

TCRP

REPORT 99

TRANSIT
COOPERATIVE
RESEARCH
PROGRAM

Embracing Change in a Changing World

***Case Studies Applying New Paradigms
for Rural and Small Urban
Transit Service Delivery***

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TCRP REPORT 99

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in a Changing World**

***Case Studies Applying New Paradigms
for Rural and Small Urban
Transit Service Delivery***

KFH GROUP, INC.
Bethesda, MD

SUBJECT AREAS

Planning and Administration • Public Transit

Research Sponsored by the Federal Transit Administration in Cooperation with the Transit Development Corporation

TRANSPORTATION RESEARCH BOARD

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TRANSIT COOPERATIVE RESEARCH PROGRAM

The nation's growth and the need to meet mobility, environmental, and energy objectives place demands on public transit systems. Current systems, some of which are old and in need of upgrading, must expand service area, increase service frequency, and improve efficiency to serve these demands. Research is necessary to solve operating problems, to adapt appropriate new technologies from other industries, and to introduce innovations into the transit industry. The Transit Cooperative Research Program (TCRP) serves as one of the principal means by which the transit industry can develop innovative near-term solutions to meet demands placed on it.

The need for TCRP was originally identified in *TRB Special Report 213—Research for Public Transit: New Directions*, published in 1987 and based on a study sponsored by the Urban Mass Transportation Administration—now the Federal Transit Administration (FTA). A report by the American Public Transportation Association (APTA), *Transportation 2000*, also recognized the need for local, problem-solving research. TCRP, modeled after the longstanding and successful National Cooperative Highway Research Program, undertakes research and other technical activities in response to the needs of transit service providers. The scope of TCRP includes a variety of transit research fields including planning, service configuration, equipment, facilities, operations, human resources, maintenance, policy, and administrative practices.

TCRP was established under FTA sponsorship in July 1992. Proposed by the U.S. Department of Transportation, TCRP was authorized as part of the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA). On May 13, 1992, a memorandum agreement outlining TCRP operating procedures was executed by the three cooperating organizations: FTA, The National Academies, acting through the Transportation Research Board (TRB); and the Transit Development Corporation, Inc. (TDC), a nonprofit educational and research organization established by APTA. TDC is responsible for forming the independent governing board, designated as the TCRP Oversight and Project Selection (TOPS) Committee.

Research problem statements for TCRP are solicited periodically but may be submitted to TRB by anyone at any time. It is the responsibility of the TOPS Committee to formulate the research program by identifying the highest priority projects. As part of the evaluation, the TOPS Committee defines funding levels and expected products.

Once selected, each project is assigned to an expert panel, appointed by the Transportation Research Board. The panels prepare project statements (requests for proposals), select contractors, and provide technical guidance and counsel throughout the life of the project. The process for developing research problem statements and selecting research agencies has been used by TRB in managing cooperative research programs since 1962. As in other TRB activities, TCRP project panels serve voluntarily without compensation.

Because research cannot have the desired impact if products fail to reach the intended audience, special emphasis is placed on disseminating TCRP results to the intended end users of the research: transit agencies, service providers, and suppliers. TRB provides a series of research reports, syntheses of transit practice, and other supporting material developed by TCRP research. APTA will arrange for workshops, training aids, field visits, and other activities to ensure that results are implemented by urban and rural transit industry practitioners.

The TCRP provides a forum where transit agencies can cooperatively address common operational problems. The TCRP results support and complement other ongoing transit research and training programs.

TCRP REPORT 99

Project B-22A FY'99
ISSN 1073-4872
ISBN 0-309-08789-9
Library of Congress Control Number 2004101686

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Price \$17.00

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The members of the technical advisory panel selected to monitor this project and to review this report were chosen for recognized scholarly competence and with due consideration for the balance of disciplines appropriate to the project. The opinions and conclusions expressed or implied are those of the research agency that performed the research, and while they have been accepted as appropriate by the technical panel, they are not necessarily those of the Transportation Research Board, the National Research Council, the Transit Development Corporation, or the Federal Transit Administration of the U.S. Department of Transportation.

Each report is reviewed and accepted for publication by the technical panel according to procedures established and monitored by the Transportation Research Board Executive Committee and the Governing Board of the National Research Council.

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TRANSIT COOPERATIVE RESEARCH PROGRAM

are available from:

Transportation Research Board
Business Office
500 Fifth Street, NW
Washington, DC 20001

and can be ordered through the Internet at
<http://www.national-academies.org/trb/bookstore>

Printed in the United States of America

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FOREWORD

*By S. A. Parker
Staff Officer
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This report summarizes the findings of TCRP Project B-22A. It will be of interest to individuals who provide public transportation in rural and small urban areas; local, regional, state, and federal planners and funders of these services; and the administrators of these programs at state departments of transportation. The findings, presented in the form of case studies, provide a valuable resource to professionals who may implement new concepts to improve public transportation in the community.

In TCRP Project B-22A, the KFH Group was asked to provide case studies of how some transportation providers are addressing the opportunities and challenges of a rapidly changing rural environment. The findings summarized in this report build on research from two previous TCRP projects: B-22 and A-21.

Under TCRP Project B-22, “New Paradigms for Rural and Small Urban Transit Service Delivery,” the research team from the University of Arizona identified the societal trends challenging rural communities and transportation providers. The study reviewed the literature on five major categories of trends: demographic, economic, social, technological, and land use. Highlights from that research appear in the March-April 2003 *TR News* article “The Changing Demographics of Rural America: What Are the Implications for Transportation Providers?”

Under TCRP Project A-21, “Innovations to Improve the Productivity, Efficiency, and Quality of Public Transportation in Rural and Small Urban Areas,” the research team of KFH Group, Inc., in association with A-M-M-A, prepared a guidebook. *TCRP Report 70: Guidebook for Change and Innovation at Rural and Small Urban Transit Systems* is divided into two parts: Part I addresses the culture for change and innovation, and Part II presents more than 40 initiatives and innovations implemented by a variety of organizations, including private nonprofit and public transit systems, regional planning agencies, state transit associations, and state departments of transportation.

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INTRODUCTION

There is a natural aversion to change among most organizations and this is no less so among transit systems. For example, *TCRP Report 53* states that “Little has changed fundamentally in how transit services have been designed and provided in the last half of the 20th century” and that “The world in which transportation needs arise and are accommodated has changed dramatically.” These two statements describe transit organizations as standing still while the world around them changes. While rural transit has only been in operation for the past 20 years, it too is at risk of becoming outdated.

Rural areas have been transformed in many ways. The evidence of a changing rural world includes a number of demographic, land use, economic, communications, and attitudinal changes. For example, almost 100% population growth on the urban fringes of areas such as Northern Virginia and Austin, Texas, have transformed these areas from rural places into large suburban sprawl communities with major employment bases. Yet during the 10 years of this phenomenal growth, federal transit funding for these areas did not change—the areas were still considered rural.

The societal changes have been rapid and dramatic, requiring the transit systems serving these areas to adapt to the new paradigms. How do the rural systems that serve these communities adapt to meet the new paradigms? That is the primary question that was examined in these case studies.

Study Purpose

The purpose of this research is to identify and examine four systems that have adapted to the new rural paradigms. This research examines how and why these sys-

tems adapted to the new paradigms. Each case study will be examined with the intent of serving as a guide for other systems to adapt to the 21st century and its new paradigms. It is hoped that these case studies will inspire managers who read this document and then spur them to action.

The New Paradigms— A New Way of Thinking

The new paradigms constitute a different way of thinking about the business of rural transit. “These paradigms suggest that what rural operators really need to change is how they view themselves and the strategies they employ to provide services” (CUTR, 2003). The underlying theme is that adapting to the new paradigms requires thinking differently about how they operate service. Each of the systems reviewed in the case studies thinks differently, as is demonstrated by the systems’ unusual approach to the provision of service and their successful adaptation to change. The systems changed not because they wanted to, but rather because they had to change in order to maintain their relevance in the community. Each changed in reaction to new paradigms in the service area (often demographics), in technology, and/or in funding.

