdiction over satellite Earth stations and receiving antennas for TV and Multichannel Multipoint Distribution Service, sometimes referred to as "wireless cable."

The 1996 Act also reaffirmed the FCC's authority to preempt any state or local law, regulation or policy that constitutes a barrier to entry into the telecommunications market. This power is apt to be tested "repeatedly and aggressively."[11]

Federal - State Joint Board Recommendations

Universal Service
In November of 1996, the Federal-State Joint Board on Universal Service released a 422-page Recommended Decision on new universal service support mechanisms required by the 1996 Act. The FCC has until June 1997 to adopt universal service rules based on the Joint Board recommendations and public comments[12].

Private Internal Networks
Applying this definition, the Federal-State Joint Board recognized that private networks dedicated exclusively to internal communications are not telecommunications providers and are not subject to the 1996 Act's mandatory universal service contribution requirement.

Carrier's Carrier Networks
The Joint Board has not made a recommendation with regard to treatment of fiber that is provided to a third-party telecommunications carrier. There is a strong argument that the provision of fiber alone does not constitute the offering of telecommunications. As unpowered glass, dark fiber would appear to fall outside of the Act's definition of telecommunications as the transmission of information.

Information Services
The Joint Board concluded that information service providers and enhanced service providers are not telecommunications services and are not subject to universal service obligations. Under this interpretation utility automatic meter reading and other energy management systems using telecommunications networks would not be subject to federal universal service requirements. In addition, the provision of Internet services would also appear to be outside of universal service obligations.

Endnotes

[1] Eric Glick, "What's up at the FCC?", *Cable World,* December 1996, p. 96.
[2] Harold K. McCombs, Jr. Esquire, *Current Legal Issues,* American Public Power Association (APPA), Orlando Florida, November 7-8, 1996.
[3] APPA, *Utilities Telecommunications Guidebook,* 1996. p. 65
[4] APPA, *Utilities Telecommunications Guidebook,* 1996. p. 66
[5] APPA, *Utilities Telecommunications Guidebook,* 1996. p. 66
[6] APPA, *Utilities Telecommunications Guidebook,* 1996. p. 66
[7] APPA, *Utilities Telecommunications Guidebook,* 1996. p. 67
[8] APPA, *Utilities Telecommunications Guidebook,* 1996. p. 67
[9] APPA, *Utilities Telecommunications Guidebook,* 1996. p. 68
[10] APPA, *Utilities Telecommunications Guidebook,* 1996. p. 121
[11] APPA, *Utilities Telecommunications Guidebook,* 1996. p. 75
[12] *UTC Information Bulletin,* UTC Legal/Government Affairs Department, November 18, 1996, p.1.
[13] *Cable Television Information Bulletin,* Federal Communications Commission Fact Sheet, October 1996, p. 21.

Overview

TELECOMMUNICATIONS ACTIVITY IN OTHER CITIES

A number of cities across the country have made efforts to create modern telecommunications infrastructures. Some have succeeded, some have recently begun to investigate their options, and others have withdrawn. None appear to be outright failures. Five themes have emerged from an examination of these cities:

1. *Smaller communities with experience in operating municipal utilities appear to be more likely to enter the telecommunications field than other communities.* The desire to facilitate new economic growth, keep money in local circulation, and provide alternative services at lower costs are common threads in Glasgow, Kentucky; Paragould, Arkansas; and Morganton, North Carolina. The strong influence of universities in Cedar Falls, Iowa and Blacksburg, Virginia was a significant force as well.

2. *A relative lack of local competition amongst telecommunications providers often prompts community telecommunications efforts.* With no one willing to voluntarily make the significant investment to serve them, many of these cities have taken on the task of soliciting infrastructure builders or creating infrastructure themselves. Harlan, Iowa, and Glasgow, Kentucky, are two small communities willing to take the risks and make the investment in a telecommunications infrastructure with the goal of attracting new business and enhancing the existing community.

3. *Determination and tenacity is a requirement.* Some of these communities have had to face large incumbent telecommunications corporations in protracted legal battles. Perhaps smaller communities have fewer distractions, allowing them to focus on telecommunications and there by compensate for their somewhat limited resources. Morganton, North Carolina had to fight a long court battle with a local cable provider before it could build its own system. On the other hand, fear of court battles caused Jefferson City, Missouri, to abandon its plans for a system.

4. *Public dissatisfaction with local incumbent telecommunications providers often prods communities to actively consider owning and operating their own system.* In both Morganton, Paragould, and Cedar Falls, strong citizen voter support for cities to own and operate their own telecommunications systems prevailed despite aggressive advertising campaigns by incumbents. Even when a community dropped out of the race with a competitor, customers still appeared to have often benefited through reduced rates, improved customer service, and additional cable channels from the incumbent operator.

5. *"First tier" cities are seeing some telecommunications competition.* First tier cities are likely to already be experiencing competition for services targeted at major business users, i.e., those taking service at T-1 levels or higher with a minimum monthly telecommunications expenditure of approximately $5,000. Even first tier cities are not yet experiencing significant competition targeted at small business or residential users located outside of the business core. Tacoma is viewed as a second tier city by telecommunications providers.

TELECOMMUNICATIONS IN THE GREATER TACOMA/PIERCE COUNTY AREA

SUMMARY

Building on background information about the broader telecommunications industry, this study turns its focus upon the local telecommunications environment. To put today's events in perspective, the first section provides a quick review of the history of telecommunications and utilities in this area.

The study then reviews in more detail the existing telecommunications providers that serve our communities, the telecommunications infrastructures that they employ, and their latest announcements of future plans for this area.

The next section provides a quick overview of the changing local regulatory picture and some of the difficult problems faced by local jurisdictions as they participate in the evolving telecommunications environment.

A review of telecommunications in our local communities analyzes both the residential and business markets for telecommunications services as they stand today. A discussion of how different economic futures are impacted by telecommunications concludes the section.

The role of telecommunications infrastructure and services in economic development is a topic of considerable interest. In order to put the local situation in perspective, the following pages discuss some of the economic development ramifications of telecommunications. This piece was authored by Professor Bruce Mann, Ph.D. with the Department of Economics at the University of Puget Sound; and Peggy sue Heath, A.B.D., with APEX Business Solutions. They conduct an interesting examination of the key role that telecommunications has begun to play in economic development, and what the future might hold for communities that create a communications infrastructure.

Telecommunications and Economic Development

Professor Bruce Mann, Ph.D.
Department of Economics
University of Puget Sound
Peggy sue Heath, A.B.D.
Apex Business Solutions

The Railroad of the 21st Century

There was a time when the simple act of drawing a line on a map could either create a community or force a town into obsolescence. Those were the days of railroad planning. To have access to the rail line meant a chance at prosperity as a "railroad town." Without access, a town would have an uphill battle to be involved in the growing network of trade. Many businesses needed the railway to send their products off to other buyers; other local businesses needed the people traffic the railroad brought to create demand for their products or services. Economic development was synonymous with rail development, and the decisions made on those planning maps fundamentally shaped the face of the entire nation.

Since the first rail tracks were laid, people have continued to improve the transport of physical goods. The last century has seen incredible developments in aeronautics with design and material breakthroughs leading to planes that can take people and products around the world overnight. Even more dramatic, however, have been the developments that allow people to overcome vast geographic differences without needing to leave the room. As we draw near the close of the 20th century, many signs indicate that the new railroad towns are "Tele-Communities", communities with a strong communications infrastructure supported by both information technology and telecommunications systems.

Why Does Telecommunications Play a Role in Economic Development?

Urban planning experts have long emphasized the role of infrastructure to support economic development and an increasing standard of living. As time goes on, telecommunications is key to creating a foundation for economic growth and health. But if telephone has been in existence since Bell's fateful afternoon in 1876, why has it become such a focus now? The answer lies in the changing nature of industry and competition.

The 21st century is being characterized as the time of bytes, rather than atoms. While historically trade has been focused on buying, selling, and transferring atoms — physical things — from one geographic area to another, many emerging and changing industries are being driven by the need to transfer "bytes" of information. Some of those industries, such as financial services and medical administration, represent the growing service-based sector in the United States. In most industries competition is driving companies to utilize information technology and telecommunications to compete more effectively.

Ironically, even industries whose focus is on transporting physical goods have begun to incorporate information management as part of their value-added services. For example, some transport companies offer services that track goods with Global Positioning Satellite (GPS) technology. Others use the Internet to provide services that identify the least costly route or shipping method. So even "atom" companies are using "bytes."

Investments in infrastructure ensure that local communities attract and retain businesses that keep residents in jobs, homes, and with a healthy standard of living. As the industrial base in communities undergoes change, the infrastructure necessary to support that base must change. Telecommunications investments can serve the needs of companies and can also provide tools for local government and the community. Some of the ways telecommunications are already being used are reviewed below.

For companies

Companies use telecommunications in several ways. For many organizations, telecommunication is used as a link to their markets. One example of this is a 1-800 number used for sales or customer service. Telecommunications can also serve as part of core production process, as when a financial service organization transfers money or transaction information from one location to another. Another key use for telecommunications is as an internal communication device to coordinate work across a number of locations.

For local governments

Local governments benefit from increased telecommunications by keeping their communities better informed about government activities and issues that affect community members. Improvements in telecommunications can increase economic development by allowing local governments to provide the kind of information necessary for companies and developers to decide to invest in a community. Improvements also meet the needs of current residents through enhanced services, including better fire and police protection.

For local communities

In the last decade in particular, communities have climbed on the bandwagon through public access networks, community-based web pages, wired libraries and schools, both public and private. Schools in particular

benefit from enhanced telecommunications, through access to remote sources of information. Telecommunications has served as a conduit for courses offered to those who are far from a major university. It has also been used to provide health care between facilities, in particular to those who don't have full access. Local business and economic development groups in California, Illinois, and elsewhere have taken the initiative to use telecommunications to provide communities with information helpful to retain or attract businesses. This information has included local land use and availability, numbers about local markets for certain goods and services, and information on local support services for siting businesses.

What Happens If Communities Aren't *Wired*?

The emphasis on getting wired has been punctuated by stories of successful telecommunications investments. In Dublin, Ireland, early investment in telecommunication supported a growth plan that brought in advanced technology industries and reduced Ireland's reliance on low-skilled labor industries they were likely to lose to nations with lower labor costs. When it comes to preemptive telecommunications investments, Singapore's plan to place "fiber in every home" is pointed to as one of the more progressive moves a country has made in this decade. Singapore's plan is predicted to have a positive long-term impact on their ability to compete for business, even though they have higher costs compared to some of their Southeast Asian rivals. Successes like these have begun to slowly raise awareness of the role of telecommunications in sustaining economic health.

A weak telecommunications infrastructure will first impact a community's ability to retain and attract commerce, including technology intensive businesses and those companies that co-locate to sell to them. These include primarily financial services, transportation and distribution, and medical administration and provision. Also affected are businesses whose success or failure lies primarily in beating the competitor to the market. These companies often use collaborative work arrangements with individuals all over the world to increase the chances of beating the competitor to market — examples include software development, biotechnology, and other advanced research companies. Additionally, each of these businesses mentioned find themselves a part of a growing group of firms who must compete aggressively for talented people to fill key positions. As more employees focus on the quality of life issues that a career choice represents, information access in their homes and their children's schools may play a larger role in their decisions to locate in one community or another.

In addition to the fundamental inability to sustain an economic base for technology companies, the lack of a modern telecommunications infrastructure can also impact a community on a more social level. Access to information has often been lauded as one equalizer in the disparity between poor and rich. Whereas some communities will have access to a wealth of knowledge with wired libraries, public access networks, and technology support for individual Internet access, those communities without such a base may be left behind in a widening cultural evolution toward the information age.

What Is The Future World Of Tele-Communities?

Whether or not it chooses to be actively involved in the revolution, a community is impacted by developments in telecommunications. How the revolution will impact each community is part of the mystique surrounding the future of Tele-Communities. Two forces surround telecommunication advances, dispersion and relocation. On one hand, experts have predicted more dispersion or spread in communities as people move away from urban centers, since telecommunications allows individuals to overcome geographic distance without the need for physical proximity. The forces of relocation, however, are more complex. As people relocate to other areas, there are two opposing arguments as to whether this physical distance will be accompanied by social distance as interaction changes. At the heart of matter is whether the forces of telecommunications advances will drive society farther apart or closer together. Further, what role can Tele-Communities play in this revolution?

Dispersion

First, let us explore some of the basic economic premises to understand why physical dispersion may occur. One of the main reasons for the economic vitality of cities is that highly concentrated, dense, proximate locations reduce the costs of transportation for businesses and households. Lower costs of travel led to more profitable operations and higher real standards of living. Firms locate near suppliers and/or their consumers. Households locate near work, shopping, and/or recreational activities. This packing together of economic activity produces the traditional patterns seen in the urban landscape. However, as the costs of overcoming the "friction" of distance fall, the economic need for individuals or businesses to be in a city declines. One of the most important impacts of the telecommunications revolution will be the change in the urban landscape.

By and large, the ability to conduct business, shop for goods, and visit with other people is significantly enhanced with modern telecommunications. The cost of meeting clients has declined as the

telephone, pager, fax, and Internet have emerged as viable communication media. Many find that shopping takes less time with the telephone, fax, and Internet in comparison to the traditional automobile trip. Getting information, reaching the market, and putting the deal together can be done without the physical act of travel in many cases — just use the modem, surf the net, or fax the document. All of these newer technologies lower the cost of doing business, for the buyer and the seller, the client and the service provider, and the employer and employee.

Households Household activities have also been the beneficiary of the modern telecommunications revolution. Television is easier to access and provides more choices. The assumed advantages of traveling to the museum, the theater, or the opera hall have diminished, as improvements in voice and picture have brought these experiences dramatically into the home. Even the activity of just visiting can be done in chat rooms, with a computer e-mail system, or using teleconferencing systems. Accessibility is increased while the need to travel with its attendant costs is reduced.

Structure Of Cities The result of reduced travel costs will have profound impacts on the structure of cities. The need to reduce distance is diminished. Telecommuting, long distance meetings, and shopping from home all have implications which suggest the decline of the traditional city landscape. One can live far from the job and still work in the city. One can live far from the shopping center and still buy goods from the city. One can reside miles away from the city and still enjoy urban entertainment. Thus, the economic value of face to face contact and actual presence in physical space is considerably less than it was ten or twenty years ago. Most importantly, these changes are not merely *predicted* to happen. These new methods of interacting have been adopted and embraced by the critical mass of consumers, businesses, and agencies necessary to make a real difference in accepted social norms.

Relocation

If it is true that the need for physical proximity has declined and people can live and work at a considerable distance from each other, the next question is whether we will draw farther apart socially as well. Will there be any relocation of "community"? There are two arguments about how relocation will occur.

The first argument rests on the assumption that the traditional economic reasons for urban life are becoming less and less important. As more people, both as workers and consumers, become comfortable and adopt new telecommunications systems they will move out of the cities of today. The result will not be just suburbanization, but a new urban structure — the city-village, edge cities, or even complete dispersion to non-urban areas. Subsequently, the need for face-to-face contact and more traditional social interaction may lessen as well.

A second argument is more optimistic for cities. This argument has the same basic set of changes. The telecommunications revolution will and does lower the costs of transactions by reducing the need for and expense of travel. By itself, as the first argument has it, this will lead to geographic dispersion. However, a *second effect* also arises due to the lower cost for communications. As the costs of communications fall, people will undertake more communications and this will lead to more total activity. The lower cost of reaching interested consumers over the Internet means that sellers will make more use of the Internet and reach more consumers. Reduced commuting and travel time means that more business can be done during the work day. Lower cost entertainment in the home means more entertainment programs will be consumed. Just as the telephone increased voice contacts and reduced mail volume, just as the railroad expanded land-based shipping and reduced shipments via wagons and barges, and just as the jet plane led to more individual contacts, so the new telecommunications technology will lead to more activity, more network contacts, and quicker delivery of information, some shifting from current forms and some being new to this technology.

This second argument says the social and economic need that cities traditionally fulfilled will continue to exist, but the way in which these needs are fulfilled will change. True, physical activity does not disappear as a place bound reality — only the communications activities "disappear." The need for location, buildings, face to face contact, and human interaction will still exist. Some of this economic activity will disappear from cities, as the concept of dispersion suggests. But, the second relocation argument recognizes that the need to be somewhere physically will change as overall activity levels increase. The importance of this second argument is that it suggests how economic relocation will occur. Survival and success will ultimately go to those areas which have adapted to the new environment by incorporating successfully the new forms of telecommunications. Successful locations will be where businesses can serve their markets cost effectively using the new forms of telecommunications. Still, labor costs will matter, proximity to natural resources will matter, land based transportation will matter, traditional infrastructure will matter, but now the accessibility and quality of modern telecommunications will also matter. Those places which adopt new approaches to telecommunications and media will be able to capture the expanded activity and benefit from the shifting patterns of behavior.

The forces of dispersion and relocation suggest a pattern of urban change. On the one hand, dispersion implies the existence of fewer densely settled cities. More of the urban landscape will be made up of scattered, fragmented, edge cities. Each of these will be smaller replicas of cities -- predominantly residential and personal service oriented with telecommuting workers. On the other hand, the relocation implies the need for some highly technological urban centers where there is some value in proximity. In the most optimistic case, these urban centers will be catalysts in the new telecommunications revolution. They will be cost

competitive for telecommunications as well as the traditional needs of businesses and households. They will also offer a complete set of urban amenities, both technological and traditional. They will move away from the historical emphasis on being near raw materials or markets and more sensitive to the quality of the overall infrastructure base — telecommunications, education, water, sewer, and electricity. While business services and information processing will be the growth sectors in these new centers, the centers could still capture much of the manufacturing and regional service functions which exist in cities today.

Conclusion

John Mayo, the President of AT & T Bell Laboratories, spoke on the technology changes that are driving our evolution:

> When I reflect on the future of information technology, I am reminded of the story about the test run of Robert Fulton's strange-looking steamboat, the Clermont. For a few hours the craft kept making a terrible racket, belching smoke and sparks as the engineers tried to get it started. Skeptics in the crowd kept yelling, "She'll never start! She'll never start!" Finally, after a lot of huffing and puffing, the boat began moving up the river. The scoffers were astonished and remained silent for a few moments, and then they started yelling again: "She'll never stop! She'll never stop!"[1]

Like the skeptics reacting to the steamboat that represented a drastic change, we face our own seemingly unstoppable force: the need for advanced telecommunications. In responding to the railroad and other technology shifts, communities have always had the opportunity to be part of the revolution, or to be dragged into the evolution that will naturally follow. The difference may be a choice between mastering one's own destiny or waiting for the train to arrive.

[1] John S. Mayo, "R & D in the Third Millenium," Research Technology Management, Vol. 35 No. 6 November-December 1992.

HISTORICAL OVERVIEW

Electricity and Water Supplies

Tacoma City Light was founded on the entrepreneurial spirit of individuals such as Charles B. Wright, the "father of Tacoma." Wright arrived in Tacoma in July 1883 as one of seven men responsible for choosing the terminus of the Northern Pacific Railroad. Tacoma had a population of 4,000, was ideally situated on a deep-water bay, and was surrounded by abundant timber and other natural resources. The arrival of the first railroad terminus in the Northwest seemed to assure Tacoma's importance in the commerce of the region and the nation.

At that time, the town's main drawback was the lack of a dependable water supply. It was obvious that the spring-fed, gravity-flow water system would be inadequate to meet the needs of the rapidly growing community. This came to Wright's attention soon after his arrival. Within two weeks he had outmaneuvered the existing water supply companies and persuaded the City Council to pass an ordinance granting him the "privilege to supply the city of New Tacoma and its inhabitants with pure and fresh water."

By June 10, 1884, Charles Wright and General John W. Sprague had incorporated the Tacoma Light & Water Company. By November 1886, the Tacoma Light & Water Company was about ready to enter the streetlighting business. Poles had been placed, wire was being strung and "electric dynamos" were nearly ready for operation. The company generated electricity from a small powerhouse in Galliher's Gulch, near South 26th Street and Pacific Avenue. Service extended three-quarters of a mile along Pacific Avenue by January 1887. Rates were high and generating capacity inadequate.

By 1889, Tacoma needed more than just streetlighting. People were asking for electricity in their homes. Complaints against the company were growing, and even with a new powerhouse completed in 1889 and equipped with a "modern" generator capable of lighting 1,500 lamps, the tide of criticism could not be stemmed.

The lights weren't bright enough, there weren't enough of them, and the company was poor in responding to outages and other service issues, customers complained. Support for a municipally owned system was increasing.

By 1892, the idea of a municipally owned light and water system had become *the* political issue of the day. The following year, after extensive study, the City decided the quickest way to own a light and power plant was to purchase Tacoma Light & Water. Wright, tiring of his investment, was interested in selling — for a sum of $2.1 million. The City Council, however, had calculated the value at $1.52 million. This fostered a fierce debate over whether or not to buy the company. Finally, a small committee traveled to Philadelphia to bargain with Wright face-to-face. This meeting led to an agreement for the City of Tacoma to purchase the Tacoma Light & Water Company for $1.75 million.[1]

In March 1893, the Council passed "an ordinance to provide for the purchase of the water works and electric light plant, and all such water supplies, riparian rights, rights of way, lands, lots, personal property and franchises as are now owned and operated by the Tacoma Light & Water Company." The issue passed the public election, and in July 1893 the the City of Tacoma became the proud owner of a municipal utility.[2]

Telephone Services

The first telephone on the West Coast was installed in Tacoma in April 1878, connecting the Telegraph Operator's Wharf on Second Street and Lighter's Foundry on Pacific Avenue and 17th Street. Tacoma's first permanent telephone, installed in 1880, connected the Tacoma Mill in Old Tacoma and the Western Union office. The next line linked Dr. Harvey's home with Bonney's Drug Store. Tacoma's first exchange, the second in the Washington Territory, was established in Rebard's Cigar Store by E.W. Melse and the Sunset Telephone and Telegraph Company in 1884.

By the turn of the century, Tacoma and its telephone service were expanding at a rapid rate. Sunset, however, began to experience competition from its rival, the Telephone Company of Puget Sound. During the next few years, the two firms struggled for customers. Customers wrestled with two separate telephones if they wanted to connect with the rival company's instruments. Finally, in 1916 the two operations were reassigned to the Pacific Telephone and Telegraph Company.[3]

Telephone service expanded over the next 50 years until it reached virtually every home in the city. Service under Pacific Telephone & Telegraph continued until 1964, when a split in its parent company led to the formation of Pacific Northwest Bell Telephone Company.

With the approval of the State Public Service Commission, Pacific Telephone & Telegraph holdings in Washington, Oregon, and parts of northern Idaho were turned over to Pacific Northwest Bell and more than 30 million shares of common stock in Pacific Northwest Bell were given to Pacific Telephone & Telegraph shareholders. At that time, 90 percent of Pacific Telephone & Telegraph shares were controlled by AT&T.[4] In addition, Pacific Northwest Bell agreed to not pass on the expenses accrued by its formation to their customers, but would maintain current rates for a period of 10 years.[5]

Cable Television Services

The year 1965 was important for both the local and national cable movement. The FCC assumed jurisdiction over Community Antenna Television (CATV) systems and began to impose its own regulations. The State Utilities and Transportation Commission called for a legislative investigation to determine whether the monopolistic nature of the industry required the state to regulate rates and services.[6] In addition, Pierce County commissioners began considering franchise applications for providing CATV to the University Place and Lakewood areas where 2,500 potential customers were anxious for the "fix" that would eliminate the "snow" the existed on their screens when using an antenna.[7]

The following year, the county approved the first franchise, but deliberations continued in Tacoma. By the spring of 1966, seven companies had filed requests for franchises within the city limits. Criteria for selection included the company's financial resources, intended scope of service, proposed rates and franchise payments, and the number of free channels provided for public use.[8] Representatives of the only two locally owned companies among the seven applicants urged the awards be made to Tacoma firms. The council also believed that the city "should do business with local people so that you can talk to the local ownership and not rely on information from attorneys representing outside companies," and felt the earnings made by Tacoma companies would remain to support the local economy. City Manager David Rowlands, however, said it was the Finance Department's opinion that two outside companies proposed franchise tax payments that offered the greatest return to the city.[9]

Arguments for local ownership eventually prevailed, and the City Council named Tacoma Cable Company and Cable TV Puget Sound in the initial franchise ordinance of September 1969.[10]

Subsequently, City Manager David Rowlands raised the possibility of the city forming its own utility for CATV. He recommended that "all previous proposals be rejected and that the city manager and his staff be directed to explore the possibility of either accepting new franchise

proposals or investigating in depth the desirability of establishing a city-owned and operated cable television antenna system."
In response to concerns expressed by officials in the cable industry, he stated: "If the state law is somewhat obscure on the right of a city to engage in a CATV utility, then I am sure that revisions could be passed by the legislature. With Tacoma ... facing a financial crisis in the years ahead, it appears that this could be another source of revenue ... while at the same time keeping the rates for the subscribers to a minimum."[11]

In January 1970 the two franchises were awarded as initially granted, although the Cable TV Puget Sound franchise was rescinded after only one week. As a result, Tacoma Cable Company was the sole cable television franchise to begin operations in Tacoma, with the second franchise once again open for discussion.[12] A few months later, TelePrompTer Corp. was granted the second franchise, with a third franchise subsequently given to Community Tele-Communication, Inc.[13] Excited about its new opportunity, TelePrompTer Corp. said work on its cable television system would begin soon. The president of the company painted a bright picture of the following five years, which included a two-way cable system which would allow every home on the system to have what amounted to a computer in its living room. He said that "bills will be sent — and perhaps paid — by cable; doctors, lawyers and businessmen can arrange conferences; housewives can browse through a market and shop by television; and school officials can arrange vast changes in curricula by using the systems."[14] By May 1971, Tacoma Cable Company was taking over the area to the north and west of South 35th Street while TelePrompTer took over the south and east. Community Tele-Communications, having only recently received its franchise, had not yet begun hanging cable.[15]

Within two years, the only remaining cable company provider in Tacoma was TelePrompTer. With 480 miles of cable and 7,300 subscribers representing 22,000 viewers, TelePrompTer offered cable service to almost every section of the city. At that time, its $4 million investment included a system with a 30-channel capacity.

Internet Services

The Advanced Research Projects Agency (ARPA)'s Information Processing Technology Office was the initial funding source for computer facilities at 17 sites across the country. Key researchers needed to access these computer resources directly from their offices. The ARPA commissioned construction of an experimental computer network based on a packet-switching technology. This was installed at UCLA in September 1969. After being hooked up to phone lines, the packet switches at four

university sites began to exchange information packets long distance. This was the beginning of the ARPANET.

Growth of the APRANET, particularly for military-related traffic, led the Defense Department to take it over in 1975. Connections were made available only to organizations doing work that fell within Defense Department guidelines. Although many universities, government agencies, and even some computer vendors were qualified, others were not. These outside sources decided to form computer networks of their own. The two most notable were CSNET and BITNET, which were formed by education and research sites.

The growth of the networks outside of the ARPANET created new challenges, in particular they had difficulty connecting to each other because of incompatible communication protocols. As a result, Transmission Control Protocol/Internet Protocol (TCP/IP) was develop to allow the different networks to interconnect and "communicate." On January 1, 1983, ARPANET and the Defense Department began using TCP/IP and this "network of networks" soon began to be referred to as the "Internet."

The Internet remained virtually unknown outside research and defense circles until the late 1980s when the growth of personal computers fueled consumer interest. By 1990, many metropolitan area residents owned a computer, modem, and telephone and were using Internet Service Providers to get online. Companies like Software Tool and Die, Panix, Digital Express, and NetCom offered individuals affordable "Internet accounts." As the number of sites and users grew, the Internet came to resemble an overgrown information jungle — one without signposts or maps. In the late 1980s and early 1990s, bewildered users created tools to locate and index resources. These guideposts helped others in the Internet community find their way, and transformed the Internet into a more user-friendly network.

"archie" was the first to cut through the information undergrowth. Created in 1990, archie enabled users to scan a lists of the Internet's holdings with a single query. archie was followed by Gopher in 1991 as the first widely-popular "Internet navigator." It let "information owners" organize data into hierarchical menus. Users could then view, scroll through, and make selections from these menus. But the question was now how to find something in "gopherspace," since the original Gopher plan did not include a general index.

The answer was called VERONICA. This database held over one million entries from Gopher menus by 1993. VERONICA servers were kept busy performing searches for Internet users around the world. Meanwhile in 1992, in Switzerland, a physicist devised a way to organize the Internet-based information and resources he needed for his physics research. He dubbed his system the World Wide Web. To connect individual pieces of information, he made use of "hypertext," which allows document owners

to include names and pointers — addresses — to other relevant items. By clicking on a hypertext link, users tell their computers to "get the address associated with this link, and go there."

An Internet browser called Mosaic, developed in 1993, made the Web and the Internet more user-friendly and accessible. Mosaic let users retrieve and display graphics, images, and sounds with a single mouse click. The combination of the Web and Mosaic — and similar programs such as Netscape Navigator — transformed the look and feel of the Internet. Formerly a world of largely text-based, hard-to-find resources, the Internet became an inviting multimedia information system.

During the past three years, the Internet has become increasingly accessible. Most visibly, the Internet has become a new venue for business. Companies are trying to determine just how this online, "cyberworld" will shape the business products and players of tomorrow. The Internet has become more than an wildly new information exchange; it's an overwhelming cultural phenomenon.[16]

Access costs, however, are still prohibitive for some segments of society. The issue of universal access has been one of the most controversial issues surrounding the Internet. For communities such as Tacoma, how to make lines, equipment, and services equally available to residential users in all neighborhoods — including homes, schools, and libraries — is an issue that has not been resolved.

Overview

EXISTING TELECOMMUNICATIONS OPTIONS IN TACOMA

Is the greater Tacoma area prepared for growth in the area of communications? Do we have the telecommunications resources necessary for businesses that may want to locate in this area? What about growth in telecommuting? How will the explosion of the Internet be accommodated?

US WEST and Tele-Communications, Inc. (TCI) control the only existing wired systems currently available for the telecommunications infrastructure needs of the greater Tacoma area. By examining these companies, the infrastructures they control, and some of the emerging wireless providers, an understanding of the existing options available to meet the needs of an economically vibrant greater Tacoma area can be achieved.

US WEST

US WEST is the incumbent provider of local telephone service in the greater Tacoma area. Currently, all requests for new services, installation of advanced or large capacity equipment, and additional phone lines must be completed through US WEST. While the central offices in Tacoma are interconnected with fiber optic cable, the majority of Tacoma's telephone system consists of twisted copper pairs. A limited amount of fiber optic cable has been placed to businesses with large telecommunications budgets. Local businesses have experienced waits of four to five months for digital lines, and some have considered completing the installation of necessary fiber links themselves.

US WEST's residential customers have experienced similar frustrations. A service request for the installation of a second phone line may take more than a month to complete. US WEST's service reputation was a leading factor in Washington regulators' decision to deny US WEST's request to more than double its monthly residential phone rate. Regulators instead ordered the company to *lower* its rates. US WEST officials have responded that without the rate increase, investment in upgrading the local telephone network will not continue and customers may continue to struggle with service.

US WEST is also facing a growing demand placed on its system from increasing numbers made through modems for Internet connections. An average Internet connection lasts approximately 14 times longer than the average voice call that the system is designed for, leading to potential disruption of vital functions such as emergency 911 services.

TCI

A second candidate to develop an advanced communications infrastructure is the existing cable television operator, Tele-Communications, Inc. TCI maintains a cable plant serving all of Tacoma and a large portion of Pierce County. This cable operator provides residences of the City of Tacoma with 36 channels at 350 MHz, and serves portions of Pierce County with 60 channels through the recent purchase of Viacom's local cable properties. TCI customers are often unhappy with the customer service they receive from TCI, and express frustration about the limited selection of channels and programming. However, the main complaint has been rising cable rates.

The company's increasing rates point to TCI's poor financial position and a need to raise revenue while curbing expenses. In November 1996, TCI announced that it would be "deferring the rebuilding of the balance of the company's cable systems" in most areas and instead would install digital set-top boxes. These boxes deliver more channels and an improved picture quality, but do *not* usually require upgrading the network from coaxial to fiber optic cable. Without an upgrade, the network will not have the capability for two-way communication and will not be able to provide telephony, two-way Internet access, or other advanced telecommunications features. Additionally, set-top boxes require an additional phone line for any pay-per-view ordering, only adding to the demand pressure on the telephone network.

The City of Tacoma is currently undergoing franchise renewal negotiations with TCI. During these negotiations, the City has looked for a commitment from TCI that the upgrades performed on the system will be with fiber optic technology, and not a "quick-fix" solution using the existing coaxial cable network. Before TCI announced a halt to system rebuilds, it had estimated that rebuilding its Tacoma System would take an estimated three to four years.

EXISTING TELECOMMUNICATIONS OPTIONS IN TACOMA

US WEST

Summary

US WEST's subsidiary, US WEST Communications, is the main provider of local telephone service in the Tacoma area. Although a major player in the telecommunications industry with $11.7 billion in annual revenues, US WEST Communications has a poor service reputation. This was a key factor behind Washington regulators' decision to deny the company's request for a large rate increase. Further, regulators required the company to reduce its rates. In response, US WEST declared that the company will no longer be able to invest as much money into improving its Washington network, causing service and the important state-wide network to be in danger.

While US WEST's main business suffers, the company has been rapidly diversifying and developing new markets. US WEST has a major stake in the cellular market, recently joining with AirTouch Communications to form the nation's third largest wireless phone company. Another alliance with Bell Atlantic and NYNEX could provide cellular service to as many as 100 million customers. In 1993 it launched a high-profile digital video trial in Omaha, with plans to expand to other major cities. After a year-long market trial, the promised digital television never was introduced, and the project was ended due to technical and financial difficulties. US WEST has also entered into the video market through its recent purchase of Continental Cablevision. It also owns 25 percent of Time Warner Entertainment, controlling the majority of Time Warner Cable, HBO, and Warner Bros.

US WEST's central offices in Tacoma are interconnected with fiber optic cable, but the rest of Tacoma's distribution plant is *not* state-of-the art. A limited number of fiber optic cables have been placed to a few select businesses and waits of four to five months for a high-capacity line are not uncommon. Growing Internet use, which keeps lines in use longer than planned, is making carriers like US WEST nervous. They claim it could lead to the disruption of vital public safety services like 911. This suggests a need for an upgraded public data network.

Background

US WEST is the incumbent Local Exchange Carrier (LEC) providing local telephone service in the metropolitan areas of Puget Sound. The company has had a near-monopoly with 25 million customers in 14 western and midwestern states since the establishment of the Regional Bell Operating Companies (RBOCs) at the breakup of AT&T in 1984. Today

US WEST has $23 billion in assets, $11.7 billion in annual revenues, 61,500 employees and more than a million shareholders. The company is headquartered in Englewood, Colorado, a Denver suburb.

No RBOC has ventured farther from its basic regulated telephone business than US WEST. This diversification was meant to provide a brighter future for US WEST as deregulation and competition slashed its monopoly telephone profits. However, this diversification is clouding its future and may have been a factor leading to deteriorating phone service.

Service Reputation

US WEST's service reputation has suffered due to the company's record of poor telephone service. US WEST struggles with the largest service territory of all RBOCs, responsible for a 14-state western region However, customers have little patience with a company incapable of installing a new line within week or sometimes even months — no matter how impressed they might be with how many states US WEST serves.

Federal and state regulators have been requiring US WEST to improve service, especially regarding the installation of new or second phone lines. Emergency rules have been proposed in at least five states in US WEST's territory, establishing voucher systems of $150 a month for customers waiting for new phone lines. The reason for the ruling in Colorado, according to that state's public utilities director, was that "little, if any, apparent progress is being made toward resolving this problem."[1] The costs of the vouchers are small for US WEST, but they are symptomatic of a growing ill will in state legislatures. In Washington, Governor Mike Lowry vetoed a 1995 US WEST-backed bill that would have maintained a ban on competition from the likes of AT&T and MCI on in-state long distance calls.

Rate Reductions

Poor service was the leading factor behind a rate reduction ordered by Washington regulators in 1996. US WEST had asked for permission to raise average monthly residential phone rates from $10.75 a month up to $26.35. Instead, the regulators ordered US WEST to *lower* its rates on residential, business, and long distance service. Further, regulators criticized the company for taking profits outside the state and paying too much in employee bonuses — all at the expense of customer service. After the company requested the rate increase in February 1995, the commission received overwhelming response from US WEST customers opposing the increase. The commissioners said that ordering US WEST to reduce its revenues by about $91.5 million "gives the company what it needs — fair rates based on the company's actual costs, greatly increased flexibility to lower prices to meet market requirements and meaningful incentives to improve service quality."[2]

Investment Jeopardized?

US WEST's vice president for Washington, Dennis Okamoto, warned that because of the decision the company no longer could invest as much money in the state and that service quality may be jeopardized. Okamoto said US WEST had been investing about a million dollars a day in its local telephone network and, without better earnings, work would not continue. While the commission's order was made in response to poor service and long waits for phone installations, company manger Kathi Willis said the order "could cause service delays to be even greater."[3] US WEST argues the commission has erred in its ruling in three areas: direct costs, laying spare capacity, and calculating depreciation.[4]

Cellular

US WEST is attempting to enter new markets other than local service within its territory. It is building a significant cellular presence, making a number of strategic moves in the last few years toward that goal. In July 1994, US WEST and AirTouch Communications announced a joint venture that combined their domestic cellular operations to create the nation's third largest wireless phone company. Together, US WEST and AirTouch serve more than 1.7 million cellular customers in coverage areas reaching 53 million people

US WEST's 30 percent commitment to this venture was likely sparked by two events. The first was AT&T's $12.6 billion acquisition of Bellevue, Washington-based McCaw Cellular Communications Inc., the nation's largest cellular company. The second was the auction in December 1994 by the FCC of wireless phone licenses for "personal communications services" which was meant, in part, to bring significant competition to the wireless services industry.

Wanting more clout in the auction, US WEST/AirTouch entered another alliance in October 1994 with Bell Atlantic Corp., and NYNEX Corp. This alliance could provide wireless service to nearly 4 million cellular users and the possibility of up to 100 million customers.[5] Under the name PCS Primeco L.P., the four companies won licenses for communications services in 11 major cities[6], including Chicago, Dallas, Miami, New Orleans, and Honolulu.

Video Trials

Another of US WEST's new ventures was in the interactive market. In 1993, US WEST announced plans to build combined voice, data, and video networks both outside and within its 14-state territory. In a highly publicized move, US WEST received FCC permission to launch a "video dial-tone" trial in Omaha consisting of a six-month technical trial, followed by a 12-month market trial.[7] One month into construction, US WEST said it would pursue a multi-market rollout of the video dial tone service in Denver, Minneapolis-St. Paul, Portland, and Boise when FCC approval was obtained.[8]

The company launched its 12-month market test in Omaha on August 31, 1995. Marketed as TeleChoice, the service passed nearly 50,000 homes using a hybrid fiber coaxial network.[9] Contrary to its initial announcements, the system began with only analog services and customers had to purchase set-top boxes unless they already owned cable-ready TVs and VCRs. Digital services, such as movies-on-demand and interactive shopping were promised.[10] The basic rate was $5.95 a month, which included many popular cable channels. Additional packages for sports, family, and news were also to be offered.[11]

By January 1996, US WEST was still "moving closer" to its near-video-on-demand model. The package of analog channels now had more than 8,000 subscribers and testing was "well ahead of schedule." The prospect of a digital system was delayed to a vague "later this year" when the system was working to US WEST's satisfaction.[12]

Less than two months later, US WEST dropped its plans for a digital rollout in Omaha. Essentially the trial was too expensive and did not work.[13] The market trial was officially ended on August 31, 1996. The company says it will continue to offer the analog cable services in Omaha. US WEST's remaining video dial tone market rollouts never moved beyond the planning stage.

Cable TV

Following the conclusion of the digital video market trial in Omaha, US WEST decided to enter the video market by purchasing cable systems in other regions. US WEST's newly formed subsidiary, the US WEST Media Group, was to manage these properties.

In February 1996, US WEST announced the purchase of Continental Cablevision with its 4.2 million cable subscribers for $11.8 billion. US WEST purchased Continental's stock for $5.3 billion and assumed its debt, valued at $6.5 billion.[14]

This deal made US WEST the nation's third largest cable operator. With its Time Warner properties, US WEST Media Group's domestic cable market potential is about 16.2 million homes.[15]

US WEST also owns 25 percent of Time Warner Entertainment, a partnership controlling most of Time Warner's 12 million cable subscribers, HBO and Warner Brothers film studio. Time Warner is seeking to regain control of Warner Brothers and HBO in exchange for shifting much of its capital-intensive cable business to US WEST, along with a significant portion of Time Warner's $17.5 billion debt load. Talks were expected to accelerate after the completion of the US WEST - Continental merger.[17]

Investment Profile

US WEST Media Group's third-quarter 1996 profits fell 38% from the previous year's quarter to $18 million — which the company tied to heavy investments in cable and wireless operations.[18] Fitch Investors Service put US WEST Media Group on the ratings agency's credit watch.[19]

US WEST in Tacoma

US WEST operates the switched telephone network in the Tacoma area. This network is based around central offices, each serving 10,000 to 50,000 customers. The central office is the wire center from which all telephone services are provided. It houses the switching center where telephone dialing information is registered and calls are switched to trunks leading to other central offices or long distance providers. All the switches and traffic between offices are digital — to maintain the quality, speed of switching and efficiency of the common network.

Seven central offices serve the Tacoma area. The central office in downtown Tacoma is the largest and most important. It has interconnecting cable to all other central offices in the area and interconnections to other large offices and long distance carriers in the region.

Central offices are interconnected with fiber optic cables. Each cable contains about 144 fibers. High speed digital communications are maintained on the cable, providing DS0, and higher capacity DS1 and DS3 circuits.

While much of the common electronics are dedicated to switched telephone traffic, other equipment is used for leased, point-to-point digital circuits for private telephone and data use. When a circuit is "nailed-up" through the central offices, it is assigned for point-to-point use. Many of the "nailed-up" circuits in Tacoma are routed through the downtown central office, because this office has the tools to provision circuits.

Basically Copper

Each phone customer has at least one pair of copper wires running from his or her telephone to a central office. These wires are wrapped around one another and are referred to as a "twisted pair." The wires start as large bundled cables that branch out from the central offices. Most of this cable in Tacoma is copper for basic telephone service. The typical maximum distance for a telephone circuit is 12,000 to 18,000 feet, depending on the gauge of wire in the cable. For services greater than this distance, Carrier Service Areas (CSAs) are defined. Within these CSAs, compact electronics cabinets are placed to serve cable plant up to another 12,000 cable feet away from the central office. DS1 circuits carry the telephone traffic back to the central office for switching. Business DS1 leased circuits can be nailed-up through the CSAs as well as the central offices. In recent construction, fiber optic cable has been used in cables from the CSAs to the central office.

A limited amount of fiber optic cable has been placed to business buildings in Tacoma. New buildings expected to have three or more DS1 leased circuits, or existing large buildings showing significant growth of high-speed digital communications, have been provided with service on fiber optic cable. However, most business service is delivered on copper telephone cable and little upgrading has been performed to replace copper telephone cable with fiber optics. The business community reports that waits of four to five months for DS1 circuits are not uncommon as US WEST attempts to recondition copper telephone cable to provide the service.

MONTHLY RATES:+	Residential	Business
DS0	$10.50	$25.00
DS1	$200.00*	$200.00*
ISDN	$68.58	$68.58[20]

*plus a $616.50 installation charge
+not inclusive of all required fees

Internet Use and the Public Switched Network

Internet data traffic has exploded and is projected to continue growing at exponential rates. Households with Internet access are expected to grow from 3.1 million today to 27.4 million by the year 2000.[21] Internet business transactions are predicted to grow to $250 billion in 2000.[22] The public switched telephone network is experiencing traffic growth from data users accessing the Internet. The switched telephone network includes common equipment shared and re-used among all users. The common equipment is expected to be available for re-use based on the average length of a telephone call.

Residential users typically have had two typical methods of connecting to the Internet — standard analog telephone lines and digital ISDN lines, both leased from US WEST. NYNEX, an East Coast RBOC, is reporting 10 percent growth per month (300 percent per year) in Internet access lines. The RBOC provides the circuit from the user to the Internet Service Provider (ISP). The ISP similarly leases business lines to receive those Internet access calls.

Longer connect times a threat?

While selling more lines may seem like good news to the RBOCs, they say the new traffic generates calls that last, on an average of 14 times longer than an average business call.[23] During the Internet session, a circuit is tied-up from the user to an ISP. The RBOCs have built the switched network so circuits are re-used among all telephone users, including voice

conversations, faxes, and emergency telephone calls. The average connect time of a call is a key design parameter used to equip the switched telephone network with the proper number of re-usable circuits. Now, with longer connect times, congestion is occurring in the switched network and more common equipment is needed to serve the traffic. A study done by Pacific Telesis in Central California's Silicon Valley found that 16 percent of local calls did not connect, mainly because of high Internet use in that region. Normally, the RBOCs claim that fewer than 1 percent of calls do not connect. The growth in Internet use, with its implications for requiring a re-engineering of the network has the local switched network has the local exchange carriers concerned.

The RBOCs have told state commissions and the FCC that the rapid expansion of Internet traffic threatens network access and could lead to the potential disruption of vital public safety services such as 911 emergency call service.

The RBOCs ask questions such as:

- How about dismantling the existing flat rate phone charge structure?
- Who will fund the expansion?
- Should all telephone users pay more for each telephone line they lease?
- Should the Internet access provider pay a large access fee to receive calls from the local switched network, since the traffic results from a service they are providing?
- Is the local switched network obsolete for growing public *data* traffic? Even though the RBOCs have been extremely vocal about the dangers of overloading the switched telephone network with heavy Internet use, and the potential threat to emergency 911 services, the RBOCs have actively teamed up with others to provide dial-up access. A local example is in the alliance formed between US WEST and the Tacoma News Tribune to provide Internet to consumers and businesses in the South Puget Sound. This service offers access speeds up to 28.8 Kbps, at a price of $19.95 per month for unlimited access, or $8.95 for 10 hours of access time.[24]

FCC Chairman Reed Hundt has said that his agency should not regulate Internet telephone or subject it to access charges — at least for now. "We shouldn't be looking for ways to subject new technologies to old rules," he said. "Instead, we should be trying to fix old rules so that if those new technologies really are better, they will flourish in the marketplace." The FCC may resolve the issue through access charge reform which the agency expects to complete in 1997.

RBOCs can upgrade their transmission systems in many ways. The circuits can be monitored for clues that each is carrying data traffic and switched to special facilities for data. Or, the data traffic can be "compressed" to free the circuit while there is silence or idle data between bursts of use.

Tele-Communications, Inc. (TCI)

Summary

TCI is the largest cable TV provider in the United States with 14 million subscribers, it also has a reputation for poor service. Customers complain about the company's continuing rate increases — including a 13 percent jump in 1996. The increases fuel TCI's acquisition strategy, a near-frenzy of purchasing designed to keep TCI larger than others in the cable industry. TCI added 2.4 million subscribers in 1996 alone. John Malone heads TCI and is also widely considered the best and brightest mind in the cable industry.

TCI's Tacoma system carries 36 TV channels at 350 MHz; while the recently acquired Pierce County system carries 60 channels. TCI had announced plans to upgrade its networks to hybrid fiber-coax systems, but has instead decided to deploy digital set-top boxes which could make it possible to offer digital TV without upgrading to fiber. This decision stems from TCI's struggling financial position and its huge debt load. The company has halted many equipment deliveries, and is in the midst of trimming expenses, eliminating jobs, and initiating another round of rate increases. TCI's financial troubles have not stopped the company from entering a number of alliances, which have vaulted it into the telephone, digital satellite and on-line businesses.

TCI has nearly $2 billion in revenues, an operating cash flow of $533 million, 14 million subscribers in the United States, and 32,000 employees in 49 states.

Customer Service

TCI has a reputation for poor customer service. TCI's own research has concluded that "subscribers are generally pleased with the technical quality and programming offered and the price they pay for it, but they are unhappy in dealing with the cable system when a problem arises — getting through on the telephone and finding a sympathetic customer service representative."

John Malone, TCI's chairman, acknowledges that TCI has a long way to go and he keeps one particular incident as a reminder: In 1994, when a Connecticut local phone company began offering cable service to TCI subscribers, as many as 20 percent defected at one time.[25] Malone does not want to see that happen again, especially on a nationwide scale.

Rate Hikes

All the programs in the world do not change the main customer complaint — cable rates. The company has a history of steady rate increases -- including a 13 percent across-the-board increase in 1996. TCI is planning

another round of rate increases for January, 1997 and July, 1997.[26] These planned increases will average 6 percent on the basic tiers, and "modest" increases in the cost of premium services and equipment.[27] Malone attempted to quell analyst reaction by saying the impact of the increases would be softened by adding new networks. In many of TCI's systems, however, TCI cannot add a new network without removing an existing one from the system. A TCI spokesman could not explain how the company will add services in systems with no extra capacity.[28] The chief reason behind previous rate hikes has been TCI's drive to acquire other systems. "Our mission in our first 25 years of existence was to become big enough to survive in the marketplace that [TCI founder Magness], Malone and others saw clearly on the horizon," said one management official.

Real Estate

TCI's focus has historically been clear — prime for more growth. Its acquisitions have ranged from mid-sized cable operators serving 740,000 customers[29], to the relatively small operators serving 31,000 customers.[30]

TCI's purchasing has left it composed of a patchwork of companies and cable systems that have only recently been woven into a corporate whole. Clustering has become a central strategy for large multiple system operators such as TCI as they prepare to compete with telephone companies, direct broadcast satellite providers and wireless cable operators.

Financial gymnastics are TCI's trademark. A basic strategy seems to be to use stock — even if the price is depressed — to continue acquiring more systems and to use leverage creatively to do everything else. When asked in a *Business Week* interview how big Malone intended to grow TCI, he responded in part by saying, "The object is not to be the biggest, it's to be the richest. The biggest is the one that gets investigated by the federal government."

TCI, already the nation's largest cable system operator, added more than 2.4 million subscribers to its existing subscribers[31] in 1996, including systems owned by TeleCable, Chronicle, Columbia, and Viacom.[32]

TCI's Chief Executive Officer

While TCI has grown to be a very large company, it remains very tightly controlled by its Chief Executive Office, John Malone. TCI's corporate culture, approach to problems, and activities are so intimately linked with John Malone that attempting to understand TCI without learning something about its CEO becomes a meaningless exercise. Even Vice-president Al Gore has called him a number of imaginative names."[33] But, the 55-year old man who has built the nation's largest cable TV network has been characterized as either "unemotional, cold or motivated by pure logic". Others in the cable industry have labeled him as a ruthless monopolist."[34]

Malone is widely considered the best and brightest mind in the cable industry and perhaps the telecommunications industry as a whole.

Malone earned a Ph.D. in Operations Research from Johns Hopkins University in 1967. He began at TCI in 1972 and one year later became president and chief executive officer. By 1982, TCI had grown into the nation's largest cable company due to his aggressive acquisition drive. His empire controls video services to one in four households in America.

Malone seems to have a knack for tough negotiations. For example, he turned off cable service in Vail, Colorado during a franchise dispute with city officials. He also removed HBO from some Texas systems during a renegotiation process with the network. Another Malone ploy used to deny competition in "his" markets involved the Learning Channel in 1990. Lifetime Television Network had offered to buy the Learning Channel. After the sale was negotiated, Malone told Lifetime he planned to drop the Learning Channel from most of TCI's cable systems. Lifetime then withdrew its bid. Four months later, the Discovery Channel, partly owned by TCI, bought the Learning Channel.

When asked, TCI says that it guarantees equal opportunities for all programmers. However, some programmers appear to be more equal than others. In October 1995, TCI raised the leased access rates for The 90's Channel, a progressive network, forcing it off the air. Meanwhile, NET, a conservative network, has maintained easy access and low rates from TCI.

An unusually low profile during 1996 fed rumors that Malone had grown disinterested in the cable business and was distancing himself from TCI. However, in the fall of 1996, Malone resumed his 14-hour workday schedule and active involvement in TCI's operations. "Contrary to rumors, I am not dead, terminally ill, or disinterested in my core business," Malone said.

Current Architecture

For the Tacoma service area, TCI operates a cableTV system carrying 36 television channels at 350 MHz. The headend is in a building on Martin Luther King Ave, near 12th Sreet. in the Hilltop area of Tacoma. The majority of television signals are distributed on coaxial cable from this headend. Amplifiers are operated on a trunk and branch architecture with many amplifiers in cascade. TCI has approximately 45,000 subscribers in the City of Tacoma, and passes roughly 78,000 homes.

In Pierce County, TCI operates the former Viacom cable TV system carrying 60 channels. There is capacity on the system to carry 80 channels. Two-way traffic cannot be carried without a major system upgrade. The headend for this system is on 19th Sreet near Sprague Avenue in Tacoma. The distribution of television signals from the headend to regions of the Pierce County service territory is most likely by point-to-point microwave radio. Coaxial cable delivers the signals from

regional facilities to the customers in a trunk and branch coaxial architecture.

Build-Up Plans

In the Tacoma - Pierce County area, negotiations for a new franchise between the City of Tacoma and TCI Cable of Tacoma are currently under way. TCI's Tacoma franchise expired in April 1995 but has been extended multiple times during the negotiations. In Tacoma, TCI had announced that it was in the process of shaping its networks into 300-home nodes that eventually would be served by hybrid fiber coax networking at 750 MHz.[35] If undertaken, TCI said the rebuild would be completed in approximately four years.

However, John Malone stated that TCI has suspended equipment shipments from suppliers and will be "deferring upgrading the balance of the company's cable systems." It will focus instead on deploying digital set-top boxes "opportunistically".[36] TCI feels set-top boxes can deliver improved pictures and more channels using compression technology that make it possible to offer digital television service without changing the company's older systems from coaxial wire to fiber.[37] This digital cable service will be deployed once General Instruments Corporation can build enough set-top boxes and digital deployment integration issues are settled.[38]

There are a number of potential problems deploying set-top boxes, as well as a number of benefits for TCI.

Potential problems:

- Each TV that receives premium services needs a new set-top box.
- TCI's cost per set-top box would be roughly $400.
- Any premium ordering by a customer requires an additional phone line or ties up an existing phone line.
- No improvement in existing analog picture quality is provided.
- The trunk and branch architecture remains susceptible to outages.
- No two-way communication, such as Internet access is available.

Benefits for TCI:

- It could be priced at an additional $20 per month, as an-add on to basic cable service.[39]
- Using eight current channels at a 24:1 ratio would allow up to 192 new digital channels in a system.[40]
- New set-top boxes would be needed for premium subscribers only.
- Set-top box could be funded by the subscribers as a lease charge. (The current box rental averages $2 to $3 dollars per month, where the new set-top boxes would be rented for approximately $6 per month).

In addition, the Telecommunications Act of 1996 allows a company like TCI to include expenditures on new set-top boxes in its rate calculations for its lowest tier of service even if subscribers paying for that service do not get the set-top boxes. Essentially, TCI can get paid twice for the new set-top boxes: once through rates and again through lease payments.

The City of Tacoma is trying to get a commitment from TCI that the cable company will perform upgrades using high-quality fiber optics instead of maintaining the current coaxial cable.[41]

The TCI (former Viacom) properties in Pierce County are currently operating as a 450 MHz system. The architecture is somewhat more advanced than the Tacoma properties. The electronics are operated at a 450 MHz capacity, though the amplifiers are spaced at 550 Mhz operation. Upgrading the Pierce County properties would generally involve only the replacement of the electronics to make the system capable of two-way communication.

TCI is also implementing a DBS strategy with Primestar. This strategy would allow TCI to offer a 140-channel, mid-power service and a separate high-power, 80-channel sports and pay-per-view offering compatible with existing cable offerings. This package (named TSAT) will act as a "wireless digital" upgrade and will be marketed as a complement to cable service, giving TCI systems which can not afford digital upgrades a chance to compete with the other DBS providers for subscribers. Another attractive feature of this service, scheduled to begin in February, 1997, will be its 13-inch dishes, which will be the smallest on the market.[42]

Investment Profile

TCI's credit status has been in a downward spiral and its stock price has fallen. Rating agencies such as Moody's and Standard & Poor's have been considering lowering TCI's debt ratings to junk-bond status – currently just one notch above it. TCI has approximately $14 billion in debt and interest alone, which more than wipes out its operating income[43], so a further downgrade would be enormously expensive for TCI.

This pressure on TCI has made it tougher for the company to raise money — either through new equity or debt placements — for continued growth. With competition looming from telephone companies, electric utilities, and direct broadcast satellite services, restraints on TCI's ability to grow come at an inopportune time.

TCI agreed that its expenses were "temporarily elevated" in the third quarter of 1996, citing costs from the company's venture into the cable modem and digital television business. John Malone said that in 1997, TCI's capital cable expenditures would be "substantially lower than in the past three or four years." In order to resolve its money crunch, TCI has decided to raise rates and reduce programming costs, capital expenditures, and its debt-to-cash-flow ratio next year. TCI said it is looking at every

expense item to trim costs[44], which was the driving force behind the company's early December 1996 elimination of 2,500 jobs and freezing salaries.[45] TCI also said that its key subscriber count fell by 70,000 during the third quarter of 1996, raising more questions about the company's ability to survive in a more competitive market.

Having watched TCI miss a number of financial goals, some media analysts say they are going to wait until TCI's plans bear fruit before investing in the company. One investment firm executive said, "They haven't met any targets. It's like the emperor has no clothes." In typical John Malone fashion, the reply from the chief executive was: "If shareholders are really discouraged, I'd be happy to put together a few friends and buy (TCI shares) back from them."[46]

Other Services Offered

TCI Telephony launched its first commercial network in Hartford, Connecticut. Telephony projects in Arlington Heights, Illinois, and Fremont, California, were scheduled to be launched by the end of 1996.[47] The company probably will not move beyond these three markets for some time, and then will consider other locations on a case-by-case basis. These telephony services can be offered by systems running at 450 MHz, but the systems must have two-way capability.

TCI also plans to offer advertising space on its network. TCI is experimenting with a plan to develop home pages on the World Wide Web for local advertisers. The advertisers would then promote the home pages on a TV commercial bought from the local TCI cable system. Local advertising looks promising to TCI. It foresees a shift in the way local advertisers think about advertising — perhaps re-evaluating newspaper and radio advertising.[48] Some of the more popular segments are aimed at real estate sales, automotive sales, classified listings, personal classifieds and even info-mercial programming.[49]

Monthly Rates+

	Basic	Enhanced	Editor's Choice	Premium
TCI (Tacoma)	$9.97	$23.12	$40.07	$57.07
TCI (Pierce County)	$11.56	$32.33	$44.50	$56.28

(approximate - depends on area)

+additional fees including equipment, taxes, etc. apply. (Addressable converters cost $3.10 per month for example).

Alliances

In 1994, TCI and five other cable operators (Time Warner, Continental Cablevision, Cox, Comcast and GE Americom) entered the digital satellite business with Primestar Partners. Primestar has grown since 1994 to 1.1 million subscribers, half of whom get bills from TCI, the other half from

the other partners. Primestar contributed $200 million to TCI's revenues last year which could easily double that this year.[50]

TCI joined with Comcast, Cox Cable and Sprint to create a venture to package long distance, local telephone, wireless and cable services. This venture (named Sprint Spectrum L.P.) includes an all-new, all-digital, nationwide network for Personal Communications Services (PCS).[51]

Microsoft, TCI, and venture capitalists Kleiner Perkins Caufield & Byers have set up a high-speed multimedia on-line service called @Home. @Home would function as the "Internet channel," offering its programming to users over TCI's two-way coaxial cable systems for roughly $35 a month. The @Home service entered testing in March 1996 in Freemont, California.[52]

Other Plans

TCI had planned to merge with Bell Atlantic in 1994 to get into the telephony market.[53] However, the $33 billion merger was called off in March, 1994 due to FCC cable rate rollbacks, TCI's weakening cash flow position, Bell Atlantic's declining stock price and the unwillingness of either company to budge on the pricing issues.[54]

TCI and Microsoft are currently engaged in a cable-based, interactive, utility services trial program in Northern California with Pacific Gas & Electric. This trial started in 1994, is testing application software, hardware, and network components of a system that can read water, gas, and electric meters and provide homeowners with hourly energy consumption reports by device.[55]

TCI owns 49 percent of Teleport, a competitive access provider that links private business networks to long distance carriers.

TCI is experimenting with McCaw Cellular on personal cellular networks in Ashland, Oregon.

Overview

THE LOCAL TELECOMMUNICATIONS MARKET

Understanding the local telecommunications market is critical to gaining an understanding of the environment in which telecommunications decisions must be made. This review of the telecommunications market in our local community analyzes both the residential and business markets for telecommunications services as they stand today. A discussion of how different economic futures are impacted by telecommunications concludes the section.

Market research and analysis is a proven method for taking the pulse of the marketplace. The following documents, Current Residential Market, Current Business Market, and Future Markets, faithfully capture the pulse of the telecommunications market in this region, and also relate how a new telecommunications business would impact the economic future of the community.

The future market analysis relates the a telecommunications infrastructure to the regional evolution of economies, in this case from the industrial age to the information age. Being at such a juncture offers communities an opportunity to step back and ask questions such as: What direction is our economic engine heading? What direction do we want it to head? Are we building a base so tracks can be laid in that direction? Based on the answers to those types of questions, communities like ours will make decisions that influence the direction the economic engine heads.

The Residential Market

Research performed by
Market Data Research Corporation
Gene Starr, Senior Principal
and
Dethman & Associates
Linda Dethman

Analysis by
Dethman & Associates
Linda Dethman

Summary

The Current Market

To help assess current market support for advanced telecommunications services in the greater Tacoma area, Tacoma City Light pursued two avenues of customer research:

- A random sample survey of 606 residential households (+/- 4% error at 95% confidence), and
- A survey of [+/- 200] businesses with over 25 employees selected from the Tacoma-Pierce County Chamber of Commerce membership and other sources.

Each piece of research addressed two major questions about Tacoma City Light's potential plan to build a broadband communications system to serve its customers:

- How strong is the market demand for services which could be offered through this system?
- How strong is customer support for Tacoma City Light building such a system?

Market and Policy Support - Residential Market

How Strong Is Market Demand?

Tacoma area households have characteristics which suggest they would be receptive to Tacoma City Light offering them cable TV and other telecommunications services.

Demographics such as a strong base of technical and professional people (29%), as well as retirees (25%), higher educational levels (68% with at least some college), and adequate income are consonant with both types of services.

Over three-quarters of households (78%) already have cable TV, and over half say they need cable to get television reception at all. In addition, many households have all or part of the experience and technology (e.g., 46% with computers, 32% with a modem, 18% using the Internet) to take advantage of other capabilities of an advanced communications system (e.g., data transmission, Internet access).

If a new cable TV provider were to offer lower prices and/or improved programming, three-quarters (73%) of customers say they would be extremely or very likely to switch to that new company. Customers are looking for the best *value, both in terms of cost and programming,* and would welcome the benefits of competition.

Customers also value Tacoma City Light: when asked which of four companies they would choose for cable TV, even if all offered similar services and prices, Tacoma City Light was the leader by far (44%), with the current provider a distant second (15%).

How Strong is Customer Support?

Most customers have not heard of Tacoma City Light's potential plan to build a new communications infrastructure. Still, when told the basics about the system — including how it would improve electrical service and how it would be financed — the large majority, 81%, supported the venture. Customers cited the benefits of competition, but a notable number also specifically mentioned that Tacoma City Light is a good company and would provide better service, perhaps at a lower cost.

Overview and Methods

Residential Customer Survey

The goals of the residential customer survey on telecommunications were to:

- Assess the demand for an alternative cable television (cable TV) provider in the greater Tacoma area
- Assess market readiness for other telecommunications products and services
- Assess support for Tacoma City Light constructing a broadband communications system

Survey Methods

Questionnaire Development. A draft survey was developed and then reviewed during a focus group discussion with 11 residential customers. Results of this focus group revealed that residential customers, while quite sophisticated about cable TV needs and concerns, were less able to discuss other telecommunications services (i.e., the need for Internet access.) Thus, the survey was revised to focus on cable TV issues and support for building the system, and to gather baseline information about household technologies which might signal readiness for other telecommunications services.

Sample Size and Reliability. From all indications, the results from this survey provide very reliable data for Tacoma City Light. This sample of 606 randomly selected households reflects Tacoma City Light's entire residential customer base within a + or - 4% margin of error, with 95% confidence.

Data Gathering. Survey data were collected through telephone interviews conducted at Market Data Research in Tacoma, Washington, during October and November 1996. Each interview lasted about 15 minutes.

Data Notes. Due to rounding, percentages may not total 100%.

Caveat. While the greatest care has been taken in all stages of this study, the survey data reflect Tacoma City Light customers at one point in time. Decision-makers should bear in mind that people can and do change their minds and may act differently than survey results indicate.

Key Findings

Residential Market

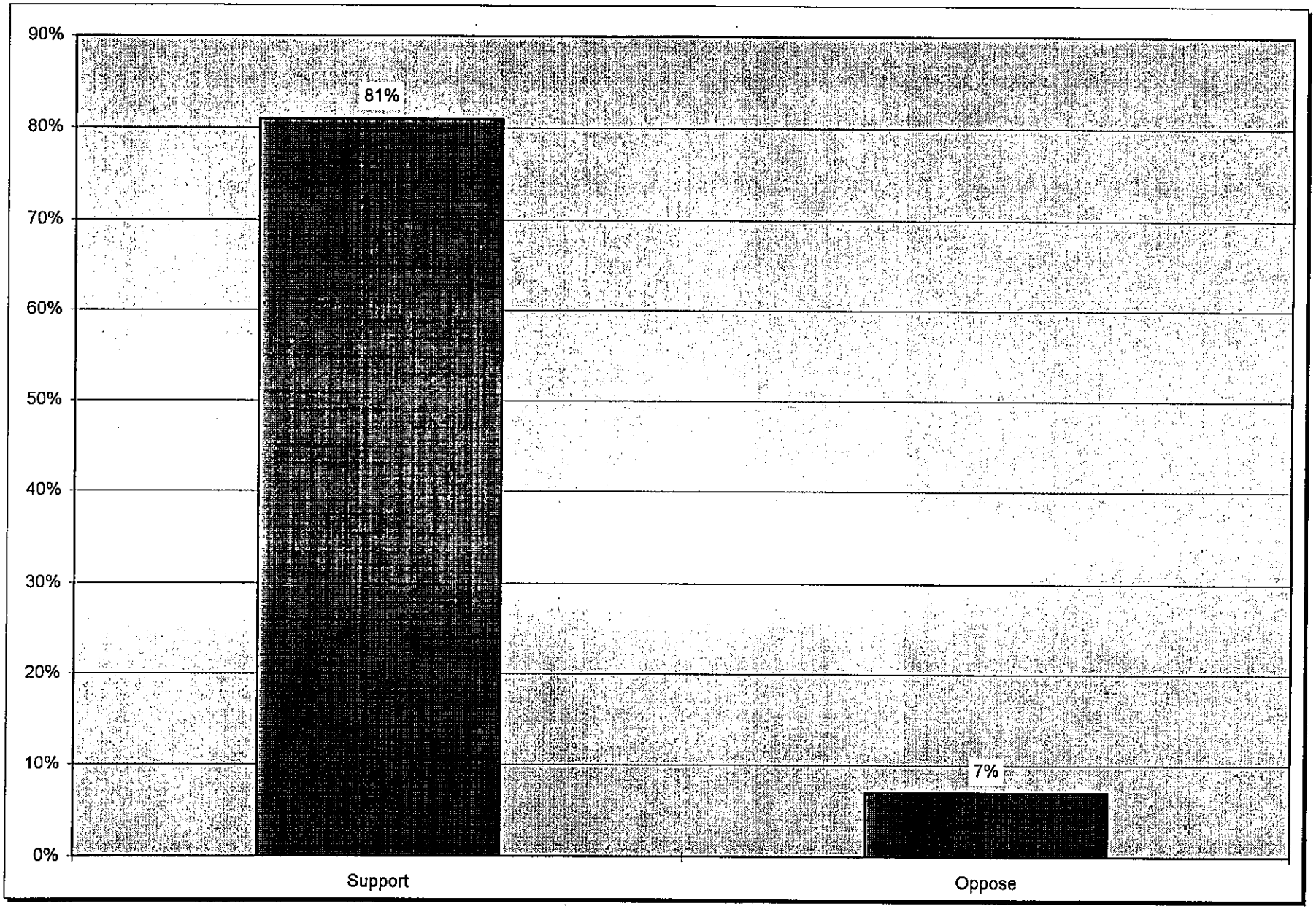
Household Demographics. Demographically, Tacoma area households have characteristics which suggest receptivity to cable TV and other telecommunications services, including:

- Substantial percentages of households with professional and technical workers (29%) or retirees (25%);
- Many households with higher educational levels (68% with at least some college); and
- A third of households with incomes of $40,000 per year or more.

