

Suburban Transit Opportunities Study



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EXECUTIVE SUMMARY

Providing successful suburban transit service is not an easy task. With the vast majority of work and non-work related trips being made by automobiles and land use policies that generally do not support conventional transit service, providing alternatives in the suburbs is always very difficult. However, as research and experience have shown, it is not impossible. Route deviation/point deviation, demand response, employer shuttles, and feeder systems have shown the ability to provide effective service and successfully compete for small markets in the suburban environment.

The Suburban Transit Opportunities Study was undertaken with the primary goal of identifying characteristics of successful suburban transit services, especially as they may apply to the Boston region. To this end, the Central Transportation Planning Staff (CTPS) performed an exhaustive review of the national and local literature, and conducted four case studies of local suburban transit agencies. Additionally, CTPS hosted a round-table discussion between suburban transit providers and state transportation agencies, and conducted passenger surveys of all suburban systems currently operating within the Boston Metropolitan Planning Organization (MPO) region.

Across the nation and here in Massachusetts, analysts and transit providers have begun to look at the challenge of providing suburban transit in new ways. Rather than attacking the problem only by trying to change its root cause – automobile-oriented land use – planners and scholars now argue that transit itself must also change in order to be successful in the suburban environment. Planning techniques, service types, and in fact, the very way in which suburban systems view themselves, must adapt. Conventional cost-effectiveness metrics cannot be used as the sole means of measuring success.

As such, this report describes methods, techniques, and lessons learned by transit agencies about operating sustainable suburban transit systems that fulfill the goals and objectives identified by their public or private stakeholders. The key aspects of these, which are more fully explored in Chapter 5, are to:

Think Like a Business

Establish a goal for the system that is focused on one or two niche markets, develop a mission statement based on that goal, determine through mission analysis the necessary steps to achieve that goal, and develop a “culture” of customer service throughout the agency.

Conduct Thorough Service Planning

Analyze all aspects of the service, starting with the mission statement. Determine all needed resources. Develop courses of action (that include well-planned potential routes) and choose the one that best serves the customer while remaining within budget constraints.

Develop and Maintain an Aggressive Marketing Strategy

Effectively “sell” the service to the general public, who may be supporting the system with tax dollars, to private sponsors, and to potential customers who need the service. Create a “brand”

identity for the service. Mark and maintain inviting bus stops, hang posters, and place ads in papers. Above all, think outside the box, and continuously seek new ways to get the system's "message" out.

Develop and Maintain Partnerships

A vital form of sponsorship and subsidy, seeking and forming partnerships should be an ongoing part of any system's management. Likely partners are Transportation Management Associations (TMAs), Regional Planning Councils (RPCs), local employers, major transit agencies such as the Massachusetts Bay Transportation Authority (MBTA), and local real estate developers.

Compete with the Automobile

Seek to emulate those aspects of cars that make them popular, including direct routings between origins and destinations. Ensure that the service is above reproach in terms of reliability and that the system's vehicles project a clean and comfortable image.

Continue to Influence Land Use Change

Ensure that representatives of the transit service attend local and regional meetings where land-use decisions are made (including those of Boards of Selectmen, planning boards, etc). Investigate and/or create transit-friendly and transit-oriented development guidelines and share them with local officials and developers. Seek to implement local ordinances that oblige new developments to support suburban transit.



INTRODUCTION

As part of the Boston Metropolitan Planning Organization's (MPO) commitment to support the provision of transit service in suburban areas, the Boston MPO Transportation Plan Update 2004–2005 contains a program to fund suburban mobility projects out of the 70% of the region's expected revenues that will be devoted to maintenance and improvement projects. That program will fund equipment and other capital-related expenses associated with services that aim to improve mobility in suburban areas. Fixed-route transit services operating in suburban-to-suburban and reverse-commute markets, employer-based van/carpools, and flexible-route transit services are among the services that this program seeks to support. Eligible applicants include local or regional public entities, Transportation Management Associations, and other appropriate non-profit organizations capable of implementing transit services.

In an effort to ensure that only the most qualified applicants are chosen for funding, the MPO began conducting the Suburban Transit Opportunities Study in the spring of 2003. This report is the result, and was compiled from research that included:

- An exhaustive review of the current literature, including national and local sources
- A round-table discussion with Boston-area suburban transit providers
- Case studies of Boston-area suburban transit systems
- A survey of suburban transit service passengers, conducted on all suburban transit systems in the Boston region
- An analysis of National Transit Database information on the operating costs of suburban transit systems nationally and in Massachusetts
- Progress-update meetings with both the Boston MPO Regional Transportation Advisory Committee (RTAC) and Transportation Planning and Programming Committee (TPPC).

This report would not have been possible if not for the timely and willing cooperation of the Boston area suburban transit agencies that were selected to participate in this study. Their time, assistance, and cooperation are greatly appreciated.



CHAPTER 1

LITERATURE REVIEW

SUMMARY

As is well known, the years following World War II saw a significant shift of residential land use away from the immediate area around large cities to land located many, many miles from a city or town center. Over the last several decades, and becoming increasingly more commonplace, this pattern now includes all forms of land use. No longer the sole domain of “bedroom communities,” the suburbs are increasingly self-contained, with their own centers of employment, education, shopping, and entertainment (Minerva et al., 1996). This process of suburbanization, which has generated new jobs and increased economic activity, was made possible by the proliferation of the automobile. Now the dominant form of transportation in America, automobiles account for 90% of work trips nationally and 79% of work trips within eastern Massachusetts (U.S. Census). This increasing trend has resulted in significant traffic congestion and a reduction in basic mobility for certain segments of the population that lack automobiles or the ability to use one.

Moreover, the nation has seen a shift in commuting patterns. Nationally, suburb-to-suburb travel is becoming the dominant commuting pattern, and central business districts (CBDs) are no longer the principal place to do business in metropolitan areas (Hooper, 1995). This economic expansion of employment and housing to the suburbs has led to activity centers and trip generators that are poorly tied together and have indirect, very dispersed travel patterns (Falbel, 1998; Minerva et al., 1996; Biemborn et al., 1992).

Given these conditions, improving suburban mobility is a difficult national challenge that is particularly acute for transit (TCRP 55, 1999). Issues involving land use suitability for transit are well known and difficult to overcome. However, municipalities and transportation agencies still have a responsibility to provide some degree of mobility for all segments of society and to attempt to reduce congestion. Thus, the question becomes, how can service be provided in this environment, and what innovative methods can communities or agencies employ to enhance suburban mobility?

The focus of this chapter is to provide an exhaustive review of the current literature for information on what techniques have been employed around the nation and here in Massachusetts to increase the likelihood of success for suburban transit. This included studies by CTPS as well as national-level sources such as the Transportation Research Record. Additionally, local Transportation Management Associations in Massachusetts were consulted for literature, case studies and other information and data regarding systems operating within their areas of responsibility. A bibliography and a listing of Internet keywords that were used to locate many of these works are provided in **Appendix A** of this report.

Particular attention was paid to innovative practices and to case studies depicting systems that have successfully accomplished their stated goals. From this review, indicators of “success” were

extracted that may be applied by the Boston MPO in determining where suburban transit services may be successful within the somewhat unique suburbs of Massachusetts’.

Scholarly and technical works from both national and local sources are straightforward with regard to the challenge faced by municipalities seeking to enhance suburban mobility. With the vast majority of work- and non-work-related trips being made by automobile and land use policies that generally do not support conventional transit service, providing alternatives is always very difficult. However, analysts have begun to look at the problem in new ways. Rather than tackling the problem solely by changing its root cause – automobile oriented land use – planners and scholars now argue that transit itself must also change in order to be successful in the suburban environment. As such, the literature points to several techniques that may lead to success in the rapidly growing suburban environment. These techniques include, but are not limited to:

- Focus the service on activity hubs: Either “people hubs” such as employment or shopping centers, or “transit hubs” such as commuter rail stations.
- Aggressive marketing: Targeted, customer/consumer-focused service. Because suburban transit is not expected to serve large segments of the population, specialized or niche markets are critical. These include but are not limited to: elderly, commuters, etc.
- Linkage to larger services: Provide connectivity to established transit systems in the service area, such as commuter rail, bus rapid transit, etc.
- Ensuring cost-effectiveness: Emphasis on smaller vehicles for Demand Responsive or flex-route type systems.
- Involve transit planners in the land use planning process as early as possible: Work with developers to ensure transit’s inclusion. Provide both transit-friendly guidelines and transit-oriented development strategies to developers and planning officials.

THE SUBURBS AND SUBURBANIZATION

How We Got Here

The generic term “suburb” is used in a general manner to describe areas surrounding traditional urban centers. It implies a settlement pattern uniformly characterized by low-density housing, strip development, shopping malls, and campus-like office and business complexes (TCRP 55, 1999). Suburbs can be politically incorporated communities within metropolitan areas, and where they are not, they are referred to as “residential developments” (Schwirian, 2003).

In the Boston experience, as well as in other parts of the country, suburbs originally sprang up along streetcar routes from the 1870s through the early twentieth century. These “neighborhoods” were an attempt to form a two-part city – a city of work separated from a city of homes (Warner, 1962). This pattern continued through the end of World War II when the process picked up pace. With the advent of greatly improved transportation (affordable automobiles that were capable of greater flexibility, greater distances, and greater speeds than street cars), and the availability of relatively cheap land throughout the countryside, developers began constructing huge residential communities with the primary breadwinner commuting into the central city for work.

However, over the following decades, employment sources began to follow workers deeper and deeper into the suburbs. Lured by a wide variety of incentives, chief among which were cheap land and lower taxes, employment and then entertainment, medical treatment, shopping, government services, etc, all began to migrate into the hinterlands, leaving behind the congestion, noise, and perceived dangers of the central city and its now aging, immediate streetcar suburbs. This is the process known as suburbanization – the exodus of economic activity into the countryside.

In Massachusetts, suburbanization took longer to set in apparently due to the strength of the

Boston CBD as an employment center, land availability, and the system of town government (Wheaton, 1994). As a result, Falbel (1998) concluded that in the Boston area “there is no single, archetypal suburb, but rather a collection of many different cities and towns, which together form a continuum stretching from urban to rural. However, because they are members of the Boston metropolitan area it is implied that a suburb-to-city relationship exists, and as such almost all the cities and towns of eastern Massachusetts are considered to be, in part, suburbs of Boston.”

Falbel’s points are well taken. However, while there may be no stereotypical suburb in the context of the southern or western U.S. experience, there are parts of the Boston Metro Region that eventually developed the same urban form issues as found in those more typical suburban settings. This is especially the case in areas near major roadways ringing Boston. Over the last decade, those parts of the region experienced an economic “boom” in technology employment and residential development that led to very large commercial complexes with vast amounts of office space, hotels with significant convention accommodations, shopping malls, and several large apartment complexes all constructed at fairly low density along Route 128/I-95, I-93, Route 1 and Route 3. These corridors, and in some cases the areas immediately adjacent to them, feature the same activities found in traditional CBDs, though spread out over a much larger area (TRCP 55, 1999). As a result, the delineation between what a towns and cities are versus what suburbs are, has begun to blur.

Redefining the Burbs

Despite the appearances of homogeneity in suburban form, either nationally or in Massachusetts, researchers have noted that the development patterns of the suburbs are evolving. In researching *Guidelines for Enhancing Suburban Transit* (TCRP 55, 1999), the analysts categorized six different types of suburban environments, each with its own implicit purpose:

- Residential suburbs,
- Balanced mixed-use suburbs,
- Suburban campuses,
- Edge cities,
- Suburban corridors, and,
- Exurban corporate enclaves.

However these types can be combined into broader categories by their overall purpose such as those identified by Dr. Schwirian of Ohio State University:

- Suburbs of Employment or Production, versus
- Suburbs of Residence or Consumption.

While the suburban environment in Massachusetts may preclude grouping large areas into categories such as these on a consistent basis, the definitions can be helpful in determining the purpose of smaller suburban areas. As a result, specific, highly focused types of mobility needs can be determined for a given area. This is important because, as will be seen later, the literature is quite specific about the need for a focused, market-based approach to providing mobility services in a suburban environment.

Regardless of definition, suburbanization has forever changed the way we live, the way we work, and especially the way we travel. While this process has had many benefits, sprawl and traffic congestion now plague most suburban communities and are in some cases of monumental proportions. In fact, over the past two decades traffic congestion has grown so tremendously, it is increasingly becoming the focus of the transportation profession (TCRP 55, 1999).

MOBILITY IN THE SUBURBS

The Challenge

It is well known that automobiles are the dominant form of transportation in all of America’s different built environments, and Massachusetts is no exception. Despite the best efforts of planners and engineers across

Massachusetts and America, cities and towns have been inundated by the very mode intended to serve them. Traffic congestion has grown, as suburb-to-suburb travel becomes the dominant pattern (Hooper, 1995). Increasingly, local governments and planning officials seek to use transit as a much-needed alternative to the automobile.