New ways of providing transit are necessary as new commuter patterns develop in response to (1) businesses moving to the urban fringe and (2) growth consequentially pushing even farther into rural areas. In the initial TCRP Project B-22 work, several new paradigms were identified for rural transit. These paradigms were based, in part, on paradigms developed for urban areas and reflect attributes of innovation at rural and small urban areas. They include themes reflecting the community context as well as attributes of innovative transit organizations. They were modified slightly

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for the case studies. The new paradigms reflecting the changes faced by rural transit systems are as follows:

1. Serving as Community Agents of Change

As we will see in the case studies, profound changes to these communities, often demographically influenced, drove these transit systems to adapt to their new environments. *TCRP Report 70* notes that the key to serving as community agents of change is to understand the changes in the community and to be able to change itself. *TCRP Report 70* also notes that an essential ingredient to change is active involvement in the communities being served. Representation and participation in community activities and organizations, looking for an opportunity to address a group, and being present and visible at community functions all help a transit system serve as a community agent of change.

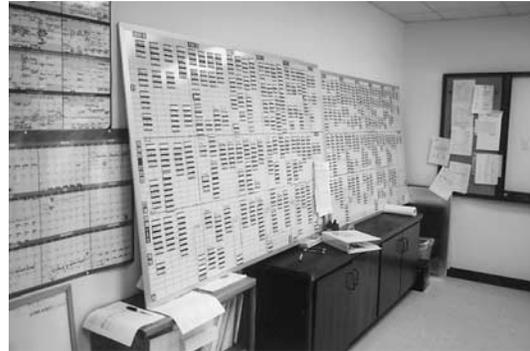
2. Optimizing Rural Resources

To provide transportation in rural and small urban areas with modest resources, it is essential that transit organizations squeeze the most out of every dollar. Stretching dollars, sharing costs, and contracting when feasible are all common activities. *TCRP Report 70* highlights a system that takes this paradigm much further than most, using some very innovative approaches to getting more vehicles into the community, thus ensuring that residents in need get service—not always directly from the transit system.

3. Adopting Technology

Research has indicated that there have been few successes in adapting intelligent transportation systems (ITS) for rural areas due to high cost, relatively low benefits, and complexity. Adopting ITS requires signifi-

cant expertise. This research will look at how one system, Capital Area Rural Transportation System (CARTS), has successfully adopted multiple technologies to benefit both the system and its riders.



4. Acting as Entrepreneurs

The entrepreneurial spirit is alive and well among some rural and small urban transit systems. These systems operate as businesses even when they are a part of a government. A number of rural operators have become much more businesslike. Instead of expecting government support, these entities seek to sell a variety of services to the private sector (as well as the public sector), in order to bring in additional funding, thus reducing dependency on a governmental source of funds.

5. Providing Effective Service

Called “state-of-the-art service” in TCRP Project B-22, this paradigm was renamed to get to the heart of the matter. Efficiency has been described as doing things right, while effectiveness constitutes doing the right things. Effective service can be service that attracts a healthy ridership, brings in significant revenue, or is seen as enhancing the quality of life. In many communities, the services of these transit systems are sought after and supported by the business community. These are all examples of effective service. Transit systems that pro-

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vide effective service gain respect in their communities.

6. Maintaining Multiple Functions and Fiscal Diversity

This element was not on the TCRP Project B-22 list, but our research indicates that service and fiscal diversity are critical to the ability to change and move forward. Merely running buses up and down streets is no longer sufficient for generating funds—in fact, in many cases (empty buses), it can destroy the credibility of a system. Transit systems must do more and tailor service to address specific needs. Transit systems may sell advertising to businesses, maintain other organizations' vehicles, or even operate street-sweeping services. The systems that adapt do not depend on one source of funding and/or one type of service. They consider the government as just one source of funding.

Adapting to New Paradigms

The new paradigms reflect the direction that a rural transit system should go in order to accommodate the changing rural world. Change is difficult for many organizations. Adapting to a changing world, however, is a constant. Like any other organization, if a transit system does not change to adapt to the changing world, as described by the new paradigms, then the system is in danger of becoming outdated.

THE CASE STUDIES

The study team selected three case studies for review. In addition, the study team conducted a technology review of a fourth case study. In each case, the principal investigator conducted a detailed site visit to verify the data provided and to make first-hand observations. The case studies were selected based on the following:

- **Geographic diversity**—including systems in Vermont, Texas, and Washington state.
- **Rural and small urban**—so that one system is an isolated rural system; another is rural, but has some advantages of small urban service areas; and the third includes rural isolated areas and two small urban systems.
- **Types of services**—including paratransit, fixed-route, long-distance medical, sponsored service, and other unique approaches.
- **Innovative skills**—so that each of these systems adapts to new paradigms.

The systems that were reviewed included the following:

1. Advance Transit (AT)—Based in Vermont, this independent nonprofit agency provides most of its service in the Lebanon/Hanover area of New Hampshire. AT recently transformed itself by promoting the system as the solution to parking and traffic problems at Dartmouth College, in the town of Hanover, and at the Dartmouth-Hitchcock Medical Center (DHMC). Because of the provision of service at the college and medical center, much of the funding is supported by the private sector. AT is very careful about its selection of services—the proposed services must make business sense. AT also works closely with two states.

2. COAST—This small system in eastern Washington and western Idaho has taken a unique approach to the provision of transit. Realizing that the traditional transit resources were too thin to adequately meet needs (similar to most rural transit systems), management came up with new

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ways to share available resources to provide more service in two states. COAST has a decidedly different mission than AT in that it never says “no” to requests for service.

3. Hill Country Transit District (HCTD)—Based out of rural central Texas, this transit system metamorphosed from serving primarily remote senior centers to an 80-bus system providing true public transportation to nine rural counties and two separate small urban areas. The urbanized areas saw explosive growth, while the rest of the service area remained very rural. HCTD transformed itself as the demographics transformed part of its service area. The focus of this case study was on how HCTD identified this area of growth and how development and implementation was accomplished.

4. Capital Area Rural Transportation System (CARTS)—In addition to the three systems reviewed in detail, we will focus on how CARTS addresses the Adopting Technology paradigm, because CARTS has embraced this paradigm as few other rural transit systems have.

The following sections discuss each case study in detail. They provide a brief overview of the system, discuss how the system has embraced the new paradigms, and review how the necessary changes came about. The case studies also examine how each system meets the key elements of innovation. For each case study, the following aspects are reviewed:

- How is the system different?
- What is the progression from the previous role?
- Why did the system change?
- How does the system adapt to new paradigms?
- How did change happen?
- What is the result?
- What is in store for the future?

CASE STUDIES

ADVANCE TRANSIT WHITE RIVER JUNCTION, VERMONT



ABOUT AT

AT is a nonprofit rural transit system serving communities in New Hampshire and Vermont. The system operates six regular fixed routes and four shuttle services, as well as ridesharing services for the Upper Connecticut River Valley. All routes are operated on weekdays only, and the general span of service is from about 6:30 a.m. to 7:00 p.m. The core routes form a triangle with transfer points in Hanover, Lebanon, and West Lebanon, New Hampshire (also serving White River Junction). Of the shuttle services offered, two are in Hanover and two are at the Dartmouth-Hitchcock Medical Center (DHMC) on 5-10 minute headways. The shuttle services are highly patronized.

AT's board consists of 14 members representing towns and



planning commissions as well as major employers. Many of the board members have been with the system from the start and have significant levels of expertise that benefit the system. They have a lot of pride in the system, and there is a high level of trust between the board and management.

AT has been in existence since 1984, first primarily as a human service transportation program, and now as a fixed-route public system. AT has experienced tremendous growth over the past 4 years as the shuttle service has increased. In 2002, there were more than 500,000

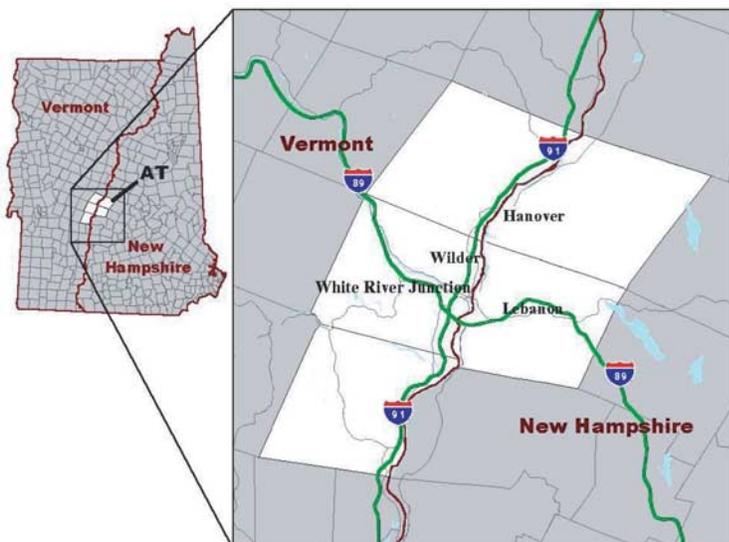
one-way trips (a 75% increase in ridership in 4 years).

