



# CIRF

## **Converging Industries Research Foundation**

*Practical Solutions for Communications Policy*

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### **Universal Service Tool Kit, Part 2: Beyond Cost Allocation: Benchmark Subsidy Method**

**October 10, 1994**

*Presentation at the November 1994 NARUC Meeting,  
Reno, Nevada*

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# Introduction

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## Introduction

This paper continues research on universal service done by the Telecommunications Industries Analysis Project (TIAP). The TIAP is writing a series of papers that can be seen as a *Universal Service Tool Kit*. Just as you need a variety of tools for different problems on your car, you also need a variety of tools (mechanisms) to restructure universal service policies. Each paper presents options or ideas for a new regulatory framework. To date, this series includes:

- **Abort, Retry, Fail? The Need for New Communications Policies<sup>1</sup>** Describes the need for a new framework for communications policies.
- **Universal Service Tool Kit, Part 1: Getting from Here to There: Transitions for Restructuring Subsidies<sup>2</sup>**  
Provides various ideas for moving from the current subsidy structure to new long-term policies.
- **Universal Service Tool Kit, Part 2: Beyond Cost Allocations: Benchmark Subsidy Method**  
Presents one long-term approach. In this idea, there is a single mechanism for subsidies, regardless of whether a market is competitive or not. The Benchmark Subsidy Method provides incentives to service providers to be efficient and allows competitive markets to operate efficiently.
- **Long-Term Restructuring Idea 1: Layering or Integrating Networks and Services<sup>3</sup>**  
Presents two approaches for restructuring oversight of all communications industries. The first alternative, called "layering," divides communications services into three basic categories - network, gateway, and content. Different regulatory rules (including no regulation) can be applied to each category. In the second alternative, called "integrating," services blend these categories (network, gateway, and content) so that service providers have complete control.

*Universal Service Tool Kit, Part 1* - covered a variety of short-term transitions that could be used to restructure the current subsidy mechanisms used for universal service.

This paper - *Universal Service Tool Kit, Part 2: Beyond Cost Allocations: Benchmark Subsidy Method* - presents a long-term idea. In this approach, a single mechanism applies for subsidies regardless of whether or not a market is competitive. The Benchmark Subsidy Method provides incentives to service providers to be efficient and allows competitive markets to operate efficiently.

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## Introduction, cont.

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This paper is one alternative that could be considered for the future. There are other alternatives, such as basing subsidies on accounting (embedded) costs, or bidding systems. If possible, TIAP plans to develop other alternatives in future papers.

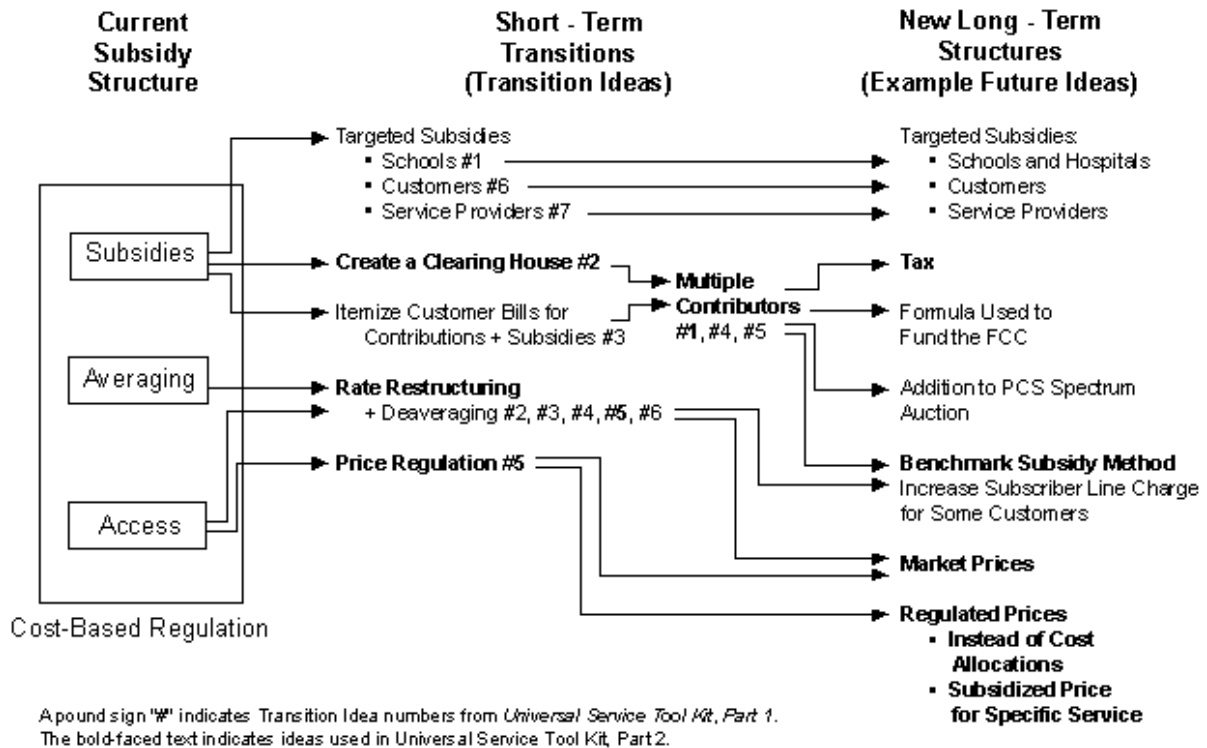
The *Benchmark Subsidy Method*, which is a long-term approach, includes three transition mechanisms from the previous paper (**Figure 1**):