However, transit as it is conventionally thought of has difficulty operating in the dispersed suburban environment. The impact of suburban development on America's transit industry has been dramatic in that where there were once well defined, relatively easy to service downtown cores, there are now multiple centers, lower densities, and multiple origination-destination pairs (TRCP 55, 1999). This condition makes providing conventional transit extremely difficult from both a fiscal and operational standpoint.

That being the case, planners have attempted to attack the problem at its root: auto-oriented land use. Planners have sought to change suburban land use policies in an effort to transform the built environment of the suburbs to a human scale suitable for alternatives. To that end, the early 1990s saw new schools of thought emerge within the planning community, such as the "New Urbanist" or "Neo-Traditional" movement that seeks higher densities built around traditional town centers like those found prior to World War II. Complementing this movement is the concept of transit-oriented development (TOD). This builds on the Neo-Traditional framework by turning focus away from the automobile and instead planning for transit as either the main focus or at least as a significant mobility resource for future land use. TOD has gained much popularity in recent years, due not only to the obvious problems of traffic congestion, but also demographics. TOD advocates have noted that increasing shares of childless couples, influxes of foreign immigrants (many of whom come from countries with a heritage of transit use), and growing numbers of "empty-nesters" seeking to downsize their living quarters have all become ready-made consumer

markets for housing near transit (Cervero et al., 2002).

Unfortunately, while TOD appears to show promise in limiting congestion and increasing mobility, implementing such a significant change in land use policy has had difficulty overcoming the institutional, financial, regulatory, and political factors involved in the development process. Stakeholders must be sufficiently convinced that demand for living and working near transit is real and sustainable (Cervero, et al., 2002). While TOD may someday become commonplace, that sort of change takes much time, and those who require mobility services should not be made to wait in the meantime. Thus, other solutions need to be found.

A New Direction

According to the authors of Transit Cooperative Research Program (TCRP) Report 55, "case studies have revealed that planning for suburban transit has been indistinguishable from traditional service planning" (TCRP 55, 1999). Indeed, as has been observed both nationally and in Massachusetts, there is a tendency to plan suburban systems as though they will operate like urban systems and evaluate them by the normal quantitative measures such as overall ridership and cost per rider. It is often difficult to apply conventional, efficiency-based criteria such as benefit-cost analysis to suburban systems for a variety of reasons. Such systems are usually small, relatively expensive, and have comparatively low overall ridership levels. Moreover, and perhaps most significantly, municipalities attempting to provide humanitarian services for less fortunate residents, such as the transit dependent, are often willing to do so at a relatively high cost. This is apparently well recognized in the current national literature. Few of the case studies found specifically addressed quantified measures for suburban transit, and the researchers for TCRP 78 recognized that "analysis of benefits and costs cannot, and should not be all that drives decisions about transit programs and projects" (TCRP 78, 2002).

Treating suburban systems like conventional urban systems may be part of the reason transit has so much difficulty in the suburbs. Suburban systems may be held to standards that they cannot achieve without causing service to suffer. Much of the national literature now takes the view that transit agencies must change the way they view suburban service planning. Analysts argue that instead of trying to reinvent the suburbs by spending enormous amounts of time and energy attempting to change land use policy, it is the transit agencies themselves that must change. They argue that “public transportation has not kept pace with changing land use patterns of the modern suburban city and, as a result, many of the transportation disadvantaged now find fewer essential destinations available to them” (TCRP 7, 1999). While it is still important to improve land use planning, the process of change is very gradual and municipalities must work to meet the needs of their constituents in the present. Thus, in the interim, suburban transit must be reinvented in order to effectively compete with the automobile as well as meet the needs and expectations of today's suburban commuter (Minerva et al., 1996).

While conventional transit may work in certain older and denser suburbs, today's highly dispersed suburbs do not appear to have either the origination or destination density required for a traditional line-haul bus route. Even in areas with significant population and employment, planners must remember that transit is competing with the automobile on its own turf, where land use density is low, every trip is practically door-to-door, and ample, free parking abounds. This means planners must adapt transit to compete with such characteristics. According to research conducted for TCRP 55, these characteristics translate to:

- Directness and comparable travel time
- Comfort and service quality
- Scheduling for convenience (e.g., flexibility, minimized transferring, connectivity)
- Simplified and competitive pricing and payment methods

- Broad market coverage

Many transit agencies nationwide are aggressively pursuing the suburban market, but to be competitive with the automobile, planning must embrace a family of services concept and be responsive to narrow, or niche market segments (Hooper, 1995; TCRP 55, 1999; Hemily and King, 2002). The following list describes some of the approaches operators have found to be useful in providing their services with the best chance of achieving success. This list was combined from two very similar lists found in both TCRP Report 55 and TCRP Synthesis 14 and is not in a particular order. These approaches are reinforced by nearly all of the works found in the current literature, and are addressed in more detail later in this review.

- Choose the right market (exploit niche markets)
- Choose the proper vehicle (small vs. large)
- Utilize demand-response or other flex-route services
- Utilize targeted marketing approaches geared to the business community
- Seek partnerships with the private sector that will provide funds
- Concentrate on serving population and employment centers (people hubs), and transit transfer points (transit hubs)
- Economize on expenses
- Link to larger transit services (commuter rail or express buses)
- Seek involvement in the development of land use and planning techniques and policies.
- Craft service innovations or other programs and techniques designed to increase transit's market share in the suburbs

DEFINING SUCCESS

From the Literature

Before discussing “what works” further, it is useful to define what success means. The case

studies identified in the current literature clearly indicate that success is defined very subjectively. Each agency or municipality studied determined its own criteria for the success of its system, so it is difficult to identify a universal model of success. However, there are several explicit and implicit guidelines as to how success may be defined and measured.

Qualitative Goals vs. Quantitative Goals

In addition to rethinking service planning, evaluation criteria must be rethought as well. It was observed in the literature that agencies primarily base the definition of success for each suburban service upon the purpose or goal for which that service was created. Given that each suburban environment will be different in terms of its purpose, travel patterns, land use arrangements, and the various institutions involved, evaluation criteria may need to be tailored to the specific suburban setting (Schwirian 2003, TCRP 55, 1999). Productivity and cost-effectiveness indicators such as overall ridership and net cost per passenger were taken into account in various studies, but a much greater weight was placed upon the largely qualitative social benefits achieved by the service. This reliance on qualitative indicators was well summarized by Minerva et al. (1996) in their study of employer shuttles. They concluded that productivity and cost-effectiveness “measures cannot be the sole determining factors for assessing whether a program should continue to operate,” and that while suburban transit agencies must closely monitor and seek to improve such factors, they “must also take into account the importance of the service as measured by its capability for meeting the service objectives previously defined” (Minerva et al., 1996)

Therefore, in attempting to determine how success will be defined and measured for a particular project, the first step should be to make a clear determination of that service’s purpose. Traditionally speaking, the majority of systems are created for one or two general purposes: either to accomplish a social objective by

performing a human service, or as part of a larger effort to reduce the impacts of congestion.

PURPOSES OF SUBURBAN SYSTEMS

Human Services

A human service is some type of social good, of which a community attempts to provide for its citizenry, but most often provides specifically for the disadvantaged segments of their population.¹ For example, a municipality or other agency may establish the goal to provide some type of assistance for transit dependent or otherwise transportation-disadvantaged community members. These may include senior citizens who can no longer drive; children too young to drive; people of all ages with health care issues that prevent them from driving; and people with no access to an automobile. Typically, the systems designed to meet these types of goals consist of one or a combination of: suburban circulator, route-deviation, or demand-response services.

Another example of social goals might be those with a direct bearing on a community’s overall well-being and prosperity, and that seek to address equity issues. Communities often try to enhance job creation and economic development by assisting those segments of their population challenged by a lack of transportation. As Alan Black summarized, “people with less mobility have less opportunities to obtain the rewards of life” (1995). By establishing reverse commuting and welfare-to-work services, municipalities or agencies provide much needed skilled labor for suburban employers and provide valuable access to employment for small markets where those residents would otherwise remain unemployed.

In terms of evaluation, both quantitative and qualitative measures could be applied to transit services with humanitarian goals. However, because many of these services are intended to

¹ Simply put, a social good is some type of product provided by society for the benefit of all society. Usually, these are provided through public funding.

serve a greater public good, the main indicators of success will likely be more qualitative than quantitative. Measures such as overall ridership, percent of fare box recovery, or net cost per rider may not fairly evaluate a system deemed to be a social necessity. More appropriate measures applied to such a transit program might be whether or not the service meets the schedule needs of customers, and whether or not the service is keeping pace with demand or turning customers away (service denials). In the case of economic development and equity, measuring the number of job vacancies filled, reduction in welfare rolls, or how much economic activity changes might be better approaches.

Reducing Congestion's Impacts

While congestion is certainly an issue of significant public concern, and the implementation of a congestion reduction program may produce some social good, transportation provided for this purpose is not considered a human service. In this case, municipalities or other agencies are employing a form of Transportation Demand Management (TDM).² The main purpose behind the use of TDM programs is to decrease the amount of single-occupant vehicles on the road, and make the transportation system more efficient (Black, 1995).

Communities may do this by creating a suburban transit system. Like traditional line haul transit systems, services created for this purpose are more straightforward than systems attempting to provide a human service. There are several types under this category and they include: commuter shuttles, employer shuttles, and occasionally suburban circulators. There are several quantitative indicators such as VMT reduction, air quality improvement, fare box recovery, ridership, and cost per passenger per day. Qualitative measures could be customer satisfaction for both rider and the corporation paying for it, the amount of local or community support, and especially continued funding.

² Transportation demand management programs are not solely transit based. They can include a variety of approaches for reducing the number of single-occupant vehicles

Types of Services

Linked to a system's purpose is the type of system most appropriate to serve its intended need. TCRP 55 researchers found that the range of suburban transit applications fell into two categories. The first category is Actions to Modify and Improve the Overall Suburban Transit Framework. These actions are best suited for well-established systems such as Local Intra-Framingham Transit (LIFT), or those suburban routes operated by the MBTA. As listed in TCRP 55, such actions include:

- Establishing a transit centers concept and timed-transfer program; and
- Enhancing line-haul services, express buses, and limited services.

In establishing transit centers and timed transfers, an expanding transit agency is making their system more efficient for the user.

The second category is Actions That Create Supporting/Complementary Service. According to TCRP 55 researchers, these are actions taken to enhance or complete a network by striving to meet localized needs and service niche markets. As shown in TCPR 55, they can be comprised of the following:

- Internal, local area circulators
- Shuttle links
- Subscription buses
- Vanpools

This implies that these types of service are purely complementary to another, larger transit network. However, it has been observed both nationally and in Massachusetts that such systems can be effective on their own. They may be more effective if they can be linked to other systems, but that should not prevent a community from starting a circulator or shuttle service provided the operator has conducted sufficient market analysis to warrant the service and is prepared to focus their service on very narrow market bases.

Common Attributes of Success

While services vary according to their own unique circumstances, the case studies and other research described in the literature did identify several common attributes that each agency believed directly contributed to success.

Focus on Hubs (Centers of Residence or Employment)

In the absence of a traditional CBD, research suggests that suburban transit planners should seek density focal points, referred to as “hubs,” of either employment or population as substitutes for the traditional density of a downtown. Essentially the major trip attractors of a community, they are redefined in the literature as “people hubs,” “transfer hubs,” “employment hubs,” or “service hubs” (TCRP 55, 1999).

By focusing on hubs, or density focal points, such as office parks, apartment complexes, hospitals or medical centers, bus or rail transfer points, university campuses, shopping malls, etc, transit operators can both maximize potential ridership and provide their customers with maximum destination and transfer options at relatively concentrated, potentially mixed-use locations. Moreover, planners can use particularly well-developed (transit-friendly) hubs as the basis for encouraging later transit-oriented development.

Marketing

Marketing suburban services is critical to their success (TCRP 55, 1999; Hooper, 1995; Minerva et al, 1996). Marketing has two key features: (1) identifying and targeting services to existing potential, and emerging ridership markets; and (2) promoting and acquainting the public with service options (TCRP 55, 1999). However, it is also a way to communicate with customers and track their changing needs. For example, it was marketing research that showed Chicago’s suburban transit service, Pace, that their traditional market of city-to-suburb travelers was shifting to suburb-to-city and suburb-to-suburb travelers. As a result, Pace was able to develop new types of services tailored to meet the needs of these growing markets (TCRP Web 8, 2000).

Suburban transit requires focused marketing activity. Traditional transit marketing plans consist largely of communications and promotional plans with little attention focused on the market segmentation, targeting, and positioning of the value offered to the customer (Hooper, 1995). They are essentially, generic advertisements designed to get someone – anyone – to try transit. However, in the suburban environment, operators must focus on small or niche markets. Some of these, such as employment shuttles, are directly competing with the automobile – the preferred method of suburban travel. The latter has an enormous marketing machine behind it, consisting of a constant media barrage of T.V. commercials, radio ads, newspaper and magazine ads, and billboard ads all feeding society’s need for status symbols. This means operators must be highly creative and precise in how they market their services and to whom.