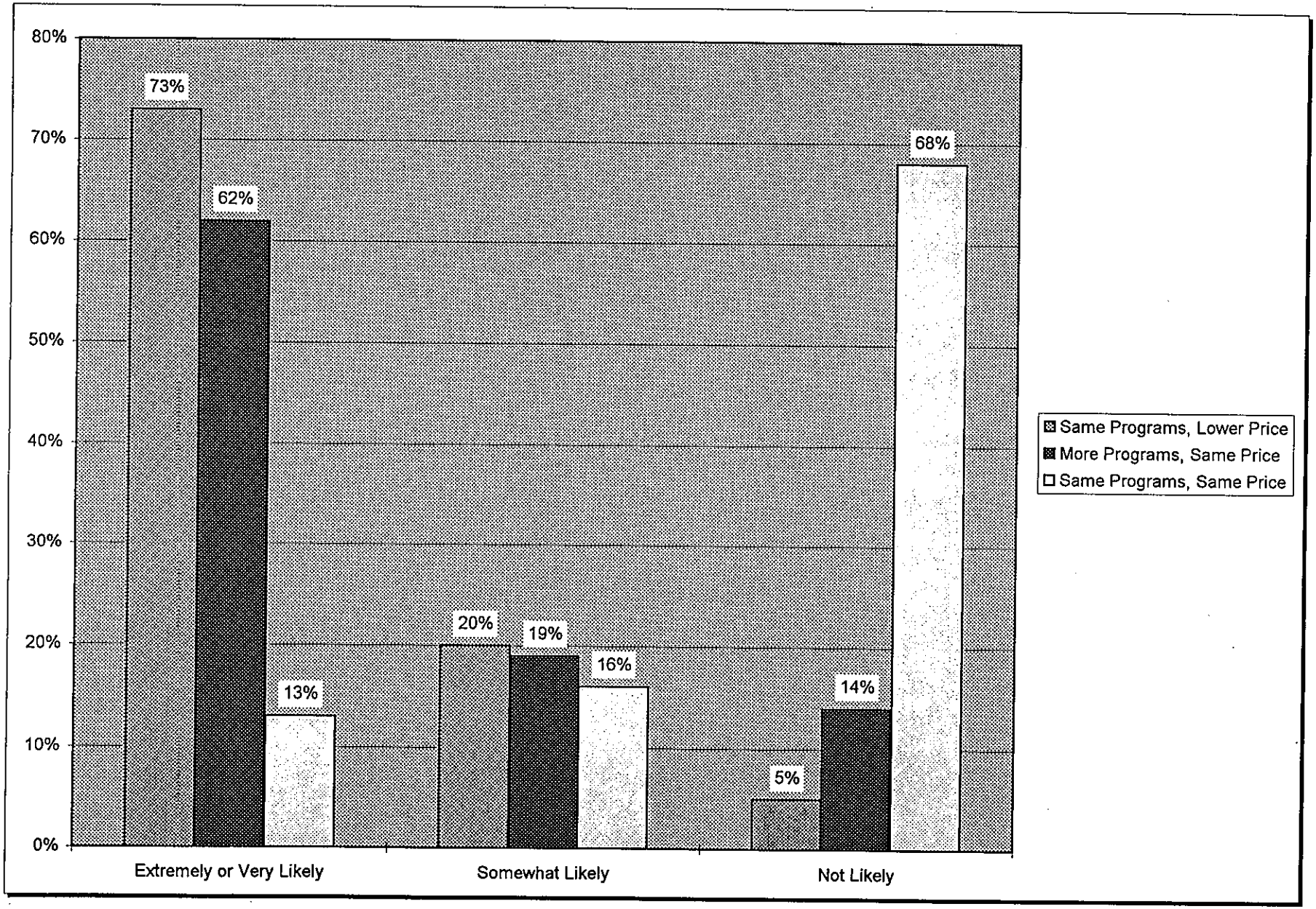
Cable TV Penetration and Stability. Most Tacoma area households have cable TV and demand appears to be quite stable. Findings which support these conclusions include:

- 78% of households subscribe to cable TV.
- Over half of cable subscribers (52%) say they need cable to get adequate reception.
- Over half of subscribers (53%) report they like the better and wider program choices that comes with cable, and another 27% say they want to receive specific types of programming or channels.
- Small percentages of respondents currently have mini (2%) or large (1%) satellite dishes .
- A fairly small percentage (6%) say they *intend* to buy a mini dish in the next 12 months.
- Further market penetration (6-12%) might be gained if various changes were made to existing cable services, including lower cost, installing lines to currently unserved areas, and improving programming and customer service.

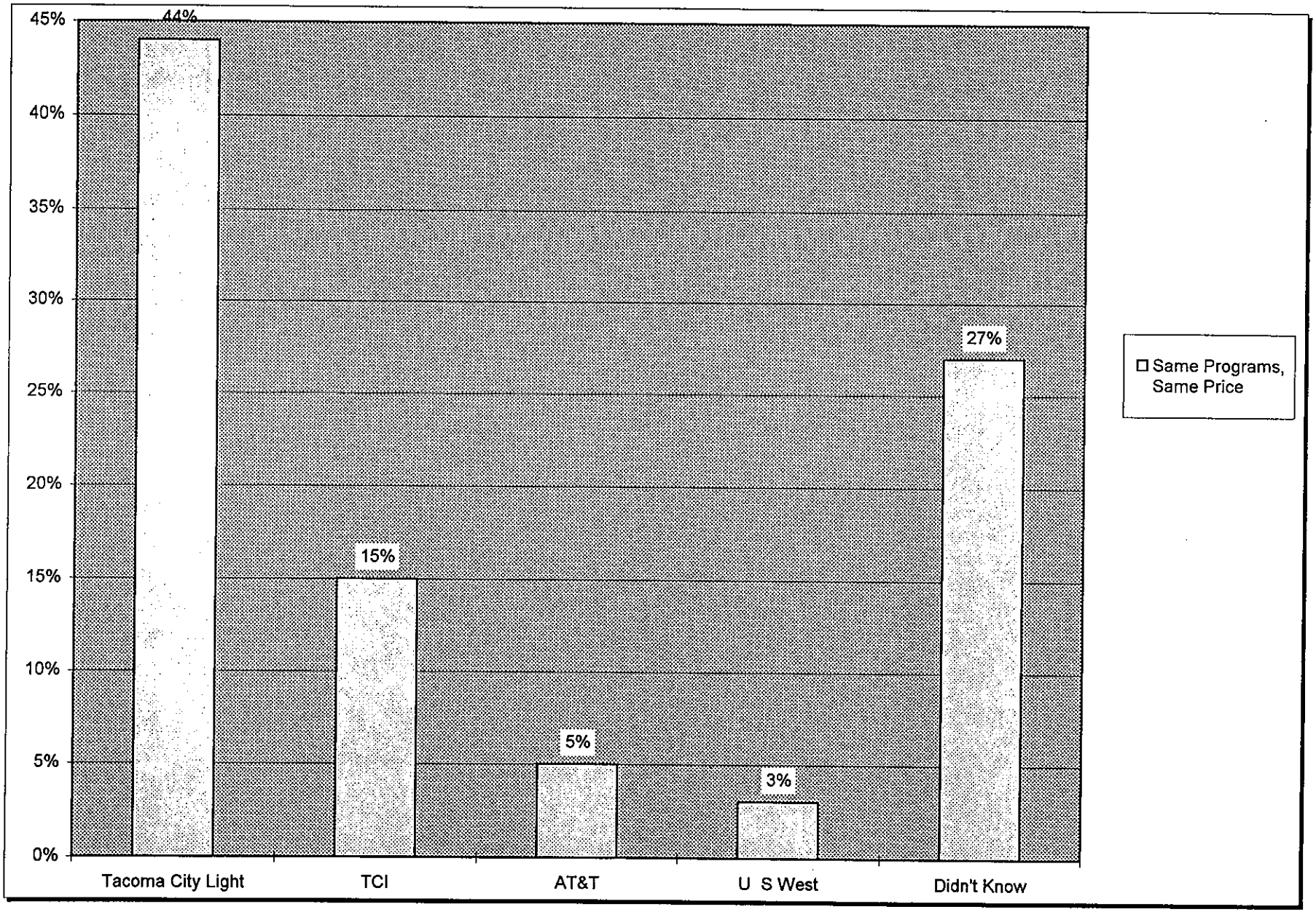
Support for Having Tacoma City Light Build a Modern Telecommunications System



Willingness to Switch to a New but Unidentified Cable Television Provider



Preferred Provider of Cable Television Services



The Current Business Market

Research performed by
Market Data Research Corporation
Gene Starr, Senior Principal
and
Dethman & Associates
Linda Dethman

Analysis by
Dethman & Associates
Linda Dethman

Summary

The Current Business Market
To help assess current business market support for advanced telecommunications services in the greater Tacoma area, Tacoma City Light pursued two avenues of consumer research:

1. An in-depth survey, personalized mail survey of 40 businesses, hand picked as *"Key Customers"* for City Light's telecommunications services. The results of this survey are not discussed in this report.

2. A telephone survey of 200 businesses, with 25 or more employees, selected from the Tacoma-Pierce County Chamber of Commerce membership. This group represents a pool of *"Potential Customers."* The results of this survey are summarized in this report.

Each piece of research addressed this question about Tacoma City Light's potential plan to build a broadband communications system to serve its customers:

How strong is the market demand for services which could be offered through this system?

Market Demand Summary - *Potential Customer* Business Market

Based upon the results of 200 telephone interviews with medium to large Tacoma area businesses, the Potential Customer business market is on the brink of being ready for advanced telecommunications technologies. The money is there, the needs are forming and increasing, but the familiarity with choices of more advanced telecommunications technologies (i.e., ISDN) and the use of such technologies are fairly low.

On the bright side of the horizon, key findings show these customers account for more than $5 billion dollars in annual revenues and 25,000 jobs. What's more, they currently spend over $10 million dollars annually on telecommunications services. They perceive telecommunications links are extremely important to the success of their businesses, and many

believe their telecommunications needs will increase rapidly, particularly for Internet access and local data networks. They are more concerned about reliability than price for their local phone service, and this concern, while not at the top of the list for telecommunications services, is certainly important. They are also very concerned about getting quick response from any telecommunications vendor.

On the more hazy side, however, most are not familiar with, nor do they use, more advanced telecommunications linkages such as ISDN and T-1 lines. They don't necessarily appear to have a wealth of employees with computers or Internet access. They spend the good portion of their communications dollars on local phone service and long distance, not data communications.

Thus, it appears the market will need considerable preparation to make it more receptive to the type of telecommunications services Tacoma City Light is considering for development. Preparing the market means working with customers to accurately inform them about the technologies available and how they can reliably and cost-effectively work for their business applications. Preparing the market also implies significant up-front costs in marketing to increase awareness, interest in, and acceptance of new providers, products, and services.

Overview and Methods

Business Market Surveys

The goals of the business market surveys on telecommunications were to:

- Assess market use of, and readiness for, business telecommunications products and services;
- Assess market need and receptivity to a new telecommunications provider; and
- Assess support for Tacoma City Light constructing a broadband communications system.

Survey Methods

Two survey approaches were used to assess the business telecommunications market, as follows:

Key Customer **Survey.** An in-depth survey was developed for about 40 key companies in the Tacoma area with a strong potential to become telecommunications customers if Tacoma City Light were to install its broadband communications system. These businesses either had substantial telecommunications needs and sophistication and/or were large employers. The instrument was pre-tested in-house at Tacoma City Light, and hand-delivered to respondents during December 1996 with a personal request that they complete the survey and return it by mail to Tacoma City Light. (At the time of this writing, these surveys were still being completed, returned, and analyzed; thus, these results are not discussed below.)

Potential Customer Survey. The same in-depth survey used for Key Customers was then reviewed during a focus group discussion with eight businesses which had 25 or more employees and which used telecommunications, but were not among the Key Customer group. Results of this focus group revealed that businesses of this size, while quite dependent on advanced telecommunications for business success, would probably not be able or willing to complete the in-depth survey. Thus, the survey was simplified and rewritten as a telephone survey.

The Tacoma-Pierce County Chamber of Commerce supplied a list of about 400 businesses which were Chamber members and which had 25 or more employees. Survey data were collected from 200 businesses through telephone interviews conducted at Market Data Research in Tacoma, Washington, during January 1996. Each interview lasted 10 to 15 minutes.

Key Findings

Potential Customer Market

Business Characteristics. While businesses in this sample of 200 companies in the greater Tacoma area vary considerably in both type and size, their annual revenues and number of employees suggest that many are likely to have significant telecommunications needs, either now or in the near future. Taken together, these businesses represent, at a minimum, $5 billion dollars in annual revenues and 25,000 jobs. In addition, over half serve a statewide or a wider geographic market and, on average, have more than one location in the Tacoma area. Notable characteristics are:

One-third (31%) of businesses surveyed are fairly small in terms of gross annual revenues (less than $5 million); however, 12% are in the 5-10 million dollar range, 17% in the 10 to 50 million dollar range, and 9% in the over 50 million dollar range. (Note: 31% of business respondents did not give their company's gross revenues.)

On average, each these Tacoma area businesses employ 129 people. A minority of these businesses have fewer than 25 employees (11%), while 37% have 25 to 50 employees, 26% have 51 to 100 employees, and 26% have more than 100 employees.

While just over one-quarter of businesses (28%) defined their primary geographic market area as the Pierce County area, the remainder had wider market horizons. Twenty-one percent defined their market area as western Washington; 22% as Washington or the Pacific Northwest, 8% as the West Coast, 13% as national; and 10% as international.

On average, the businesses surveyed each had just over 3 locations (3.45) in the greater Tacoma area. While two-thirds (69%) have only one business location in the greater Tacoma area, 12% have two locations, 5% have three, and 11% have 4 or more. Only 3% of businesses surveyed did not have a location in the greater Tacoma area.

Based upon length of time in operation, Tacoma area businesses appear to be quite stable: on average, they've each been in business 41 years.

Almost all the businesses interviewed (86%) already are customers of Tacoma City Light.

Importance of Telecommunications Products and Services. Qualitative perceptions of the importance of telecommunications services, and the amount of money these companies already spend each year on such services, indicate telecommunications are a mainstay of most of these businesses. Results show that among the 118 businesses which could supply a figure, $50,000 on average was spent in 1996 on telecommunications. If this average is used for all 200 businesses, these companies spent about $10 million dollars on telecommunications services last year. Key results include:

Almost three-quarters (74%) say that telecommunications links are *extremely important* to the success of their business, with another 17% saying that such links are *very important.*

When asked "If your telecommunications services were out for one day, how would this impact your business?" 62% replied *it would cause serious harm to business operations,* and another 20% said it *would shut down business operations.*

Of the 118 businesses estimating 1996 telecommunications costs, 29% reported the bill was in excess of $30,000, 31% said the bill was between $10,000 and $30,000, and 40% said the bill was between $500 and $10,000 per year. The average yearly bill was about $50,000.

Current Telecommunications Characteristics and Decisions. While the 200 businesses surveyed appear to spend quite a lot on telecommunications, it is probably not being spent on data communications, nor do they tend to rely on advanced telecommunications links such as ISDN and T-1 lines. However, many are encountering new telecommunications needs and review those needs on at least a yearly basis; many are making use of the Internet; and a sizable group say are considering more sophisticated telecommunications links. The following data support these conclusions:

Every business surveyed has at least one computer. However, about half of businesses had less than 25 computers, even though only 11% had 25 or fewer employees. Thus, many businesses do not have computers for every employee.

The majority of businesses have at least one employee with access to the Internet (61%), but usually the proportion of employees with Internet access is small.

Although most companies spend money on each of four types of telecommunications services — local voice telephone lines, long distance lines, cellular phones, and data communication — most telecommunications dollars go toward local telephone service. Long distance services are second, followed by cellular phone and data communications services.

The most frequently used Internet service is e-mail (68% of companies), followed by dial-up access (41%), Web Page hosting (41%), dedicated access (28%), electronic product and service delivery (21%), and electronic customer service (19%).

Two-thirds of business respondents were not familiar with ISDN lines or T-1 lines. Only a handful have an ISDN line (13%), with somewhat more having T-1 lines (23%). However, about 10% of all customers without these lines say they have considered installing them.

Only 11% of these businesses are currently served by fiber optics from U.S. West, although 41% didn't know if their company had this service.

Businesses report that several factors are important when they decide to acquire new telecommunications services, with price (35%), reliability (20%), and customer service (15%) heading the list.

Response time is very important to these businesses when choosing a telecommunications provider: 48% defined "good customer service" as quick response.

Choosing a Local Phone Company. Businesses report that reliability is by far the most important consideration among price, reliability, and customer service, if they were choosing between their current local phone company and a new company. No doubt this point of view is influenced by that fact that almost half (48%) report their phone service has been out at least once during the past year. Notably, only 41% would choose their current company (U.S. West) if they had a choice, but few were willing to choose Tacoma City Light as their local phone service provider. Specific findings show:

Almost two-thirds (63%) chose reliability as the most important factor in their choice, compared to 32% choosing price, and 6 % choosing customer service.

94% chose reliability as one of their top two deciding factors, compared to 70% choosing price, and 38% choosing customer service.

Less than half (41%) would choose U.S. West as their local phone service provider, 26% would choose AT&T, 5% would choose Tacoma City Light, and 4% would choose Sprint. Notably, however, one-quarter said they didn't know who they would choose.

Almost one-third of businesses report "fair, poor, or terrible" response time from U.S. West in solving problems with their phone lines.

Future Trends. Across a series of questions, these 200 companies reported that telecommunications needs were likely to change quite dramatically over the next 2 to 5 years. Telecommuting will increase, and many identify cellular phones, local data network interconnections, and Internet access as essential, fast growing telecommunications needs for the future. In particular:

These businesses report that, on average, 14% of their employees telecommute on a regular basis; they expect this average to increase to 18% of employees over the next 2 years.

The large majority of companies think that cellular phones (71%), local data networks (68%), and Internet access (63%) will be very or somewhat essential to their companies communications needs in the future.

49% of businesses think their company's use of the Internet will double (32%) or more than double (17%) over the next five years.

Almost all of these businesses (85%) think that the amount of time employees spend on the Internet will increase some (45%) or a lot (40%) in the next two years. They also believe the number of employees with Internet access will increase (43% somewhat, 22% a lot).

36% of businesses think their company's use of local data networks will double (27%) or more than double (9%) over the next 5 years.

26% of businesses think their company's use of cellular phones will double (21%) or more than double (5%) over the next five years.

1% or less of these businesses think their use of the Internet, local data networks, and cellular phones will decrease over the next five years.

Future Market to Serve

Produced by
APEX Business Solutions

Purpose

Tacoma, like other communities, has evolved in response to changing economic, social, political, and technical dynamics at work not only in the local area, but in the region, the country, and even the world. Understanding this change process for a given community is critical due to the reciprocal relationship between these dynamics and the community's economic base.

Over time, existing businesses contract, expand, or change focus in response to these dynamics—for example, the depletion of an area's natural resources, the building of a rail line, or the encroachment of competitors can each lead to change in the community's economic base. In other cases, certain conditions may lead new businesses or whole new industries to relocate in an area—for example, aluminum smelters' need for cheap power. The entrance of these new industries and fundamental changes in existing ones, in turn, contribute to and alter the original dynamics. As a result, reciprocal effects of the choices these businesses make are felt in a community's job mix, education system, infrastructure investments, and more. Based on this evolution, an area's economic base is built with tracks laid for its economic engine to take one route rather than another.

These periods of steady evolution, however, are occasionally punctuated by intervals of rapid revolution, where societies undergo more fundamental changes. We are in one such period now as we move from the industrial age to the information age. Being at such a juncture offers communities an opportunity to step back and ask questions such as: What direction is our economic engine heading? What direction do we want it to head? Are we building a base so tracks can be laid in that direction? Based on the answers to those questions, communities like Tacoma can make changes to influence the direction their economic engine heads.

One of the most significant ways a community and its economic base are intertwined is through an area's infrastructure. As a result, the evolution of a community's economy often depends upon the investments it makes in its transportation system, power system, and—given the shift to the information age—its telecommunication system. To plan for infrastructure needs to support an evolving community requires attention to its possible future states. This study was therefore commissioned to investigate Tacoma's potential economic futures and the inter-relationship between its economic development and telecommunication system investment decisions.

To help ensure Tacoma's telecommunication needs were assessed comprehensively, scenarios are based on information about the current context as well as potential future developments. Information was gathered from a variety of sources. Interviews with key business and civic leaders focused on the goals and efforts of various development activities. Data from published and unpublished sources were examined for insight into economic trends in each of the major sectors.

Economic engine. We identified the local economic engine, describing the relationships between sectors that drive economic health, growth and changes in a region. It is not unusual for a community's economic engine to evolve over time. Understanding how and why the engine is changing provides important insights into opportunities and threats that could affect the economic health of a region. Exploring this economic engine requires a historical understanding of a community's development, along with comprehensive review of how each industry sector is evolving in response to local and national pressures.

Economic interventions. Most communities have examples of economic development interventions, or deliberate action taken to change or impact economic activity. These interventions can take the form of programs, projects, and initiatives. Interventions often involve the forming of specific groups whose purpose is to design or implement these programs. These groups typically dissolve after the program is implemented. In other cases, long-standing groups have an ongoing purpose of economic intervention and may develop and manage multiple programs.

Interventions can focus on education or training, taxation/regulatory relief, business retention/expansion/recruitment; small business startup/jobs, international trade, government/military, transportation, telecommunications, energy, public safety, housing, culture, tourism/entertainment, investment confidence/image, and various industry sectors.

Each intervention represents a potential change in the economic engine. They either support or enhance the current trajectory, or represent attempts to alter the track a community is on. Each intervention has its own set of assumptions that influence the design of the program, implementation plans, and desired outcomes. The actual outcomes of the program interventions, however, depend on how the program characteristics interact with the local context. Analyzing the intervention requires understanding the local participation in the program, the program's overall purpose, and the validity of the program's assumptions. In this way, we can assess the potential outcomes of the intervention on the economic base in a community.

Scenario building. Not all economic interventions have the same impact. Not all evolution in industries will affect each community the same. Scenario generation involves analyzing each possible trajectory in a community and combining these individual plans into combinations of possible future states in the community. Through scenario analysis, inconsistencies or conflict between economic development activities can be identified. Competing projects or industries can be assessed to determine the more likely candidate for success and survival. Changes in the base of export jobs are assessed against other support industries to ensure that each is evolving in a way that will increase chances of mutual survival. Infrastructure issues around housing, education, transportation, etc. are all analyzed to determine the support for various future states. This complex analysis, when successful, usually yields scenarios that are relatively simple and elegant. In this study, we were fortunate enough to find little direct competition for resources among industries or projects. As such, we were able to filter our analysis down to three key scenarios that we discuss.

Implications of scenarios. Each scenario has an implication for the volume and type of growth in the community. Using the Puget Sound Governmental Council and State Office of Financial Management reports as a baseline, adjusted for recent changes in the local economy, growth rates for each scenario were generated from economic modeling. The scenarios also represent a potentially different set of telecommunication needs and may have implications for system architecture design. The study provides a brief overview of telecommunication needs.

In this section we provide an overview of the key outcomes of this study. You will find a more detailed, comprehensive review in Appendix D.

Changes in the Economy

Tacoma's Current Economic Base

The basic economic structure of the Tacoma/Pierce County economy is relatively well defined and easy to characterize. The most important economic sector of the economy is related to *government and military activity*. The major military installations in the county (McChord, Fort Lewis, and Madigan) support almost one half of the basic economic structure. Added to this are significant amounts of employment from state, county, and city as well as federal agencies and offices. Indeed, thirteen of the twenty largest employers in the county are governmental agencies. In addition to this governmental activity, employment related to *health care* and *professional business services* is also important to the local economy. These businesses reflect Pierce County's role as a regional service center for the southwestern portion of the state. Included in this set of activities are hospital

and medical facilities, regional financial services, and the supporting commercial businesses. The third important sector of the local economy revolves around the *Port of Tacoma* and its related activities. This sector includes businesses directly related to the movement of ships and cargo through the port, as well as warehousing, materials handling, and transshipment activities.

Tacoma's Historic Economic Base

Tacoma's current economic environment emerged as a result of the substantial changes that have occurred over the last 25 years. A quarter of a century ago the Tacoma/Pierce County economy was much more dependent on manufacturing activities than it is today. Such businesses were tied to the natural resources base of agriculture, lumber, and fishing. Declines in those industries have been due to a combination of factors including: cost issues, environmental changes, and shifting patterns of world production. As these historically important economic activities decreased, the area could have suffered severe economic problems. Instead, the local economy was resilient enough that these changes caused only moderate problems and adjustments. This suggests the local economy is flexible and adaptable.

In Support of Development

The flexibility and adaptability demonstrated through this 25-year restructuring was the result of a number of forces. Two of the most important factors were the *physical environment* and *the business environment*. Over time, the natural beauty of the area's mountains, water, and open spaces as well as the moderate climate have become more important to businesses and individuals for "lifestyle" reasons. In a recent survey on business climate, the overall quality of life and opportunities for cultural experiences are considered to be two of the strongest factors that encourage businesses to locate or remain in Tacoma[1]. Second, the community's business environment has also been a positive draw. Again, the recent survey revealed that half of the businesses (50%) think the City of Tacoma regulations and codes are being fairly enforced[2]. Public-private cooperative initiatives, a healthy labor-management working relationship, attractive infrastructure, and available sites for development all have contributed to a positive atmosphere that was attractive to many firms. A growing population in a large metropolitan region has created a productive and adequate labor force that reduced location costs. Finally, relatively non-restrictive land-use regulations have provided an incentive for development in the Pierce County area. Significantly, some of these forces remain in place today.

Growth prospects for the areas, therefore, continue to remain strong. Tacoma has been recognized nationally as one of the best places for small business start-ups, based on cost structures in the area. The new University of Washington Tacoma campus has enhanced the educational offerings for local residents. Cooperation among local colleges, technical schools, and employers is strong. Recent initiatives in the urban core have improved the art, cultural, and entertainment offerings in the county. To a large extent these types of activities and advantages were important in the decision of Intel to move into the area, for Boeing to establish a new production facility at Fredrickson, and for Frank Russell to expand downtown operations.

Barriers to Development

In a recent survey of business climate in Tacoma, half (51%) of the businesses believed the current business environment in Tacoma causes companies to be reluctant to locate or remain in Tacoma[3]. The survey identified the most frequently mentioned 'significant factors contributing to this situation' were all taxes (29%), specifically the B & O tax (21%), regulations (13%), taxes too high for small business (10%), poor image of Tacoma (8%), and crime (8%). Factors that clearly discourage businesses to locate or remain in Tacoma are the crime rate, business and occupation tax rate, and the permitting and land use regulations.

Although amenities and infrastructure are adequate, transportation infrastructure is a problem. Additional road and rail capacity is the most problematic issue. Rail links and road access from the Port will likely be a short term issue that will be resolved with route suggestions posed in a study completed recently by the Port. Longer term solutions are under study for handling freight movement out of the area. Expansion of SeaTac airport is also of concern. Without a third runway, it may be difficult for the airport to compete with Vancouver and San Francisco in securing more international flights. The lack of such flights may impact the Northwest region's ability to attract global businesses.

DESCRIPTION OF SCENARIOS

During our analysis two key trends were identified that shaped the scenarios we developed:

- As discussed in the last few pages, Tacoma has been and is still experiencing *change in its economic base* as a consequence of industrial changes throughout the United States and globally; and

- The outcome of *downtown Tacoma development* activities will have a significant impact on Tacoma's future economic mix as a whole.

As a result of these two key trends, we used comprehensive analysis to construct three possible scenarios for Tacoma's economic future.

- The first scenario is what will likely occur under the *current economic trajectory*, with few or none of the planned development activities succeeding.

- The second scenario describes a world that enjoys not only the benefits from the first scenario, but also *accelerated growth* from the successful implementation of the International Services Zone.

- The third scenario experiences the benefits of the previous two, along with an *expanded, diversified base* from enhancements in tourism, culture, and entertainment from a "culture cluster."

These scenarios will be briefly reviewed below, including some of the economic development projects and growth impacts linked to each scenario. This is followed by a brief assessment of telecommunication needs.

Scenario One: Current Trajectory

Each of the specific economic development activities currently underway in Tacoma face barriers to be successfully implemented. Our first scenario examines the prospect that the current activities to enhance economic development (like the International Services Development Zone effort discussed later in this report) are not implemented, and the financial service sector

evolves along its current trajectory without aid of tax benefits and other direct interventions.

The three drivers of the economy, Government Services, Transportation and Distribution (the Port) and Medical Services would play a major role in this scenario's development. The Port of Tacoma and military bases at Fort Lewis and McChord Air Force Base would remain the drivers of the economy. The military bases presently contribute to roughly 50% of the economic activity in the Pierce County, employing over 32,000 military and civilian workers without taking Washington State National Guard employees at Camp Murray and elsewhere into consideration.

Services to Tacoma's growing medical services industry, including back office support for physician provider groups and insurance operations, are also expected to grow as a result of the criteria described above. Back offices allow service organizations such as hospitals, banks, and brokerage houses to outsource the administrative and record-keeping tasks of doing business. Such services are typically cheaper for companies than doing them in-house, and they allow firms to concentrate on those aspects of the business that make them money. Back offices may be attracted to Tacoma due to lower real estate costs and salary scales.

It is anticipated that intra-state, regional and national transportation services will remain an important component of the local economy, fueled by population growth, increased trade with the Far East, and the trend to consolidate cargo handling at large mega-ports. With its modern port facilities, rail links, proximity to a major interstate and an international airport, Tacoma is an important hub in the state's transportation system. As a result, the transportation sector will continue to provide Tacoma with a source of competitive advantage, if congestion can be controlled. In addition to distribution centers and major shipping lines, Port of Tacoma officials expect light industrial companies to locate more facilities in its service area due to the commercial zoning available.

At the same time, a modest number of computer-related manufacturing units as well as research and development units could arrive in the wake of successful operations at Intel and Matsushita. Some of these would likely provide support to the established computer companies in a technology corridor from Bellevue to Bothell in King County. Quebecor Integrated Media, a major Microsoft supplier, is an example of such a firm. Large tracts of relatively inexpensive land where custom facilities can be built, easy access to most modes of transportation, and an available work force make this prospect likely.

Implications for Growth

The three scenarios must be compared to a basis. For this report the basis is the Puget Sound Governmental Council and State Office of Financial Management reports, adjusted for recent changes in the local economy. Their forecast for population growth in Pierce County is 1.8% per year from 1995 through 2005 and then declines slightly to an annual rate of 1.5% for the subsequent fifteen years. For Tacoma, population growth is predicted to average 1.25% per year through 2005, and then slow to 1.0% annually through 2020. These growth forecasts assume that the current state of the economy remains unchanged. Housing unit growth will increase by the same percentage amounts as per the population. In Pierce County, over the long term, housing units tend to increase at about the same rate as population.

It is reasonable (but not certain) to assume that the basic economic structure will remain unchanged over the medium term horizon (through the year 2020). However, at least two forces will impact the nature of the local area economy. One is the effect of the Growth Management Act requirements. The other is the provision of adequate infrastructure, including telecommunication support. Each of these will be addressed following the scenario descriptions.

Scenario Two: Accelerated Growth

In addition to the growth occurring naturally from the evolution of different industrial sectors, a second scenario portrays Tacoma/Pierce County as a center for professional services including financial services aimed at an export market. The redevelopment of Tacoma's downtown is a second major trend influencing the economic future of the city. There are several economic development groups with specific projects underway designed to enhance downtown Tacoma. Major projects are reviewed below. Downtown development could take one of several directions, depending on the outcome of these projects.

This scenario would also include a higher rise in advanced technology companies to follow the upgrade in the downtown corridor that would accompany a financial service center. This prospect could result in the greatest change in the nature of the employment base in the Tacoma/Pierce Country area. This vision of the area's economic future rests on the passage of the International Services Development Zone, which would provide tax advantages at the federal and state level to attract international services companies (especially financial services firms) to Tacoma. In addition to financial services firms, the types of businesses attracted under this scenario include professional services such as law and accounting, architecture and engineering, and environmental consulting firms.

Support for Professional Business Services

The "Zone". In 1994, Tacoma was awarded a $ 3 million federal Enterprise Community grant, and was designated a state Empowerment Zone. In addition to the funding, the EZ/EC designation carries a number of tax and regulatory advantages. The primary purpose of the EZ/EC programs are to create jobs in distressed urban areas. The TEC has underway a number of significant programs to achieve this goal, including an employment initiative, the Tacoma Business Assistance Center, the Micro Loan program, and the International Services Development Zone (ISDZ). The ISDZ has the potential to significantly change the face of downtown Tacoma.

The strategic mission for the establishment of an ***International Services Development Zone*** is to contribute to the economic prosperity of Tacoma by bringing financial service and related firms into a state designated empowerment zone within the city. The International Services Development Zone Committee is modeling its ideas on the successful International Financial Services Centre in Dublin, Ireland. The Irish venture has created training opportunities, jobs, and community redevelopment. The ISDZ Committee has the active help of the Irish government in obtaining information on how its program and its technological, educational, and administrative support are structured. The ISDZ initiative hope to achieve similar success in Tacoma, through a three-pronged program: (a) tax relief at the federal, state, and local level, (b) appropriate investment in technology (especially telecommunications) infrastructure, and (c) coordination of education resources to provide adequately trained employees for sophisticated international service businesses. The primary focus at present is the promotion of tax incentive legislation at the federal, state, and local level.

The organizing committee, consisting of local business leaders, city officials, and other concerned parties, has already contributed toward drafting federal and state legislation. If successfully passed, the legislation will create multiple tax benefits designed to attract businesses. The group has also created committees to ensure completion of plans for facilities, infrastructure, and education to support companies locating to the zone. It is anticipated that state and federal legislation will be passed during the 1997 session. The ISDZ is part of a larger effort by the Tacoma Empowerment Consortium (TEC) designed to provide training and jobs to zone residents and improve the overall economic health of the area within the zone. Other efforts by TEC include a one-stop-shop for capital investments in cooperation with the Small Business Association, a micro-loan program, and a technical assistance center.

Support for an Urban Retail Core

City Beautification If there is to be significant change in the base of professional service businesses, additional retail support will be required. As such, the *Thea Foss Waterway Redevelopment* could be a fundamental part of any downtown renaissance. The City of Tacoma purchased the waterway with the intent to clean-up and revitalize the area. Recently, the City created a Public Development Authority which will issue bonds to underwrite the creation of an Esplanade, walkways, and public parks that should help move the project forward.

The Foss Waterway development could add by the year 2020 between 125,000 and 400,000 sq.ft. of new office space and 100 to 500 new residential units in the redevelopment area. New employment in the area would range from 1,100 to 3,500 over this time period. In addition, the visual appearance of the downtown core will be dramatically enhanced by such a project. This would provide an added attraction both to organizations working on Tacoma's economic development as well as to private developers. Other proposed mixed-used buildings in the redevelopment area could support the growth of professional business services. Possibilities include: class "A" office for ISDZ companies and other firms; government office space; retail and condominium space; as well as a museum complex, public park, and marina.

Enterprises that locate in the ISDZ would blend well with existing financial services firms in the area. They would also provide employment for a highly educated, well-compensated work force. In doing so, they create an upward employment path for workers in existing businesses such as the medical insurance industry, the banking industry, as well as for retiring military personnel who typically have extensive management and/or technical training.

In addition to the growth of computer-related technology companies envisioned under Scenario One, the migration of biosciences firms to the area is also possible. Several factors make this likely. The greater Seattle area is already the sixth largest life sciences center in the country, with growth fed by research at the Fred Hutchinson Cancer Research Center and the University of Washington. Many of these biosciences companies are reaching the end of their research and development cycle and are moving on to the manufacturing and marketing phase. In doing so, they will be in search of custom built laboratory and manufacturing space. Again, available land at a relatively low cost and the prospect of retrofitting existing office or warehouse space make Tacoma/Pierce County a contender. Research institutions and those potential headquarters operations that remain in the Seattle area are located under an hour away by car. The existing medical centers in Tacoma could provide controlled patient testing opportunities. In addition, the new research facility at Madigan Army Medical Center could provide a stream of trained employees as military personnel leave the service. Under this scenario, universities would need to work with new employers to ensure

they graduate an appropriately prepared work force. For example, the University of Washington's nursing program plans to expand its public health management program at the downtown campus would support this scenario.

The impact of one large advanced technology company or a few international professional services firms could have a significant impact on the economic growth of the area. The arrival of such firms would encourage more high and middle income housing to locate in or near the Central Business District, followed by the development of additional retail opportunities. Smaller business districts such as Proctor, Lincoln, Stadium and Sixth Avenue would provide retail support for the newly arrived professionals as they visit restaurants, use local services, and shop for goods. In addition, executive housing in North Tacoma, University Place, Lakewood, Puyallup and the Key Peninsula would also be in greater demand, with concurrent impact on the retail core in those communities.

Implications for Growth

The location of another large technology company (following the Intel example) or the successful development of the ISDZ would produce a major employment gain. In this case, growth within Tacoma would increase by 0.75% annually in the early time frame (1995-2005) and by 0.25% in the later frame (2005-2020). A slow down in the acceleration of growth would be due to more attractive non-Tacoma locations. This type of scenario would initially increase annual growth in Pierce County by 0.5% annually, and then slow to 0.75% over the longer time frame. Again, this would reflect better siting opportunities outside of Tacoma.

A recently produced consultant report[4] indicates that if as fully developed as the Dublin project, this could produce about 10,000 jobs in the city — 3,500 for the ISDZ and 7,000 for indirect jobs. The earnings would be $130 million for the 3,500 direct and $200 million for the indirect, or total new earnings of $330 million. The jobs would also provide a large number of entry level, high school education positions with, of course, a mix of higher level professional service type jobs. The site would include about 27 acres, 8 on the water. This would produce about 1,565,000 square feet of new office and commercial space — 20,000 for retail, 1,500,000 for class A office, and 45,000 other.

Scenario Three: Accelerated Growth with Culture Cluster

Adding to the conditions that built scenarios one and two, a third scenario considers the enhancement of tourism, entertainment, and culture industries in Tacoma. If Tacoma makes some significant facilities improvements it would become eligible to bid on larger national and international conventions. Minimally, these include the construction of a second "Business Class" hotel and the expansion of the existing Convention Center. Benefits would reach private convention facilities, such as the Landmark Convention Center and the Sheraton, public facilities like the Tacoma Dome and Cheney Stadium, and retail businesses. For example, the proximity of several large performing stages to one another in the Broadway Theater District creates the opportunity for Tacoma to become an important center for performing arts conferences such as the recent "World Harp Congress."

Support for Increased Tourism and Convention Trade

In further attempts to bring business into downtown Tacoma, opportunities and venues for new entertainment and cultural locales are being pursued by several interested parties. Such projects could increase visits by tourists and/or conventioneers.

Conventions The Sheraton Hotel currently provides business accommodations downtown. Tacoma cannot be considered, however, for a specific "class" of convention because it lacks enough space to qualify. To host such conventions requires larger convention center space and more business hotel rooms. Plans to rectify this situation are underway. The Planning and Development Department has already proposed an expansion of the Convention Center and the construction of a second business class hotel within walking distance of the Convention Center

Museum Complex Plans are also underway to create a Museum Complex within a larger "culture cluster." This complex will center on a portion of the Thea Foss Waterway and an adjacent portion of Pacific Avenue between 15th and 21st Avenues. The Washington State Historical Museum on Pacific Avenue anchors this complex and is already open for business. The University of Washington-Tacoma campus, which includes several renovated historical buildings, is located across from the museum and has allocated the Pacific Avenue level for commercial use. The International Museum of Modern Glass is scheduled to open in the year 2000. Other possible tenants in such a "culture cluster" include a relocated Maritime Museum, a Puyallup Tribal Culture Museum, and the Tacoma Art Museum. The recently formed Public Development Authority for the Thea Foss Waterway will undertake long term planning for this area.

Movie Theaters To encourage more traffic into the downtown area, the City of Tacoma recently rewrote its theater ordinance to encourage the development of a large, *multiplex movie theater* in downtown Tacoma. Such cineplexes typically include eating and drinking establishments as well as video games complexes and would attract people downtown during evening hours. This would have the added benefit of improving the perception of safety, in that people walking to their transportation say they feel safer when others are around.

Casino The Puyallup Tribe of Indians recently opened a *gambling casino*, eventually to be relocated on a riverboat docked on the Blair Waterway. The success of such development efforts should increase the number of evening visitors to the downtown area and have a positive impact on existing retail establishments.

Rail Connections The *Train to the Mountain - Park Junction Resort* project is designed to create passenger train service between downtown Tacoma and the entrance to Mount Rainier National Park. Organizers expect the project to eventually include a second spur down to Morton, Washington. The City of Tacoma already owns the tracks from Tacoma to Morton. Park Junction Resort, a private convention and hotel center to be located near the park entrance, will serve as the track's mountain terminus. Tourists will be able to board a train in downtown Tacoma and a short time later step outside to enjoy recreational opportunities in and around the mountain. Transportation plans include shuttle bus service from the terminus to Paradise Lodge and other significant sites inside the park. Board members are proposing to provide service by 1999. The *Three Mountain Tourism Council* has also secured assistance from Microsoft to provide interactive historical and geological information at several sites in the area. This assistance may be coordinated with the Train to the Mountain project as it becomes more developed.

Second, if a "culture cluster" was created in Tacoma's Central Business District, Tacoma could become a tourist destination in its own right. It is anticipated that as tourists explore traditional attractions in the area, such as Point Defiance Park and Mount Rainier National Park, they will learn of the community's cultural attractions located downtown. The Washington State Historical Museum, Tacoma Art Museum, the Broadway Theater District and a possible multiplex movie theater in combination with the International Museum of Modern Glass and other prospective developments on the Thea Foss Waterway would create a downtown destination of interest. Increased tourist traffic would then support the development of additional attractions, for example a maritime museum developed from the existing Maritime Center on Dock Street, an aquarium, a Puyallup Indian Tribal Museum, and additional public parks.

Linkage between these tourist attractions and existing business districts which have developed their own personalities, such as Proctor, Lincoln, Old Town, Stadium and Sixth Avenue, could provide a significant

business boost for these neighborhoods. In addition, increased tourism would lead to opportunities for new and existing Bed & Breakfast and other lodgings.

At minimum, however, a modest expansion of employment in the professional services sector as described under Scenario One would be required for this scenario. Local people with disposable income are needed to support these facilities during the low point in the tourist season. That fact also makes facilities in this scenario more likely to thrive if Scenario Two comes to pass. In addition, Scenario Three would be helped by a well-orchestrated approach to cross-promotional marketing by the various tourist locales.

Implications for Growth

This scenario would have a significant impact on the moderate term growth outlook for the area would come from the development of an expanded art/cultural and tourist industry. This could happen if the "culture cluster" generates the critical mass of activity needed to attract travelers and put the area on the "map" of destination stops. The effect will be to raise Tacoma's annual growth by 0.1% and Pierce County by 0.2% in the 1995-2005 time frame. Greater growth will occur during the 2005-2020 time frame as infrastructure is developed and earlier impacts are felt, with increases by 0.25% for Tacoma and 0.3% for the county.

Impact of the Growth Management Act

An issue that will influence where and how population growth will occur is the impact of the Growth Management Act based on its Under new regulations, the emphasis is on concentrating growth in the existing urban areas, curbing growth in the unincorporated areas, and avoiding growth in rural areas. As a result, more growth will be channeled into the Tacoma and Puyallup vicinity than in the past. Areas with clear development plans and the ability to provide traditional infrastructure will also see steeper growth. This factor favors areas such as Browns Point, Dash Point, DuPont, and Thun Field.

New housing types will change. Within urban areas, including the central business district, there will be a growth in multi-family housing. The density in the main existing residential areas (e.g., Proctor and Stadium, Lincoln, University Place, Steilacoom) will increase — with a strong possibility of more high rise (two to six story) units. In the county, the expansion will be primarily accommodated through single-family, detached units. Even in the county, however, the pressure will be to consolidate growth into those areas that already have traditional infrastructure.

Growth on the Key Peninsula will be more problematic. Transportation is obviously a problem, and this will favor location there by non-commuters, generating more demand for local retail goods in Gig Harbor. Infrastructure In that area, such as water and sewer will be more expensive and will push up housing prices.

To the extent that the employment growth occurs closer to DuPont than to the current Tacoma boundaries, some housing growth (and population) will occur in Thurston rather than Pierce County. One estimate, by the Thurston County Economic Development Board, expects that almost 70% of the non-DuPont residences of Northwest Landing employees to be in Thurston and only 30% in Pierce. As Thurston grows, however, people will travel to Pierce County for shopping and entertainment. Although a second spill over area could be Auburn in south King County, residential neighborhoods located there are not as attractive as in Thurston County nor is the economic base as diverse.

TELECOMMUNICATION NEEDS

Our findings suggest that with appropriate investments in infrastructure and a supportive business climate, growth patterns should continue into the future. As a result, Pierce County will continue to be an attractive location for new forms of economic activity. In this section we briefly describe the relationship between each scenario and its telecommunication needs.

Impact of Telecommunications Infrastructure

Patterns of growth in the major sectors of the local economy are, and will be more so in the future, dependent on the community's telecommunications infrastructure. Many established sectors will also require continued technology investments to remain competitive.

Government activity at military installations will continue to be the a significant sector in the local area economy. However, as the size of the public sector in the national economy continues to get smaller (moving toward the promised balanced budget), reductions in the defense budget will become increasingly important. The existing facilities in Pierce County have survived two rounds of base closures, due in part to the fact that they were technologically sound. The future is always uncertain, however. Access to the most modern telecommunications technology will help assure their survival in the local area.

Up-to-date communication and information services are essential to the survival of *health services.* Commercial data management in support of medical services also require a substantial and increasing telecommunications infrastructure. The health care industry is a primary industry in Tacoma Pierce-County and a rich source of potential applications and associated technology drivers. Not only are there a variety of applications driving both applied and fundamental research, but the spectrum of actual operating modes in health care provision systems span a wide range. Provision ranges from elective, non-emergency, monitoring where the patient and provider are together in a well equipped office, to emergency diagnostic and treatment situations where the diagnostic expertise is geographically remote from the patient and the treatment expertise. Remote diagnosis requires high bandwidth, real time connection oriented services which support multiple video and data streams as well as voice communication. The precise telecommunications capability required to support this activity is application specific, but can be analyzed within a distributed communication framework since in general health care providers may be geographically dispersed in multiple locations.

The increasing telecommunications need is also true of other *professional services*, especially in the area of *financial services.*
The financial services are not communications limited in the same sense as remote medical diagnostic services, or shipment status monitoring. While financial service providers at both the institutional level and the consumer level are sophisticated users of information, the financial services industry does not place heavy demand on the design of the telecommunications technology. This somewhat curious situation results from several factors:

1. Most financial information is coded in alphanumeric formats. These formats are very efficient to transmit using a variety of existing telecommunications technology.
2. Humans utilize financial information and services in alphanumeric or rudimentary graphical formats (trend charts).
3. Financial information is semantically "dense", the simple statement "DOW off %5" contains a wealth of information, but is amazingly compact (eight bytes).

So it is clear that need for increased bandwidth is usually not instigated by their need to support more volume. However, the financial services sector in the Tacoma area does have unmet telecommunications needs, as evidenced by the Frank Russell Company, one example of a professional services firm experiencing increased telecommunication needs in order to link its headquarters with its international offices and clients. For these kinds of clients overall bandwidth may not be an issue, but security of the line, speed and direction, and responsiveness of the vendor may be. This is an industry sector where telecommunications is part of the production process — a breakdown in the system can cause the organization itself to cease to function until the system is back on-line. Failure to invest in new technologies, especially communications technologies, would therefore

limit the growth potential of the area. Companies like Frank Russell would be forced to continue to privately construct work around solutions or utilize a remote service center that could supply desired access and services. Other areas looking to attract these types of companies would need to provide access to a sound telecommunication infrastructure. The success of the international services district and the ability to attract new businesses to the redeveloped Foss will depend, to a great degree, on access to low cost, full service telecommunications technologies.

More uncertain, and equally important, will be the information and communication needs of shipping and support activities in the *Port of Tacoma* area. Increase in direct competition to Tacoma's container trade, competition for new shipping lines, just-in-time inventory requirements, and lower labor costs all suggest the provision of telecommunications technologies will be important for this sector of the economy as well. Distribution centers in the Port of Tacoma, with SuperValu as another example, are becoming increasingly dependent on telecommunications for the transfer of data between regional distribution centers, vendors, and the parent company. . Customers frequently desire to know the status of shipments which they have sent or are waiting to receive. These shipment status services are often effective differentiators for shipment service providers. In the small package shipment service business competitive pressure drove both FedEx and UPS to offer shipment status services. With the small package shippers, status generally provides pickup time, expected or actual delivery time and other information. With integrated shipment services providers such as the typical port authority, the cargo may be at sea, in the air or with some common carrier trucking firm which makes an accurate and reliable determination of shipment location problems. A possible solution entail utilizing global positioning systems (GPS) and wireless telecommunications technology to update port authority databases on the location and condition of shipments in transit.

In the *retail sector*, increased reliance on computer usage in stores is likely, as inventory costs can more effectively be controlled with timely ordering and control, use of fax and modem transactions is increasing, and the use of things like fingerprint recognition for credit cards or check writing. Successful merchants will need to adapt to these new demands -- a potential large increase in data transmission needs from many small and scattered sites.

The *advanced technology* businesses also can have telecommunication needs. A research based organization will often desire high-speed access to other researchers or their works. In fact, it is the ability to telecommute and connect regionally-located Universities that has fueled some of the dispersion in advanced technology companies to smaller communities.

Culture-based organizations in this scenario are not as technology-dependent as professional and health services, but telecommunications does play an increasing useful role in the tourist/convention category. The Visitor and Convention Bureau anticipates the use of smart cards to allow tourists access to a variety of services from transportation to tickets to shows. That idea would require a well developed communications network in the city and adjacent points of interest. For the conventioneer, satellite conferencing and digital information transfers are of growing importance. In addition, many business travelers expect a computer modem in their hotel rooms to connect with their home office. Museums increasingly use interactive media as an educational tool.

It is not merely the business applications themselves that require infrastructure access. Sophisticated, technology oriented employees of many of these types of firms would expect to have access to their workplace computer system from their home, access to the Internet, high quality cable systems, and eventually new technologies which are only on the drawing board at this time. A failure to invest in the appropriate infrastructure may leave Tacoma out of the running as a location for these types of firms and the employees who work for them.

RESOURCES

____. *1996 Washington State Advanced Technology Directory.* (Seattle, WA: Commerce Publishing, 1996).

____. *Employment and Payrolls in Washington State by County and Industry.* (Tacoma, WA: Tacoma-Pierce County Chamber of Commerce, February, 1996).

____. "Health Insurers," *Puget Sound Business Journal*, 15 March, 1995, p. 30.

____. "Hotels: The Largest in the Puget Sound Area," *Puget Sound Business Journal*, 25 August, 1996, p. 26.

____. "Kaiser Aluminum Hires 50 in Tacoma, Wash., to Maintain Output," *Knight-Ridder/Tribune Business News*, 18 June, 1995, p6180251. (Story originated in the News Tribune, Tacoma).

____. "Key Bank Layoffs to Hit Tacoma, Wash., Area Hard," *Knight-Ridder/Tribune Business News*, 26 November, 1996, p1126B1009. (Story originated in the News Tribune, Tacoma).

____. "Private medical practices in squeeze," *Tacoma News Tribune*, http:www.tribnet.com:80/projects/top100. (New Tribune Web Site: Top 100 Employers of Washington).

____. "Software Developers: The largest in Washington state by 1995 revenue," *Puget Sound Business Journal*, 19 July, 1996, p. 20.

____. *Tacoma Tideflats Circulation Study: Executive Summary.* (Tacoma, WA: Washington State Legislative Transportation Committee and the Port of Tacoma, November, 1996).

Baker, Sharon. "Freight-Industry Vets Offer Internet 'Mall' for Shippers," *Puget Sound Business Journal*, 18 October, 1996.

Brock, Kathy. "Four NW Blues Plans Develop Alliance," *National Underwriter, Life & Health/Financial Services*, 17 April, 1995, p. 32.

Brown, Leslie. "Industry Observers Claim Pulp, Paper Business on the Rise," *Knight-Ridder/Tribune Business News*, 18 July, 1996, p7180052. (Story originated in the News Tribune, Tacoma).

Brown, Leslie. "Weyerhaeuser Opens Tacoma, Wash., Recycling Plan," *Knight-Ridder/Tribune Business News*, 27 September, 1996, p927B0139. (Story originated in the News Tribune, Tacoma).

The Business Climate/Regulations Team, 1996, *Tacoma Business Climate Survey.* (Tacoma, WA: February, 1996).

Bussewitz, Walter. "Four NW Blues Plans In Talks About Affiliation," *National Underwriter, Life & Health/Financial Services*, 6 June, 1994, p. 63.

Chase, Robert & Hansen, Reed, *Tacoma Washington International Services Development Zone: An economic & fiscal impact analysis.* (Tacoma, WA: Tacoma Empowerment Association, December, 1996).

DiBenedetto, William. "Listless Northwest Ports Bank on Strong 2nd Half," *Journal of Commerce and Commercial*, 16 August, 1996, p. 1B.

Dunbar, Carolyn. "MultiCare Health System Saves Millions of Dollars Through Redesigned Care," *Health Management Technology*, July, 1994, p. 22.

Eckart, Kim. "Tacoma, Wash., Mall Sees Revival; Now Called 'Mall of the Future'," *Knight-Ridder/Tribune Business News*, 2 May, 1996, p5020189. (Story originated in the News Tribune, Tacoma).

Economic Development Board for Tacoma-Pierce County (EDB). *Pierce County Major Employers.* (Tacoma: EDB, 1996).

Epes, James. "Warehouse Wars in Fife," *Puget Sound Business Journal*, 12 January, 1996, p. 23.

Fagerstrom, Scott. "CEOs Predict Steady Growth for Washington State Economy," *Knight-Ridder/Tribune Business News*, 16 May, 1996, p5160026. (Story originated in the News Tribune, Tacoma).

Fagerstrom, Scott. "Frank Russell Co. to Expand Tacoma, Wash., Office Space," *Knight-Ridder/Tribune Business News*, 6 June 1996, p6060165. (Story originated in the News Tribune, Tacoma).

Fagerstrom, Scott. "Key Bank to Close Nine Tacoma, Wash., Area Branches," *Knight-Ridder/Tribune Business News*, 21 May, 1996, p5210065. (Story originated in the News Tribune, Tacoma).

Flash, Cynthia, "Puyallup, Wash., Allows Matsushita to Continue with Expansion," *Knight-Ridder/Tribune Business News*, 30 September, 1996, p930B0043. (Story originated in the News Tribune, Tacoma).

Flash, Cynthia. "DuPont, Wash., Plant to Play Important Role in Intel's Future, Executive Says," *Knight-Ridder/Tribune Business News*, 28 June, 1996, p6280112. (Story originated in the News Tribune, Tacoma).

Freeman, Paul. "Wooing Visitors From Abroad," *Puget Sound Business Journal*, 25 August, 1995, p. 22.

Fysh, Graham. "DuPont, Wash., Can Avoid Pitfalls of Attracting Corporate Giatn, Analyst Says," *Knight-Ridder/Tribune Business News*, 28 March, 1996, p3280226. (Story originated in the News Tribune, Tacoma).

Fysh, Graham. "Focus on Developing Downtown Tacoma, Wash., Urged," *Knight-Ridder/Tribune Business News*, (Story originated in the News Tribune, Tacoma).

Fysh, Graham. "Key Bank Announces Consolidation Plan in Northwest States," *Knight-Ridder/Tribune Business News*, 20 April, 1996, p4260111. (Story originated in the News Tribune, Tacoma).

Fysh, Graham. "Study Offers In-Depth Look at Washington State Tourism Industry," *Knight-Ridder/Tribune Business News*, 25 June, 1996, p6250197. (Story originated in the News Tribune, Tacoma).

Fysh, Graham. "Tacoma, Wash., Mall Plan $10 Million Renovation," *Knight-Ridder/Tribune Business News*, 24 May, 1996, p5240043. (Story originated in the News Tribune, Tacoma).

Fysh, Graham. "Washington State Business Executives Discuss New Ventures at Annual Meeting," *Knight-Ridder/Tribune Business News*, 29 September, 1995, p9290005. (Story originated in the News Tribune, Tacoma).

Gibbs, Al. "Kaiser Aluminum's Plant in Tacoma, Wash., Gets New Lease on Life," *Knight-Ridder/Tribune Business News*, 20 March, 1996, p3200204. (Story originated in the News Tribune, Tacoma).

Griffin, Sean. "Boeing Honors Tacoma, Wash., Firm as Small Business of Year," *Knight-Ridder/Tribune Business News*, 18 July, 1996, p7180118. (Story originated in the News Tribune, Tacoma).

Johnson, Dennis. "Hope on the Hilltop," *Puget Sound Business Journal*, 18 October, 1996, p.24.

Machalaba, Daniel. "Deal Is Near for Major Rail Link in Northwest," *Wall Street Journal*, 2 April, 1996.

Maharry, Mike. "Intel Gives Pierce College Equipment for Technician Training Program," *Knight-Ridder/Tribune Business News*, 20 May, 1996, p5290031. (Story originated in the News Tribune, Tacoma).

Maharry, Mike. "Piano Maker to Build Keyboard, Synthesizer Plant in DuPont, Wash.," *Knight-Ridder/Tribune Business News*, 15 August, 1996, p8150133. (Story originated in the News Tribune, Tacoma).

Maharry, Mike. "Pierce, King Counties Wash. Join National Surge in Home Sales," *Knight-Ridder/Tribune Business News*, 15 August, 1996, p8150133. (Story originated in the News Tribune, Tacoma).

Maharry, Mike. "Washington State Officials Predict Continued Rosy Economic Outlook," *Knight-Ridder/Tribune Business News*, 22 November, 1996, p1122B1029. (Story originated in the News Tribune, Tacoma).

Mann, Bruce D. *Economic Analysis for Development of the Thea Foss Waterway.* (In preparation).

Mann, Bruce, D. & Frerichs, Ben. *An Economic Base Study for Pierce County, Washington, 1992: Analysis and Conclusions with Special Reference to High Technology and Environmental Service Industries.* (Unpublished Document, January, 1996).

Mann, Bruce D. & Goodman, Douglas E., *The Road Ahead: The Pierce County Economic Index 1996-97.* Presented at the annual Horizons Economic Forecast Event. (Tacoma-Pierce County Chamber of Commerce, 1996).

Marks, Anita. "Intel Hits Stride," *Puget Sound Business Journal*, 27 September, 1996, p. 1.

Neurath, Peter. "Banks For the Memories," *Puget Sound Business Journal*, 28 April, 1995, p. 18.

Neurath, Peter. "MultiCare, Swedish Hedge Bets with Cigna Buy," *Puget Sound Business Journal*, 7 October, 1994, p. 19.

Neurath, Peter. "Tacoma-Area Community Banks Sprout After Buyouts," *Puget Sound Business Journal*, 24 June, 1994, p. 4.

Rodenhouse (ed.), *1996 Directory of Higher Education.* (Falls Church, VI: Higher Education Publications, 1996).

Popham, Art. "Art Popham Column," *Knight-Ridder/Tribune Business News*, 23 April, 1996, p4230084. (Story originated in the News Tribune, Tacoma).

Puget Sound Regional Council (PSRC), *1995 Population and Employment Forecasts for the Central Puget Sound Region.* (PSRC, August, 1995).

Puget Sound Regional Council (PSRC), *1992 Puget Sound Subarea Forecasts: Model Calibration and Forecasts.* (PSRC, April, 1992).

Reed Hanson & Associates, *Port of Tacoma Economic Impact Study.* (Tacoma, WA: Port of Tacoma, 1993).

Salensky, Kathryn. "Downtown Tacoma's Retail Void has yet to be Filled," *Real Estate Quarterly*, 18 November, 1994, p. 33.

Sather, Jeannie. "Tourist Tap," *Puget Sound Business Journal*, 28 April, 1995, p.30.

Szymanski, Jim. "Developers of DuPont, Wash., Mall Lining Up Tenants," *Knight-Ridder/Tribune Business News*, 29 June, 1996, p6290036. (Story originated in the News Tribune, Tacoma).

Szymanski, Jim. "Schoenfelds Ends 94 Years of Downtown Tacoma, Wash., Furniture Sales," *Knight-Ridder/Tribune Business News*, 24 September, 1996, p924B0201. (Story originated in the News Tribune, Tacoma).

Szymanski, Jim. "Tacoma, Wash., Area Urged to Lure Manufacturers, Jobs More Quickly," *Knight-Ridder/Tribune Business News*, 11 December, 1996, p1211B1074. (Story originated in the News Tribune, Tacoma).

Ullmann, Caroline Young. "Two Washington State Health Insurers Seek to Combine Services, But Costs," *Knight-Ridder/Tribune Business News*, 12 July, 1996, p7120077. (Story originated in the News Tribune, Tacoma).

Washington State Employment Security (WSES), *Tacoma-Pierce County Employment, December, 1996 (Place of Work).* (Tacoma-Pierce County Chamber of Commerce, January, 1997).
Wilhelm, Steve. "Beyond Remediation," *Puget Sound Business Journal*, 17 May, 1996, p. 24.
Wilhelm, Steve. "Big Cargo Ships Demand Costly Upgrade at Ports," *Puget Sound Business Journal*, 15 March, 1996, p. 1.
Wilhelm, Steve. "Congestion Snarls Region's Rail Lines," *Puget Sound Business Journal*, 19 April, 1996, p. 1.
Wilhelm, Steve. "Getting on the Map of World Trade," *Puget Sound Business Journal*, 28 April, 1995, p. 36.
Wilhelm, Steve. "Lynden Air Building Global Freight Forwarding Network,"
Wilhelm, Steve. "Marking Tracks," *Puget Sound Business Journal*, 23 August, 1996, p. 1.
Wilhelm, Steve. "NEC Cranks Up Laptop Output in Fife Factory," *Puget Sound Business Journal*, 26 January, 1996, p. 1.
Wilhelm, Steve. "Truckers Caught in Headlights of Deregulation," *Puget Sound Business Journal*, 16 June, 1995, p. 5.
Wilhelm, Steve. "Waves of Change Rock Maritime Industries," *Puget Sound Business Journal*, 28 April, 1995, p. 22.
Wilhelm, Steve. "West Coast Port Traffic Takes a Dip," *Puget Sound Business Journal*, 6 September, 1996, p. 1.
Winslow, Ron. "Aetna Agrees to Acquire U.S. Healthcare," *Wall Street Journal*, 2 April, 1996.

Overview

A Local Telecommunications Business Plan

This study has reviewed the telecommunications industry both nationally and locally. In reviewing the local situation it is clear that the local market has a growing need for better telecommunications access. Something significant is clearly underway when 18% of the homes in the greater Tacoma area report that they are using the Internet and that use is projected to grow to 24% by the end of 1997. Despite this growth in demand, the incumbent wire line service providers have stated that their investments in the local infrastructure will either slow without significant rate increases or be halted all together. One could hope that other companies would step forward and create a modern telecommunications system through out our community but the prospects for that occurring anytime soon appear dim. While Competitive Access Providers will eventually enter the local market, their focus is almost exclusively on large business users. Other potential systems are either of low capacity or not scheduled to be fully deployed until the next century.

Could Tacoma City Light create an advanced telecommunications system to meet the telecommunications needs of the communities it serves in addition to its own internal communication needs? And, if Tacoma City Light were to create such a system and operate it in a business like manner, would the system generate sufficient revenues to make the system self sustaining? As this section demonstrates, the answer to both questions is yes.

A viable business would be created by:

1. offering products and services that meet customer needs directly and by providing a pathway through which the private sector can meet additional needs,
2. pricing those products and services competitively, and
3. delivering them over a modern, high-speed, high-reliability telecommunications system, a business is created that is viable using conservative revenue projections.

The following subsections outline how such a business could look by providing a review of the Products and Services, the Technology Architecture, the Operating Plan, the Organization, and the pro forma Financials of such a business.

PRODUCTS AND SERVICES

Three types of telecommunications services would be offered by Tacoma City Light — wholesale high-speed telephony and data transport, Internet data transport, and cable television. Each of these services meet the growing telecommunications needs in the greater Tacoma area and are explored in the following sections.

High-Speed Telephony and Data Transport

High-speed telephony and data transport on a fiber optic SONET system would be offered by Tacoma City Light on a wholesale basis to the business community. These high-speed digital lines would be offered from point-to-point in standard DS1, DS3, and higher capacity connections, at an estimated cost of less than half the existing comparable high-speed copper lines. The lines would be open on a non-discriminatory basis to local and long distance carriers, local value-added service providers, and local businesses. The availability of these lines would bring choice and price competition to the greater Tacoma business community.

The network of fiber optic cables would be constructed throughout the area Tacoma City Light serves. The system would interconnect with the offices of major telecommunications providers in the region. The diverse routing of cables in a multi-ring architecture would be used to enhance reliability.

Business Applications

Lines between offices would be used for teleconferencing, data networking, image transfer, or telephones. New leased lines would be quickly provided to customers. Customers would have low-cost access to new telephone service providers. Competition would exist for transport of telephone and data applications. Individual businesses would benefit from competitive prices and prompt service. Redundant fiber optic paths would be utilized to provide the transport service.

Private Data Networks Data network applications are likely to be the most common application on the system, meeting the performance and growth expectations driven by business computer use. The system would meet the reliability and security needs of this critical business application. These lines would support private data networks, which could include Intranet and Extranet links. An Intranet link improves the features of network service among buildings within one company; an Extranet link extends the ease of private information exchange among a few businesses.

Telephone Access Access to new telephone service providers is likely to be the second most common application. Lines would be extended directly to inter exchange carriers allowing them to competitively reach customers without using the local exchange carrier. Long distance carriers would have the ability to offer local telephone service directly to customers by providing dial-tome and switching service over the fiber SONET system. These interconnections with regional communications companies would provide more choices to customers. Access to alternate central offices, alternate POPs and other issues of reliability that are of importance to businesses who rely heavily on their phone lines would be met by this system's design.

Value - Added Services A provider of a value-added service would be able to obtain transport on high-speed lines and provide custom telecommunications applications. For example, a value-added service provider can design, install and configure a business wide area network, composed of several local area networks linked with routers, which convert local area network signals for transmission on the SONET system.

High-Speed Transport Service for Local Schools and Public Safety

The high speed telephony and data transport network would be constructed to meet the transport needs of schools, public safety offices, and libraries, if franchise authorities so desire. These offices could use the transport facilities to substantially improve their internal communications and their services to the community. Also, the needs of the electrical transmission and distribution sections of Tacoma City Light would also be addressed with transport services to all substations.

Internet Data Transport

Internet data transport would be offered on the hybrid fiber coax system. Cable modems would be used to provide high-speed Internet access for homes and small businesses, in partnership with Internet service providers. Transport service for cable modems would be provided by Tacoma City Light between customers and Internet service providers.

Customers would use Internet services for entertainment, education, and shopping for other products and services. The delivery of information would be in the form of multimedia text, images, animation, sound and video. Use of this service would reduce reliance on traditional telephone lines for access to the Internet.

Cable Modems vs. Standard Telephone Lines

Cable modems deliver data up to 1000 times the speed of standard telephone lines. Customers would be able to quickly search and retrieve information such as stock quotes, weather reports, and headline news. Providing high-speed capability removes restrictions of telephone lines on size and complexity of Internet features. Sound, images and better full-motion video can easily be delivered from the Internet on cable modems.

The use of the cable modem frees the telephone line and network for telephone calls. Internet service providers transfer *data packets* which can be individually switched and routed, without the inefficiencies of using switched *circuits*. Increased Internet traffic will eventually force telephone system operators to upgrade their local switched telephone systems in order to maintain its availability for emergency and other telephone use. Cable modems, a new HFC cable plant, and direct transmission to Internet service providers would relieve telephone system operators of this burden. Home computers could be continuously connected to the Internet, performing work without impacting telephone use. Returning the household telephone for traditional use would also preserve the current flat-rate local telephone billing system.

Cable Modems vs. ISDN

Integrated Services Digital Network (ISDN) was invented to make digital service available in the telephone network to homes. As home services become digital, the quality and variety of services the telephone network can deliver increases. ISDN enables many new telephone services, as well as data speeds of 144 kbps, two to four times the speed of standard telephone modems. As with common telephone lines, ISDN lines are switched circuits, tying-up capacity while the line is in use. ISDN lines have the same inherent impacts that standard telephone lines have on telephone network availability when used for Internet access.

Cable modems provide a data connection directly to an Internet Service Provider, bypassing the telephone network. Cable modems provide approximately 100 times the speed of an ISDN line used for data. Cable modems provide the speeds that should allow new forms of service to prosper on the Internet.

The following graph illustrates the comparable services and costs between a standard telephone line, an ISDN line, and a cable modem.

One - Way Cable Systems

Competing products which deliver high speed data, such as Direct Broadcast Satellite or Cable Data on one-way cable systems, continue to use telephone lines for the return path. Use of such products only exacerbates the already overloaded telephone system.

Cable Television

Offering full service cable television directly to local homes would bring price, programming, picture quality, and service-level competition to the greater Tacoma area.

The system that delivers Internet data transport service also provides cable television. The use of fiber optics optimizes system operation and performance. Tacoma City Light would offer a wide range of programming, including local broadcast, news and information, sports, arts and entertainment, movies, family, as well as public access, education, and government (PEG channels).

Initially, digital television would not be offered, since the system would offer a multitude of clean and sharp analog channels. Since the channels would be viewable on a cable-ready television without a set-top box, problems that set-top boxes cause with television features like picture-in-picture and VCR functions would be avoided. An 80 channel lineup of television programs provides significant value to the large majority of customers. The digital television business in not yet mature. The risk of offering digital television right now is great, as the digital set-top boxes are not generally available and are expensive, and most program content is available in forms which are expensive to convert for compressed digital transmission to homes. As digital television on cable systems matures, then simple revisions can be made to offer many digital programs.

TECHNOLOGY ARCHITECTURE

The following key areas are considered in telecommunications architecture decisions:

- Adaptability to easily serve future needs
- Efficiency in serving telecommunications requirements
- Compatibility with other systems
- Future capacity for growth
- Integration of electronic components
- Maintenance and Operations standards and procedures

Telecommunications System Design

Hybrid Fiber Optic Coaxial (HFC)

The basis of many modern, cost effective telecommunications architectures is the hybrid fiber optic coaxial (HFC) structure carrying many radio frequency (RF) channels. Fiber optic cable is used to carry signals from the communication system facilities to the vicinity of subscriber homes, with final delivery on coaxial cable.

HFC systems are the most economical way of transporting vast amounts of information to homes for the following reasons:

- HFC systems make use of commercially proven electronic transmitters and amplifiers in both the optical and coaxial cable transmission of information.
- HFC systems are compatible with communication devices already present in customer homes.
- HFC systems allow new customers to tap into the same main cable used by other customers on the same street, minimizing the cost of providing each customer service.