- Alternative Funding Sources: Percent Subsidy Contributions from Communications Equipment Suppliers and Service Providers (Transition Idea #1B, Option 1).
- External Funding Mechanism: Create a Clearing House (Transition Idea #2).
- Basis for Subsidy: Subsidies Under Price Regulation (Transition Idea #5).

While the *Benchmark Subsidy Method* described in this paper illustrates the mechanism, it does not provide specific numbers, such as overhead percents or market prices for the benchmark itself. The intent is to show, in simple terms, how this approach might be applied. Actual dollars would require explicit assumptions and detailed study.

## Introduction, cont.

**Figure 1**  
**Flow from Current Subsidy Structure with**  
**Transitions Leading to New Long-Term Structures**



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## Universal Service Tool Kit, Part 2

### Beyond Cost Allocations: Benchmark Subsidy Method

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**Objective:** To illustrate a single mechanism for subsidies regardless of whether or not a market is competitive. To provide incentives for efficiency. Also, to preserve basic subsidies while shifting to a new regulatory mechanism.

**Importance:** Subsidies can be used to promote universal service even when there is competition. Also, subsidies can be constructed to work in both regulated and non-regulated markets. It is possible to shift to price regulation and eliminate rate of return regulation and allocations of accounting costs while still retaining subsidies for some definition of basic service.

**Assumptions:**

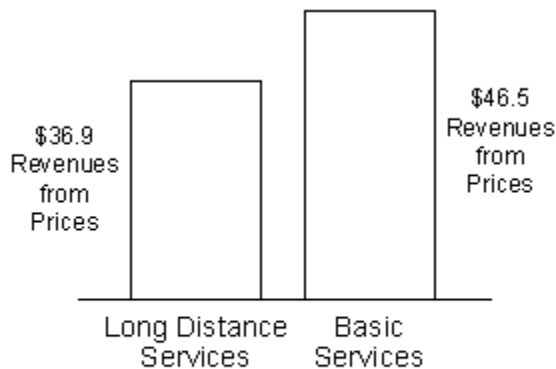
- The revenues received by service providers (prices plus subsidies) must be sufficient to keep reasonably efficient service providers financially viable.
- Basic Service is defined as "local exchange service" for illustrative purposes; however, basic service could be defined in many different ways as long as the benchmark cost matches the definition of basic service.
- Basic service revenues include revenues for local services and subscriber line charges. Long distance revenues include revenues for local exchange company toll revenues and access revenues (including the carrier common line charge and interstate subsidies).
- The subsidy mechanism should provide incentives for efficiency by basing subsidies on something other than accounting costs.

**Caveats:**

- This approach shows only the basics of the method and not the details for implementation.
- Amounts for prices, costs, and subsidies are for illustrative purposes only.
- While some of portion of subsidies illustrated covers carrier of last resort obligations, this example does not explicitly cover all elements (current or potential) of this issue.
- Other issues related to competition, such as flexible pricing, are not covered in this paper.