The National Academies, under the Transit Cooperative Research Program, has produced an extensive array of texts on the topic of marketing for transit. The bulk of this literature suggests that operators must begin to think like a business, such as a retailer. Agencies must begin to view their ridership as customers – customers that operators want to see again and again. Moreover, transit agencies need to view customers as assets. Customers can be a powerful source of information and a necessary one if transit is to keep up with market shifts.

Researchers point out that any marketing program must represent a direction for the operator’s whole staff (TCRP 51, 1999). To this end, it is recommended that transit managers develop an agency wide, customer oriented mission statement – one that actually mentions the customer and the agency’s commitment to them (Potts, 2002). Operators need to create a “culture of customer service” among employees so that they treat local employers and other potential markets as clients, not just riders, and work to address their individual transportation needs (TCRP Web 8, 2000).

Next, the agency must perform some technical market analysis and develop a marketing plan.

There are many ways to approach an effective marketing plan, but some smaller agencies may have neither the personnel nor the budget to pursue them effectively. In cases like this, a partnership, such as with a TMA, can help an agency market their service. For the benefit of those unfamiliar with this aspect of transit planning, the following list provides a synthesis of techniques found in the literature and should be treated as a minimum starting point.

- Identify the market(s) to be serviced and their spatial and demographic characteristics.
- Advertise. Conduct direct mailings explaining the service. Mailings may consist of brochures or flyers describing or introducing the service. Also, seek free or inexpensive public service announcements on local radio or TV stations.
- Create a Web presence.
- Provide incentives. This includes ride passes and guaranteed rides home.
- Track progress, growth, and change.

Identifying markets and their spatial and demographic characteristics is arguably the most critical part of the plan. This is where the operator determines who will be served, where they will be served, and how the agency will be able to provide that service, i.e. the routes and needed vehicle capacity. This would be best accomplished through the use of Geographic Information Systems (GIS), but it is unlikely that most start-up or existing systems can afford this type of expertise. Thus, it would be necessary for other potential partners such as the MPO or RPC to provide such highly technical assistance.

Advertising is a huge part of marketing, especially for a suburban system. Many potential customers in the suburbs have never used transit before and are unfamiliar with it. Conducting direct mailings is a relatively inexpensive method to reach out directly to that market. Sending attractive brochures that provide a description of the service, how to access it, and schedule and route information can be

an extremely effective technique and has been used by many agencies such as New Jersey Transit's (NJ Transit) Wheels (Hooper, 1995).

Intensive marketing to businesses within the private sector is also found throughout the literature and is heavily emphasized. While businesses do not consume transit directly, their employees do (TCRP 51, 1999). Some researchers believe that the single largest factor determining whether a shuttle service will succeed or fail is the amount of employer support the operator obtains (Minerva et al, 1996). This is because reaching out to potential individual riders is difficult without an expensive campaign. However, by marketing to private sector employers – as well as universities, shopping malls, and other activity centers – operators can reach many potential customers through a single targeted approach (TCRP 51, 1999).

Internet Web sites are another form of marketing, and offer an extremely effective way to augment the strategies of any agency. Web sites are a relatively inexpensive method for providing current and potential transit customers, employees, and stakeholders a convenient way to access a wide variety of service related information (Schaller, 2002). Web sites are more interactive than traditional forms of marketing, and the size and complexity of a site can vary on the size of the agency or on the amount of information to be provided. According to Schaller's Synthesis of the Practice 43, agencies considering websites should view schedules, fare rates, and route information as their first priority. Additionally they should use a simple, easy-to-remember URL. (For example, Chicago's Pace uses the URL www.pacebus.com.) Such an introductory site would need infrequent updates and may only generate an annual cost of less than \$5,000 (Schaller, 2002).

User incentives are vital in an automobile-dominated market place, and suburban transit providers should try to include some type of incentive for riders. Such services should include guaranteed rides home, customized services, pre-paid passes, and voucher programs (TCRP Web 8, 2000; Hooper, 1995). Some of these incentives can be instituted with the

assistance of local employers, who can help market the programs to their employees.

Finally, data collection and tracking has been identified as an area in desperate need of improvement among all agencies studied (Hooper, 1995; TCRP 55, 1999). In addition to monitoring the effectiveness of marketing campaigns, a marketing department or section would be well advised to monitor other data such as overall ridership. By tracking this statistic, they can monitor their own effectiveness and inform management of overall trends and of any shifts in rider demographics or other customer/ridership related issues.

Linkage to Other Systems

An important consideration that can lead to increased ridership and effectiveness is the concept of linking to other systems. For example, a local circulator operating within a suburban community can increase its overall customer base by including stops at rail stations or the transfer location of another operator's shuttle service. By entering into an agreement or even a partnership, both operators can time their services for easy transfers.

Choosing the Right Vehicle and Economization

Part of cost-effectiveness is using the right tool for the right job. In the suburban environment, smaller vehicles have begun to dominate on a national basis. They have several advantages over traditional 40-foot city buses, such as high load factors, a marketable image, sometimes lower capital and operating costs, shorter boarding and alighting time, faster acceleration and deceleration, better maneuverability in narrow streets and parking lots, and most importantly, the ability to better match capacity with demand (TCRP 55, 1999; Hemily and King, 2002).

While the inference that smaller size equals lower cost is often valid, small buses have been known to have higher-than-expected maintenance costs (Hemily and King, 2002). According to TCRP Synthesis 41, this was grounded in specific brands of buses and opera-

tors must attempt to make the most informed purchase possible. However, despite this cost concern, the use of small buses (30-foot or less) by operators nationwide grew by 112% between 1988 and 1998, which was nearly twice the growth rate for new standard buses (Hemily and King, 2002).

Land Use

Ultimately, the key to the long-term success of any suburban transit service is to begin modifying land use practices to better accommodate transit use. Thus, transit agencies/planners should get involved in the land use planning process as soon as possible. In a survey of twenty-three transit agencies operating suburban services, Katherine Hooper found that fourteen of them were involved in site design and land use on a routine basis (Hooper, 1995). There are basically two approaches to this. First, planners, engineers, and transit operators can develop transit-friendly design guidelines that will facilitate better service; and second, planners can seek to implement transit-oriented development strategies and help officials to create more effective land use policy.

Transit-Friendly Design

Not to be confused with transit-oriented development, transit-friendly design refers to the physical characteristics of the transportation system and the built environment of which it serves. Primarily an issue for local Public Works agencies, transit-friendly issues involve the size of intersections and their turning radii, the presence of sidewalks at transit stops and how large they should be, the inclusion of bus pull-ins, and any other physical characteristic that could make transit easier to use.

Many existing systems have developed transit-friendly guidelines and checklists that they share with both the development community and local officials. Such guides can raise awareness of design features that can cause serious access problems for transit users. For example, the design of a bus stop can have a tremendous impact on how the public views a service. "It is the first point of contact between the passenger and the bus operator" (TCRP 19, 1996). As

such, transit providers can develop standards for bus stops and shelters and work with local officials to ensure passengers have a positive experience. Such guidelines would not be intended to supersede local codes or ordinances, but are presented to encourage the design of transit-accessible developments in an effort to enhance transit service (Pace, 1999).

One example of this is Maryland's MTA which published a guideline called "Access by Design" that provides engineering design standards such as those required for transit vehicles to maneuver in tight areas (Hooper, 1995). PACE Transit of Illinois produces guidelines as well. Accessible from the agency's Web page, the guidelines provide directions for roadway design, vehicle characteristics, bus stop zones, land use considerations, and plan and service review procedures. The land use considerations include site design and demand management techniques that explain in simple terms how these techniques can be employed. For example:

Bus turnouts can be provided on streets in front of buildings over 25,000 square feet, if those buildings are at mid-block locations. Turnouts provide an effective off-street bus stop area that does not restrict traffic flow. These transit facilities are desirable in locations where high ridership volumes are anticipated and stops may produce traffic backups.

"Pace Site Design Techniques" (Pace, 1999)

Transit-friendly checklists can be extremely useful too. NJ Transit produced a checklist that it distributes to officials and developers as a kind of pop-quiz to help determine how transit-friendly their current zoning ordinance, site plan ordinance, and master plan are (Hooper, 1995). It includes questions about the kinds of density encouraged, sidewalk usage and other pedestrian access issues, and whether or not parking reductions or restrictions are present. Such checklists can be influential in that they serve to remind developers and officials of key considerations necessary for creating a sense of place and human scale in the areas around transit stations.

This is key for ensuring the inclusion of other transit-friendly design features such as sidewalks. An important consideration with transit is that patrons must walk at least a short distance at both ends of the trip. Therefore, it is important to ensure that customers have adequate pedestrian facilities at the transit stop. For example, sidewalk areas near bus stops may need to be widened to accommodate both transit riders walking to or waiting for buses and pedestrian through traffic (TCRP 33, 1998).

Transit-Oriented Development

As mentioned earlier, transit-oriented development has become a very popular concept. Much has been written on the topic and TOD is seen as a way to address such urban ills as congestion, sprawl, lack of affordable housing, and declining real estate values (Black, 1995; Cervero, 2002; TCRP 22, 1997). However, the concept has essentially two overall goals: to create a more livable community by de-emphasizing automobile use, and to assist transit in regaining a significant level of influence over general land development patterns.

"New TODs are on the drawing boards from Alaska to Florida" (Tumlin and Ball, 2003). These developments are essentially high-density neighborhoods created around transit stations. They contain a mixture of high-density residential, commercial, and office space all located within walking distance of a transit station, and a roadway network that actually discourages driving. By doing this, a TOD is by design a much more pedestrian-oriented environment that can, and in many cases does, cause an increase in transit ridership. However, as Alan Black (1995) points out, "the object is to create livable communities, not to enhance transit revenues."

Even with TOD's growing popularity and potential benefits, getting the development community interested in undertaking such projects can be very difficult. For the better part of the twentieth century, developers have been conditioned by what they perceive to be market forces and still have a fixation with automobile-oriented development (Black, 1995;

Porter, 1997). Many stakeholders and officials involved in the development process find it difficult to make the fundamental land use changes necessary for TOD to be successful. They are not yet convinced that any development, whether around a transit station or not, will sell without ample parking. Experience has shown that if transit-oriented developments are to have a chance for success, they must be championed by the public sector (Cervero, 2002).

Whether for bus, commuter rail, or rapid transit, planners and town officials should encourage developers to make the transit station either the focal point or one of the main focal points for growth within their town. This would include providing incentives to developers for reducing the amount of parking and including land uses that are complementary to transit and transit's customers. Planners and officials should also be careful to encourage the right kind of physical development. According to Hank Dittmar, a nationally recognized authority on alternative transportation planning, many developments occurring around the nation today claim to be transit-oriented, "but functionally consist of conventional suburban, single use, development patterns with conventional parking requirements, so that the development is actually transit-adjacent, not transit-oriented" (Tumlin and Ball, 2003). Transit-adjacent development (TAD) fails to have a true "functional connectivity" to the transit station (Cervero, 2002). Such a development might see increased transit patronage because it is proximate to trip attractors, but at the same time may not see the kinds of investment a TOD is intended to generate, such as increased value of real estate near the station for residential, commercial, and other land uses (Cervero, 2002; Tumlin and Ball, 2003). While a TAD may be better than the current form of suburban development, it should not be considered the standard to aspire to. Transit-oriented development can bring substantially greater benefits to any community in both financial and personal terms.

Within Massachusetts, "the impact of the MBTA on the residential real estate market has

been significant, and the reintroduction or expansion of commuter rail into the suburbs has made "walk to the station" a key phrase in the real estate classifieds" (Kaplan, 1999). However, many towns with commuter rail or rapid transit stations have not fully exploited this resource.

With few exceptions, two situations exist throughout the MBTA service area. First, many communities have not developed the areas around stations at all, save for a commuter parking lot. Second, development that occurs around stations tends to be driven by normal, automobile-oriented, market real estate practices and is not tailored in a way that complements the form and function necessary for pedestrians to access them. Many times, sites near the stations are zoned with significant setbacks or no direct walk-access from the station making them difficult or impossible to access. Moreover, even when transit users can reach the adjacent land use, they are often of a type that few riders would seek to access, such as a gas station.

Planners interested in fostering transit-oriented development should encourage local officials to view station areas as a centerpiece for the community, not just a collection/drop-off point (Cervero, 2002). They are ideal locations to begin rezoning for mixed-usage and pedestrian orientation. This approach can have enormous economic benefits for the community. A great example of this that can be found in several literature sources is Davis Square in Somerville. While Somerville is very close to Boston and a city unto itself, the area can still be a great example for the smaller towns of eastern Massachusetts because the basic planning principles and techniques used in this case can be applied to any transit hub.

Davis Square is a triumph of effective community involvement, and public and private partnerships and is held by many as proof that TOD is possible. Emerging from dilapidation and neglect, the area experienced an incredible rebirth after the extension of the MBTA Red Line in the early 1980s, and that is not coincidental (TCRP 22, 1997; Kaplan, 1999). The City

used the construction of the new station as the catalyst for physical and economic revitalization in the square by seeking better urban form in the promotion of new commercial growth targeted to be within walking distance of the station (TCRP 22, 1997).