SONET

Wholesale telephony and data transport services differ from residential services. Businesses often require large volumes of transport, which is mostly two-way and concentrated. The fiber optic cables in the HFC infrastructure can be used to transport business telecommunications traffic independently on dedicated optical fibers in the same cables with optical fibers for two-way cable television and Internet data transport. The key to serving business telecommunications is providing high-speed digital transport based on common transmission and connection standards. SONET is a highly standardized system of providing transmission of digital telephone and data circuits. SONET systems are in broad use

today by local exchange carriers, long distance companies, and competitive access providers.

System Basics

The headend, distribution hubs, and serving area nodes are the three major categories of communications system facilities. Each of these categories correlates to system equipment and geographic areas served.

Headend

The headend is the control center where incoming television, radio, and satellite signals are amplified, converted, processed and combined for transmission to customers. In advanced systems, the content from other service providers such as video on demand, telephone, and data are also received and inserted into the HFC system. Program content that is broadcast to all subscribers is inserted into the HFC system at the headend. Program content unique to each hub service area can also be inserted into the HFC system at the headend.

SONET digital transmission can be used to bring the advanced services from other facilities, such as telephone switching centers and Internet access centers to the headend for insertion into the HFC cable system.

Distribution Hubs

Distribution hubs are necessary to provide an insertion point for subscriber specific or narrowcast program content. Without a hub, fibers to neighborhood nodes would have to be cabled directly from the headend. By using as few fibers as possible to transmit common or "broadcast" channels from the headend to the hub, other fibers can be loaded with narrowcast channels. Most growth would likely take place in narrowcast channels which would determine the assignment of the fibers and new hub equipment.

Hubs are also necessary for high-speed telephone and data transport for businesses. The transported signals from customers premises are concentrated at the hubs onto higher speed SONET transport systems for transmission to service providers.

Nodes

Nodes are terminals in the HFC communication network where signals are combined or re-transmitted. Nodes are also the transition point from optical fibers to coaxial cable. Coaxial cable is the final distribution link to subscriber homes. From nodes, coaxial cable trunks branch out to distribute signals and trunk amplifiers are used to boost signals as distance increases. Node size is chosen to match the number of

narrowcast channels used by subscribers — node serving areas would be divided into smaller areas as customer demand grows.

Within the node serving area are the power supplies with battery backup, trunk amplifiers, branch amplifiers, service taps and coaxial service drops to subscriber homes. All services to subscribers are provisioned from passive electrical devices (taps) to the coaxial cable. The largest portion of overall system cost is in the outside coaxial plant from the node to the customer.

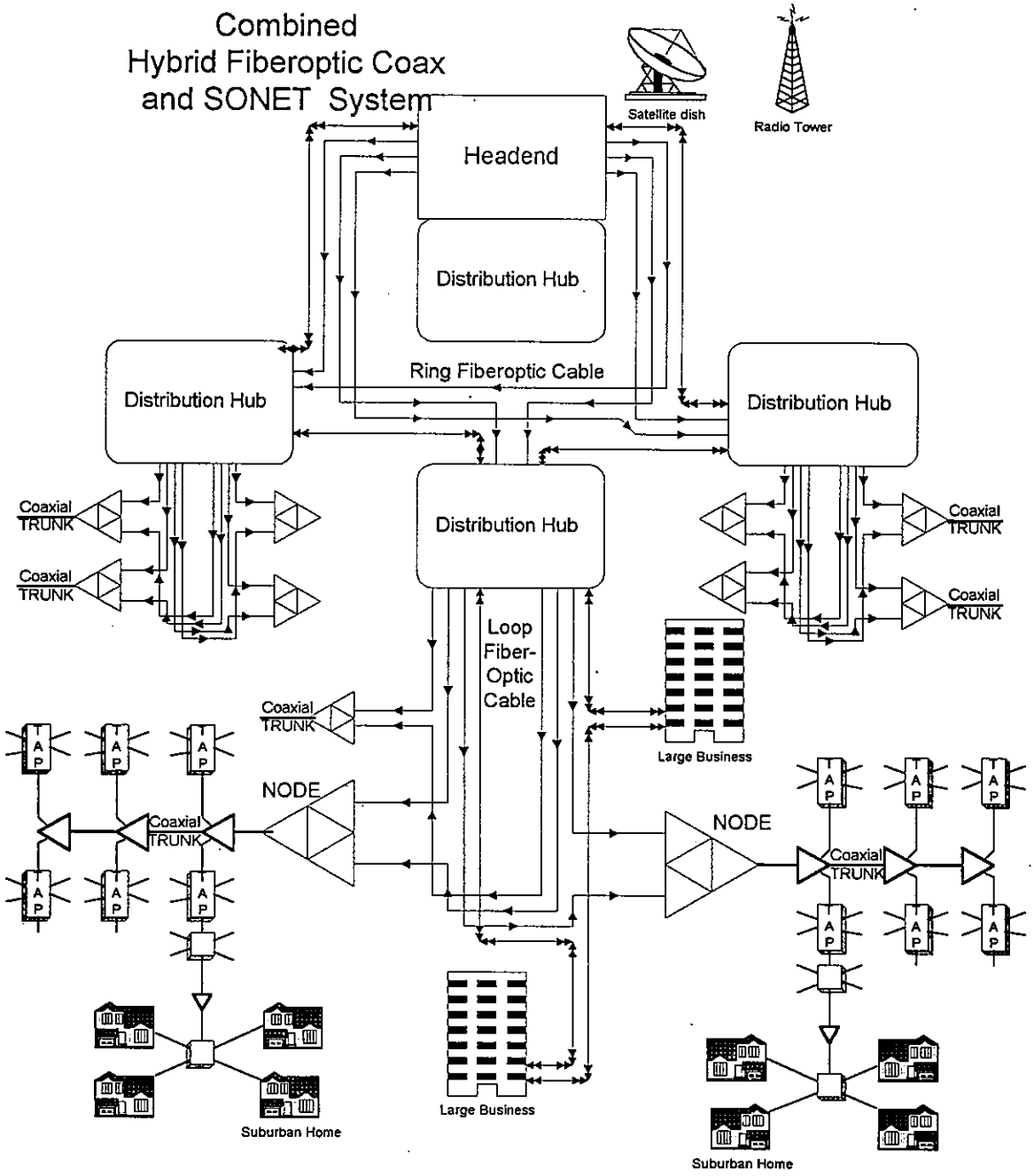
The diagram labeled "Combined Hybrid Fiberoptic Coax and SONET System" outlines the relationship between headend, distribution hubs, and nodes.

High-speed data and telephone transport for businesses are delivered directly on fiber to the business premises. Cables are shared from the distribution hub, using separate fibers for SONET and for HFC nodes. Nodes are not needed for high-speed data and telephone transport, as the services are carried on fiber optics to the customer. Electronics for the conversion of signals from SONET optical transmission to standard electrical signals are installed for each customer.

Redundancy

Redundancy ensures that services are not interrupted due to preventative maintenance or component failures. This is particularly important in regard to telephone and data services. Telephone customers have grown accustomed to high reliability, and telephony has earned the distinction of being a "lifeline" service, especially in case of emergency. Redundancy also benefits residential customers of entertainment video. While not as threatened with hardship, loss of video service is annoying. Traditionally, cable television systems have not used redundancy in their services.

Hybrid fiber optic coax (HFC) systems can be constructed with considerable redundancy. The benefits and risks of operating a "bulletproof" telecommunications transmission system must be compared to prevent spending too much on the infrastructure, charging too much for transport on the infrastructure, and to meet the requirements regarding system integrity of each of the services transported.


Combined
Hybrid Fiberoptic Coax
and SONET System
Satellite dish
Radio Tower
Headend
Distribution Hub
Ring Fiberoptic Cable
Distribution Hub
Distribution Hub
Distribution Hub
Coaxial TRUNK
Coaxial TRUNK
Coaxial TRUNK
Coaxial TRUNK
Loop Fiber-Optic Cable
Coaxial TRUNK
Large Business
NODE
NODE
Coaxial TRUNK
Coaxial TRUNK
A P
Suburban Home
Large Business
Suburban Home

Matching Channels to Service Territory

HFC systems carry radio frequency (RF) signals. All applications are carried within one or more 6 MHz bandwidth RF channels. The allocation of these channels both in frequency assignment and physical coverage area must be managed carefully, because the ability to carry new applications depends on the availability of channels. The capacity of an HFC system to carry unique content to each customer depends on the re-use of frequencies among nodes.

Some channels are identical and are broadcast to all customers, such as basic and enhanced basic cable television. Some channels are broadcast to a smaller geographic area, like the hub serving area. Examples of these channels are public access, education and government (PEG) television channels, or television channels with localized advertising. The remaining channels are those unique to one node, serving 500 to 2,000 customers each.

Each time a channel is assigned to a limited area, the channel frequency assigned can be re-used in other areas. This re-use of frequencies is very important in the conservation of capacity of the HFC system. Advanced digital services are narrowcast. Examples include telephony, cable data networks or Internet access, and video on demand. Advanced services contain two-way information unique for each customer, and must be available on demand.

The Return Path

New applications for cable television systems are often two-way and therefore use the return communications path. The return path enables billing management, telephone transport, and data network connections. Possible electric utility applications are: remote meter reading, outage notifications, interactive customer communication, and active energy conservation measures.

A Final System Design

The final system architecture is a tradeoff of technical and economic choices. One architecture is described here, with reasons for recommendation, limitations, and estimated costs. Some alternatives are described, with their benefits, limitations and costs.

Several assumptions were made in order to be able to select a system architecture. First, the system must initially be able to support 50 percent of the cable television subscribers market. Second, the population and residential density in 2010 was the basis for planning the common infrastructure. The initial number of optical nodes is based on 2,000 homes per node, resulting in 82 nodes. Using 1996 residential figures, this results in approximately 1,500 homes per node.

Headend Program Reception

Six satellite dishes are needed to receive enhanced basic, premium and pay-per-view programs, covering all the satellites serving the west coast of the United States. The headend and satellite dishes work best if co-located at the same facility. The initial recommendation for headend location is Southwest Substation, with alternates at the Tacoma City Light Administrative complex or Cowlitz Substation.

There are ten broadcast television stations, requiring antennas and receiving equipment. This equipment must be located in a prime receiving spot and can be placed in a location remote from the headend facility. Broadcast studios can provide direct feeds to the headend of higher quality than off-air antennas, but unfortunately, most studios are located in Seattle.

Franchise obligations include carrying public access, education and government access (PEG) channels. Content for PEG broadcasts can be delivered to the headend in tape format, or transmitted to the headend on optical fibers from production studios.

Commercial advertising is inserted at the headend. A storage and playback device holds all the commercials to be used in one week, and they are played automatically on queue. Schedules are set and signals are sent within regularly scheduled programs to queue the insertion of commercials.

A major system alternative that could have significant impact on system capacity is the development of digital television. Programming could be delivered as digital channels. Some of the six headend satellite dishes could then be re-used for reception of digital channels, greatly increasing their channel capacity.

Some channels are identical for all customers, such as basic and enhanced basic cable television. Level 1 channels originate at the headend and are broadcast to all hubs, nodes and customers. They will be assigned from 50 to 550 MHz. There are a maximum of 80 channels to allocate to Level 1.

Level 2 channels are targeted to a smaller geographic area, the hub serving area. Each of the five distribution hubs serves an area of 30,000 to 45,000 homes. Examples of Level 2 channels are Public Access, Education and Government (PEG) television channels, or television channels with localized advertising. Each Level 2 channel can re-use the frequency assigned in other hubs. This re-use of frequencies is very important in the conservation of capacity of the HFC system. There are no channels currently allocated to Level 2.

Hub Quantity and Locations

There will be one hub co-located with headend. This headend and hub location is recommended to be Southwest Substation, due to optical performance, service to a major electrical substation, and property availability.

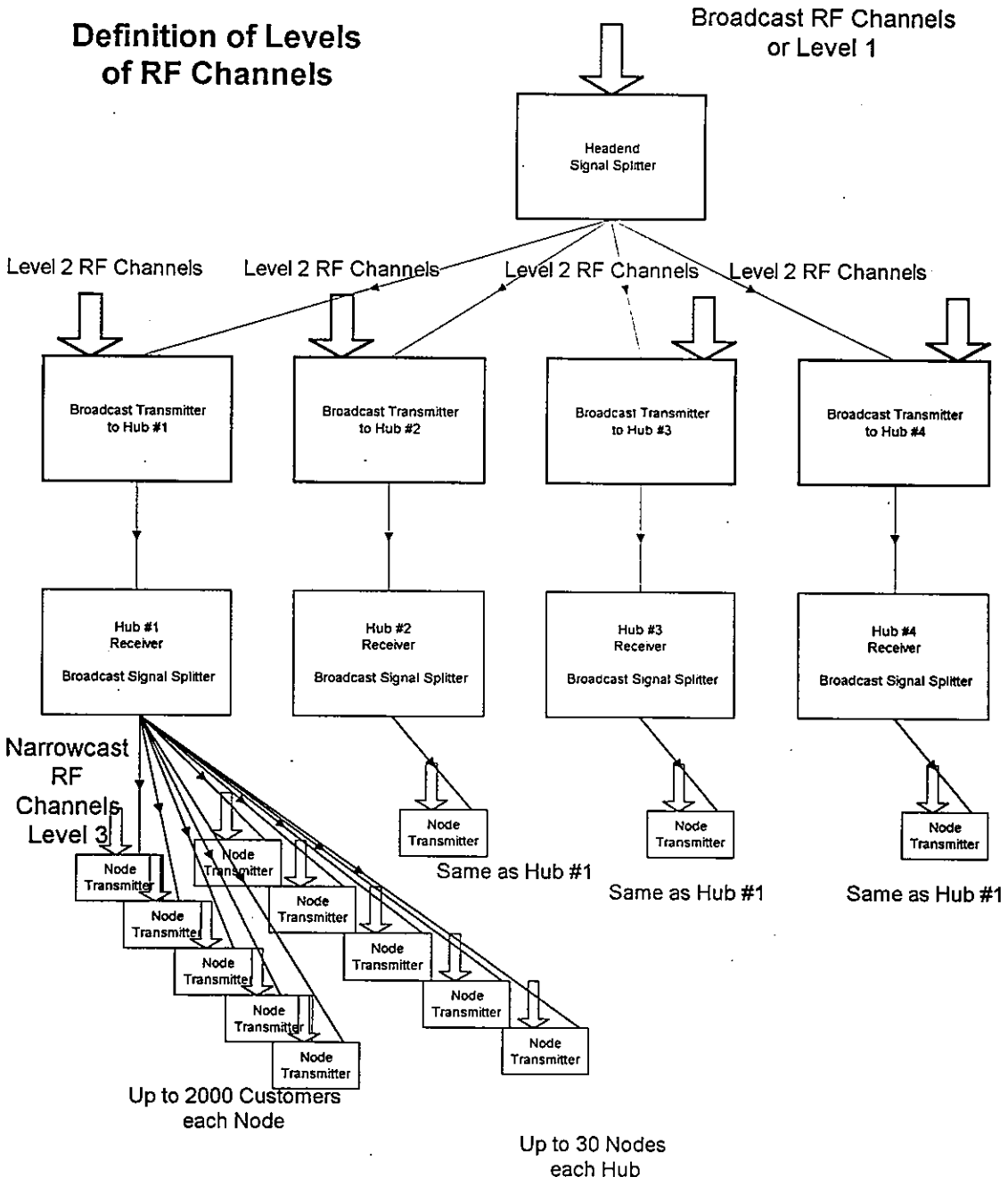
Four remote hubs will each serve within physical boundaries, growing to seven remote hubs if needed. The hubs are initially recommended to be Pearl Substation (with Adams as alternate), Northeast Substation (with Tideflats as alternate), Cowlitz Substation (with Roosevelt as alternate) and Elk Plain Substation. Buildings for hubs must be sized and powered to house future electronics, even if underutilized in the early years of operation.

Transmission From Headend to Hubs

Transmission to distribution hubs will be through optical fibers. Initially concentrating electronics at the headend in order to minimize electronics at the hubs is desirable. Growth in advanced services, such as residential telephony and Internet data transport will eventually increase the electronics at each hub.

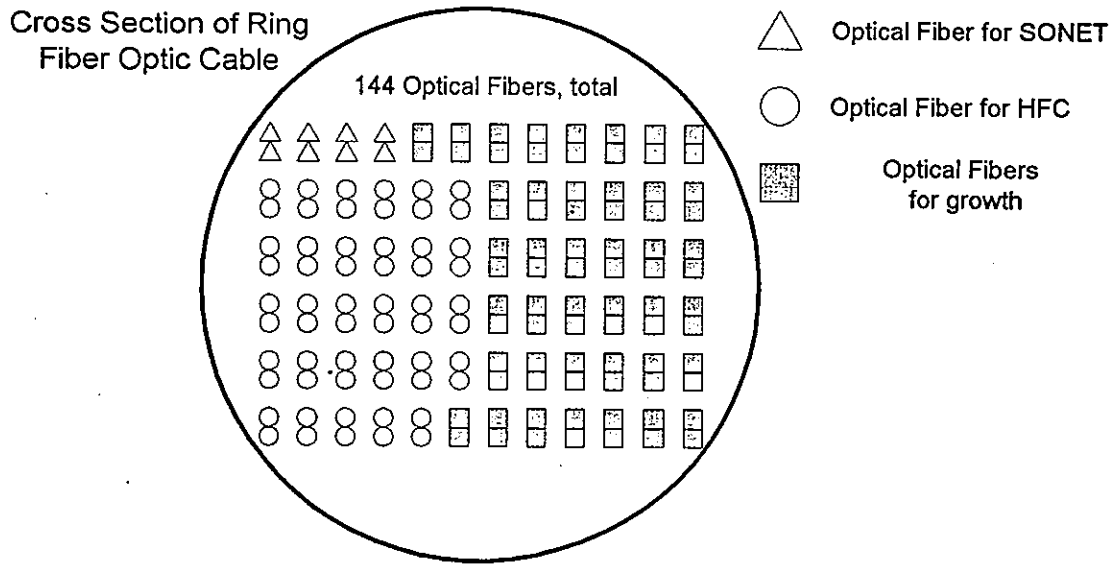
The number of fibers in the ring cable between remote hubs must be large enough to accommodate growth. All optical transmitters chosen for transmission from the headend to the hubs must be of the highest quality (54 dBc carrier to noise ratio) to make up for any signal degradation in the transmission from the hub to node and node to customer.

Transmitters and optical fibers are associated with broadcast and narrowcast of channels. From the headend to the hubs, transmission of RF channels takes place on optical transmitters and optical fibers. Redundant optical transmitters would be used and redundant optical fibers would be routed in diverse paths ensuring continuation of service in the event of fiber cable cuts. See diagram labeled "Ring and Loop Optical Cable" for an example of route redundancy.



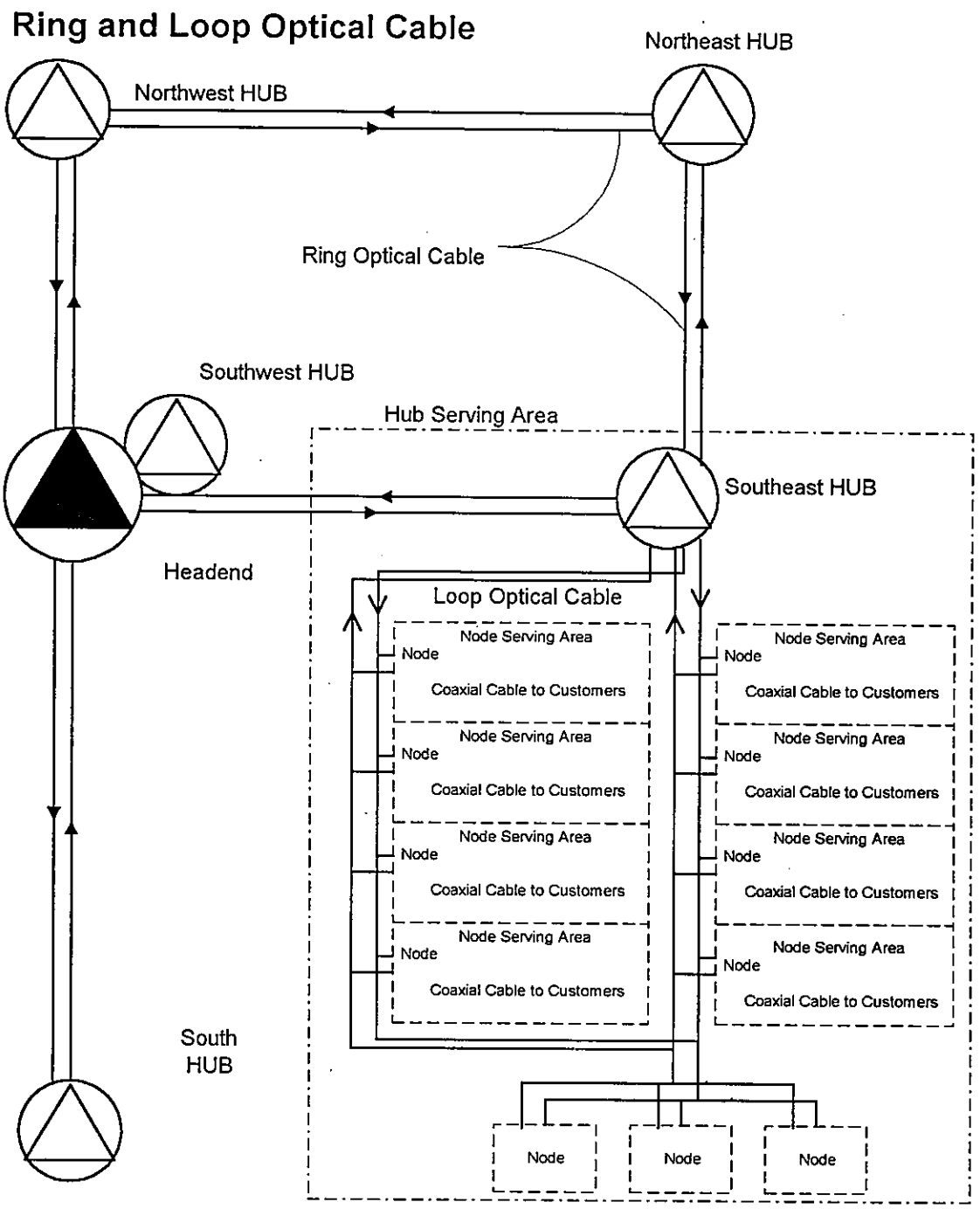
Hub Fiber Optic Ring Cable Plan

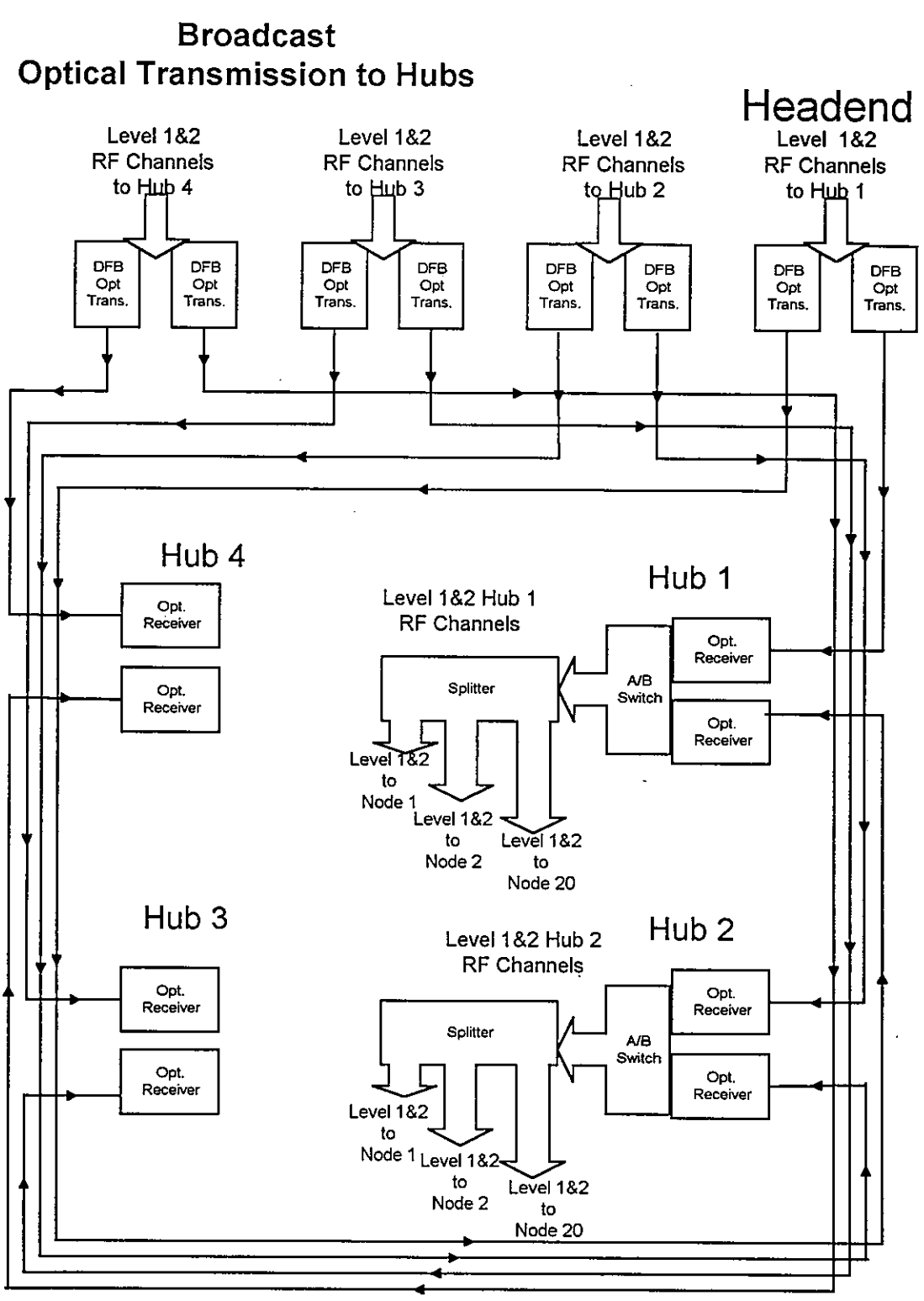
In summary, there are ten optical fibers needed in the ring for Level 1 and Level 2 RF channels, eight for SONET, 28 for Level 3 RF channels, and 20 for return RF channels. The minimum quantity to operate the initial system is 66. Tacoma City Light would build a ring cable plant supporting transmission among hubs for a lifetime of 30 years, which is beyond the traffic predictions trusted today. Optical cables are built in loose tubes of twelve fibers each, with twelve tubes, therefore, the fiber count to be installed would be 144 fibers.



The optical fibers in the ring would support the following design:

- All Level 1 (those reaching all customers), Level 2 (those reaching all customers in a hub only), and Level 3 (those reaching individual nodes only) RF channel modulators are concentrated at the headend.
- Level 1 and Level 2 RF channels can be transported redundantly to each of the four initial hubs using four fibers in the ring and eight each Distributed Feedback lasers at the headend.
- The minimum ring optical fibers reserved to carry Level 1 and Level 2 RF channels to four initial and seven maximum remote hubs is seven fibers. See diagram labeled "Broadcast Optical Transmission to Hubs."


Ring and Loop Optical Cable
Northeast HUB
Northwest HUB
Ring Optical Cable
Southwest HUB
Hub Serving Area
Southeast HUB
Headend
Loop Optical Cable
Node Serving Area
Node
Coaxial Cable to Customers
South
HUB
Node
Node
Node


Broadcast
Optical Transmission to Hubs
Headend
Level 1&2
RF Channels
to Hub 4
Level 1&2
RF Channels
to Hub 3
Level 1&2
RF Channels
to Hub 2
Level 1&2
RF Channels
to Hub 1
DFB
Opt
Trans.
DFB
Opt
Trans.
DFB
Opt
Trans.
DFB
Opt
Trans.
DFB
Opt
Trans.
DFB
Opt
Trans.
DFB
Opt
Trans.
DFB
Opt
Trans.
Hub 4
Opt.
Receiver
Opt.
Receiver
Hub 1
Level 1&2 Hub 1
RF Channels
Splitter
A/B
Switch
Opt.
Receiver
Opt.
Receiver
Level 1&2
to
Node 1
Level 1&2
to
Node 2
Level 1&2
to
Node 20
Hub 3
Opt.
Receiver
Opt.
Receiver
Hub 2
Level 1&2 Hub 2
RF Channels
Splitter
A/B
Switch
Opt.
Receiver
Opt.
Receiver
Level 1&2
to
Node 1
Level 1&2
to
Node 2
Level 1&2
to
Node 20

Level 3 channels are those unique to one node, serving 500 to 2,000 customers each. Level 3 is commonly referred to as narrowcast. Advanced digital services such as telephony, cable data, Internet access, and video-on-demand are assigned to Level 3. These advanced services use RF channels to serve the customers in an area of 500 to 2,000 homes. The channels assigned to Level 3 in one node can be re-assigned in all other nodes. The capacity of an HFC system to carry unique content to each customer depends on the re-use of frequencies among nodes.

Even with re-use of frequencies, HFC systems cannot meet all applications. Business communication systems are concentrated geographically and are high-volume. Such systems cannot share coaxial cable with residences. One solution is to assign extra optical fibers in the cable plant exclusively to business data and telephony transport, and use digital SONET transmission standards.

The maximum HFC allocation is for 34 narrowcast Level 3 RF channels to each node. They will be assigned from 550 to 754 MHz. The initial allocation is eight RF channels to Level 3.

- To minimize electronics at the hubs the Level 3 RF channels can originate at the headend. This significantly increases the optical fibers in the ring and optical transmitters/receivers between the hubs. Maintenance and diagnostics of the electronics and transmission system is simplified, however the cost of installation and restoration of fiber optical cable in the ring increases. With a ring of 35 miles circumference and optical fiber expense of $500 per mile, extra fiber costs $17,500 each.

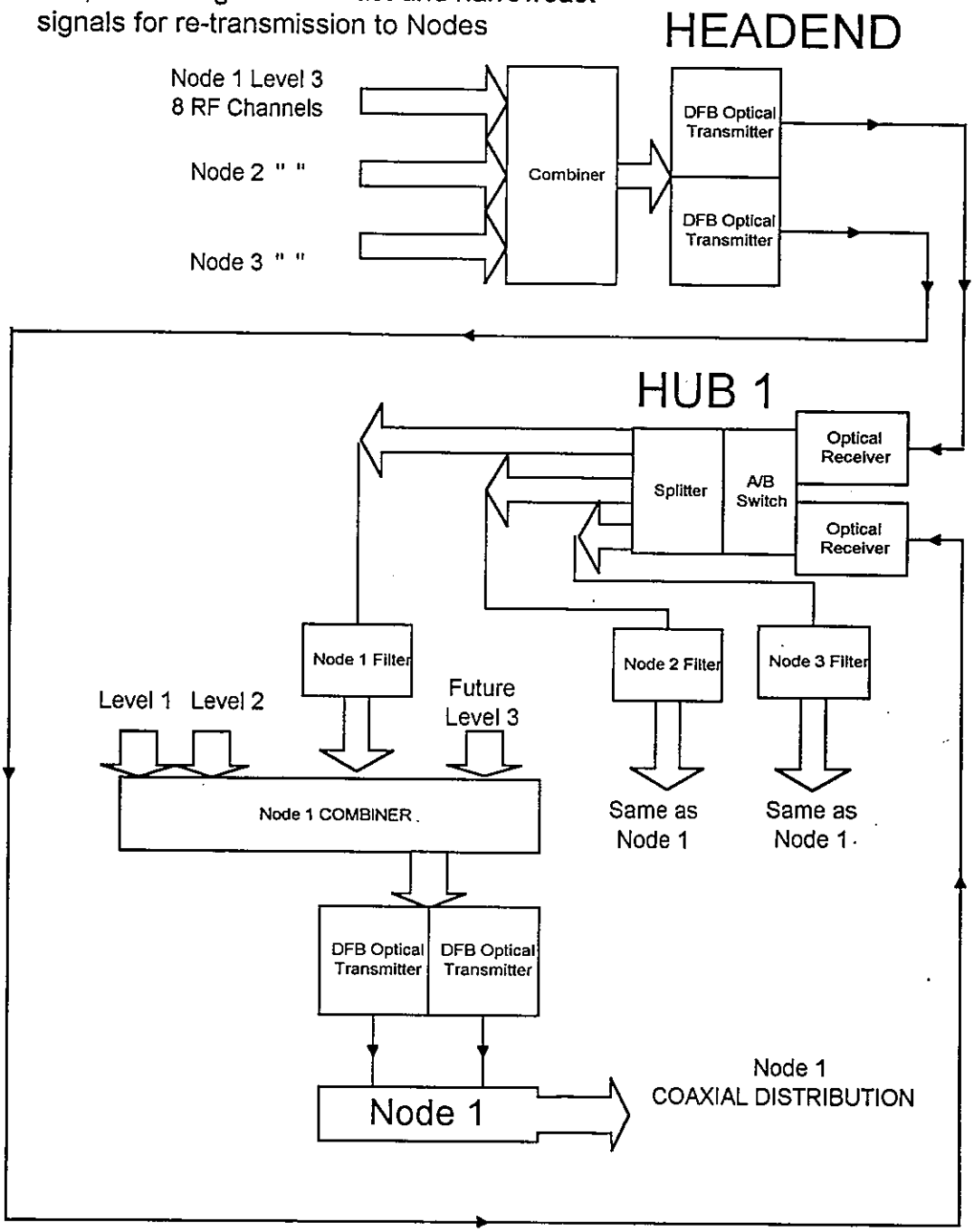
- To establish the optimum fiber count, it is assumed that, at start-up, 8 each Level 3 RF channels are transmitted from the headend to the HUB for each node.

- RF channels for multiple nodes can be combined at the headend, transmitted on one optical fiber, and separated at the hub. See the diagram labeled "Narrowcast Optical Transmission to Hubs." The direct savings are $7,500 for each transmitter and $17,500 for each fiber, for a total savings of $25,000. A balancing expense of $3,000 is for filters to separate the signals, for a net savings of $22,000 for each fiber saved.

Using this approach, Level 3 RF channels can be transmitted to the hubs using 28 fibers added to the ring.

Narrowcast Optical Transmission to the Hubs,

Also, combining of broadcast and narrowcast signals for re-transmission to Nodes



Return optical fibers complete the two-way path for services like telephone, data, near video-on-demand, video-on-demand, and utility applications. Each node transmits to the hub on six RF return channels. These can be frequency block converted at least five to one at the hub for retransmission to the headend. Return Level 3 and Level 2 information can be transported redundantly on 20 optical fibers in the ring.

Limitations

This option cannot effectively carry the full capacity of Level 3 traffic of 34 RF channels each to more than 320 nodes of 500 customers each. It is an economical method of entering into the business, but cannot grow to meet full utilization of HFC capabilities.

Alternative approaches to Level 3 transmission expected to be available to meet growth in advanced services are to use block frequency conversion, optical wavelength division multiplexing, or digital transmission.

SONET will transport digital information for business telephone and data traffic to the hubs efficiently. The final delivery to businesses will share the same cable but remain on separate optical fibers from those used for residential services. Two optical fibers are needed in the ring for each SONET system. Once two or three systems are in operation, if a fourth is needed, all four systems can be combined to operate on a single optical fiber pair. A minimum of four optical pairs, or eight optical fibers are needed for high-speed SONET traffic.

Optional System Architectures

- Dedicating optical fibers for use in transmitting Level 3 signals from the headend for each node will result in 82 optical fibers used in the ring for Level 3. The direct cost is $1.4M to add these fibers and optical transmitters. As the system changes from 2,000 homes passed per node to 500 homes passed, the optical fibers needed would grow by four to one, to over 320 fibers from hubs to the headend.

- Additional Level 3 RF channels can be combined onto each fiber and block frequency conversion can re-position each channel to correctly place it in the channel line-up. This adds electronics at the hub and the quality of frequency conversion is not high. This option is not yet priced, but does not meet criteria for simple hub electronics and known high quality.

- Wavelength Division Multiplexing places several light signals on the same optical fiber. While this is applied today for digital transmission networks of high-speed data and telephone, the optical sources for direct application to HFC AM lightwave transmission are not yet available.

- A final Level 3 transmission alternative is to use digital transmission such as SONET to the hubs, and move all Level 3 RF channel modulators to the hubs. This takes advantage of the point that the most Level 3 RF channels carry digital information. Modern high-speed digital transmission schemes can move the data efficiently to and from the hubs. SONET carries standard digital traffic in the same formats businesses predominantly use today. Telephone and data service provider equipment would be installed at the hub, converting the digital traffic from the SONET formats to the cable television format. To allow final combination with Level 2 and Level 1 RF channels at the hubs requires RF channel modulators. This strategy distributes the electronics from the headend to the hubs and does not serve digital television signals well. This approach could be necessary to accommodate growth as nodes are split four to one to reach 500 homes per node, and as Level 3 RF channels increase beyond eight per node.

- Remote hubs could be located following substation service area boundaries. The initial selection of these hubs could be the distribution substations of Union, Adams, Pearl, University, Bridgeport, Custer, Clement, Roosevelt, Polk, Portland, and Tideflats. The site of the headend could be the Administration complex. The beneficial impact is to reduce the branch optical cable length and expense. However, it complicates delivery of Level 2 programming when the hub service area boundaries are not close to the political, school district, library, or city boundaries.

Node Cable Plan

Each node is planned to require four optical fibers each. Two fibers downstream and two fibers upstream provide redundancy for television, telephone and data services. The number of nodes would grow from 82 to more than 320 as the nodes are split from 2,000 homes per node into four each, 500 homes per node. Node optical cables are planned in loops to allow redundant paths to hubs. To allow digital data and telephone traffic to be transported independently from the hub on SONET branches to businesses, schools, libraries or substations requires many extra fibers.

From hub to node, redundancy is expensive due to the quantities of optical transmitters, fibers and receivers. Whether the predominant failure mode is electronic failure or optical cable cut has not been resolved. Either type will take significant numbers of customers from service and require emergency restoration.

The redundant optical fibers to the nodes, as well as reserves for growth and business communications services, must be planned for and installed in the initial plan — costs associated with adding redundant fibers later are extremely high.

Future services to be offered on HFC systems are telephony and Internet transport services. Data and Internet residential applications have become integral especially to home-based businesses. The economic impact of service interruptions to home-based and other businesses will grow as the data applications on the HFC systems grow.

Finally, the HFC system will carry several applications simultaneously. The need for reliability is compounded when thousands of customers are receiving all of their telecommunications services on one common system.

Given the importance of redundancy, redundant fiber paths to nodes and fibers for growth have been included in the preliminary system design and supporting financials.

Business Telecommunications

The telephony and data services typically provided to large businesses differ from residential services. Business traffic predominantly travels on high-speed digital lines, the most common of which are T-1 circuits. T-1 circuits carry 1.5 megabits per second (1.5 Mbps) two-way, symmetrically. They are used for efficient transport of business telephone traffic and corporate data traffic. Some large corporate offices use *many* T-1 circuits for telephone access to the Public Switched Telephone Network (PSTN), or for point-to-point data transport.

The fiber optic cables in the HFC infrastructure can be used to carry business telecommunications traffic independently, with the business traffic on dedicated optical fibers in the same cables with optical fibers for two-way residential services. Optical fibers in the ring between hubs can provide high-speed transport of digital business traffic to the telephone and data switching centers found in the greater Tacoma area, such as national or regional Internet access providers, the long distance carriers, and the local exchange carriers. Optical fibers in the same branch cables from the hubs to the nodes can be extended to businesses. Laying the branch cable out in rings enhances the reliability of the SONET system through the use of redundant optical fibers.

The key to serving business telecommunications is providing high-speed digital transport based on common transmission and connection standards, and doing so in a reliable and efficient manner. SONET is a highly standardized system for providing transport of digital telephone and data circuits. Many manufacturers provide compatible SONET electronics in high volumes, which may be upgraded in speed and capacity. The majority of long distance telecommunications transmission capacity today is provided on SONET systems. SONET multiplexing shelves would be placed in the hubs and at end-user premises. Small SONET shelves at the customer site deliver standardized high-speed digital lines which can be connected to their digital telephone and data network systems.

Planned Changes in System Operation

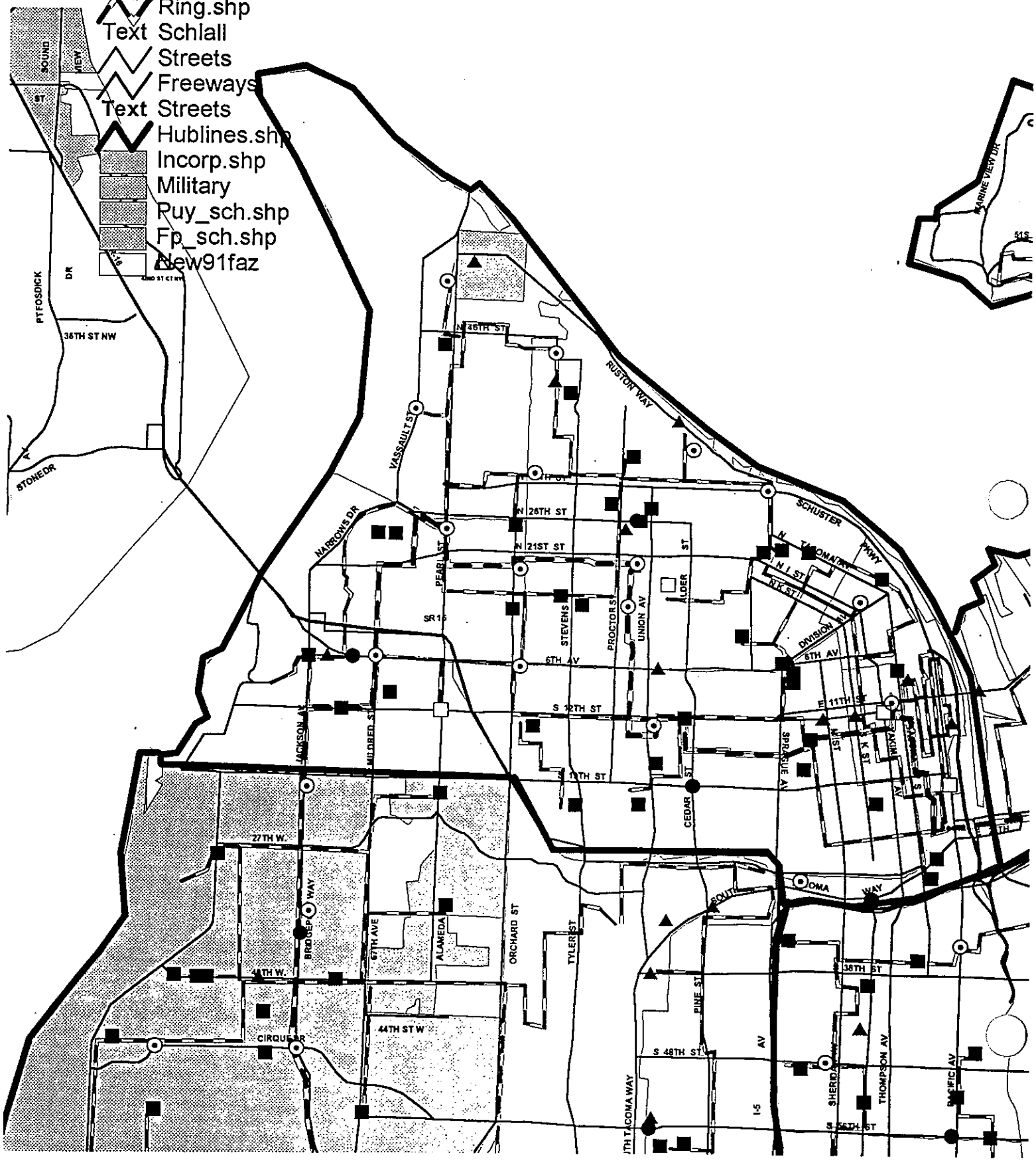
Changes are to be expected in system operation during the first ten to fifteen years of operation. The changes would be driven by marketing success, penetration of services, new services added, and population growth and may include the following:

- Migrate Level 3 telephony and data RF channels to SONET transmission and hub video modulation.
- Migrate to 500 home nodes as needed.
- Offer PCS carriage using strand-mounted transmitters and receivers.
- Install SONET electronics and optical cables to business as needed
- Build additional hubs as optical cables to nodes become filled, or as expansion into neighboring communities is requested by franchise authorities.

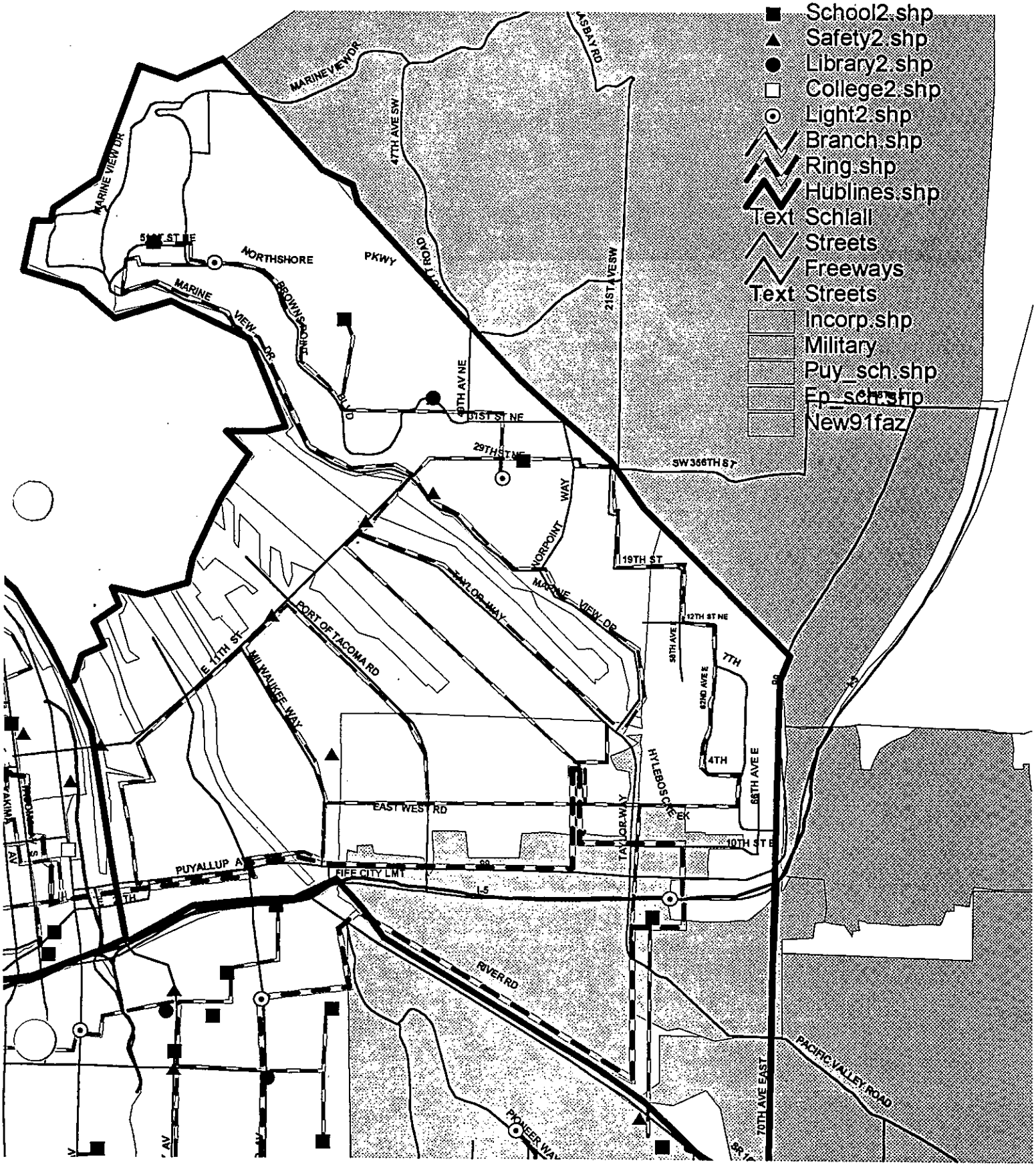
The following maps provide an overview of the fiber optic design of the proposed Hybrid Fiber Coax plant. These maps are divided to display the service areas of four hubs.

School2.shp
Safety2.shp
Library2.shp
College2.shp
Light2.shp
Branch.shp
Ring.shp
Text Schlall
Streets
Freeways
Text Streets
Hublines.shp
Incorp.shp
Military
Puy_sch.shp
Fp_sch.shp
New91faz

Northwest Tacoma Hub
Franchise Service Areas

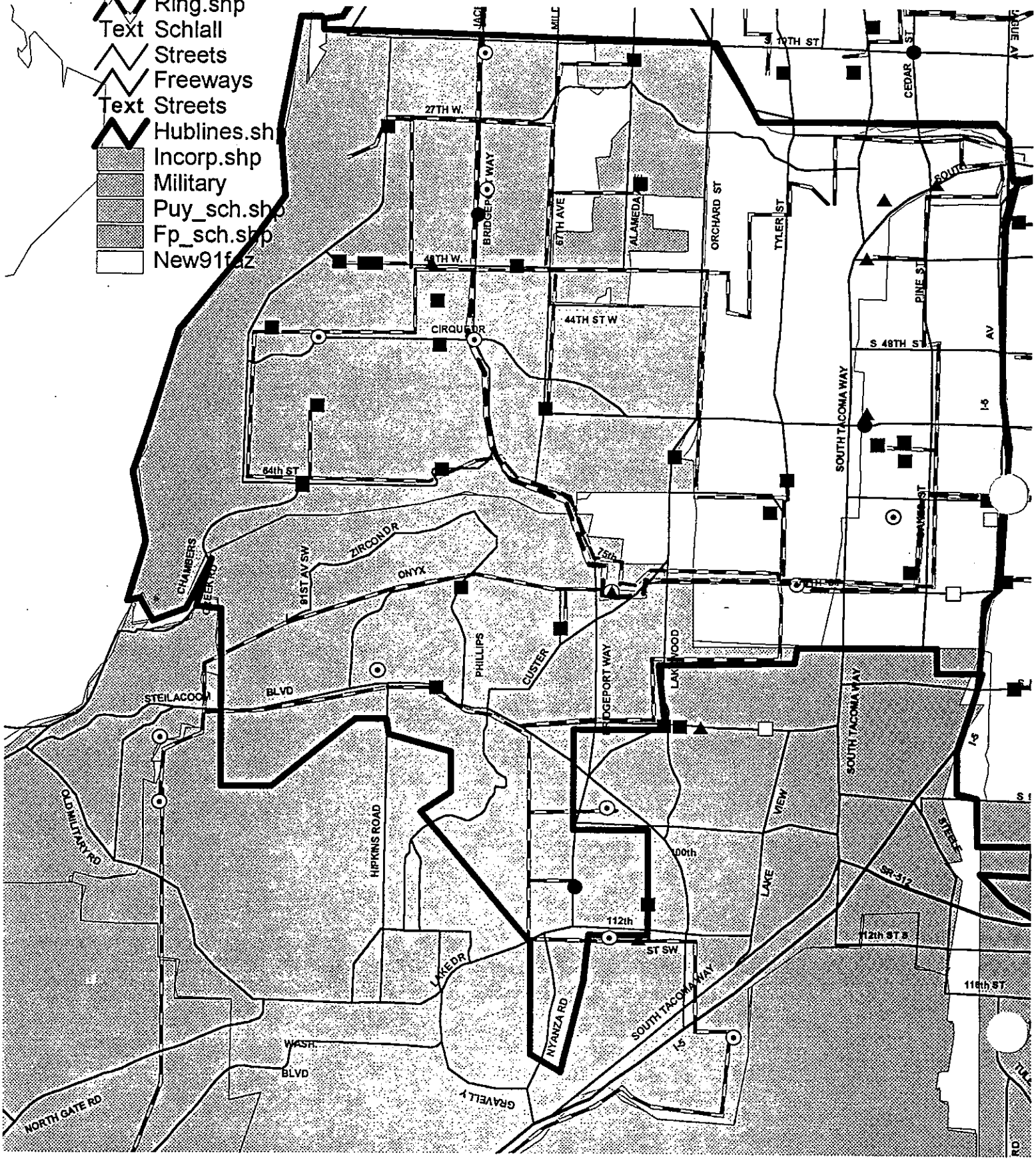


Northeast Tacoma Hub
Franchise Service Areas

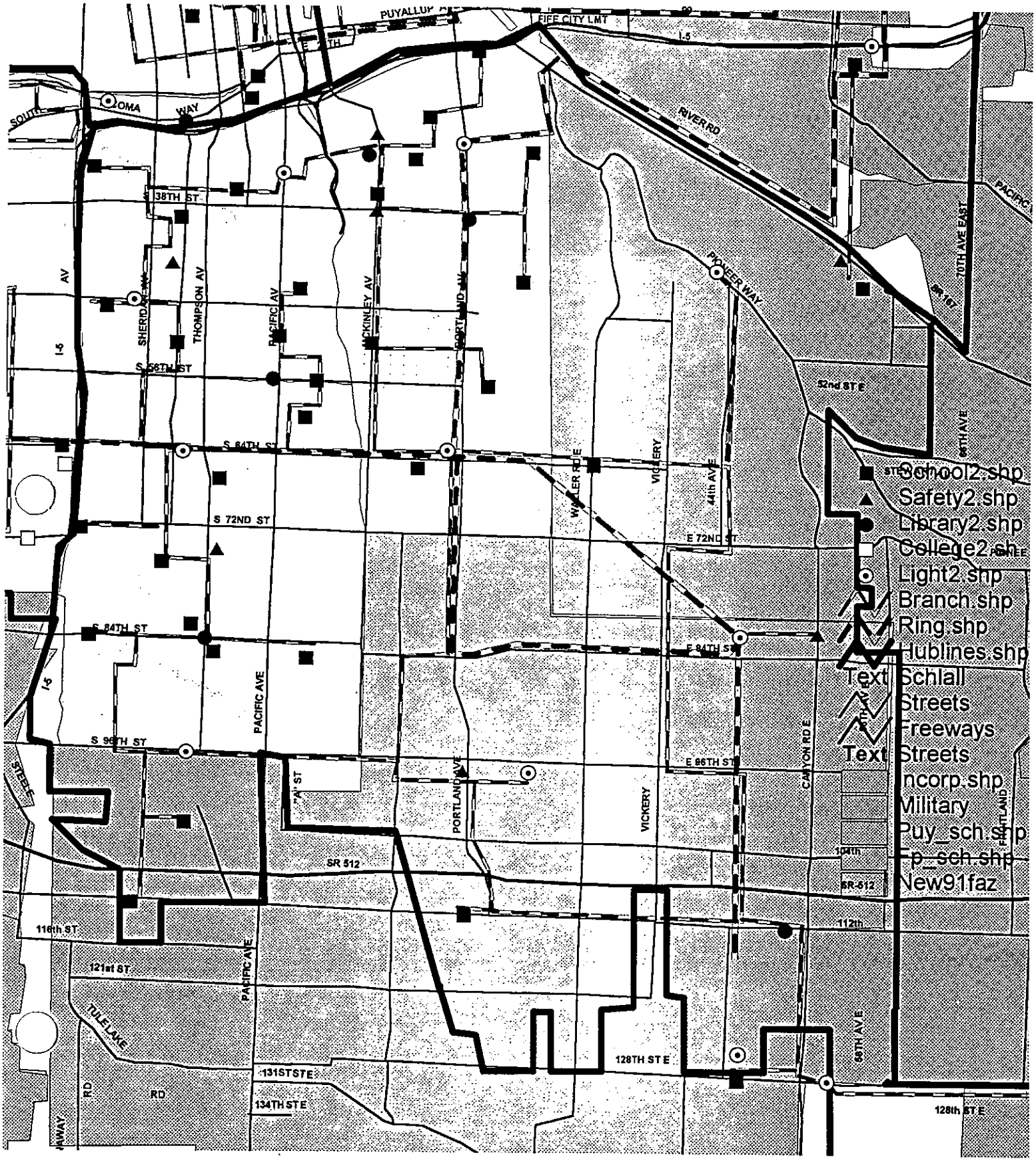


School2.shp
Safety2.shp
Library2.shp
College2.shp
Light2.shp
Branch.shp
Ring.shp
Text Schlall
Streets
Freeways
Text Streets
Hublines.shp
Incorp.shp
Military
Puy_sch.shp
Fp_sch.shp
New91faz

Southwest Hub
Franchise Service Areas



Southeast Tacoma Hub
Franchise Service Areas



Hybrid Fiber Coax vs. Fiber to the Home (FTTH)

There are expectations that some day communications services will be delivered to the home on a fiber optic pair, or fiber to the home (FTTH.)

FTTH is a wider-bandwidth duplication of the local exchange carrier's existing infrastructure, which is twisted-pair copper wire dedicated from the central office to each home. It has proven to be very costly to maintain and operate dedicated paths to each home.

Delivery of services via coaxial cable is relatively inexpensive for several reasons:

- Costs are shared when many customers are served by common coaxial cables.
- Coaxial cable capacity is very high, allowing service to several customers over the short distance from a single node.
- Physical connections are simple, using standard electrician's tools, hardware, and methods.
- Connections within the home are familiar to most customers who have purchased installation of cable television service.
- Radio frequency amplifiers are common designs, perfected over 40 years of radio and television transmission experience.
- Inexpensive, simple radio-type return transmitters will be used verses relatively expensive and sensitive optical transmitters.
- Intelligent devices are moving into the customer homes, such as MPEG2 digital television compression, cable modems, and customer-premise network interface units (NIU), which allows higher efficiency of the available RF bandwidth in the coaxial cable plant.

Communications technology applies fiber optics where appropriate, such as long cable runs in electrically noisy environments. Optimum communications design today uses a mix of fiber optic and coaxial cables.

Interdiction

Interdiction is commonly known as scrambling or blocking, where a specific television signal is rendered unusable. There are two common, current forms of interdicting specific services at the home; traps or filters, and analog set-top boxes.

Market Penetration Questions:

Will customers have a choice between digital and analog premium channels? Will digital television be marketed as providing more choice, as well as a high quality version of analog programs, and co-exist with the analog equivalents? Or, if any subscriber wants any premium channel, will they be carried only by the digital video provider?

Conclusion:

Given that digital television is rapidly maturing, install traps and filters initially, and migrate to digital television for premium tiers when feasible. (See Implications of Digital Television, below.)

The Return Path

New applications for cable television systems are often two-way, and use the return communications path. The return path enables system monitoring, billing management, telephone transport, and data network connections.

Operating the return path on coaxial cable is a great challenge. Noise can penetrate the system at every customer and tap, it is amplified and combined along the return path, and could mask the actual signals desired. The term used to summarize the problem is "ingress." The return path funnels all returning signals to the node. One noise source, whether a babbling transmitter in a home or a failing coaxial amplifier, can interfere with many customers.

In the 5 to 42 MHz return frequency range, the ingress is higher from 5 to 15 MHz than above, because of noise from electric appliances, motor controls and amateur radio operators. The techniques to minimize ingress are simple and effective, but must be performed throughout the coaxial system. The best materials must be used and installed properly to minimize ingress. The skill of construction technicians must be high to install the cable and tune the amplifiers properly. Each outlet must be filtered to eliminate unwanted return path noise. In-home filtering techniques cannot be expected to be performed by the customer. The cable television technician can install filters to block unwanted return path noise outside the home, either at the pole mounted "tap" or the "demarcation" where the signal splits to each of the outlets.

Implications of Digital Television for HFC Business

All of the subscribers to basic cable television programs would be served with standard analog channels. Analog delivery of expanded basic and premium channels will require some form of interdiction, or scrambling. This business is mature and the electronic devices are standardized.

Compressed digital television technology allows a much higher utilization of the cable television system. A single analog television channel can be re-used for ten or more compressed digital television programs, with the same or better picture quality. The programs are digitized at the source, and compressed for transmission. The HFC system transports the signals as if they were a standard television signal. The programs are not de-compressed and converted from digital back to analog until the viewer selects the program, maintaining high quality throughout the transmission media. The compression technique is standardized, allowing the decompression capability to be placed into many electronic devices.

Near video-on demand and true video-on-demand will offer many choices to customers and will be a valuable service.

The digital set-top is a computerized electronic device. It is addressable, in order to receive a unique setup from a centralized controller. It allows the customer to change what they want to pay for, without expensive visits by cable television technicians.

Other Applications of Digital Television Transmission

Amplitude Modulated (AM) lightwave transmission on fiber optics has performance limits, where the quality of signal is difficult to maintain, especially over long distances combined with wide bandwidths. In particular, when AM lightwave transmission is cascaded, one transmitter and receiver after another, then higher cost laser optical transmitters are used to maintain performance quality of each RF channel within acceptable limits. Since the design for this system does not require long cascades, this is the recommended method for the Tacoma City Light system.

Digital lightwave fiber optic transmission products were considered. At the headend, the RF channels can be converted into digital form and transmitted to the hubs, with or without compression. The transmission via digital lightwave is very high quality, and could be applied for transmission from the headend to the distribution hubs to achieve performance goals. Simplicity and flexibility is sacrificed to gain this quality, however.

These digital lightwave systems for television are typically expensive. The competing digital systems are based on SONET, Fibre Channel, or are proprietary. Only 16 to 32 channels of video can be carried on one digital transmission system, requiring more electronics to carry the same signal as AM lightwave. Only single vendor systems are available for digital transport, reducing competition for upgrades and component replacements (unless SONET broadcast transmission is used). Video modulation of broadcast channels is duplicated in each distribution hub, instead of concentrated at the headend.

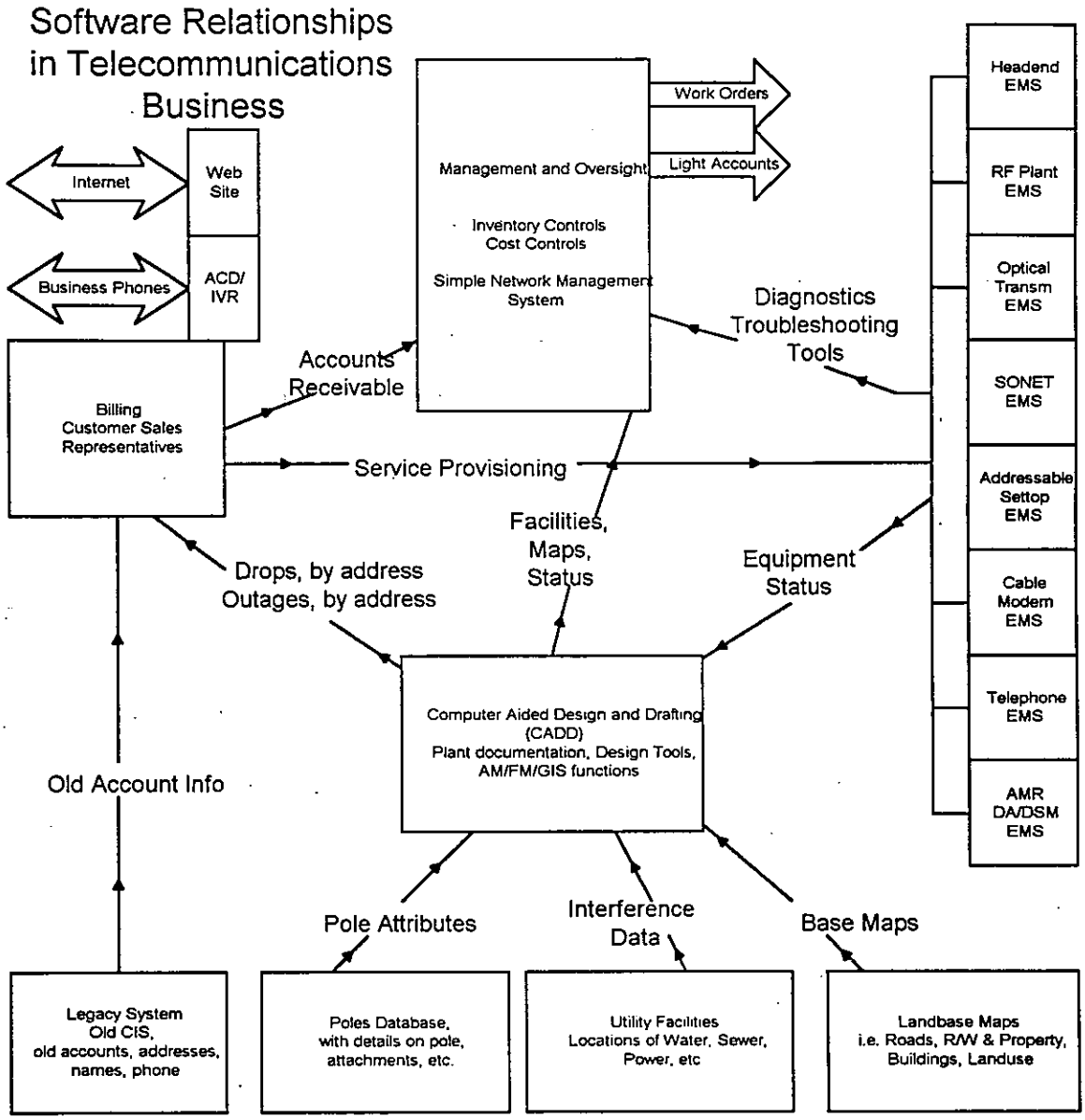
Network Management

With the construction of a new system, the opportunity will never be better to install high quality tools, diagnostics, equipment and software. Computers and network control systems are necessary to meet these goals. The diagram "Software Relationships in Telecommunications Business" shows their interactivity.

Cable television has not required the sophisticated system monitoring and customer accounting systems that have been necessary in the electrical or telephone business. Telephone companies use sophisticated monitoring and automation systems in providing basic telephone service, and in their operation and maintenance functions. As cable televisions systems begin to deliver advanced telecommunications services, the necessity grows for system monitoring, automation, and sophisticated customer-supporting software systems.

Fortunately, other industries have forced the development of many standardized tools that can be directly applied to a new business operation and infrastructure. Element Management Systems are computers that gather data from a specific group of field devices, and provide information and controls to the operating staff. Several Element Management Systems computers are diagrammed on the right of the following sketch. Higher level software and computers can use this information for their own purposes, and pass commands to field devices through the Element Management System. The higher level software can perform mapping, assist customer sales representatives, or generate operational reports using real and accurate information from the field devices. All of these are based on "Open Systems" which allow them to exchange information through relational databases and standard physical interconnections.

Tacoma City Light has developed a "data model" that defines the relationships among many data files, necessary to create data warehouses. The existence of accurate computerized maps and pole locations will be helpful in the design and construction of all the outside facilities. The new Automated Mapping/Facilities Management/Geographic Information System (AM/FM/GIS) will provide many more tools for efficient operation and management of a telecommunications system.



OPERATING PLAN

In the provision of telecommunications services, Tacoma City Light would interact with many parties to ensure the cost effective delivery of advanced telecommunication services to the local business and residential market. Some parties will be familiar, such as the electric system operating sections of Tacoma City Light. Others will be new to Tacoma City Light but mature in their own markets, such as the video production and telephone industries. Finally, there will be interaction with companies that are relatively new and growing such as Internet service providers and competitive access providers.

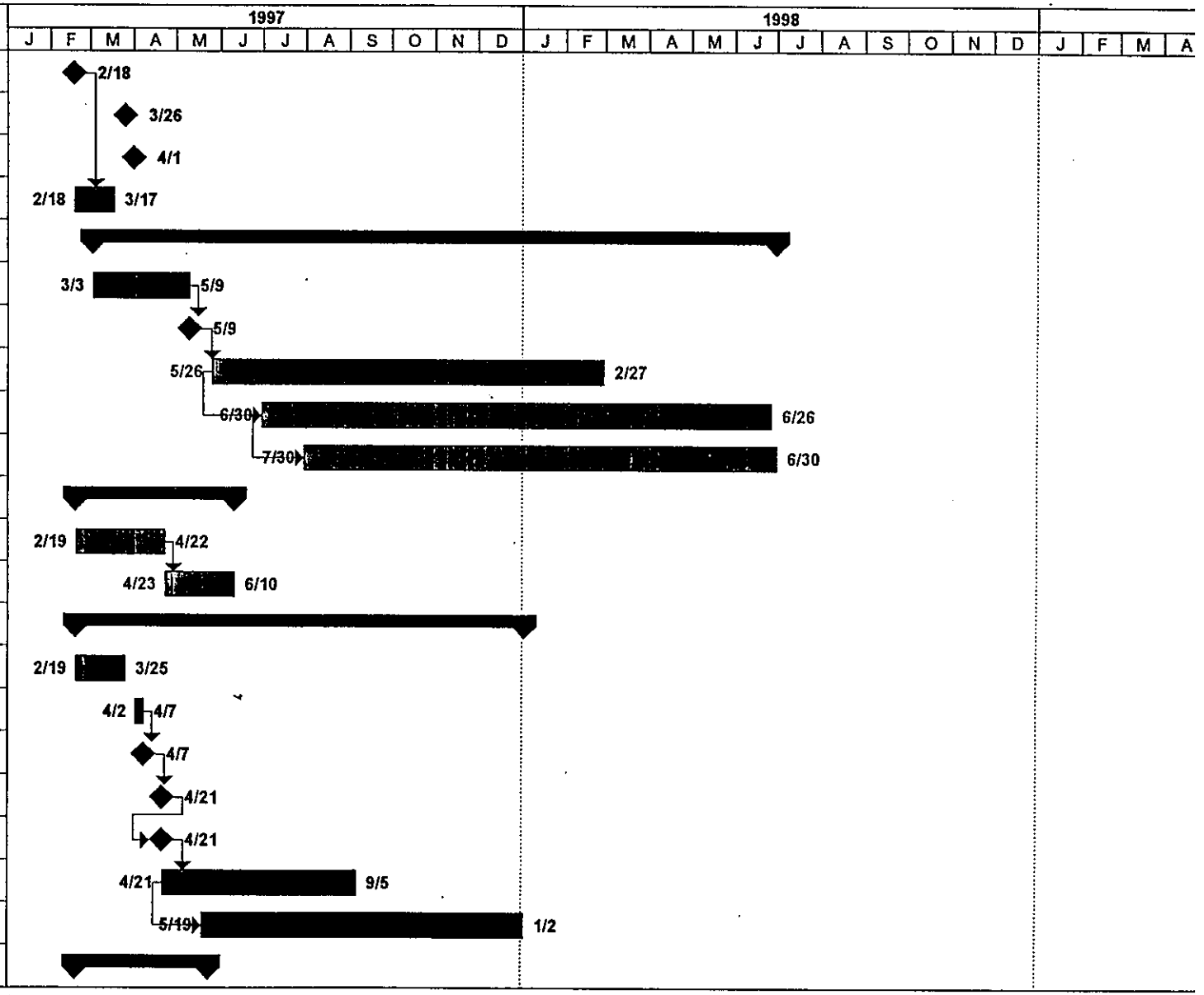
Diagrams have been developed to represent the possible relationships and responsibilities between the parties. There are diagrams representing the businesses of wholesale high-speed digital transport, Internet data transport, and the cable television businesses.