## Universal Service Tool Kit, Part 2 Beyond Cost Allocations: Benchmark Subsidy Method, cont.

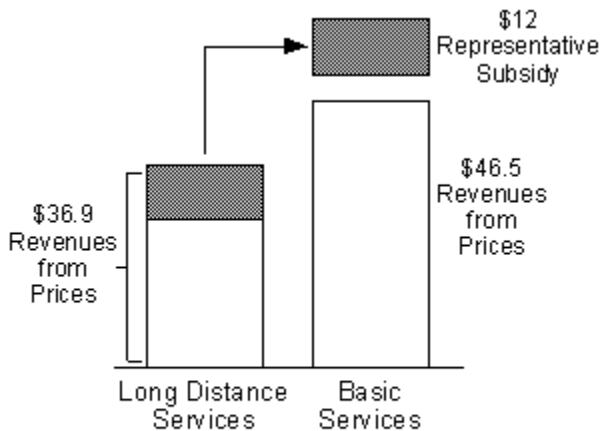
**A. What are the current prices for basic and long distance services?**



Current prices for local exchange carrier services provide \$46.5 billion in revenues for basic local exchange service and \$36.9 billion in revenues for long distance services.<sup>4</sup>

**1992 Nationwide Service Revenues  
(dollars in billions)**

**B. What is the current subsidy for these services?**

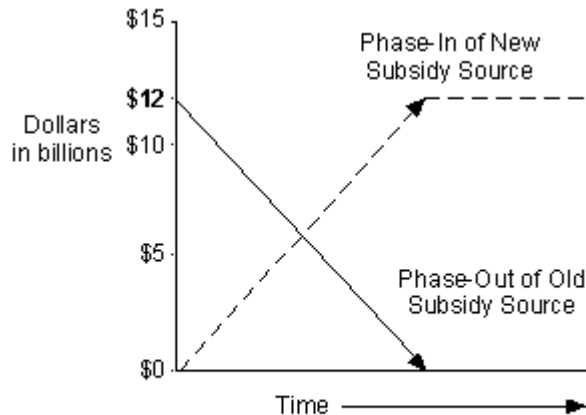


**Example of 1992 Subsidy Flows  
(dollars in billions)**

Some current subsidies flow from long distance to local service, and are based on allocations of accounting costs.<sup>5</sup> In the example, the subsidy supplements current basic services revenues and keeps the price lower on average than it might be otherwise. The subsidy amount of \$12 billion is an average between two estimates (\$4 billion and \$20 billion) and is for illustrative purposes only.<sup>6</sup> The focus is on how current subsidy structures and associated pricing methods might be changed; the focus is not on exact amounts.

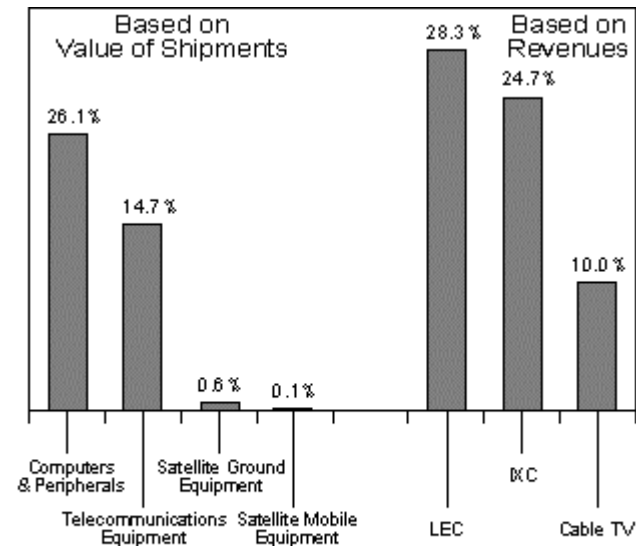
## Universal Service Tool Kit, Part 2 Beyond Cost Allocations: Benchmark Subsidy Method, cont.

### C. What is the new subsidy funding mechanism?



**Subsidy Sources:  
Phase-Out Old, Phase-In New**

Phase-Out of Old Source; Phase-In of New Source:  
The \$12 billion representative subsidy from long distance service customers (prices) is phased out over time and replaced by dollars from a new source.<sup>7</sup> The subsidy amount on the first day of the phase-in is the same as it is on the last day before the transition starts.