“The new rapid transit station replaced a poorly defined parking area festooned with debris to form a central plaza within Davis Square” (TCRP 33, 1998). Because it is well known that parking cost is highly correlated with a traveler’s decision to drive, automobile access to the station was completely discouraged and no commuter parking was provided. Not an easy feat, but local residents, acting as part of the Davis Square Task Force, managed to overcome other factions interested in intensifying conventional development in Davis Square that would have included adding huge parking structures. Residents felt such construction would completely destroy Davis Square’s small-town urban fabric, and worked with planners and architects to make Davis Square a central meeting place with a human scale. This was accomplished in part by emphasizing access to alternative modes such as the extensive bike trail that connects the station in Davis Square to the surrounding residential areas including the towns of Lexington and Arlington (TCRP 33, 1998; TCRP 22, 1997). Local residents believe this has been significant in helping the community retain its human scale (TCRP 33, 1998).

This hard work and investment have paid off in several ways. Davis has become a highly desirable place to live and conduct business. Residential real estate values continue to rise around Davis. Homes within what real estate brokers call the “Golden Triangle” of Davis Square, Porter Square and Tufts University sell for up to \$50,000 more than homes outside of that area, and it is important to note that two of those three points have transit stations (Kaplan, 1999).

Davis Square was made possible through partnerships and much public involvement. Other communities can adapt the techniques used in this case around commuter rail and rapid tran-

sit stations, or bus transfer locations. MPOs can enact policies that support TOD within regional transportation plans with the expectation that such policies will influence how money gets doled out among competing projects in transportation improvement programs (Cervero, 2002). However, planners, architects, engineers, transit operators, and other officials must help the development community understand the benefits of planning for transit as the focus of their efforts and be willing to partner together in order to make the changes happen.

In Massachusetts, communities have some advantage over other parts of the nation in that the majority of them began developing well prior to the automobile age. As such, many communities still have small, yet compact town centers that “provide clusters of commuter destinations” (Porter, 1998). Local communities should be encouraged to take advantage of this ideal urban form.

As referred to above, real estate markets and research reveal that urban form and design are highly important, especially in compact settings like station areas (Cervero, 2002). Suburban communities interested in starting or expanding their transit service should focus their attention on these areas for the purpose of introducing new land use policies that support transit-oriented development. However, where the urban form is more “modern” or suburbanized, and no rail stations or bus terminals are present, suburban transit must operate in linear corridors (Biemborn et al., 1992).

Suburban systems can function well within such corridors, but most of the commercial centers found there are designed for the automobile. Policies and partnerships would need to be crafted to redesign some of the parking facilities and entranceways to accommodate bus or shuttle traffic and the resulting pedestrian trip. (Note the section on transit-friendly development above.) Land use policies throughout some of these corridors may need to be adjusted as well. Certain types of trips are distinctly automobile-dependent and would be difficult for transit customers to accomplish (Beimborn et al., 1992). For example, on a trip

to a furniture store, both transit users and motorists may have the store deliver large items such as sofas and dining room sets. However, there are smaller commonly purchased items such as microwaves, bookshelves, TVs, etc., that would be easily transported via automobile but extremely difficult, if not impossible, to carry home via transit. By clustering transit user-friendly land uses such as government offices, basic retail, restaurants, etc., in nodes along the corridor, planners can attract new riders and would, by default, increase trip end densities – a hallmark of well-functioning transit.

Planning for transit-oriented development around stations or at least transit-complementary land uses along corridors that are pedestrian accessible can be key for the continued growth of a suburban system. A transit shuttle that takes commuters from their homes to the train station will only be successful up to a point unless new activities begin popping up around or near the station area. For example, the Maplewood Jitney, which will be discussed further in another section of this report, began offering various commuter services such as dry cleaning that has helped maintain and increase ridership. Developments such as this are what can draw potential customers away from their automobile commutes.

CASE STUDIES FROM THE LITERATURE

There are three types of suburban travel patterns identified in the literature: suburb-to-suburb, intra-suburb, and city-to-suburb (Falbel, 1998; Hooper, 1995). City-to-suburb, also known as reverse commuting, was studied extensively by CTPS in the 2001 MBTA Reverse Commuting Study by Thomas J. Humphrey. This report listed and described the various services currently in operation and suggested where new or improved service could be offered. The study found that it is very difficult to attract transit-dependent riders to jobs “beyond 15 miles of downtown Boston.” This is apparently due to the need for many transfers and long travel times. Because the study concluded that the area within 15 miles of

downtown Boston is better served by rapid transit and bus services, no further expansion of existing reverse commuting rail service was recommended. Additionally, the report recommended that local Regional Transit Authorities or other community-based bus services take on the role of managing this form of commuting, as they might do so at a significantly lower cost (Humphrey, 2001). While it is mentioned in most literature covering suburban transit, no other significant work or case study specifically focused on reverse commuting could be found in the national literature.

The bulk of all other case studies found in the literature focus on the suburb-to-suburb commute. This can be defined as transit serving “low-density areas being non-radial and non-city center oriented” (Hooper, 1995). Typically this is accomplished via conventional buses, paratransit services, vanpools, carpools, and private-for-hire vehicles. One type that stood out in the literature is the employer shuttle.

Employer Shuttles

Shuttle services are used to supplement the existing transit network by providing highly tailored, high-quality connecting services between major activity centers, one of which is often a transit center. Their purpose is to “make regional rail or bus travel a more viable option by creating the final link in the network – the home-to-station or station-to-work/final destination trip” (TCRP 55, 1999).

One mode that is available on the station-to-work end of the trip is employer shuttles. Employer shuttles have become more prevalent in recent years in response to the growing need to reduce highway travel and congestion, and have been successful in linking employment locations with commuter rail stations (Minerva et al., 1996). They are an example of an operation that is highly tailored to the consumer, often using small vehicles that are easy to board, have comfortable seating, and make limited stops. This is necessary because the market for such service tends to be more affluent and inclined to drive (Hooper, 1995).

For an employer shuttle service to be success-

ful, it must have several prerequisites, such as public/private partnerships, community support, an effective marketing program, and the right set of geographic conditions – for example, a commuter rail station, an employment hub, and a heavily congested highway between them (Minerva et al, 1996).

Another large factor that will determine whether a shuttle service will succeed or fail is the amount of employer support obtained during the initial planning process. In order to obtain maximum support, agencies need to establish a continuous dialogue and work in close cooperation with the private sector (Minerva et al., 1996).

By combining with effective partnering an understanding of why the automobile is so attractive, an agency can provide an efficient, attractive service. Employer shuttles are an example of transit innovation in the suburbs.

OTHER EXAMPLES OF SUCCESSFUL SUBURBAN TRANSIT

Jitneys

Jitneys fall under the category of what Gilbert et al. describe as Private-for-Hire Vehicles (PHV). In a recent survey of 677 PHV companies, 32 (2%) were operating jitney services (Gilbert et al., 2002). While this is a small number, interest in this industry is growing because, where they are operating, they do so without subsidy and at a profit.

Traditionally, jitneys were privately owned buses that operated along semi-fixed routes with unlimited and unscheduled stops. These services competed directly with streetcar services by providing faster, more comfortable service. However, they were not regulated, and the “legitimate” streetcar companies pressured municipalities to crack down on them, after which jitneys all but disappeared (Miami-Dade, 2003).

However, jitneys are making a comeback. Planning and municipal officials are taking another look at this form of suburban transit. There are now jitney services operating in a

number of places nationwide with varying degrees of subsidy such as in Maplewood, NJ; Islip, NY; and Miami, FL.

The most notable among these is the Maplewood jitney, and essentially consists of a subscription feeder service that carries riders from stops near their homes surrounding Maplewood to the NJ Transit train station in the center of town. Congestion management was the main reason the service was started. Apparently, demand for parking at the local commuter rail station was becoming high (1,200 riders per day), and a large parking structure was proposed to deal with it. However, Maplewood is an older town with a small dense, village-like town center. It was feared that a larger parking structure would ruin the charm and human scale of the town center. Officials introduced the jitney service to eliminate the need for such a disruptive structure.

As of Spring 2001, the service is considered a tremendous success and carries 200 passengers (or 12% of the town’s ridership) per day (“Rail Station,” 2001). By taking rail commuters off the road and consequently out of the parking lot, the need for a large parking structure within the picturesque downtown was avoided. Moreover, town officials believe that as a result of the jitney’s success, they were able to keep the downtown more walkable and allow residents to forego purchasing second cars (Davenport, 2001).

To achieve this success, Maplewood used a variety of techniques that included congestion pricing of rail parking passes; affordable service targeted to a specific market; additional services at the station such as a “station concierge” with links to fifty local businesses where rail commuters can arrange errands; and marketing that includes publishing shuttle schedules and route information on the Internet (“Transit Town,” 1998; Davenport, 2001).

Maplewood has been an inspiration to other communities. Central Islip introduced a similar door-to-door service in 2001 with the intent of relieving congestion in commuter rail parking lots (“Rail Station,” 2001). However, not all systems are new. Miami has had jitney services

operating “illegally” for some time. Now, the Miami-Dade MPO and the Florida Department of Transportation (FDOT) have begun studying the services to see how they can do so well in a low-density environment. According to the study, Miami jitneys carry approximately 23-27% of Metrobus’ ridership and operate at a profit with no public subsidy (Miami-Dade, 2003).

Potomac Rappahannock Transportation Commission (PRTC)

In their 1996 study of Potomac and Rappahannock Transportation Commission (PRTC), Farwell and Marx demonstrate that suburban transit can be successful if adequately planned from the start. The most significant aspects of their study are the use of GIS in suburban transit planning, and that in certain situations where individual markets are too small to support transit service, planners can combine markets (e.g. choice riders and general or service riders) in order to achieve sufficient ridership using demand-driven service (Farwell et al., 1996). Farwell and Marx’s case study covers the planning and initial implementation of each service.

PRTC, based in Woodbridge, VA, operates the OmniLink family of suburban transit services.³ In 1994-95, the PRTC began offering two new services funded as part of a federal project that was testing the use of Intelligent Transportation Systems (ITS) in transit operations. PRTC was interested in combining two small transit markets into one large enough to reach acceptable ridership thresholds and thus sustain the system.

PRTC utilized ITS funding to create two new services that would operate with the same vehicles, and serve two very different markets.⁴ One service, a fixed route, flag stop feeder shuttle

³ The OmniLink family consists of a line-haul commuter bus service (OmniRide), flex-route bus system (OmniLink), and a ride matching system (OmniMatch). More information can be obtained at <http://www.omniride.com/family-ofservices.htm>

⁴ At the time of the study, the planned ITS applications had been installed and thus played no significant roll in the planning and implementation of these services.

for commuter rail stations would operate during peak periods in an effort to reduce congestion in commuter rail parking lots and increase access to the rail service. The other suburban service, a “hybrid” demand-response/flex-route system would meet the needs of the entire community, including individuals who may have difficulty walking to established bus stops (Farwell et al., 1996; OmniRide, 2003).

Planning for the dual service was difficult and the effort required substantial analysis. The fixed-route service, which is now apparently part of the OmniRide suburban bus service, was initially designed to be a simple feeder service. However, after surveying commuter-rail passengers and extensive spatial analysis of both survey and demographic data, the PRTC opted for a flag stop system.⁵ The shuttle would operate from 5:30 A.M. to 8:00 A.M. and 4:30 P.M. to 8:00 P.M., and pick up commuter rail passengers at any point along the route and then deliver them to a station in accordance with scheduled departures. Farwell and Marx did not provide information on the type of vehicle used, but from information gathered at PRTC’s current Web site, it appears the service uses small shuttle buses and vans.

Feeder service commenced in December 1994 with three routes feeding two stations (meeting three trains each during both A.M. and P.M.). After three months of operation, a fourth route was added and all routes then began meeting four morning and five evening trains. According to the case study, ridership on the system increased 250% over the course of eight months achieving an average of 8.3 passengers per trip. (The researchers expected that this would increase to over 10 after 12 months of service.) At one overcrowded station in particular, the system successfully captured 33% of the commuter rail riders and accordingly reduced congestion in their crowded parking lots.

Apparently, one of the reasons the feeder system became popular was the availability of free transfer to the commuter rail. According to

⁵ GIS was used to identify potential market densities, service coverage area, suitable roadway networks, demand distribution, etc.

Farwell and Marx, the results of a survey conducted just prior to their study indicated that 52% of feeder bus passengers either started taking the train or continued to take the train due to the feeder's existence.

Other than during a short, but taxing overlap period, the remainder of the day, from 7:30 A.M. until 6:00 P.M., belongs to the innovative "hybrid" system, now called OmniLink.⁶ This aspect of the overall system was designed to provide access to key services such as health-related and shopping-related activities for all residents. This system is essentially a manually dispatched, route-deviation service and was difficult to plan and implement, and provides a fine example of how to plan for human services. According to Farwell and Marx, extensive use of GIS was incorporated to generate a "transit-needs database." Key indicators of potential transit use were identified at the Census block group level. These indicators included population and household densities, elderly populations, youth populations, household incomes, and households without cars. Other considerations examined via GIS included the location of activity hubs and the impassibility of local street networks, all of which helped generate logical, prospective routes. The routes were shared with major human-service providers in the area for their input, which was included in the initial route section.