The system is funded by a combination of federal grants (from Vermont and New Hampshire), Vermont state funding, and significant contributions from local municipalities (tied to service levels), the college, and DHMC.

How Is AT Different?

AT is very focused on its mission, while taking a conservative business approach to building transit. The focus is on funding for fixed-route services. AT prefers to operate what it knows how to operate and therefore focuses on fixed routes. For example, AT is seen as an excellent way to mitigate traffic and parking problems. The town of Hanover chose to fund additional shuttle service rather than build a parking garage downtown. AT is now expanding a route, timed to reduce congestion due to a road construction project. AT is seen as a serious option to reduce traffic, and it has been successful in those efforts.

AT does not operate any paratransit, preferring to leave that service to other agencies. Since



AT is a nonprofit corporation, it is exempt from operating Americans with Disabilities Act (ADA) paratransit to complement its fixed-route services. Management states that a number of agencies provide paratransit service to meet the needs of the community. All of AT's vehicles are accessible for persons with disabilities.

AT is very careful about seeking out the types of opportunities that will match its mission. First and foremost, management believes that any service that AT takes on should pay for itself. This guiding principle ensures that AT remains financially viable.

The Progression from the Previous Role

AT started out in 1984 as a nonprofit transit service for human service agencies. The service was minimal, and the focus was virtually all on human service needs. In 1987, the system, short on funds, hired the current executive director, who slowly made changes to all aspects of the organization. The first change was to become involved in the business community and to gain acceptance among community leaders. He began developing a relationship with the Chamber of Commerce, local transit management associations, each of the seven towns, and Vermont's Transportation Advisory Committee (TAC). The executive director is currently the chair of the TAC, as well.

The first niche that AT identified was the need for shuttle service throughout the college and in the adjacent downtown Hanover. As DHMC was moving to the out-

skirts of town, AT entered into negotiations with the medical center to provide a shuttle service. Shortly after that, AT entered into discussions with the town of Hanover and the college. The issue was traffic congestion that AT could mitigate. Shuttle service has become a big success, and most of the funding comes from the college, DHMC, and the town of Hanover. The entire system is now fare free (also supported by the college, DHMC, and Hanover), which has also stimulated ridership. DHMC requires all of its employees to park at a remote site and take an AT shuttle that operates on 5-minute headways during peak hours.

The results of these efforts have brought in considerable cash for the system, which increases the flexibility of the system to leverage federal operating and capital dollars, often a problem for rural transit systems. The cash does not have restrictions on how it can be used, adding to the flexibility of these contributions.

The next step was to identify capital funding so the system could keep up with its facility and vehicle needs. Management

worked a number of years to secure funding for a facility, and in 1995 the facility was built in Vermont, giving AT the space it needed to keep up with the increasing demand for service. Demand is continuing, and 8 years later, AT finds it necessary to seek funds for expanding the facility as the system expands (8 new 35-foot, heavy-duty transit coaches are currently on order for expansion).

Why Has AT Changed?

In 1987, AT started on its current path from "hand to mouth" low-ridership paratransit service to fixed-route public transportation with much higher ridership. The current executive director initiated this change when he started with the system in 1987. The system coupled the need to change in order to be effective and make a difference in the community with other opportunities that began to present themselves. AT began to address some of the significant public transit needs in

- The Hanover/Lebanon area, a community with a sizeable population, a downtown, and a shopping district;



- The college/downtown area that is often congested and in need of shuttle service; and
- A large regional medical center that was near the downtown area, but has since moved about 3 miles away.

These needs had not been addressed previously and were identified as opportunities for the system. Over a period of years, management worked with the community to become part of the solution to traffic congestion and parking problems. This ultimately led to implementation and expansion over the next 10 years. The community's needs and the AT solution were a perfect match. Change was a natural outgrowth of the needs and the opportunities.

ADAPTING TO NEW PARADIGMS

AT has embraced a number of the new paradigms in its quest to maintain its relevance and effectiveness. Their successes in generating nongovernmental funding, expanding service, and making a difference in the community is in large part due to sound business practice and using the new paradigms. The new paradigms include the following.

Serving as Community Agents of Change

AT is very active in the community, which is essential to becoming an agent of change. Over the years, AT has worked hard to ensure success and to become a part of the solution. Once that occurred, AT became a true agent of change, working closely with business, political, and community leaders. AT's

credibility is such that the community leaders turn to AT for solutions to congestion and parking problems. This respect and excellent working relationship allows AT to propose and implement new solutions to commuter, congestion, and parking issues in the Upper Connecticut River Valley area.

Providing Effective Service

AT has found a valuable niche in providing a high-visibility shuttle service that enjoys very high ridership. The service provided by the blue and white buses is well recognized by political, community, and business leaders. The vehicles look good, and the operators are professional. Persons of every income level use the service.

The high-quality and very effective services provided by AT bring AT the respect and trust necessary to be able to change as needed. *TCRP Report 70* indicates that respect and trust are essential elements in being able to make change happen.

Acting as Entrepreneurs

While AT is always looking for new opportunities, AT management takes a very cautious businesslike approach to providing service. It will not take on service unless it is fully compensated and the funding is guaranteed. Management carefully analyzes opportunities and funding to ensure that the plan is viable. AT does not grow for growth's sake; rather, it takes a measured and patient approach to growth.

Maintaining Multiple Functions and Fiscal Diversity

AT has a wide variety of services and funding sources in which to maintain a viable system. Services include rural public transit in two states, as well as a series of shuttles funded by Dartmouth College, DHMC, and the town of Hanover. In addition, AT uses job access funding for some of its commuter service. All services focus on commuters and mitigating congestion and parking problems.

AT receives federal rural transit funding from two states, local governmental funding, Congestion Mitigation Air Quality (CMAQ) and Job Access funding, and funding from a medical center and a college. In addition, AT applies directly to the U.S. Department of Agriculture (USDA) loan program for low-interest loans to assist with the local match requirement for capital equipment. The diversity of funding and loans helps to keep AT financially stable even if funding is reduced in some programs.

The USDA loan program has helped finance the local share of capital projects. AT currently goes directly to the USDA for low-interest loans. These loans allow the system to leverage money and spread the payments out over time, rather than attempt to come up with cash all at one time—"smoothing out the bumps"—as explained by the executive director. This has dramatically improved the capital planning process and allows AT to purchase new heavy-duty transit coaches for

the first time. These transit-quality buses are ultimately less expensive to operate.

AT has been moving to a fare-free concept for a number of years. At first, the Hanover portion of the fare-free zone was underwritten by the town of Hanover, Dartmouth College, Dartmouth Medical School, and DHMC, while the Lebanon portion was underwritten by the city of Lebanon and DHMC. Then, using a CMAQ grant from the Vermont Agency of Transportation, all trips that started in Vermont were free and Vermont to New Hampshire riders could obtain a token from the driver for a free return ride. This fare-free service also boosted ridership. AT's service is now totally fare free.

How Did Change Happen?

AT is well adapted to change. The board, management, and staff all expect change on a regular basis. Management moves cautiously, but inevitably toward change in order to meet the demands of the community. AT is looked at to see how it adapts to change according to the following elements of change identified in *TCRP Report 70*:

- **Quality Service**—AT's buses look good, are clean, and are very often filled with riders. Quality breeds respect, and AT has both, making change that much easier.
- **Focus on the Mission**—AT stays focused on its mission of fixed-route public transportation. It provides only this type of service, focusing on commuter-oriented service, relieving

congestion, and mitigating parking problems.