**% Contribution from Communications  
Equipment Suppliers and Service Providers**

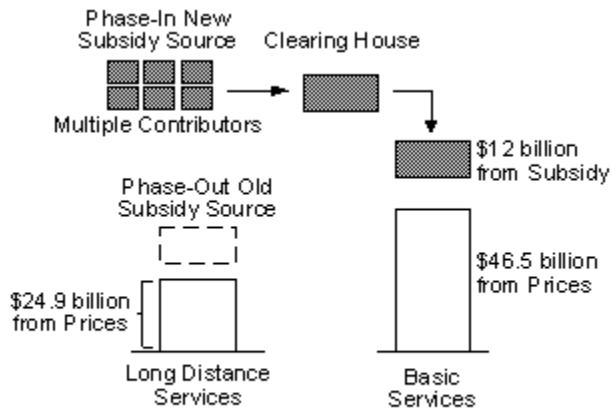
### New Funding Source - Multiple Contributors:

The new subsidy source is payments by all telecommunications providers, including new competitors. Various mechanisms are possible, including fees based on revenues, on number of customers, or on some other basis.<sup>8</sup> The funding could be explicit on customer bills to help customers see the subsidy mechanisms - who pays it and who receives it.

In this example, the funding is based on some form of tax (e.g., excise tax) on all communications companies (equipment suppliers as well as service providers). The illustration contains percents based on value of shipments revenues from *representative* industries.

## Universal Service Tool Kit, Part 2 Beyond Cost Allocations: Benchmark Subsidy Method, cont.

**C. What is the new subsidy funding mechanism?, cont.**



**Transition to New Subsidy Funding Mechanism**

**Create a Subsidy Clearing House:**

A subsidy clearing house collects and distributes the subsidies.<sup>9</sup> The example shows the combination of all three transition mechanisms – new funding source, phase-out of old source, and use of a clearing house.

In this illustration, the service providers receive \$46.5 billion from basic service customers and \$12 billion for subsidies from the new source - multiple contributors.

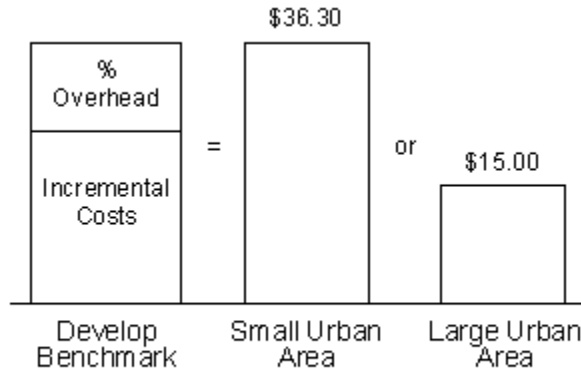
**D. What is the new basis for determining the amount of subsidy?**

**Benchmark Subsidy Method:**

It is likely that the subsidy amount (illustrated by \$12 billion in the example) will need to change in the future. The basis for determining the new subsidy amount is the Benchmark Subsidy Method. In this method, the subsidy is the difference between benchmark costs and benchmark prices.

## Universal Service Tool Kit, Part 2 Beyond Cost Allocations: Benchmark Subsidy Method, cont.

**D. What is the new basis for determining the amount of subsidy?, cont.**



**Example of Benchmark Monthly Cost per Line**

**1. Determine Benchmark Costs:**

The regulatory process would determine for a geographic area how much revenue a reasonably efficient basic service provider would need to be financially viable. These geographic areas should be small enough so that each customer within an area has essentially the same cost.

The amount of revenue needed per customer is based on benchmark costs — an estimate of the incremental cost of basic service plus a reasonable contribution to overhead costs. Contributions to overhead costs are necessary to permit service providers to be financially viable. (See Appendix A, for development of illustrative costs.)

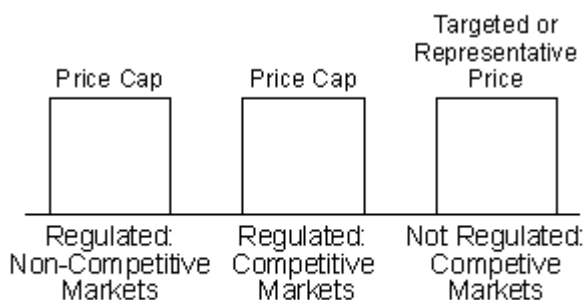
**2. Determine Benchmark Prices for Basic Service:**

The regulatory process would determine benchmark basic service prices for purposes of setting subsidy amounts. (Benchmark prices may be existing basic service prices.) Basic service prices could be broadly averaged as they are today.