Once route planning concluded, other major planning hurdles were tackled such as capacity needs, scheduling, dispatching, and the amount of deviation from the route. Of these, Farwell and Marx noted that scheduling and deviation were particularly challenging, however PRTC planners established basic service objectives that sought to assure schedule adherence, facilitate accessibility for the riders at stops, and allow sufficient flexibility for deviation from routes (Farwell et al., 1996). It was determined that customers would be required to call-in a request for deviation to a dispatch at least a day in advance. Moreover, because scheduling would be tight, only a certain number of deviations could be allowed per trip, and

⁶ Farwell and Marx point out that demand during these periods pushes the limits of vehicle availability.

the maximum distance for a deviation was set at .75 miles from any given route.

Using the available data and their professional judgment, planners decided to initially limit operations to three routes and expand conservatively if warranted. Furthermore, planners established the following rules for deviated service in order to maintain the highest level of service standards for all of their customers:

- All route deviations must be scheduled, and drivers cannot make unscheduled stops.
- Riders must call a dispatcher to request service at least a day prior and then will only be picked up if there is time available during a given trip schedule.
- Door-to-door service would be available only to those who could be "certified" as unable to reach specified pick up points.

Operations commenced in April of 1995. During the five months of operation covered in this study, call-in (deviation) service was so popular that service was capped as to not adversely effect overall system performance (Farwell et al., 1996). Apparently, the demographic analysis was right on target as many of the potential customers identified by GIS were seeking to utilize the service. Boardings on all three routes rose steadily during the evaluated period.

In evaluating OmniLink, Farwell and Marx examined several factors including average daily passenger trips, percent of call-in ridership, boardings, and net cost per passenger. During the planning process, PRTC established a ridership goal of 12 passengers per service hour after 12 months, and a net cost per passenger of \$2.69 after 12 months.⁷ The researchers noted that OmniLink could be considered an initial success as ridership goals were either being met or were showing tangible signs of being met within months.⁸ After five

⁷ Net cost per passenger may have been adjusted over the course of the first 5 months of operation, but was set at \$2.69 at the time of Farwell and Marx's study.

⁸ At the time of Farwell and Marx's study, the system was growing rapidly thanks to heavily congested roads. Such congestion is a major determinant of success for any shuttle service according to Minerva et al.

months of operation, OmniLink achieved 6.6 passengers per service hour, which was over halfway to the established ridership goal. Also, thanks to this increasing ridership, the net cost per passenger came down steadily. When the system started in April 1995, the net cost per passenger was over \$20. However, after only 4 months of operation the net cost per passenger was down to \$5.33 (Farwell et al., 1996).

By combining the commuting market with its approximate 10 riders per trip, and general or human service market with its approximate 12 riders per trip, PRTC was able to maintain ridership at a level high enough to keep costs reasonable and thus sustain the system. No further studies on the OmniLink family of services is available, however a follow up look at this service may yield interesting benefits to suburban systems in Massachusetts.

Finally, while not mentioned in the case study, the PRTC appears to recognize the need for marketing and outreach. While researching additional background on this case study, CTPS staff found that the PRTC maintains a Web site that provides a wealth of information on the agency itself, services offered, routes, and incentive programs in an extremely user-friendly environment. Moreover, the Web site serves as a communication mechanism. The site provides information on new projects such as the implementation of Intelligent Transportation Systems (ITS) applications, customers can contact OmniRide through the site, and new riders are encouraged to fill out a general survey to benefit both the agency and the rider.

Summary of Findings from the Literature

As pointed out in the literature, providing suburban transit is not an easy task. Planning, implementing, and promoting services designed to address mobility needs across jurisdictional and institutional boundaries requires a great deal of collaboration on a regional basis (TCRP Web 7, 2000). However, flex route, demand response, employer shuttles, and feeder systems have shown the ability to provide responsive service and effectively compete for

small markets in the suburban environment. Unfortunately, a universal model for success is difficult to define. Stakeholders tend to measure success in a largely subjective manner that is relative to their systems goals and objectives.

As such, before applying for funds, a prospective mobility management agency should be required to do its homework. The list below is a compilation of techniques seen throughout the literature, and applicable here in Massachusetts. The MPO may implement a bidding process whereby agencies seeking to become suburban transit providers/mobility managers must provide a business plan containing the information suggested below before funding will be approved.

Taken together, these items may form a guide to success for prospective mobility providers. In fact, according to representatives from the Boston based commuter assistance company, CARAVAN for Commuters, while no national or state level case studies have been performed on them, several mobility providers in Massachusetts are already using these techniques with some degree of success.

- 1) Because the measures of success are tied to a system's purpose, providers must clearly identify the reason for starting or expanding the service. Each reason will have unique evaluation and performance criteria.
 - Reducing congestion's impacts
 - o Employer shuttles
 - o Transit shuttle (feeder)
 - Human services
 - o Elder care
 - o All non-drivers regardless of the reason.
- 2) Identify the service's potential target markets and their characteristics. For example:
 - Choice commuters: Peak period travelers. They are well-paid workers who will normally drive to work unless travel is too difficult or transit incentives are provided, or both.
 - Transit-dependent commuters: Peak period

travelers. They lack access to an automobile and/or the ability to use one. They are within the normal working age groups but may include a higher portion of low wage earners.

- Transit-dependent service-based travelers: Probably both peak and non-peak period travelers. They lack access to an automobile and/or the ability to use one. Elderly, persons with disabilities, too young, too ill, driving privileges revoked.
- Transit-dependent shopping/entertainment-based travelers: Probably non-peak period. They lack access to an automobile or the ability to use one, or do not wish to drive.

Note: The examples listed above are not the only potential suburban markets and as presented, some may overlap. Local agencies will increase their chances of successfully serving their customers by describing their characteristics in as much detail as possible.

- 3) Identify activity centers, also referred to as hubs, within the area to be served. The prospective agency should at least indicate the location of the following:
 - Employment hubs: Office parks/campuses, industrial complexes, etc.
 - Service hubs: Government and medical services.
 - Shopping/entertainment hubs: Regional shopping malls and commercial corridors.
- 4) Assess the size of the market (potential demand).
 - Conduct ridership forecasts or other market estimations.
 - Match target markets with destination hubs.
 - Determine supply requirements. How many buses/vans will be required?
 - Determine cost of service.
 - Plan appropriate routes.
- 5) Establish partnerships.

- Contact employers to better tailor service and to help with marketing/incentives/subsidies.
 - Contact TMAs for technical and marketing assistance.
 - Contact existing transit agencies to coordinate the linkage of systems for greater mobility.
- 6) Develop an aggressive marketing plan. Many potential customers are unfamiliar with non-traditional transit, or transit in general. Agencies must be prepared to reach out to the market.
 - Flyers/posters in well-traveled areas well before start of service.
 - Employer representation. (See #5 above)
 - Direct mailing to potential customers in service area.
 - Newspaper ads.
 - Radio/TV ads when affordable. Services created for the public good may seek public service advertising time.
 - Internet resources (Pace and OmniRide are great examples)
 - 7) Future land use intervention
 - Develop transit-friendly design guidelines for public works engineers. (Check list developed by PACE is an example.)
 - Develop transit-oriented land use guidelines for local officials and planners.



CHAPTER 2

ROUND TABLE DISCUSSION

The Suburban Transit Round Table Discussion was conceived as a practical supplement to the other research being conducted by CTPS. Held in the Boston MPO conference room, the purpose of the discussion was to provide an opportunity for suburban transit operators to share information on the experiences, techniques, and strategies they use in running their services. This was the first time such an event has ever been held in the MPO area, and the discussion proved to be an informative and worthwhile experience for all who attended.

Invitations to participate were sent to all suburban transit providers in the MPO area, including the MBTA and TMAs such as CARAVAN for Commuters. Attendees included representatives from the 128 Business Council, Natick Neighborhood Bus, Lexpress, TransAction Associates, Inc., CARAVAN for Commuters, the Metropolitan Area Planning Council (MAPC), MassHighway, and the MBTA.

The discussion was moderated by project members from CTPS, and was preceded by a presentation of key findings from the suburban transit literature review. After the presentation, the representatives were invited to discuss how they accomplish the following: measuring success, marketing, creating service plans, forming partnerships, and participating in land use decisions.

Several providers were very eager to share their experiences, while others were less so – for reasons that will be explained at the end of this section. Otherwise, the responses in most cases echoed many of the research findings uncovered while performing the literature review. For example, the discussion confirmed the importance of marketing suburban systems, and provided insight as to which techniques work and which are less useful. The providers also discussed how to best approach land use and transit compatibility issues, and most felt that it was important to work directly with local governments, and even developers, to accomplish change.

The discussion also had two other benefits. First, some of the providers had never actually spoken face to face prior to this meeting. As a result of this round table, the attendees were able to open up lines of communication for further sharing of information and occasional partnering.

Second was the formation of trust between planning agencies and the service providers. After the event concluded, several attendees expressed some misgivings as to the actual purpose of the event and had been hesitant to attend. This was apparently due to the often-controversial nature of some suburban systems and their funding. However, by the conclusion of the discussions, their fears proved unfounded and they understood that the round table was genuinely intended as a workshop for finding ways to make suburban transit function better.

Now that these misgivings have been cleared away, it may be productive to hold another such event at a later date. In fact, it may be useful for service providers to meet on a semi-annual basis to discuss the successes and failures of their most recent efforts in a non-politicized environment where they can learn from one another.



CHAPTER 3

RESULTS OF SUBURBAN TRANSIT SERVICE PASSENGER SURVEY

BACKGROUND

As part of this study, questionnaires were distributed to passengers on 11 suburban transportation systems serving communities within the study area. These included 5 systems that receive funding from the MBTA's Suburban Carrier Program, 4 funded through TMAs, 1 funded by an individual office complex, and 1 operated by a municipality.

The majority of the Suburban Carrier Program systems covered in the survey were designed for general-purpose transportation within a single city or town, but some of them also link two or more municipalities. All of them also have direct connections with one or more MBTA commuter rail or bus routes. The systems surveyed were the Burlington Bus B Line, the Beverly Shopper's Shuttle, the Dedham Bus, the Framingham LIFT, and the Natick Neighborhood Bus.

The TMA systems were designed primarily to provide connections from MBTA rapid transit or commuter rail stations to office or manufacturing complexes outside of the urban core. The systems surveyed were the Route 128 Business Council's Alewife and Needham Shuttles, the Neponset Valley TMA's Rail Link #2 (Route 128 Station), and the Metrowest/495 TMA's Southborough Rail Link. Two of these, the Alewife and Southborough systems, also offer service from limited numbers of residential locations to their rail connections for commuting toward Boston. All four systems operate only during AM and PM peak commuting hours. (Inbound AM and outbound PM trips on the Alewife system are identified as the Windsor Village Shuttle.) The two independent services surveyed, the Peabody Transit Commuter Shuttle, and the Clock Tower Place (Maynard) shuttle, are more similar in purpose and operating characteristics to the TMA services than to the Suburban Transportation Program services.

SURVEY DISTRIBUTION STRATEGY

The survey distribution strategy was similar to that used in surveys of MBTA services in recent years. On a selected day on each route, CTPS data collectors rode every trip from the first departure of the day until the last departure prior to 3:30 PM (On routes with no midday service, the survey span ended with the final AM peak trip.) Every passenger on each surveyed trip was offered a questionnaire, which could either be completed and returned to the survey distributor during the trip, or completed later and returned to a bus driver for forwarding to CTPS. The rationale behind limiting the survey to passengers boarding during AM peak or midday hours is that the vast majority of the users of a transit route on a given day will use it to return from as well as to travel to their destinations. Most of these riders will make at least their initial trips of the day prior to the PM peak, and will therefore have at least one opportunity to obtain survey forms when the CTPS distribution strategy is used.

In addition to distributing the surveys, the data collectors recorded boardings and alightings by stop on each route. Assuming that surveys were completed by representative cross-sections of the riders on each route, the percentage responses to the survey questions can be applied to the count totals to estimate absolute numbers of passengers with various characteristics or opinions. The schedule of this study necessitated distributing the surveys during summer months, when ridership would be expected to be below-average because of vacations. However, given the limited ridership levels on the routes in question, the absolute differences between summer and non-summer ridership would be small. The Suburban Transportation Program routes would be expected to carry more students during non-summer months, but experience has shown that students under the age of 18 are among the least likely passengers to respond to surveys in any case.

FINDINGS

The surveyed routes included all of the routes of three systems and one route from a fourth that are the subject of case studies in Chapter 4 of this report. These are the Alewife/Windsor Village Shuttle, Burlington Bus B Line, Natick Neighborhood Bus, and Framingham LIFT Route 7. Findings from the surveys on those routes are incorporated directly in the case studies. Highlights of the survey results from the other systems and routes are presented below.