There are many milestones to pass before there is an operational system, before the first customer can be satisfied. Only then does the daily operational plan takes effect to sustain and grow the business.

- The final team of experienced employees must be on the job and in control of the process of creating and developing this business.
- Contracts must be negotiated and signed, to provide the content, design, procurement, and installation that becomes the "system". All contracts must be closely managed and performance of those contracts must be under constant scrutiny.
- The permanent staff of marketing, technicians, sales and engineering must become familiar with the new system, trained on specialized equipment operation, and be trained in the ways they will need to perform in the highly competitive environment of telecommunications.
- Installation must proceed in an economical but swift manner, culminating in high performance two-way connections to residences, small businesses, and large telecommunications users and suppliers.

Telecommunication Project Schedule

ID	Task Name
1	PUB/Council Study Session
2	Public Utility Board vote on business entry
3	City Council vote on business entry
4	Public Meetings
5	**Construction Period**
6	Prepare RFPs
7	Approve bid and authorize construction
8	Design Phase
9	Build Phase
10	Perform system acceptance
11	**Arrange and Secure System Financing**
12	Bond Preparation
13	Bond Issues
14	**Hire Operational Staff**
15	Advertising for top 3 positions
16	System Manager Interviews
17	Hire System Manager
18	System Manager Onboard
19	Hire Marketing Manager
20	Hire Operations Staff
21	Training
22	**Franchises**

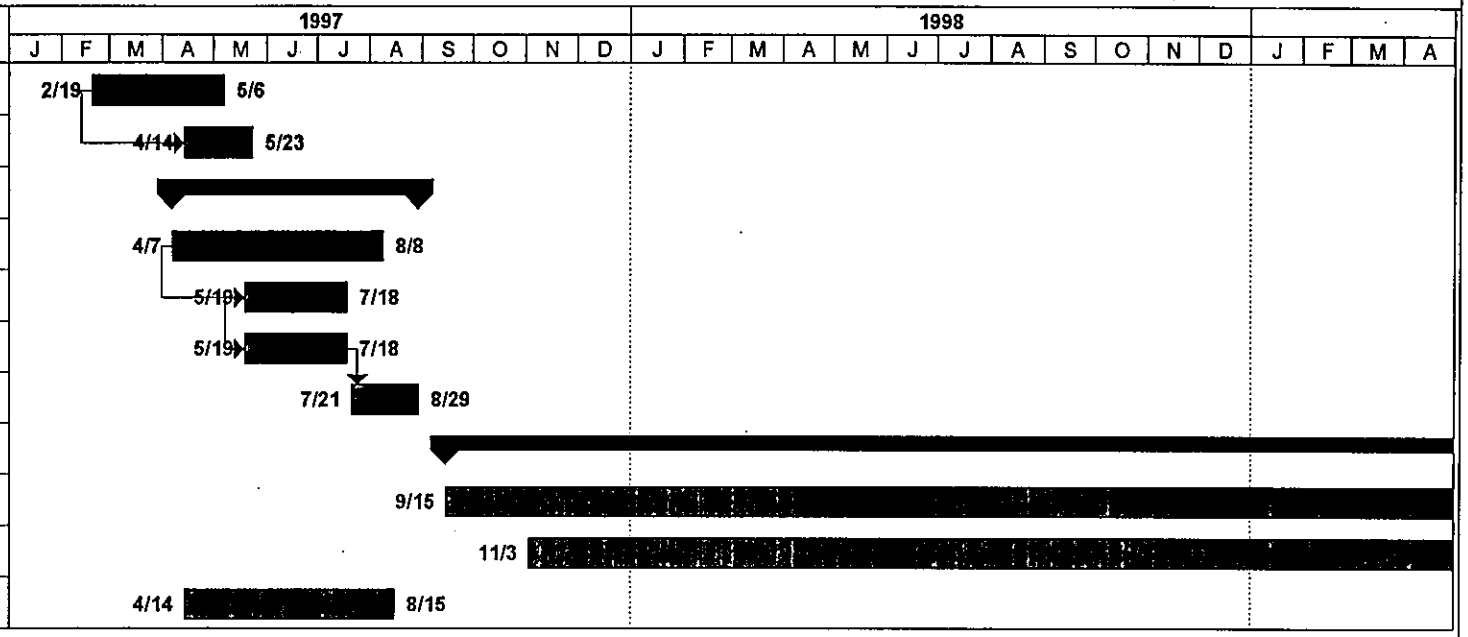


Task ■ Milestone ◆ Rolled Up Task ■ Rolled Up Progress ■

Progress ■ Summary ◆ Rolled Up Milestone ◇

Telecommunications Project Schedule

ID	Task Name
23	Discussions with Local Jurisdictions
24	Sign Franchises
25	**Marketing Development**
26	Write Marketing Plan
27	Early Bird Sign Up
28	Community Programming Selection
29	Arrange for programming packages
30	**Commence Operations**
31	Begin operations of the CATV service
32	Add new services from service providers
33	Arrange Billing System



Task Milestone Rolled Up Task Rolled Up Progress

Progress Summary Rolled Up Milestone

General Operations

A common telecommunications infrastructure will be used for all three of the major lines of business: high speed telephone and data transport, Internet data transport, and cable television. The cost of common operation and maintenance of the plant will be shared.

There are key interactions with telecommunications service providers, directly supporting this business, which must be managed with special contracts, physical standards, and technical relationships. Tacoma City Light would transport content which originates in a few points on the network, supporting all three lines of business. Satellites dishes would receive cable television programs from orbiting satellites. Internet traffic would flow to and from the electronic facilities of Internet Service Providers. Long distance telephone traffic would flow to and from POP facilities.

That content, which originates in a few points, would be distributed throughout the Tacoma City Light service territory to wholesale and end-use customers. These customers would to some degree associate all the delivered products with Tacoma City Light, whether or not all the responsibilities of service are Tacoma City Light's. In admitting that, then there would be a role for Tacoma City Light staff in ensuring new systems are installed correctly, and service is prompt and extraordinary.

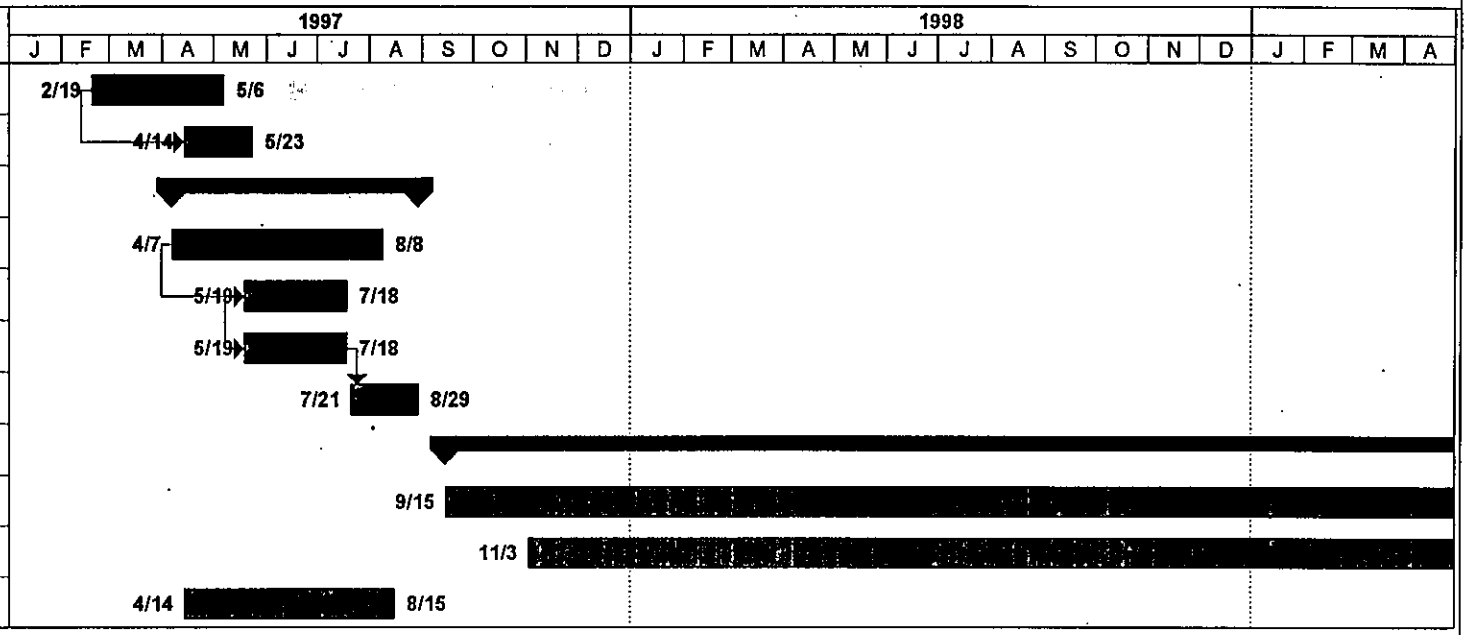
The aggressive marketing of services and products will determine the success of this new telecommunications system more than any other single factor. Staff would be assigned directly to this activity. Advertising and promotional programs would be the norm and would be performed by ensuring that current information about products and services is always available to the customer/owner.

Operational Support Systems would be in place, providing the tools and information needed by staff to perform their duties efficiently and promptly. As services delivered by the telecommunications system are based on electronics, the facilities themselves would provide information about their own health and status. Computer systems today allow the system support staff to have information and responsibilities that were diversified only a few years ago. Continuous performance monitoring of the communications facilities allows crews to respond quickly to trouble, even before the trouble affects service.

Continuous attention must be paid to developments in communications technology, to continue to serve a changing market. Management and engineering staff will seek to introduce devices on the fiber-optic transmission network that meet the developing needs of new applications for sound, data, images, and television.

Telecommunications Project Schedule

ID	Task Name
23	Discussions with Local Jurisdictions
24	Sign Franchises
25	**Marketing Development**
26	Write Marketing Plan
27	Early Bird Sign Up
28	Community Programming Selection
29	Arrange for programming packages
30	**Commence Operations**
31	Begin operations of the CATV service
32	Add new services from service providers
33	Arrange Billing System



Task — Milestone — Rolled Up Task — Rolled Up Progress

Progress — Summary — Rolled Up Milestone

Regular Operations

The Regular Operations must be discussed in the context of each business line: high-speed digital transport, Internet data transport and cable television.

High Speed Telephone and Data Transport

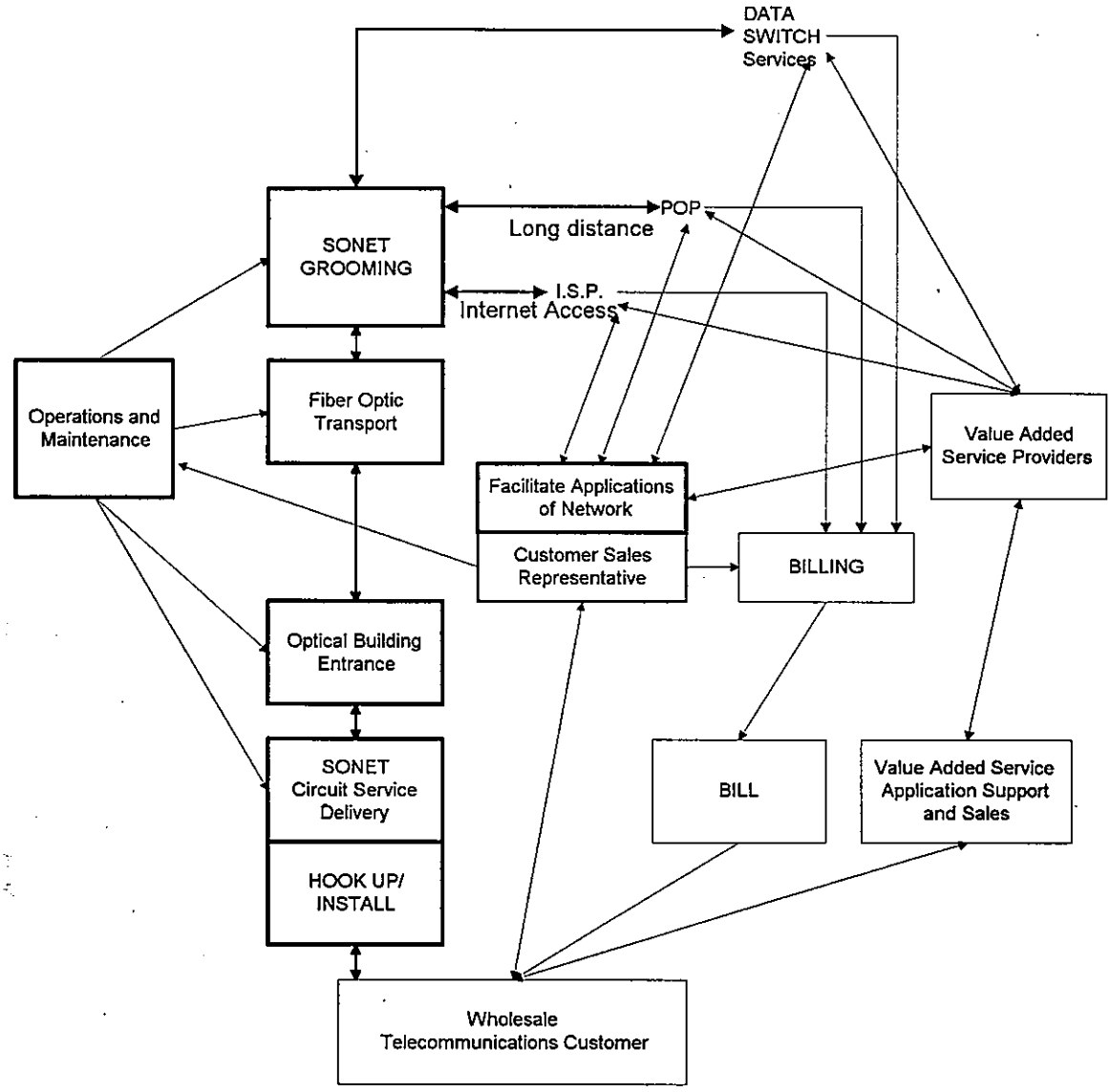
Tacoma City Light would own and operate a communications transmission system, capable of providing wholesale high-speed digital transport circuits for telephone and data transport from point to point throughout its service area. This service would be offered on a non-discriminatory basis for the use by others. This service would be limited to transport only: Staff would not be dedicated to application-specific customer support. That duty would be filled by the private sector value added service providers or individual customers.

Tacoma City Light would sponsor and participate in user groups and forums, in which users can exchange experiences in applying the high-speed data transport, and can be introduced to value-added service providers. Market research indicated that most customers expect a high level of specialization in applying high-speed digital transport for use in the customer's business. Local service providers would craft solutions for the users and would utilize Tacoma City Light's wholesale transport. Forums would likely be held on a bi-monthly schedule. Tacoma City Light would host the forums by arranging for convenient meeting space, publishing meeting notices and agendas, and participating in the discussions as a transport provider and end-user.

Tacoma City Light would install electronics in the users buildings, to create the high-speed pathways. By distributing the electronics, redundancy and reliability of the entire network is increased compared to a centralized office structure. Fiber optic cable would enter buildings, with redundant cable routes available if requested by the customer. Tacoma City Light would operate and maintain all the fiber optic cables and transport electronics.

The high-speed transport circuits would terminate either in the customers buildings, or at the facilities of one of the following: long distance providers, local telephone service providers, or data network service providers. Developing strong and effective business relationships with these providers would be a critical factor in the success of the telecommunications system.

High Speed Telephone and Data Transport



BOLD = Tacoma City Light functions and facilities

High-Speed Internet Data Transport

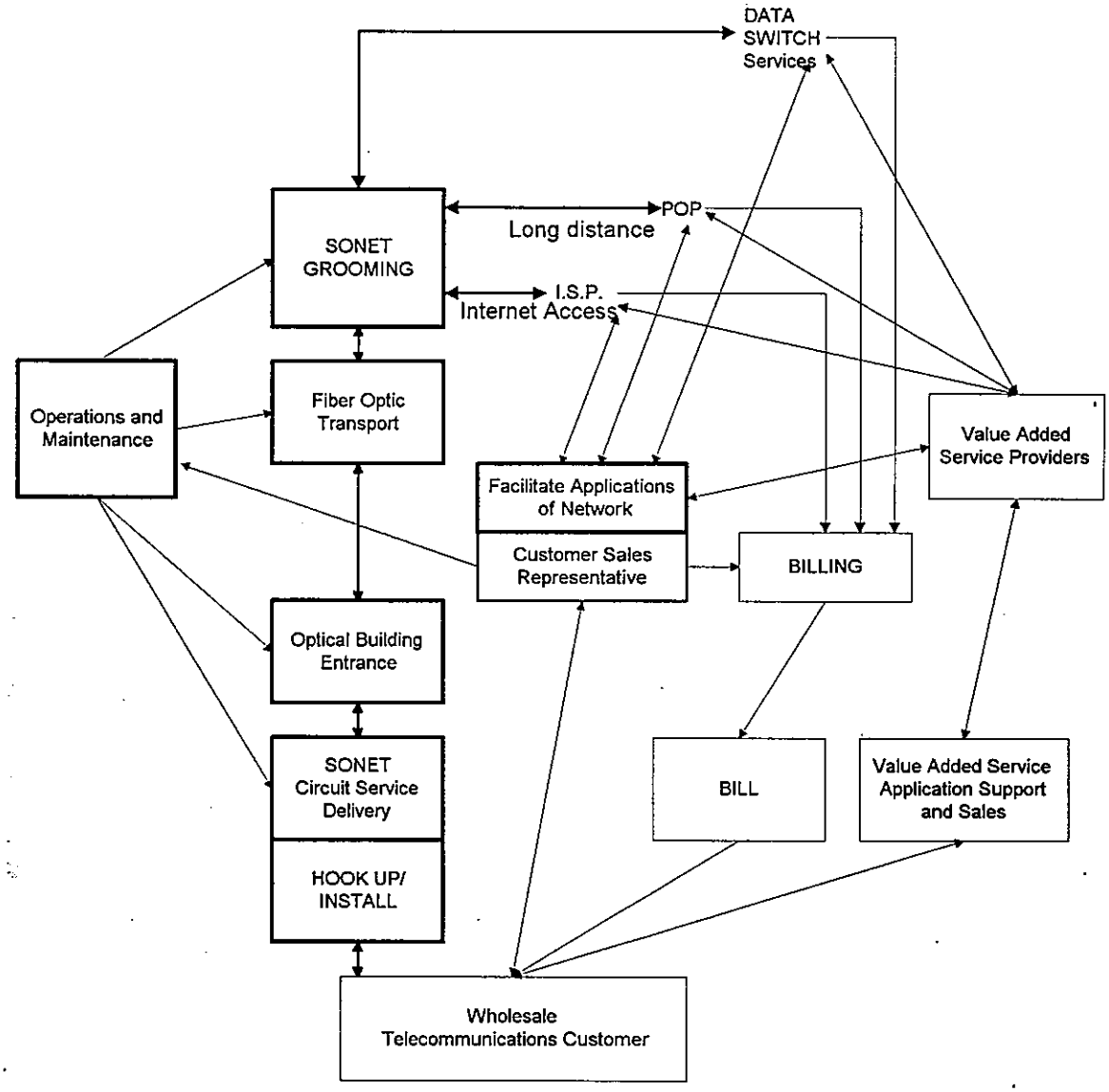
Tacoma City Light would own and operate a hybrid fiber optic - coaxial cable telecommunications system, distributing connectivity throughout the Tacoma City Light service territory. Tacoma City Light would provide transport service for use by Internet Service Providers to provide cable modem - based Internet access to all residents and small businesses.

Internet Service Providers would use Tacoma City Light's digital, fiber optic transport from their centralized facility to the data network routers which convert digital signals into RF channels. Internet Service Providers would be provided transport using Tacoma City Light's RF channels to deliver cable modem signals to and from end-use customers, including both residential and small business users.

Internet Service Providers would partner with Tacoma City Light to ensure the delivery of the highest quality products and services to end-users. Key issues to consider in partnering with Internet Service Providers to deliver the growing Internet traffic are: Internet Service Provider investment in caching computers to serve the common Internet information requests locally; leasing of highest speed interconnections to the national Internet infrastructure; choice of cable modems for efficient use of RF channels in data networking; and the history of responsiveness to customers service and trouble calls.

High-speed Internet data transport is a relatively new application of the Hybrid Fiber Coax cable television infrastructure, providing two-way service on the cable to the home. Extreme care would be placed on the installation of the cable serving end-users. All cable in the home used for two-way services must be of top-quality materials. Electrical noise infiltrating into the return path could affect the service of others and would be eliminated with careful installation and material choices.

High Speed Telephone and Data Transport

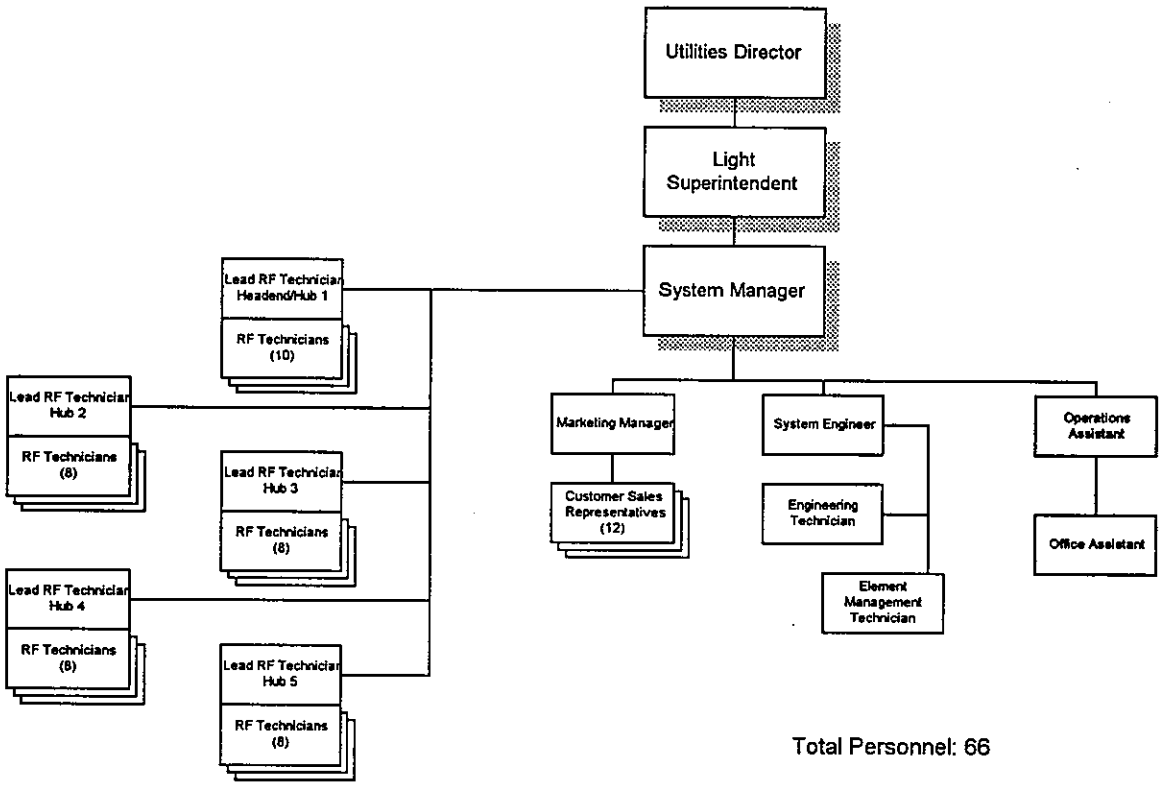


BOLD = Tacoma City Light functions and facilities

ORGANIZATION

Staffing for the Communications Section would include both reallocation of existing personnel and the recruitment of new employees with communications, technical and marketing experience. The Section will also rely on the support of other departments within Tacoma City Light and the City of Tacoma, such as Legal, Fleet, and Accounting.

Telecommunications
Organization Chart



Total Personnel: 66

NOTES TO FINANCIAL STATEMENTS

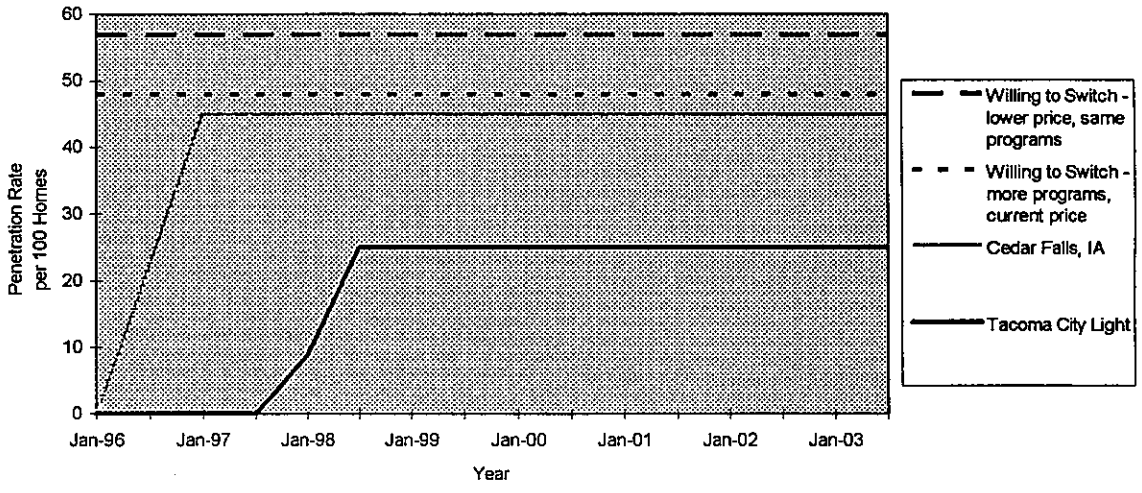
The Light Division (Tacoma City Light) is a division of the City of Tacoma, Department of Public Utilities, which also operates the Water and Belt Line Railroad Divisions. The Telecommunications Project would be a section of the Light Division.

The following is a summary of significant financial notes and is intended to assist the reader in understanding and interpreting the financial statements and other data in this report.

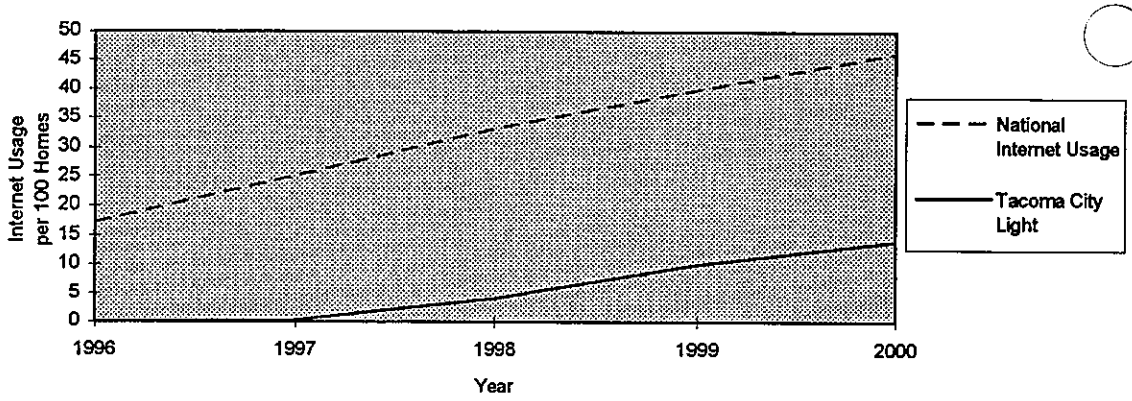
NOTE 1
Financial Analyses

Tacoma City Light's financial analyses for the Telecommunications Project are summarized in the Income Statement and Cash Budget. The analysis deliberately understates revenues to give a conservative view. The analyses show that the proposal to build the system is economically feasible if pursued in a business like manner. All amounts are shown in constant 1997 dollars.

Comparison of Cable TV Penetration As seen in the graph below, cable television penetration rates have been conservatively estimated at 25 subscribers per 100 homes.



Comparison of Internet Usage Compared with the forecasted growth in the national Internet usage rate, Tacoma City Light's projected Internet transport rates are also conservative.



NOTE 2
Cost Estimates

Cost estimates are based on unit costs collected in the telecommunications study and from existing telecommunications companies reports and operating statements. The estimates are given in unadjusted Year 1 dollars and should be used only for determining the feasibility of this proposal. Certain costs, including programming and payroll & benefits, have been inflated to account for historic increases above the rate of inflation.

NOTE 3
Services Offered To City and Terms

The franchise jurisdictions have goals, interests and needs related to the proposed Telecommunications Project. Tacoma City Light's development plan makes provisions for these goals and interests. These needs are proposed to be addressed through the provision of Public, Educational, and Governmental (PEG) video channels, taxes and fees, and through the construction of an Institutional Network which will provide fiber links to all primary and secondary schools, colleges, universities (both public and private), fire stations and police stations, including SONET electronics to enable the links to be used as soon as possible.

NOTE 4
Infrastructure

The infrastructure would be built with a regional headend, 5 hubs, and 82 nodes. Also included are SONET electronics supporting an initial 176 business sites, 8 central offices, and 3 Points of Presence. The system

supports optical coupling, switches and amplifiers. SONET shelves are also included for Tacoma City Light substations and the Institutional Network. The construction total incorporates hardware discounts off list offered on large quantity orders.

NOTE 5
Financing

This project would be funded through the use of insured taxable municipal bonds with interest rates based on U.S. Treasury yields plus a spread of between 35 and 70 basis points depending on term, and capital available from the Light Division. The total financing amount includes operating capital and incurred start-up costs. The bonds would be issued with a range of terms, the maximum of which is calculated at 10 years for the purpose of this analysis.

NOTE 6
Revenues Generated

Tacoma City Light would be the service provider of cable television services. Subscriptions would be offered in a multi-tier selection. Tacoma City Light would charge an installation fee, however, for purposes of this analysis, that charge has been waived until 1999. These financial statements are based on conservation penetration rates in the cable television market.

The telecommunications system would make transport available to service providers of other services including telephony, data transport, and video on demand. These features would be available through partnerships between Tacoma City Light and other service providers. Since Tacoma City Light would only be the transport provider, it would not be involved in rate schedules set by providers for these services. Tacoma City Light would, however, receive revenues from the service provider for carriage on the telecommunications network.

The telecommunications system would also service the needs of the Tacoma City Light. Functions such as distribution automation, substation monitoring, real-time pricing, and customer billing information would be available to the Light Division through the use of this system.

NOTE 7
Operating Expenses

Conclusions

The study team set out to answer a number of questions at the outset of this project:

- What is happening on the technological front?
- Who are the major telecommunications players, what have they done in the past, and what are they doing now?
- What is happening in the regulatory environment?
- What have other communities done with regard to telecommunications?
- What has happened historically in our community?
- What do the existing telecommunications options look like?
- What kind of market demand for telecommunications exists in our community?
- What are the economic development implications for our community if an advanced telecommunications system is built or fails to be built?
- And finally, could Tacoma City Light build and operate such a system and how would it look?

This study of telecommunications has answered those questions. But there is a final question that must be asked. Should Tacoma City Light create a modern telecommunications infrastructure to serve the local community? The answers to the previous questions are critical to understanding and answering this question.

This study has reviewed telecommunications both nationally and locally. In reviewing the local situation it is clear that the local market has a growing need for better telecommunications access. Despite growing local demand, the incumbent wire line service providers have stated that their investments in the local infrastructure will either slow without significant rate increases or be halted all together. One could hope that other companies would step forward and create a modern telecommunications system through out our community but the prospects for that occurring appear dim. While Competitive Access Providers will eventually enter the local market, their focus is almost exclusively on large business users. Other potential systems are either of low capacity or not scheduled to be fully deployed until the next century.

Tacoma City Light could create an advanced telecommunications system to meet the telecommunications needs of the communities it serves in addition to its own internal communication needs. If Tacoma City Light were to create such a system and operate it in a business like manner, the system would generate sufficient revenues to make the system self sustaining. By offering products and services that either meet customer needs directly and providing a pathway through which the private sector can meet additional needs, pricing those products and services competitively, and delivering them over a modern, high-speed, high-reliability telecommunications system, a

business is created that is viable using conservative revenue projections.

The following principles provide a framework for considering whether Tacoma City Light should enter the telecommunications arena in our community.

1. The primary purposes for Tacoma City Light financing, constructing and operating a broadband telecommunications system shall be as follows:
   - Provide a state-of-the-art fiber optic technology to support enhanced electric system control, reliability and efficiency.
   - Provide capability to meet the expanding telecommunications requirements in an evolving competitive electric market, the most critical of which is real-time, two-way interactive communications with individual energy consumers.
   - Provide greater revenue diversification through new business lines (i.e., Internet transport, cable TV, etc.), enhance traditional products and services and maximize return on Tacoma City Light assets.
2. Important additional community benefits derived from this project are as follows:
   - Promote economic development and business retention.
   - Insure broad community accessibility to high quality, state-of-the-art telecommunication technology.
3. The Telecommunication Project, including all infrastructure, and proposed business lines, shall be an integral Tacoma City Light operating responsibility and function.
4. The Telecommunication Project business lines shall be operated in a business-like manner similar to electric services which are subject to market forces and are not tax supported.
5. In order to avoid the perception of government control of the content of the cable television business line, programming will be determined on the basis of local consumer demand and input.
6. The Telecommunication Project construction will reflect the current overhead to underground configuration of Tacoma City Light's electric system. Any significant divergence from this will greatly increase the project costs and jeopardize the viability of the project.
7. Tacoma City Light's Telecommunication Project will not proceed unless there is broad and strong policy and community support.

Ultimately, the question of whether Tacoma City Light should create a modern telecommunications infrastructure is one that policy makers must answer with the informed input of the community they represent. It is our sincere hope that the communities that Tacoma City Light serves will find the background information contained in this study useful.

Acknowledgments

The Telecommunications Study Team was a multidisciplinary group made up of both Tacoma City Light staff and outside consultants. There is always a concern when approaching a study of this magnitude, that a single view of the industry and market in question will prevail without rigorously examining alternative viewpoints. In the case of telecommunications, many industry experts have a tendency to view the world with either a telephone or cable perspective. Rather than hire a single consultant under a large contract to work with staff in the development of this report, the decision was made early in the project to hire multiple consultants with diverse perspectives and areas of expertise under small individual contracts. This allowed the team to examine and weigh a wide variety of ideas and perspectives and thereby ensure that the final study incorporated the best ideas and knowledge possible. This approach is not the easiest way of conducting a study of this sort since the discussions that ensue can become quite lively and challenging. Staff would like to thank the following consultants that willingly and vigorously participated in those discussions and the work of preparing this report.

Bruce Campbell, Metro Utility Communications Group
F. Paul Carlson, Ph.D., Metropolitan Communications Consultants
Linda Dethman, Dethman & Associates
Stuart Hauser, Metro Utility Communications Group
Peggy sue Heath, A.B.D., APEX Business Solutions
Sandy Hunt, Ph.D., APEX Business Solutions
Richard C. T. Li, P.E., Metropolitan Communications Consultants
Bruce Mann, Ph.D., University of Puget Sound
Mel Oyler, APEX Business Solutions
Catherine Rudolph, APEX Business Solutions
Susan V. Marr, Metro Utility Communications Group
Laura Rosenwald, Preston Gates & Ellis
Gene Starr and the research team at Market Data Research
Elizabeth Thomas, Preston Gates & Ellis

Many staff members at Tacoma Public Utilities willingly put in extra time to help the team with this study. In particular, the team would like to thank the following people: Mark Bubenik, Linda Carlton, Julie Dahlen, Alex Gebhard, Deborah Hall and the Graphics Services group, David Lerman, James Mack, Glenna Malanca, Peter Richardson, and Sue Veseth.

We would also like to thank the many members of the community that have voluntarily spoken with us about their ideas, desires, and concerns regarding telecommunications. Finally, I would like to thank the staff members on the Telecommunications Study Team:

Chandra Enos
Steve Roberts, P.E.
Lisa Steadmon

Their dedication, hard work, willingness to dig beyond the easy answer, and ability to present complex material in a clear and understandable form was the key to this study.

Jon Athow
Telecommunications Project Manager

Growth on the Key Peninsula will be more problematic. Transportation is obviously a problem, and this will favor location there by non-commuters, generating more demand for local retail goods in Gig Harbor. Infrastructure In that area, such as water and sewer will be more expensive and will push up housing prices.

To the extent that the employment growth occurs closer to DuPont than to the current Tacoma boundaries, some housing growth (and population) will occur in Thurston rather than Pierce County. One estimate, by the Thurston County Economic Development Board, expects that almost 70% of the non-DuPont residences of Northwest Landing employees to be in Thurston and only 30% in Pierce. As Thurston grows, however, people will travel to Pierce County for shopping and entertainment. Although a second spill over area could be Auburn in south King County, residential neighborhoods located there are not as attractive as in Thurston County nor is the economic base as diverse.

Growth Impact of Scenarios

Scenario Two The location of another large technology company (following the Intel example) or the successful development of the ISDZ would produce a major employment gain. In this case, growth within Tacoma would increase by 0.75% annually in the early time frame (1995-2005) and by 0.25% in the later frame (2005-2020). A slow down in the acceleration of growth would be due to more attractive non-Tacoma locations. This type of scenario would initially increase annual growth in Pierce County by 0.5% annually, and then slow to 0.75% over the longer time frame. Again, this would reflect better siting opportunities outside of Tacoma.

Scenario Three Another change that would have a significant impact on the moderate term growth outlook for the area would come from the development of an expanded art/cultural and tourist industry. This could happen if the "culture cluster" generates the critical mass of activity needed to attract travelers and put the area on the "map" of destination stops. The effect will be to raise Tacoma's annual growth by 0.1% and Pierce County by 0.2% in the 1995-2005 time frame. Greater growth will occur during the 2005-2020 time frame as infrastructure is developed and earlier impacts are felt, with increases by 0.25% for Tacoma and 0.3% for the county.

IMPACT OF TELECOMMUNICATIONS INFRASTRUCTURE

Patterns of growth in the major sectors of the local economy are, and will be more so in the future, dependent on the community's telecommunications infrastructure. Many established sectors will also require continued technology investments to remain competitive.

Government activity at military installations will continue to be the a significant sector in the local area economy. However, as the size of the public sector in the national economy continues to get smaller (moving toward the promised balanced budget), reductions in the defense budget will become increasingly important. The existing facilities in Pierce County have survived two rounds of base closures, due in part to the fact that they were technologically sound. The future is always uncertain, however. Access to the most modern telecommunications technology will help assure their survival in the local area.

Up-to-date communication and information services are essential to the survival of *health services.* Commercial data management in support of medical services also require a substantial and increasing telecommunications infrastructure. The health care industry is a primary industry in Tacoma Pierce-County and a rich source of potential applications and associated technology drivers. Not only are there a variety of applications driving both applied and fundamental research, but the spectrum of actual operating modes in health care provision systems span a wide range. Provision ranges from elective, non-emergency, monitoring where the patient and provider are together in a well equipped office, to emergency diagnostic and treatment situations where the diagnostic expertise is geographically remote from the patient and the treatment expertise. Remote diagnosis requires high bandwidth, real time connection oriented services which support multiple video and data streams as well as voice communication. The precise telecommunications capability required to support this activity is application specific, but can be analyzed within a distributed communication framework since in general health care providers may be geographically dispersed in multiple locations.

The increasing telecommunications need is also true of other *professional services*, especially in the area of *financial services.* The financial services are not communications limited in the same sense as remote medical diagnostic services, or shipment status monitoring. While financial service providers at both the institutional level and the consumer level are sophisticated users of information, the financial services industry does not place heavy demand on the design of the telecommunications

technology. This somewhat curious situation results from several factors:

1. Most financial information is coded in alphanumeric formats. These formats are very efficient to transmit using a variety of existing telecommunications technology.
2. Humans utilize financial information and services in alphanumeric or rudimentary graphical formats (trend charts).
3. Financial information is semantically "dense", the simple statement "DOW off %5" contains a wealth of information, but is amazingly compact (eight bytes).

So it is clear that need for increased bandwidth is usually not instigated by their need to support more volume. However, the financial services sector in the Tacoma area does have unmet telecommunications needs, as evidenced by the Frank Russell Company, one example of a professional services firm experiencing increased telecommunication needs in order to link its headquarters with its international offices and clients. For these kinds of clients overall bandwidth may not be an issue, but security of the line, speed and direction, and responsiveness of the vendor may be. This is an industry sector where telecommunications is part of the production process — a breakdown in the system can cause the organization itself to cease to function until the system is back on-line. Failure to invest in new technologies, especially communications technologies, would therefore limit the growth potential of the area. Companies like Frank Russell would be forced to continue to privately construct work around solutions or utilize a remote service center that could supply desired access and services. Other areas looking to attract these types of companies would need to provide access to a sound telecommunication infrastructure. The success of the international services district and the ability to attract new businesses to the redeveloped Foss will depend, to a great degree, on access to low cost, full service telecommunications technologies.

More uncertain, and equally important, will be the information and communication needs of shipping and support activities in the *Port of Tacoma* area. Increase in direct competition to Tacoma's container trade, competition for new shipping lines, just-in-time inventory requirements, and lower labor costs all suggest the provision of telecommunications technologies will be important for this sector of the economy as well. Distribution centers in the Port of Tacoma, with SuperValu as another example, are becoming increasingly dependent on telecommunications for the transfer of data between regional distribution centers, vendors, and the parent company. . Customers frequently desire to know the status of shipments which they have sent or are waiting to

receive. These shipment status services are often effective differentiators for shipment service providers. In the small package shipment service business competitive pressure drove both FedEx and UPS to offer shipment status services. With the small package shippers, status generally provides pickup time, expected or actual delivery time and other information. With integrated shipment services providers such as the typical port authority, the cargo may be at sea, in the air or with some common carrier trucking firm which makes an accurate and reliable determination of shipment location problems. A possible solution entail utilizing global positioning systems (GPS) and wireless telecommunications technology to update port authority databases on the location and condition of shipments in transit.

In the *retail sector*, increased reliance on computer usage in stores is likely, as inventory costs can more effectively be controlled with timely ordering and control, use of fax and modem transactions is increasing, and the use of things like fingerprint recognition for credit cards or check writing. Successful merchants will need to adapt to these new demands -- a potential large increase in data transmission needs from many small and scattered sites.

The *advanced technology* businesses also can have telecommunication needs. A research based organization will often desire high-speed access to other researchers or their works. In fact, it is the ability to telecommute and connect regionally-located Universities that has fueled some of the dispersion in advanced technology companies to smaller communities.

Culture-based organizations in this scenario are not as technology-dependent as professional and health services, but telecommunications does play an increasing useful role in the tourist/convention category. The Visitor and Convention Bureau anticipates the use of smart cards to allow tourists access to a variety of services from transportation to tickets to shows. That idea would require a well developed communications network in the city and adjacent points of interest. For the conventioneer, satellite conferencing and digital information transfers are of growing importance. In addition, many business travelers expect a computer modem in their hotel rooms to connect with their home office. Museums increasingly use interactive media as an educational tool.

It is not merely the business applications themselves that require infrastructure access. Sophisticated, technology oriented employees of many of these types of firms would expect to have access to their workplace computer system from their home, access to the Internet, high quality cable systems, and eventually new technologies which are only on the drawing board at this

time. A failure to invest in the appropriate infrastructure may leave Tacoma out of the running as a location for these types of firms and the employees who work for them.

Thank You

We would like to extend our thanks to those in the community who were generous in sharing their time and judicious in sharing their opinions about the future economic prospects of Greater Tacoma.

Connie Bacon, Executive Director, World Trade Center Tacoma
Shawn Bunney, Council Staff, Pierce County Council
Tom Dickson, President, Tacoma Urban League
David Graybill, Tacoma/Pierce County Chamber of Commerce
Hank G. The Port of Tacoma
David B. Johnson, Structural Engineer, AHBL
Geoff Hodston, Principal, AHBL Engineering (Australian Citizen)
Mirriam Kantor-Crutchfield
Mark Lewington, Graham & Dunn
Don Meyer, Acting Director, The Port of Tacoma
Kevin R. Phelps, President, Landmark Convention Center
George Polich, Public Affairs Officer, Ft. Lewis
Bob Snyder, Pierce County Airport Planner
James R. Walton, Deputy City Manager, City of Tacoma
Nancy Watkins, Executive Director, Tacoma/Pierce County Visitor & Convention Bureau
Juli Wilkerson, Director, Planning and Development, City of Tacoma

EXHIBIT 11

ORDINANCE NO. 25930

AN ORDINANCE of the City of Tacoma, Washington establishing a telecommunications system as part of the Light Division, supplementing Ordinance No. 23514 and providing for the issuance and sale of the City's Electric System Revenue Bonds in the aggregate principal amount of not to exceed $1,000,000 to provide part of the funds necessary for the acquisition, construction and installation of additions and improvements to the telecommunications system.

TABLE OF CONTENTS

Page

ARTICLE I
DEFINITIONS AND AUTHORITY

Section 1.1. Supplemental Ordinance 3
Section 1.2. Definitions 3
Section 1.3. Authority for this Eighth Supplemental Ordinance 4

ARTICLE II
FINDINGS; ESTABLISHMENT OF THE TELECOMMUNICATIONS PROJECT AS A SEPARATE SYSTEM; AND ADOPTION OF PLAN AND SYSTEM

Section 2.1. Establishment of Telecommunication System 5
Section 2.2. Adoption of Plan; Estimated Cost 5
Section 2.3. Findings of Parity 5
Section 2.4. Due Regard 6
Section 2.5. Findings 6

ARTICLE III
AUTHORIZATION OF BONDS

Section 3.1. Principal Amount, Designation and Series 6
Section 3.2. Purpose 6
Section 3.3. Date, Maturities and Interest 7
Section 3.4. Denomination and Numbers 7
Section 3.5. Redemption Terms 7
Section 3.6. Reservation of Right to Purchase 7
Section 3.7. Tax Exemption 7
Section 3.8. Arbitrage Rebate 8

ARTICLE IV
REGISTRATION, FORM AND GENERAL TERMS

Section 4.1. Registrar and Paying Agent 8
Section 4.2. Transfer and Exchange 8
Section 4.3. Limitation on Transfer or Exchange of Bonds 9
Section 4.4. Effect of Payment 10
Section 4.5. Mutilated, Lost, Stolen or Destroyed Bonds 10
Section 4.6. Execution and Authentication of Bonds 11
Section 4.7. Form of Bonds 12

30

ARTICLE V
APPLICATION OF PROVISIONS OF ORDINANCE TO BONDS

Section 5.1. Issuance of Future Parity Bonds 17
Section 5.2. Contract Resource Obligations 17
Section 5.3. Application of Sections 7.1 through 7.3 of Ordinance Relating to Special Funds and Accounts 17
Section 5.4. Covenants to Secure Bonds 18
Section 5.5. Supplemental and Amendatory Ordinances 18
Section 5.6. Defaults and Remedies 18
Section 5.7. Amendments and Bondowners' Meetings 18
Section 5.8. Miscellaneous 18
Section 5.9. Rights of AMBAC 18
Section 5.10. Reserve Subaccount 18

ARTICLE VI
DISPOSITION OF BOND PROCEEDS

Section 6.1. Construction Account 19
Section 6.2. Disposition of Proceeds 20

ARTICLE VII
SALE OF BONDS

Section 7.1. Sale of Bonds 20
Section 7.2. Official Statement; Insurance 20

ARTICLE VIII
MISCELLANEOUS

Section 8.1. Defeasance 21
Section 8.2. Undertaking to Provide Ongoing Disclosure 21
Section 8.3. Severability 21
Section 8.4. Effective Date 22

31

ORDINANCE NO. 25930

AN ORDINANCE of the City of Tacoma, Washington establishing a telecommunications system as part of the Light Division, supplementing Ordinance No. 23514 and providing for the issuance and sale of the City's Electric System Revenue Bonds in the aggregate principal amount of not to exceed $1,000,000 to provide part of the funds necessary for the acquisition, construction and installation of additions and improvements to the telecommunications system.

WHEREAS, the City of Tacoma (the "City") owns and operates an electric utility system (the "Electric System"); and

WHEREAS, the Ordinance provides that the City may create a separate system as part of the Electric System and pledge that the income of such separate system be paid into the Revenue Fund; and

WHEREAS, RCW 35A.11.020 authorizes the City to operate and supply utility and municipal services commonly or conveniently rendered by cities or towns; and

WHEREAS, RCW 35.92.050 authorizes cities to construct and operate works and facilities for the purpose of furnishing any persons with electricity and other means of power and to regulate and control the use thereof or lease any equipment or accessories necessary and convenient for the use thereof; and

WHEREAS, the Utility Board and the Council have determined that it is in the best interest of the City that it install a telecommunications system among all of its Electric System substations in order to improve communications for automatic substation control; and

WHEREAS, the City has determined that it is prudent and economical to provide additional capacity on such telecommunications system to provide the Electric System with sufficient capacity to perform or enhance such functions as automated meter reading and billing, appliance control, and load shaping; and

32

WHEREAS, the Light Division may wish to connect such telecommunications system to individual residences and businesses in its service area or to other providers of telecommunications services; and

WHEREAS, the City has determined that it should create a telecommunications system as part of the Electric System in order to construct these telecommunications improvements; and

WHEREAS, the City by Ordinance No. 23514 passed November 20, 1985 (as amended and supplemented, the "Ordinance"), authorized Electric System Revenue Bonds (the "Bonds") of the City to be issued in series, made covenants and agreements in connection with the issuance of such Bonds and authorized the sale and issuance of the first series of such Bonds in the aggregate principal amount of $125,505,000 (the "1985 Bonds") for the purpose of refunding all of the City's then outstanding light and power revenue bonds; and

WHEREAS, the 1985 Bonds were issued under date of December 1, 1985 and are now outstanding; and

WHEREAS, the City has heretofore issued ten additional series of Bonds on a parity with the 1985 Bonds, which bonds were issued and are now outstanding:

Authorizing Ordinance	Bonds Dated	Principal Amount Issued
23663	July 1, 1986	$ 30,000,000
24073	May 1, 1988	60,400,000
24296	May 1, 1989	48,500,000
25004	December 1, 1991	13,800,000
25004	December 5, 1991	42,400,000
25004	December 5, 1991	42,400,000
25089	May 1, 1992	31,295,000
25165	September 1, 1992	131,675,000
25333	August 1, 1993	3,318,500
25489	May 10, 1994	135,665,000

33

WHEREAS, after due consideration, it appears to the City Council and the Public Utility Board (the "Board") that it is in the best interest of the City to create and construct a telecommunications system and to issue Electric System Revenue Bonds to finance a portion of the costs of such construction and that the exact amount of Bonds and terms of the Bonds shall be determined by resolution of the Council; and

WHEREAS, Section 10.1 of the Ordinance provides that the City may, without the consent of the owners of any Bonds, adopt an ordinance supplemental to or amendatory of the Ordinance to provide for the issuance of Future Parity Bonds and to prescribe the terms and conditions pursuant to which such Bonds may be issued, paid or redeemed; and

WHEREAS, the City desires to provide that the issuance and sale of the Bonds will be issued and secured under the Ordinance as amended and supplemented by Ordinance No. 23663, Ordinance No. 24073, Ordinance No. 24296, Ordinance No. 25004, Ordinance No. 25089, Ordinance No. 25165, Ordinance No. 25333, Ordinance No. 25489 and this Ordinance;

NOW, THEREFORE, BE IT ORDAINED BY THE CITY OF TACOMA:

ARTICLE I

DEFINITIONS AND AUTHORITY

Section 1.1. Supplemental Ordinance. This Ordinance No. 25930 is supplemental to and is adopted in accordance with Section 5.1 and Article X of the Ordinance and shall be known as the Eighth Supplemental Electric System Revenue Bond Ordinance (the "Eighth Supplemental Ordinance").

Section 1.2. Definitions.

A. All terms that are defined in Section 1.1 of the Ordinance shall have the same meanings, respectively, in this Eighth Supplemental Ordinance as such terms are given in

34

Section 1.1 of the Ordinance, as amended and supplemented by the First, Second, Third, Fourth, Fifth, Sixth, and Seventh Supplemental Ordinances.

B. In this Eighth Supplemental Ordinance:

"Arbitrage and Tax Certification" means the certificate executed by the Director of Finance of the City pertaining to the calculation and payment of any Rebate Amount with respect to the Bonds.

"Bond Sale Resolution" means the resolution to be adopted by the City Council setting forth the final terms of the Bonds.

"Bonds" means the Electric System Revenue Bonds, 199__, of the City issued pursuant to the Ordinance and this Eighth Supplemental Ordinance.

"Code" means the Internal Revenue Code of 1986, as amended, together with corresponding and applicable final, temporary or proposed regulations and revenue rulings issued or amended with respect thereto by the United States Treasury or the Internal Revenue Service, to the extent applicable to the Bonds.

"Eighth Supplemental Ordinance" means this Ordinance No. 25930.

"Rebate Amount" means the amount, if any, determined to be payable with respect to the Bonds by the City to the United States of America in accordance with Section 148(f) of the Code.

Section 1.3. Authority for this Eighth Supplemental Ordinance. This Eighth Supplemental Ordinance is adopted pursuant to the provisions of the laws of the State of Washington, the Tacoma City Charter and the Ordinance.

35

ARTICLE II

FINDINGS; ESTABLISHMENT OF THE TELECOMMUNICATIONS PROJECT AS A SEPARATE SYSTEM; AND ADOPTION OF PLAN AND SYSTEM

Section 2.1. Establishment of Telecommunication System. The City hereby creates a separate system of the City's Light Division to be known as the telecommunications system (the "Telecommunications System"). The public interest, welfare, convenience and necessity require the creation of the Telecommunications System, contemplated by the plan adopted by Section 2.2 hereof, for the purposes set forth in Exhibit A. The City hereby covenants that all revenues received from the Telecommunications System shall be deposited into the Revenue Fund.

Section 2.2. Adoption of Plan; Estimated Cost. The City hereby specifies and adopts the plan set forth in Exhibit A for the acquisition, construction and implementation of the Telecommunications System (the "Telecommunications Project"). The City may modify details of the foregoing plan when deemed necessary or desirable in the judgment of the City. The estimated cost of the Telecommunications Project, including funds necessary for the payment of all costs of issuing the Bonds, is expected to be approximately $40,000,000.

Section 2.3. Findings of Parity. The Council hereby finds and determines as required by Section 5.2 of the Ordinance as follows:

A. The Bonds will be issued for financing capital improvements to the Electric System.

B. At the time of issuance and delivery of the Bonds, there will be no deficiency in the Bond Fund and no Event of Default shall have occurred.

C. At the time of issuance and delivery of the Bonds, there will be on file with the City Clerk the certificate of the Director of Finance required by Section 5.2(B)(1) or Section 5.2(C) of the Ordinance.

The applicable limitations contained in Section 5.2 of the Ordinance having been complied with in the issuance of the Bonds, the Bonds will have a lien upon the Net Revenues of the Electric System for the payment of principal thereof and interest thereon equal in priority to the lien upon the Net Revenues of the Electric System for the payment of the principal of and interest on the 1985 Bonds, the 1986 Bonds, the 1988 Bonds, the 1989 Bonds, the 1991 Bonds, the 1992 Bonds, the 1992B Bonds, the 1993 Bonds and the 1994 Bonds.

Section 2.4. Due Regard. The Council and Board hereby find and determine that due regard has been given to the cost of the operation and maintenance of the Electric System and that it has not obligated the City to set aside into the Bond Fund for the account of the Bonds a greater amount of the revenues and proceeds of the Electric System than in its judgment will be available over and above such cost of maintenance and operation.

Section 2.5. Findings. The Council and Board hereby find it to be necessary and in the best interests of the City to issue the Bonds in order to provide part of the funds necessary to finance the Telecommunications Project.

ARTICLE III

AUTHORIZATION OF BONDS

Section 3.1. Principal Amount, Designation and Series. Pursuant to the provisions of the Ordinance, a series of Bonds of the City entitled to the benefit, protection and security of such provisions is hereby authorized in the aggregate principal amount of not to exceed $1,000,000. Such Bonds shall be designated as, and shall be distinguished from the Bonds of all other series by the title, "City of Tacoma, Washington Electric System Revenue Bonds, 199_."

Section 3.2. Purpose. The purpose of the Bonds is to provide part of the funds necessary to finance the Telecommunications Project, make any necessary deposit to the Reserve Account and to pay the costs of issuance and sale of the Bonds.

37

Section 3.3. Date, Maturities and Interest. The Bonds shall be issued in the aggregate principal amount of not to exceed $1,000,000 and shall be dated as of the date provided in the Bond Sale Resolution and shall bear interest from their dated date to their stated dates of maturity or prior redemption. The exact principal amount of the Bonds shall be established by the Bond Sale Resolution. The Bonds shall mature on the dates of the years and in the principal amounts and shall bear interest payable semiannually on the dates and at the rates per annum set forth in the Bond Sale Resolution.

Section 3.4. Denomination and Numbers. The Bonds shall be issued in fully registered form in the denominations of $5,000 or any integral multiple of $5,000 within a maturity. The Bonds shall be numbered separately in such manner and with any additional designation as the Registrar deems necessary for purposes of identification. The Bond Sale Resolution may provide for the Bonds to be held in book-entry only form.

Section 3.5. Redemption Terms. By the Bond Sale Resolution, the City Council may determine that all or a portion of the Bonds shall be subject to redemption prior to maturity at the option of the City, in whole or in part, on any date and at the respective redemption prices specified in the resolution. The City Council may designate certain Bonds as Term Bonds that will be subject to redemption by operation of the Bond Retirement Account through Sinking Fund Requirements in the years and amounts set forth in the resolution.

Section 3.6. Reservation of Right to Purchase. The City reserves the right to use money in the Revenue Fund or any other legally available funds at any time to purchase any of the Bonds in the open market provided there is no deficiency in the accounts within the Bond Fund. Any purchases of Bonds may be made with or without tenders of Bonds and at either public or private sale.

Section 3.7. Tax Exemption. The City shall comply with the provisions of this section unless, in the written opinion of nationally-recognized Bond Counsel to the City, such

compliance is not required in order to maintain the exemption of the interest on the Bonds from federal income taxation.

The City hereby covenants that it will not make any use of the proceeds from the sale of the Bonds or any other funds of the City which may be deemed to be proceeds of such Bonds pursuant to Section 148 of the Code and the applicable regulations thereunder which will cause the Bonds to be "arbitrage bonds" within the meaning of said Section and said regulations. The City will comply with the applicable requirements of Section 148 of the Code (or any successor provision thereof applicable to the Bonds) and the applicable regulations thereunder throughout the term of the Bonds.

The City further covenants that it will not take any action or permit any action to be taken that would cause the Bonds to constitute "private activity bonds" under Section 141 of the Code.

Section 3.8. Arbitrage Rebate. The City will pay the Rebate Amount, if any, to the United States of America at the times and in the amounts necessary to meet the requirements of the Code to maintain the federal income tax exemption for interest payments on the Bonds, in accordance with the Arbitrage and Tax Certification.

ARTICLE IV

REGISTRATION, FORM AND GENERAL TERMS

Section 4.1. Registrar and Paying Agent. The initial Registrar and Paying Agent shall be the fiscal agencies for the state of Washington in Seattle, Washington, and New York, New York.

Section 4.2. Transfer and Exchange. So long as the Bonds are not in book-entry form, any Bond may be transferred pursuant to its provisions at the Registrar's principal office for such purpose by surrender of such Bond for cancellation, accompanied by a written instrument of transfer, in form satisfactory to the Registrar, duly executed by the registered owner in

person or by the registered owner's duly authorized attorney. Upon payment of any applicable tax or governmental charge, the City will execute and the Registrar will authenticate and deliver at the principal office of the Registrar (or send by registered mail to the owner thereof at the owner's expense), in the name of the transferee or transferees, a new Bond or Bonds in authorized denominations of the same interest rate, aggregate principal amount and maturity, dated as of the last interest payment date to which interest has been paid so that there shall result no gain or loss of interest as a result of such transfer. To the extent of authorized denominations, one Bond may be exchanged for several bonds of the same interest rate and maturity, and for a like aggregate principal amount, and several Bonds of the same interest rate and maturity may be exchanged for one or several Bonds, respectively, of the same interest rate and maturity and for a like aggregate principal amount.

In every case of a transfer or exchange of any Bonds, the surrendered Bonds shall be canceled by the Registrar and a certificate evidencing such cancellation shall be promptly transmitted by the Registrar to the City. As a condition of any such transfer or exchange, the City at its option may require the payment of a sum sufficient to reimburse it for any tax or other governmental charge that may be imposed thereon. All Bonds executed, authenticated and delivered in exchange for or upon transfer of Bonds so surrendered shall be valid obligations of the City evidencing the same debt as the Bonds surrendered, and shall be entitled to all the benefits and protection of the Ordinance to the same extent as the surrendered Bonds.

Section 4.3. Limitation on Transfer or Exchange of Bonds. The City shall not be required to (a) issue, transfer, or exchange Bonds after the 15th day of the month prior to any interest payment date therefor, or (b) to register, discharge from registration, transfer or exchange any Bonds which have been designated for redemption within a period of 30 days next preceding the date fixed for redemption.

Section 4.4. Effect of Payment. All payments of or on account of interest to any registered owner of any Bond, and all payments of or on account of principal to any registered owner of any Bond (or to his or her assigns), shall be valid and effectual and shall be a discharge of the City, the Paying Agent and the Registrar in respect of the liability upon the Bonds or claims for interest, as the case may be, to the extent of the sum or sums paid.

All Bonds upon the payment or redemption thereof shall be canceled and destroyed by the Paying Agent, and a certificate evidencing such payment, cancellation and destruction shall be promptly transferred by the Paying Agent to the City.

Section 4.5. Mutilated, Lost, Stolen or Destroyed Bonds. In case any Bond shall at any time become mutilated or be lost, stolen or destroyed, the City in the case of such mutilated Bond shall, and in the case of such lost, stolen or destroyed Bond in its discretion may, execute and direct the Registrar to authenticate and deliver a new Bond of the same interest rate and maturity and of like tenor and effect in exchange or substitution for and upon surrender and cancellation of such mutilated Bond, or in lieu of or in substitution for such destroyed, stolen or lost Bond. If such stolen, destroyed or lost Bond shall have matured or have been called for redemption, instead of issuing a substitute therefor, the City may without the surrender of such Bond at its option pay the same (in which case the City shall promptly file a certificate to that effect with the Paying Agent and Registrar) or cause the same to be paid by the Paying Agent by a certificate of the City directing such payment filed with the Paying Agent. Except in the case where a mutilated Bond is surrendered, the applicant for the issuance of a substitute Bond shall furnish to the City and the Registrar evidence satisfactory to them of the theft, destruction or loss of the original Bond, and also such security and indemnity as may be required by the City or the Registrar, and no such substitute Bond shall be issued unless the applicant for the issuance thereof shall reimburse the City and the Registrar for the expenses incurred in connection with the preparation, execution, authentication, issuance and

delivery of the substitute Bond. Any such substitute Bond shall be equally and proportionately entitled to the security of the Ordinance with all other Bonds issued hereunder, whether or not the Bond alleged to have been lost, stolen or destroyed shall be found at any time. The Registrar shall cancel all mutilated Bonds surrendered to it.

Section 4.6. Execution and Authentication of Bonds. The Bonds shall be executed on behalf of the City with the manual or facsimile signature of the Mayor and attested with the manual or facsimile signature of the City Clerk and the seal of the City shall be imprinted or impressed on each of the Bonds. The Bonds shall bear thereon a certificate of authentication, in the form set forth in Section 4.7 of this Eighth Supplemental Ordinance, executed manually by the Registrar. Only such Bonds as shall bear thereon such certificate of authentication shall be entitled to any right or benefit under the Ordinance and no Bond shall be valid or obligatory for any purpose until such certificate of authentication shall have been duly executed by the Registrar. Such certificate of the Registrar upon any Bond executed on behalf of the City shall be conclusive evidence that the Bond so authenticated has been duly authenticated and delivered under the Ordinance and that the owner thereof is entitled to the benefits of the Ordinance.

In case any of the officers who shall have signed or attested any of the Bonds shall cease to be such officers before the Bonds so signed or attested shall have been actually delivered, such Bonds shall be valid nevertheless and may be issued by the City with the same effect as though the persons who had signed or attested such Bonds had not ceased to be such officers.

42

Section 4.7. Form of Bonds.

(a) The Bonds shall be in substantially the following form:

UNITED STATES OF AMERICA

STATE OF WASHINGTON

CITY OF TACOMA
ELECTRIC SYSTEM REVENUE BOND, 199_

No. _____ $_____

Interest Rate:	Maturity Date:	CUSIP No:
____%	_____	_____

Registered Owner:

Principal Amount: _____ DOLLARS

The City of Tacoma, a municipal corporation of the State of Washington (hereinafter called the "City"), for value received, hereby promises to pay to the Registered Owner identified above, or registered assigns, on the Maturity Date identified above, the Principal Amount indicated above and to pay interest on such principal amount from the date hereof or the most recent date to which interest has been paid or duly provided for, at the Interest Rate set forth above per annum, payable _____, 199_, and semiannually thereafter on the first day of each _____ and _____ until payment shall have been made or provided for.

Principal of and interest on this bond are payable solely out of the special fund of the City known as the "Electric System Revenue Bond Fund" created and established by Ordinance No. 23514 of the City (the "Bond Fund"). Both principal of and interest on this bond are payable in lawful money of the United States of America. Interest shall be paid by mailing a check or draft or by wire transfer as provided in the Bond Ordinance (as hereinafter defined) to the registered owner or assigns at the address shown on the bond register as of the 15th day of the month prior to the interest payment date. Principal shall be paid to the registered owner or assigns upon presentation and surrender of this bond at the principal office of the Paying Agent or Agents which initially are the fiscal agencies of the State of Washington in Seattle, Washington, and New York, New York. (Such fiscal agencies also act, and are hereinafter referred to collectively, as the "Bond Registrar").

This bond shall not be valid or become obligatory for any purpose or be entitled to any security or benefit under the Bond Ordinance until the Certificate of Authentication hereon shall have been manually signed by the Bond Registrar.

This bond is one of a duly authorized series of bonds aggregating $_____ in principal amount and designated as "Electric System Revenue Bonds, 199_." This bond and the bonds of this series (the "Bonds") are issued under and pursuant to Ordinance No. 23514 as amended and supplemented by Ordinance No. 23663, Ordinance No. 24073, Ordinance No. 24296, Ordinance No. 25004, Ordinance No. 25089, Ordinance No. 25165, Ordinance No. 25489 and Ordinance No. 25930 of the City (together the "Bond Ordinance"), and under the authority of and in full compliance with the Constitution and laws of the State of Washington.

The Bonds are issued for the purpose of providing part of the funds necessary for financing capital improvements to the Electric System. The Bond Ordinance permits the issuance of Future Parity Bonds payable from the Bond Fund ranking on a parity with the 1985 Bonds, the 1986 Bonds, the 1988 Bonds, the 1989 Bonds, the 1991 Bonds, the 1992 Bonds, the 1992B Bonds, the 1993 Bonds, the 1994 Bonds and the Bonds and secured by an equal charge and lien on the Net Revenues and permits the costs associated with certain Contract Resource Obligations to be included in the Electric System's Operating Expenses (as such terms are defined in the Bond Ordinance). The 1985 Bonds, the 1986 Bonds, the 1988 Bonds, the 1989 Bonds, the 1991 Bonds, the 1992 Bonds, the 1992B Bonds, the 1993 Bonds, the 1994 Bonds, the Bonds and any Future Parity Bonds are hereinafter collectively referred to as the "Parity Bonds."

Copies of the Bond Ordinance are on file at the office of the City Clerk and at the principal office of each Paying Agent for this bond. Reference is hereby made to the Bond Ordinance and to any and all modifications and amendments thereof for a more complete description of the Revenues available for the payment of the principal of and interest on the Bonds and the rights and remedies of the owners of the Bonds with respect thereto, the terms and conditions upon which the Bonds have been issued, and the terms and conditions upon which this bond shall no longer be secured by the Bond Ordinance or deemed to be outstanding thereunder if money or certain specified securities sufficient for the payment of this bond shall have been set aside in a special account and held in trust for the payment thereof. Capitalized terms used herein and not otherwise defined shall have the meanings set forth in the Bond Ordinance.

Under the Bond Ordinance, the City is obligated to set aside and pay into the Bond Fund out of the Revenues of said Electric System certain fixed amounts sufficient to pay the principal of and interest and premium, if any, on all Parity Bonds at any time outstanding as the same become due and payable, all as is more fully provided in the Bond Ordinance. The Bonds and the interest thereon constitute the only charge against the Bond Fund and the amount of the Net Revenues pledged to said Bond Fund, as provided in the Bond Ordinance.