*Non-competitive Markets:* Benchmark prices would be the regulated price cap for basic service.

*Competitive Markets:* If regulators chose to provide subsidies in competitive areas, then benchmark prices would be:

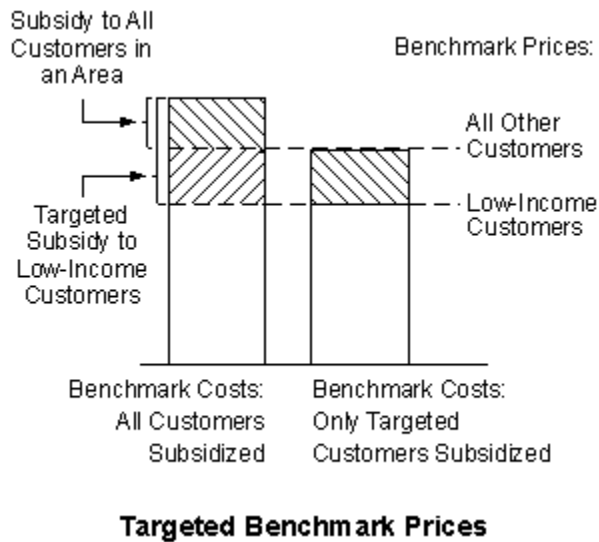
- Target or representative prices, if prices are not regulated.
- A price cap, if prices are regulated.



**Benchmark Price per Line for Basic Service**

## Universal Service Tool Kit, Part 2 Beyond Cost Allocations: Benchmark Subsidy Method, cont.

*What is the new basis for determining the amount of subsidy?, cont.*

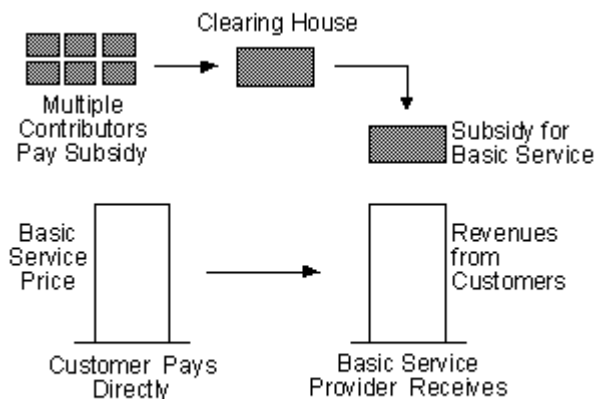


### 3. Determine Subsidy Amount by Geographic Area:

The regulatory process would determine the new subsidy amount for an area by subtracting the benchmark prices from the benchmark costs. Subsidies would not be necessary when benchmark prices were equal to or above benchmark costs.

Subsidies could be general or specific, or both. An example of a general subsidy is one applied to all customers in an area. An example of a specific subsidy is one applied to low-income customers. The chart illustrates both of these examples. In the same area, it is possible to have both of these subsidies. The dashed lines indicate two different benchmark prices.

### E. Who gets the subsidy?



The subsidy payment can be made available to any basic service provider the customer chooses. The service provider receives the price the customer pays and the subsidy payment.

### Who Pays and Who Gets the Subsidy

## Appendix A

### Calculations of Example Benchmark Costs

This appendix calculates the example benchmark costs. This is only one way these benchmark costs could be calculated. Incremental cost data are for 1988, and are from Bridger M. Mitchell, *Incremental Costs of Telephone Access and Local Use*, The RAND Corporation, Santa Monica, CA, July 1990, Tables 10 and 12, pages 47-48. These incremental costs represent the mid-range of the published estimates. An overhead contribution of 20% above incremental cost is used for illustrative purposes.