BEVERLY SHOPPER'S SHUTTLE

This service was instituted in 1987 under the MBTA Suburban Transportation Program. Most trips run on a "figure 8" route with some side branches; the center of the "figure 8" is in downtown Beverly. Weekday trips depart hourly between 6:45 AM and 5:45 PM from the Bridge Street Variety Store near the Danvers town line, except that a single round trip to the North Beverly Plaza runs in place of one midday trip on the regular route. Connections with the MBTA Newburyport/Rockport commuter rail line can be made at Beverly Depot. Connections can also be made at several points with MBTA bus Route 451 (North Beverly-Salem). However,

there is little coordination between the Shopper's Shuttle schedule and those of the MBTA train or bus services.

The survey span included all trips from the start of service through the 2:45 PM trip, completed at 3:45. The total passenger count on the survey trips was 54. Surveys were filled out by 30 of the passengers, making a response rate of 56%. Of the respondents who specified actual trip origins and destinations, all but one were traveling entirely within Beverly. The exception was a commuter traveling from home in another North Shore town to work in Beverly by transferring from an inbound Newburyport train to the Shopper's Shuttle. Another passenger completed a trip within Beverly by transferring from the shuttle to MBTA Route 451. Other than these, all respondents walked from their origins to their boarding stops and from their alighting stops to their destinations.

All of the respondents were either starting from home (93%) or returning home. Despite the name Shopper's Shuttle, only 41% of the respondents listed shopping as the activity at the beginning or end of the trip. Trips between home and unspecified "other" activities were second, at 24%, and trips between home and work locations third, at 21%.

Middle-aged or senior passengers were predominant with 96% age 45 or older and 41% age 65 or older. The riding population was evenly divided between males and females. Of the passengers answering the income question, 95% reported annual household incomes of \$20,000 or less and none reported incomes over \$29,999.

Although 31% of the respondents reported having valid driver's licenses, 96% did not have autos available for the trip made on the survey day. The most common reason cited for using the shuttle was "only transportation available" (52%), with "convenience" (48%) second. Passengers were asked to choose at most two reasons from a list on the survey. "Inexpensive way to travel" was the only other reason cited, at 21%.

Nearly half of the survey respondents (47%)

used the shuttle five days a week, and another 7% used it six days a week. Only 17% rode fewer than three days a week. (The shuttle was one of the few services in the study with Saturday service, but the survey was conducted only on weekdays.) Most of the respondents had made the same trips by other means before using the shuttle, with 53% having walked, 20% having gotten rides, and the rest using various other alternatives. This suggests that many of these passengers still had other options instead of using the shuttle, and may explain why half of those without cars cited “convenience” rather than “only transportation available” as the reason for using the shuttle.

Marketing efforts apparently had little effect in attracting ridership. The most common ways that passengers had learned about the shuttle were by seeing it (62%) or hearing about it from a friend or relative (28%).

Dedham Bus

The Dedham Bus has been funded through the MBTA suburban program since 1984, but it was a pre-existing system. Most of the present coverage has been included in routes operated by various private carriers (and briefly by the MBTA) since the 1920s or '30s. Service is now provided by one route, with variations. The basic route runs from Dedham Manor to a connection with MBTA bus Route 36 at Spring Street (Charles River Loop) in West Roxbury, just outside Dedham. Ten round-trips are operated on weekdays only, with the first departure from Dedham Manor at 6:45 AM and the last arrival there at 5:10 PM. Trips from late morning until end of service make side diversions to the Dedham Mall. Two early-morning and two late-afternoon trips run via East Street to serve Dedham High School. In addition to the Route 36 connection at Spring Street, the Dedham Bus intersects MBTA Route 52 there, and Route 34E at Dedham Square. The Dedham Bus also passes within a short distance of Endicott Station on the Franklin commuter rail line, but there is little coordination between the Dedham Bus schedule and those of the MBTA train or bus services.

The survey span included all trips from the start of service through the 3:00 PM trip from Dedham Manor. (This trip arrives at Spring Street at 3:35.) The total passenger count on the surveyed trips was 28. Surveys were filled out by 17 of the passengers, making a response rate of 61%. Of these responses, 82% showed actual trip origins and destinations both within Dedham. Of the rest, 12% (2) were going from Dedham to points in West Roxbury, and 6% (1) from West Roxbury to Dedham. None of the West Roxbury passengers used connecting MBTA bus service but two passengers completed trips in Dedham by transferring to Route 34A.

The majority of the respondents (88%) were either starting from home or returning home, with the rest traveling between a work or shopping location and a location other than home. The most common trip purposes were travel between home and work (35%) and travel between home and a medical appointment or between home and other unspecified activities (18% each).

Middle-aged or senior passengers were predominant, with 88% age 45 or older and 47% age 65 or older. Female passengers outnumbered males 73% to 27%. Of the passengers answering the income question, 53% reported annual household incomes of under \$20,000, but there were some responses from all ranges except \$80,000 or greater.

Only 6% (1) reported having a valid driver's license, and none had autos available for the trip made on the survey day. The most common reason cited for using the Dedham Bus was “only transportation available” (71%), with “convenience” (53%) second. Passengers were asked to choose at most two reasons from a list on the survey, but no other reason was indicated on more than one survey.

The most common reported frequency of use of the Dedham Bus was five days a week (41%), followed by three and four days at 29% each and none less frequent. The Dedham bus has no weekend service. Because of the length of time that the Dedham Bus (or predecessors) has been running, the survey question on mode

used before the service started did not pertain as worded, but survey respondents indicated modes they had used before switching to the bus. The most common prior means of travel was walking, at 41%, but 29% had not made the same trip by any other means. Most of the rest (24%) had gotten rides.

Marketing efforts apparently had little effect in attracting ridership. The most common ways that passengers had learned about the Dedham Bus were by seeing it (50%) or hearing about it from a friend or relative (19%). Only 6% (1 respondent) had been attracted by information in a newspaper.

Framingham LIFT

The Framingham LIFT system currently consists of five routes, numbered 2, 3, 5, 6, and 7. A sixth route, LIFT 4, was in operation when the surveys were conducted. It has since been discontinued because of low ridership, but the information obtained from the surveys is still of some interest for the lessons learned. LIFT 7 is the subject of a case study in this report, and some of its survey results are also discussed in Chapter 4.

The LIFT system was established in 1984 under the MBTA suburban program, but there have been some changes to the route structure over the years. LIFT 2 and 3 are clockwise and counter-clockwise routings of the same loop route connecting downtown Framingham with Framingham Center, Nobscot, Saxonville, Shoppers World, and Natick Mall. Private-carrier bus service between downtown Framingham and most of these points had been discontinued a few years before the establishment of LIFT. The oldest segments of the earlier bus routes had replaced trolley lines in the 1920s, and most of the newer segments had been run since the 1940s.

LIFT Route 4, now discontinued, was the only LIFT route entirely outside Framingham. It ran from Milford via Hopkinton to the Southborough commuter rail station, and was established soon after that station opened in 2002.

LIFT Route 5 runs from Hopkinton to Framingham via Ashland. It was added to the LIFT system as part of the MBTA Interdistrict Transportation Service program about 1987. Private-carrier bus service on this route had ended a few years earlier, after dwindling to one round-trip per day. Bus service on this route had originally replaced a trolley line in the 1920s.

LIFT Route 6 runs from Milford to Framingham via Holliston and Ashland. It was added to the LIFT system in 1990. Operation of this route had been funded through the Interdistrict program separately from the LIFT system since 1987. Private-carrier bus service had been run on the route since the 1920s, when it replaced a trolley line.

Survey Results – LIFT 2 and 3

Both of these routes have hourly service on weekdays, with the first departure from downtown Framingham at 6:30 AM and the last arrival at 7:30 PM. The downtown Framingham terminal is near the commuter rail station, but most LIFT and train schedules are not well coordinated. The survey spans on both routes ran from the first departure to the 2:30 PM departure, which arrived back at downtown Framingham at 3:30. During this span, LIFT 2 had 116 riders and 59 returned surveys, for a response rate of 51%. LIFT 3 had 143 riders and 47 returned surveys, for a response rate of 33%.

On both routes, the vast majority of survey respondents (88% on LIFT 2, 87% on LIFT 3) had actual trip origins within Framingham. Responses from individual cities or towns outside Framingham ranged from 1 to 4 each on LIFT 2 and 3 combined. The origins outside Framingham included only 2 respondents transferring from commuter rail. One was a reverse-commuter going from home in Boston to work in Framingham. The other was a Framingham resident returning home from work in Brookline.

On LIFT 2, final destinations in Framingham were reported by 71% of respondents, with almost all of the rest (27%) going to Natick. On LIFT 3, 61% of reported destinations were in

Framingham, 28% in Natick, and the rest scattered. Almost all of the Natick passengers alighted at one of the LIFT 2 or 3 stops at the Natick Mall or Sherwood Plaza in that town, just outside Framingham. LIFT 2 had no responses from passengers transferring to commuter rail. LIFT 3 had 3 commuter rail transfers, with one each destined for Boston, Newton, and Waltham. (The Waltham passenger transferred from the train to an MBTA bus.)

On both routes, the majority of passengers were coming from home (76% on LIFT 2, 79% on LIFT 3). Most of the rest were returning home (20% on LIFT 2, 21% on LIFT 3). The majority of passengers who filled out surveys for one half of a round-trip did so on the first half rather than the return half, and the hours covered in the survey would have included a higher proportion of initial trips than return trips. Trips from home to work or work to home accounted for the largest shares of ridership on both routes (51% on LIFT 2, 61% on LIFT 3). Trips from home to shopping or return were next, at 29% on LIFT 2 but only 15% on LIFT 3. Although both routes stop at the same malls, more homes have shorter access times via LIFT 2 than via LIFT 3.

Ridership was not strongly weighted toward any particular age group. For the two routes combined, the proportion of respondents age 65 or older was somewhat higher than that of the Framingham population in general (20% versus 13%). On LIFT 2, responses came equally from male and female passengers, but on LIFT 3 females outnumbered males 70% to 30%. On both routes, among passengers who answered the household income question, the largest single category was “Under \$20,000,” at 45% on LIFT 2 and 55% on LIFT 3. At the opposite extreme, 5% of the riders on each route had household incomes of \$80,000 or more.

On LIFT 2, only 36% of respondents had driver’s licenses, and only 7% had autos available for their trips. The corresponding figures on LIFT 3 were 55% and 19%. On both routes, the most common reason cited for using the service was “only transportation available” (49% on LIFT 2, 51% on LIFT 3), followed closely by

“convenience” (47% and 46%). Significant numbers (29% and 24%) also checked “inexpensive way to travel.”

LIFT 2 and 3 both have Saturday service, though with shorter operating spans than on weekdays. Among LIFT 2 respondents, 41% were five-day riders and 18% were six-day riders. The corresponding figures on LIFT 3 were 32% and 16%. Both routes had fairly high numbers of infrequent (one day or less per week) riders at 13% on LIFT 2 and 21% on LIFT 3. The most common reported means of transportation prior to use of LIFT service were walking and getting rides, at 30% each on LIFT 2 and at 37% and 22% on LIFT 3. On LIFT 2, “did not make trip” was third, at 19%, followed by driving alone, at 11%. On LIFT 3, these alternatives were tied at 16% each.

As on the other surveyed services, marketing strategies were found to have had limited results in attracting riders. The greatest number of LIFT 2 riders (40%) learned about it from a friend or relative, with seeing a LIFT bus next, at 33%. Newspaper information was cited by 9% and e-mail or Web site information by 5%. On LIFT 3, seeing a bus was the most common way of learning of the service, at 49%, followed by hearing from a friend or relative at 43%. Newspaper and Web site information were cited by only 2% each.

Survey Results – LIFT 5

When the survey was conducted, this route had eight inbound (toward Framingham) and seven outbound trips on weekdays. The first trip left Hopkinton at 6:45 AM, and the last arrived there at 6:45 PM. Most of the service was concentrated in peak hours, but there were also a few midday trips. This route includes a stop directly at the Framingham commuter rail station, and also passes near the Ashland station, but the train and bus schedules are not well coordinated.

The survey span ran from the first Hopkinton departure until the 2:00 PM departure, which arrives in Framingham at 2:30. The total passenger count on these trips was 43. Surveys were filled out by 26 of the passengers, making

a response rate of 61%. Of these respondents, 44% showed actual trip origins in Hopkinton, 28% in Ashland, 24% in Framingham, and 4% (1 survey) in Upton, the next town west of Hopkinton. Reported final trip destinations were 48% in Framingham, 24% in Natick, 16% in Ashland, 8% in Hopkinton, and 4% in Holliston. Some of the passengers destined for points not served by LIFT 5 completed their trips by using other LIFT routes, but no transfers to or from commuter rail were reported.

The majority of the respondents (85%), were starting from home, with most of the rest (12%) returning home. Trips from home to work or work to home accounted for 50% of all responses. Trips between home and other unspecified destinations were next, at 15%. Trips between home and shopping locations and trips between home and medical appointments each accounted for 11%. No particular age group was predominant, but senior citizen use was unusually low at only 4%. Female passengers outnumbered males 75% to 25%.

Of the passengers answering the income question, 50% reported annual household incomes of under \$20,000, but there were some responses from all ranges listed on the survey form except \$60,000 to \$79,999. The highest income range, \$80,000 or above, was checked by 9%.