In and by the Bond Ordinance, the City covenants to establish, maintain and collect rates and charges for electric energy sold through the ownership or operation of the Electric

HH

System and all other services, facilities and commodities sold, furnished or supplied by the City in connection with the ownership or operation of the Electric System which shall be fair and adequate to provide Revenues sufficient for the payment of the Parity Bonds and all payments which the City is obligated to set aside in the Bond Fund and for the proper operation and maintenance of the Electric System, including payment of certain Contract Resource Obligations, all necessary repairs, replacements and renewals thereof and other costs thereof, as provided in the Bond Ordinance.

The Bonds maturing on and after _____ 1, _____ are subject to redemption prior to maturity at the option of the City on any date on and after _____ 1, 20__, in whole or in part, upon written notice as provided hereinafter, at the redemption prices with respect to each Bond (expressed as a percentage of the principal amount of the Bonds to be redeemed) set forth below, together with the interest, if any, accrued thereon to the date fixed for redemption:

Redemption Period	Redemption Price

If less than all of the Bonds subject to optional redemption are to be called for redemption, the City shall choose the maturities to be redeemed. In the event that less than all of the Bonds of any maturity are called for redemption, the particular Bonds of such maturity to be redeemed shall be selected by lot by the Bond Registrar, or, so long as the Bonds are held in book-entry form, by the Securities Depository.

The Bonds maturing on _____ 1, ____ (hereinafter referred to as the "Term Bonds") shall be redeemed prior to maturity by lot, not later than _____ 1 in the years _____ through _____, inclusive, from amounts credited to the Bond Retirement Account in the Bond Fund as sinking fund installments therefor (to the extent such amounts have not been used to redeem or purchase such Bonds as provided below) and in the principal amounts as set forth below, upon written notice as provided hereinafter by payment of the principal amount thereof, together with the interest, if any, accrued thereon to the date fixed for redemption.

Year	Amount

The City may purchase or redeem the Term Bonds through the application of part or all of the respective sinking fund installments therefor at any time prior to any _____ 1 due date.

Any money not so used to redeem or to purchase such Term Bonds shall be substantially exhausted by application to the redemption of such bonds on such succeeding _____ 1. If, as of any _____ 1, the principal amount of Term Bonds retired by purchase or redemption from any source exceeds the cumulative requirement for sinking fund installments through such date, such excess may be credited against the sinking fund installment for the next fiscal year.

Written notice of redemption shall be given by first class mail, postage prepaid, not less than 30 days nor more than 60 days before the redemption date to the registered owners of the Bonds to be redeemed in whole or in part at their last addresses, if any, appearing on the Bond Register, but any defect with respect to the redemption of any bond shall not invalidate the redemption of any other bond. Notice of redemption having been given by mailing, as aforesaid, the Bonds so called for redemption shall on the date specified in such notice become due and payable at the applicable redemption price herein provided, and from and after the date so fixed for redemption (except as to any bond, or portion of any bond, not so redeemed in accordance with such call for redemption) interest on said Bonds so called for redemption shall cease to accrue.

A portion of the principal sum of this bond in the amount of $5,000, or any integral multiple thereof, may be redeemed, and if less than all of the principal sum hereof is to be redeemed, in such case upon the surrender of this bond at the principal office of the Bond Registrar, there shall be issued to the registered owner, without charge therefor, for the then unredeemed balance of the principal sum hereof, fully registered bonds of like series, maturity and interest rate in any of the denominations authorized by the Bond Ordinance.

This bond shall be transferable by the registered owner at the principal offices of the Bond Registrar upon surrender and cancellation of this bond, and thereupon a new registered bond or bonds of the same principal amount and interest rate and maturity will be issued to the transferee as provided in the Bond Ordinance. The City, the Bond Registrar, the Paying Agents and any other person may treat the person in whose name this bond is registered as the absolute owner hereof for the purpose of receiving payment hereof and for all purposes and shall not be affected by any notice to the contrary, whether this bond be overdue or not.

It is hereby certified, recited and declared that all acts, conditions and things required by the Constitution and statutes of the State of Washington to exist, to have happened and to have been performed precedent to and in the issuance of this bond do exist, have happened and

46

have been performed in due time, form and manner as prescribed by law, and that the amount of this bond, together with all other obligations or indebtedness of the City, does not exceed any constitutional or statutory limitations of indebtedness.

IN WITNESS WHEREOF, the City of Tacoma, by its City Council, has caused this bond to be executed in its name with the facsimile or manual signature of its Mayor, and attested by the facsimile or manual signature of its Clerk, and the seal of said City to be imprinted or impressed hereon, all as of the _____ day of _____, 199_.

CITY OF TACOMA, WASHINGTON

By _____
Mayor

(SEAL)

Attest:

_____
City Clerk

Authentication Date: _____

CERTIFICATE OF AUTHENTICATION

This bond is one of the bonds described in the within-mentioned Bond Ordinance and is one of the Electric System Revenue Bonds, 199_ of the City of Tacoma, Washington, dated _____, 199_.

WASHINGTON STATE FISCAL AGENCY, Bond Registrar

By _____
Authorized Officer

47

ASSIGNMENT

FOR VALUE RECEIVED, the undersigned hereby sells, assigns and transfers unto

_____

PLEASE INSERT SOCIAL SECURITY OR TAXPAYER IDENTIFICATION NUMBER OF TRANSFEREE

[ ]

_____

(Please print or typewrite name and address, including zip code, of Transferee)

_____ the within bond and does hereby irrevocably constitute and appoint _____ attorney-in-fact to transfer said bond on the books kept for registration thereof with full power of substitution in the premises.

DATED: _____.

SIGNATURE GUARANTEED:

_____

_____

NOTE: The signature on this Assignment must correspond with the name of the registered owner as it appears upon the face of the within bond in every particular, without alteration or enlargement or any change whatever.

ARTICLE V

APPLICATION OF PROVISIONS OF ORDINANCE TO BONDS

Section 5.1. Issuance of Future Parity Bonds. The provisions of Article V of the Ordinance relating to the issuance of Future Parity Bonds shall apply to the Bonds.

Section 5.2. Contract Resource Obligations. The provisions of Article VI of the Ordinance relating to Contract Resource Obligations shall apply to the Bonds.

Section 5.3. Application of Sections 7.1 through 7.3 of Ordinance Relating to Special Funds and Accounts. Except as otherwise provided below in Section 5.10, the provisions of

Sections 7.1 through 7.3 of the Ordinance relating to the Revenue Fund and the accounts therein, the Bond Fund and the accounts therein, the Cumulative Reserve Fund, and the investment of money held for the credit of such Funds shall apply to the Bonds.

Section 5.4. Covenants to Secure Bonds. The provisions of Article IX of the Ordinance setting forth the covenants to secure Bonds, as amended by Article VII of the First Supplemental Ordinance, shall apply to the Bonds.

Section 5.5. Supplemental and Amendatory Ordinances. The provisions of Article X of the Ordinance relating to supplemental and amendatory ordinances shall apply to the Bonds.

Section 5.6. Defaults and Remedies. The provisions of Article XI of the Ordinance relating to defaults and remedies shall apply to the Bonds.

Section 5.7. Amendments and Bondowners' Meetings. The provisions of Article XII of the Ordinance relating to amendments and bondowners' meetings shall apply to the Bonds.

Section 5.8. Miscellaneous. The provisions of Article XIII of the Ordinance relating to the City's contract with the owners of Bonds, money held by the Paying Agent one year after the due date, the benefits of the Ordinance and severability shall apply to the Bonds.

Section 5.9. Rights of AMBAC. The provisions of Article X of the Second Supplemental Ordinance and Article VII of the Fifth Supplemental Ordinance and Article VIII of the Sixth Supplemental Ordinance relating to the rights of AMBAC Indemnity Corporation are incorporated herein by reference and shall be in force and effect so long as any 1988 Bond, 1992 Bond or 1992B Bond, respectively, is Outstanding and insured by the municipal bond guaranty insurance policy therein authorized.

Section 5.10. Reserve Subaccount. There is hereby established within the Reserve Account a special subaccount entitled the "199__ Reserve Subaccount." Funds in such Reserve Subaccount shall be treated in all respects as other funds in the Reserve Account. The City shall make transfers into the Reserve Subaccount from money and investments in the

Reserve Account, from proceeds of the Bonds, or from other available money in amounts sufficient to satisfy the Reserve Account Requirement with respect to the Bonds.

The City is authorized to satisfy the requirements of Section 7.2 of the Ordinance with respect to the Reserve Account as to the Bonds through the use of Qualified Insurance, or a Qualified Letter of Credit, which may be purchased on the date of closing of the Bonds or after the issuance of the Bonds and substituted for amounts in the Reserve Subaccount pursuant to the provisions of Section 7.2 of the Ordinance.

ARTICLE VI

DISPOSITION OF BOND PROCEEDS

Section 6.1. Construction Account. A special fund of the City has heretofore been created and designated the "City of Tacoma Electric System Construction Fund" (the "Construction Fund"). There is hereby created within the Construction Fund a special account to be known as the "199__ Bonds Construction Account" into which shall be deposited from the proceeds of sale of the Bonds. Money in the Construction Account shall be used for paying part of the costs of the acquisition, construction and installation of the additions and improvements described in Exhibit A, and for paying all expenses incidental thereto (including but not limited to costs of issuance of the Bonds, engineering, financing, legal or any other incidental costs) and for repaying any advances heretofore or hereafter made on account of such costs, and such money or so much thereof as may be necessary be and hereby is appropriated for such purpose.

All proceeds of the Bonds so deposited in the Construction Account shall be continuously and fully invested to the extent practicable in Permitted Investments. Interest earned and income or profits derived by virtue of such investments shall remain in the account and be used for the purposes for which the Bonds are issued or other lawful purposes. Money in the Construction Account may be transferred to the Bond Fund in such amounts as shall be

necessary to pay principal of and interest on Bonds, and may be used to pay any Rebate Amount.

Section 6.2. Disposition of Proceeds. The proceeds of the Bonds are hereby appropriated for the following purposes and shall be deposited as follows:

1. The amount equal to the interest accruing on the Bonds from their dated date to the date of their delivery shall be deposited in the Interest Account in the Bond Fund and invested in Permitted Investments.

2. To the extent permitted by the Code, the amount that when added to other money in the Reserve Account will ensure that the total amount in the Reserve Account equals the Reserve Account Requirement shall be deposited in the Reserve Account in the Bond Fund.

3. The balance of the Bond proceeds shall be deposited in the Construction Account and used for the purposes specified in Sections 6.1, including payment of costs of issuance of the Bonds.

ARTICLE VII

SALE OF BONDS

Section 7.1. Sale of Bonds. The Bonds may be sold by competitive or negotiated sale, which sale shall be approved by the Bond Sale Resolution.

Section 7.2. Official Statement; Insurance. The Director and/or Deputy Director of Utilities are authorized to prepare a preliminary official statement for the marketing of the Bonds and to solicit bids for bond insurance. The Bond Sale Resolution shall approve the preliminary and final official statements and any bond insurance.

ARTICLE VIII

MISCELLANEOUS

Section 8.1. Defeasance. In the event that the City, in order to effect the payment, retirement or redemption of any Bond, sets aside in the Bond Fund or in another special account, advance refunding bond proceeds or other money lawfully available or direct obligations of the Department of the Treasury of the United States of America ("Government Obligations"), or any combination of such proceeds, money and/or Government Obligations, in amounts which, together with known earned income from the investment thereof are sufficient to redeem, retire or pay such Bond in accordance with its terms and to pay when due the interest and redemption premium, if any, thereon, and such proceeds, money and/or Government Obligations are irrevocably set aside and pledged for such purpose, then no further payments need be made into the Bond Fund for the payment of the principal of and interest on such Bond, and the owner of such Bond shall cease to be entitled to any lien, benefit or security of the Ordinance except the right to receive payment of principal, premium, if any, and interest from such special account, and such Bond shall be deemed not to be outstanding hereunder.

Section 8.2. Undertaking to Provide Ongoing Disclosure. In the Bond Sale Resolution the City shall undertake to provide certain ongoing disclosure for the benefit of the owners of the Bonds as required by Section (b)(5) of the Securities and Exchange Commission's Rule 15c2-12 under the Securities and Exchange Act of 1934.

Section 8.3. Severability. If any one or more of the provisions of this Eighth Supplemental Ordinance is or are held by any court of competent jurisdiction to be contrary to law, then such provision or provisions shall be null and void and shall be deemed separable from the remaining provisions and shall in no way affect the validity of the other provisions of this Eighth Supplemental Ordinance or the Bonds.

52

Section 8.4. Effective Date. This Eighth Supplemental Ordinance shall take effect and be in force thirty days after its passage, approval and publication as required by law. Any actions taken pursuant to this Eighth Supplemental Ordinance before its effective date and after its passage are hereby ratified, approved and confirmed.

INTRODUCED AND READ FOR THE FIRST TIME at a regular meeting of the City Council held the 16th day of July, 1996.

PASSED by the City Council of the City of Tacoma, Washington, and authenticated by its Mayor at a regular meeting of the Council held this 23rd day of July, 1996.

CITY OF TACOMA, WASHINGTON

By _____
Mayor

Attest:

Rick Rosenbladt
City Clerk

APPROVED AS TO FORM:

City Attorney, ch. 45 57.

53

CLERK'S CERTIFICATE

I, the undersigned, the duly chosen, qualified and ~~acting~~ City Clerk of the City of Tacoma, Washington, and keeper of the records of the City Council (herein called the "Council"), DO HEREBY CERTIFY:

1. That the attached Ordinance No. 25930 (herein called the "Ordinance") is a true and correct copy of an Ordinance of the Council, as finally passed at a regular meeting of the Council held on the 23rd day of July, 1996 and duly recorded in my office.

2. That said meeting was duly convened and held in all respects in accordance with law, and to the extent required by law, due and proper notice of such meeting was given; that a legal quorum was present throughout the meeting and a legally sufficient number of members of the Council voted in the proper manner for the passage of said Ordinance; that all other requirements and proceedings incident to the proper adoption of said Ordinance have been duly fulfilled, carried out and otherwise observed, and that I am authorized to execute this certificate.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the official seal of the City as of this 24th day of July, 1996.

Rick Rosenbladt

City Clerk
City of Tacoma, Washington

54

EXHIBIT A

TELECOMMUNICATIONS PROJECT

The Telecommunications Project will include some or all of the following elements:

Infrastructure improvements

Construct a hybrid fiber coax ("HFC") telecommunications infrastructure consisting of fiber optic rings and branches connecting nodes throughout the Light Division service area. This telecommunications system will be asymmetrically two-way capable. It will interconnect all Light Division substations. Connections may also be made with Light Division customers and with other providers of telecommunications infrastructure and services. This telecommunications system will have 500 channels. It will utilize existing Light Division rights-of-way.

Functions to be performed by infrastructure improvements

Through construction of the HFC telecommunications system, the Light Division's Telecommunications System will be capable of performing some or all of the following functions:

- conventional substation communications functions
- automated meter reading (electric and water)
- automated billing (electric and water)
- automated bill payment (electric and water)
- demand side management (DSM) functions, such as automated load (*e.g.* water heater) control
- provision of information to customers that is relevant to their energy and water purchasing decisions (*e.g.* information on time-of-use or "green" power rates)
- distribution automation
- remote turn on/turn off for electric and water customers
- city government communications functions
- CATV service
- transport of signals for service providers offering telecommunications services (*e.g.* Personal Communications Service (PCS), video on demand, high speed data, as well as conventional wired and wireless telecommunications services)
- Internet access service

55

REQUEST FOR ORDINANCE OR RESOLUTION

Request #:
Ordinance #:
Resolution #:

CITY CLERK USE
5257
25930

1. Date: June 21, 1996

	Requesting Department/Division/Program	Sponsored By	Phone/Extension
2.	Tacoma Public Utilities/Light Division	***Steve Klein***	***8203***
	Contact Person (for questions):		Phone/Extension
3.	Steve Klein		***502-8203***

4. Preparation of is requested for the City Council meeting of Tuesday July 16, 1996.

5. Summary Title/Recommendation: (A concise sentence, as it will appear on the Council Agenda)

   Authorize a Bond Ordinance for City of Tacoma, Washington, Department of Public Utilities, Light Division to clarify its legal authority to develop telecommunication capacity for cable television outside the City limits, certain telecommunications services, and other uses.

6. Background Information/General Discussion: (Why is this request necessary? Are there legal requirements? What are the viable alternatives? Who has been involved in the process?)

   Approval of this Bond Ordinance is necessary to confirm Light Division authority to engage in certain telecommunications activities. This determination will facilitate the decision-making process at the conclusion of the feasibility studies currently underway.

7. Financial Impact: (Future impact on the budget.)

8. List all material available as backup information for the request and indicate where filed:

Source Documents/Backup Material	Location of Document
Proposed Ordinance	Attached
Public Utility Board Resolution U-9198	Attached
Letter to City Council and Public Utility Board dated June 19, 1996.	Attached

9. Funding Source: (Enter amount of funding from each source)

Fund Number & Name:	State $	City $	Other $	Total Amount

If an expenditure, is it budgeted? ☐ Yes ☐ No Where? Org # Acct #

56

10. Department Director/Utility Division Approval	Approved as to Availability of Funds Director of Finance	City Manager/Director Utilities Approval

F\OffSys\Template\REQORD.DOC
06/21/96

Office Systems

Tacoma Public Utilities

Mark Crisson
Director

3628 South 35th Street
P.O. Box 11007
Tacoma, WA 98411-0007

Divisions
Light
Water
Belt Line

June 19, 1996

To the Mayor and Members of the City Council
and
To the Chairman and Members of the Public Utility Board

RE: Proposed Bond Ordinance Approval and Authorization to Proceed With a Declaratory Judgment Legal Action to Confirm Authority to Construct and Operate a Fiber Optics System With Cable Television and Telecommunications Capabilities/Board Resolution U-9198

As we previously discussed with you, the Light Division is proceeding to move forward with a further in-depth analysis of the feasibility of a fiber optics system. We will not move forward with this project until we have reviewed this future analysis with you and obtained your further appropriate approval.

This enabling legislation ordinance is specifically necessary at this time, however, in order to seek and obtain a declaratory judgment by the appropriate Washington State court to clarify the legal authority for certain aspects of the project. Chief Assistant City Attorney Mark Bubenik's confidential memorandum dated June 21, 1996 which has been furnished to each of you delineates the legal issues and procedures involved.

Very truly yours,

Mark Crisson
Director of Utilities

f/m/cabletv2

Tacoma Public Utilities

MEMORANDUM

To: Rick Rosenbladt, City Clerk

From: Mark Bubenik, Chief Assistant City Attorney

Date: June 27, 1996

Subject:

Please place the following proposed resolution(s) ordinance(s) on the agenda for the July 16, 1996 Council Meeting:

U-9198 Authorize approval of a proposed bond ordinance for the City of Tacoma, Light Division to clarify its legal authority to develop telecommunication capacity for cable tv outside the City limits

RESOLUTION NO. U-9198

WHEREAS the Light Division has determined that a telecommunications network system-wide will provide substantial benefits for the Light Division for substation communications, meter reading, demand side management, communications and other beneficial Light Division Electric System uses, and

WHEREAS by the installation of additional telecommunications capactiy, this system would have the capability of providing additional public benefits for the City, and Light Division ratepayers, and

WHEREAS for the above-stated purposes it will be necessary to approve a plan and system ordinance declaring the estimated cost thereof providing for the method of financing and providing for the adoption and implementation thereof, and a proposed ordinance providing for the issuance and sale of special obligation bonds of the City of Tacoma consisting of one million dollars ($1,000,000) of electric system revenue bonds to be issued to provide funds for such purposes, all as more specifically stated in the said proposed ordinance, which by this reference is incorporated herein, and

WHEREAS it is in the best public interest to approve the proposed ordinance and to request its passage by the City Council; Now, therefore,

BE IT RESOLVED BY THE PUBLIC UTILITY BOARD OF THE CITY OF TACOMA:

That the findings, terms and conditions of said proposed ordinance is

approved and the Council of the City of Tacoma is requested to concur by passing an ordinance substantially in the same form as attached and as approved by the City Attorney.

Approved as to form & legality:

Mark Bubenik

Chief Assistant City Attorney

Lydia Stevenson

Clerk

Carl W. Virgil

Chairman

Bil Moss

Acting Secretary

Adopted 6/26/96

ASLRA

Ordinance No. 25930

First Reading of Ordinance: JUL 16 1996 (Final reading 7/23/96)

Final Reading of Ordinance: JUL 23 1996

Passed: JUL 23 1996

Roll Call vote:

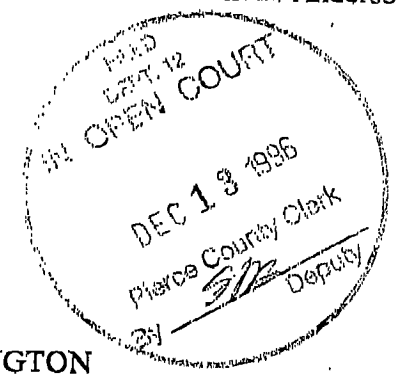
MEMBERS	AYES	NAYS	ABSTAIN	ABSENT
Mr. Baarsma	✓			
Mr. Crowley	✓			
Mr. DeForrest	✓			
Mr. Evans	✓			
Mr. Kirby	✓			
Dr. McGavick	✓			
Mr. Miller	✓			
Dr. Silas	✓			
Mayor Moss	✓			

MEMBERS	AYES	NAYS	ABSTAIN	ABSENT
Mr. Baarsma				
Mr. Crowley				
Mr. DeForrest				
Mr. Evans				
Mr. Kirby				
Dr. McGavick				
Mr. Miller				
Dr. Silas				
Mayor Moss				

EXHIBIT 12

Julia Marlowe 12/13
509-372-3330

The Honorable Grant L. Anderson



IN THE SUPERIOR COURT OF WASHINGTON

FOR PIERCE COUNTY

CITY OF TACOMA, a municipal corporation,

Plaintiff,

v.

THE TAXPAYERS AND RATEPAYERS OF THE CITY OF TACOMA,

Defendants.

No. 96 2 09938 0

ORDER GRANTING CITY OF TACOMA'S MOTION FOR SUMMARY JUDGMENT

This matter came on this day for hearing before the undersigned upon the City of Tacoma's ("City's") Motion for Summary Judgment. Plaintiff City of Tacoma appeared through its counsel, Elizabeth Thomas. Defendants Taxpayers and Ratepayers of the City of Tacoma appeared through their counsel, Ronald E. Thompson.

Counsel for the parties have drawn the Court's attention to the following documents: Summons, Complaint for Declaratory Judgment; Acceptance of Service; City of Tacoma's Motion for Summary Judgment; Memorandum in Support of Motion for Summary Judgment; Declaration of Jon Athow in Support of Motion for Summary Judgment; Defendants' Responsive Memorandum in Opposition to City of Tacoma's Motion for Summary Judgment; and City of Tacoma's Reply Brief.

Based on these documents, the Court finds that there is no genuine issue as to any material fact and that the facts set forth in the Declaration of Jon Athow are true.

PRESTON GATES & ELLIS
5000 COLUMBIA CENTER
701 FIFTH AVENUE
SEATTLE, WASHINGTON 98104-7078
TELEPHONE: (206) 623-7580
FACSIMILE: (206) 623-7022

Having considered the documents identified by the parties, the arguments of counsel and the record herein, the Court concludes that the following order should be entered.

1. The Court has jurisdiction over the subject matter and parties in this action.

2. Tacoma City Ordinance No. 25930 (the "Bond Ordinance") was properly enacted.

3. The City has authority under the laws of the State of Washington and the United States to provide cable television service in the Light Division service area.

4. The City has authority under the laws of the State of Washington and the United States to lease telecommunications facilities and capacity to telecommunications providers.

5. ~~The City has authority under the laws of the State of Washington and the United States to issue the Bonds for the purposes set for in paragraphs (3) and (4) above and in the manner set forth in the Bond Ordinance.~~

DONE IN OPEN COURT this 13 day of December, 1996.

GRANT L. ANDERSON

JUDGE

FILED
DEPT. 12
IN OPEN COURT
DEC 13 1996
Pierce County Clerk
By Deputy

Presented by:

PRESTON GATES & ELLIS

By /s/
Elizabeth Thomas, WSBA # 11544
Laura A. Rosenwald, WSBA # 25722

CITY OF TACOMA

By /s/
Mark Bubenik, WSBA # 3093
Chief Assistant City Attorney
Attorneys for Plaintiff City of Tacoma

PRESTON GATES & ELLIS
5000 COLUMBIA CENTER
701 FIFTH AVENUE
SEATTLE, WASHINGTON 98104-7078
TELEPHONE: (206) 623-7580
FACSIMILE: (206) 623-7022

The Honorable Grant L. Anderson

IN THE SUPERIOR COURT OF WASHINGTON

FOR PIERCE COUNTY

CITY OF TACOMA, a municipal corporation, Plaintiff, v. THE TAXPAYERS AND THE RATEPAYERS OF THE CITY OF TACOMA, Defendants.	No. 96 2 09938 0 CITY OF TACOMA'S MOTION FOR SUMMARY JUDGMENT

Plaintiff City of Tacoma ("City") requests that this Court enter a judgment declaring that:

1. The Court has jurisdiction over the subject matter and parties in this action.

2. Tacoma City Ordinance No. 25930 (the "Bond Ordinance") was properly enacted.

3. The City has authority under the laws of the State of Washington and the United States to provide cable television service in the Light Division service area.

4. The City has authority under the laws of the State of Washington and the United States to lease telecommunications facilities and capacity to telecommunications providers.

5. The City has authority under the laws of the State of Washington and the United States to issue the Bonds for the purposes set for in paragraphs (3) and (4) above and in the manner set forth in the Bond Ordinance.

O:\LAR\24624-00.015/SJMOT.DOC

PRESTON GATES & ELLIS
5000 COLUMBIA CENTER
701 FIFTH AVENUE
SEATTLE, WASHINGTON 98104-7078
TELEPHONE: (206) 623-7580
FACSIMILE: (206) 623-7022

Grounds for this motion are set forth in the record in this matter, the accompanying memorandum in support of motion for summary judgment, and the declaration of Jon Athow.

DATED this 12th day of November, 1996.

PRESTON GATES & ELLIS

By _____
Elizabeth Thomas, WSBA # 11544
Laura A. Rosenwald, WSBA # 25722

CITY OF TACOMA

By _____
Mark Bubenik, WSBA # 3093
Chief Assistant City Attorney

Attorneys for Plaintiff City of Tacoma

PRESTON GATES & ELLIS
5000 COLUMBIA CENTER
701 FIFTH AVENUE
SEATTLE, WASHINGTON 98104-7078
TELEPHONE: (206) 623-7580
FACSIMILE: (206) 623-7022

The Honorable Grant L. Anderson

IN THE SUPERIOR COURT OF WASHINGTON

FOR PIERCE COUNTY

CITY OF TACOMA, a municipal corporation, Plaintiff, v. THE TAXPAYERS AND THE RATEPAYERS OF THE CITY OF TACOMA , Defendants.	No. 96 2 09938 0 MEMORANDUM IN SUPPORT OF CITY OF TACOMA'S MOTION FOR SUMMARY JUDGMENT

Table Of Contents

I. INTRODUCTION 3

II. RELIEF REQUESTED 3

III. STATEMENT OF ISSUES 4

IV. EVIDENCE RELIED UPON 4

V. ARGUMENT 5

A. Summary Judgment Standard 5

B. The City Has Authority Under Washington Statutes To Construct and Operate the Telecommunications System and to Lease Portions of the System's Capacity or Facilities. 6

1. A Charter City Has Broad Powers. 6

2. A City Has Even Broader Powers When It Is Operating a Utility. 7

3. The City Has Authority Under Washington Statutes To Provide Telecommunications Services. 8

4. Washington Case Law Recognizes the City's Authority To Provide Telecommunications Services. 8

5. The City Has Authority To Lease City-Owned Telecommunications Facilities 9

C. Federal Law Requires that the City be Allowed to Provide Telecommunications Service. 10

VI. CONCLUSION 11

I. INTRODUCTION

The City of Tacoma (the "City") brought this declaratory judgment class action under RCW 7.24 and 7.25 and CR 23(B)(2) to confirm its authority to issue bonds for the purpose of constructing and operating a telecommunications system consisting of a hybrid fiber coaxial network (the "Telecommunications System"). On July 23, 1996, the Tacoma City Council adopted Ordinance No. 25930, which authorized the sale of Electric System revenue bonds (the "Revenue Bonds") in order to finance the first phase of constructing and operating the Telecommunications System. The City will utilize the Telecommunications System to enhance electric service to customers of its Light Division. The City may also utilize a portion of the Telecommunications System to provide cable television service to customers in the Light Division service area, and lease Telecommunications System facilities or capacity to providers of telecommunications services.

II. RELIEF REQUESTED

The City requests that the Court enter judgment declaring that:

1. The Court has jurisdiction over the subject matter and parties in this action.
2. Tacoma City Ordinance No. 25930 (the "Bond Ordinance") was properly enacted.
3. The City has authority under the laws of the State of Washington and the United States to provide cable television service in the Light Division service area.
4. The City has authority under the laws of the State of Washington and the United States to lease telecommunications facilities and capacity to telecommunications providers.
5. The City has authority under the laws of the State of Washington and the United States to issue the Bonds for the purposes set for in paragraphs (3) and (4) above and in the manner set forth in the Bond Ordinance.

III. STATEMENT OF ISSUES

1. Whether the City has authority under state law to provide cable television service.

2. Whether the City has authority under federal and state law to lease telecommunications facilities and capacity to telecommunications providers.

IV. EVIDENCE RELIED UPON

The City believes that the following facts are undisputed in every material respect. These facts are contained in the Declaration of Jon Athow in Support of the City's Motion for Summary Judgment ("Athow Decl.").

Plaintiff, the City of Tacoma, is a municipal corporation and a city of the first class of the State of Washington. The Defendants herein are taxpayers of the City of Tacoma and ratepayers of its electrical utility, which is known as the Light Division of the Department of Public Utilities (the "Light Division"). Harold E. Nielsen, Jr., the taxpayer and ratepayer representative, is a resident and taxpayer of the City and a customer of the Light Division. The City currently owns and operates, through its Light Division, an electric utility (the "Electric System") for the purpose of providing electricity and other energy services throughout the City and other portions of Pierce County.

The Telecommunications System will be used to improve the speed and capability of the existing real-time communications among certain Electric System substations, and to extend such real-time communications to the remaining substations. In addition, the Telecommunications System may be used to enhance such existing energy services as demand management, identification of outages, meter reading, billing and payment, and resource dispatch. The Telecommunications System may be used to perform similar functions for the City's provision of water service. The City's authority to issue the Revenue Bonds to finance the purposes discussed in this paragraph is not at issue.

The City may also utilize a portion of the Telecommunications System to provide cable television service to customers within the Light Division service area, and to lease facilities or capacity to providers of video-on-demand, data transport, telephony, and other telecommunications services. By providing cable television service and/or leasing facilities or capacity to telecommunications providers, the City can ensure a range of choices for consumers, provide public interest television programming, and improve the availability of competitively priced telecommunications services.

The City also estimates that by providing cable television service and/or leasing facilities or capacity, it could generate substantial revenue to help offset the costs of constructing and operating the Telecommunications System. Because the infrastructure for the telemetry improvements designed to meet Electric System needs represents a substantial portion of the costs of the Telecommunications System, the relative cost of these additional revenue-producing capabilities is low.[1]

The Tacoma City Council enacted Ordinance No. 25930 (the "Bond Ordinance") on July 23, 1996, at a regular meeting.[2] The Bond Ordinance provides for the construction and operation of a Telecommunications System within the Light Division and for the issuance and sale of Electric System revenue bonds in the aggregate principal amount of $1,000,000.

V. ARGUMENT

A. Summary Judgment Standard

Summary judgment is appropriate to dispose of actions or parts thereof when no genuine issues of material fact exist or when only a question of law exists. CR 56(c). "The burden is on the moving party to demonstrate that there is no issue as to a material fact." *Scott v. Pacific West Mountain Resort*, 119 Wn. 2d 484, 502-03 (1992). If the party seeking summary judgment successfully carries its initial burden, the burden shifts to the non-moving party to establish the

---

1 Declaration of Jon Athow in Support of Motion for Summary Judgment ("Athow Decl."), ¶ 10.

2 A true and correct copy of the Bond Ordinance is attached as Exhibit C to Mr. Athow's Declaration.

existence of the facts on which it has the burden of proof at trial. *Young v. Key Pharmaceuticals, Inc.*, 112 Wn. 2d 216, 225 (1989). The non-moving party must respond with specific facts and cannot rely on bare allegations contained in his or her pleadings. *Baldwin v. Sisters of Providence,* 112 Wn. 2d 127, 132 (1989). Conclusory statements or argumentative assertions raised in affidavits are insufficient to raise an issue of fact and do not preclude summary judgment. *Grimwood v. University of Puget Sound, Inc.*, 110 Wn. 2d 355, 359-60 (1988).

In the instant case, there are no issues of material fact. The facts bearing on the City's authority to provide cable television service and to lease telecommunications facilities and capacity to telecommunications providers are undisputed. Only questions of law remain. The case should therefore be resolved on summary judgment.

B. The City Has Authority Under Washington Statutes To Construct and Operate the Entire Telecommunications System and To Lease Portions of the System's Capacity or Facilities.

1. A Charter City Has Broad Powers.

The Washington Constitution grants broad powers to first-class charter cities such as Tacoma. It states, "Any city containing a population of ten thousand inhabitants, or more, shall be permitted to frame a charter for its own government, consistent with and subject to the Constitution and laws of this state . . . ." Wash. Const. art XI, § 10. Under Chapter 35 RCW, a charter city has "all the powers which are conferred upon incorporated cities and towns by this title or other laws of the state, and all such powers as are usually exercised by municipal corporations of like character and degree." RCW 35.22.570. In addition to this "omnibus" grant of power, RCW 35.22.900 provides that grants of power to first-class cities must be liberally construed to carry out the objectives of chapter 35.22 RCW. *See also Citizens for Financially Responsible Government v. City of Spokane*, 99 Wn. 339, 343 (1983).

In light of these constitutional and statutory provisions, the Washington Supreme Court has held that "the only limitation on the power of cities of the first class is that their action cannot

contravene any constitutional provision or any legislative enactment. . . . [A] city of the first class has as broad legislative powers as the state, except when restricted by enactments of the state legislature." *Winkenwerder v. City of Yakima*, 52 Wn. 2d 617, 622 (1958).

2. A City Has Even Broader Powers When It Is Operating a Utility.

The powers of a city under Washington law are especially broad when the city is performing a proprietary, as distinguished from a governmental, function. In *Tacoma v. Taxpayers*, 108 Wn.2d 679 (1987), the Washington Supreme Court stated that while municipal authority must be narrowly construed when the function is governmental, "when the Legislature authorizes a municipality to engage in a business, it may exercise its business powers much in the same way as a private individual. . . . We have viewed the Legislature as implicitly authorizing a municipality to make all contracts, and to engage in any undertaking necessary to make its municipal electric utility system efficient and beneficial to the public." *Id.* at 694-95. *See also Hite v. Public Utility Dist. No. 2*, 112 Wn.2d 456, 459 (1989) ("It is clear that in the production and sale of electricity, a municipal corporation acts in its proprietary capacity. . . . In that capacity, a municipal corporation acts as the proprietor of a business enterprise for the private advantage of the city and may exercise its business powers in much the same way as a private individual or corporation.").[3]

In addition, the courts have recognized many instances in which public utility districts, which are municipal corporations with more limited powers than cities, may engage in activities that are incidental to their expressly authorized functions of providing electric or other utility service. *See, e.g., Puget Power and Light Co. v. Public Utility District No. 1 of Chelan County*, 17 Wn. App. 861 (1977) (involving public utility district's provision of recreational facilities); *Snohomish County Public Utility District No. 1 v. Broadview Television Co.*, 91 Wn.2d 3, 8 (1978) (upholding district's

[3] *Hite* and *Taxpayers* made clear that the holding in *Chemical Bank v. Washington Public Power Supply System*, 99 Wn.2d 772 (1983), does not detract from the broad authority that cities enjoy when acting in a proprietary capacity.

authority to lease pole attachments even though activity is "only incidental to the accomplishment of the district's primary purpose, the distribution and sale of electricity").

3. The City Has Authority Under Washington Statutes To Provide Telecommunications Services.

The City's statutory powers include the authority to provide telecommunications services. First, the City, as a first class charter city having code city powers as well, has all powers not denied by law, "including operating and supplying of utilities and municipal services commonly or conveniently rendered by cities or towns." RCW 35A.11.020. Tacoma may conveniently render telecommunications services because the Light Division has an existing citywide electric system of connections to customers' homes, because it has existing billing relationships with customers, and because it can provide services economically. Second, there is no express statutory prohibition against city provision of municipal telecommunications services. *Winkenwerder, supra.* To the contrary, the Legislature has acknowledged that cities provide communications services through enacting a statute providing for the burying of city-owned communications facilities. RCW 35.96.030. Finally, the Legislature has determined that competitive markets for telecommunications services serve the public interest. RCW 80.36.300; *In re Electric Lightwave, Inc.*, 123 Wn.2d 530, 538-39 (1994) (noting that "it is the state's policy to promote diversity in the supply of telecommunications services and products in telecommunications markets throughout the state"). The City's provision of telecommunications services will make the market more competitive, thus furthering the public interest recognized by the Legislature.

4. Washington Case Law Recognizes the City's Authority To Provide Telecommunications Services.

The Washington Supreme Court in *Issaquah v. Teleprompter Corp.*, 93 Wn. 2d 567 (1980), recognized the power of a code city under RCW 35A.11.020 to utilize its telecommunications system to provide telecommunications services, including cable television service. The Court held in *Teleprompter* that a city was authorized by statute to operate a cable television system under the

broad authority of RCW 35A.11.020 because there was "no general law which conflicts with the city's authority under the optional municipal code to operate such a system." *Id.* At 575. First class charter cities such as Tacoma have all the powers granted to code cities. RCW 35.22.570. Thus, under *Teleprompter* the City is clearly authorized to use its Telecommunications System to offer cable television service.

Tacoma's authority is not limited to the provision of cable television service. *Teleprompter* provides no basis for distinguishing cable television from other telecommunications services. The Washington Legislature views cable television as a telecommunications service. *See, e.g.,* RCW 80.04.010 (defining "telecommunications" as "the transmission of information by wire, radio, *optical cable,* electromagnetic, or other similar means) (emphasis added); RCW 80.36.370 (exempting cable television from the Washington Utilities and Transportation Commission's regulation of telecommunications services). Thus, *Teleprompter* clarifies the authority for Tacoma to provide telecommunications services.

5. The City Has Authority To Lease City-Owned Telecommunications Facilities

The City has authority under its charter and under state law to lease excess capacity and facilities of its Telecommunications System to other telecommunications providers. Tacoma's Charter expressly permits the City to lease City property. Tacoma, Wash., Code § 9.1. Under state law, a first class city has the power to:

> control the finances and property of the corporation, and to acquire, by purchase and otherwise, such lands and other property as may be necessary for any part of the corporate uses provided for by its charter, and to dispose of any such property as the interests of the corporation may, from time to time, require.

RCW 22.280(3). The Washington Supreme Court has upheld the authority of cities to lease municipal property to private parties as long as the lease does not interfere with public use. *Winkenwerder, supra* at 624. Cities are specifically authorized to lease surplus utility property and equipment. Ch. 35.94 RCW.

C. **Federal Law Requires that the City Be Allowed To Provide Telecommunications Service.**

The City's authority to provide telecommunications services must be recognized under the Telecommunications Act of 1996, Pub. L. No. 104-104, § 253, 110 Stat. 70 (1996) (the "Act"), as a consequence of the Act's prohibition against barriers to the entry of any entity into the telecommunications market. Federal law can preempt state utility regulation. *Public Utility District No. 1 of Pend Oreille County v. Federal Power Commission*, 308 F.2d 318 (D.C. Cir. 1962) (holding that the Federal Power Act preempted Washington statute purporting to limit city's ability to condemn property for power plant). The *Pend Oreille* court found that preemption was required merely by implication of a federal law. Here, the case for preemption is far stronger because the Act expressly preempts state interference in the telecommunications market. Section 253 of the Act states, "No state or local statute or regulation, or other state or local legal requirement, may prohibit or have the effect of prohibiting the ability of *any entity* to provide *any* interstate or intrastate telecommunications service." Telecommunications Act of 1996, Pub. L. No. 104-104, § 253, 110 Stat. 70 (1996) (emphasis added). There is no language in either the statute or its legislative history exempting cities from the law's application. To the contrary, a House Committee Report states that Section 253 "is intended to remove all barriers to entry in the provision of telecommunications services." House Rep. No. 104-458. A state law precluding telecommunications services constitutes a legal requirement. Thus, any Washington law that would prohibit Tacoma from providing telecommunications service is expressly preempted by the Act.

In addition, the thrust of the Telecommunications Act is to encourage the availability and affordability of telecommunications services. *See, e.g.,* Section 254, requiring various mechanisms to promote universal service. Tacoma is well positioned to make telecommunications services available to the public at a competitive price, thereby furthering this federal policy.

VI. CONCLUSION

Under its broad powers as a first-class charter city, the City has authority to use a portion of its Telecommunications System to provide cable television service and to lease a portion of its Telecommunications System facilities or capacity to other telecommunications service providers. Federal law expressly bars any requirement that would undercut this authority. Because there is no dispute over the material facts underlying its authority, the City is therefore entitled to judgment as a matter of law.

DATED this 5th day of November, 1996.

Respectfully submitted,

PRESTON GATES & ELLIS

By _____
Elizabeth Thomas, WSBA # 11544
Laura A. Rosenwald, WSBA # 25722

CITY OF TACOMA

By _____
Mark Bubenik, WSBA # 3093
Chief Assistant City Attorney
Attorneys for Plaintiff City of Tacoma

EXHIBIT 13

The Honorable Grant L. Anderson

IN THE SUPERIOR COURT OF WASHINGTON

FOR PIERCE COUNTY

CITY OF TACOMA, a municipal corporation, Plaintiff, v. THE TAXPAYERS AND RATEPAYERS OF THE CITY OF TACOMA, Defendants.	No. 96 2 09938 0 (PROPOSED) ORDER GRANTING CITY OF TACOMA'S MOTION FOR SUMMARY JUDGMENT

This matter came on this day for hearing before the undersigned upon the City of Tacoma's ("City's") Motion for Summary Judgment. Plaintiff City of Tacoma appeared through its counsel, Elizabeth Thomas. Defendants Taxpayers and Ratepayers of the City of Tacoma appeared through their counsel, Ronald E. Thompson.

Counsel for the parties have drawn the Court's attention to the following documents: Summons, Complaint for Declaratory Judgment; Acceptance of Service; City of Tacoma's Motion for Summary Judgment; Memorandum in Support of Motion for Summary Judgment; Second Declaration of Jon Athow in Support of Motion for Summary Judgment; Defendants' Responsive Memorandum in Opposition to City of Tacoma's Motion for Summary Judgment; Declarations of Heidi Imhoff, Thomas Pagano, and Cary Deaton; City of Tacoma's Reply Brief; and Declaration of Steven J. Klein.

PRESTON GATES & ELLIS
5000 COLUMBIA CENTER
701 FIFTH AVENUE
SEATTLE, WASHINGTON 98104-7078
TELEPHONE: (206) 623-7580
FACSIMILE: (206) 623-7022

however the Court is making no finding as to the financial feasibility of the Project or as to the legality of any future bond issues. 11/16

Based on these documents, the Court finds that there is no genuine issue as to any material fact ~~and that the facts set forth in the Declaration of Jon Athow are true~~ and Steven J. Klein. 11/16

Having considered the documents identified by the parties, the arguments of counsel and the record herein, the Court concludes that the following order should be entered.

The City has authority under the laws of the State of Washington and the United States to issue the Bonds for the purposes set forth in paragraphs (3) and (4) in this Court's Order dated December 13, 1996 and in the manner set forth in the Bond Ordinance. Bi motion of revenue Nb

DONE IN OPEN COURT this 9th day of May, 1997.

Grant E. Anderson
JUDGE

Presented by:

PRESTON GATES & ELLIS

By E. Thomas
Elizabeth Thomas, WSBA # 11544
Laura A. Rosenwald, WSBA # 25722

CITY OF TACOMA

By Mark Bubenik
Mark Bubenik, WSBA # 3093
Chief Assistant City Attorney
Attorneys for Plaintiff City of Tacoma

(Copy received 9 May 97
Attorney for Petitioners
4085

PRESTON GATES & ELLIS
5000 COLUMBIA CENTER
701 FIFTH AVENUE
SEATTLE, WASHINGTON 98104-7078
TELEPHONE: (206) 623-7580
FACSIMILE: (206) 623-7022

The Honorable Grant L. Anderson

IN THE SUPERIOR COURT OF WASHINGTON

FOR PIERCE COUNTY

CITY OF TACOMA, a municipal corporation,

Plaintiff,

v.

THE TAXPAYERS AND THE RATEPAYERS OF THE CITY OF TACOMA,

Defendants.

No. 96 2 09938 0

CITY OF TACOMA'S REPLY BRIEF

I. INTRODUCTION

The City of Tacoma (the "City") has moved for summary judgment on the fifth of five issues brought in this action:[1] Whether the City has authority to issue revenue bonds to finance the first phase of construction and operation of a telecommunications system consisting of a hybrid fiber coaxial network (the "Telecommunications System"). In its Motion on this final issue, the City

[1] On December 13, 1996, this Court ruled on four of the City's five requested declarations. The Court held that (1) the Court has jurisdiction over the subject matter and parties in this action; (2) Tacoma Ordinance No. 25930 (the "Bond Ordinance"), which provides for the issuance and sale of Electric System revenue bonds in the aggregate principal amount of $1,000,000 (the "Bonds") in order to finance the first phase of constructing and operating the Telecommunications System, was properly enacted; (3) the City has authority under the laws of the State of Washington and the United States to provide cable television service in the service area of the Light Division of the City's Department of Public Utilities (the "Light Division"); and (4) the City has authority under the laws of the State of Washington and the United States to lease telecommunications facilities and capacity to telecommunications providers. *See* Order Granting City of Tacoma's Motion for Summary Judgment dated December 13, 1996 (the "Order").

explained how issuing the bonds is a legislative act subject to review only for such deficiencies as fraud, bad faith, or ultra vires actions. The City noted that no facts relating to fraud, bad faith, etc., have been alleged and that through the Order, the Court has already determined that construction and operation of the Telecommunications System is not ultra vires.

Defendants' responsive brief did not take issue with any of these points. Nor did their brief attempt to show facts sufficient to satisfy the stringent legal standard for review of legislative acts. Defendants' sole legal argument is that the Tacoma City Charter (the "Charter") requires a public vote authorizing issuance of the Bonds. However, the Charter does not require a vote of the people under the facts of this case because no such vote is required for the issuance of *revenue* bonds.

Defendants' brief also argues extensively that revenues from the Telecommunications System may be inadequate to cover debt service on the Bonds. This factual argument is simply not material to the question of the City's authority to issue the Bonds, and therefore cannot raise a "genuine issue as to any *material* fact[.]" CR 56 (emphasis supplied). Moreover, the issue is outside of the scope of the Court's review.

II. STATEMENT OF ISSUES

1. Whether a Tacoma City Charter provision that requires a vote of the people to authorize certain general obligation bonds should be read to require such a vote for the issuance of Electric System revenue bonds for the first phase of the Telecommunications Project.

2. Whether the adequacy of revenues from the Telecommunications System is material to whether the Tacoma City Council acted within its legislative discretion in approving the Bond Ordinance and determining to proceed with the Telecommunications Project.

III. STATEMENT OF FACTS

For purposes of this Motion for Summary Judgment, the City accepts Defendants' truly factual statements. However, the Court should not consider Defendants' unsupported conclusions or

the statements of their experts that are beyond the scope of their expertise.[2] Many of Defendants' unsupported conclusions are belied by admissible evidence. For example, the brief makes an inflammatory and irrelevant reference to the Washington Public Power Supply System,[3] claiming that the Tacoma general fund and City taxpayers will be burdened with debt if Light Division revenues fail to cover debt service on the Bonds.

Defendants' have alleged no specific facts in support of their conclusion that the Telecommunications Project could become an obligation of the general fund. The Bond Ordinance expressly states that it provides "for the issuance and sale of the City's Electric System Revenue Bonds[.]" Complaint, Ex. 1, title page; *see also* id. at sections 1.2.B ("Bonds" defined to mean revenue bonds); 2.3 (Bonds' only lien is upon net revenues of electric system); 2.4 (finding that sufficient revenues over and above operation and maintenance will be available to pay debt service on Bonds); 3.1 and 4.7(a) (reiterating that the type of bond involved is a revenue bond).

The difference between revenue bonds and general obligation bonds is highly significant. The City's obligation under a revenue bond is limited to funds available from the Electric System (which includes the Telecommunications Project). Bond holders will buy a bond that says, "Principal of and interest on this bond are payable solely out of the special fund of the City known as the Electric System Revenue Bond Fund[.]" Bond Ordinance section 4.7(a). The bond will also make clear that the City is obligated to set aside only "Revenues of said Electric System" to pay off the bonds. *Id.* Thus, no general fund dollars are committed and no general obligation is incurred under the Bond Ordinance. By the same token, revenues from electric customers are retained by the Light Division

---

[2] Defendants' submission of a declaration from Mr. Pagano fails to comply with the rules for disclosure of experts. Defendants have not identified Mr. Pagano as a witness, despite the fact that the cutoff for disclosure of witnesses was in November 1996. The City was not aware that he had been retained prior to receiving Defendants response on this motion, and have had no opportunity to conduct discovery. Yet in order to put this matter before the Court expeditiously, the City is not seeking discovery at this time.

[3] *See* Defendants' Responsive Memorandum in Opposition to City of Tacoma's Motion for Summary Judgment ("Defendants' Response") at 4.

and are not available to the General Fund. In sum, there is no exposure to the City general fund or City taxpayers.

In a similarly unsupported and unsupportable allegation, Defendants claim that the City has failed to fully consider the legality of the issuance of the Bonds. *See* Defendants' Response at 4. However, the whole purpose of this action is to ensure full consideration of whether the Bonds are legal prior to proceeding with the Telecommunications System.[4]

Defendants also assert that the City's financial projections ignore current trends with regard to technology, regulations and competition. *See* Defendants' Response at 5. This argument is immaterial for reasons detailed below. Moreover, the Telecommunications Study was prepared by a team of experts who devoted considerable attention to trends in the telecommunications industry. *See* Klein Decl. at Paragraphs 7-11. Defendants allege without benefit of supporting authority that the Tacoma City Council ("City Council") had reservations about financing the Telecommunications System. *See* Defendants' Response at 5. However, it is an undisputed fact that the City Council unanimously adopted the Resolution authorizing the City to proceed with the Telecommunications System.[5]

IV. ARGUMENT

A. To Defeat a Motion for Summary Judgment, Defendants Must Present Admissible Evidence To Establish the Existence of an Issue of Material Fact.

Summary judgment is appropriate to resolve actions or parts thereof when no genuine issues of material fact exist or when only a question of law exists. CR 56(c). "The burden is on the moving party to demonstrate that there is no issue as to a material fact." *Scott v. Pacific West Mountain Resort*, 119 Wn. 2d 484, 502-03 (1992). If the party seeking summary judgment successfully carries its initial burden, the burden shifts to the non-moving party to establish the existence of the facts on

---

[4] The City's approach to this Telecommunications Project, seeking confirmation of its authority from this Court before proceeding, is markedly different from the course of events involving WPPSS. There, no declaration of authority was sought before construction began.

[5] Second Declaratoin of Jon Athow in Support of Motion for Summary Judgment dated April 11, 1997, ("Second Athow Decl."), paragraph 6.

asserted failure to comply with the Charter provision. Therefore, they have implicitly admitted that the City has authority to issue the Bonds if their Charter argument fails.

C. Charter Section 4.2 Is Irrelevant Because the Question of Whether the City May Finance the Telecommunications System with General Obligation Bonds Is Not Before the Court.

Defendants claim that under the Tacoma City Charter, a vote of the people is required in order to incur general indebtedness for the Telecommunications Project. This may be true, but the argument is wholly misplaced. Under the Charter, no vote of the people is required for utility system acquisitions unless "general indebtedness is incurred by the city."[7] The Bonds are revenue bonds. Under Washington law, the principal and interest on revenue bonds is payable only from specified municipal revenues, and such bonds "shall **not** constitute . . . a general obligation" of the municipal corporation. RCW 39.46.150. Therefore, no amount of argument over the assumptions and conclusions of the financial plan can convert the bonds at issue in this case from revenue bonds into general obligation bonds. No matter how poorly the Telecommunications Project might perform, holders of the Bonds would have no claim upon the general fund. Poor performance could not convert the Bonds from revenue bonds into general obligation bonds. Accordingly, no vote of the people is required for issuance of the Bonds.

The City could have chosen to issue general obligation bonds for the Telecommunications System. However, at this time, it has elected to issue only revenue bonds. If the City in the future wished to issue general obligations bonds as a funding source for the Telecommunications System, the Charter provision might apply. However, concerns about general obligation bonds at this point are purely speculative.

---

[7] The Charter provision upon which Defendants rely is Section 4.2 It proivdes:

> The city may purchase, acquire, or construct any public utility system, or part thereof, or make any additions and betterments thereto or extensions thereof, without submitting the proposition to the voters, provided no general indebtedness is incurred by the city. If such indebtedness is to be incurred, approval by the electors, in the manner provided by state law, shall be required.

IV. CONCLUSION

This Court has already ruled that the City has authority to construct and operate a telecommunications system for purposes of enhancing electrical service and for providing telecommunications services and leasing telecommunications facilities and capacity. This Court's role is not to second-guess the City Council's and Public Utility Board's carefully considered decisions about whether and how the Telecommunications System should be developed. The only question before the Court is whether the City can issue revenue bonds to finance activities that, according to the Court, it is authorized to carry on. Defendants' sole legal argument, that the City must obtain a vote of the people for such bonds, fails because revenue bonds are not a "general obligation." Defendants' remaining factual arguments are either unsupported by admissible evidence or do not address the standard under which the Court must review legislative acts. Therefore, the Court should grant the City's Motion for Summary Judgment.

DATED this 5th day of May, 1997.

Respectfully submitted,

PRESTON GATES & ELLIS

By _____
Elizabeth Thomas, WSBA # 11544
Laura A. Rosenwald, WSBA # 25722

CITY OF TACOMA

By _____
Mark Bubenik, WSBA # 3093
Chief Assistant City Attorney
Attorneys for Plaintiff City of Tacoma

The Honorable Grant L. Anderson

IN THE SUPERIOR COURT OF THE STATE OF WASHINGTON

IN AND FOR THE COUNTY OF PIERCE

CITY OF TACOMA, a municipal corporation,

Plaintiff,

v.

THE TAXPAYERS AND THE RATEPAYERS OF THE CITY OF TACOMA,

Defendants.

No. 96-2-09938-0

DECLARATION OF STEVEN J. KLEIN IN SUPPORT OF CITY'S REPLY

1. My name is Steve Klein. I am the Superintendent of the Light Division of Tacoma Public Utilities. The purpose of this declaration is to support the City of Tacoma's reply brief on its motion for summary judgment. I am over the age of eighteen, competent to testify in this matter, and make this declaration based upon my own personal knowledge.

2. The City of Tacoma, through its Light Division, plans to construct and operate telecommunications facilities and services to enhance the Light Division's ability to provide highly reliable, cost-effective and convenient electric service to its customers (the "Telecommunications Project"). Such a system would also be capable of carrying other telecommunications services, including cable television service.

3. As my staff has described previously, the City adopted the Bond Ordinance (Complaint, Ex. 1) in July 1996 for the purpose of partially funding the Telecommunications Project.[1] The City's purpose in bringing this litigation is to test the validity of the Bond Ordinance, which provides for the issuance of revenue bonds only. The City is not asking the Court to determine whether the City could issue any other type of bonds.

4. The Bond Ordinance unequivocally provides for the issuance of revenue bonds rather than general obligation bonds. The Bond Ordinance expressly states that it provides "for the issuance and sale of the City's Electric System Revenue Bonds[.]" Complaint, Ex. 1, title page; *see also* id. at sections 1.2.B ("Bonds" defined to mean revenue bonds); 2.3 (Bonds' only lien is upon net revenues of electric system); 2.4 (finding that sufficient revenues over and above operation and maintenance will be available to pay debt service on Bonds); 3.1 and 4.7(a) (reiterating that the type of bond involved is a revenue bond).

5. The difference between revenue bonds and general obligation bonds is highly significant. The City's obligation under a revenue bond is limited to funds available from the Electric System (which includes the Telecommunications Project). Bond holders will buy a bond that says, "Principal of and interest on this bond are payable solely out of the special fund of the City known as the Electric System Revenue Bond Fund[.]" Bond Ordinance section 4.7(a). The bond will also make clear that the City is obligated to set aside only "Revenues of said Electric System" to pay off the bonds. *Id.* Thus, no general fund dollars are committed and no general obligation is incurred under the Bond Ordinance. By the same token, revenues from electric customers are retained by the Light Division and are not available to the General Fund.

6. The only other funding source that is currently contemplated for the Telecommunications Project is a surplus of approximately $40 million in the Light Division current

---

[1] Declaration of Jon Athow in Support of Motion or Summary Judgment (Nov. 5, 1996), paragraph 15.

fund. This is the money that I mentioned at a City Council meeting on April 8, 1997.[2] This money is generated exclusively by Light Division activities, primarily sales of electric power. As I stated, that $40 million might otherwise be used to buy down debt. But contrary to the unsupported implication of Defendants' Response, the money would only be used to buy down Light Division debt, not general fund or other City debt. Because the Telecommunications Project is an element of the Electric System, it will enhance the capability and value of the Electric System, and will be owned and operated by the Light Division, it is an appropriate investment for Light Division surplus.

7. The Light Division produced a Telecommunications Study[3] that includes a Business Plan. The Business Plan was *unanimously* approved by both the Tacoma Public Utility Board and the Tacoma City Council in April 1997.

8. The Business Plan is based upon assumptions that are fully substantiated in light of current trends in the telecommunications industry. It involved a review of the industry both nationally and locally. *Id.* at page 1. It was based on input from a wide range of experts. The Telecommunications Study, including the Business Plan, was prepared by a multidisciplinary group called the Telecommunications Study Team. This team of approximately twenty people included Jon Athow, other Light Division staff and outside consultants practicing in the areas of telecommunications, finance, business planning, marketing and the law.

9. The Telecommunications Study also included an economic development study produced expressly for purposes of analyzing whether the City should proceed with the Telecommunications Project. *See* Appendix D. Two of the five authors of this economic development study hold doctorate degrees, and the authors consulted with about 20 other professionals in the community.

---

[2] My comments are excerpted in the Declaration of Heidi Imhoff dated April 28, 1997.

[3] This study, which is contained in a three-ring binder, was submitted as Exhibit D to Jon Athow's declaration dated April 11, 1997.

10. Through the Telecommunications Study, the City carefully considered issues similar to those raised by Defendants' witnesses. *See, e.g.*, chapter on options (fifth section of Study). This section of the Study analyzes in detail the various options for telecommunications services from various private providers, considering such factors as types of service offered, current and potential technology utilized by different providers, projections for future growth and financial risk, investment profile, etc. This options analysis is thoroughly documented through 73 endnotes. *See also* Appendix B (Light Division response to TCI letter regarding municipal ownership of telecommunication and cable systems).

11. The members of the Utility Board and the members of the City Council participated actively in analysis of financial plan issues. After the Telecommunications Study was complete, they held a three-hour work session on the Telecommunications Project and entertained about two hours of public testimony and discussion before unanimously voting to proceed with the Project as set forth in the Study. Discussion was vigorous both at the work session and at the public hearing.

12. As Light Division staff explained to the Board and Council, and as the Council itself found in the Resolution approving the Project,[4] a key purpose of the Telecommunications Project is to protect and enhance the value of the Light Division's existing electric utility assets by having a telecommunications system that is sophisticated enough to enable the Light Division to compete effectively in the rapidly evolving electric industry. To fulfill this important purpose of protecting the value of existing Light Division *electric* assets, it is not at all necessary that the revenues from the provision of telecommunications and cable television services cover the entire cost of the Telecommunications Project.

13. The Council and Board were aware when they voted to proceed that revenues from the provision of telecommunications and cable services might fall short of projections. As Light Division staff informed the Board and Council, under a "worst case" shortfall, electric rates might

---

[4] This resolution as adopted is attached as Exhibit B to Jon Athow's declaration dated April 11, 1997.

have to be increased by as much as 2.5%. This scenario assumed that we incurred all the cost of building the system but obtained no revenues from provision of cable television service or from provision of telecommunications service to third parties. This "worst case" scenario is significantly worse than the scenario that Defendants' experts present.

14. Light Division staff explained to the City Council our view that even if the Telecommunications Project's revenues fell short of projections, even to the point of a worst case scenario (resulting in a 2.5% rate increase), still the City should proceed with the Project in order to secure the value of the City's electric system assets. I believe that in voting to proceed with the Project, the Council fully understood and accepted the risk of an electric rate increase.

15. Thus, it is not terribly important whether the Telecommunications Project's own revenues will be sufficient to cover its costs. Similarly, although I believe our Financial Plan is very sound, including our assumptions regarding interest rates and other factors, whether we used precisely correct assumptions is not significant.

16. The important question is whether Light Division revenues will be sufficient to cover Telecommunications Project costs, since we are issuing electric system revenue bonds for the Project and other Project costs will be funded by accumulated Light Division revenues. Obviously, Light Division revenues are sufficient. Indeed, Light Division revenues are 40 times greater than worst-case Project costs. Thus there is zero possibility that the Telecommunications Project could somehow affect the City's general fund and its taxpayers.

I swear under the penalty of perjury of the laws of the State of Washington that the foregoing is true and correct.

Dated: May 5, 1997 at Tacoma, Washington.

Steven J. Klein

EXHIBIT 14

Tacoma Public Utilities

Mark Crisson
Director

3628 South 35th Street
P.O. Box 11007
Tacoma, WA 98411-0007

Divisions
Light
Water
Belt Line

June 30, 1998

Mr. Ray E. Corpuz, Jr.
City Manager
Tacoma, Washington

Dear Ray:

I am forwarding for distribution to the Mayor and City Council copies of a recent article from the Internet. MSNBC has written a very informative piece about Tacoma Power's Click!Network. It was written complete with slides of our work in progress. I know the City Council, as well as the Board, will be proud of this national coverage.

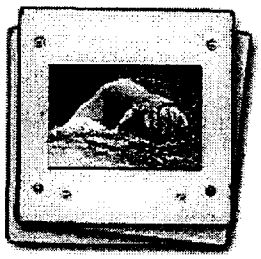
Thank you for your assistance in this matter.

Very truly yours,

Lydia Stevenson
for Mark Crisson
Director of Utilities

Attachment
cc: Public Utility Board
Staff

Terri Harris / Special to MSNBC



Click for slide show

Debra Stewart, ClickNetwork manager, with part of the new fleet of vehicles the utility has acquired.

Tacoma Power to give TCI a jolt

Municipal utility prepares to jump into cable

By David Bowermaster
MSNBC

June 28 — While AT&T officials congratulate themselves on their $48 billion purchase of Tele-Communications Inc., they might want to keep an eye on the Northwest corner of TCI's sprawling cable empire. Tacoma Power, the city-owned utility of Tacoma, Wash., will soon turn on a $100 million broadband communications network that will enable it to sell cable TV and Internet access as well as water and electricity — making it a direct competitor to TCI.

COMPLETE STORY

MSNBC COVERAGE
SPECIAL REPORT AT&T-TCI special report

IF THE PROJECT is successful, it is sure to encourage more municipal utilities to take on TCI and other cable monopolies across the country.

The effort is already getting attention from local governments weary of residents' complaints about high prices and poor service from their incumbent cable provider. Tired of waiting for new competitors to shake things up, many cities and towns are thinking about either constructing their own cable network, or encouraging their local utility to do it for them. Tacoma Power's ClickNetwork is the largest such effort to date.

Concerned cable industry officials are launching a public relations counter-offensive, citing studies that question the viability of such projects and complaining that access to public funds give government-backed systems an unfair competitive edge.

"Financially, they just don't work," says Steven Effros, president of the Cable Telecommunications Association in Washington, D.C.

TCI considered ClickNetwork enough of a threat that Leo Hindery, president of the $7.6 billion cable powerhouse and a Tacoma native, traveled to his old hometown last October to lobby against it.

The visit did not go well. Hindery's first meeting deteriorated into an ugly shouting match when Tacoma City Council members ripped TCI for what they considered its history of abysmal service. And Hindery's offer to work with Tacoma Power (then called Tacoma City Light) and upgrade TCI's cable system to meet the needs of both the city and the utility was disregarded as too little, too late.

"Leo looked us in the eye and said, 'I understand there have been broken promises. I understand there have been a lot of tears. I'm here to make things right,' " recalls city council member Bill Baarsma. "But to have that discussion on the day of the vote created really an impossible situation for us."

Operator-foreman Craig Moore, of Westland Inc., a

By a


Moore, of Westland Inc., a general contractor from Gig Harbor, Wash., uses the "hole hog" to bore a trench in northwest Tacoma prior to placing conduit for ClickNetwork. The neighborhood will be one of the first to receive the new cable service.

Teri Harris / Special to MSNBC

unanimous 9-0 margin, the City Council authorized Tacoma Power to spend $67 million to get the project under way. The utility will have to go back to the council for approval to spend the additional $22.4 million needed to finish the job. The funds will come from a cash reserve of more than $100 million that the utility has accumulated by aggressively buying and selling power on the open market.

Deb Stewart, a 20-year cable industry veteran recruited to run the show, has pushed an aggressive build-out schedule. An official launch date is not set, but Stewart says cable service will be available to selected Tacoma neighborhoods in a few weeks, and all 200,000 residents will have access to both cable and high-speed Internet access from ClickNetwork by the end of 1999.

From the outset the network will offer somewhere between 75 and 85 channels of video programming. Until recently TCI's 50,000 customers in Tacoma have received just 40 channels, but TCI spokesman Steven Kipp says the company is spending "tens of millions of dollars" on upgrades in Tacoma that are boosting capacity to around 70 channels. The upgrades have reached about 20,000 customers so far and should hit the rest by the end of the year.

TCI is also beta-testing the At Home high-speed Internet access service in Tacoma and should start rolling it out in the fall. Stewart says ClickNetwork will begin offering high-speed Web surfing capabilities at roughly the same time.

Stewart refused to disclose pricing for either service, but says they will be "extremely competitive" with TCI.

FRINGE BENEFITS

Tacoma Power did not have cable on its mind when it first considered building a fiber-optic network three years ago. Rather, the initial plan was to build an internal network that would improve communications between the company's far flung electric, water and railway operations. Deregulation of the power business was looming, and Tacoma Power knew it needed to operate more efficiently in a competitive world.

'The system is not being built as a cable system. We have got a multilayered business model.'
— **DEB STEWART**
ClickNetwork

Consultants from Stanford Research Institute brought in to review the project told Tacoma Power officials that the utility could vastly improve the economics of the planned network by extending it throughout the city and selling a mix of cable TV, high speed Internet access and telephone service.

"The system is not being built as a cable system," insists Stewart, general manager of ClickNetwork. "We have got a multilayered business model."

The distinction is an important one, intended to counter arguments that the financial returns of a cable "overbuild" — a new network infrastructure built over the same area as an existing one — can not cover the costs.

A recent study by telecommunications consulting firm The Strategis Group examined the prospects for utility-built cable networks in cities with 5,000 homes, 50,000 homes and 150,000 homes. Even if the municipal utility secured a 50 percent market share and also sold high-speed Internet access services, The Strategis Group concluded that in all cases "an overbuilder would not generate sufficient cash flow from operations of the cable system to pay back its debt."

Carol Mann, one of the study's authors, says the review did not account for potential revenues from telephone service — which ClickNetwork plans to offer eventually — or cost savings from the utility's internal operations. Stewart says those added benefits will enable Click to pay off with just a 25 percent cable market share.

"I would not recommend that any cable operator, or a municipality, do an overbuild just to get a 50 percent market share of cable customers," Stewart says.

WILL EFFORT SPREAD?

Utilities are looking at 'whatever they can provide to give them more stability in their customer base.'
— **BRIAN TOURNIER**
A.G. Edwards & Sons

Projects like ClickNetwork are also extremely important to the core business of utilities like Tacoma Power, says Brian Tournier, a municipal bond analyst with A.G. Edwards & Sons, since new communications services will help discourage customers from fleeing to new competitors.

"In almost every case the interest in telecommunications and cable is being driven by the desire to keep their electric services competitive with other electricity providers," Tournier says. Utilities are looking at "whatever they can provide to give them more stability in their customer base," he says.

So far most of the new municipal utility cable projects have been built in small, often remote towns. But if the Tacoma project does well, big cities are likely to jump into the fray as well. If that happens, conflicts with the cable industry are sure to grow in intensity.

"If you're a small municipality, it's likely you can do this and not incite the wrath of the cable industry,"

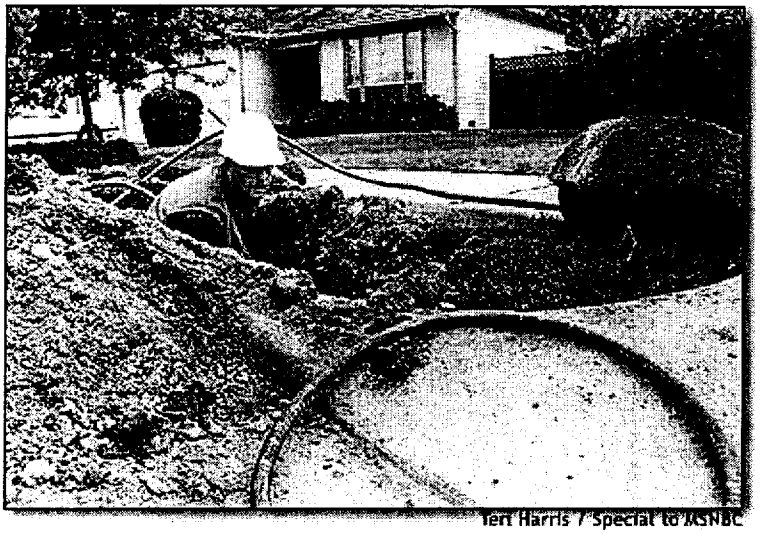
Tournier says, "but you will see very bitter fights in any large cities where a municipal systems tries to introduce cable service. The existing companies will fight them tooth and nail."