#### Representative Calculations

<i>Description</i>	<i>Exchange Size</i>		<i>Source and Calculations:</i>
	<i>Small Urban</i>	<i>Large Urban</i>	
1. Annual Average Incremental Cost of Residential Basic Service per Line*	\$179.00	\$93.00	Mitchell, <i>Incremental Costs</i> , Table 12, page 48.
2. Annual Fixed Costs of Basic Service per Line*	\$184.00	\$57.00	Mitchell, <i>Incremental Costs</i> , Table 10, page 47.
3. Total Annual Incremental Cost of Residential Basic Service per Line	\$363.00	\$150.00	Line 1 + Line 2.
4. Assumed Overhead Contribution	20%	20%	Assumed amount.
5. Annual Overhead Contribution	\$72.60	\$30.00	Line 3 x Line 4
6. Annual Benchmark Cost of Residential Basic Service per Line	\$435.60	\$180.00	Line 3 x Line 5.
7. Monthly Benchmark Cost of Residential Basic Service per Line	\$36.30	\$15.00	Line 6 / 12.

\*Average incremental cost measures the additional costs of increasing the volume of local exchange service. Fixed costs represent costs that are incurred in order to offer local exchange service, but that do not change with changes in volume. Average incremental costs and fixed costs are summed in this example to approximate all of the costs covered by local exchange services.

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## Notes

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### End Notes

Gordon Calaway, National Exchange Carrier Association assisted with data for the analysis.

### Acronyms:

NARUC	National Association of Regulatory Utility Commissioners
NECA	National Exchange Carrier Association
TIAP	Telecommunications Industries Analysis Project

1. Weinhaus, Carol; Pitts, Teresa; McMillin, Rob; Jamison, Mark; et al., *Abort, Retry, Fail? The Need for New Communications Policies*, Telecommunications Industries Analysis Project, Public Utilities Research Center, College of Business Administration, University of Florida, July 11, 1994, revised October 10, 1994.
2. Weinhaus, Carol; Monroe, Terry.; Harris, Dan; et al., *Universal Took Kit, Part 1: Getting from Here to There Transitions for Restructuring Subsidies*, Telecommunications Industries Analysis Project, Public Utility Research Center, College of Business Administration, University of Florida, Boston, MA, July 18, 1994; revised October 10, 1994.
3. Weinhaus, Carol; Pitts, Teresa, et al., *Long-Term Restructuring Idea 1: Layering or Integrating Networks and Services*, Presentation at the National Association of Regulatory Utility Commissioners Meeting, San Diego, California, July 11, 1994, revised October 10, 1994.
4. Dollar amounts are from *Abort, Retry, Fail* Figure 12, page 15. For a more detailed discussion of the calculations, see Weinhaus, Carol; Makeeff, Sandra; Jamison, Mark; et al., *Who Pays Whom Cash Flow for Some Support Mechanisms and Potential Modeling of Alternative Telecommunications Policies*, November 15, 1992.
5. See Weinhaus, Carol; Pitts, Teresa; and Jamison, Mark, et al., *Apples and Oranges: Differences between Various Subsidy Studies*, Public Utility Research Center, College of Business Administration, University of Florida, October 10, 1994, for a discussion of some different methods of defining subsidies in the traditional telecommunications industry (long distance and local exchange carriers) and the resulting amounts.
6. *Universal Service Tool Kit, Part 1*, page 4. Several recent studies have attempted to answer the question "How large is the subsidy?" The results range from \$1.1 billion to \$20 billion. These studies examine different types of subsidies and markets, and they use dissimilar methods and data. In addition, there are varying views as to what constitutes incremental cost. There is a temptation to add or subtract these different study results; however, without detailed knowledge of each study, the resulting calculations are meaningless (see *Apples and Oranges*).

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## Notes, cont.

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7. For the basics of this mechanism, see *Universal Service Tool Kit, Part 1, Transition Idea #5B*, page 13.

8. Chart is from *Universal Service Tool Kit, Part 1, Transition Idea #1B, Option 1*, page 5. Other options in this paper include percent of subsidy contribution based on the 1994 FCC funding formula, fund the interstate subsidy portion with an increased subscriber line charge, and use FCC personal communications services (PCS) auctions to fund targeted subsidies, pages 5 and 6.