- **Dynamic Leadership**—The executive director of this nonprofit agency plays a leadership role in the Upper Connecticut River Valley and works closely with other community leaders. He has excellent presentation skills and is always seeking new opportunities.
- **Organizational Support**—The board is very supportive and works well with management. Their expertise is relied on; however, they are careful not to micromanage.
- **Community Involvement and Communication**—As described in detail, AT management and board are very involved in the community in many ways, including sponsoring the Zamboni at college hockey games.
- **Staff Development and Motivation**—Many of the staff have long tenure with the organization. It is clear from talking to staff that there is a lot of pride in the organization.

- **Building Resources**—AT specializes in building resources and generating local cash from a variety of sources.
- **Seizing the Opportunity and Serendipity**—AT always looks for opportunities to address commuter needs, as well as mitigate traffic and parking problems.

What Is the Result?

The result of AT's efforts is a financially viable transit system that makes a significant impact on the quality of life in the Upper Connecticut River Valley. AT partners with towns, a college, a medical center, and other such entities to provide a variety of well-patronized fixed routes and shuttle services. While AT only addresses needs associated with fixed-route types of service, it is very effective in what it does. The system meets many of the needs of the community and continues to look for opportunities for expansion. However, it will continue to accept only those projects that pay for themselves.

AT has the full respect and trust of the board, staff, and manage-



ment, as well as the political, business, and civic leaders of the community. AT makes a difference to many people in its service area.

Future Efforts

Future efforts include a measured approach toward growth in fixed-route service, possibly serving parts of Vermont for commuters and medical appointments at the medical center. AT is receiving new 35-foot, heavy-duty transit coaches to implement in some of its highly patronized shuttles. AT allows for expansion of that service. Management is also pursuing funding for a facility expansion.

AT is planning an expansion of its shopping plaza route using CMAQ funds; headways will be cut from 1 hour to 30 minutes. This expansion is timed to address construction on that route, attempting to help mitigate traffic congestion. AT already has an excellent track record in traffic mitigation.

AT plans to stay involved in the community and to work with the leadership to continue improving the lives of the residents of the service area. The focus will remain on the new paradigms.

CONTACT INFORMATION

*Advance Transit
P.O. Box 1027
Wilder, VT 05088*

*Van Chesnut,
Executive Director
(802) 295-1824
Email: vchesnut@sover.net*

ABOUT COAST

COAST is a part of the Council on Aging and Human Services (CoA&HS) based in Colfax, Washington, about 60 miles south of Spokane. CoA&HS was formed in 1976 as a not-for-profit corporation, to provide services to persons over age 60. It has expanded its goals twice since its inception to serve other groups of people with needs. CoA&HS provides a wide range of services, including nutrition programs, information and referral services, commodity food distribution, home care, advocacy, and transportation.

CoA&HS’s transportation program, known as COAST, serves four counties in Washington state, including CoA&HS’s home county of Whitman, and five counties of Idaho. The very large service area includes four small cities—Lewiston, Clark-

ston, Pullman, and Moscow—each the location of a grant university. COAST receives a variety of funding, including Federal Transit Administration (FTA) funds (Sections 5310 and 5311 and JARC) distributed through the two states. Other major funding sources include Medicaid and the Older Americans Act. Local funding is also available to COAST.

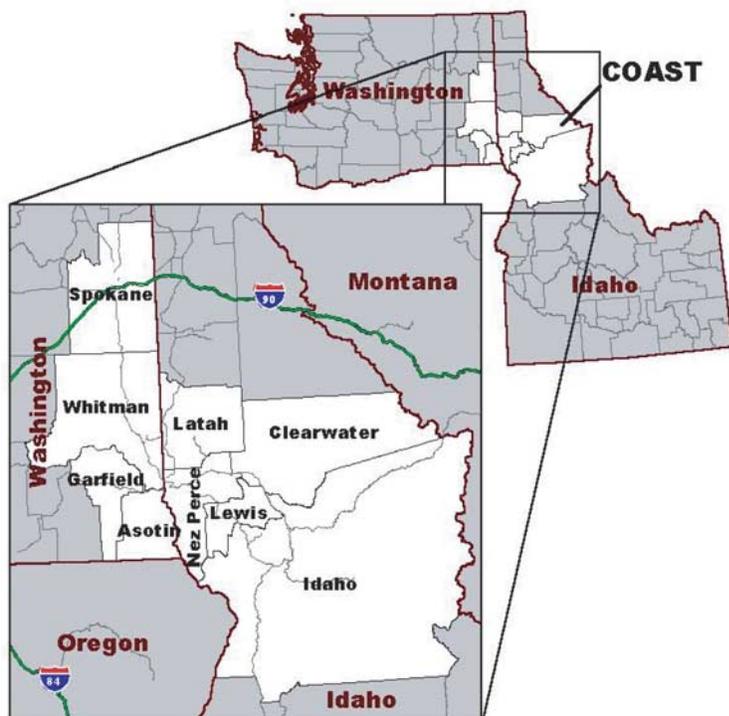
COAST provides transit services for the general public and human service agencies in its two-state service area. In fact, one of the innovative features of COAST is the variety of transit services it provides, only some of which are directly operated with the agency’s own 14-vehicle fleet. Some of the service is provided by other local agencies using COAST vehicles, and some is provided through contracts with private and public providers. COAST

stresses the importance of the paradigm—*building community resources*—with a philosophy that it does not matter which agency operates the service, as long as there is a safe effective service for persons in need. Consequently, COAST is involved in a number of non-traditional, innovative efforts.

Within COAST’s 9-county service area, 24 communities are served at least 1 day each month, with service into 1 of the 4 small cities and to Spokane on a regular schedule. Advance reservations are usually required. In addition, 5-day-per-week, demand-response service is available in one of the small cities—Moscow—where COAST also operates a general public service. COAST sponsors an extensive volunteer transportation program and serves as a broker for a variety of services, including Medicaid trips. Through its directly operated, contracted, and volunteer service, COAST provided 90,000 one-way trips in 2002, covering 1,000,000 miles.

Core Values and Mission

One of the factors that drive innovation at COAST is the parent agency’s deeply held core values and goals that have been accepted by the board, management, staff, and constituents. COAST, as part of CoA&HS, has a strong mission statement and goals that guide the system. The agency motto is “Enhancing Lives and Strengthening Communities.” Most of the work done by COAST is geared to building community resources rather than simply



providing transit directly. In many cases, innovation centers on COAST, which is finding new ways to build these community resources.

CoA&HS's motto is included on most of its literature, in reports, and in the office for all staff and visitors to see. In addition to the parent agency's mission statement and goals, there are goals for COAST as well. Staff is well aware of these goals and values, which guide them as well as management and the board. The agency's core values and mission are clearly understood by all in the organization. The goals and objectives are reviewed annually by the board and used as a basis for the board's evaluation of the executive director.

How Is COAST Different?

Out of necessity, COAST has a very unconventional approach toward transportation. The agency's executive director believes that *mobility is the foundation for participation in a free society*. He states that

For COAST, it is not a question of whether or not we will choose to provide service. The question is whether or not we have the will to find a way to provide the service. Working at COAST is not about saying no. Instead, it is about finding a way after we have already said yes.

This philosophy means that COAST undertakes a number of different, often innovative services. Some of these have been difficult to implement, and other transit agencies would likely balk at doing some of the services. But COAST believes that



mobility is too important, and this philosophy pervades much of what COAST does.

COAST is a most unusual rural transit system, eschewing the standard operating mode of providing service directly. In some cases, it operates service directly. In some cases, it contracts with other entities, such as the postal bus. In a particularly innovative arrangement that is a major part of the paradigm—building resources—COAST has agreements with human service agencies where it turns over its used vehicles to these entities, places these vehicles on COAST's insurance pool, and trains the drivers. These agencies in turn support and provide local funds for COAST's Section 5310 applications for new vehicles. Management has designed these unique arrangements to stretch resources.

COAST is part of a multi-function agency and is very closely in tune with community needs because of the activities of its other departments. COAST has a decidedly altruistic mission statement, where service is first and worrying about paying for it is second. This model has worked successfully for many years in this unique environment.

The Progression from the Previous Role

Like many of the older rural systems, COAST was formed to primarily serve seniors and persons with disabilities in support of the agency's other programs. Over the years, COAST saw the wisdom of expanding and coordinating its services and then entering the general public field. Most of its change has been evolutionary. The area has experienced slow growth, so

there is little need to make major changes based on demographics. Management and staff continue to make changes to meet the needs of the residents of the service area.