LINKS, SITES & MEDIA
MSNBC not responsible for content of Internet links
INTERNET Tele-Communications Inc.
INTERNET AT&T
INTERNET Tacoma Power
INTERNET Cable Telecommunications Association

Cover | Quick News | News | Business | Sports | Local News | Technology | Living & Travel | On Air
Opinions | Weather | The Microsoft Network | Find | About MSNBC | Help | Cool Tools | Write Us
Index | Advertising on MSNBC | Terms, Conditions, and Privacy

MSNBC • Find • Help • Cool Tools • Write Us

Going whole hog



Teri Harris / Special to MSNBC

Operator/foreman Craig Moore, of Westland Inc., a general contractor from Gig Harbor, Wash., uses the "hole hog" to bore a trench in northwest Tacoma prior to placing conduit for Click!Network. The neighborhood will be one of the first to receive the new cable service.

MSNBC COVERAGE

•Return to story

MSNBC HOME

Keeping in touch

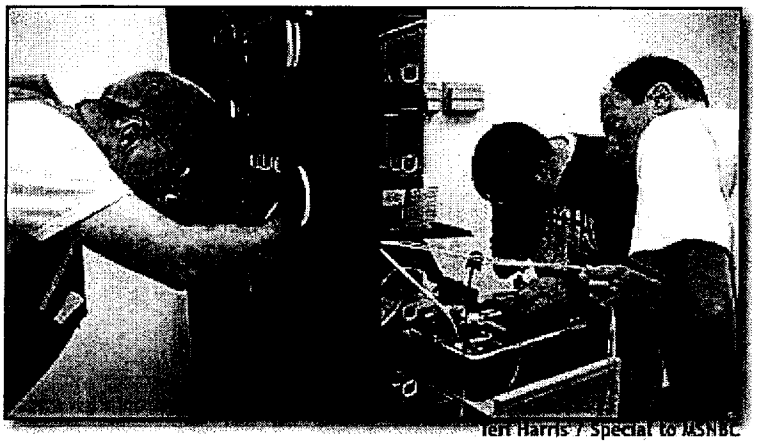
Jeri Harris / Special to MSNBC

Click!Network customer care representatives Josh Newman, left, and Jan Stacy study a Tacoma area map to verify new construction for a customer. Poor customer service from TCI in the past is one reason Click!Network got a go-ahead from city officials.

MSNBC COVERAGE

- Return to story

Data Splicing



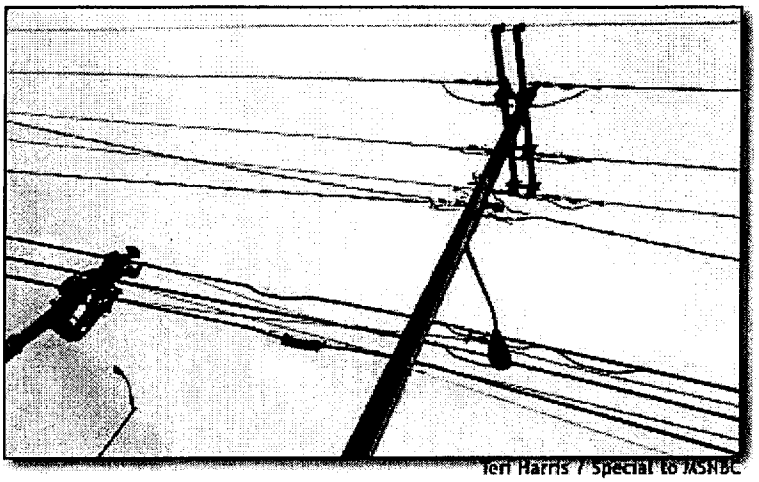
Jeff Harris / Special to MSNBC

Network technicians Craig Taylor, left, Tim Normandin and Tim Hogan splice fiber for incoming data at the Click!Network headend facility. The information will enable technicians to monitor the network's performance.

MSNBC COVERAGE

- Return to story

More Fiber



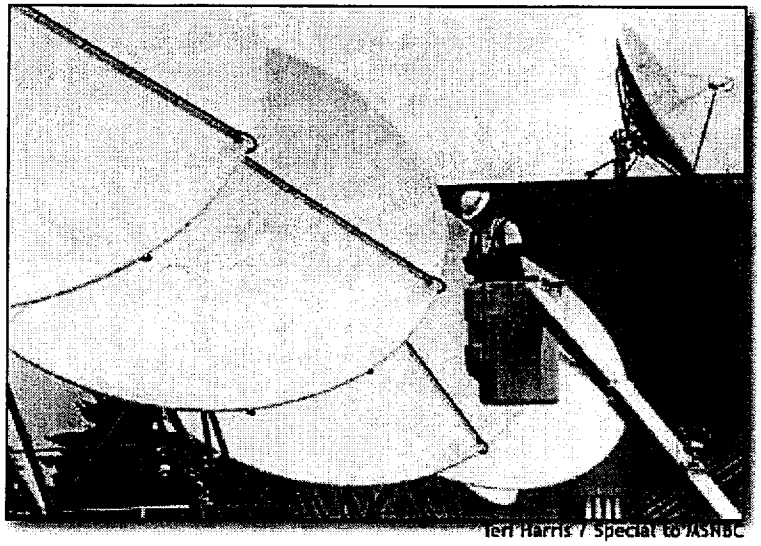
Teri Harris / Special to MSNBC

Lineman Andrew Hannah, of Florida-based subcontractor Fibre Cable Inc., pulls extra fiber for future expansions of Click!Network. Eighty percent of the installation is overhead work.

MSNBC COVERAGE

- Return to story

Doing the Dishes



Teri Harris / Special to MSNBC

Network technician Craig Taylor checks the alignment on one of the six satellite receiving dishes at Click!Network. Each of the dishes is aligned on a different satellite in geosynchronous orbit 26,000 miles above the earth.

MSNBC COVERAGE

•Return to story

EXHIBIT 15

2019 FCC Form 499-A Telecommunications Reporting Worksheet (Reporting 2018 Revenues)

Approval by OMB
3060-0855

>>> Please read instructions before completing. <<<

Annual Filing -- due April 1, 2019

Block 1: Contributor Identification Information

During the year, filers must refile Blocks 1, 2 and 6 if there are any changes in Lines 104 or 112. See Instructions.

101 Filer 499 ID [If you don't know your number, contact the administrator at (888) 641-8722. If you are a new filer, write "NEW" in this block and a Filer 499 ID will be assigned to you.]	825076
102 Legal name of filer	City of Tacoma, Dept. of Public Utilities, Light Division
103 IRS employer identification number	[Enter 9 digit number] 91-6001283
104 Name filer is doing business as	Click! Network

105 Telecommunications activities of filer [Select up to 5 boxes that best describe the reporting entity. Enter numbers starting with "1" to show the order of importance -- see instructions.]

☐ Audio Bridging (teleconferencing) Provider		☐ CAP/CLEC	☐ Cellular/PCS/SMR (wireless telephony inc. by resale)	
☒ 1 Coaxial Cable	☐ Incumbent LEC	☐ Interconnected VoIP	☐ Interexchange Carrier (IXC)	☐ Local Reseller
☐ Non-Interconnected VoIP	☐ Operator Service Provider	☐ Paging & Messaging	☐ Payphone Service Provider	☐ Prepaid Card
☐ Private Service Provider	☐ Satellite Service Provider	☐ Shared-Tenant Service Provider / Building LEC		☐ SMR (dispatch)
☐ Toll Reseller	☐ Wireless Data	☒ 2 Other Local	☐ Other Mobile	☐ Other Toll

If Other Local, Other Mobile or Other Toll is checked, describe carrier type / services provided: → Carrier Carrier last mile transport

106.1 Affiliated Filers Name/Holding company name (All affiliated companies must show the same name on this line.)	Check if filer has no affiliates ☒
106.2 Affiliated Filers Name/Holding company IRS employer identification number	[Enter 9 digit number]
107 FCC Registration Number (FRN) [https://apps.fcc.gov/cores/userLogin.do] [For assistance, contact the CORES help desk at 877-480-3201 or CORES@fcc.gov]	[Enter 10 digit number] 0007466642
108 Management company [if filer is managed by another entity]	
109 Complete mailing address of reporting entity corporate headquarters	Street1 3628 South 35th St; Street 2; Street 3; City Tacoma; State WA; Zip (postal code) 98409; Country if not USA United States
110 Complete business address for customer inquiries and complaints ☐ check if same address as Line 109	Street1 3628 South 35th St; Street 2; Street 3; City Tacoma; State WA; Zip (postal code) 98409; Country if not USA United States
111 Telephone number for customer complaints and inquiries [Toll-free number if available]	(253) - 502-8900 ext -

112 List all trade names used in the past 3 years in providing telecommunications. Include all names by which you are known by customers.

a	Click! Network	g	
b		h	
c		i	
d		j	
e		k	
f		l	

Use additional sheets if necessary. Each filer must provide all names used for telecommunications activities.

PERSONS MAKING WILLFUL FALSE STATEMENTS IN THE WORKSHEET CAN BE PUNISHED BY FINE OR IMPRISONMENT UNDER TITLE 18 OF THE UNITED STATES CODE, 18 U.S.C. § 1001

Block 2-A: Regulatory Contact Information

201 Filer 499 ID [from Line 101]	825076
202 Legal name of filer [from Line 102]	City of Tacoma, Dept. of Public Utilities, Light Division
203 Person who completed this Worksheet	First Pamela MI S Last Burgess
204 Telephone number of this person	(253) - 502-8015 ext -
205 Fax number of this person	(253) - 502-8493
206 Email of this person || not for public release ||	pburgess@click-network.com
207 Corporate office, attn. name, and mailing address to which future Telecommunications Reporting Worksheets should be sent check if same name as Line 203 [X] check if same address as Line 109 [X]	Office Attn First name Pamela MI S Last Burgess Email ||not for public release|| pburgess@click-network.com Phone (253) - 502-8015 ext- Fax (253) - 502-8493 Street1 3628 South 35th St Street 2 Street 3 City Tacoma State WA Zip (postal code) 98409 Country if not USA United States
208 Billing address and billing contact person [Plan administrators will send bills for contributions to this address. Please attach a written request for alternative billing arrangements.] check if name and address same as Line 207 [X]	Company Attn First name Pamela MI S Last Burgess Email ||not for public release|| pburgess@click-network.com Phone (253) - 502-8015 ext- Fax (253) - 502-8493 Street1 3628 South 35th St Street 2 Street 3 City Tacoma State WA Zip (postal code) 98409 Country if not USA United States
208.1 Email address pertaining to ITSP regulatory fee issues	||not for public release|| shelley.roberts@click-network.com

Block 2-B: Agent for Service of Process

All carriers and providers of interconnected and non-interconnected VoIP must complete Lines 209 through 213. During the year, these filers must refile Blocks 1, 2 and 6 if there are any changes in this section. See Instructions.

209 D.C. Agent for Service of Process	Company Attn First name MI Last
210 Telephone number of D.C. agent	( ) - ext -
211 Fax number of D.C. agent	( ) -
212 Email of D.C. agent	
213 Complete business address of D.C. agent for hand service of documents	Street1 Street 2 Street 3 City Washington State DC Zip
214 Local/alternate Agent for Service of Process (optional)	Company Attn First name MI Last
215 Telephone number of local/alternate agent	( ) - ext -
216 Fax number of local/alternate agent	( ) -
217 Email of local/alternate agent	
218 Complete business address of local/alternate agent for hand service of documents	Street1 Street 2 City State Zip (postal code) Country if not USA

PERSONS MAKING WILLFUL FALSE STATEMENTS IN THE WORKSHEET CAN BE PUNISHED BY FINE OR IMPRISONMENT UNDER TITLE 18 OF THE UNITED STATES CODE, 18 U.S.C. § 1001

Block 2-C: FCC Registration and Contact Information	Filers must refile Blocks 1, 2 and 6 if there are any changes in this section. See Instructions.
219 Filer 499 ID [from Line 101]	825076
220 Legal name of filer [from Line 102]	City of Tacoma, Dept. of Public Utilities, Light Division
221 Chief Executive Officer (or, highest ranking company officer if the filer does not have a chief executive officer)	First Tenzin MI Last Gyaltsen
222 Business address of individual named on Line 221 check if same as Line 109 ☒	Street1 3628 South 35th St Street 2 Street 3 City Tacoma State WA Zip (postal code) 98409 Country if not USA United States
223 Second ranking company officer, such as Chairman (Must be someone other than the individual listed on Line 221)	First Pamela MI Last Burgess
224 Business address of individual named on Line 223 check if same as Line 109 ☒	Street1 3628 South 35th St Street 2 Street 3 City Tacoma State WA Zip (postal code) 98409 Country if not USA United States
225 Third ranking company officer, such as President or Secretary (Must be someone other than individuals listed on Lines 221 or 223)	First Carrie MI Last Harding
226 Business address of individual named on Line 225 check if same as Line 109 ☒	Street1 3628 South 35th St Street 2 Street 3 City Tacoma State WA Zip (postal code) 98409 Country if not USA United States

227 Indicate jurisdictions in which the filer provides service. Include jurisdictions in which service was provided in the past 15 months and jurisdictions in which service is likely to be provided in the next 12 months.

☐ Alabama	☐ Guam	☐ Massachusetts	☐ New York	☐ Tennessee
☐ Alaska	☐ Hawaii	☐ Michigan	☐ North Carolina	☐ Texas
☐ American Samoa	☐ Idaho	☐ Midway Atoll	☐ North Dakota	☐ Utah
☐ Arizona	☐ Illinois	☐ Minnesota	☐ Northern Mariana Islands	☐ U.S. Virgin Islands
☐ Arkansas	☐ Indiana	☐ Mississippi	☐ Ohio	☐ Vermont
☐ California	☐ Iowa	☐ Missouri	☐ Oklahoma	☐ Virginia
☐ Colorado	☐ Johnston Atoll	☐ Montana	☐ Oregon	☐ Wake Island
☐ Connecticut	☐ Kansas	☐ Nebraska	☐ Pennsylvania	☒ Washington
☐ Delaware	☐ Kentucky	☐ Nevada	☐ Puerto Rico	☐ West Virginia
☐ District of Columbia	☐ Louisiana	☐ New Hampshire	☐ Rhode Island	☐ Wisconsin
☐ Florida	☐ Maine	☐ New Jersey	☐ South Carolina	☐ Wyoming
☐ Georgia	☐ Maryland	☐ New Mexico	☐ South Dakota	

228 Year and month filer first provided (or expects to provide) telecommunications in the U.S.	☒ Check if prior to 1/1/1999, otherwise:	Year	Month

Block 3: Carrier's Carrier Revenue Information

301	Filer 499 ID [from Line 101]	825076				
302	Legal name of filer [from Line 102]	City of Tacoma, Dept. of Public Utilities, Light Division				
	Report billed revenues for January 1 through December 31, 2018. Do not report any negative numbers. Dollar amounts may be rounded to the nearest thousand dollars. However, report all amounts as whole dollars. See instructions regarding percent interstate & international.	Total Revenues (a)	If breakouts are not book amounts, enter whole percentage estimates: Interstate (b)	If breakouts are not book amounts, enter whole percentage estimates: International (c)	Breakouts: Interstate Revenues (d)	Breakouts: International Revenues (e)
	Revenues from Services Provided for Resale as Telecommunications by Other Contributors to Federal Universal Service Support Mechanisms					
	Fixed local service					
	Monthly service, local calling, connection charges, vertical features, and other local exchange service including subscriber line and PICC charges to IXCs					
303.1	Provided as unbundled network elements (UNEs)	$0.00	0.00%	0.00%	$0.00	$0.00
303.2	Provided under other arrangements	$0.00	0.00%	0.00%	$0.00	$0.00
	Per-minute charges for originating or terminating calls					
304.1	Provided under state or federal access tariff	$0.00	0.00%	0.00%	$0.00	$0.00
304.2	Provided as unbundled network elements or other contract arrangement	$0.00	0.00%	0.00%	$0.00	$0.00
	Local private line & business data service					
305.1	Provided to other contributors for resale as telecommunications	$489,626.82	0.00%	0.00%	$0.00	$0.00
305.2	Provided to other contributors for resale as interconnected VoIP	$0.00	0.00%	0.00%	$0.00	$0.00
306	Payphone compensation from toll carriers	$0.00	0.00%	0.00%	$0.00	$0.00
307	Other local telecommunications service revenues	$0.00	0.00%	0.00%	$0.00	$0.00
308	Universal service support revenues received from Federal or state sources	$0.00	0.00%	0.00%	$0.00	$0.00
	Mobile services (i.e., wireless telephony, paging, messaging, and other mobile services)					
309	Monthly, activation, and message charges except toll	$0.00	0.00%	0.00%	$0.00	$0.00
	Toll services					
310	Operator and toll calls with alternative billing arrangements (credit card, collect, international call-back, etc.)	$0.00	0.00%	0.00%	$0.00	$0.00
311	Ordinary long distance (direct-dialed MTS, customer toll-free (800/888 etc.) service, "10-10" calls, associated monthly account maintenance, PICC pass-through, and other switched services not reported above)	$0.00	0.00%	0.00%	$0.00	$0.00
312	Long distance private line services	$0.00	0.00%	0.00%	$0.00	$0.00
313	Satellite services	$0.00	0.00%	0.00%	$0.00	$0.00
314	All other long distance services	$0.00	0.00%	0.00%	$0.00	$0.00
315	Total revenues from resale [Lines 303 through 314]	$489,626.82	0.00%	0.00%	$0.00	$0.00

See section III.C.2 of the instructions for the requirements applicable to revenue reported on this page. These records must be made available to the administrator or the FCC upon request.

Federal Communications Commission

(RETAIN FOR YOUR RECORDS)

Form 477 Filing Summary

FRN: **0007466642** | Data as of: **Jun 30, 2018** | Operations: **Non-ILEC** | Submission Status: **Original - Submitted** | Last Updated: **Aug 20, 2018 11:54:09**

Filer Identification

Section	Question	Response
Filer Information	Provider Name	Tacoma Power dba Click! Network
	Holding Company Name	City of Tacoma
	SAC ID	
	499 ID	825076
Data Contact Information	Data Contact Name	Pam Burgess
	Data Contact Phone Number	(253) 502-8015
	Data Contact E-mail	pburgess@click-network.com
Emergency Operations Contact Information	Emergency Operations Name	Click Network Operations Center
	Emergency Operations Phone Number	(253) 502-8990
	Emergency Operations E-mail	clicknoc@click-network.com
Certifying Official Contact Information	Certifying Official Name	Tenzin Gyaltsen
	Certifying Official Phone Number	(253) 502-8763
	Certifying Official E-mail	tgyaltsen@click-network.com

Data Submitted

Form Section	File Name	Date & Time	Number of Rows
Fixed Broadband Deployment	FBD_Jan_Jun_2018_Click_Network.txt	Aug 20, 2018 11:48:55	6911
Fixed Broadband Subscription	2018_08_14 Click! Census Tract (do over).txt	Aug 20, 2018 11:51:12	442

Fixed Broadband Deployment

Census Block Counts by State, DBA Name and Technology

State	DBA Name	Technology	Blocks
Washington	ClickCableTV(wholesale)	Cable Modem – DOCSIS 3.0	6701
		Optical Carrier/Fiber to the End User	210
Total			**6911**

Fixed Broadband Subscription

Fixed Broadband Subscriptions by State, Technology and End-user Type

State	Technology	Census Tracts	Subscriptions		
			Consumer	Business / Govt	Total
Washington	Cable Modem	442	21150	1294	22444
Total		**442**	**21150**	**1294**	**22444**

Fixed Broadband Subscriptions by Bandwidths and End-user Type

Downstream Bandwidth (in Mbps)	Upstream Bandwidth (in Mbps)	Consumer	Business / Govt	Total
6.000	1.000	6886	337	7223
12.000	2.000	8486	338	8824
20.000	5.000	3964	68	4032
30.000	6.000	697	200	897
55.000	8.000	302	233	535
100.000	10.000	815	118	933
Total		**21150**	**1294**	**22444**

Fixed Broadband Subscriptions by Technology, Bandwidths and End-user Type

Technology	Downstream Bandwidth (in Mbps)	Upstream Bandwidth (in Mbps)	Consumer	Business / Govt	Total
Cable Modem	6.000	1.000	6886	337	7223
	12.000	2.000	8486	338	8824
	20.000	5.000	3964	68	4032
	30.000	6.000	697	200	897
	55.000	8.000	302	233	535
	100.000	10.000	815	118	933
Total			**21150**	**1294**	**22444**

Description of Services Ordered and Certification Form 471

Universal Service Administrative Co.

FCC Form 471

Application Information

Nickname 19TPL-471-C1

Application Number 191019585

Funding Year 2019

Category of Service Category 1

Billed Entity

Tacoma Public Library
1102 Tacoma Ave S Tacoma WA 98402
253-292-2001
cbassett@tplonline.org

Billed Entity Number 17001842

FCC Registration Number 0011877545

Applicant Type Library System

Contact Information

Joseph Pillo
203-306-1722
jpillo@eratefirst.com

Consulting Firms

Name	Consultant Registration Number	City	State	Zip Code	Phone Number	Email
E-Rate First	16065884	Milford	CT	6460	203-306-1722	jpillo@eratefirst.com

Entity Information

Library System - Details

BEN	Name	FSCS Code	Urban/ Rural	School District Name	School District BEN	Library System Attributes
17001842	Tacoma Public Library		Urban		352041	Public Library System

Related Entity Information

Related Child Library Entity - Details

BEN	Name	FSCS Code	Locale Code	Urban/ Rural	Total Square Footage	School District Name	School District BEN	Library Attributes
115884	MOTTET BRANCH LIBRARY		999	Urban	5025			Public Library
115905	GEORGE O SWASEY BRANCH LIBRARY		999	Urban	9686			Public Library
115925	GRACE R MOORE BRANCH LIBRARY		999	Urban	15487			Public Library

BEN	Name	FSCS Code	Locale Code	Urban/ Rural	Total Square Footage	School District Name	School District BEN	Library Attributes
115933	SOUTH TACOMA BRANCH LIBRARY		999	Urban	7475			Public Library
115944	KOBETICH BRANCH LIBRARY		999	Urban	5000			Public Library
115966	FERN HILL BRANCH LIBRARY		999	Urban	7996			Public Library
145280	TACOMA PUBLIC LIBRARY		999	Urban	95727	TACOMA SCHOOL DISTRICT 10	145279	Main Branch; Public Library
189853	WHEELOCK BRANCH		999	Urban	16932			Public Library

Discount Rate

Associated School District Full-time Enrollment	Associated School District NSLP Count	Associated School District NSLP Percentage	Library Urban/ Rural Status	Category One Discount Rate	Category Two Discount Rate
30221	16811	56.0%	Urban	80%	80%

Funding Request for FRN #1999029534

Funding Request Nickname: 19TPL-WAN-CLICK

Service Type: Data Transmission and/or Internet Access

What is the FRN number from the previous year ? 1899031537

Agreement Information - Contract

Contract Number

Establishing FCC Form 470 160006668

Was an FCC Form 470 posted for the product and/or services you are requesting? Yes

Award Date February 26, 2016

How many bids were received for this contract? 1

What is the service start date? July 01, 2019

Account Number

Service Provider City of Tacoma Dept of Public Utilities Light Division (SPN: 143035981)

Based on State Master Contract? No

Based on a multiple award schedule? No

Includes Voluntary Extensions? No

Remaining Voluntary Extensions

Total Remaining Contract Length

What is the date your contract expires for the current term of the contract? June 30, 2021

Document Name	Document Description
Signed Click Service Order.pdf	Click IA

Pricing Confidentiality

Is there a statute, rule, or other restriction which prohibits publication of the specific pricing information for this contract? No

Narrative 1Gbps of Internet Access, burstable up to 10Gbps delivered via 10G circuit to Library hub, distributed over Library WAN via (7) 1G circuits

Line Item # 1999029534.001

Product and Service Details

Purpose Internet access service with no circuit (data circuit to ISP state/regional network is billed separately)

Function Fiber

Type of Connection Ethernet

Bandwidth Speed

Upload Speed 1.0 Gbps

Download Speed 1.0 Gbps

Burstable Speed 10.0

Connection Information

Does this include firewall services? Yes

Is this a connection between eligible schools, libraries and NIFs (i.e., a connection that provides a "Wide area network")? No

Is this a direct connection to a single school, library or a NIF for Internet access? Yes

Cost Calculation for FRN Line Item # 1999029534.001

Monthly Cost	
Monthly Recurring Unit Cost	$2,350.00
Monthly Recurring Unit Ineligible Costs	- $0.00
Monthly Recurring Unit Eligible Costs	= $2,350.00
Monthly Quantity	x 1
Total Monthly Eligible Recurring Costs	= $2,350.00
Months of Service	x 12
Total Eligible Recurring Costs	= $28,200.00

One-Time Cost	
One-time Unit Cost	$0.00
One-time Ineligible Unit Costs	- $0.00
One-time Eligible Unit Cost	= $0.00
One-time Quantity	x 0
Total Eligible One-time Costs	= $0.00

Summary	
Total Eligible Recurring Costs	$28,200.00
Total Eligible One-time Costs	+ $0.00
Pre-Discount Extended Eligible Line Item Cost	= $28,200.00

Transparency Disclosures

City of Tacoma, Dept. of Public Utilities, Light Division dba Click! Network

FRN 0007466642

Type of ISP Service:	Click! Network provides wired broadband Internet access service using the Data Over Cable System Interface Specification (DOCSIS) platform, on a wholesale basis for resale by qualified Internet Service Providers	
Effective date:	June 11, 2018	
Submission type:	Initial Disclosure	
Version History:	Original	6/11/2018
	Revision 1 - speeds	2/1/2019

Click! Network, a section of Tacoma Power, strives to provide information to customers and end users about all of its services in a transparent manner. Additionally, the Federal Communications Commission (FCC) requires that Click! Network and other providers of broadband Internet access services disclose certain information about those Internet services. The purpose of this document, in addition to the disclosures, terms and conditions posted at www.clickcabletv.com, is to assist consumers in finding the information needed to make an informed decision about which services best meet their needs.

Click! Network operates a network consisting of a fiber optic backbone, fiber optic rings, and a hybrid fiber-coaxial (HFC) distribution system throughout Tacoma, University Place, Fircrest, Fife, and portions of Lakewood and unincorporated Pierce County that fall with the service territory of Tacoma Power, a division of Tacoma Public Utilities owned by the City of Tacoma, Washington. These disclosures will be updated as necessary. Questions can be directed to 253-502-8900 or customercare@click-network.com.

Use of broadband Internet access services on the Click! network is governed by:

- Internet Acceptable Use Policy
- Bandwidth and Network Management Policy
- Open Internet Policy

These policies can be accessed at www.clickcabletv.com/legal-notices. In addition, there may be governing policies published by the Internet Service Provider with whom the end user establishes a service account. Please refer to the ISP's disclosure statements and/or website for those details.

Certification of Filing Accuracy

I, Tenzin Gyaltsen, General Manager of Click! Network, hereby certify that I have examined the information contained in the disclosure and that all information contained in the submission is true and correct to the best of my knowledge, information and belief.

Date:

Tenzin Gyaltsen, General Manager

Network Management Practices

General Summary

Click! Network maintains a system on which the Internet is offered to customers, through authorized and trusted third parties, as an open platform providing customer choice with full access to all lawful content, services, sites, platforms, network compatible types of equipment, and applications. The Click! network is designed for usage by typical residential and commercial users of broadband Internet access services. Bandwidth on the network is a limited, shared resource among Click! Network's customers (including commercial customers, carriers and Click! Network Authorized ISPs/resellers and their customers and end-users) and other users of Click! Network's broadband Internet access service. Click! Network actively manages its network to ensure that activity resulting in excessive or sustained bandwidth consumption, which may burden the network and affect other users, is limited. Accordingly, such usage may be restricted.

Click! Network strives to provide users the best experience when using the network and may use tools and techniques to manage its network, deliver the service, and ensure compliance with its policies. These tools and techniques are dynamic, like the network and its usage, and can and do change frequently. For example, these network management activities may include (i) identifying spam and preventing its delivery to user e-mail accounts, (ii) detecting malicious Internet traffic and preventing the distribution of viruses or other harmful code or content, (iii) limiting speeds during periods of extended congestion, (iv) requiring an upgrade or purchase of a different Internet service and (v) using other tools or techniques that Click! Network may be required to implement in order to meet its goal of delivering the best broadband Internet experience to all users.

Click! Network does not:

- Discriminate among specific uses, or class of uses, on its network
- Impair, degrade or delay VoIP applications or services that compete with its video services or services of its affiliates
- Impair, degrade, delay or otherwise inhibit access by customers to lawful content, applications, services or non-harmful devices, subject to reasonable network management
- Impair free expression by slowing traffic from certain web sites
- Demand pay-for-priority or similar arrangements that directly or indirectly favor certain traffic over other traffic
- Prioritize its own applications, services or devices or those of its affiliates
- Block lawful content, applications, services, or non-harmful devices, subject to reasonable network management

With regard to specific disclosures required by the Federal Communications Commission, Click! Network's practices and policies are as follows:

Blocking

Click! Network does not block any lawful content or application, subject to reasonable network management practices and Click! Network's Internet Acceptable Use Policy, Bandwidth and Network Policy, and Open Internet Policy.

Throttling

Click! Network does not discriminate among specific uses, or class of uses, on its network, throttle traffic from certain web sites, or otherwise impair, degrade, delay or otherwise inhibit access by customers to lawful content, applications, services or non-harmful devices, subject to reasonable network management.

Affiliated Prioritization

Click! Network does not prioritize its own applications, services or devices or those of its affiliates.

Paid Prioritization

Click! Network does not prioritize any traffic over its network in exchange for consideration.

Congestion Management

Congestion management on the network is approached from an agnostic perspective and with the objective of ensuring an optimum experience for all users of the network. Click! Network uses industry standard tools and generally accepted best practices to protect its network and customers' experience. Specifically, Click! Network actively monitors activity on its network and takes action as needed to augment capacity, balance usage across network service groups and mitigate excessive use. It is difficult to forecast congestion, so Click! Network cannot describe its frequency; however, Click! Network endeavors to minimize the frequency and extent of congestion to the greatest extent practicable.

The network management tools and techniques employed by Click! Network do not and will not target specific usages or applications (such as peer-to-peer) and instead focus in a content-neutral manner on bandwidth usage in real time, with the goal of providing reasonable and

equitable access to the network for all similarly situated customers. In other words, to the extent that the use of network management practices may affect the performance or other characteristics of Internet service, they are designed to affect all similarly situated customers equally.

Excessive use means bandwidth or data usage that is significantly higher than typical usage for which our network is designed, and will be determined in the sole judgment of Click! Network. Excessive users consume so much data that their usage could negatively impact the service provided to other customers. In order to ensure an optimized Internet experience for all users, data guidelines have been assigned to all Internet services, and are subject to change. Current data usage guidelines are always available at https://www.clickcabletv.com/about/legal-notices/bandwidth-and-network-policy/.

If Click! Network in its sole but reasonable discretion determines that a user has exceeded the Excessive Use threshold or is using the service in a manner significantly uncharacteristic of a typical user of the service to which they have subscribed, Click! Network may (a) adjust, suspend, limit or terminate service at any time and without notice; or (b) require the user to upgrade their service level or pay additional fees in accordance with the ISP's then-current, applicable rates and charges for such service; or (c) use any technology to be chosen by Click! Network at its sole discretion to limit the user's service for purposes of conserving bandwidth.

Residential Package	Package Description	Data Guideline per Billing Cycle
10 Mbps	10 Mbps down/1 Mbps up	300 GB
25 Mbps	25 Mbps down/2 Mbps up	300 GB
50 Mbps	50 Mbps down/5 Mbps up	350 GB
75 Mbps	75 Mbps down/8 Mbps up	400 GB
100 Mbps	100 Mbps down/10 Mbps up	500 GB

Commercial Package	Package Description	Data Guideline per Billing Cycle
10 Mbps	10 Mbps down/2 Mbps up	300 GB
25 Mbps	25 Mbps down/5 Mbps up	400 GB
50 Mbps	50 Mbps down/8 Mbps up	500 GB
75 Mbps	75 Mbps down/10 Mbps up	600 GB
100 Mbps	100 Mbps down/10 Mbps up	800 GB

Application-Specific Behavior

Click! Network does not block or rate control any specific protocols, or modify any protocol field in ways not prescribed by the protocol standard. Certain ports may be blocked in residential packages for the purpose of spam prevention and network security. No functions of the network are designed to inhibit or favor certain applications or classes of applications.

Prioritization is employed in certain Internet package configurations that are designed for voice traffic. The configuration assigns a higher processing priority (QoS) to voice traffic and the cable modem termination system processes that traffic before lesser priority data packets when it detects network congestion. The purpose of this QoS assignment is to maintain voice quality.

Users are expected at all times to comply with Click! Network's Internet Acceptable Use Policy, Bandwidth and Network Policy, and Open Internet Policy, which do prohibit certain activities which the network is not designed to support. For instance, users may not run a server in connection with Click! Network's residential services, nor provide network services to others via Click! Network's residential services. Examples of prohibited uses include, but are not limited to, running servers for mail (pop3 & smtp), http, https, FTP, IRC, DHCP and multi-user interactive forums.

Device Attachment Rules

Click! Network allows devices to be attached to the network that are CableLabs certified DOCSIS 3.0 or higher, that are fully supported for firmware upgrades by the manufacturer, and that do not harm the network.

Security

Click! Network manages its network in an effort to provide an optimum experience for its customers by using industry standard tools and generally accepted best practices and policies to protect its network and customer information. Click! Network reserves the right to utilize network tools and practices to prevent harmful or illegal activity, denial of service attacks, viruses or other malicious code, or transfer of unlawful content including copyright infringing files. Click! Network notifies its Internet Service Provider partners when allegations of such activities are received specific to individual end users, and reserves the right to terminate service to end users without notice for repeated allegations of violations. Click! Network cannot guarantee the prevention of spam, viruses, security attacks, or other actions which can affect service. End users are required to take all necessary steps to secure and manage the use of the services received over the Click! network. To prevent such events, Click! Network monitors its

network and will take active measures to minimize the effects of spam, viruses, security attacks, and other actions which could impact an optimum experience for customers.

Performance Characteristics

Service Description and Performance

Click! Network consists of a system of fiber optic and coaxial cabling and associated equipment that enables provision of broadband Internet access service using the DOCSIS 3.0 specification through a cable modem. Click! operates an Open Access Network, whereby service is delivered to end use customers by qualified third party Internet Service Providers, not by Click! Network. Retail pricing of services is set by the Internet Service Providers and therefore cannot be included in these disclosures. Retail pricing information is available directly from each third-party reseller.

Currently authorized third party resellers include:

Advanced Stream
253-627-8000
www.advancedstream.com
info@advancedstream.com

Rainier Connect
253-683-4100
www.rainierconnect.com
customerservice@rainierconnect.com

As of the effective date of this Disclosure Notice, the following residential services are made available for resale:

Package	Advertised Download	Advertised Upload	Actual Download	Actual Upload	Latency
Ultimate	100 Mbps	10 Mbps	101.9 Mbps	10.6 Mbps	9 ms
Extreme	75 Mbps	8 Mbps	75.2 Mbps	8.5 Mbps	9 ms
Turbo	50 Mbps	5 Mbps	50.6 Mbps	4.9 Mbps	9 ms
Fast	25 Mbps	2 Mbps	25.6 Mbps	1.94 Mbps	10 ms
Standard	10 Mbps	1 Mbps	10.4 Mbps	1.02 Mbps	9 ms

Actual performance measurements were initially collected in July 2018 and again collected in January 2019. These tests were run using a standard laptop with a 1 Gbps interface. The cable modem used for testing was an Arris CM3200 with 32x8 channel bonding capabilities. The tests were performed from an edge point on the network to an external speed test server located in a city about 35 miles from the network.

Impact of Non-Broadband Internet Access Service Data Services

Wholesale commercial Ethernet Data Services up to 10 Gbps are delivered over a separate fiber network for resale by data carriers. Interoperability of the Carrier Ethernet grade of products is certified by the Metro Ethernet Forum (MEF). Other services on the network include transmission of data from certain Internet-connected power meters. These power meters transmit data only within the network, never acquire a public IP address, and transmit data on a frequency separate from the commercial broadband Internet access service traffic. The operation of the power meters and carrier Ethernet product have no impact on the performance of the commercial Internet access products.

Commercial Terms

General Description

Certain Internet services are configured to provide additional features for use by commercial enterprises. The advertised and actual speed performance of the commercial services are the same as the above residential services. Commercial package configurations allow for running mail servers (pop3 and smtp), http and https, FTP, IRC and DHCP. Static IP addresses are included with commercial packages. Retail services are governed by the policies described above and available at www.clickcabletv.com/legal-notices. End users are also bound by the terms of service of the third-party reseller of Click! Network services to which they subscribe.

Prices

As detailed previously, Click! Network offers retail services exclusively through unaffiliated third-party resellers. Pricing information, including monthly prices, usage-based fees, early termination fees, or other costs for additional services, are not within Click! Network's control and therefore are not included in this disclosure.

Privacy Policies

Personally identifiable information of Internet service end users is collected as supplied by the Internet Service Providers for use in providing Services to those end users. This information is not used for any non-network management purposes and is not shared with third parties by Click! Network. As a municipal corporation of the state of Washington, Click! Network is subject to the Washington State Public Records Act (Chapter 42.56, R.C.W.). We may disclose personally identifiable information pursuant to a valid request made under the Public Records Act if and as required to do so by the Act and/or pursuant to a court order, subpoena, civil investigative demand or other legal process.

Click! Network does not inspect or store network traffic, except to the extent network tools associate IP address assignments to individual end users as identified by the Internet Service Provider.

Redress Options

Informal complaints or questions may be directed to 253-502-8900 or customercare@click-network.com. Informal complaints will be investigated and the results will be communicated to the complainant. Formal complaints may be made in writing, including all pertinent information and the complainant's name, address, telephone number and email address (if applicable) and sent to 3628 S. 35th St., Tacoma, WA 98409, or delivered in person to that address during business hours as listed on our website at www.clickcabletv.com. Responses to formal, written complaints will be delivered in writing.

EXHIBIT 16

Department of Public Utilities Activity	Tax Rate
Power Division	7.5%
Cable Television	8%
Water and Rail Systems	8%

Broadband Taxed as Utility

7.5% Tacoma Utilities Gross Earning Tax is Paid to City of Tacoma on Broadband Revenue

2018 Month	TACOMA CATV REVENUE	TOTAL CATV REVENUE	TACOMA BroadBand REVENUE	GROSS EARNINGS TAX 8%	TACOMA FRANCHISE FEE 5%	TACOMA P.E.G. Fee 1%	TACOMA GROSS EARNINGS TAX 7.5%	Total Taxes
January	1,140,714.97	1,431,421.25	700,067.64	114,513.70	57,035.75	11,407.15	52,505.07	235,461.67
February	1,130,173.92	1,421,390.40	699,783.26	113,711.23	56,508.70	11,301.74	52,483.74	234,005.41
March	1,168,449.06	1,471,028.85	703,894.40	117,682.31	58,422.45	11,684.49	52,792.08	240,581.33
April	1,113,432.02	1,399,888.78	696,299.76	111,991.10	55,671.60	11,134.32	52,222.48	231,019.50
May	1,140,068.45	1,424,366.84	706,928.02	113,949.35	57,003.42	11,400.68	53,019.60	235,373.05
June	1,077,906.29	1,350,419.67	703,665.27	108,033.57	53,895.31	10,779.06	52,774.90	225,482.84
July	1,135,513.59	1,426,190.21	702,165.14	114,095.22	56,775.68	11,355.14	52,662.39	234,888.41
August	1,092,341.45	1,372,958.52	698,624.15	109,836.68	54,617.07	10,923.41	52,396.81	227,773.97
September	1,062,114.33	1,335,948.06	702,974.92	106,875.84	53,105.72	10,621.14	52,723.12	223,325.82
October	1,103,895.21	1,385,088.54	697,295.75	110,807.08	55,194.76	11,038.95	52,297.18	229,337.97
November	1,069,017.79	1,338,002.74	698,810.78	107,040.22	53,450.89	10,690.18	52,410.81	223,592.10
December	1,090,564.31	1,365,110.77	685,704.43	109,208.86	54,528.22	10,905.64	51,427.83	226,070.55
	13,324,191.39	**16,721,814.63**	**8,396,213.52**	**1,337,745.17**	**666,209.57**	**133,241.91**	**629,716.01**	**2,766,912.61**

EXHIBIT 17

Click! Network
Telecommunications Installation and Services Agreement

(For Multiple Dwelling Units)

This AGREEMENT made effective this 1 day of February 2018 ("Effective Date") by and between The City of Tacoma, Dept. of Public Utilities, Light Division, dba Click! Network (hereinafter referred to as "Click!") and Napoleon Group LLC the title owner of record of, or said owner's duly authorized property manager for, the following described residential real property ("Owner") located at 1515 Tacoma Avenue South, Tacoma, Pierce County, Washington, consisting of 135 Units in One separate building(s), and commonly known as The Napoleon (the "Premises");

WHEREAS,

A. Click! is the owner and operator of a telecommunications system for provision of cable television and other communications and data transmission services and desires to provide such services to the Premises subject to the terms and conditions of this Agreement; and

B. Owner desires to make available to the residents of the Premises telecommunications services such as that provided by Click! and is prepared to grant Click! access to the Premises to install Facilities (defined below) and a license for on-going operation of such Facilities subject to the terms and conditions of this Agreement

NOW, THEREFORE, in consideration of the foregoing Recitals, the mutual promises herein contained, and for other good and valuable consideration, the receipt and sufficiency of which is hereby expressly acknowledged, the Parties hereby agree to the following covenants, terms and conditions:

1. Rights Granted:

A. Access to the Premises to Construct and Install Telecommunications Facilities: Owner grants to Click!, the right to enter and access the Premises for the purpose of installing telecommunications facilities in, at, and upon the Premises including, but not limited to, all wiring, cables, conduits, electronic and other equipment, antennae, switches, amplifiers, filters, traps, signal receiving/scrambling/decoding equipment, key lock box(es) and key(s), and any additional equipment that may be requested or required during the Term of this Agreement for provision of cable television and/or telecommunications services at the Premises ("Facilities" and collectively "Telecommunications System").

B. Access to Operate, Maintain, Repair, Inspect and/or Remove Telecommunications Facilities: Owner further grants to Click! the right, license and privilege, during the Initial Term and any Renewal Term(s), to enter and reasonably access the Premises for the purpose of operating, repairing, maintaining, inspecting and/or removing any and all

Facilities comprising the Telecommunications System installed by Click! at the Premises. Without limiting the foregoing, it is understood that Click! shall be permitted to:

(1) Make reasonable periodic inspections of the Facilities and the condition of the Premises where those Facilities are located;

(2) Reasonably advertise and promote telecommunications products and services offerings to residents at the Premises. Such promotion may include the distribution of advertising material, market research surveys, and/or sales of telecommunication services to residents at the Premises. Owner understands that Click! will sell directly to individual residents and contract the same for additional and/or premium telecommunications services; and

(3) Enter and access the Premises for up to sixty (60) days following expiration or termination of the Term of this Agreement to allow Click! to remove its Facilities from the Premises.

C. Related Rights and Limitations: With respect to the rights granted under this Section 1, it is mutually understood and agreed that Click!'s entry and access rights shall:

(1) Include any entry and/or access rights held by the Owner pursuant to easement, right-of-way, right-of-entry or license as reasonably needed by Click!.

(2) Be subject to the prior and continuing right of Owner to access and otherwise use any and all parts of the Premises, rights-of-way, and/or easements concurrently with Click! and/or any other person or persons.

(3) Be subject to any conditions, covenants, restrictions, or encumbrances affecting the Premises pursuant to deed, easement, or other recorded instrument and/or which Owner has provided written notice of to Click! at the time of Click!'s installation of Facilities.

(4) Be deemed material obligations of Owner in performance under this Agreement.

2. Work to be Performed

A. Scope of Work. Owner authorizes Click! to install a Telecommunications System in, at and upon the Premises, including all appropriate Facilities for Click!'s use and operation thereof, per the specifications and assumptions stated in the Scope of Work attached hereto as Exhibit A and by this reference incorporated into this Agreement.

B. Work Standards, Coordination of Installations, and Repairs.

(1) In installing, maintaining, repairing, modifying, upgrading, replacing and removing any of Click!'s Facilities, Click! shall strictly adhere to all current and subsequently adopted building and zoning codes applicable to construction and/or installation of Facilities at the Premises. Click! shall obtain all required permits from the applicable governmental authorities before commencing any work requiring a permit. Click! shall, at its expense, promptly return the buildings, improvements and landscape that have been altered or affected by virtue of any installation, maintenance, repair, modification, upgrade, replacement or removal of Click!'s

facilities to substantially the same state and condition that existed prior to the work, ordinary wear and tear excepted.

(2) Click! and the Owner, or Owner's authorized agent, will cooperatively coordinate installation work for each Unit on the Premises.

(3) During the Term of this Agreement, Click! will make all repairs, replacements and improvements to its Facilities as reasonably necessary to maintain such Facilities in good repair and operating condition. In the event of damage to or destruction of Facilities due to and arising from the intentional willful misconduct or gross negligence of the Owner and/or Owner's employees, agents or tenants, the Owner agrees to reimburse Click! for all reasonable expenses of labor and materials incurred by Click! to repair or replace such Facilities.

(4) All duties specified in this Section are deemed material obligations in performance under this Agreement.

3. Ownership and Use of Click! Telecommunications System and related Equipment

A. The Telecommunications System serving the Premises, including all Facilities installed and/or subsequently modified by Click!, shall be and will remain the personal property of Click!. No equipment or part of the Facilities comprising the Telecommunications System shall be considered a fixture of the Premises; except that all cables permanently affixed to the Premises by Click! will become part of the realty and will not be removed upon termination. Owner shall not make, or allow any third party to make, any alterations or additions to the Telecommunications System.

B. Click! shall have the exclusive right to access, use, control, and operate the Click! installed Telecommunications System and all of the Facilities comprising such System. Owner shall not use any Click! owned Facilities to provide telecommunications or other services to or at the Premises via any other system, technology, vendor or distributor.

C. All rights and duties specified in this Section are deemed material to performance under this Agreement.

4. Term of Agreement

A. The Initial Term of this Agreement shall commence on the Effective Date first written above and shall continue for five (5) years unless terminated earlier in accordance with the terms of this Agreement.

B. The Term of this Agreement will be automatically renewed at the end of the Initial Term for an additional one (1) year term ("Renewal Term") and thereafter for additional one (1) year successive Renewal Terms , unless or until a written notice of termination is provided by either Party to the other no earlier than 180 days and no later than 90 days prior to the expiration of the then current Renewal Term.

Exhibit A
Scope of Work

Installation Work

Click! and Owner, pursuant to the Telecommunications Installation and Services Agreement to which this Scope of Work is attached, hereby acknowledge and mutually agree to the following specifications and assumptions for Facilities installation work:

1. Click! Network will pull fiber optic service feeds into and upon the Premises for the purpose of installing telecommunications Facilities for service to multiple dwelling units (MDUs) located at the Premises.
2. Click! Network will pull fiber into building through placed conduit and place conduit from meter room to main demarcation/distribution room. Click! will place an enclosure in building's main demarcation/communications room to house electronics.
3. Click! Network will place fiber services to each floor in owner provided riser duct and place distribution equipment on each/every other floor per building plans. Owner will place backboard for Click! where distribution equipment will be mounted.
4. Click! will install one microduct to each unit and one fiber home run to each unit from demark to each unit outlet hub. Microduct will be installed according to bend radius requirements of manufacturer and coordination of placement will be with project manager.
5. Access into property for installation of system will be coordinated through Owner/project manager.
6. All work is to be completed for reasonable approval by the Owner/Manager.
7. An on-site meeting prior to construction is available upon request for scheduling and coordination of MDU installation work.

Owner will provide access to all areas of the Premises for the installation, maintenance, service and operation of Click! Facilities pursuant to the Agreement.

EXHIBIT 18

A Sampling of Municipal Broadband Utilities in the USA

Compiled by Mitchell Shook, June 22, 2019

Below is a sampling of municipal utilities that, in addition to their traditional services of water and power, also provide Broadband as an additional utility function. These are only a few of many such publicly-owned utility systems now offering Broadband in the USA. The descriptions are direct quotes taken from the utility's own websites about their services.

1. Lafayette Utilities System has a long and proud history of serving the people of Lafayette. LUS offers quality electric, water, wastewater and telecommunications services, and because we are customer owned and operated, our customers have the power to control our standard of service. Lafayette enjoys the lowest residential electric utility rates in the state. LUS helps to keep Lafayette taxes low. Approximately $22 million of in-lieu-of-tax (ILOT) is transferred to the Consolidated Government General Fund each year. This ILOT contribution supports services like police and fire protection, parks and recreation, and community development. Lafayette, LA https://lus.org/about-lus/history-and-service

2. Reedsburg Utility Commission, is one of this country's 2,200 public power systems — a utility owned by the people and the community it serves. Reedsburg Utility began its roots in 1894 by providing electric and water to its public-spirited citizens. Today, Reedsburg's public-spirited citizens can also receive Light Speed Internet, TV, and Telephone services from their own hometown team! We are one Utility and one Community, and it's all about service! We live in this community with you. We provide competent, reliable, high quality, courteous, honest, and responsive service. We treat you like a neighbor, because we are your neighbors. Public power systems like Reedsburg Utility Commission are non-profit and have one main purpose — to provide customers with the best services at the lowest possible cost. Reedsburg, Wisconsin. http://reedsburgutility.com/about-us

3. Clarksville Department of Electricity (CDE), offers Electricity, Internet, Digital TV and Telephone services., Our world-class Fiber Optic Network keeps electric costs low and allows us to deliver exceptional products and constant innovation. The network provides savings of over $1 million annually in operating costs and provides over $5 million annually in income for electrical grid improvements Additionally, access to our network increases home values by 3% or an average of over $5,000, according to the Fiber to the Home Council. Based in large part on access to the superior digital products provided by CDE Lightband, Clarksville has been designated a first 50 "Next Century City." Clarksville, Tennessee. https://cdelightband.com/about-us/

4. Jackson Energy Authority We provide reliable electric, gas, propane, water, wastewater, and broadband services. Our fiber optic network, owned by our community, provides cable tv, high speed internet, and telephone service to our customers. We serve about 40,000 residences, businesses and industry in Jackson, TN and parts of Madison County. Jackson, Tennessee. https://www.jaxenergy.com/about/

5. Since 1942 Spencer Municipal Utilities has provided electric and water services. In 1997, SMU added municipal communications to the utility, for cable, internet, and telephone service, to be owned and operated on behalf of the citizens. https://smunet.net/about-us/history/

6. Dalton Utilities has operated as a public utility since 1889. Dalton Utilities provides potable water, electrical, natural gas and wastewater treatment services to the City of Dalton and portions of Whitfield, Murray, Gordon, Catoosa and Floyd counties. Beginning in 1999, Dalton Utilities branched into telecommunications with broadband services to large industrial/commercial customers. In 2003, Dalton Utilities launched its OptiLink family of services and now provides broadband, cable tv, telephone and internet services to area residents and businesses. Dalton Utilities serves approximately 50,000 customers and employs over 300 area residents. https://www.dutil.com/about/

7. Longmont Power & Communications (LPC) is the City's not-for-profit electric and internet services utility. Our goal is to deliver outstanding electric and internet service experiences to our customer-owners while providing exceptional value and benefit to our community. For more than 100 years, we have provided innovative service that has kept electric rates low while improving reliability and convenience for Longmont businesses and citizens. https://www.longmontcolorado.gov/departments/departments-e-m/longmont-power-communications

8. Vernon's municipal Light & Power Department provides businesses reliable and low-cost utility services. Vernon Light & Power has operated for more than 70 years. Today, it provides electricity, gas, and fiber optic service. http://www.cityofvernon.org/business/201-powering-business-competitiveness

9. Coon Rapids Municipal Utilities is a locally owned and locally controlled utility company. We provide electric, natural gas, water, wastewater, and communication products and services. CRMU was created by the community....to serve the community. While many companies exist to turn a profit and earn money for their stockholders, at CRMU, we exist to provide exceptional customer service for our customers and value for the community. CRMU was established in 1937 because the people of Coon Rapids were tired of receiving poor service and paying high prices for electricity. http://www.crmu.net/

10. Cedar Falls Utilities. When you live in Cedar Falls, CFU is your utility. The Electric, Water, Gas and Communications Utilities are owned by the community. That means our only focus is providing dependable service at the best possible value to Cedar Falls homes and businesses. Learn more about your Utilities on these pages and through our monthly newsletter. https://www.cfu.net/utilities/

11. Welcome to Marshall Municipal Utilities. As a citizen of Marshall and a customer of MMU, you are part owner of a utility company. MMU is municipally owned, so you have a direct and personal interest in our business. As a municipal utility, we have several distinct advantages. Stockholders do not own our electric, water, wastewater, internet, and natural gas transportation utilities - the community does. Not paying dividends or making money for out-of-town investors helps us keep your rates low. Also, local control and management means we make decisions with your best interest in mind.
Marshall, Missouri. http://www.mmumo.net/about.php

12. Harlan Municipal Utilities is Harlan's premier provider of Electric, Gas, Water and Telecommunications products and services. Proudly serving Harlan for over 128 years.
http://www.harlannet.com/

13. Lenox Municipal Utilities & Communications is a municipally owned entity providing electric and water. In addition, our communication system is state of the art. We provide television, internet, and telephone services to the residents of Lenox, IA.
https://sites.google.com/lenoxschools.org/lenox-municipal-utilities/home?authuser=0

14. Waverly Utilities is an award-winning national leader in electric reliability, safety and renewable energy. In 2016, Waverly Utilities became a telecommunications utility offering gigabit speed internet, enhanced cable and digital telephone services. We are committed to serving Waverly with the same neighborly customer service we've been providing since 1904.
http://www.waverlyutilities.com/

15. The Russellville Electric Plant Board is a municipal electric power distributor that serves the electrical needs of customers in the vicinity of Russellville, KY with 103.7 miles of line with approximately 39 customers per mile. It began providing wireless Internet service to the greater Russellville area in 2006 and expanded its broadband services to video, telephone and high-speed data service in 2011. It currently serves approximately 4,300 electric customers and more than 2,600 broadband customers. http://www.epbnet.com/index.php/about/history/

16. Concord Municipal Light Plant (CMLP) is a municipal-owned, public power utility offering electric and broadband Internet service under the direction of the Town Manager. CMLP offers Concord Light Broadband Internet service delivered through a dedicated fiber line right to homes or businesses. Broadband service is currently available to 95% of Concord residents and many businesses. CMLP offers consistent, guaranteed speeds throughout the day. https://concordma.gov/464/Municipal-Light-Plant

17. Welcome to Sebewaing Light and Water – Your Low Cost Dependable Electric Services since 1911. We are proud to be a Public Power organization - owned by the Residents of Sebewaing Village. We provide safe, reliable and environmentally responsible Electric, Water and Internet Utilities to our customers. By operating all three utilities, we are able to provide these services at some of the lowest costs in the area. Sebewaing, Michigan

http://www.slandw.com

18. Tullahoma Utilities Board The Tullahoma Utilities Authority (TUA) is located at 901 South Jackson Street in Tullahoma, Tennessee. The contact phone number is (931) 455-4515. TUA is the Tullahoma provider of Electric, Water, and Wastewater as well as Television, Internet, and Telephone https://www.tub.net/about-us

19. Pulaski Electric System, Established in 1891, is Tennessee's oldest municipal electric system and the first in the state to receive power from the Tennessee Valley Authority. PES currently provides electric power to nearly 15,000 customers in the City of Pulaski and the communities of Ardmore, Elkton, Goodspring, Lynnville, Minor Hill and Prospect. Operating and maintaining over 1,200 miles of electric line throughout Giles County to deliver 99.98% reliability is our top priority. PES Energize is the only 100% fiber to the home network in Giles County providing high-speed internet, television, and telephone service to residents and businesses in the City of Pulaski, and to educational institutions in Giles County. Pulaski, Tennessee. https://pesenergize.com/

20. Bristol Tennessee Essential Services (BTES) is a municipally-owned electric utility that also provides high-speed Internet, telephone, and cable television services over a fiber optic network, as well as water heating services. BTES is in the business of providing reliable, safe and cost-effective electric service to more than 33,000 customers in a 280-square-mile service area in the City of Bristol and Sullivan County, Tennessee. Sixty years after our inception as an electric company, BTES began providing Internet and cable television services in 2005. One year later, the BTES' telephone services were fully operational. BTES now provides some of the fastest Internet speeds available in the United States with speeds of ten Gigabits per second available to every business and home in our service area! Bristol, Tennessee. http://www.btes.net/

21. Benton County Public Utility District was organized by a local vote of the people in 1934. Washington's first initiative, passed by voters in 1930, gave citizens of each county the right to form a public utility district (PUD). Benton PUD was organized by a local vote of the people in 1934. PUDs were created to provide electricity, water and sewer services for the benefit of the people of Washington State. Since their conception, the role of public utility districts has expanded to include wholesale broadband telecommunication services. Benton PUD's wholesale broadband network and business structure is based on an "open access" model. This means that any entity may use the system even if they do not own physical infrastructure themselves. The open access model along with a transparent and non-discriminatory rate structure has made Benton PUD's broadband network a key contributor to business recruitment, retention and expansion in our community. Benton County, WA https://www.bentonpud.org

22. Chelan Public Utility District. Chelan County is home to world-class, ultra-fast fiber optic internet. Chelan County PUD has laid this high-tech infrastructure throughout most

communities, allowing you to enjoy life at the speed of fiber — which means a more reliable connection and faster connections to entertainment and work. We can help direct you to several Internet Service Providers to choose from who can help you get connected to fiber. Chelan County, WA
https://www.chelanpud.org/my-pud-services/residential-services/fiber-optics

23. Franklin County Public Utility District was founded in 1934 and is headquartered in Pasco, Washington. We are a customer-owned utility, offering electric power and broadband telecommunications services. Franklin PUD is owned and governed by the people and communities we serve. We have an obligation to provide you ownership and control of your utility and to do so reliably, efficiently, and at the lowest reasonable cost. We have been providing Franklin County the benefits of fast, reliable, and secure broadband services since 2001. As a wholesale provider, we work together with local Retail Service Providers (RSP) to bring state of the art communications to businesses and homes in our community by using fiber optics and wireless technologies.
https://www.franklinpud.com/broadband/retail-service-providers/residential-service/

24. Grant County Public Utility District, Serving Grant County, WA since 1938. We are a public electric utility serving more than 40,000 customers in Grant County. From Electric City to Royal City and everywhere in between, our affordable, reliable power and fiber continue to drive our county's rapidly expanding economy.
https://www.grantpud.org/high-speed-network

25. Mason County PUD 3, Mason County, WA In 1929, the Washington State Grange sent the very first initiative to the Legislature, to allow rural communities to form their own publicly owned utilities. This is our story. In the 1930 election, the measure passed in a landslide. Mason PUD 3 supporters jumped on board in 1934 calling for a countywide PUD. Mason PUD 1 backers had been working on their own district since 1932. On November 6, 1934, local voters approved the formation of both districts. Mason PUD 3's wholesale fiber optic network is a nondiscriminatory, open-access, net neutral service. PUD 3's partners, internet service providers, sell gigabit speed internet, HDTV, special digital circuits, and phone services. The network provides for improved educational opportunities, telehealth services, economic development, and increased property values
http://www.pud3.org/service/about-us/what-is-a-pud

26. Electric Power Board of Chattanooga, Powering Chattanooga, EPB is one of America's largest publicly owned electric power providers. We're also the pioneering communications company that surprised the nation with the first Gigabit Internet speeds, crystal clear television and telephone service utilizing a community-wide fiber optic network. But most of all, we're here to serve Chattanooga with the neighbor-to-neighbor local service you've come to expect from us. *Chattanooga, Tennessee* https://epb.com/

EXHIBIT 19

Public Notices

Posted September 20, 2019

City of Duvall

CITY OF DUVALL
NOTICE OF PUBLIC HEARING
Resolution Declaring Certain
City Property Surplus

Notice is hereby given that the City Council of the City of Duvall, Washington will hold Public Hearing at the Riverview Educational Service Center, 15510 1st Ave NE, Duvall, WA. at 7:00 p.m. or as soon as possible thereafter on October 1, 2019 regarding:
Property originally purchased for utility purposes that is either no longer needed for that use and / or past its useful life and the city desires to sell the property, pursuant to RCW35.94.040.
It is proposed that all items be disposed of to the general public by means of direct sales, sealed bid, trade-in, or auction, as determined to be in the best interests of the City by the Public Works Director and to the highest, responsible bidder. To request a copy of the full list of surplus items email; Project Manager, Alana McCoy at alana.mccoy@duvallwa.gov or call 425-939-8045.
All persons having an interest in said hearing are invited to comment in person at the hearing or in writing to the City Clerk prior to the hearing. For further information, please contact City Hall, P.O. Box 1300, Duvall, WA 98019; 425-788-1185. Jodi Wycoff, City Clerk.

CITY OF DUVALL
WASHINGTON

RESOLUTION NO. 19-17

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF DUVALL, WASHINGTON, DECLARING CERTAIN CITY PROPERTY SURPLUS

WHEREAS, the City from time to time has assets that become surplus to its needs; and

WHEREAS, the City has utility related items requiring disposal and per RCW 35.94.040 the City shall host a public hearing prior to disposal of the utility items; and

WHEREAS, the City Council has the authority to dispose of surplus property pursuant to RCW 35A.11.010;

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF DUVALL, WASHINGTON, DO RESOLVE AS FOLLOWS:

Section 1. Surplus of Certain City Property. The City Council hereby declares that this property, listed in the attached Exhibit "A", is surplus to the needs of the City and disposal thereof will be for the common benefit.

Section 2. Disposal Method. The property listed in the attached Exhibit "A" may be disposed of to the general public by means of direct sales, sealed bid, trade-in, or auction, as determined to be in the best interests of the City by the Public Works Director. Property that is deemed of no value will be recycled or disposed of responsibly.

PASSED BY THE CITY COUNCIL AT A REGULAR MEETING THEREOF ON THE 1st DAY OF October, 2019.

CITY OF DUVALL

Amy Ockerlander

Mayor Amy Ockerlander

Approved as to form:

Rachel Turpin, City Attorney

ATTEST/AUTHENTICATED:

Jodi Wycoff, City Clerk

Exhibit "A"

City of Duvall
Small Town. Real Life.

Date: September 9, 2019

Re: **Itemized Surplus List for City Council Approval**

---

1. 2011, Dodge Charger, VIN#2B3CL1CT0BH554297.
    - Miles: 103,414
2. 2012, Dodge Charger, VIN#2C3CDXAT0CH240334.
    - Miles: 107,848
3. 1996 Chevy Pickup, VIN#1GCEC14WXTZ129848.
    - Miles: 70,898
4. 2004 Chevy Pickup, VIN#1GCGC24U24Z199486.
    - Miles: 111,659
5. One (1) wood laminate bookcase with doors.
6. One (1) 30" x 40" and one (1) 18" x 24" White Board.
7. Keyboard drawer, desk pencil drawer.
8. Three (3) Plantronics wireless headset with misc. parts and pieces.
9. One (1) ViewSonic projector with case.
10. A set of Logitech computer speakers.
11. One (1) Toshiba 32" television.
12. One (1) Coby DVD player.
13. Miscellaneous electrical cords.
14. One (1) metal key box.
15. Eleven (11) hard drives wiped clean.
16. Two (2) Compaq ProLiant ML370 Computers.

Exhibit "A"

Itemized Surplus List for City Council Approval, continued.

17. One (1) Foundry Networks Fast Iron 800 Computer.
18. Three (3) Computer desk monitors.
19. One (1) BB Battery pack HR9-12.
20. One (1) Desktop tower.
21. One (1) drafting table.
22. One (1) six-foot-long wood grain office desk with drawers.
23. One (1) HP printer.
24. One (1) Stihl weed eater, gas powered. Needs repairs.
25. One (1) MAT Compressor 1.5 125.
26. One (1) Eight-foot metal bike rack.
27. One (1) antique hay rake stored at the WWTP since 2001.
28. Two (2) 24' aluminum stadium bench seats with footings.
29. One (1) Fellowes Power Shredder.


1.


2.


3.

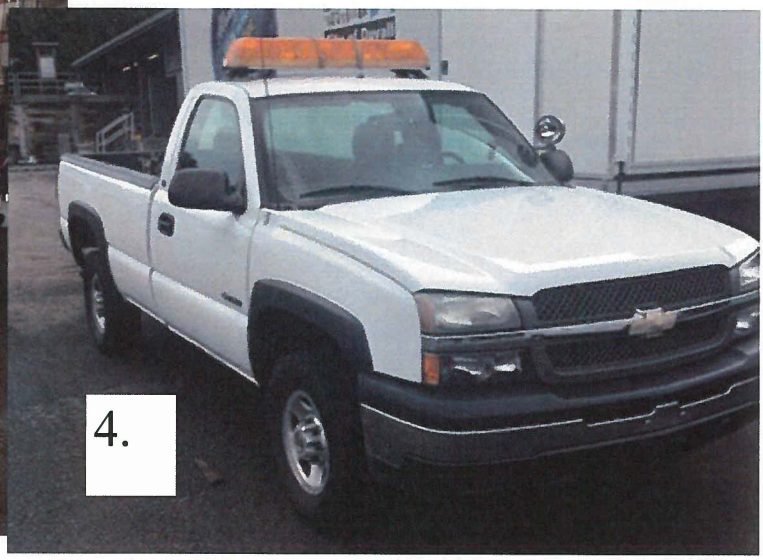

4.

EXHIBIT 20

AMENDED RESOLUTION NO. U-10828

A RESOLUTION relating to Click! Network; authorizing Click! to prepare a business plan to provide, in addition to retail cable television, retail internet services including voice over data internet ("VoIP") protocol, commercial broadband and Gigabit service ("Retail Services").

WHEREAS the City Council of Tacoma authorized the Department of Public Utilities ("TPU"), Light Division (dba "Tacoma Power"), to implement and manage a broadband telecommunication system ("Click! Network" or "Click!" as authorized through City Council Substitute Resolution No. 33668, approved April 8, 1997, and Public Utility Board Amended Substitute Resolution U-9258 approved April 9, 1997), and

WHEREAS Tacoma Power provided retail cable TV services to customers, wholesale internet to independent Internet Service Providers ("ISPs") who served retail customers and wholesale broadband service to business customers, and

WHEREAS the broadband telecommunication system is critical infrastructure for Tacoma Power, including the connection of substations, support of approximately 18,000 Gateway smart meters, as well as providing support for the City's I-net system, and

WHEREAS the City Charter Section 4.6 requires a vote of the people before the City may sell, lease, or dispose of any utility system, or parts thereof essential to continued effective utility service, and

WHEREAS the presence of Click! Cable TV in the marketplace provided savings for all cable TV customers, regardless of provider, in the Click! Market

scheduled basis established by the Committee and Click!. The Public Utility Board and the City Council may consider delegating specific authority in the governance of Click! to the Click! Engagement Committee in the future as the Business Plan is further developed and implemented.

Sec. 4. Prior to implementing the Business Plan contemplated in this resolution, TPU and the City's Legal Department, shall seek a legal opinion or declaratory judgment in Pierce County Superior Court, to confirm that Tacoma Power may operate the City of Tacoma's telecommunications system in accordance with the business plan. The City's Legal Department shall include in its request for a legal opinion or declaratory judgment, those specific components of the business plan necessary to provide the Utility Board and the City Council comfort that they may fully implement the business plan reasonably without threat of disruption by legal challenge. TPU and the City's Legal Department are authorized to utilize the services of third-party legal advisors in connection with this activity.

Sec. 5. Click! shall review and resubmit rate adjustments budgeted and proposed by Click! and approved by the Public Utility Board (previously approved by Board Resolution U-10773 on April 22, 2015), that support the Business Plan and the City Council is requested to approve an ordinance amending Tacoma Municipal Code Chapter 12.13, to authorize said rate adjustments.

Sec. 6. A fiscal note is attached to and incorporated in this Resolution U-10828. The fiscal note estimates the Capital and O&M budget requirements and impacts in addition to the financial gains and losses anticipated over the next five (5) years, in connection with the Click! business plan contemplated herein.

Approved as to form and legality:

William C. Fosbre
Chief Deputy City Attorney

Chair

Monique Trudnowski
Secretary

Chaveen Jacobs
Clerk

Adopted 12-3-15

EXHIBIT 21

COMMUNITY-BASED BROADBAND SOLUTIONS

THE BENEFITS OF COMPETITION AND CHOICE FOR COMMUNITY DEVELOPMENT AND HIGHSPEED INTERNET ACCESS

The Executive Office of the President

January 2015

Contents

Executive Summary 3
Economic Benefits of Broadband 5
Challenges in Broadband Access and Adoption 6
Broadband Competition 10
Community-Based Broadband 13
Chattanooga, TN: Gigabit service drives investment, innovation 13
Wilson, NC: Municipal broadband encourages private competition 14
Lafayette, LA: Network increases customer savings, strengthens local anchor institutions 15
Scott County, MN: Municipal government sees savings for county, school operations 16
Leverett, MA: State and federal programs enable local investment 17
Choctaw Nation Tribal Area, OK: Public private collaboration brings broadband to new communities 17
Promoting Broadband that Works 18
Appendix 1: U.S. Municipalities with Broadband Networks 20

Executive Summary

Affordable, reliable access to high speed broadband is critical to U.S. economic growth and competitiveness. Upgrading to higher-speed broadband lets consumers use the Internet in new ways, increases the productivity of American individuals and businesses, and drives innovation throughout the digital ecosystem. As this report describes, while the private sector has made investments to dramatically expand broadband access in the U.S., challenges still remain. Many markets remain unserved or underserved. Others do not benefit from the kind of competition that drives down costs and improves quality. To help fill the void, hundreds of towns and cities around the country have developed their own locally-owned networks. This report describes the benefits of higher-speed broadband access, the current challenges facing the market, and the benefits of competition – including competition from community broadband networks.