Although 40% reported having a valid driver's license, only 4% had autos available for the trips made on the survey day. The most common reason cited for using LIFT 5 was "only transportation available" (75%), with "convenience" (29%) second. "Inexpensive" was third, at 8%.

LIFT 5 runs only on weekdays. The most common reported frequency of use was five days a week (71%), followed by four days at 17%. The rest were equally divided between three days, two days and less than one day. The most commonly reported prior means of travel was "got a ride" at 38%, but 29% had not made the same trip by any other means. The rest were scattered among other modes.

Marketing efforts apparently had little effect in attracting ridership. The most common ways

that passengers had learned about LIFT 5 were by seeing it (46%) or hearing about it from a friend or relative (42%). None had been attracted by information in a newspaper, and only one by Internet information.

Survey Results – LIFT 6

When the survey was conducted, LIFT 6 had only two round-trips over the full length of the route, both during midday. There were also three short-turn round-trips between Framingham and the Shaw's Plaza in Ashland. All trips stopped either at or near the Framingham commuter rail station. (In September 2003, in conjunction with the discontinuance of LIFT 4, some peak-period service was restored on LIFT 6, and midday schedules were revised.)

The survey included the two Ashland short-turns in the AM peak, one Milford round-trip, and the outbound trip leaving Framingham at 2:30 and arriving in Milford at 3:30. The total passenger count on these trips was 23. Surveys were filled out by 12 of the passengers, making a response rate of 52%. Of these respondents, 36% showed actual trip origins in Framingham, 27% in Ashland, and 18% each in Milford and in Hopedale, the next town beyond Milford. Reported final trip destinations were 30% each in Ashland and Framingham and 10% each in Milford, Hopkinton, Marlborough, and Natick. Most of the passengers destined for points not served by LIFT 6 completed their trips by using other LIFT routes, but no transfers to or from commuter rail were reported.

The majority of the respondents (83%) were starting from home, with the rest returning home. Trips between home and work and trips between home and shopping each accounted for 33%. Trips from home to court were next, at 25%, with trips from home to school accounting for the remaining 8%.

The most common reported age groups were 25 to 34 (36%) followed by 45 to 64 (27%) and 65 or over (18%). Female passengers outnumbered males 73% to 27%. Of the passengers answering the income question, 82% reported annual

household incomes of under \$20,000, and the rest \$20,000 to \$29,999.

Although 64% reported having a valid driver's license, only 30% had autos available for the trip made on the survey day. The most common reason cited for using LIFT 6 was "only transportation available" (56%), with "convenience" (22%) second.

LIFT 6 runs only on weekdays. The most common reported frequency of use was five days a week (46%), followed by four days at 27% and two days at 18%. The most commonly reported prior means of travel was "drove alone," at 27%, but 18% had not made the same trip by any other means, and another 18% had walked. The rest were scattered among other modes.

Marketing efforts apparently had little effect in attracting ridership. The only reported ways that passengers had learned about LIFT 6 were by hearing about it from a friend or relative (67%) or seeing it (33%).

Survey Results – LIFT 7

On weekdays, inbound service on this route begins with a short-turn from Lincoln and Pleasant streets in Marlborough at 6:45 AM. All subsequent trips depart from the Solomon Pond Mall, starting at 7:30 AM and continuing hourly until 6:30 PM, except that former 10:30 AM and 12:30 PM departures were eliminated shortly before the survey was conducted.

Outbound service from downtown Framingham begins at 6:30 AM and continues hourly until 6:30 PM, except that 9:30 and 11:30 AM trips have been eliminated. Weekend service on this route is not operated as part of the LIFT system, but Gulbankian Bus Lines runs a Saturday-only route on a similar alignment under contract with the MBTA.

Surveys were distributed on all trips in each direction from the first departure of the day up to and including the 2:30 PM departure. The inbound and outbound trips served somewhat different markets, so the results are discussed separately below for the two directions. During the survey period, the inbound LIFT 7 had 68 riders and 31 returned surveys, for a response

rate of 46%. LIFT 7 outbound had 71 riders and 48 returned surveys, for a response rate of 68%. The two-way combined response rate was 57%.

On inbound trips, Marlborough accounted for the largest share of actual trip origins at 55%, followed by Framingham at 32%. The remaining 13% of trips all originated in Southborough. Outbound, 51% of the trips originated in Framingham, 18% in Marlborough and 4% in Southborough, but 27% originated in cities and towns not served directly by LIFT 7. Almost all of the latter transferred to LIFT 7 from commuter rail at Framingham Station, but 4% transferred from other LIFT routes. Among the commuter rail transfers, no individual city, town, or Boston neighborhood accounted for more than one survey response.

On inbound trips, 71% of the reported final destinations were in Framingham, 10% in Marlborough, and 3% in Southborough. The other 16% were in cities and towns not served directly by LIFT 7. Most of these trips included transfers to commuter rail. All of the outbound trips ended in one of the three municipalities served by LIFT 7, with 58% ending in Marlborough, 34% in Framingham, and 6% in Southborough. Most of the outbound passengers (92%) completed their trips by walking, but 8% were picked up.

The majority of LIFT 7 passengers in each direction (81% inbound, 73% outbound) were coming from home. Most of the rest (13% inbound, 21% outbound) were returning home. As on the other LIFT routes, the majority of LIFT 7 passengers who filled out surveys for one half of a round-trip did so on the first half rather than the return half, and the hours covered in the survey would have included a higher proportion of initial trips than return trips. Trips from home to work or work to home accounted for the largest shares of ridership in each direction (52% inbound, 48% outbound). Trips from home to shopping or return were next, at 19%, outbound, but were only third, at 13%, inbound. The outer terminal of LIFT 7 is at a large shopping mall. Many of the passengers using LIFT 7 to return home from shopping

trips to the mall would not have done so until after the end of the survey span. Those returning on surveyed trips would already have had a chance to fill out surveys on their outbound trips.

The distributions of riders by age range differed between inbound and outbound trips.

Inbound, the most common age range was 45-to-64, at 48%, followed by 35-to-44, at 24%. Ages 25 to 34 were next, at 17%, with the remaining 10% age 65 or over. There were no responses from riders under age 25. This was partly a result of the survey having been conducted in July. Survey response rates from students under age 18 are usually low in any case, but Framingham State College, which is directly on LIFT 7, would be expected to generate more ridership at other times of year.

Outbound ridership showed a greater distribution of ages. The largest concentration was a tie between 35-to-44 and 45-to 64, at 27% each, but 18-to-24 was close behind, at 22%. The 25-to-34 age range was about equally important outbound as inbound (18% versus 17%), but only 7% of outbound riders were age 65 or over. There were no responses from outbound riders under age 18.

Responses on outbound trips came about equally from male and from female passengers (52% versus 48%), but on inbound trips male respondents outnumbered females 60% to 40%. In both directions, among passengers who answered the household income question, the largest single category was Under \$20,000, at 56% inbound and 51% outbound. At the opposite extreme, 6% of the outbound riders, but none of the inbound riders had household incomes of \$80,000 or more.

The number of passengers with driver's licenses varied significantly by direction, with 45% of the outbound riders but only 26% of the inbound riders being licensed. Only 10% of the outbound riders and only 4% of the inbound riders had autos available for their trips.

Among inbound riders, the most common reason cited for using the service was "only transportation available" (58%) followed closely by

"convenience" (50%). Among outbound riders, these two reasons were tied at 42% each. Significant numbers (23% inbound, 15% outbound) cited "inexpensive way to travel." (Passengers could indicate up to two reasons, so the reported totals added to over 100%)

The percentages of five-day a week riders on LIFT 7 were similar inbound (55%) and outbound (58%). However, four-day use was much more common inbound (21%) than outbound (7%). Occasional use (one day a week or less) was slightly more common outbound (5%) than inbound (3%).

The percentages of LIFT 7 riders who had not previously made the same trip by other means were about equal inbound (36%) and outbound (37%). Inbound riders were much more likely than outbound riders to have gotten rides previously (43% versus 24%). Outbound riders were more likely to have driven alone previously (12% versus 4%).

As on the other surveyed services, marketing strategies were found to have had limited results in attracting riders to LIFT 7. The greatest number of inbound riders (58%) learned about it from a friend or relative, with seeing a LIFT bus next, at 23%. Newspaper information was cited by 13%, but none cited e-mail or Web site information. The remaining 6% learned of the service from their employers. Among outbound riders, seeing a bus was the most common way of learning of the service, at 38%, followed by hearing from a friend or relative at 33%. Newspaper information and information from employers accounted for the same percentages outbound as inbound (13% and 6%), but 8% of outbound riders got their information from a Web site.

Survey Results – LIFT 4 (discontinued September 2003)

LIFT 4 was started in September 2002 as a feeder service to the recently opened Southborough commuter rail station. It was intended for use both by commuters going from homes in the communities along its route to work locations on the commuter rail route, and by commuters going to work locations on the bus route from

homes on the rail line. When the survey was conducted, LIFT 4 had five inbound AM peak trips and four outbound PM peak trips scheduled between Milford and Southborough Station. Reverse-commuting service consisted of one outbound AM peak trip and one inbound PM peak trip between Southborough Station and the EMC complex in Hopkinton. A previous schedule had provided more outbound AM peak and inbound PM peak bus service. This was intended to attract passengers arriving by train from points west of Southborough, but was unsuccessful.

The survey distribution plan was to cover all of the morning trips on LIFT 4. On the survey day, the first inbound trip did not run because of equipment failure. The second trip had only three passengers, and the last three trips had none. The outbound trip had one passenger. All four passengers filled out surveys, and all were going from home to work. The three inbound passengers all had actual trip origins in Milford and had walked to or were dropped off at their boarding stops. Two of them transferred to a train at Southborough Station and rode to Boston. One of these had a final destination in downtown Boston, and the other continued on from there by rapid transit. The third inbound passenger transferred to LIFT 5 in downtown Hopkinton to continue to a final destination in Framingham. All three passengers would now be able to make their trips by taking LIFT 6 from Milford to Framingham. The one outbound passenger on LIFT 4 had taken a train from Framingham to Southborough Station to get to work at EMC.

The outbound passenger had learned of the service from EMC. Two of the inbound riders had learned of it from friends and one from radio. At least two of the inbound passengers had an automobile available; previously drove alone or got rides, and used LIFT 4 for convenience. The outbound passenger did not have an auto available, had not made the same trip before LIFT 4 was started, and had no other transportation available for the same trip. All of the riders used the service either four or five days a week.

The experience of LIFT 4 is illustrative of the difficulties that can be anticipated in attracting riders to new transit services in suburban areas that have previously had little or no public transportation.

Needham Shuttle

The Route 128 Business Council instituted this service about three years ago, and runs from Newton Highlands Station on the D Branch of the Green Line to several businesses clustered on both sides of state Route 128 in Needham. The shuttle is primarily for the employees of participating companies who can ride for free with proper identification. The general public may also use the service for a \$2.00 fare. The present schedule provides five outbound AM peak trips and four inbound PM peak trips, but no off-peak service. There is one basic route, but for operational reasons the sequence in which stops are served varies among trips.

The survey coverage included all of the morning trips. The total passenger count on the survey trips was 35. Surveys were filled out by 26 of the passengers, making a response rate of 74%. As would be expected, all of the respondents were traveling from home to work. All but two were employees of participating companies in Needham. One of the cash-fare passengers had a destination in Newton. All of the passengers transferred to the shuttle from outbound Green Line trains. The majority (69%) began their trips somewhere in Boston. There were only one or two respondents each from any other city or town.

The most common age for passengers was 25 to 34 (50%), followed by 18 to 24 (38%). The rest were age 35 to 44. The riding population was evenly divided between males and females. There were some responses from every income range listed on the survey form. The largest group was in the \$40,000-to-\$59,999 range (33.3%). Only 12.5% had incomes below \$20,000, but 21% were above \$80,000.

Although 71% reported having valid driver's licenses, 92% did not have autos available for the trip made on the survey day. The most common reason cited for using the shuttle was

“only transportation available” (52%), with “convenience” (24%) a distant second. Passengers were asked to choose at most two reasons from a list on the survey. “Speed/travel time was cited by 16%, and “inexpensive way to travel” by 12%.

The vast majority of the survey respondents (84%) used the shuttle five days a week, and another 12% used it four days a week. None rode fewer than three days a week. Prior to the establishment of the Needham Shuttle, 42% of the respondents had not made the same trip by other means, but 25% had used other public transportation, 13% had walked (presumably from Newton Highlands), and 8% had car-pooled or vanpooled. The rest had used various other alternatives.

The majority of the respondents (89%) had learned about the Needham Shuttle from their employers. Another 8% had seen it.

Neponset Valley Rail Link 2

The Neponset Valley TMA instituted this service about three years ago. It runs from the Route 128 Station on the Attleboro/Stoughton commuter rail line to several businesses. It is open only to employees of participating companies. The present schedule provides eight outbound AM peak trips and four inbound PM peak trips, but no off-peak service. Bus departures and arrivals are scheduled for connections with specific trains. The combination of businesses served varies among trips. Several business that formerly participated no longer do so, with the result that ridership has dropped significantly from the 52 morning riders found in a December 2000 count.