New opportunities exist with COAST's community van program, which has just recently begun. In this program, a sponsor (a town, the 4H club, a rural hospital district, or a Chamber of Commerce, for example) will be given a van to operate for its use. The sponsor supplies the volunteer drivers who must be fully screened and trained by COAST. A local operating committee is formed to determine how the vehicle is used, and the riders pay for operating expenses. Typical uses are for sports outings, senior shopping, medical transportation (the vehicles can also be used for COAST's Medicaid program), 4H club outings, and a variety of other programs. COAST monitors the vehicle's use and may assign it to another organization when the vehicle is not being otherwise used.

Why Has COAST Changed?

For COAST, change is routine and has been for many years. Certainly, COAST adapts as the needs change, but it also changes to provide better service as new ideas are recognized and implemented. COAST recognizes its very limited resources and the energy necessary to seek funding from and adhere to the regulations of two states. It is constantly changing as opportunities arise.

ADAPTING TO NEW PARADIGMS

With its unique approach toward the provision of transit service, COAST has adapted well to many of the paradigms and has pursued opportunities that the paradigms present. The focus for COAST is on the following.

Serving as Community Agents of Change

The board, management, and staff are all active in the community. The board encourages such involvement by COAST management and staff. The executive director is involved with various community activities, believing that one of the best ways to gauge the needs of the community is to be involved in it. All of the senior management staff serve in elected positions on local, regional, and state boards and commissions. This gives the system a sense of the issues the community is addressing. Since this agency is multi-purpose, it is looking for needs and opportunities in a number of areas, not just transportation.

The organization is proactive in the community. The board is especially active and guides change in many instances. The organization is recognized and respected by community leaders, and the board and the executive director are considered community leaders.

Optimizing Rural Resources

Building resources in the community is one of COAST's guiding principles. COAST has

some very innovative approaches to building local resources. Most unique is that COAST provides service directly with only 14 vehicles, but is responsible in some manner for the operation of another 26 in its service area (for a total of 40 vehicles). This is an illustration of its philosophy of building transportation resources in the community. This resource-building effort began with COAST's involvement with the Washington state Medicaid brokerage program, with requirements that a broker find and/or develop resources that can provide transportation as part of the brokerage. COAST has been operating a Medicaid brokerage in its Washington state service area for 17 years.

COAST is able to increase its vehicle fleet through innovative approaches to building resources. COAST provides well-maintained used vehicles to smaller agencies in its region, with the agencies providing the 20% match to COAST to obtain new vehicles through the federal Section 5310 program. COAST also builds resources through its *insurance pool* and driver training program for the smaller agencies in the region (see *TCRP Report 70*).

COAST management also worked closely with one for-profit company for over 5 years, through the development of an innovative postal bus service, where the private provider carried passengers in addition to the packages and mail that were transported under contract to the U.S. Postal Service on a rural intercity route. COAST saw an opportunity to use the private provider's vehicles to

also provide passenger transportation and realized this would be a more cost-effective strategy than trying to provide the service itself. COAST also made its driver training available to this private provider.

Maintaining Multiple Functions and Fiscal Diversity

COAST maintains a wide variety of functions: procuring and dispensing vehicles, contracting for service, operating service directly, training drivers, providing insurance for other agencies, and providing a wide range of transportation services in two states. COAST management believes that this diversity of activities ensures that more needs are met.

COAST, by its nature, has diversified funding in that it serves two states and receives federal Section 5311 and 5310 funding from those two states as well as state funding from Washington. COAST also takes advantage of human service funding, receiving Title III Older Americans Act funds. Local human service agencies assist by supplying

matching funds for new vehicles. Again, this diversity ensures that the system can survive in difficult economic times because it will not have to rely solely on one or two funding sources.

How Did Change Happen?

As with the other case studies, COAST has adapted to change. From the board, to management, to staff, change is expected and anticipated. This system was highlighted in *TCRP Report 70*, and further details can be found there. A summary of the elements of innovation demonstrates how change is able to happen:

- **Quality Service**—Because of the type of services provided, customers may not even know that the service is provided or supported by COAST. Therefore, the quality may not always be evident. However, with COAST’s emphasis on safety and training, quality is ingrained in the system.

- **Focus on the Mission**—COAST’s board, management, and staff have a very strong identification with COAST’s mission. The executive director uses the mission statement to guide all of COAST’s actions. The agency’s mission is embedded in the agency’s culture.
- **Dynamic Leadership**—The current executive director is a dynamic, risk-taking manager with a focus on the agency’s mission and core values. He believes that *innovation and change are 90% persistence* and dismisses the standard barriers to change and innovation. COAST’s executive director has been with the organization for 18 years and is very active in the communities served.
- **Organizational Support**—COAST’s board strongly supports the agency’s mission and trusts the executive director to carry out that mission. The director describes his board as having vision and tenacity. A number of the board members are community activists, and one is the chair of a United Nations commission on children. Many of the members serve on other local boards and committees, spreading COAST’s vision throughout the community.
- **Community Involvement and Communication**—As discussed previously, management considers this element essential to identifying needs and opportunities



for change. The board, management, and staff are all actively involved in the community.

- **Staff Development and Motivation**—COAST’s staff is experienced, with an average tenure of 18 years for senior staff, and dedicated to the agency and its mission. Management ensures numerous opportunities for training and attendance at state, regional, and national conferences.
- **Building Resources**—Building resources is also one of the hallmarks of this system. COAST has developed some very innovative approaches to building its resources and has managed to maintain a diversity of resources.
- **Seizing the Opportunity and Serendipity**—Sometimes opportunities just arise. The key is to identify them and then act on them. This is something that COAST is able to do through the trust and respect it has earned in the community.

What Is the Result?

The result of COAST’s innovations and addressing of new paradigms is a system whose importance is measured by more than its own ridership numbers. In fact, due to its unique approaches, ridership numbers tell only part of the story.

Future Efforts

COAST continues to adapt and change. The new community

van program is just another innovation designed to provide service in very isolated communities. Recently, the system has procured and implemented a modest paratransit software product to help in the reservations, scheduling, dispatch, and recordkeeping functions. The executive director and the board continue to work with the state agencies and the legislatures to influence regulations or legislation. Management places a strong emphasis on working at the state level to make it easier for transit to operate and be flexible to needs. COAST will continue to provide these grass-root types of services because that is the environment of Idaho and eastern Washington.

CONTACT INFORMATION

*Council on Aging and Human Services
P.O. Box 107
210 South Main
Colfax, WA 99111*

*Karl Johanson,
Executive Director
Tel: (509) 397-4611
Fax: (509)397-2917
Email: karlj2@adelphia.net*



ABOUT HCTD

HCTD has been providing transportation in 9 counties of central Texas for 28 years. During 21 of those years, it has been a coordinated public transit/human service transportation provider, coordinating public transit with Medicaid and senior (Title III) transportation. HCTD started as part of a community action agency—a nonprofit agency that provides a wide variety of human service to nine counties in the central Texas region. In 1998, HCTD separated itself from the community action agency. It is now an independent political subdivision of the state of Texas and a rural transit district. This allows HCTD to act as an interlocal governmental agency for transit purposes, giving the system additional advan-

tages in contracting with governmental agencies. HCTD’s board is composed of elected officials appointed by each county and the municipalities they represent.