~

Since President Obama took office, the United States has significantly expanded its broadband network and increased access. Investments from the federal government have helped deploy or upgrade more than 78,000 miles of network infrastructure since 2009, and more than 45 million Americans have adopted broadband Internet during the President's time in office. Today, more than 90 percent of Americans can access the Internet on a wired line and 98% by either wired or wireless connection.

Competitive markets have helped drive expansion in telecommunications services as strong infrastructure investments and falling prices have opened up a wide range of new communications products and services. Where there is strong competition in broadband markets today, it drives similar improvements. Unfortunately, competition does not extend into every market and its benefits are not evenly distributed. While the U.S. has an extensive network "backbone" of middle-mile connections (long, intra- or interstate physical fiber or cable network connections) with the capacity to offer high-speed Internet to a large majority of Americans, many consumers lack access to the critical "last-mile" (the last legs of the physical network that connect homes and businesses to the broader system), especially in rural areas. It is these last-mile connections that make higher speeds possible. For example, 94 percent of Americans in urban areas can purchase a 25 Mbps (megabit per second) connection, but only 51 percent of the rural population has access to Internet at that speed.

Competition has also been slow to emerge at higher speeds. Nearly forty percent of American households either cannot purchase a fixed 10 Mbps connection (i.e. a wired, land-based connection), or they must buy it from a single provider. And three out of four Americans do not have a choice between providers for Internet at 25 Mbps, the speed increasingly recognized as a baseline to get the full benefits of Internet access.

Without strong competition, providers can (and do) raise prices, delay investments, and provide sub-par quality of service. When faced with limited or nonexistent alternatives, consumers lack negotiating power and are forced to rely on whatever options are

available. In these situations, the role of good public policy can and should be to foster competition and increase consumer choice.

At the federal level, the government has already taken active steps to support broadband, committing billions of dollars to deploy middle-mile and last-mile infrastructure, and to ensure that our public schools and libraries have high speed broadband connections.

But local governments also have an important role to play. As this report details, communities around the country like Chattanooga, TN and Wilson, NC have developed a variety of strategies for building locally-owned broadband networks and promoting higher-speed Internet access. Over the past few years, these municipal networks have emerged as a critical tool for increasing access, encouraging competition, fostering consumer choice, and driving local and regional economic development. Local investments have also spurred the private sector to compete for customers, improving services, increasing broadband adoption, and providing more choice for consumers.

Not all communities, however, have the choice to pursue a local broadband network. 19 states currently have barriers in place limiting community broadband and protecting incumbent providers from competition. President Obama believes that there should be a level playing field for community-based solutions and is announcing today a series of steps that the Administration will be taking to foster consumer and community choice.

Economic Benefits of Broadband

In technical terms, broadband refers to a method of transmitting information using many different frequencies, or bandwidths, allowing a network to carry more data. For most Americans, however, the term broadband simply refers to a fast Internet connection—whether fixed or wireless.

Over time, our perceptions of what constitutes a "fast" Internet connection have changed. As consumer and business uses of the Internet evolve, and new applications become more deeply embedded into everyday life, higher speeds frequently shift from being a luxury to a requirement for many users. For example, beginning in 2000 the Federal government defined "broadband" as any service with a download speed of 200 kilobits per second (kbps) or faster.[1] In 2010, the Federal Communications Commission redefined "basic" broadband service as a connection with speeds of at least 4 megabits per second (Mbps) downstream – 20 times faster than the 2000 definition – and at least 1 Mbps upstream.[2]

Today, as everyday experiences for tens of millions of Americans suggest, even these speeds are insufficient for some applications, particularly when a connection is shared by several users. In recognition of the growing need for increased bandwidth, the FCC is considering further revisions to the definition of broadband, and has expressed interest in raising the threshold to 10 or even 25 Mbps downstream and from 1 Mbps to 3 Mbps upstream.[3] The following chart provides a sense of what these definitions mean by showing how long it would take a single user to upload or download different types of content at various connection speeds.

Time Required for Selected Internet-Based Activities at Different Speeds

	3 Minute Song *5 MB (Download)*	**2 Hour Movie** *5 GB (Download)*	**20 Photographs** *40 MB (Upload)*	**5 Minute Video** *200 MB (Upload)*
256 Kbps, 256 Kbps *2000 Broadband*	2m36s	43h24m	20m50s	1h44m
4 Mbps, 1 Mbps *2010 Broadband*	10s	2h46m	5m20s	26m40
25 Mbps, 3 Mbps *Advanced Broadband*	1.6s	26m40s	1m46s	8m53s

Source: CEA Calculations*Note:* These numbers assume that the ISP is meeting its advertised speed. Download times may be greater during periods of peak traffic.

Demand for Internet access is growing quickly. Total wired and wireless Internet access revenues in 2013 were $140 billion, and have increased by about 15 percent per year in real terms since 2005. [4] The rapidly growing demand for bandwidth is driven by new applications of the Internet that effectively require a broadband connection. These applications, which are increasingly central to everyday life for many Americans, include video streaming, which is used for education, entertainment, and communication; teleworking; cloud storage that allows users to store their files on the Internet, share them, and access them from any device; and online games that allow users to interact with one another in a virtual environment.

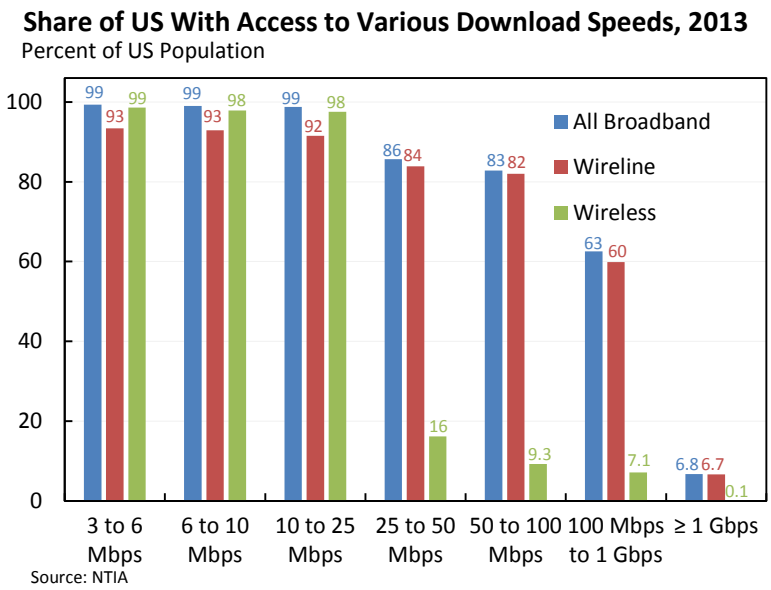
Economic studies confirm that broadband Internet creates significant value for consumers and makes an important and rapidly growing contribution to GDP. For example, one study of expenditures for Internet access estimates that as of 2006 – before the widespread availability of streaming audio and video – broadband Internet accounted for $28 billion in U.S. GDP. That study also found that broadband created an additional $5 to $7 billion in consumer surplus in 2006, meaning that consumers would have been willing to pay that much more for the service.[5] Another industry-sponsored study from 2009 estimates that broadband creates $32 billion in annual consumer surplus.[6] While these studies estimate consumer surplus by examining price sensitivity, another approach is to examine the amount of time users spend online, leading to estimates of $2,500 to $3,800 in value per-user per-year, which imply total consumer surplus in the hundreds of billions of dollars.

Over the longer term, broadband adoption also fuels a virtuous cycle of Internet innovation. This cycle begins when new applications of the Internet create demand for more bandwidth, resulting in a wave of network-level innovation and infrastructure investment. As more bandwidth becomes available, application-sector innovators find new ways to use that capacity, creating additional demand, leading to another round of network investment, and so on. While it is impossible to know what the next bandwidth-hungry killer application will be — perhaps it will be the "Internet of Things" or immersive virtual reality — both history and economic theory show that this virtuous cycle is a powerful driver of innovation and economic growth.[7]

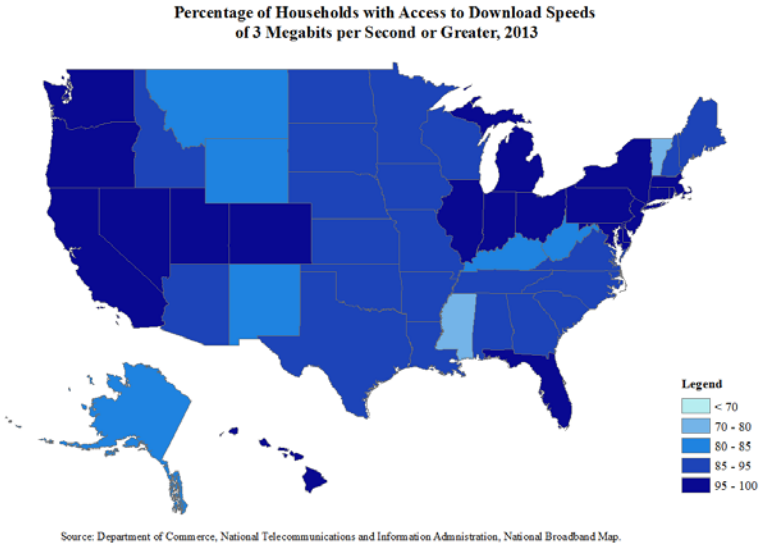
The recent history of wireless broadband provides a good example of the virtuous cycle of innovation and investment. Industry studies suggest that between 2007 and 2011 mobile applications development grew from almost nothing into a $20 billion industry, creating 311,000 U.S. jobs in the process.[8] This led to increased demand for wireless broadband, so that by 2013 private investment in new wireless infrastructure was $34 billion, more than the investments of the big three auto companies combined.[9]

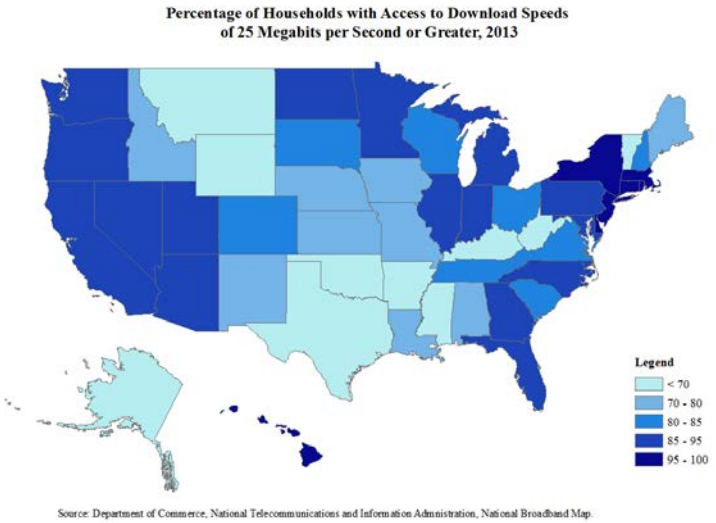
Challenges in Broadband Access and Adoption

Since the President took office, national broadband availability has increased at all advertised speed levels.[10] Today, about 93 percent of Americans have access to wired broadband speeds of at least 3 Mbps downstream (i.e. broadband that allows a user to download 3 megabits per second), and 99 percent of Americans have access to similarly fast mobile wireless broadband. This increased availability reflects both private and public investment, including the $4 billion invested through the National Telecommunications and Information Administration's (NTIA) Broadband Technology Opportunities Program (BTOP) and $3.5 billion invested through the U.S. Department of Agriculture's (USDA) Rural Utilities Service Broadband Initiative Program (BIP), both part of the American Recovery and Reinvestment Act of 2009, as well as $66 million through USDA's ongoing Community Connect grant program.



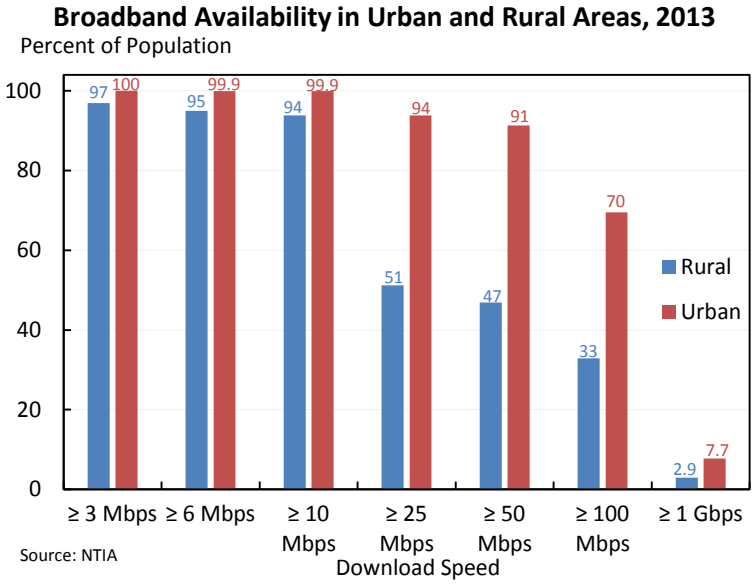
Nevertheless, nearly 51 million Americans cannot purchase a wired broadband connection with download speeds of at least 25 Mbps, and only 63 percent have access to speeds of 100 Mbps or more.[11] Moreover, the costs, benefits, and availability of broadband Internet are not evenly distributed. For example, the following two maps show the state-level availability of broadband with download speeds of at least 3 Mbps, and at least 25 Mbps respectively as of June 2013. The first map shows that most Americans have access to "basic" broadband, though some work remains to fully connect the most rural states. However, there is considerable variation in the availability of 25 Mbps connections between states, with some reaching 95 percent penetration and others offering this high-quality service to less than 70 percent of households.





Urban and Rural Communities

One factor that creates disparities in broadband access and adoption is the divide between urban and rural communities. While the gap for the most basic broadband speeds has almost closed (nearly 100 percent of urban residents have access to speeds of 6 Mbps or greater compared to 95 percent of rural residents), rural communities still enjoy far less access to higher speeds. The following figure illustrates this point:



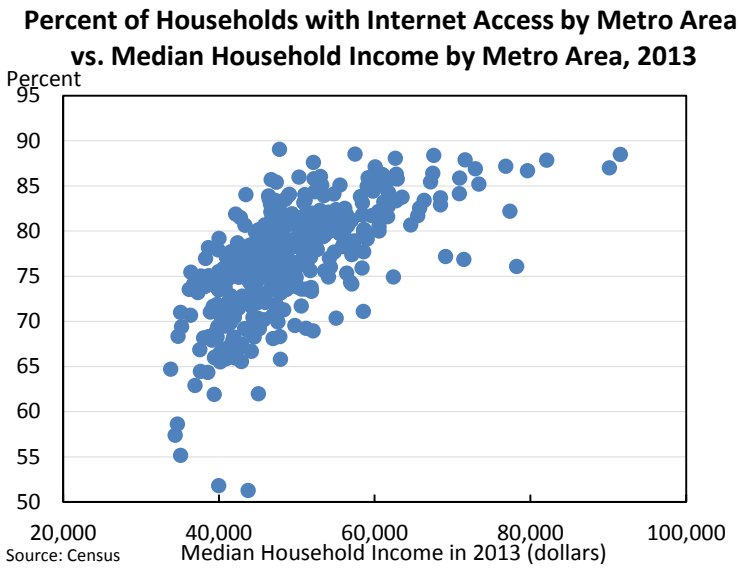
The gap in broadband availability between urban and rural communities is linked to the economics of network investment. The costs of providing a connection increase with distance, and the expected profits increase with the number of customers served. This makes it more economical to serve densely populated urban locations, where shorter wires can serve a larger number of potential customers. While satellite and terrestrial wireless technologies continue to deliver promising improvements, more work is needed to close the urban rural gap in broadband availability.

To address this gap, the USDA, BTOP, and the FCC's Connect America Fund program have all invested in creating the middle-mile infrastructure that provides high-speed access to "anchor institutions" such as schools and libraries in many rural communities. With middle-mile and community infrastructure in place, the remaining challenge is to provide last-mile connections so millions of Americans have access to high-speed broadband. As we describe below, the availability of middle-mile connections creates a significant opportunity for municipalities to increase such access.

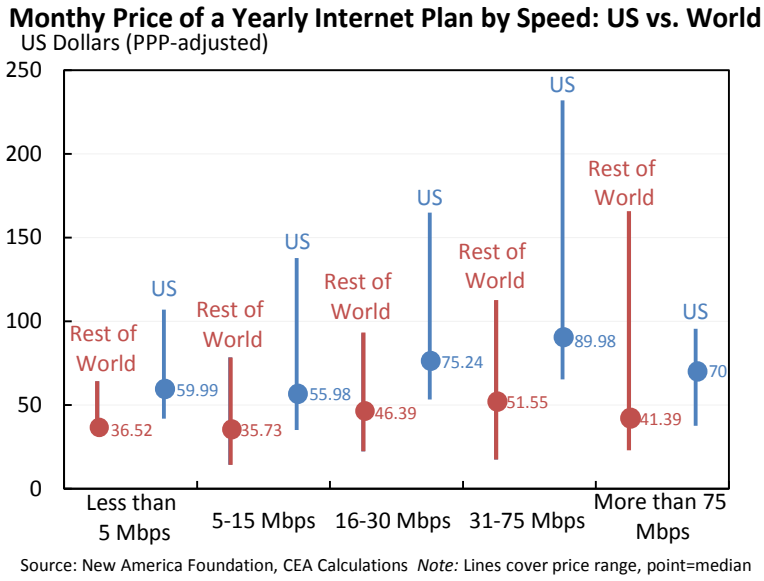
Affordability

In total, almost 30 percent of American households did not have a home broadband connection as of 2013. One of the main challenges facing increased broadband adoption is price. In a 2010 survey conducted by the FCC, 36 percent of households without a home broadband connection pointed to expense as the major barrier.[12]

Not surprisingly, the cost of broadband represents a greater obstacle for lower-income Americans than middle- and high-income Americans. The NTIA reports that in 2012, 32 percent of families not online with incomes below $25,000 indicated that the high cost of Internet service prevents them from using broadband at home, compared to less than 22 percent of households not online with annual incomes above $50,000.[13] Overall Internet use is strongly correlated with household income, as illustrated in in the figure below, which plots median income against Internet adoption for a sample of 368 Metropolitan Statistical Areas.



U.S. broadband is also relatively expensive when compared internationally. The next chart uses data from a recent report on broadband prices in 24 U.S. and international cities.[14] While the 24 cities in this study may not be representative of all urban locations in the U.S. or abroad, it is notable that the median monthly price at each speed level is higher in the U.S., often by 50 percent or more. And while it appears that the U.S. has less price variability at speeds above 75 Mbps, this observation actually reflects the fact that fewer U.S. cities even offer a consumer plan at that level.



Source: New America Foundation, CEA Calculations *Note:* Lines cover price range, point=median

Broadband Competition

One proven mechanism for increasing Internet access, quality and affordability is to promote competitive markets. Over the past 30 years, telecommunications policy has consistently attempted to encourage market competition in local, long-distance and Internet access markets. For example, the threat of satellite services pushed cable companies to expand their network capacity, positioning them to challenge phone companies in the market for home Internet access. And the ongoing competition between phone and cable companies has created a positive cycle of investment, as providers in many communities continuously upgrade their networks and improve their offerings.[15]

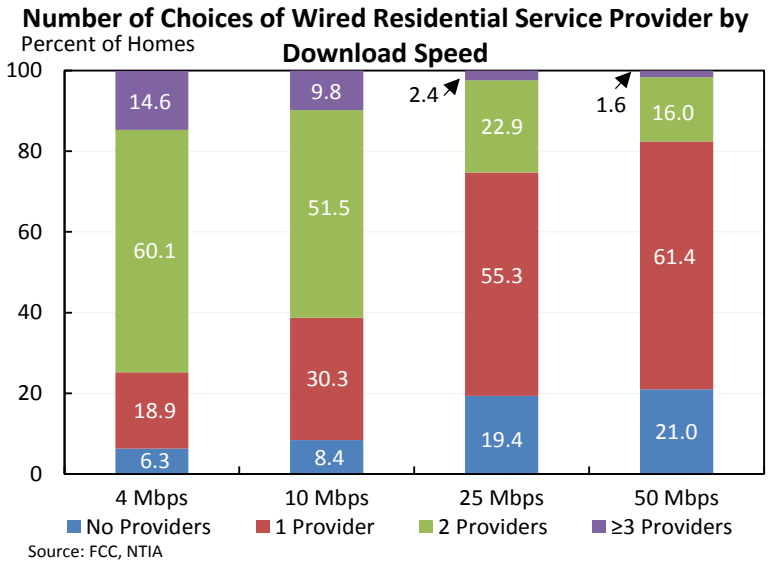
However, the overall national investment picture obscures regional variation. Many local and regional markets today do not have the kind of competition required to continue to ensure affordable access to the higher-speed broadband connections that Americans increasingly require. For example, the following table illustrates the number of choices available to American consumers in fixed and mobile broadband markets. When it comes to wired Internet, which can reliably deliver the highest speeds, the majority of Americans have three choices or less. The situation is somewhat better in wireless markets, although focusing on the number of choices obscures the large share of the market served by a handful of the largest providers. And while competition appears reasonably robust if one focuses on combined choices, it is important to recognize that fixed and wireless Internet are not necessarily substitutes, particularly at speeds of 25 Mbps or higher where there is typically no wireless service available.

Broadband Choice for American Consumers

Number of Choices	Share of U.S. Population (%)		
	Fixed	*Mobile*	*Combined*
1	9	0	0
2	33	3	1
3	37	5	2
4	13	22	4
5	3	26	10
6	1	22	18
7	0	11	19
8+	0	12	46

Source: NTIA, CEA Calculations

To illustrate the declining level of competition at higher speeds, the following chart shows the number of wired broadband service providers serving American consumers at different speeds. At speeds of 4 Mbps or less, 75 percent of consumers have a choice between two or more fixed providers, and 15 percent can select among three or more ISPs. However, in the market for Internet service that can deliver 25 Mbps downstream – the speed increasingly recognized as a baseline to get the full benefits of Internet access – three out of four Americans do not have a choice between providers.



While increased competition will not necessarily solve all broadband access challenges, basic economics suggests that increased competition leads to a better deal for consumers. For example, a 2014 OECD survey of eleven OECD member countries found that new entrants in wireless markets have a substantial impact on both prices and quality of service. Tellingly, the OECD study indicated that this result occurred even when a market already had three participants – that is, the fourth entrant into a wireless market significantly improved costs and services.[16] As shown above, less than 1 out of 40 American homes has 3 or more choices of providers at speeds in excess of 25 Mbps. Entry also had a positive impact on the market even when the new firm was very small.[17] In the U.S., a 2013 NTIA report found that among those who reported switching their Internet service provider, 38 percent did so to get a better price, and this option is simply unavailable to consumers who are only served by a single Internet Service Provider—or a single provider at the speeds they require.[18]

Even the threat of new competition can lead existing firms to make investments to improve the quality of their goods or services. In the Netherlands, for example, incumbent wireless carriers began offering plans at lower rates in an effort to prevent a new entrant from capturing market share by undercutting existing prices.[19] The U.S. cable television industry also provides an example of the benefits of potential competition. Academic research has shown that during the 2000's U.S. cable television operators were more likely to upgrade their systems to allow two-way communications in cities where the cable operator faced a threat of entry from a local municipal electric utility.[20]

Domestic experiences also show how the threat of competition can produce gains for broadband consumers. When Google announced that Google Fiber was coming to Kansas, speeds on existing networks surged 97 percent—the largest year-over-year jump in bandwidth observed in any state, ever. Likewise, when Google indicated that it would begin offering extremely fast connection speeds in Austin, TX, AT&T responded by announcing its own gigabit network.

Community-Based Broadband

Where the market does not generate the optimal level of competition or investment, the public sector can step in to make investments, encourage competition and provide choice to consumers. For example, government infrastructure investments, such as those made by the Department of Commerce and Department of Agriculture or by Massachusetts (as described below), may be able to put in place the "middle mile" network that lowers costs of entering the "last mile" market. These investments can attract the private sector or provide local governments the opportunity to build their own systems at much lower prices.

Antitrust and telecommunications policies can also promote competition. At the Federal level, the Department of Justice has an important role to play in preventing the unlawful acquisition or abuse of market power. The Telecommunications Act of 1996 also empowers the FCC to regulate service providers in a manner that promotes competition both within and between technology-based platforms such as cable, cellular, satellite, and wireless. The President's recent call for strong Net Neutrality rules to ensure that no company can act as a gatekeeper to Internet content are fundamentally about preserving access and competition in the digital marketplace. And states have an important role in promoting competition and ensuring fairness in their local communications markets.

But these federal and state initiatives are only part of the solution. Local governments also have a critical role to play. In markets where private competition is anemic, whether because of regulatory barriers to entry or the high fixed costs of infrastructure investment, town and cities can build their own middle-mile networks and offer competitive access to the private sector, as Scott County, MN has done. Or municipalities can provide service directly to consumers, like in Chattanooga, TN. In either case, municipalities are creating more choices for consumers, fostering competition and creating opportunities for economic growth. Municipal broadband is often a logical choice for towns and cities that are already served by a municipal electric utility, since infrastructure costs can be shared across those two services, just as private cable companies leveraged their networks to provide Internet service. Hundreds of towns and cities around the country have experimented with these networks and created tremendous benefits for consumers and businesses. APPENDIX 1 includes a full list of municipal networks around the country.

Today, however, there are barriers to community-owned broadband in 19 states around the country. The Obama Administration believes that consumers should have the option to provide themselves broadband services through local government and locally-owned utilities and that state and local policy should support a level playing field for these community-based solutions. This section considers several detailed case studies of municipal broadband initiatives and their benefits for consumers, businesses and communities.

Chattanooga, TN: Gigabit service drives investment, innovation

In 2007, Chattanooga's Electric Power Board (EPB), a municipally-owned utility, announced a 10 year plan to build out a fiber network to serve all of Chattanooga. Based on their analysis, EPB had determined that investments in the network could both drive a smart grid system that would generate significant savings by increasing the reliability of its electricity and also provide customers with improved communication services. In 2009, EPB began offering its triple-play services—Internet, phone, and cable television. Since 2009, EPB has upgraded the mid-tier consumer service from 15 to 30, from 30 to 50, and from 50 to 100 Mbps, without raising costs. In 2010, EPB announced it would offer the first 1 gigabit per second (Gbps) service in the United States. Today, EPB operates 8,000 miles of fiber for 60,000 residential and 4,500 business customers out of a potential 160,000 homes and businesses.

EPB's efforts have encouraged other telecom firms to improve their own service. In 2008, for example, Comcast responded to the threat of EPB's entrance into the market by investing $15 million in the area to launch the Xfinity service – offering the service in Chattanooga before it was available in Atlanta, GA. More recently, Comcast has started offering low-cost introductory offers and gift cards to consumers to incentivize service switching. Despite these improvements, on an equivalent service basis, EPB's costs remain significantly lower.

EPB's investments are reshaping Chattanooga's economic landscape. The gigabit broadband service has helped the City attract a new community of computer engineers, tech entrepreneurs and investors. For example, local entrepreneurs have organized Lamp Post, a venture incubator that provides capital and mentorship to startups. Lamp Post now has over 150 employees in a 31,000 square foot office space in downtown Chattanooga. CO.LAB, a local nonprofit organization, provides shared working space, access to investor networks and hosts the annual summer GITANK program, a 14-week business accelerator. The investment community has responded in kind. Since 2009, Chattanooga has gone from close to zero venture capital to at least five organized funds with investable capital of over $50 million. The growing tech ecosystem has been profiled by the *New York Times*, *Washington Post* and *The Atlantic*.

While the broadband network is opening up new economic pathways, EPB itself remains the most important customer for the fiber network, which it has used to develop one of the nation's leading smart grids. The smart grid, which involves 170,000 intelligent electric meters all reporting every 15 minutes, helps EPB monitor and respond to outages, emergencies, and electricity theft in real time. EPB's smart grid has cut duration of power outages by 60 percent, saving local businesses and industry an estimated $45 to $60 million. With the monitoring system in place, EPB crews can also respond in a targeted fashion during emergencies, helping families and businesses cope with tornados and other natural disasters. [21]

Wilson, NC: Municipal broadband encourages private competition

In November of 2006, Wilson's City council voted unanimously to build a fiber-to-the-home (FTTH) network through the town's electricity provider, Greenlight. The City Council issued $28 million in debt to start construction. Greenlight began offering its

services in 2008 and expanded its network to include triple-play (television, phone, and internet) services citywide by January 2009. In 2010, the city took another $4.5 million loan from Wells Fargo to improve its network. The subscription base grew steadily in its first few years and numbers over 7000 today –more than a third of Wilson's 21,000 households.

Greenlight has been a commercial success. Greenlight achieved its first monthly operating profit one year ahead of schedule in October 2010 and made a profit of nearly three-quarters of a million dollars in 2013. However, a 2011 state law prevents municipalities from providing broadband service to other towns outside of its area, limiting further growth.

Greenlight's introduction of its triple-play service has increased industry competition, which has lowered prices for Wilson's residents. From 2007 to 2009, Time Warner raised rates for almost all of its services across the board. According to a December 2009 presentation for the House Select Committee on High Speed Internet Access in Rural and Urban Areas, TWC raised rates in non-competitive areas around Wilson while holding Wilson's rates steady. According to the same report, TWC raised its prices for basic internet service in the North Carolina Research Triangle — as much as 52 percent in Cary — but did not impose any rate hike in Wilson. Moreover, TWC stabilized prices in Wilson for the digital sports and games tier, while Triangle customers paid 41 percent more. The lowered prices in Wilson make a big difference. According to an independent consultant for Wilson, Greenlight saved its residents more than $1 million each year compared to what Time Warner Cable customers in other areas pay.

Increased competition has also yielded increased speeds for Wilson customers. Greenlight's system offers speeds of up to 1 gigabit for consumers and businesses. In 2008, Time Warner's residential Road Runner service in the state offered speeds no higher than 10 Mbps, equivalent to Greenlight's lowest consumer tier. TWC charged $57 per month for the service while Greenlight charged $35. In response, TWC upped its top-tier speed to 15 Mbps "because of the competitive environment," according to a Time Warner spokesperson.[22]

Lafayette, LA: Network increases customer savings, strengthens local anchor institutions

The residents of Lafayette have a long history of supporting local infrastructure initiatives. Recognizing the need to modernize its broadband infrastructure in the early 2000's, the community voted in 2005 to approve construction of a fiber-to-the-home (FTTH) network. After overcoming serious opposition from local broadband service providers, the publicly-owned Lafayette Utilities System (LUS) started connecting homes and businesses to its LUS Fiber network in 2009. The network seeks to provide equitable access to all of Lafayette's citizens, and the system was rolled out across high-income and low-income neighborhoods equally. LUS Fiber now offers 100 Mbps speed for all subscribers.

As competing firms adjusted their plans to account for LUS Fiber's market entry, residents who weren't customers of the network started to see lower prices. Cox Communications, a major regional provider which had raised rates six times in four years, kept its rates stable from 2004 to 2007 to account for LUS's possible market entry. Still, LUS's prices have been consistently lower than those offered by Cox. Terry Huval, the director of LUS, estimates that the community saved $4 million from these deferred rate increases. Using estimates of Cox's average competing discounts and LUS Fiber's lower rates, LUS projects the fiber system will create total savings of between $90 and $100 million over the its first 10 years.

The fiber network has brought in companies eager to obtain fast service at lower prices. Pixel Magic brought 100 to 200 jobs when it built an office in Lafayette to accomplish work on the movie "Secretariat". The high-speed capability of the broadband network was a big factor in their eventual decision to maintain their office in Louisiana permanently. The tech startup firm Skyscraper Holding moved from Los Angeles to Lafayette to obtain 100 Mb/s speeds at a fraction of the cost the company was charged on the west coast. The company pays just $200 a month for more reliable service.

The network has strengthened community anchors as well, delivering greater value and opportunities for connectivity to Lafayette's school and library systems. By mid-2008, all of the schools in the Lafayette Parish School System were able to access 100 Mbps speeds for $390/month. Not only can students now do more to leverage the Internet for better learning opportunities, this monthly fee saves community tax dollars by being a better value than competitors could offer. Lafayette's public libraries also benefit from the network by sharing a 90 Mbps connection from LUS that was rated as the best value amongst possible providers by the federal E-Rate program. [23]

Scott County, MN: Municipal government sees savings for county, school operations

In the early 2000s, Scott County started exploring options for increasing broadband services for county government buildings and schools. In 2007, the County issued $3.5 million in bonds to install a high-speed middle-mile network. The network connects all county-owned facilities, including schools, libraries, city halls, policy and fire departments and public safety towers. It also connects with the state's high capacity backbone network and with multiple private providers. From the beginning, the project was a joint effort between local and state government and the private sector. While the county paid the upfront costs, the state pays for the network's operating costs in exchange for use of the network. The open architecture of the system allows private companies to offer their own services; private providers, in turn, cover the network's maintenance costs.

The network has achieved significant benefits. Scott County's annual bond payment for the construction of the backbone is $35,000 less than what the County was paying for leasing private sector lines. Local schools have seen even greater savings. The costs for Scott County's school districts per megabit of Internet service went from an average of $58.00 to $6.83 per megabit for all school districts—a cost reduction of nearly 90

percent per megabit. The net effect was a tripling of availability (100 to 300 megabits) while costs fell from $5,800 to $2,049 a month. At the state level, the government is saving approximately $1 million per year from access to the public network.

The network has also helped attract significant private investment and fostered job creation. In 2010, for example, Emerson Process Management was finalizing a decision on where to site a new $70 million investment that would create 500 jobs. Emerson's two finalist sites were the town of Shakopee in Scott County, Minnesota and Chihuahua, Mexico. Recognizing the savings from the high-speed broadband network, Emerson chose Scott County. [24]

Leverett, MA: State and federal programs enable local investment

In 2008, Massachusetts Governor Deval Patrick created the Massachusetts Broadband Initiative (MBI). MBI was charged with bringing broadband to all residents and businesses in MA within three years. The Broadband Act provided MBI with initial $40 million in state bond funds. Over the last six years, Massachusetts has built 1,200 miles of new fiber optic cable that provide access to more than 120 communities in Western and North Central Massachusetts.

Of the original state funds, $25 million were directed to build a broadband network in Western, MA. With the support of additional federal funds, MBI developed "MassBroadband 123", a middle-mile network serving 123 communities in the region. MBI worked closely with the private sector to build the project. Today, MassBroadband 123 is operated by Axia NGNetworks. The network has an open architecture that allows any Internet service provider to purchase wholesale services on the network at the same rates. The network also positions municipalities to focus on putting homes and businesses on the network through last-mile connections.

Leverett, MA saw the opportunity to build its own broadband system. In 2012, Leverett voters approved a modest property tax increase and a $3.6 million bond to fund the network. Leverett created a publicly controlled Municipal Light Plant (MLP) entity to own and operate its network, named LeverettNet. The town is currently in the process of building the network – which will provide 1 gigabit service – and connecting it to all 630 households in the community. [25]

Choctaw Nation Tribal Area, OK: Public private collaboration brings broadband to new communities

In early 2009, much of the ten Southeastern Oklahoma counties encompassed by the Choctaw Nation's Tribal Area lacked access to reliable broadband service. The low population density (8.3 to 19.7 people per square mile), the high poverty rate (25 percent of the population below the poverty line) and the rugged terrain made the economics of broadband infrastructure very challenging. Initial capital costs to deploy broadband meant that broadband service was limited only to commercially viable areas.

Pine Tele, the service provider offering voice, video, cell, long distance, and high-speed broadband in SE OK applied for and received 4 American Recovery and Reinvestment awards in 2009 and 2010. One grant was to build out fiber to the home in the area already covered by landlines, and the other three were for wireless – advanced 3G technology – to completely unserved areas. As of September 2014 Pine Tele had deployed 324 miles of fiber, 5,500 fiber drops, and 54 tower sites. New or improved broadband service had been made available to 1,757 fiber customers and 1,194 wireless customers. Today, Pine Telephone provides a variety of broadband packages over both their fiber and wireless facilities ranging from 1.5 Mbps to 5 Mbps for download speeds and 384 Kbps to 5 Mbps for upload speeds.

The benefits for the community have been significant. Every school in the 10 county Pine Tele service area is now connected with high-speed fiber optic broadband service. This has created the ability to integrate online educational tools into everyday teaching and assessments of student comprehension. Broken Bow School District is one example. This district serves approximately 1,280 students per day. They have been able to integrate smart boards, iPads, online lesson plans, and the "I-Ready program" to supplement learning. Hundreds of performance tests are now completed online. And family engagement is improved, as parents are increasingly provided online access to records of attendance, assignments, and test scores. The connectivity also allows the Choctaw Nation to multicast educational videos and share messages from Tribal leadership from a central location. For example, the Choctaw School of Language now offers distance learning courses to approximately 14 head starts and 32 high schools within the Choctaw Nation, in addition to several universities. [26]

Promoting Broadband that Works

Last November, the President outlined his plan to keep the Internet open to new competition and innovation by safeguarding net neutrality — which will help ensure no one company can act as a gatekeeper to digital content. But there is more work to do so that every American has access to a free and open internet. This is particularly true in areas where broadband competition is lacking, resulting in high prices and slow service.

High-speed, low-cost broadband is paving the way for economic revitalization not just in Cedar Falls, but in places like Chattanooga, TN and Lafayette, LA — which have Internet speeds up to 100 times faster than the national average and deliver it at an affordable price. To help more communities achieve these results, support economic growth, and promote a level playing field for all competitors, the Obama Administration is:

- Calling to End Laws that Harm Broadband Service Competition: Laws in 19 states — some specifically written by special interests trying to stifle new competitors — have held back broadband access and, with it, economic opportunity. Today President Obama is announcing a new effort to support local choice in broadband, formally opposing measures that limit the range of options to available to communities to

spur expanded local broadband infrastructure, including ownership of networks. As a first step, the Administration is filing a letter with the Federal Communications Commission (FCC) urging it to join this effort by addressing barriers inhibiting local communities from responding to the broadband needs of their citizens.

- Expanding the National Movement of Local Leaders for Better Broadband: As of today, 50 cities representing over 20 million Americans have joined the Next Century Cities coalition, a nonpartisan network pledging to bring fast, community-supported broadband to their towns and cities. They join 37 research universities around the country that formed the Gig.U partnership to bring fast broadband to communities around their campuses. To recognize these remarkable individuals and the partnerships they have built, in June 2015 the White House will host a Community Broadband Summit of mayors and county commissioners from around the nation who are joining this movement for broadband solutions and economic revitalization.

- Announcing a New Initiative to Support Community Broadband Projects: To advance this important work, the Department of Commerce is launching a new initiative, BroadbandUSA, to promote broadband deployment and adoption. Building on expertise gained from overseeing the $4.7 billion Broadband Technology Opportunities Program funded through the Recovery Act, BroadbandUSA will offer online and in-person technical assistance to communities; host a series of regional workshops around the country; and publish guides and tools that provide communities with proven solutions to address problems in broadband infrastructure planning, financing, construction, and operations across many types of business models.

- Unveiling New Grant and Loan Opportunities for Rural Providers: The Department of Agriculture is accepting applications to its Community Connect broadband grant program and will reopen a revamped broadband loan program which offers financing to eligible rural carriers that invest in bringing high-speed broadband to unserved and underserved rural areas.

- Removing Regulatory Barriers and Improving Investment Incentives: The President is calling for the Federal Government to remove all unnecessary regulatory and policy barriers to broadband build-out and competition, and is establishing a new Broadband Opportunity Council of over a dozen government agencies with the singular goal of speeding up broadband deployment and promoting adoptions for our citizens. The Council will also solicit public comment on unnecessary regulatory barriers and opportunities to promote greater coordination with the aim of addressing those within its scope.

Appendix 1: U.S. Municipalities with Broadband Networks[27]

City	State	Name of Network	Type
Ketchikan	AK	KPU Telecommunications	cable
Kotlik	AK	Kotlik	cable
Statewide	AK	Rural Alaska Video E-Health Network (RAVEN)	inet
White Mountain	AK	White Mountain	cable
Opelika	AL	Opelika	fiber
Opp	AL	Opp Cablevision	cable
Scottsboro	AL	Scottsboro EPB	cable
Sylacauga	AL	Sylacauga	cable
Conway	AR	Conway Corporation	cable
Paragould	AR	Paragould Light Water and Cable	cable
Sells	AZ	Tohono O'odham Last-Mile FTTH and Broadband Wireless Network	partial
Anaheim	CA	Anaheim	dark
Anaheim	CA	Anaheim Fiber	inet
Burbank	CA	Burbank Water and Power	partial
Glendale	CA	Glendale	dark
Humboldt County	CA	Digital Redwoods	inet
Loma Linda	CA	Loma Linda	dark
Loma Linda	CA	Loma Linda Connected Community	fiber
Lompoc	CA	City of Lompoc (LompocNet)	inet
Long Beach	CA	Long Beach	dark
Mendocino County	CA	Mendocino Community Network	inet
Palo Alto	CA	Palo Alto Fiber	dark
Pasadena	CA	Pasadena	dark
San Bruno	CA	San Bruno Municipal Cable TV	cable
San Francisco	CA	SF Fiber	question
Santa Clara	CA	Santa Clara	partial
Santa Monica	CA	Santa Monica City Net	partial
Santa Monica	CA	Santa Monica Fiber	partial
Shafter	CA	City of Shafter, California	partial
Truckee	CA	Truckee Donner Public Utility District	dark
Vernon	CA	Vernon Light & Power	fiber
Cortez	CO	Cortez Community Network	partial
Durango	CO	Durango	dark
Glenwood Springs	CO	Glenwood Springs Community Broadband Network (GSCBN)	partial
Longmont	CO	NextLight	fiber

Bristol	CT	Bristol CT	inet
East Hartford	CT	Connecticut Education Network	dark
Manchester	CT	Manchester Wireless	inet
Fort Pierce	FL	FPUAnet Communications	partial
Gainesville	FL	GATOR NET	partial
Hobe Sound	FL	Martin County Dark Fiber	dark
Indiantown	FL	Martin County Dark Fiber	dark
Jacksonville	FL	Jacksonville iNet	inet
Jensen Beach	FL	Martin County Dark Fiber	dark
Jupiter Island	FL	Martin County Dark Fiber	dark
Lakeland	FL	Lakeland	dark
Leesburg	FL	Leesburg	partial
New Smyrna Beach	FL	Utilities Commission, City of New Smyrna Beach	inet
Ocala	FL	Ocala Utility Services	partial
Ocean Breeze Park	FL	Martin County Dark Fiber	dark
Palm Beach County	FL	Palm Beach County	partial
Palm City	FL	Martin County Dark Fiber	dark
Palm Coast	FL	Palm Coast FiberNET	partial
Port Salerno	FL	Martin County Dark Fiber	dark
Quincy	FL	NetQuincy	fiber
Sewall's Point	FL	Martin County Dark Fiber	dark
Stuart	FL	Martin County Dark Fiber	dark
Tallahassee	FL	Tallahassee	dark
Valparaiso	FL	Valparaiso Broadband	cable
Baconton	GA	Community Network Services - Camilla	cable
Baker County	GA	SGRITA Rural Last-mile Infrastructure Project Last-mile	partial
Cairo	GA	Community Network Services - Cairo (Syrup City)	cable
Calhoun	GA	CALNET	partial
Calhoun County	GA	SGRITA Rural Last-mile Infrastructure Project Last-mile	partial
Camilla	GA	Community Network Services - Camilla	cable
Cartersville	GA	Fibercom	partial
Catoosa County	GA	OptiLink	partial
Columbia County	GA	Columbia County Community Broadband Network	partial
Dalton	GA	OptiLink	fiber
Doerun	GA	City of Doerun	cable
Douglasville	GA	Douglas County School System Fiber	inet
Dublin	GA	Dublin	partial

Early County	GA	SGRITA Rural Last-mile Infrastructure Project Last-mile	partial
Elberton	GA	Elberton Utilities	cable
Flintstone	GA	EPB Fiber Optics	fiber
Forsyth	GA	Forsyth Cablenet	cable
LaGrange	GA	LaGrange Telecommunications Department	partial
Miller County	GA	SGRITA Rural Last-mile Infrastructure Project Last-mile	partial
Mitchell County	GA	SGRITA Rural Last-mile Infrastructure Project Last-mile	partial
Monroe	GA	Monroe Utilities Network	cable
Moultrie	GA	Community Network Services - Moultrie	cable
Murray County	GA	OptiLink	partial
Pelham	GA	Community Network Services - Pelham (Pelnet)	cable
Rossville	GA	EPB Fiber Optics	fiber
Sandersville	GA	Sandersville FiberLink	partial
Thomasville	GA	Community Network Services - Thomasville	cable
Tifton	GA	Tifton	dark
Whitfield County	GA	OptiLink	partial
Wildwood	GA	EPB Fiber Optics	fiber
Algona	IA	Algona Municipal Utilities	cable
Alta	IA	Altatec	cable
Bellevue	IA	Bellevue	fiber
Cedar Falls	IA	Cedar Falls Utilities	fiber
Cedar Falls	IA	Cedar Falls Utilities - rural expansion	partial
Coon Rapids	IA	Coon Rapids Municipal Utilities	cable
Grundy Center	IA	Grundy Center Municipal Light & Power	cable
Harlan	IA	Harlan Municipal Utilities	cable
Hartley	IA	The Community Agency	cable
Hawarden	IA	HITEC - Hawarden Integrated Technology, Energy, & Communication	cable
Independence	IA	Independence Light & Power, Telecommunications	cable
Indianola	IA	Indianola	partial
Laurens	IA	Laurens Municipal Power and Communications	cable
Lenox	IA	Lenox	fiber
Manning	IA	Manning Municipal Communication and Television System Utility	cable
Mapleton	IA	Mapleton Communications	cable

Muscatine	IA	MachLink	cable
Osage	IA	Osage Municipal Utilities	cable
Paullina	IA	The Community Agency	cable
Primghar	IA	The Community Agency	cable
Reinbeck	IA	Reinbeck Telecom	cable
Sanborn	IA	The Community Agency	cable
Spencer	IA	Spencer Municipal Utilities	fiber
Webster City	IA	Webster City	dark
Ammon	ID	Ammon	partial
Idaho Falls	ID	Circa	dark
Plummer	ID	Coeur d'Alene Reservation FTTH Project Last-mile Non-remote	partial
Aurora	IL	Onlight Aurora	partial
Aurora	IL	OnLight Aurora	dark
Champaign	IL	Urbana-Champaign Big Broadband UC2B	partial
DeKalb County	IL	DeKalb Advancement of Technology Authority Broadband	partial
Evanston	IL	Evanston	partial
Highland	IL	Highland Communication Services	fiber
LaSalle County	IL	DeKalb Advancement of Technology Authority Broadband	partial
Princeton	IL	Princeton Municipal Utilities	partial
Rochelle	IL	Rochelle Municipal Utilities	partial
Rock Falls	IL	Rock Falls	partial
Urbana	IL	Urbana-Champaign Big Broadband UC2B	partial
Anderson	IN	Anderson Municipal Light and Power	partial
Auburn	IN	Auburn Essential Services	fiber
Lebanon	IN	Lebanon Utilities	cable
Mishawaka	IN	Saint Joe Valley MetroNet	dark
South Bend	IN	Saint Joe Valley MetroNet	dark
Westfield	IN	City of Westfield	partial
Chanute	KS	Chanute	partial
Lenexa	KS	Lenexa Fiber	dark
Ottawa	KS	Ottawa Network	partial
White Cloud	KS	Iowa Tribe of Kansas and Nebraska Fiber-to-the- Premise	partial
Barbourville	KY	Barbourville	cable
Bardstown	KY	Bardstown Cable	cable
Bowling Green	KY	Bowling Green Municipal Utility	partial
Corinth	KY	City of Williamstown	partial
Frankfort	KY	Frankfort Plant Board	cable

Franklin	KY	Franklin Municipal FiberNET	partial
Glasgow	KY	Glasgow Electric Power Board	cable
Grant County	KY	City of Williamstown	partial
Hopkinsville	KY	Energy Net	cable
Monticello	KY	Community Telecom Services	cable
Murray	KY	Murray Electric System	cable
Owen County	KY	City of Williamstown	partial
Owensboro	KY	OMU Online	partial
Paducah	KY	Paducah Power System	partial
Russellville	KY	Russellville EPB SmartNet	fiber
Williamstown	KY	City of Williamstown	cable
Lafayette	LA	Lafayette Utilities System	fiber
Braintree	MA	Braintree Electric Light Department	cable
Chicopee	MA	Chicopee Electric Light	partial
Holyoke	MA	Holyoke Gas & Electric Co.	partial
Leverett	MA	LeverettNet	fiber
Norwood	MA	Norwood Light Broadband	cable
Russell	MA	Russell Municipal Cable	cable
Shrewsbury	MA	Shrewsbury Electric and Cable Operations	cable
South Hadley	MA	Five College Fiber Optic Network	inet
Taunton	MA	Taunton Municipal Lightning Plant	partial
Worcester	MA	Worcester Municipal Fiber Loop	inet
Carroll County	MD	Carroll County Broadband	dark
Columbia	MD	Howard County Fiber Network	dark
Dayton	MD	Howard County Fiber Network	dark
Easton	MD	EastonOnline	cable
Elkridge	MD	Howard County Fiber Network	dark
Ellicot City	MD	Howard County Fiber Network	dark
Fulton	MD	Howard County Fiber Network	dark
Highland	MD	Howard County Fiber Network	dark
Savage	MD	Howard County Fiber Network	dark
Coldwater	MI	CBPU	cable
Crystal Falls	MI	City of Crystal Falls	cable
Holland	MI	Holland Fiber Network	fiber
Negaunee	MI	City of Negaunee Dept. of Public Works	cable
Norway	MI	City of Norway CATV System	cable
Sebewaing	MI	Sebewaing Light & Water	fiber
Wyandotte	MI	Wyandotte	cable
Bagley	MN	Bagley Public Utilities	fiber
Barnesville	MN	Barnesville Municipal Utilities	partial
Belle Plaine	MN	Scott County Fiber Network	dark

Bingham Lake	MN	SMBS - Bingham lake	fiber
Brewster	MN	SMBS - Brewster	fiber
Carver	MN	CarverLink	dark
Chanhassen	MN	CarverLink	dark
Chaska	MN	Chaska.Net	partial
Cologne	MN	CarverLink	dark
Crosslake	MN	Crosslake Communications	fiber
Eagan	MN	Access Eagan	partial
Elko New Market	MN	Scott County Fiber Network	dark
Hamburg	MN	CarverLink	dark
Heron Lake	MN	SMBS - Heron Lake	fiber
Jackson	MN	SMBS - Jackson	fiber
Jordan	MN	Scott County Fiber Network	dark
Lake County	MN	Lake County	partial
Lakefield	MN	SMBS - Lakefield	fiber
Mayer	MN	CarverLink	dark
Monticello	MN	Monticello Fiber Network	fiber
New Germany	MN	CarverLink	dark
New Prague	MN	Scott County Fiber Network	dark
Norwood Young America	MN	CarverLink	dark
Okabena	MN	SMBS - Okabena	fiber
Pine City	MN	Pine City Fiber Optic Backbone	partial
Prior Lake	MN	Scott County Fiber Network	dark
Round Lake	MN	SMBS - Round Lake	fiber
Savage	MN	Scott County Fiber Network	dark
Shakopee	MN	Scott County Fiber Network	dark
Silver Bay	MN	Lake County Fiber Network	partial
St. Louis Park	MN	St. Louis Park	inet
Two Harbors	MN	Lake County Fiber Network	partial
Victoria	MN	CarverLink	dark
Waconia	MN	CarverLink	dark
Watertown	MN	CarverLink	dark
Westbrook	MN	Westbrook Municipal Light & Power	cable
Wilder	MN	SMBS - Wilder	fiber
Windom	MN	Windomnet	fiber
Kahoka	MO	Kahoka	cable
Marshall	MO	Marshall	fiber
North Kansas City	MO	liNKCity	fiber
Poplar Bluff	MO	City of Poplar Bluff Municipal Utilities	cable
Springfield	MO	SpringNet	partial
Collins	MS	Collins Communications	cable

Asheville	NC	ERC Broadband	dark
Chapel Hill	NC	Chapel Hill Fiber Optic Services	inet
Cornelius	NC	MI-Connection	cable
Davidson	NC	MI-Connection	cable
Mooresville	NC	MI-Connection	cable
Morganton	NC	Morganton	cable
Salisbury	NC	Fibrant	fiber
Sylva	NC	BalsamWest FiberNET	partial
Tryon	NC	PANGAEA	partial
Wilson	NC	Greenlight	fiber
South Sioux City	NE	South Sioux City Municipal Network	inet
Cheshire	NH	Fast Roads	dark
Claremont	NH	Fast Roads	dark
Enfield	NH	Fast Roads	partial
Fitzwilliam	NH	Fast Roads	dark
Goshen	NH	Fast Roads	dark
Hanover	NH	Fast Roads	dark
Keene	NH	Fast Roads	dark
Lebanon	NH	Fast Roads	dark
Lyme	NH	Fast Roads	dark
Marlow	NH	Fast Roads	dark
New London	NH	Fast Roads	dark
Newport	NH	Fast Roads	dark
Orford	NH	Fast Roads	dark
Richmond	NH	Fast Roads	dark
Rindge	NH	Fast Roads	partial
Springfield	NH	Fast Roads	dark
Sunapee	NH	Fast Roads	dark
Swanzey	NH	Fast Roads	dark
Glassboro	NJ	Glassboro Municipal Area Network	inet
Vineland	NJ	Vineland Metropolitan Area Network	inet
Churchill	NV	CC Communications	fiber
Bristol Center	NY	Axcess Ontario	dark
Bristol Springs	NY	Axcess Ontario	dark
Canandaigua	NY	Axcess Ontario	dark
Cheshire	NY	Axcess Ontario	dark
Clifton Springs	NY	Axcess Ontario	dark
East Bloomfield	NY	Axcess Ontario	dark
Farmington	NY	Axcess Ontario	dark
Fishers	NY	Axcess Ontario	dark
Geneva	NY	Axcess Ontario	dark

Gorham	NY	Axcess Ontario	dark
Hogansburg	NY	St. Regis Mohawk Tribe Connect (Economic Development for the 21st Century)	partial
Honeoye	NY	Axcess Ontario	dark
Hopewell	NY	Axcess Ontario	dark
Manchester	NY	Axcess Ontario	dark
Naples	NY	Axcess Ontario	dark
New York City	NY	New York City Wireless Network NYCWiN	inet
Phelps	NY	Axcess Ontario	dark
Rushville	NY	Axcess Ontario	dark
Stanley	NY	Axcess Ontario	dark
Victor	NY	Axcess Ontario	dark
West Bloomfield	NY	Axcess Ontario	dark
Akron	OH	OneCommunity	partial
Ashtabula	OH	OneCommunity	partial
Barberton	OH	OneCommunity	partial
Bryan	OH	Bryan Municipal Utilities	cable
Butler County	OH	Butler County	inet
Canton	OH	OneCommunity	partial
Cincinnati	OH	Hamilton County	inet
Cleveland	OH	OneCommunity	partial
Cleveland Heights	OH	OneCommunity	partial
Dover	OH	Dover Technology	dark
Dublin	OH	Dublink+	partial
Eastlake	OH	OneCommunity	partial
Elyria	OH	OneCommunity	partial
Gahanna	OH	Gahanna	inet
Hamilton	OH	Hamilton Miami U	inet
Lorain	OH	OneCommunity	partial
Mayfield Village	OH	OneCommunity - Mayfield Village	partial
Medina County	OH	Medina County	dark
Mentor	OH	OneCommunity	partial
Middletown	OH	Middletown Miami U	inet
New Albany	OH	BlueAlbany	partial
Sandusky	OH	OneCommunity	partial
Wadsworth	OH	City of Wadsworth Electric & Communications Dept.	cable
Wadsworth	OH	OneCommunity	dark
Woodsfield	OH	Woodsfield Municipal Power	cable
Wooster	OH	OneCommunity	partial
Ponca City	OK	Ponca City Technology Services	partial

Sallisaw	OK	DiamondNet	fiber
Ashland	OR	Ashland Fiber Network	cable
Canby	OR	Clackamas Broadband Express	dark
Damascus	OR	Clackamas Broadband Express	dark
Douglas County	OR	Oregon South Central Regional Fiber Consortium Lighting the Fiber Middle-mile Project	partial
Estacada	OR	Clackamas Broadband Express	dark
Eugene	OR	Eugene	dark
Gladstone	OR	Clackamas Broadband Express	dark
Government Camp	OR	Clackamas Broadband Express	dark
Happy Valley	OR	Clackamas Broadband Express	dark
Independence	OR	MINET	fiber
Klamath County	OR	Oregon South Central Regional Fiber Consortium Lighting the Fiber Middle-mile Project	partial
Lane County	OR	Oregon South Central Regional Fiber Consortium Lighting the Fiber Middle-mile Project	partial
Milwaukie	OR	Clackamas Broadband Express	dark
Molalla	OR	Clackamas Broadband Express	dark
Monmouth	OR	MINET	fiber
Mulino	OR	Clackamas Broadband Express	dark
Oregon City	OR	Clackamas Broadband Express	dark
Sandy	OR	SandyNet	partial
Sherwood	OR	Sherwood Fiber	partial
Springfield	OR	Springfield Utility Board	dark
The Dalles	OR	Q-Life Network	partial
Wilsonville	OR	Clackamas Broadband Express	dark
Beaver County	PA	Beaver County Fiber	inet
Kutztown	PA	Hometown Utilicom	fiber
Pitcairn	PA	Pitcairn Power/Community Cable	cable
Hartsville	SC	Hartsville	question
Oconee County	SC	Oconee FOCUS (Fiber Optics Creating Unified Solutions)	partial
Orangeburg County	SC	Orangeburg	partial
Aberdeen	SD	CityNet (Dakota Interconnect)	inet
Beresford	SD	Beresford Municipal Telephone/Cablevision	cable
Brookings	SD	Swiftel	fiber
Bristol	TN	Bristol TN Essential Services	fiber
Chattanooga	TN	EPB Fiber Optics	fiber
Clarksville	TN	Clarksville CDE Lightband	fiber

Columbia	TN	CPWS Broadband	cable
East Ridge	TN	EPB Fiber Optics	fiber
Erwin	TN	Erwin Utilities	partial
Fayetteville	TN	Fayetteville Public Utilities	cable
Jackson	TN	Jackson Energy Authority	fiber
Johnson City	TN	BVU OptiNet	partial
Lookout Mountain	TN	EPB Fiber Optics	fiber
Morristown	TN	FiberNET	fiber
Nashville	TN	NESNet	dark
Pulaski	TN	PES Energize	fiber
Red Bank	TN	EPB Fiber Optics	fiber
Ridgeside	TN	EPB Fiber Optics	fiber
Signal Mountain	TN	EPB Fiber Optics	fiber
Tullahoma	TN	Tullahoma Utilities Board	fiber
Greenville	TX	GEUS	cable
Lindon	UT	Utah Telecommunications Open Infrastructure Agency (UTOPIA)	partial
Brigham City	UT	Utah Telecommunications Open Infrastructure Agency (UTOPIA)	fiber
Centerville	UT	Utah Telecommunications Open Infrastructure Agency (UTOPIA) HQ	fiber
Layton	UT	Utah Telecommunications Open Infrastructure Agency (UTOPIA)	partial
Midvale	UT	Utah Telecommunications Open Infrastructure Agency (UTOPIA)	partial
Murray	UT	Utah Telecommunications Open Infrastructure Agency (UTOPIA)	partial
Orem	UT	Utah Telecommunications Open Infrastructure Agency (UTOPIA)	partial
Payson	UT	Utah Telecommunications Open Infrastructure Agency (UTOPIA)	partial
Perry	UT	Utah Telecommunications Open Infrastructure Agency (UTOPIA)	partial
Spanish Fork	UT	Spanish Fork Community Network	cable
Tremonton	UT	Utah Telecommunications Open Infrastructure Agency (UTOPIA)	fiber
West Valley City	UT	Utah Telecommunications Open Infrastructure Agency (UTOPIA) HQ	partial
Abingdon	VA	BVU OptiNet	fiber
Arlington County	VA	ConnectArlington	dark
Atkins	VA	BVU OptiNet	partial
Bluefield	VA	BVU OptiNet	partial

Bristol	VA	BVU OptiNet	fiber
Castlewood	VA	BVU OptiNet	partial
Cedar Bluff	VA	BVU OptiNet	partial
Chillhowie	VA	BVU OptiNet	partial
Clay Pool Hill	VA	BVU OptiNet	partial
Cleveland	VA	BVU OptiNet	partial
Clinchco	VA	BVU OptiNet	partial
Clintwood	VA	BVU OptiNet	partial
Damascus	VA	BVU OptiNet	partial
Danville	VA	nDanville	partial
Duffield	VA	LENOWISCO Planning District Commission	partial
Eastern Virginia	VA	Eastern Shore of Virginia Broadband Authority	question
Emery-Meadow View	VA	BVU OptiNet	partial
Galax	VA	Wired Road	partial
Glad Spring	VA	BVU OptiNet	partial
Grundy	VA	BVU OptiNet	partial
Haysi	VA	BVU OptiNet	partial
Hiltons	VA	BVU OptiNet	fiber
Honaker	VA	BVU OptiNet	partial
Independence	VA	BVU OptiNet	partial
Lebanon	VA	BVU OptiNet	partial
Luray	VA	Page County Broadband Project	partial
Marion	VA	BVU OptiNet	partial
Martinsville	VA	Martinsville Information Network - MINET	partial
Nelson County	VA	Nelson County Virginia Broadband Project	partial
Page County	VA	Page County Broadband Project	partial
Richlands	VA	BVU OptiNet	partial
Rockbridge County	VA	Connect the Dots: Rockbridge Broadband Initiative	partial
Rural Retreat	VA	BVU OptiNet	partial
Saltville	VA	BVU OptiNet	partial
Shenandoah	VA	Page County Broadband Project	partial
St Paul	VA	BVU OptiNet	partial
Stanley	VA	Page County Broadband Project	partial
Staunton	VA	Staunton	dark
Sugar Grove	VA	BVU OptiNet	partial
Tazewell	VA	BVU OptiNet	partial
Troutdale	VA	BVU OptiNet	partial
Vansant	VA	BVU OptiNet	partial

Wytheville	VA	BVU OptiNet	partial
Barnard	VT	ECFibernet (East Central Vermont Community Fiber Network)	partial
Bethel	VT	ECFibernet (East Central Vermont Community Fiber Network)	partial
Braintree	VT	ECFibernet (East Central Vermont Community Fiber Network)	partial
Brookfield	VT	ECFibernet (East Central Vermont Community Fiber Network)	partial
Hancock	VT	ECFibernet (East Central Vermont Community Fiber Network)	dark
North Randolph	VT	ECFibernet (East Central Vermont Community Fiber Network)	partial
Pomfret	VT	ECFibernet (East Central Vermont Community Fiber Network)	partial
Reading	VT	ECFibernet (East Central Vermont Community Fiber Network)	dark
Rochester	VT	ECFibernet (East Central Vermont Community Fiber Network)	dark
Royalton	VT	ECFibernet (East Central Vermont Community Fiber Network)	partial
Sharon	VT	ECFibernet (East Central Vermont Community Fiber Network)	partial
Stockbridge	VT	ECFibernet (East Central Vermont Community Fiber Network)	dark
Aberdeen	WA	Grays Harbor PUD	partial
Ardenvoir	WA	Chelan PUD	partial
Bauer's Landing	WA	Douglas County Community Network	inet
Benton City	WA	Benton PUD Broadband	partial
Benton County	WA	Benton PUD Broadband	partial
Blewett	WA	Chelan PUD	partial
Bridgeport	WA	Douglas County Community Network	inet
Bridgeport Bar	WA	Douglas County Community Network	inet
Burlington	WA	Mt Vernon Fiber Optic Services	partial
Cashmere	WA	Chelan PUD	fiber
Chelan	WA	Chelan PUD	partial
Chelan County	WA	Chelan PUD	fiber
Cheney	WA	Cheney Fiber Network	partial
Chumstick	WA	Chelan PUD	partial
Clallam County	WA	Clallam PUD	partial
Coulee City	WA	Grant PUD	partial
Coulee Dam	WA	Grant PUD	partial

Desert Aire	WA	Grant PUD	fiber
Desert Canyon	WA	Douglas County Community Network	inet
Douglas County	WA	Douglas County Community Network	inet
Dryden	WA	Chelan PUD	fiber
East Wenatchee	WA	Douglas County Community Network	inet
Edmonds	WA	City of Edmonds	dark
Entiat	WA	Chelan PUD	partial
Ephrata	WA	Grant PUD	partial
Franklin County	WA	Franklin PUD Broadband	partial
Grand Coulee	WA	Grant PUD	fiber
Grant County	WA	Grant PUD	fiber
Hartline	WA	Grant PUD	fiber
Kennewick	WA	Benton PUD Broadband	fiber
Kitsap County	WA	Kitsap PUD	fiber
Leavenworth	WA	Chelan PUD	fiber
Mansfield	WA	Douglas County Community Network	inet
Mason County	WA	Mason County PUD3	partial
Mattawa	WA	Grant PUD	fiber
Meritt	WA	Chelan PUD	partial
Monitor	WA	Chelan PUD	fiber
Moses Lake	WA	Grant PUD	partial
Mt Vernon	WA	Mt Vernon Fiber Optic Services	partial
Newport	WA	Pend Oreille County Public Utility District (PUD) Broadband Network	partial
Okanogan County	WA	Okanogan PUD	fiber
Orondo	WA	Douglas County Community Network	inet
Pacific County	WA	Pacific County PUD#2	partial
Pasco	WA	Franklin PUD Broadband	fiber
Pend Oreille County	WA	Pend Oreille PUD	fiber
Peshastin	WA	Chelan PUD	fiber
Port of Skagit County	WA	Mt Vernon Fiber Optic Services	partial
Prosser	WA	Benton PUD Broadband	fiber
Quincy	WA	Grant PUD	fiber
Royal City	WA	Grant PUD	fiber
Sequim	WA	Clallam PUD	partial
Shelton	WA	Mason County Public Utilities District	partial
Soap Lake	WA	Grant PUD	fiber
Sun Cove	WA	Douglas County Community Network	inet
Tacoma	WA	Click! Network	cable
Warden	WA	Grant PUD	fiber

Waterville	WA	Douglas County Community Network	inet
Wenatchee	WA	Chelan PUD	fiber
Wilson Creek	WA	Grant PUD	fiber
Yodelin	WA	Chelan PUD	partial
Eau Claire	WI	Chippewa Internetworking Consortium (CINC)	inet
Oconto	WI	Oconto Falls Municipal Utilities	cable
Platteville	WI	Chippewa Internetworking Consortium (CINC)	partial
Reedsburg	WI	Reedsburg Utility Commission	fiber
Reedsburg	WI	Reedsburg Utility Commission - rural expansion	partial
Shawano	WI	Shawano Municipal Utilities	fiber
Sun Prairie	WI	Sun Prairie Utilities	partial
Superior	WI	Chippewa Internetworking Consortium (CINC)	partial
Wausau	WI	Chippewa Internetworking Consortium (CINC)	partial
Philippi	WV	Philippi Communications System	fiber
Powell	WY	Powell Fiber Optic Network	fiber

[1]National Telecommunications and Information Administration (NTIA). 2013. "US Broadband Availability: June 2010-June 2012." http://www.ntia.doc.gov/files/ntia/publications/usbb_avail_report_05102013.pdf, 3.
[2]Federal Communications Commission. 2010. "Sixth Broadband Deployment Report." July 20. https://apps.fcc.gov/edocs_public/attachmatch/FCC-10-129A1_Rcd.pdf.
[3]Federal Communications Commission. 2014. "Tenth Broadband Progress Notice of Inquiry." August 5. https://apps.fcc.gov/edocs_public/attachmatch/FCC-14-113A1.pdf
[4]United States Census Bureau. "Table 4: Estimated Sources of Revenue for Employer Firms: 2010 through 2013." November 19. *Annual and Quarterly Services.* https://www.census.gov/services/index.html (CEA Calculations).
[5]Greenstein, Shane and Ryan C. McDevitt. 2009. "The Broadband Bonus: Accounting for Broadband Internet's Impact on U.S. GDP" NBER Working Paper No. 14758. http://www.nber.org/papers/w14758. This study suggests that roughly 50 percent of this amount– $8 to $11 billion– was "new GDP" that would not have been realized but for the replacement of dial-up with broadband connections.
[6]Dutz, Mark, Jonathan Orszag, and Robert Willig. 2009. "The Substantial Consumer Benefits of Broadband Connectivity for U.S. Households." COMPASS LEXECON, commissioned by the Internet Innovation Alliance, July. http://internetinnovation.org/files/special-reports/CONSUMER_BENEFITS_OF_BROADBAND.pdf.
[7]Bresnahan, Timothy F., and Shane Greenstein. 1999. "Technology Competition and the Structure of the Computer Industry." *Journal of Industrial Economics* 47: 1-40, DOI: 10.1111/1467-6451.00088.
[8]Mandel, Dr. Michael. 2012. "Where the Jobs Are: The App Economy." February 2. https://www.conference-board.org/retrievefile.cfm?filename=Where-the-Jobs-Are_-The-App-Economy.pdf&type=subsite.
[9]US Telecom. The Broadband Association. "Broadband Investment." http://www.ustelecom.org/broadband-industry/broadband-industry-stats/investment; Carew, Diana G. and Michael Mandel. 2012. "Investment Heroes: Who's Betting on America's Future?" Progressive Policy Institute, July. http://progressivepolicy.org/wp-content/uploads/2012/07/07.2012-Mandel_Carew_Investment-Heroes_Whos-Betting-on-Americas-Future.pdf.
[10]NTIA, 2013.
[11]Office of Science and Technology Policy & The National Economic Council. 2013. "Four Years of Broadband Growth." June. http://www.whitehouse.gov/sites/default/files/broadband_report_final.pdf.
[12]Horrigan, John B. 2010. "Broadband Adoption & Use in America. Results from an FCC Survey.". March. http://transition.fcc.gov/DiversityFAC/032410/consumer-survey-horrigan.pdf.
[13]Department of Commerce (NTIA and ESA). 2013. "Exploring the Digital Nation. America's Emerging Online Experience." June. http://www.ntia.doc.gov/files/ntia/publications/exploring_the_digital_nation_-_americas_emerging_online_experience.pdf, page 39.
[14]Hibah, Hussain, Danielle Kehl, Patrick Lucey, and Nick Russo. 2013. "The Cost of Connectivity 2013. Data Release: A comparison of high-speed Internet prices in 24 cities around the world." New America Foundation, October. http://oti.newamerica.net/publications/policy/the_cost_of_connectivity_2013. The US cities included are: Bristol (VA), Chattanooga (TN), Kansas City (MO), Lafayette (LA), Los Angeles (CA), New York (NY), San Francisco (CA), and Washington (DC). The international cities included are: Toronto (Canada), Hong Kong, Prague (Czech Republic), Copenhagen (Denmark), Paris (France), Berlin (Germany), Dublin (Ireland), Tokyo (Japan), Riga (Latvia), Mexico City

(Mexico), Amsterdam (Netherlands), Bucharest (Romania), Seoul (South Korea), Zurich (Switzerland), and London (UK). Some of these cities are omitted from the data underlying the chart below, as the plans included in NAF's dataset are not all annual contracts.