9. For the development of this mechanism, see *Universal Service, Tool Kit, Part 1, Transition Idea #2*, page 7.

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## List of Participants in the Telecommunications Industries Analysis Project, 1994

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### 1994 List of Participants in the Telecommunications Industries Analysis Project

State Regulators	NARUC representatives from: Iowa Utilities Board New York Public Service Commission Washington Utilities and Transportation Commission
Regional Holding Companies	Ameritech Bell Atlantic BellSouth NYNEX Pacific Telesis Southwestern Bell US WEST
Large Independents	GTE Sprint Local Telecom Division Anchorage Telephone Utility
Interexchange Carrier	AT&T Sprint
Foreign Domestic	NTT America InfoCom Research, Inc.
Local, National, and International Services	BT
Materials Manufacturers	Corning
Telecommunications Equipment Manufacturers	Northern Telecom

#### Sponsors:

Corporation for Public Broadcasting

#### Assisting with *public* data:

Federal Communications Commission  
National Exchange Carrier Association

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## Project Background

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### Background on the Telecommunications Industries Analysis Project

The goal of the Telecommunications Industries Analysis Project is to provide information to support the development of alternative communications policies to meet the needs of stakeholders in an environment that includes competitive and non-competitive markets, federal and state regulatory jurisdictions, and a proliferation of new services made possible by technological advances. The purpose of the project is to produce research and analysis which will assist policy makers in making informed decisions.

The project is a neutral forum of communications industry stakeholders exploring multiple viewpoints of selected issues. This forum incorporates the following elements:

- **Broad representation:** The current forum includes foreign and domestic local exchange carriers (LECs), interexchange carriers (IXCs), materials and equipment manufacturers, and regulators. The project actively seeks expansion of this forum to include other communications industry representatives such as competitive access providers, cable television companies, computer companies, electric power utilities, or publishers.
- **Multiple viewpoints:** Participants are required to play an active role in the research and analysis, to represent their own interests, to understand and to assist in developing others' perspectives, and to work toward the common goal of representing multiple views.
- **Analysis and results of alternative policies:** Research tools, including a jointly produced data base and computer software models, and data analysis developed by this forum create a common language for examining issues. The common language allows the participants to focus on underlying issues. Appropriate computer software tools, including modifications to existing tools, are developed.
- **All data, analysis methods, and results are public:** Data used by this project must be publicly available on a nationwide basis. Research products become public domain information.
- **Neutral setting:** The project resides in a neutral setting, free of partiality, thereby ensuring objective and independent research.

### What the Project has Done

The project has conducted public workshops at the national meetings of the telecommunications industry regulators. The project's research papers have been the basis for meetings with the Federal Communications Commission, Congressional staffs, the Congressional Research Service, and the National Telecommunications Information Administration. The project has also produced a number of papers plus software modeling tools for analysis of financial structures and new technology deployment.

**Request for Background Papers**  
Telecommunications Industries Analysis Project  
Public Utility Research Center  
College of Business Administration  
University of Florida

Fill out the form and fax (617-367-7127) or mail your request to the following address:

Carol Weinhaus  
Meeting House Offices  
121 Mount Vernon St.  
Boston, MA 02108  
(617) 367-6909

Name \_\_\_\_\_  
Title \_\_\_\_\_  
Address \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
Phone \_\_\_\_\_  
Fax \_\_\_\_\_

**RESEARCH PAPERS**

**1994:**

- \_\_\_ *Apples and Oranges: Differences between Various Subsidy Studies*
- \_\_\_ *Universal Service Tool Kit, Part 1: Getting From Here to There: Transitions for Restructuring Subsidies*
- \_\_\_ *Universal Service Tool Kit, Part 2: Beyond Cost Allocations: Benchmark Subsidy Method*
- \_\_\_ *Abort, Retry, Fail? The Need for New Communications Policies*
- \_\_\_ *Long-Term Restructuring Idea 1: Layering or Integrating Networks and Services*
- \_\_\_ *Redefining Universal Service: The Cost of Mandating the Deployment of New Technology in Rural Areas*

**1993:**

- \_\_\_ *Breaking the Mold: Changing Policies to Meet Customer Needs*
- \_\_\_ *Beyond Future Shock: Need for a New Response to Technological Change*
- \_\_\_ *Square Pegs and Round Holes: Mismatches between Government Policies and  
Converging Communications Markets*
- \_\_\_ *What is the Price of Universal Service? Impact of Deaveraging Nationwide Urban/Rural Rates*
- \_\_\_ *Who Pays Whom? Cash Flow for Some Support Mechanisms and Potential Modeling of Alternative Telecommunications Policies*