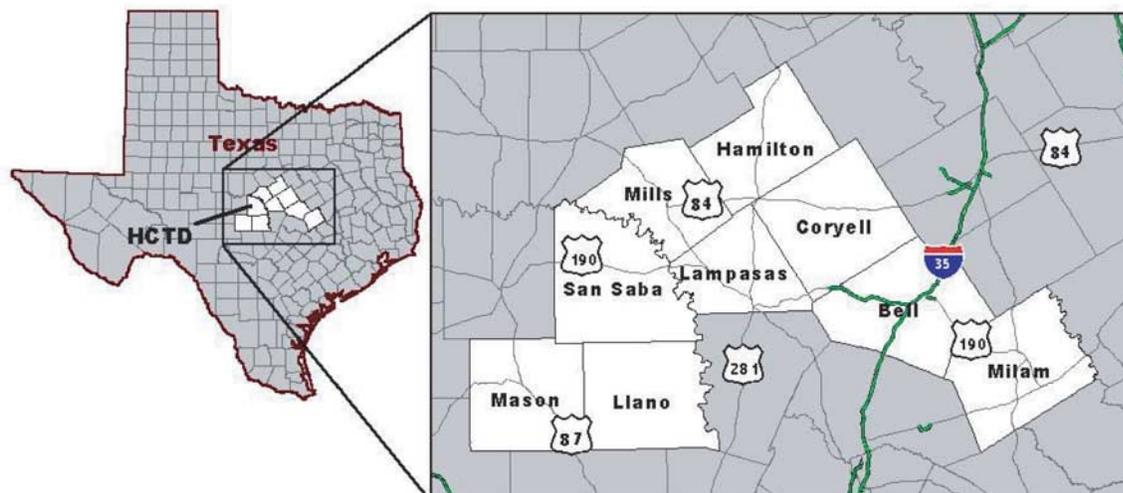
In 1998, HCTD entered into an interlocal agreement with the cities of Copperas Cove, Harker Heights, and Killeen to develop and operate an urban fixed-route system and ADA paratransit. Three years later, HCTD reached an agreement to operate fixed-route and ADA paratransit for the city of Temple. HCTD currently operates rural and human service transit in nine counties and two separate urban areas. Subsequent to the new services implemented by HCTD, the budget went from \$800,000 in 1998 to \$4 million in 2003, a 500% increase in 5 years. Ridership jumped from about 168,000 annual one-way trips in 1998 to more than 500,000 trips in 2003, a 300% jump in ridership.

HCTD’s mission statement is as follows:

HCTD, a political subdivision of the State of Texas, is a public transit system whose mission is to build, refine, and operate a safe, dependable and effective transportation network that provides mobility, improves the quality of life, and stimulates economic development through the provision of rural, urban fixed-route, and ADA complementary paratransit service for citizens and visitors of the Central Texas area.

The system’s goals are

- To provide professional, coordinated transportation services for the residents of the nine-county area;
- To improve access to needed services;
- To promote energy savings through ridership on public transportation;
- To positively impact the local economy through provision of jobs and revenues to local business; and



- To maximize transportation service per dollar spent.

How Is HCTD Different?

HCTD is different from many other rural systems because of its size (nine counties) and its combination of rural and two small urban transit systems of Temple and Killeen and its surrounding cities. HCTD has been identified as one of the more innovative systems in the state. Staff are used to change and doing things differently. For example, HCTD has had a dedicated safety and training manager for many years, when many larger systems did not even fully train their drivers. It conducts a regional bus rodeo every year that includes the participation of many neighboring systems. This rodeo has become a tradition in central Texas. HCTD has also successfully recruited management from a large urban transit system, which is very unusual for a rural transit system. The fact that HCTD even thought about operating a small urban system (let alone operate two) demonstrates that management and staff are not fearful of change and are willing and able to embrace the new paradigms.

The Progression from the Previous Role

As part of a community action agency, HCTD was initially formed prior to Section 5311 (Section 18 at the time) to meet the needs of the agency in transporting clients to senior centers and to meet medical needs through Older Americans Act Title III funding and Medicaid funding. The agency was reluctant at first to apply for rural

public transit funding when it became available; when the agency finally decided to delve into public transportation, it started slowly and cautiously, still attempting to emphasize its own needs.

The Texas legislature passed legislation in 1995 that designated the existing rural (Section 5311) transit operators as rural transit districts (RTDs). As part of this legislation, HCTD was able to act as an interlocal agency while continuing its nonprofit corporate status, provided that it became a separate corporate entity and not a part of a community action agency. This was the next step for HCTD. In 1998 the system, which had grown to 50 vehicles, separated the transit system from the community action agency while retaining some ties (limited administrative functions). In 1998, HCTD

ment to this change was to enable HCTD to become an interlocal government agency, allowing HCTD to enter into contractual relationships with municipalities and counties.

HCTD realized that Bell County (Temple and Killeen) was growing rapidly and was becoming two separate urbanized areas for transit purposes. Temple had already pursued public transit funding and contracted for paratransit service. However, Killeen had not pursued any FTA funding. In 1998, HCTD initiated discussions with the Texas Department of Transportation (TxDOT) and the cities of Killeen, Harker Heights, and Copperas Cove for the purpose of funding and operating public transportation in the Killeen urban area. It should be noted that Killeen is the home to Fort Hood, one of the largest military bases in the



went from a rural nonprofit agency to an RTD. HCTD had its foray into urban transit in 2000 and again in 2002. HCTD has come a long way from being a senior center transportation program to being one of the largest rural transit systems in the state, as well as operating in two urban areas with more than 80 vehicles. The key ele-

world. Through an agreement with the three cities, HCTD received the FTA and state funds for the system. With the assistance of a consultant, HCTD designed routes for the new system and the designated recipient for FTA funds. HCTD operates Killeen’s service as a “turnkey” system—that is, it conducts all the efforts needed



to plan, manage, and operate the service.

The service was an immediate success, with its teal and fuchsia vehicles and sharply dressed drivers. Ridership started at about 600 one-way, fixed-route trips daily (about 8 one-way trips per hour) and 100 trips on ADA paratransit in 2000 and grew to about 1,000 one-way, fixed-route trips and 100 paratransit trips daily in 2003. Along with this steady growth in fixed-route ridership, ADA paratransit ridership has remained stable, with growth in ridership among persons with disabilities on fixed route.

In 2000, shortly after the successful implementation of

Killeen's service, HCTD, with the assistance of a consultant, sent the city of Temple an unsolicited proposal to transform Temple's service into a fixed-route/ADA paratransit service similar to the very successful Killeen service. After discussion and negotiation, the city of Temple agreed to an arrangement similar to Killeen's, with HCTD as the designated recipient. Service was implemented in mid-2002. Total ridership is up almost 60% over the dial-a-ride service previously operated.

During this time, HCTD was able to recruit a top manager from a large urban system to serve as Director of Urban Operations at HCTD. This type of recruitment is almost unheard of in the rural transit industry, and HCTD has been fortunate to have this diversity in management as it was implementing the small urban services.

Why Has HCTD Changed?

There were a number of reasons cited for change. First and foremost was the change in the service area demographics. Rapidly changing demographics,

discussed in detail in an earlier section, are a powerful force that cannot be stopped. The needs of Bell County in particular had changed, and HCTD management decided that the only choice was to change the system as the demographics changed, rather than lose that service area and the opportunities. Guided by its mission statement, HCTD pursued new opportunities.

As can be seen above, HCTD has regularly reinvented itself, from human service to public transportation, and developed strong safety and training programs as it became a political subdivision. Each time HCTD has reinvented itself, it has implemented a fixed-route system. The board, management, and staff are accustomed to, and expectant of, change.

ADAPTING TO NEW PARADIGMS

As HCTD's service area changed, HCTD embraced new paradigms in order to grow the system with an eye toward the future. The board, management, and staff are all focused on change. Consequently, HCTD



has evolved as it has addressed the following paradigms.

Community Agents of Change

HCTD serves nine counties, many more small towns, and two urban areas. It is important for HCTD to be active in each of these communities. HCTD makes it a priority to understand the new trends and the needs in the communities. The former parent organization is aggressive in its pursuit of understanding its community's needs, and HCTD has maintained that tradition. HCTD uses its board, management, and staff to participate in their communities and understand the needs of those communities. The board is composed of active members of each community and includes county judges (the highest elected office in the county), county commissioners, and city council members. These individuals are more than capable of representing their communities and expressing community needs. In addition, management tours the system regularly, attends meetings in the communities, and meets with drivers and other staff. Management is also in tune with the community needs. The field staff that represents HCTD in each community further verifies this. HCTD believes that all staff must represent the company and not just drive or dispatch. All of these factors help HCTD understand community needs, formulate a plan, and address the needs in a proactive manner.

Providing Effective Service

Effective service is all about looking good and being good. Changing and adapting to new

paradigms are much easier when the service is seen as important to the community and is respected. Effective service means meeting the needs and doing the right things as an organization. HCTD has done a number of things recently that demonstrate its effectiveness in the communities served.