[15]Wheeler, Tom. 2014. "Prepared Remarks of Chairman Tom Wheeler. 'The Facts and Future of Broadband Competition.'" September 4. https://apps.fcc.gov/edocs_public/attachmatch/DOC-329161A1.pdf.

[16]OECD. 2014. "Wireless Market Structures and Network Sharing." *OECD Digital Economy Papers,* No. 243. OECD Publishing. http://dx.doi.org/10.1787/5jxt46dzl9r2-en.

[17]The case of 3UK is cited by OECD as particularly indicative of this reality.

[18] Department of Commerce (NTIA and ESA). 2013. "Exploring the Digital Nation. America's Emerging Online Experience." June. http://www.ntia.doc.gov/files/ntia/publications/exploring_the_digital_nation_-_americas_emerging_online_experience.pdf, page 39.

[19] OECD. 2014.

[20]Seamans, Robert. 2012. Fighting City Hall: Entry Deterrence and Technology Deployment in the Cable TV Industry. *Management Science* 58(3): 461-475.

[21]Sources used to prepare this case study: Technology, Gig, and Entrepreneurship Task Force. 2014. "Chattanooga Forward." March 19. http://www.chattanooga.gov/images/Mayor_Images/Chattanooga_Forward_Working_report.pdf; Wyatt, Edward. 2014. "Fast Internet is Chattanooga's New Locomotive." *New York Times,* February 3. http://www.nytimes.com/2014/02/04/technology/fast-internet-service-speeds-business-development-in-chattanooga.html; Fung, Brian. 2013. "How Chattanooga beat Google Fiber by half a decade." *Washington Post,* September 17. http://www.washingtonpost.com/blogs/the-switch/wp/2013/09/17/how-chattanooga-beat-google-fiber-by-half-a-decade; Rushe, Dominic. 2014. "Chattanooga's Gig: how one city's super-fast internet is driving a tech boom." *The Guardian*, August 30. http://www.theguardian.com/world/2014/aug/30/chattanooga-gig-high-speed-internet-tech-boom; Cosco, Joey. 2014. "A City in Tennessee Has The Big Cable Companies Terrified." *Business Insider,* July 30. http://www.businessinsider.com/chattanooga-tennessee-big-internet-companies-terrified-2014-7; Mitchell, Christopher. 2012. "Broadband At the Speed of Light. How Three Communities Built Next-Generation Networks." April. Institute for Local Self-Reliance and Benton Foundation, April. http://ilsr.org/wp-content/uploads/2012/04/muni-bb-speed-light.pdf.

[22]Sources used to prepare this case study:
Mitchell, Christopher. O'Boyle, Todd. 2012. "Carolina's Connected Community: Wilson Gives Greenlight to Fast Internet." December. Institute for Local Self-Reliance and Common Cause Education Fund, December. http://ilsr.org/wp-content/uploads/2012/12/wilson-greenlight.pdf; New York Times. 2014. "Communities Fight State Laws That Can Divide Broadband Access." November 9. http://www.nytimes.com/2014/11/10/technology/in-rural-america-challenging-a-roadblock-to-high-speed-internet.html; Indy Week. 2008. "Mighty, mighty broadband." June 18. http://www.indyweek.com/indyweek/mighty-mighty-broadband/Content?oid=1209049; Wired.com. 2011. "North Carolina Enacts Pro-ISP, Anti-Municipal Broadband Law." May 23. http://www.wired.com/2011/05/nc-gov-anti-muni-broadband/; Davidson, Charles M. Santorelli, Michael J. 2014. "Understanding The Debate Over Government-owned Broadband Networks: Context, Lessons Learned, and a Way Forward for Policy Makers." June. Advanced Communications Law and Policy Institute at New York Law School, June. http://www.nyls.edu/advanced-communications-law-and-policy-institute/wp-

content/uploads/sites/169/2013/08/ACLP-%E2%80%93-Wilson-Case-Study-%E2%80%93-June-2014.pdf; Wilson Times. 2010. "Greenlight competition affects rates elsewhere." http://www.wilsontimes.com/greenlight/Story/Greenlight-competition-affects-rates-elsewhere

[23]Sources used to prepare this case study:
Huval, Terry. 2010. Testimony Before the Committee on Small Business and Entrepreneurship. *Hearing on "Connecting Main Street to the World: Federal Efforts to Expand Small Business Internet Access."* Senate Hearing 111-1166, April 27. http://www.sbc.senate.gov/public/index.cfm?a=Files.Serve&File_id=646b01b6-6e75-4f5a-9c0f-790c0ba48889
Jervis, Rick. 2012. "Louisiana city blazes high-speed Web trail." *USA Today*, February 5. http://usatoday30.usatoday.com/news/nation/story/2012-02-01/broadband-telecom-lafayette/52920278/1
Mitchell, Christopher. 2012. "Broadband at the Speed of Light: How Three Communities Built Next-Generation Networks." April. Institute for Local Self-Reliance and Benton Foundation, April. http://ilsr.org/wp-content/uploads/2012/04/muni-bb-speed-light.pdf
Pollick, Michael. 2010. "Dark lines are a draw for business". *Sarasota Harold-Tribune*, September 7. http://www.heraldtribune.com/article/20100907/ARTICLE/100909825/-1/news?p=all&tc=pgall

[24]Sources used for this case study: Collaborative Governance Council. 2010. "Scott County Broadband (Fiber) Project." Minnesota Office of the State Auditor, August 12. http://www.osa.state.mn.us/Other/councils/CollaborativeGovernance/081210/ScottCountyBroadbandProjectPresentation.pdf; Minnesota Ultra High Speed Broadband Task Force. 2009. "Scott County Broadband (Fiber) Approach." February 20. http://www.ultra-high-speed-mn.org/CM/Custom/Shelton%20-%20Broadband%20Task%20force%20Presentation.pdf; Moore, Janet. 2013. "Scott County approves incentives for Shutterfly." *Minnesota Star Tribune*, August 20. http://www.startribune.com/blogs/220393971.html; Mitchell, Chris, and Lisa Gonzalez. 2014. "All Hangs on Deck. Minnesota Local Government Models for Expanding Fiber Internet Access." Institute for Local Self-Reliance, September. http://www.ilsr.org/wp-content/uploads/downloads/2014/09/all_hands_on_deck_mn.pdf.

[25]Sources used for this case: Gonzalez, Lisa. 2012. "Network Moves Forward in Leverett, Western Massachusetts." Community Broadband Networks, December 20. http://www.muninetworks.org/content/network-moves-forward-leverett-western-massachusetts; Crawford, Susan and Robyn Mohr. 2013. "Bringing Municipal HighSpeed Internet Access to Leverett, Massachusetts." Harvard University Berkman Center Research Publication No. 26, December 17. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2366044; Lennett, Benjamin, Patrick Lucey, Joanne Hovis, and Andrew Afflerbach. "The Art of the Possible: An Overview of Public Broadband Options." New American Foundation Open Technology Institute and CTC Technology & Energy, May 6. http://newamerica.net/sites/newamerica.net/files/policydocs/TheArtofthePossibleOverviewofPublicBroadbandOptions_NAFOTI-CTC.pdf; Scherban, Debra. 2014. "Crocker Communications to provide Internet Service for Leverett's own broadband network." *Daily Hampshire Gazette*, September 2. http://www.gazettenet.com/home/13387776-95/crocker-communications-to-provide-internet-service-for-leveretts-own-broadband-network.

[26] Sources used for this case: Yocum, Katie. 2010. "USDA Recovery Act-Funded Wireless Internet to Reach Remote Choctaw Nation." United States Department of Agriculture, June 11. http://blogs.usda.gov/2010/06/11/usda-recovery-act-funded-wireless-Internet-to-reach-remote-choctaw-nation; The Choctaw Nation of Oklahoma. "Programs & Services for the Choctaw People." http://s3.amazonaws.com/choctaw-msldigital/assets/2345/choctaw_services_original.pdf. Material from a site visit conducted by USDA from September 22 to 25, 2014 in Broken Bow, Oklahoma was also relied upon for the Pine Telephone Company Case Study.

[27] The Institute for Local Self-Reliance, data provided to NEC/CEA upon request.

EXHIBIT 22

A Light in Digital Darkness: Public Broadband after Tennessee v. FCC

Mikhail Guttentag[1]

20 YALE J. L. & TECH. 311 (2018)

Ten years ago, the city of Chattanooga, Tennessee built its own high-speed Internet network, and today Chattanooga's publicly owned Internet infrastructure ("public broadband" or "municipal broadband") is faster and more affordable than almost anywhere else in the world. In this Article, I make the case for why other communities currently underserved by private broadband providers should consider building their own high-speed broadband networks and treating Internet as an essential public service akin to water or electricity, and I explore means by which these communities can overcome the legal and political hurdles they may face along the way.

[1] J.D., Yale Law School. My deepest thanks for the guidance of professors Alvin Klevorick, David Schleicher, and Gordon Silverstein; for the feedback and encouragement of Olevia Boykin, Ariel Dobkin, Paul Henderson, Lina Khan, and Theodore Rostow; for the editing of the *Yale Journal of Law and Technology*, particularly editors Anderson Christie, Allison Douglis, and Aislinn Klos; and for Mayor Andy Berke of Chattanooga, Tennessee, who warmly answered a law student's cold e-mail and invited him to check out his city. This Article is dedicated to my former students and coworkers at Heights High School in Houston, Texas, who bring light to darkness, digital and otherwise, and inspire this work. All errors are my own.

INTRODUCTION: PUBLIC BROADBAND AND PUBLIC POWER

> *"Failure to provide broadband to rural areas of America is a death sentence for those communities. They cannot compete economically without access to broadband."*
>
> —United States Senator Angus King (I-ME)[2]

> *"We see broadband in the 21st century as electricity was in the 20th."*
>
> —Danna Bailey (Vice President, Chattanooga EPB)[3]

Internet can be delivered like other publicly funded services, such as water, electricity, sewers, and roads.[4] To date, Internet provision is left almost entirely to the private sector, leaving many places without affordable or high-speed service. However, there are a growing number of municipalities in the United States who have built their own high-speed Internet networks and offer it like a public utility. More cities should join them.

Many communities currently underserved by Internet providers—rural areas especially—were once underserved by private electricity providers that offered electricity to big cities and wealthy customers but left the rest of the country behind.[5] These communities formed locally owned electric utilities to

---

[2] Mal Leary, *Angus King, Senators Want Improved Rural Broadband*, ME. PUB. (July 13, 2016), http://mainepublic.org/post/angus-king-senators-want-improved-rural-broadband [http://perma.cc/HHT5-N77K].

[3] Henry Grabar, *Republicans Are Coming Around to This Public Internet Idea*, SLATE (Sept. 1, 2016, 1:05 PM), http://www.slate.com/blogs/future_tense/2016/09/01/public_broadband_is_a_bipartisan_issue_now.html [http://perma.cc/ML84-6XZA].

[4] *See* Jeff Stricker, Note, *Casting a Wider 'Net: How and Why State Laws Restricting Municipal Broadband Networks Must Be Modified*, 81 GEO. WASH. L. REV. 589, 614 (2013) ("The only unique feature of telecommunications service provision by a government entity as compared to other government-provided services (such as electricity, water, sewers, and roads) is that the telecommunications industry is today predominantly administered by the private sector." (footnote omitted)).

[5] *See* D. Stan O'Loughlin, *Preemption or Bust: Fear and Loathing in the Battle over Broadband*, 28 CARDOZO L. REV. 479, 482-83 (2006) ("Beginning in the 1880s, electric power in the United States was provided primarily by large, private electric companies . . . private power companies did not consider rural electrification to be economically feasible and focused their resources on the more profitable urban market, leaving most of the country's smaller cities and rural areas underserved or totally without access to electricity." (footnotes omitted)).

Chattanooga, and others, and build their own high-speed broadband networks. I look at how the Supreme Court's 2004 *Missouri Municipal League* decision emboldened ISPs to lobby states to restrict the growth of public broadband, and revisit Justice Stevens' lone dissent, a position which today looks increasingly prescient. The specter of *Missouri Municipal League* haunts efforts to build publicly owned broadband, and in light of the *Tennessee v. FCC* decision, I argue that *Missouri Municipal League* is due for review and reconsideration.

I conclude by arguing that advocates for public broadband should engage on all fronts to lift unnecessary restrictions on the public provision of broadband. Like electricity, broadband has become an essential service, and no community should be left in digital darkness.

I. THE COSTS OF LIMITING CITIES TO PRIVATE BROADBAND

> *"Here in Seattle, we don't rely on for-profit companies to provide our water or electricity. The Internet shouldn't be any different."*
>
> —Upgrade Seattle[32]

Like roads, broadband Internet is essential infrastructure for the modern economy.[33] Without utility-style regulation or public provision in areas where the private market for broadband has failed, communities will continue to fall behind.

Like electricity in the late nineteenth century, the provision of Internet service today largely follows the profit motives of private providers.[34] These profit motives disfavor providing affordable high-speed service to less profitable poor or rural populations when compared to denser, higher-income neighborhoods.[35] Some scholars have argued that these market

---

32 *See* UPGRADE SEATTLE, http://www.upgradeseattle.com [http://perma.cc/YB83-K6UA].

33 PENNY PRITZKER & TOM VILSAK, U.S. DEP'T OF AGRIC. & U.S. DEP'T OF COMMERCE, BROADBAND OPPORTUNITY COUNCIL REPORT AND RECOMMENDATIONS 12 (2015), http://obamawhitehouse.archives.gov/sites/default/files/broadband_opportunity_council_report_final.pdf [http://perma.cc/UT6S-HZP3] ("Broadband has steadily shifted from an optional amenity to a core utility for households, businesses and community institutions. Today, broadband is taking its place alongside water, sewer and electricity as essential infrastructure for communities.").

34 *See, e.g.*, Stricker, *supra* note 4, at 620 ("Broadband deployment is analogous to the deployment of electricity in the United States in the early twentieth century. In the 1880s, most electricity in the United States was supplied by large, private companies that did not view extending service to less densely populated areas as profitable or feasible and thus chose to ignore them in favor of urban markets." (footnote omitted)).

35 The basic thinking behind this approach is that in most cases, the more

The lack of broadband bears repeating: nearly four in ten Americans living in rural areas, and one in ten Americans overall, currently have no option—at any price—to subscribe to broadband access where they live.[61]

These digital divides—most pronounced among poor and rural communities, tribal areas, and senior citizens—represent a challenge and an opportunity for state and local governments hoping to bring residents and local businesses online to reap the numerous expected educational, economic, and social benefits of broadband access.[62]

Many communities who are still waiting for market competition to deliver universal, affordable broadband access should consider whether that approach has failed. The need for that service is urgent. To bridge these digital divides and deliver affordable, high-speed broadband, those communities should take a closer look at networks in cities like Chattanooga, Tennessee, as well as the nearly one hundred other local governments that provide public broadband.[63]

II. THE PUBLIC BROADBAND ALTERNATIVE

> *"I might call the right of people to own and operate their own utility something like this: a 'birch rod' in the cupboard to be taken out and used only when the 'child' gets beyond the point where a mere scolding does no good."*

---

http://www.pressherald.com/2013/01/14/googles-ultra-fast-internet-creates-silicon-prairie/ [http://perma.cc/Z8XM-Y2PC] ("The advantage [of high-speed Internet] for startups is simple: A fast Internet pipe makes it easier to handle large files and eliminates buffering problems that plague online video, live conferencing and other network-intensive tasks.").

61 FED. COMMC'NS COMM'N, *supra* note 13, at 38 tbl.6.

62 *See, e.g.*, Stricker, *supra* note 4, at 595-96 ("The benefits of high-speed Internet to both ordinary citizens and businesses are numerous and linked directly to broadband's greater speeds. For individuals, broadband performs critical functions such as assisting people in finding employment and facilitating communication and education in addition to offering great convenience and entertainment value. Broadband also gives businesses the ability to expand their operations globally, find more and better customers and suppliers, streamline operations, advertise more efficiently, and recruit employees. The result is a substantial net benefit to the community, as communities with high-quality broadband networks are more likely to attract and retain businesses, offer greater educational opportunities, provide government services more efficiently, and attract tourists. Speed is key, as slower, non-broadband Internet connections render most of these benefits unobtainable either because of the time required to access the benefits or because the Internet products and services cannot be transmitted to users lacking broadband access.").

63 *Community Broadband Networks*, INST. FOR LOC. SELF-RELIANCE (Jan. 2015), http://ilsr.org/wp-content/uploads/2015/02/cbbmap-fact-sheet.pdf [http://perma.cc/E2K8-6QPQ].

change, and perhaps in a few years a "Dragonslayer" will again head the agency and take up this cause. If she does, she should encourage Congress to clarify the meaning of "any entity" in section 253 to include municipally owned utilities. She could ask Congress for an up-or-down vote on whether or not the statute provides the FCC authority to preempt non-neutral state laws that prohibit local governments from providing broadband. Given the widespread bipartisan public support for the right to offer public broadband, national attention could help.

Even if Congress does not take a vote, a recent federal court ruling upholding Title II reclassification of broadband service suggests growing public recognition of the essential nature of broadband service.[286] For this reason, the FCC may have more success if it again uses section 253 to selectively preempt state laws that unfairly restrict public broadband. If brought to court, the agency could follow a different approach than it did before the Sixth Circuit. Instead of distinguishing *Missouri Municipal League*, the agency should admit it made a mistake when it denied the Missouri Municipals' preemption petition in 2004. Given broadband's subsequent concentration into an oligopoly of providers, and a "crazy quilt" where only some cities can offer broadband and others cannot, the FCC should ask the Court to join the agency in reversing the legacies its twenty-year-old decisions have left.

Like electricity, broadband has grown from a luxury to an essential part of public life. Like electricity, citizens should have the right to choose to pool their resources and entrust their local government to provide it. There are many forms of public broadband, and cities should be able to choose the model that best fits their needs.

When Franklin D. Roosevelt campaigned for Americans' right to own their own electric utilities, he argued that every big public electric project "will be forever a national yardstick to prevent extortion against the public and to encourage the wider use of that servant of the people— electric power."[287] Publicly funded broadband networks can be the new yardstick to prevent extortion against the public and encourage wider

---

[286] *See, e.g.*, Rebecca R. Ruiz & Steve Lohr, *F.C.C. Approves Net Neutrality Rules, Classifying Broadband Internet Service as a Utility*, N.Y. TIMES (Feb. 26, 2015), http://www.nytimes.com/2015/02/27/technology/net-neutrality-fcc-vote-internet-utility.html [http://perma.cc/T225-7MYA] (upholding the FCC's classification of broadband providers as "common carriers" under Title II); *see also* WU, *supra* note 162, at 58 ("At the heart of common carriage is the idea that certain businesses are either so intimately connected, even essential, to the public good, or so inherently powerful—imagine the water or electric utilities—that they must be compelled to conduct their affairs in a nondiscriminatory way.").

[287] Roosevelt, *supra* note 7.

Internet use.

So far, public broadband networks have shown that they can deliver high-speed broadband at affordable rates. In areas where a broadband market failed to materialize, it may be time for communities to realize that Roosevelt's "birch rod"[288] is a better solution than waiting for the private market to improve on its own.

Public power did not come easy. Public broadband will not come easy, either. But as the number of successful public networks grows, combined with widespread bipartisan public support for these efforts, public broadband advocates have plenty of reasons to see a bright future ahead.

---

[288] *Id.*

EXHIBIT 23

USDA United States Department of Agriculture
Rural Development

Telecom Programs

Announcement : For information about the broadband pilot program (ReConnect Program) authorized in the Consolidated Appropriations Act, 2018 please log into : https://reconnect.usda.gov

USDA is investing in Rural Broadband to rebuild America's infrastructure. Read more.

Access to broadband has become essential for the social and economic benefits it provides to American residents, businesses, governments and communities. Broadband is crucial for increased health, educational and economic opportunities, as well as for job and business creation and growth. Broadband can help close the digital divide between rural and urban communities.

USDA Rural Development's Rural Utilities Programs provide a variety of loans and grants to build and expand broadband networks. Loans to build broadband networks and deliver service to rural households and businesses, provide capital for rural telecommunications companies and broadband providers. Grants are reserved for communities with the highest need.

Telecommunications Loan and Grant Programs offered are:
1. Community Connect Grants
2. Distance Learning and Telemedicine Grants
3. Rural Broadband Access Loan and Loan Guarantee
4. Telecommunications Infrastructure Loans and Guarantees

Eligible applicants include for-profit and non-profit entities, tribes, municipalities and cooperatives. USDA particularly encourages investments in tribal and economically disadvantaged areas.

Once funds are awarded, Rural Development monitors the projects to make sure they are completed, meet all program requirements and are making efficient use of Federal resources.

Each program has different applicant and project eligibility requirements and program objectives.

Contact: Chad Parker, Assistant Administrator, Telecom Program, at (202) 720-9556

Announcement : OPEN LETTER FROM THE ASSISTANT ADMINISTRATOR regarding reorganizations of Awardee's companies for the Broadband Initiatives Program ("BIP") Awardees ("Awardees").

Functional Structure is focused on Customer Service

The RUS Telecom Program is comprised of three divisions: the Loan Origination and Approval Division (LOAD), Portfolio Management and Risk Assessment Division (PMRAD), and the Policy and Outreach Division (POD).

Where a Loan or Grant Application Starts, is Completed and Submitted

EXHIBIT 24

2SSB 5511 - H COMM AMD
By Committee on Capital Budget

ADOPTED 04/16/2019

Strike everything after the enacting clause and insert the following:

"NEW SECTION. **Sec. 1.** The legislature finds that:

(1) Access to broadband is critical to full participation in society and the modern economy;

(2) Increasing broadband access to unserved areas of the state serves a fundamental governmental purpose and function and provides a public benefit to the citizens of Washington by enabling access to health care, education, and essential services, providing economic opportunities, and enhancing public health and safety;

(3) Achieving affordable and quality broadband access for all Washingtonians will require additional and sustained investment, research, local and community participation, and partnerships between private, public, and nonprofit entities;

(4) The federal communications commission has adopted a national broadband plan that includes recommendations directed to federal, state, and local governments, including recommendations to:

(a) Design policies to ensure robust competition and maximize consumer welfare, innovation, and investment;

(b) Ensure efficient allocation and management of assets that the government controls or influences to encourage network upgrades and competitive entry;

(c) Reform current universal service mechanisms to support deployment in high-cost areas, ensuring that low-income Americans can afford broadband, and supporting efforts to boost adoption and utilization; and

(d) Reform laws, policies, standards, and incentives to maximize the benefits of broadband in sectors that government influences significantly, such as public education, health care, and government operations;

(5) Extensive investments have been made by the telecommunications industry and the public sector, as well as

policies and programs adopted to provide affordable broadband services throughout the state, that will provide a foundation to build a comprehensive statewide framework for additional actions needed to advance the state's broadband goals; and

(6) Providing additional funding mechanisms to increase broadband access in unserved areas is in the best interest of the state. To that end, this act establishes a grant and loan program that will support the extension of broadband infrastructure to unserved areas. To ensure this program primarily serves the public interest, the legislature intends that any grant or loan provided to a private entity under this program must be conditioned on a guarantee that the asset or infrastructure to be developed will be maintained for public use for a period of at least fifteen years.

NEW SECTION. **Sec. 2.** A new section is added to chapter 43.330 RCW to read as follows:

The definitions in this section apply throughout this section and sections 3 through 6 of this act unless the context clearly requires otherwise.

(1) "Board" means the public works board established in RCW 43.155.030.

(2) "Broadband" or "broadband service" means any service providing advanced telecommunications capability and internet access with transmission speeds that, at a minimum, provide twenty-five megabits per second download and three megabits per second upload.

(3) "Broadband infrastructure" means networks of deployed telecommunications equipment and technologies necessary to provide high-speed internet access and other advanced telecommunications services to end users.

(4) "Department" means the department of commerce.

(5) "Last mile infrastructure" means broadband infrastructure that serves as the final connection from a broadband service provider's network to the end-use customer's on-premises telecommunications equipment.

(6) "Local government" includes cities, towns, counties, municipal corporations, public port districts, public utility districts, quasi-municipal corporations, special purpose districts, and multiparty entities comprised of public entity members.

(7) "Middle mile infrastructure" means broadband infrastructure that links a broadband service provider's core network infrastructure to last mile infrastructure.

(8) "Office" means the governor's statewide broadband office established in section 3 of this act.

(9) "Tribe" means any federally recognized Indian tribe whose traditional lands and territories included parts of Washington.

(10) "Unserved areas" means areas of Washington in which households and businesses lack access to broadband service, as defined by the office, except that the state's definition for broadband service may not be actual speeds less than twenty-five megabits per second download and three megabits per second upload.

NEW SECTION. **Sec. 3.** A new section is added to chapter 43.330 RCW to read as follows:

(1) The governor's statewide broadband office is established. The director of the office must be appointed by the governor. The office may employ staff necessary to carry out the office's duties as prescribed by this act, subject to the availability of amounts appropriated for this specific purpose.

(2) The purpose of the office is to encourage, foster, develop, and improve affordable, quality broadband within the state in order to:

(a) Drive job creation, promote innovation, improve economic vitality, and expand markets for Washington businesses;

(b) Serve the ongoing and growing needs of Washington's education systems, health care systems, public safety systems, industries and business, governmental operations, and citizens; and

(c) Improve broadband accessibility for unserved communities and populations.

NEW SECTION. **Sec. 4.** A new section is added to chapter 43.330 RCW to read as follows:

(1) The office has the power and duty to:

(a) Serve as the central broadband planning body for the state of Washington;

(b) Coordinate with local governments, tribes, public and private entities, nonprofit organizations, and consumer-owned and investor-owned utilities to develop strategies and plans promoting deployment

EXHIBIT 25

A. Overview

Unless otherwise authorized or prohibited by state law and the City's Purchasing Code, the following standards and procedures apply to the disposition of surplus personal property owned by the City.

Surplus personal property with commercial value will be disposed of in an efficient manner that achieves the highest resale proceeds for the City of Tacoma. Surplus property with little or no commercial value or when disposal and sales efforts are judged more costly than estimated net proceeds, may be transferred in the order as stipulated in TMC 1.06.278, and eventually disposed of through salvage contracts or other efficient means if not so transferred. Items that are broken, unusable, and have no commercial, salvage or donation value may be declared as "trash" and efficiently disposed of as such. Regulatory or special disposal requirements shall be followed when applicable (e.g., hazard metals, cathode ray tubes). The dollar values referenced in this policy are the estimated current commercial or resale value of the property at the time the property is declared surplus, *not* the original acquisition value, as determined by the owning department/division and/or as determined by a knowledgeable third party hired by the owning department/division.

B. Highlights

1. In addition to City website postings for disposal of surplus personal property, advertising, promotional and resale assistance through a third party contracted by the City may also be appropriate.

2. Traditional surplus disposal procedures are inefficient and costly to the City for items that are broken, unusable, and have no commercial salvage or donation value. Departments may declare and dispose of such items themselves as trash.

3. City employees are permitted in limited situations to participate in the surplus property program.

4. This policy does **not** apply to surplus real property, that is, real estate transactions.

C. General Requirements

1. Declaration of Surplus Property (DSP) Form. This form can be found on the Purchasing website. The DSP form is used for declaring surplus property and must be completed for **all** disposal situations, including real property and "trash" items. Except for "trash" items, the form must be submitted to Purchasing prior to **initiating** the surplus property disposal process. For "trash" disposals, the form need not be submitted to the Purchasing Division, but is maintained by the owning department for accountability purposes for a period of two years after the disposal of "trash" items.

2. For personal property with estimated values over $200,000, follow the sealed solicitation procedures for requests for bids outlined in Section XV. of the Purchasing Policy Manual unless a negotiated disposition process has been authorized per TMC 1.06.273 A. See subsection C. 19. below for additional guidance applicable to disposition of utility specific surplus personal property owned by TPU.

3. Surplus personal property with an estimated value between $25,001 and $200,000 shall follow the informal solicitation procedures for requests for bids outlined in Section XII. of the Purchasing Policy Manual. However, some items may be appropriate for on-line auctioning due to general public appeal, collector value and/or broader exposure of unique items for sale. Such requests may be approved by the Procurement and Payables Division manager on a case-by-case basis when on-line auctioning is anticipated to be more successful.

4. Surplus personal property with estimated values between $1,001 and $25,000 will be posted to the City website for a minimum of 10 business days, supplemented by posting announcements to the Association of Washington Cities surplus property website. Departments/divisions may post and distribute notices to their own mailing list or potential interested parties. In lieu of the above, the department/division may request on-line auctioning approval from Purchasing.

5. Surplus personal property with estimated values between $250 and $1,000 will be posted to the City website. After 10 business days, items not sold will be disposed of through salvage contracts or transferred in the order specified in TMC 1.06.278. If desired by the owning department/division, on-line auctioning may be requested. However, on-line auctioning approval from Purchasing for lower valued items may not be granted if special requirements render the process not cost-effective. For example, if special disclaimer or legal language (other than the standard) must be researched and incorporated with the posting, or if special posting, bidding or payment arrangements are needed that require the standard City set-up with the on-line auction company to be modified. These situations are not cost-effective for an item with estimated value of $350, but may be for items valued at $750.

6. Surplus personal property with estimated values less than $250 may be transferred or disposed of in the order specified in TMC 1.06.278, on a first come-first requested basis. Items will be posted to the City website and items will become available to the next eligible group after a set period (5 business days unless otherwise specified) expires. Items valued less than $199 may also be sold/transferred through "2good2toss.com", a waste reduction/recycling exchange website sponsored by the State Department of Ecology and other governmental entities including the City of Tacoma.

7. "Trash" Items. Surplus property that is broken, unusable, or has no commercial, salvage or donation value and no special disposal requirements (e.g., hazardous metals), may be declared as "trash" by the owning department/division by completing a Declaration of Surplus Property (DSP) form and disposing of the items themselves, using whatever method that is efficient (garbage, landfill, etc.). Purchasing does not need to be involved and these "trash" items are not handled through normal surplus procedures. Purchasing will pursue citywide contracts with salvage and junk dealers to aid in timely and environmentally proper disposal where practicable. ***Please note that cathode ray tubes (CRTs) are banned from disposal as garbage by state regulations.*** CRT containing devices include computer monitors, televisions or other items that contain a picture tube.

Practice Tips

- **Prior to sale, always determine the fair market value of the item to be sold**. If you sell it for less, you may be violating the "gift clause," in Article VIII, Sec. 7 of the State Constitution, which states that "No county, city, town or other municipal corporation shall hereafter give any money, or property, or loan its money, or credit to or in aid of any individual, association, company or corporation, except for the necessary support of the poor and infirm, or become directly or indirectly the owner of any stock in or bonds of any association, company or corporation." But see RCW 39.33.010 mentioned in the list of statutes above.
- **Hold a public hearing**, if required by RCW 39.33.020 or RCW 35.94.040. AGO 1997 No. 5 concludes that the public hearing requirement in RCW 39.33.020 only applies to intergovernmental transfers of property.
- **Pass a resolution** declaring the property to be surplus, and specifying how the property is to be sold, or delegating that task to a particular administrative official.
- **Proceed with sale as required by the town or city council, or in any commercially reasonable way**. Sale can be by auction, private sale, sealed bid, through a broker or agent, etc.
- **City officials and certain administrative officers may be restricted from purchasing surplus property due to conflict of interest concerns.** The general rule is that those who are involved in the decision to surplus property (the council) and those in charge of administering the sale (mayor, city manager, or other city officer responsible for the sale) should not purchase the property. General city employees can purchase surplus city property.
- **Consider adopting policies concerning sale of city property**. For examples, see the Policies section below.

EXHIBIT 26

CLICK! NETWORK
TACOMA PUBLIC UTILITIES

Click! Organization Chart

Effective: 03/13/2018

Click! Budgeted FTEs = 92
T&D HFC Budgeted FTEs = 10
Total Budgeted FTEs = 102
Vacancies = 19
Active FTEs = 83
Temp = 2

Gyaltsen, Tenzin
General Manager
(551100)

Whitmarsh, Michelle
Office Administrator
(551100)

Burgess, Pam
Business Operations
(552100)

Bacon, Pat
Technical Operations
(553200)

Yomes, Patrick
Network Admin.
(553200)

Mantle, Carrie
Sales & Marketing
(552200/552300)

Vacant - Morris
Business Systems
(552600)

Fisher, Sheila
NSA/Dispatch
(555600)

Jamison, John
Service Installation
(553500)

Ostrus, Ken
CIC Warehouse
(553700)

Rudi, Greg
Network Operations
(555300)

Ken Mathes
Power Spvr III

Sales
(552200)
Edwards, Debra
Newman, Josh
Vacant - Tufts

Marketing
(552200)
King, Rebecca
Lorfeld, Valerie
Peterson, Bernie

WCS
(552200)
Richardson, Jewel
Vacant - Schindler

McCord, Teri
Cust. Sales & Svc.
(552500)

Customer Care
(552500)
Cook, Sean (L)
Coyne, Brenda
Cross, Dawn
England, David
Joiner, Gertrude
Leifester, Donna
Vacant - Cook
Pearson, Bill
Reed, Kristina
Walloe, Wanda
Ware, Tuashua
Whalen, Lynn
Williams, Kristi
Hatcher, Melodie
Vacant - Shinn
Ortiz, Joanie (Temp)
Clark, Donald (Temp)

Business Systems
(552600)
Kartes, Randi
Sweatt, Nathalie
Pence, Brenda

Network Svc. Assurance
(555600)
Ahola, Matthew
Vacant - Arledge (L)
Garcia, Ruben
Kerlee, Denyse
Lee, Carmen
Roy, Matt (L)
Solus, Bill
Vacant - Vincent

Dispatch
(553600)
Vacant - Wanda
McClatchey, Shawn
Whitmore, Barb (L)
Wiggins, Chuck

Installation
(553500)
Vacant - Torres (AS)
Browitt, Dan
Busenius, Carl
Vacant - Kleindl
Klock, David
Newell, Kirk
Freeman, Scott (AS)
Bodine, Christopher
Foster, Michael
Hathaway, Jason
Simmons, Jeff
Sullivan, Dan (AS)
Luckey, Mandrell
Minnich, Levi
Richmond, Shawn
Schweickert, Jesse
Vacant - Schulz
Keeley, Dan
Vacancy - Hempel
Vacant - Taylor
Vacant - Hall

CIC
(553700)
Burns, Karen
Choe, Gil
Whitfield, Derrek

Network Engineers
(555500)
Merriam, Steve
Vacant - Peterson

Network Operations
(555300)
Hogan, Tim (L)
Young, Rob
Clements, John
Lindberg, Jon (L)
Sherman, Randy
Swiger, Todd
Taylor, Craig
Wisor, Steve
Vacant - Hansen

Interactive Svcs
(555400)
Jacobs, Patrick (L)
Vacant - Goodwin
Van Tuyl, Ted (L)
Vacant - Cross
Kim, Hong
Vacant - Ortiz
Vance, Gary

HFC Construction
(562700)
Bagely, Ken
West, Tom
Elliot, Joe
McFadden, Pattricl
Ramsdell, Tyson
Pia, Ray

HFC Engineering
(562800)
Quinones, Kim
Netcher, Greg
Collier, Regina

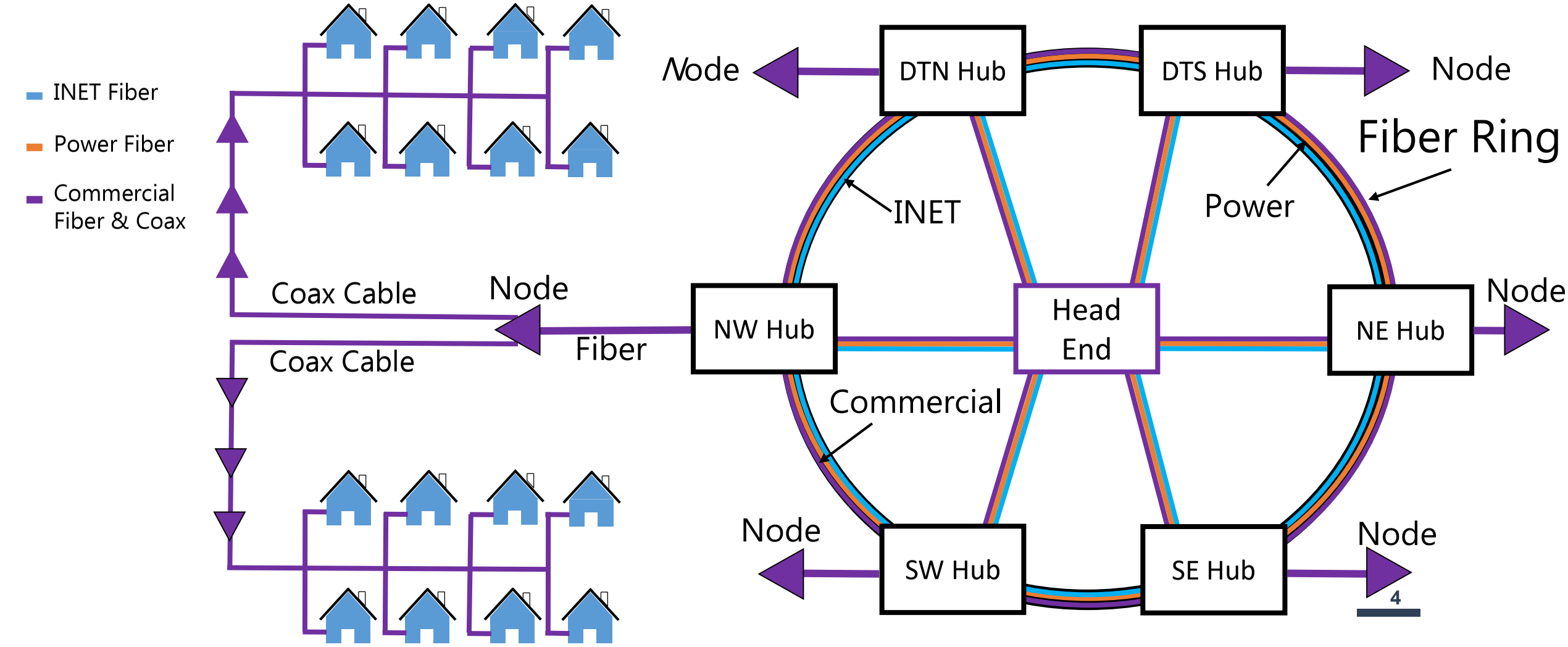
EXHIBIT 27

Click! Surplus Declaration

Tacoma Public Utility Board

Public Hearing
October 23, 2019
Item No. One

The Network Layout



Surplus declaration of the Commercial Network (purple) only.

Network Ownership & Operators (Current)

Tacoma Public Utilities

Tacoma Power - *Network Owner*

City of Tacoma – *Operator*

City Network (I-Net)

Tacoma Power - *Operator*

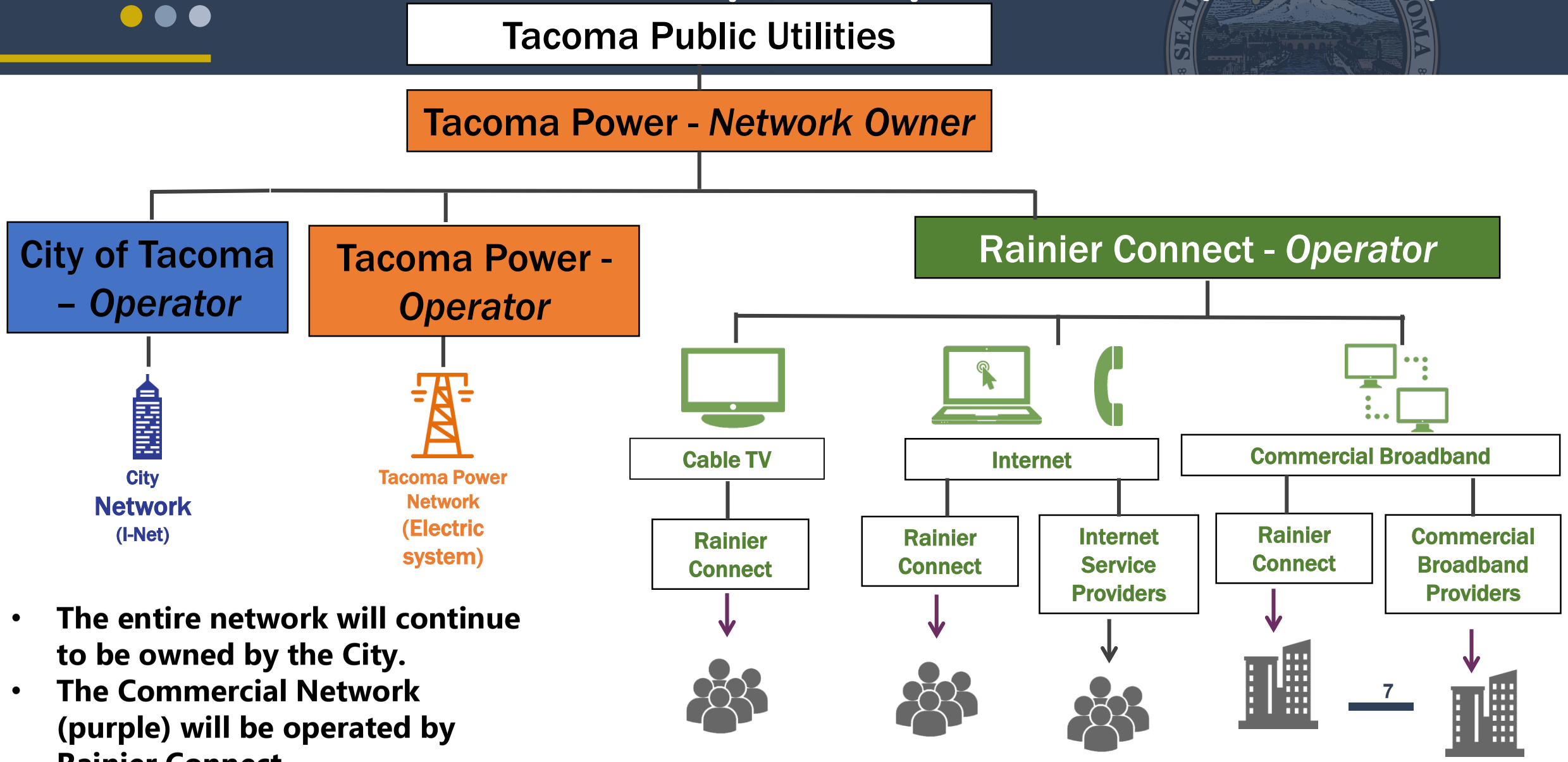
Tacoma Power Network (Electric system)

Click! Network - *Operator*

- **Cable TV** → **Click! Network**
- **Internet** → **Advanced Stream, Net-Venture, Rainier Connect**
- **Commercial Broadband** → **Optic Fusion, Zayo Wave Broadband, CenturyLink & Rainier Connect**

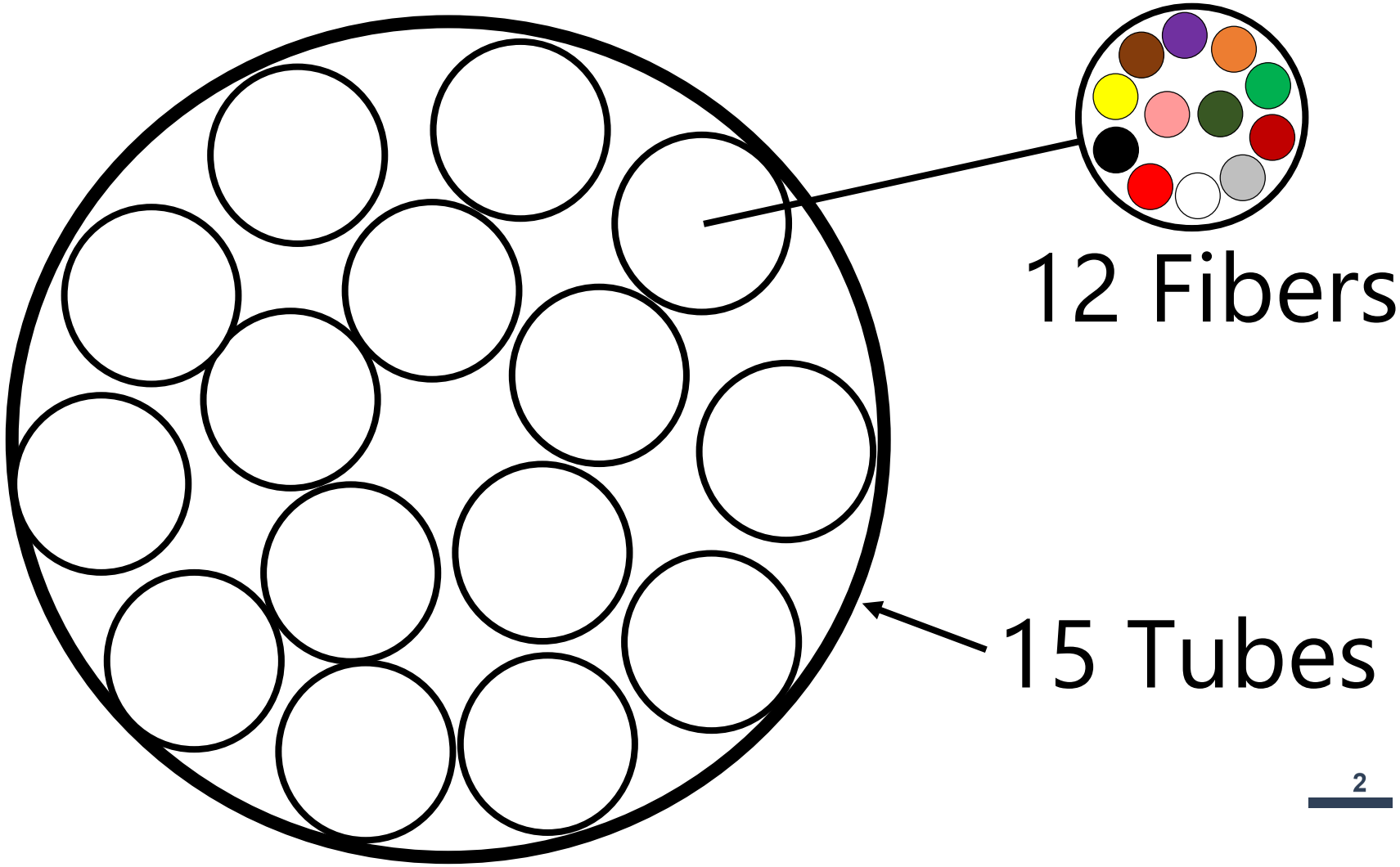
- **The entire network will continue to be owned by the City.**
- **The Commercial Network (purple) will be operated by Rainier Connect.**

Network Ownership & Operators (Future)

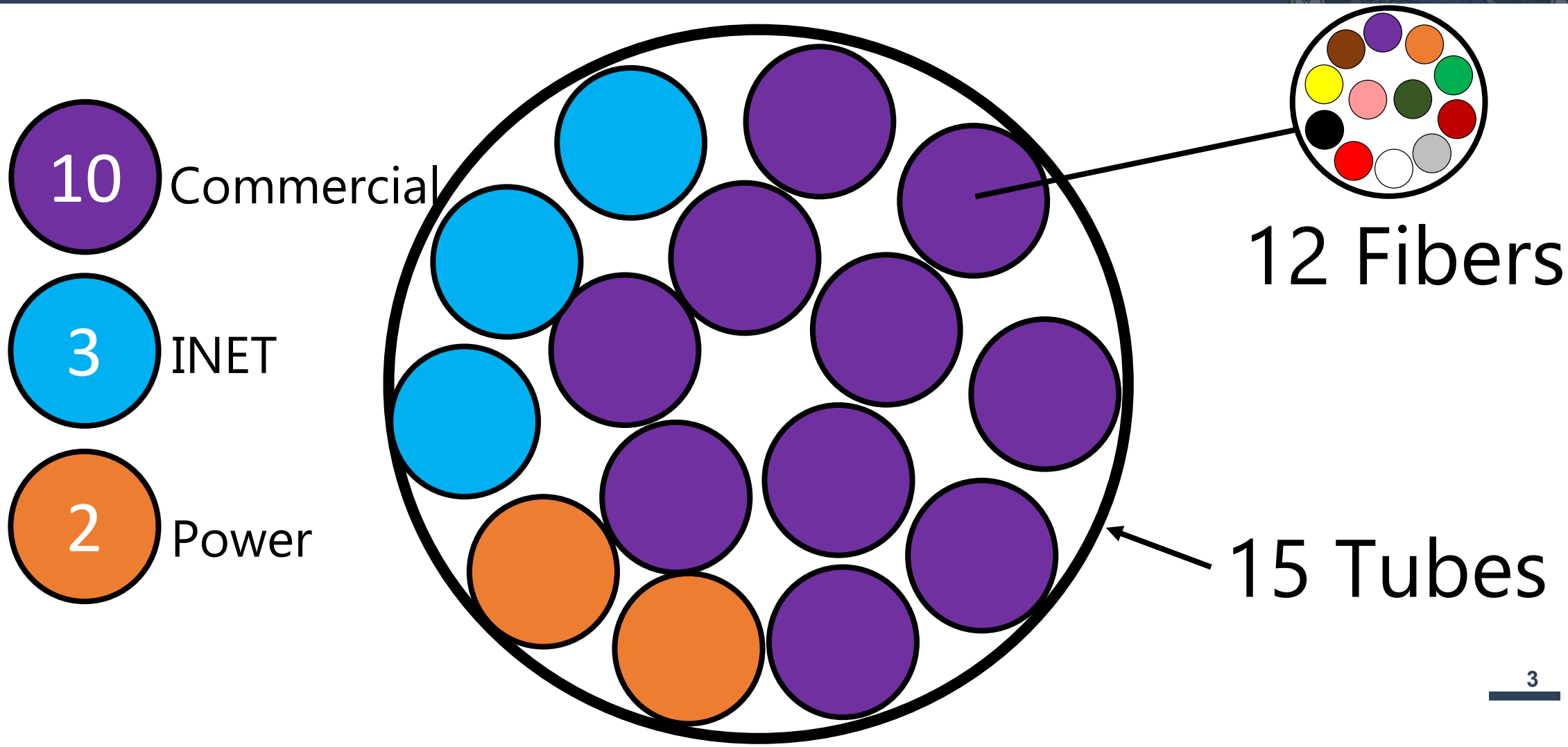


- **The entire network will continue to be owned by the City.**
- **The Commercial Network (purple) will be operated by Rainier Connect.**

180 Count Backbone Fiber (Current)

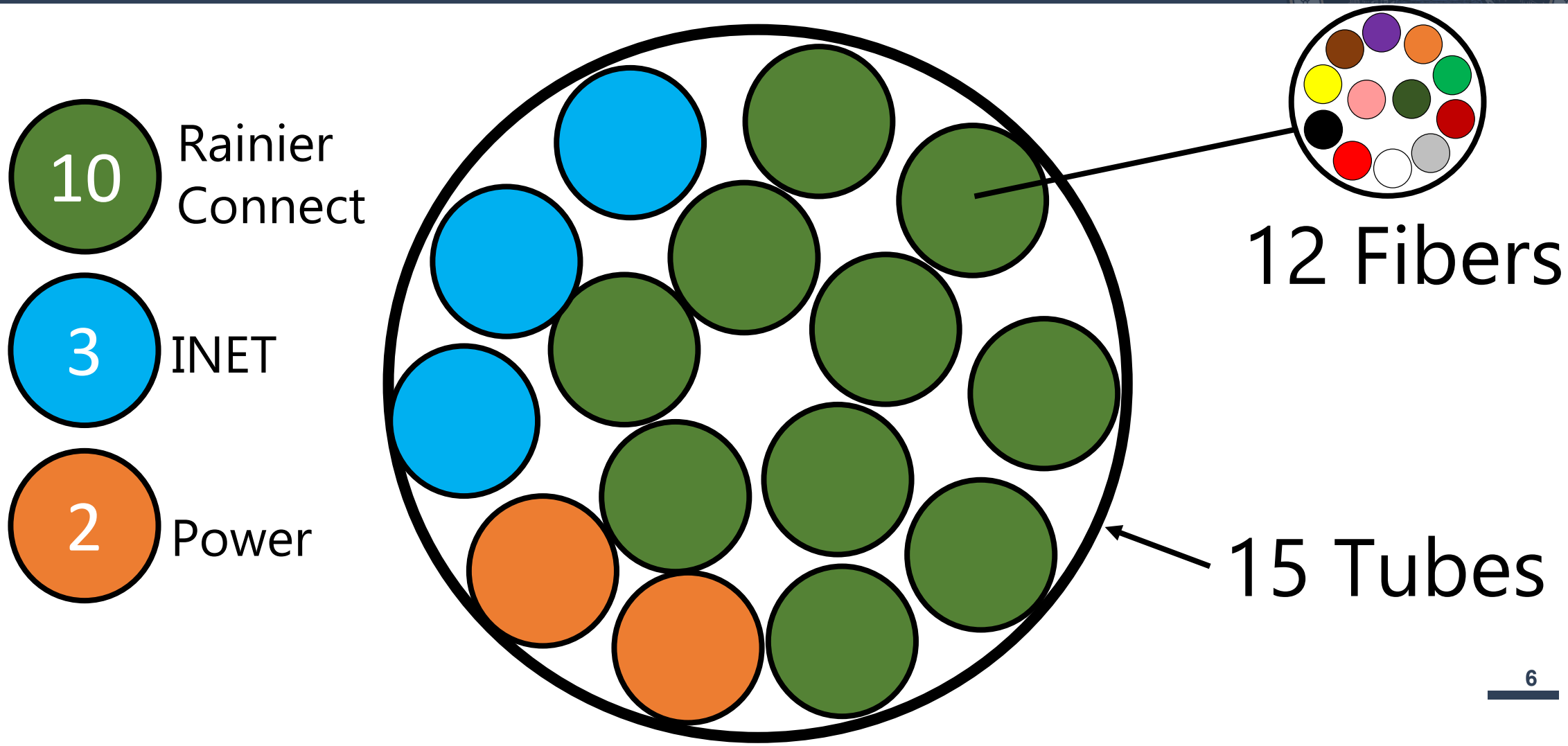


180 Count Backbone Fiber (Current)



Surplus declaration of the Commercial Network (purple) only.

180 Count Backbone Fiber (Future)



Surplus declaration of the Commercial Network (purple) only.

Surplus Declaration

THE SURPLUS PROPERTY DECLARATION

Surplused Assets

What assets of Tacoma Power will be declared surplus?

- Inventory, equipment and vehicles used by Click! that will be conveyed to Rainier Connect

- Excess Capacity of the HFC Network

Proposed Disposal

What methods of disposal are proposed in the contract documents?

- Inventory, equipment and vehicles: Title is proposed to be conveyed to Rainier Connect in consideration for contract obligations and value assigned to certain property.

- Excess Capacity of HFC Network: Operational rights proposed to be transferred pursuant to the terms of the indefeasible right of use agreement for a term of 20 years with two additional 10 year extensions.

- Ownership: City will retain ownership of the Excess Capacity

EXHIBIT 28

AGO 2003 No. 11.
Washington Attorney General Opinions
2003.
AGO 2003 No. 11.
December 15, 2003

COUNTIES --- CITIES AND TOWNS - TELECOMMUNICATIONS --- Authority of cities, towns, and counties to provide telecommunications services.

Those counties and cities that have "home rule" powers (that is, charter counties, first class cities, and cities operating under the Optional Municipal Code) have authority to provide telecommunications services to their residents; other cities, towns, and counties lack this authority.

The Honorable Jeff Morris
State Representative, 40th District
P.O. Box 40600
Olympia, WA 98504-0600

Cite As: AGO 2003 No. 11

Dear Representative Morris,
By letter previously acknowledged, you have requested an opinion on the following paraphrased question:
Do cities, towns, and counties have the authority to provide telecommunications services to their residents?
Specifically, you ask for a review and an update to AGO 53-55 No. 273, which concluded that a city was not authorized to own or operate a telephone system.(fn1)

BRIEF ANSWER

The answer to your question depends on the extent to which a municipal government may exercise "home rule" powers. First-class and code cities and charter counties may offer telecommunications services to their residents to the extent not specifically barred by state statute. These municipalities, often described as having "home rule" powers, do not need express or implied statutory authority to enact local legislation. Other classes of cities, towns, and counties are limited to those powers granted by statute, and since there is no statute providing authority to provide telecommunications services, they lack statutory authority to provide telecommunications services to the public. We overrule AGO 1953-55 No. 273 to the extent it is inconsistent with this opinion.

ANALYSIS

A. Definition Of "Telecommunications"

In your question, you ask whether municipalities (specifically to cities, towns, and counties) are authorized to be in the telecommunications business. To answer your question, we first must address the meaning of "telecommunications."

For purposes of regulating telecommunications companies, state law broadly defines "telecommunications" as:

[T]he transmission of information by wire, radio, optical cable, electromagnetic, or other similar means. As used in this definition, "information" means knowledge or intelligence represented by any form of writing, signs, signals, pictures, sounds, or any other symbols.

RCW 80.04.010 (defining "telecommunications" for purposes of laws regulating telecommunications companies).(fn2) For ease of reference, we will adopt this definition of the term.

B. General Rules Regarding The Authority Of Cities, Towns, And Counties

As a preliminary matter, there are several classifications of cities, towns, and counties under Washington law. There are first class cities, second class cities, code cities, unclassified cities, and towns. The classification of cities stems from the Washington Constitution, which provides, in relevant part:

Any city containing a population of ten thousand inhabitants, or more, shall be permitted to frame a charter for its own government, consistent with and subject to the Constitution and laws of this state[.]

Const. art XI, § 10. First class cities are those that have adopted a charter pursuant to this provision. RCW 35.01.010. Second-class cities and towns do not have their own charters but are governed by a statutory scheme set forth primarily in RCW Title 35.(fn3) Unclassified cities include those created by special charter prior to adoption of the state constitution (RCW 35.30.010) and statutory enactments supplement the powers they derive from their territorial charters. Finally, "code cities" are those which were incorporated, or have re-incorporated, under an Optional Municipal Code originally enacted in 1967. Laws of 1967, Ex. Sess., ch. 119, codified as RCW Title 35A.

Counties also vary as to the extent of their local legislative powers. The Washington Constitution allows any county to "frame a 'Home Rule' charter" for its own government subject to the Constitution and laws of this state". Const. art. XI, § 4.(fn4) Those counties that have not adopted charters are governed by a statutory framework which is primarily codified in RCW Title 36.

With respect to all municipal corporations, the general rule is that they are limited to those powers expressly granted by statute, those powers necessarily or fairly implied in or incident to powers expressly granted, and those powers essential to the declared purposes and objects of the corporation. *Port of Seattle v. Wash. Utils. & Transp. Comm'n*, 92 Wn.2d 789, 794-95, 597 P.2d 383 (1979). "If there is a doubt as to whether the power is granted, it must be denied." *Id.* at 795 (citations omitted).

However, this general rule does not apply to cities and counties that have adopted charters pursuant to the Washington Constitution (Const. art. XI, §§ 4, 10) or to cities operating under the optional municipal code ("code cities"). RCW 35A.11.020.(fn5) These cities and counties (first class cities, code cities, and charter counties) have legislative powers analogous to those of the state, except they cannot contravene any constitutional provision or state statute. *Winkenwerder v. City of Yakima*, 52 Wn.2d 617, 622, 328 P.2d 873 (1958). These municipalities, often described as having "home rule" powers, do not need express or implied statutory authority to enact local

legislation.

Despite their broad powers, the Washington Supreme Court has held that first class and code cities are not exempt from legislative control:

[A]t least when the interest of the State is paramount to or joint with that of the municipal corporation, the municipal corporation has no power to act absent a delegation from the legislature.

Massie v. Brown, 84 Wn.2d 490, 492, 527 P.2d 476 (1974) (citations omitted). In addition, a first class or code city's authority is preempted when the Legislature adopts a law concerning a particular interest, unless the Legislature has left room for concurrent jurisdiction. *Heinsma v. City of Vancouver*, 144 Wn.2d 556, 560, 29 P.3d 709 (2001). A city ordinance will be invalid (1) if a general statute preempts city regulation of the subject or (2) if the ordinance directly conflicts with a statute. *Id.* at 561.

The scope of a municipal corporation's powers also may depend on whether the powers are governmental or proprietary. *Hite v. Pub. Util. Dist. 2*, 112 Wn.2d 456, 459, 772 P.2d 481 (1989). Proprietary powers are more broadly defined than governmental powers. Where a municipal corporation is authorized to conduct a business, it may exercise its business functions in much the same way as a

PRIVATE

entity. *City of Tacoma v. Taxpayers of Tacoma*, 108 Wn.2d 679, 694, 743 P.2d 793 (1987). The provision of a product or service to the public--such as water, electricity, natural gas, or telecommunications--is a proprietary, rather than a governmental, function of a city or county. *Id.* at 694.

C. Authority Of "Home Rule" Cities And Counties To Provide Telecommunications Services

As stated above, "home rule" cities and counties have broad, though not unlimited, legislative powers. The Washington Constitution states that providers of telephone services are common carriers subject to control by the Legislature. Const. art. XII, § 19. Telecommunications businesses are public utilities and are regulated by the state to varying degrees. RCW 80.01.040(3). Thus, the state has enacted statutes regulating telecommunications services. However, these statutes neither expressly permit nor expressly prohibit cities and counties from providing such services.

The Legislature has authorized cities and towns to provide certain utilities such as electricity, gas, water, sewerage, and solid waste services. *See* RCW 35.92.010 (any city or town may provide water to end users); 35.92.020 (city or town authorized to provide sewerage and solid waste services to end users); 35.92.050 (city or town authorized to provide electricity and gas to end users); RCW 35A.80.010 (code city may provide utility service to extent authorized by general laws). Counties are authorized to provide a number of services to their residents, including transportation (RCW 36.57 and 36.57A), solid waste disposal (RCW 36.58), hospitals (RCW 36.62), and water-sewerage-drainage systems (RCW 36.94).

Neither cities, towns, nor counties are specifically authorized to provide telecommunications services. The question also arises whether the list of permitted utilities set forth in statute is exclusive, creating the inference that the Legislature did not intend for cities or counties to provide

any services beyond those authorized by various statutes.

This point was considered in *City of Issaquah v. Teleprompter Corp.*, 93 Wn.2d 567, 611 P.2d 741 (1980), in which Issaquah, a city operating under the Optional Municipal Code, had established and operated a cable television system serving the city's residents, taking over franchises previously held by a

PRIVATE

cable company. The cable company challenged the city's acts, and the state supreme court upheld the city. The court found that providing cable television service was of appropriate local concern to be the subject of city legislation, and that the state had not preempted the field by declaring it a paramount state concern. *Id.* at 572-575.(fn6) The court also rejected several other statutory and constitutional objections. *Issaquah* establishes that "home rule" cities and counties do not need express statutory authority to exercise their legislative authority.

As to "home rule" governments, then, the question is whether the state has enacted a "general law" that supersedes or controls the exercise of legislative authority. None of the Legislature's enactments purport to prohibit cities or counties from providing telecommunications services, and none are so sweeping and comprehensive as to leave no room for local legislation. We note also that courts in two other jurisdictions have upheld the authority of "home rule" local governments to provide telecommunications services. *GTE Northwest, Inc. v. Oregon Pub. Util. Comm'n*, 179 Ore. App. 46, 39 P.3d 201(2002); *In re Application of Lincoln Elec. Sys.*, 655 N.W.2d 363 (2003). The Oregon case involved a county with "home rule" powers, and the Nebraska case involved a charter city with "home rule powers."(fn7) Therefore, we conclude that "home rule" cities and counties may provide telecommunications services except as may be limited by specific statutory language governing particular services.

In AGO 1953-55 No. 273, we concluded that first class cities lacked authority to provide telephone service to their residents. Although the opinion specifically noted that first class cities were under discussion, it included no analysis of the effect of first class "home rule" powers on the question. To the extent that AGO 1953-55 No. 273 is inconsistent with this opinion, we overrule it.

D. Authority Of Second Class Cities, Towns, And Non-Charter Counties To Provide Telecommunications Service

As noted above, the Legislature has not expressly authorized such entities to engage in such business, nor is the provision of telecommunications necessarily implied or incident to the provision of authorized services. In addition, the authority of second class cities and towns is more limited than the authority of first class and code cities. Like most municipal corporations (and unlike the home-rule governments discussed above), second-class cities, towns, and non-charter counties cannot exercise powers except those expressly granted by the Legislature or those necessarily implied from granted powers. *See, e.g., Sundquist Homes, Inc. v. Snohomish Cy. Pub. Util. Dist. 1*, 140 Wn.2d 403, 997 P.2d 915 (2000); *Town of Othello v. Harder*, 46 Wn.2d 747, 284 P.2d 1099 (1955). Therefore, in the absence of any express legislation authorizing these categories of municipal corporations to provide telecommunications services, we conclude that they may not lawfully do so.(fn8)

We trust that the foregoing will prove useful to you.

Sincerely,
SHANNON E. SMITH
Assistant Attorney General

_____

Footnotes:

1. Your original question was whether municipalities had authority to "be in the telecommunications business." This is a very broad term, and it potentially covered many unlikely possibilities. From the context of your letter and from general knowledge about proposals municipalities have considered, we limit our analysis to cities or counties seeking to provide telecommunications services to the general public rather than other forms of "telecommunications business."

2. This definition also applies to those statutes authorizing public utility districts and port districts to construct and operate telecommunications facilities for wholesale. RCW 53.08.005(2); 54.16.005(2). Port districts and public utility districts are authorized to construct and operate telecommunications facilities for their own use and for wholesale. RCW 53.08.370; 54.16.330. In granting this authority, the Legislature expressly provided that neither port districts nor public utility districts may provide telecommunications services to end users. *Id.*

3. RCW 35.23 contains provisions applying specifically to second-class cities, and RCW 35.27 contains provisions applying to towns.

4. A county and one or more cities may also form a combined city-county government (with "home rule" powers) through a constitutional charter process. Const. art. XI, § 16. However, as of this date, no city-county governments have been created under this provision.

5. Code cities with a population of 10,000 or more may adopt a charter, but they are not required to do so. RCW 35A.01.030.

6. The plaintiff in the *Issaquah* case argued that "home rule" cities could not operate any utilities beyond those listed in statute. *Issaquah,* 93 Wn.2d at 574. The *Issaquah* court found that the cable television system was not a utility (based on the representations of the parties before the court) and thus did not reach the question whether a city could operate a utility other than those specifically authorized by statute. *Id.* at 574-575. The court's decision did not appear to turn on this point, however. We conclude that the analysis is the same whether the provision of a particular telecommunications service is a utility or not.

7. The Nebraska court also found that a federal statute independently provides a basis for a municipality to provide telecommunications service and that this law preempts any contrary state law. Courts and other tribunals have differed on whether the federal statute barring states from prohibiting "any entity" to provide telecommunications services preempts state laws that preclude municipalities from providing such services. *See, e.g., City of Abilene, Texas v. F.C.C.*, 164 F.3d 49 (D.C. Cir. 1999); *Iowa Tel. Ass'n v. City of Hawarden*, 589 N.W.2d 245 (Iowa 1999); City of Bristol v. Earley, 145 F. Supp.2d 741 (W.D. Va. 2001). Whether "any entity" includes municipalities is thus not a settled question and will not be addressed here. Certiorari has been granted by the United States Supreme Court on this issue in *Nixon v. F.C.C.*, U. S. Supreme Court Docket No.

02-1386.

8. Of course, the Legislature is free to expand or limit the powers of cities, towns, and counties in the area, should it choose to do so. For reasons discussed in the main text, any limitations on the powers of "home rule" municipalities would need to be spelled out in statute. As to "non home rule" governments, new statutory language would be needed to authorize and define the services such governments would be allowed to provide.