At one time, HCTD was a human service transportation program. Since that time, it has worked hard to lose its image as a human service program and has encouraged the general public to use its services. However, even as the system has opened up to the general public, it has never forgotten its roots and continues its efforts in human service transportation.

Critical to the perception of HCTD's constituents was the changing of the paint scheme, from white to a much more colorful, professional design. This increased positive visibility and helped in gaining respect—looking good is important to gaining the proper image and respect (*TCRP Report 70*). Drivers wear professional-looking uniforms as well.

Everything from brochures to caps is colorful and bright—this instills pride according to drivers interviewed as part of this case study. HCTD also has a very professional approach toward the areas of safety and training, continuing to enhance its reputation for quality and effective service. The management, staff, customers, and local leaders all believe in the service, allowing HCTD to continue to evolve.

Maintaining Multiple Functions and Fiscal Diversity

Survival is often the reason that rural transit systems do things as they do. For HCTD the choice was clear: either diversify and grow or continue to struggle to survive. HCTD has expanded its governmental funding base through its continued efforts in a number of human service transportation programs and considers this funding critical to its survival. A portion of these funds may be used as a local match, making the funds even more valuable. FTA funding includes Section 5311 rural funding, Section



5307 small urban funds for two separate systems, and state of Texas local matching funds. In addition, each community is asked to contribute its fair share.

This diversified funding allows HCTD flexibility in its decision making and an ability to focus on operations without the constant search for funding. In addition, the diversified funding allows administrative and fixed costs to be spread out over more service, reducing costs for all.

Concomitant to the diversification of funding was the diversification of services as the community changed. Isolated rural transit and human service transportation were expanded to include completely different small urban fixed-route and ADA service. This diversification protects the system from dramatic shifts in funding priorities and allows the system to reach out to more customers.

How Did Change Happen?

HCTD is a textbook example of an innovative transit system that is accustomed to change. It includes all of the elements of innovation and change detailed in *TCRP Report 70*. HCTD is at the point where the board, management, and staff all expect change as a normal course of action, making future changes that much easier. Following is a discussion of how HCTD has managed change:

- **Quality Service**—Long dedicated to safety and training, HCTD remade its service with a new bright paint scheme, logo, and driver uniforms. Through

the hard work of management, the system gained respect and credibility for its successes, such as in Killeen. Other towns and cities took notice and wanted systems similar to the one in Killeen. HCTD is now seen as an asset to its communities.

- **Focus on the Mission**—HCTD makes its staff proud of the agency’s mission statement and goals. The goals are stated in the quarterly newsletter as a constant reminder to staff and are posted at all transit sites in the service area.
- **Dynamic Leadership**—Ms. Warlick has been the manager of the system for 20 years. She has gained respect as a leader in the nine-county area and works closely with political, business, and civic leaders in each of HCTD’s communities. It helped that the former parent organization had been in existence since the 1960s and also had the respect of the community.
- **Organizational Support**—HCTD managers have proven themselves with the no-nonsense board. There is a high level of trust that works two ways. This allows management to look in new directions knowing the board will support it. Success breeds success.
- **Community Involvement and Communication**—As discussed earlier, HCTD is very involved in its communities through its board

representation, through the management’s engagement in the community, and through the staff who for the most part have roots in their communities.

- **Staff Development and Motivation**—HCTD has one of the finest independent rural transit training programs in the nation. The director of operations is a nationally known expert and has credentials in all aspects of safety and training. Management routinely attends conferences and training to ensure diversity of ideas. Management’s recent hiring of an operations manager from a large urban system is an example of this diversity.
- **Building Resources**—HCTD uses a variety of funding sources to accomplish its mission. With the addition of two separate small urban systems, HCTD has increased the diversity of funds, thereby helping secure the agency’s future.
- **Seizing the Opportunity and Serendipity**—HCTD had been monitoring the possibility of operating the Killeen system for a number of years. HCTD first contracted to operate the dial-a-ride service in Temple and then saw an opportunity to manage and operate a newly revamped system and was able to convince the city that HCTD had a vision for transit in the community.

What Is the Result?

HCTD is a dynamic transit system with a vision for the future. It has embraced change and regularly reinvents itself. The board, management, and staff all expect change regularly and continue to look at new ways of providing community-based transit service. HCTD's change from a rural, human service-oriented transit program to one of the nation's largest rural/small urban transit systems with three distinct service units is a model for other transit systems.

HCTD has adhered to a number of the new paradigms that have pushed the system to change. HCTD works closely with its communities to ensure that needs are met. The bottom line is that the system is growing and increasing ridership and contributing to mobility in central Texas.

Future Efforts

HCTD wants to focus on continual improvement of services. Its ability to expand public service will now depend on service quality, since the service area is surrounded by other transit systems and there are no more cities to be served. However, there may be some private-sector opportunities in Bell County.

HCTD is focusing on a new community-based model where the rural driver is also the dispatcher and represents HCTD in the community—an all-in-one position. When a passenger wants a ride, he/she calls the driver's cell phone and the driver immediately schedules and provides the service in real

time. In one community where this service has been activated, ridership increased over 100% in the past 4 years in large part due to the community-based approach and the ability of the driver to represent HCTD in his/her county. This new community-based approach will be attempted in other remote counties as the opportunity presents itself.

HCTD is also interested in delving into ITS solutions. It has taken a slow and cautious approach to implementing technologies because it has not yet seen any products that would be cost-effective for HCTD's unique services. However, management is actively looking at ITS opportunities.

**CONTACT
INFORMATION**

*Hill Country Transit District
2509 West Wallace
P.O. Box 217
San Saba, TX 76877*

*Carol Warlick,
General Manager
Tel: (915) 372-4677
Fax: (915) 372-6110
Email: hctd@hccaa.com*



ABOUT CARTS

This additional case study is intended to focus solely on the new paradigm of Adopting Technology. This extra case study was initiated to ensure that the new paradigm of technology was represented. The fact is, most rural transit systems use a minimum of the ITS technology that is used for fixed-route and large urban paratransit. CARTS is an exception to that rule. For ITS purposes, CARTS is considered to be one of the most highly advanced transit systems in the nation. This case study will describe CARTS's unique approach to this paradigm.

Service Area and Demographics

CARTS provides transportation services for a rapidly growing nine-county area surrounding Austin, Texas, home to 428,000 rural Texans. The area has enjoyed a population increase of 46.5% since the previous census in 1990.

The rapid growth has been problematic for CARTS. While funding has remained largely static, parts of the service area have doubled in population, making it very difficult to adequately meet the needs of these faster-growing parts of the service area. The other difficulty encountered from the change in demographics is the population shift to the exurban areas and the employment shift to the suburbs. Technology is one set of tools that CARTS has used to keep up with the changes in its service area.

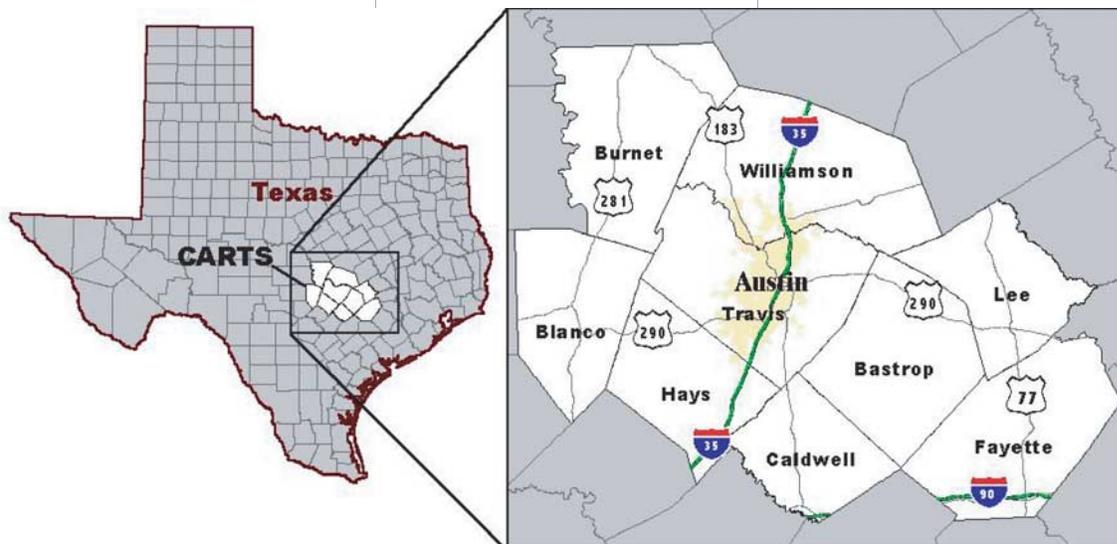
CARTS (a political subdivision) provides for a variety of ground transportation services, including fixed-route, fixed-schedule, commuter, and paratransit services for all groups of people, including the general public, the elderly, and persons with disabilities. In addition to its role as a public transit provider, CARTS also coordinates services through contracts with a variety of human service agencies to provide client transportation services and with the TxDOT Austin District office, which coordinates Section 5310

funding and procurement.

In Fiscal Year 2002, the CARTS RTD operated 176,496 demand-response trips over 856,562 miles and 73,277 hours. The fixed routes provided another 89,497 trips over 286,881 miles and 17,212 hours. To provide this service, CARTS operated 88 vehicles in Fiscal Year 2002. CARTS is funded through federal Sections 5311 and 5310, Title III Aging, Title XIX Medicaid, and other human service funds; state transit funds; local government funds; and farebox revenue.

The Progression from the Previous Role

Over the past 10 years, CARTS has taken advantage of Advanced Public Transportation Systems (APTS) technology and is recognized as one of the nation's leaders in implementing rural transit technology. CARTS has been cited in two national studies for its rural APTS successes. CARTS has been successful due in part to its phased-in approach toward technology deployments. Its



philosophy has been to implement one ITS change at a time, and once it is operating successfully, begin the next phase.

Slow and incremental is the approach that was used in this most successful implementation of APTS technologies in rural transit. The first step in the process was to procure automated scheduling demand-response software (DRT)—the heart of any paratransit automation project. It took more than a year to gain proficiency in this software. CARTS first implemented the DRT in 1994, being one of the first successful rural installations in the nation. CARTS staff now has almost 10 years of experience in operating the software. The second step in the ITS process was to implement a fully digital radio system covering all nine of the counties in the district. CARTS completed this step in 1997. CARTS purchases state-of-the-art communications services from the Lower Colorado River Authority (LCRA), a conservation and reclamation district created by the Texas legislature that supplies power throughout the entire CARTS service area. When the LCRA built its communication system, it was looking for other governmental entities to participate in the system. CARTS was the very first, due to the diligence of management who were monitoring its progress a year before it was implemented. The LCRA now has many emergency service providers throughout the region using this radio system.

The LCRA has provided technical and engineering support to CARTS in all aspects of its voice and data communication system. In 2003, CARTS, hav-

ing all of the technologies in place, implemented mobile data terminals (MDTs) and automatic vehicle locators (AVLs), again being one of the very first successful implementations in rural areas.

Why Has CARTS Changed?

For purposes of this study, the focus will be on technology applications and its corresponding paradigm. CARTS had a goal more than 10 years ago to be a leader in the use of technology, reasoning that new technologies can help improve service for customers in a number of ways. CARTS management cited a number of goals back in 1993 for its technology improvements:

- **Uniformity of service**—The software technology would ensure that all trips are booked in a similar manner.
- **Greater passenger productivity**—Technology would help improve productivity.
- **Greater staff productivity**—Fewer staff would be needed to conduct the reservation, scheduling, and dispatch process.
- **Improved customer service**—The reservation process would be streamlined.
- **System safety**—Communications equipment would enhance emergency capabilities.

- **Uniform recordkeeping**—Technology would generate accurate and timely reports.

ADAPTING TO A NEW PARADIGM

CARTS management has long believed that technology can be a part of the long-term solution. CARTS has thus embraced the following paradigm.

Adopting Technology

CARTS, like most rural transit systems, has far less information technology (IT) support staff than a typical larger urban system has. This has been one of the primary reasons why rural transit systems have had far less success in adopting technology than their urban counterparts have had. A second hurdle that most rural systems face is funding and cost-benefit analysis. CARTS had to overcome these two hurdles prior to success. CARTS management had been interested in using technology to help support the system for many years. The solution to these hurdles was for CARTS to take the cautious approach, implementing one technology at a time, perfecting it, then considering other technologies (unlike many rural systems that attempted to do too much at one time). CARTS management felt that this was the best way to adapt to the new technologies. CARTS slowly gained experience with the DRT software and ultimately devoted part of one staff person’s time to IT support. In addition, through an agreement with the LCRA, CARTS communications engineers supplied considerable free technical as-

sistance (CARTS was the first customer on the LCRA communications network—that was important). CARTS also used the services of a consultant to assist in the development of the request for proposals and the procurement process.

What Is the Result?

To date, results of implementing the technology have given CARTS a number of benefits for the system and its customers. First, CARTS now has improved reporting and recordkeeping in real time for the system. The DRT software has improved the reservation process, most importantly by turning reservations and scheduling into a uniform procedure that treats all customers equally. The DRT software also allows CARTS to easily expand its paratransit operations. The software supports the reservations, scheduling, and dispatch process, thereby both speeding the process up and allowing each staff person to be more productive.

The communications technology has dramatically improved communications and is able to support the entire digital network currently in place. The emergency functions tied into the system help everyone: drivers, dispatchers, customers, and management. The AVL adds a layer of safety and also supports the dispatcher, while the MDTs can reduce the expense of recordkeeping due to the one-time data entry function.

Future Efforts

The next step for CARTS is to employ the card read/write func-

tion of the MDTs for the reading of magnetic stripe cards and the immediate downloading of the information to the CARTS central data network.

Subsequent goals for the card readers include the following:

- Create operational efficiencies for CARTS in the areas of data collection and reporting and fare collection and billing, allowing data collection and billing resources to be diverted to the provision of actual service. Ultimately, this will include debit functions and electronic benefit transfers from human service agencies.
- Assist TxDOT and its rural operators (through enhanced recordkeeping and reporting) in the coordination of human service transportation now under TxDOT's control.
- Simplify payment by customers, making the service easier to use.
- Improve and simplify CARTS fare collection.
- Increase in-house data management and report-writing capabilities.

CARTS management noted early on in the process that reductions in operations funding might be, in part, made up by the judicious investment in technologies.

CONTACT INFORMATION

*Capital Area Rural Transportation System (CARTS)
2010 East Sixth Street
Austin, TX 78702
Tel: (512) 481-1011
Fax: (512) 478-1110*

*Dave Marsh,
Executive Director
Dave@ridecarts.com*

SUMMARY AND BIBLIOGRAPHY

SUMMARY

All of the case study transit systems changed, not because they wanted to, but rather because they had to in order to maintain relevance in the community. The systems changed in reaction to new paradigms in the service area (often demographics), in technology, or in funding. The systems all operate differently with different missions and goals (especially AT and COAST), yet each of them has embraced the elements of change and expects change as a normal course of action. Each exemplifies how a system manages change.

The case studies demonstrate the importance of aligning the system for change. Each system, in its own way, exemplifies how to embrace the elements of change. Once that is accomplished and the board, management, staff, and customers understand the reason for change, then the system can begin to adopt the new paradigms. Not all paradigms will be easily adoptable, but system managers should identify the paradigms most appropriate for the service area and then embrace them. It is hoped that the ideas identified in this report will be used to help guide change.

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Abbreviations used without definitions in TRB publications:

AASHO	American Association of State Highway Officials
AASHTO	American Association of State Highway and Transportation Officials
APTA	American Public Transportation Association
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
ATA	American Trucking Associations
CTAA	Community Transportation Association of America
CTBSSP	Commercial Truck and Bus Safety Synthesis Program
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
FMCSA	Federal Motor Carrier Safety Administration
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
IEEE	Institute of Electrical and Electronics Engineers
ITE	Institute of Transportation Engineers
NCHRP	National Cooperative Highway Research Program
NCTRP	National Cooperative Transit Research and Development Program
NHTSA	National Highway Traffic Safety Administration
NTSB	National Transportation Safety Board
SAE	Society of Automotive Engineers
TCRP	Transit Cooperative Research Program
TRB	Transportation Research Board
U.S.DOT	United States Department of Transportation