The survey coverage included all of the morning trips. The total passenger count on the survey trips was 29. Surveys were filled out by 16 of the passengers, making a response rate of 55%. As would be expected, all of the respondents were traveling from home to work. All of them transferred to the Rail Link from outbound commuter rail trains except for one who transferred from an inbound train and one who was dropped off at the station. Half began their trips somewhere in Boston. There were only

one or two respondents each from any other city or town, including one from Rhode Island.

The most common age for passengers was 45 to 64 (54%), followed by 25 to 34 (23%) and 35 to 44 (15%). The rest were age 18 to 24. Female passengers outnumbered males 62% to 39%. There were some responses from every income range listed on the survey form except “Under \$20,000.” The largest group was in the \$40,000-to-\$59,999 range (36%). Over \$80,000 was second, at 27%, and \$20,000 to \$29,999 third, at 18%.

Although 69% of respondents reported having valid driver’s licenses, an equal percentage did not have autos available for the trip made on the survey day. Nevertheless, the most common reason cited for using the Rail Link was “convenience”(71%), with “only transportation available” second at (36%). Because passengers could indicate two reasons listed on the survey form, there was some overlap in these responses, with 21% indicating both. Of the 50% that cited “convenience” but not “only transportation available,” most had either made the same trip previously by other means or had autos available for the trip. Other reported reasons for using the service included “avoid driving/traffic,” cited by 21%, and “inexpensive way to travel,” cited by 14%

The vast majority of the survey respondents (79%) used the Rail Link five days a week, with the rest evenly divided between one, two, and three days. Prior to the establishment of the Rail Link, 46% of the respondents had not made the same trip by other means, but 23% had walked (presumably from Route 128 Station), and 15% each had driven alone or gotten rides.

Most of the respondents (94%) had learned about the Rail Link from their employers. The rest had seen it.

Clock Tower Place (Maynard) Shuttle

This service was instituted about 1999 by the developers of the Clock Tower Place office complex in Maynard. It runs from South Acton Station on the Fitchburg commuter rail line to Clock Tower Place, about two miles away. The

present schedule provides five outbound morning trips connecting with trains arriving between 7:58 and 10:32 AM, and four inbound trips, connecting with trains leaving between 5:07 and 8:57 PM

The survey coverage included all of the morning trips. The total passenger count on the survey trips was 19. (This was the same as the number observed in January 2001.) Surveys were filled out by all 19 of the passengers. As would be expected, all of them were traveling from home to work. All of them transferred to the shuttle from outbound commuter rail trains except for one who transferred from an inbound train and one who walked to South Acton Station from a home in the same town. Only 16% began their trips anywhere in Boston. Cambridge and Somerville, which are served by Porter Square Station, each originated another 16%. In absolute terms, no other city or town produced more than two trips. Intermediate stations along the line originated a total of 21%. Another 21% accessed the train via rapid transit service from points outside Boston.

The three age groups 18 to 24, 25 to 34, and 35 to 44 each originated 27% of the riders (5 each). There were 2 riders (11%) age 45 to 64, and 1 age 17 or under. Male passengers outnumbered females, 58% to 42%. There were some responses from every income range listed on the survey form except "\$80,000 or more." The largest group was in the \$60,000-to-\$79,999 range (47%); \$40,000 to \$59,999 and "under \$20,000" were tied for second, at 18% each.

Although 63% reported having valid driver's licenses, 74% did not have autos available for the trip made on the survey day. The most common reason cited for using the service was "environmentally responsible" (21%). This was the largest proportion citing this reason on any of the services surveyed. "Convenience" and "avoid driving/traffic" were the second most common reasons cited, at 16% each. Only 5% (1 passenger) checked "only transportation available."

The vast majority of the survey respondents

(79%) used the shuttle five days a week, with most of the rest using it four days. Prior to the establishment of the shuttle, 79% of the respondents had not made the same trip by other means, but 16% had driven alone and 5% (1) had walked (presumably from South Acton).

The majority of the passengers (84%) had learned about the shuttle from their employers. Another 11% had seen it, and 5% had learned of it via a Web site.

Southborough Rail Link

Southborough Station on the Framingham/Worcester commuter rail line opened in the summer of 2002. The Metrowest/495 TMA implemented the Southborough Rail Link in 2003. It includes two routes – the Westborough Shuttle and the Marlborough Shuttle. The Westborough Shuttle connects Southborough Station with several employment locations in the vicinity of Interstate Route 495 and state Route 9 in Westborough. The Marlborough Shuttle connects Southborough Station with several employment locations west of I-495 and south of U.S. Route 20 in Marlborough and also with downtown Marlborough. In addition, it provides connections to the station from downtown Marlborough and from a satellite parking lot on the border of Marlborough and Southborough for passengers going from homes in these towns to work locations served by other stations on the rail line.

The published schedule for the Westborough Shuttle shows three trips away from the station in the AM peak. All of these are scheduled to connect with inbound trains from Worcester, and one also connects with an outbound train from Boston. In the PM peak, two trips to the station are scheduled on this route, with one intended for an inbound train connection and the other for an outbound connection.

The published schedule for the Marlborough Shuttle shows three trips away from the station in the AM peak. All of these are scheduled to connect with inbound trains from Worcester, and one also connects with an outbound train from Boston. The first trip runs only to the area

west of I-495, but the other two are scheduled to run through to downtown Marlborough. Going toward the station in the AM peak, two trips are scheduled from downtown Marlborough via the satellite lot, and two more from the lot only. All of these are supposed to connect with inbound trains, and one also has an outbound connection.

In the PM peak, the Marlborough Shuttle has two scheduled trips from downtown Marlborough to the station via the I-495 employment areas, with one scheduled for an outbound train connection and one for an inbound connection. There are also three scheduled trips from the station to the satellite lot, with two connecting from outbound trains and one from an inbound train.

The survey strategy for this service called for distribution on all morning trips on both shuttle routes, but it was found that the first inbound trip from downtown Marlborough and the second short-turn from the satellite lot were often not run. Consequently, they could not be relied on and did not attract passengers. The first trip from the satellite lot and the second trip from downtown Marlborough were run, but also had no passengers. Of the three trips from the station to Marlborough, only the second had any passengers, and it had only two. This was the trip with both inbound and outbound train connections. On the Westborough route, the one trip with inbound and outbound train connections was also the only one with any passengers. It also had only two, but they told the survey distributor that there were usually four others with them.

All four passengers on the two shuttle routes were going to work and had transferred from outbound trains. Three had started from home, and one was returning from a vacation and would not ordinarily have used this service. All four boarded the train in Boston, with two having trip origins there and two first making connections from outlying points via other transit services.

Reported ages were all in the three ranges from 25 to 64. There were three male passengers, and one female. Reported incomes were all in

the three ranges from \$30,000 to \$79,999. Half had driver's licenses and half did not, but only one of the four had a car available for that trip. All of the choices of reasons for using the service listed on the survey form got one or two votes, except for "parking cost/availability" and "speed/travel time," which got none.

Of the three regular riders, two used the service five days a week and one used it three days. All three had previously made the same trip before, with two driving alone and one carpooling or vanpooling. One had learned about the service from the employer, one from a Web site, and one from a friend. The one-time rider had seen the bus.

Peabody Transit Commuter Shuttle

This service was implemented by the City of Peabody in 1993 to supplement long-established private-carrier bus service between Peabody and Salem. The Peabody Transit service has always operated during peak hours only. All trips run to or from Salem Station on the Newburyport/Rockport commuter rail line. Several MBTA bus routes also serve that location. At present, during A.M. peak hours Peabody Transit runs four round-trips to Salem Station, with two originating at the North Shore Mall and two at the Centennial Park office complex. (The sequence of stops varies; so all trips serve both of these locations either inbound or outbound.) In PM peak hours there are five round-trips and a final one-way trip from Salem to Peabody Square.

The survey coverage included all of the morning trips. The total passenger count on the survey trips was 9. Surveys were filled out by 8 of the passengers, for a response rate of 89%. Trips from home to work were reported on 75% (6) of the surveys, with the remainder consisting of a trip from home to a medical appointment and a trip between two work locations.

Of the 8 respondents, 5 rode outbound trips, with all boarding at Salem Station and alighting in Peabody. One transferred from an outbound train, completing a trip from Boston. One transferred from an MBTA bus from another part of Salem. The rest walked to Salem

Station to access Peabody Transit. The three inbound passengers all started in Peabody and transferred to trains at Salem. At least two ended their trips in Boston.

All respondents who reported their ages were in one of the three groups from age 25 to age 64. Males outnumbered females slightly, 57% to 43%. The greatest number of responses on income was in the \$80,000 or more range, at 60%, with the rest split between \$20,000 to \$29,999 and \$40,000 to \$59,999. Although 57% reported having valid driver's licenses, 71% did not have autos available for the trip made on the survey day. The most common reasons cited for using the service were "convenience" and "only transportation available," tied at 38% each. "Parking cost/availability" and "speed/travel time" each got 12.5%.

The largest group of riders used the service five days a week (57%), with the rest evenly divided between four days, one day, and less than one day. Four of the respondents had first learned of the service from friends, two first saw it, one heard from an employer, and one got information at the city hall.

SUMMARY OF FINDINGS

As noted above, the eleven suburban transportation systems covered in the survey can be divided into two broad categories: general-purpose systems and feeder systems to rapid transit or commuter rail. Those in the latter category include routes intended primarily to provide access to suburban work locations for reverse-commuters and routes serving suburban residents with jobs in the urban core. Because of the different purposes of the two categories of routes, overall survey findings are most useful if examined separately for each category.

General-Purpose Systems

The general-purpose systems surveyed were the Beverly Shopper's Shuttle, Burlington B Line, Dedham Bus, Natick Neighborhood Bus, and Framingham LIFT system. (The now-discontinued LIFT Route 4 is classified as a feeder route for purposes of discussion.) The Beverly Shopper's Shuttle and the Dedham Bus each

have one base route, with variations. The Natick Neighborhood Bus has two routes. The B Line has six routes, run as three interlined pairs. LIFT (excluding LIFT 4) has five routes. Because of the loop configuration of several routes and the limited ridership on others, survey results were not tabulated separately by route direction except for LIFT 7. This resulted in a total of thirteen sets of summary tables for the general-purpose routes.

Distributions of Origins and Destinations

Each of the general-purpose routes surveyed makes at least one connection with MBTA rail or bus service, and several connect with other local routes. Nevertheless, all were found to be used mostly for trips entirely within the cities or towns that they served directly. For the group overall, 90% of passengers reported trip origins in municipalities served by their survey routes, and 93% reported destinations within these municipalities.

The only routes with more than 12% of trips originating in off-line communities were LIFT 7 outbound, at 31%, LIFT 6, at 18%, and Burlington B Line Route 2/5, at 14%. On LIFT 7, transfers accounted for most of the off-line origins from commuter rail passengers at Framingham, reported by 14 of the 48 survey respondents. On LIFT 6, 2 of the 11 respondents walked to the outer endpoint of the route from origins in the next town beyond. On B Line Route 2/5, 2 of 14 respondents transferred from MBTA buses at Burlington Mall.

The only general-purpose routes with more than 12% of trips destined for off-line communities were LIFT 5, at 28%, LIFT 6, at 30%, and LIFT 7 inbound, at 16%. On LIFT 5, 6 of 25 respondents completed their trips by transferring to another LIFT route at Framingham, and 1 continued on the same bus on a through-routed trip on LIFT 6. On LIFT 6, 2 of 10 respondents completed their trips by transferring to another LIFT route at Framingham and 1 continued on the same bus on a through-routed trip on LIFT 5. On LIFT 7 inbound, 4 of 31 respondents completed their trips by transferring to commuter rail at Framingham,

and 1 by transferring to another LIFT route there.

The overall low levels of transfers between these suburban services and MBTA rail or bus routes can be attributed at least in part to lack of schedule coordination and to the need to walk some distance between stops at the transfer points. These problems would be difficult to remedy, however, as the schedules and route configurations of the suburban and MBTA services are constrained by considerations other than the ability to provide convenient transfers.

Trip Purposes

The mix of trip purposes varied widely among the general-purpose routes. The spans of operating hours, the kinds of land uses along the routes, and the availability of connections with other services would all have had some influence on the kinds of trips attracted. For the group overall, the most common trip purpose was home to or from work at 41%, with home to or from shopping second, at 27%, and home to or from unspecified other third, at 15%. Other purposes each accounted for 5% or less of ridership. This distribution was heavily influenced by the results from the LIFT system, which accounted for 61% of the survey responses from the entire general-purpose route sample. For the LIFT routes alone, 51% of the trips were home-based work, 20% home-based shopping, and 13% home-based other unspecified. In contrast, on the non-LIFT routes, home-based shopping was the most important trip purpose, at 37%, followed by home-based work, at 24%, and home-based other unspecified, at 19%. There were also substantial variations in the mix of trip purposes within each sub-group. Therefore, in predicting the market for potential new services, it is important to consider the characteristics of the specific routes under consideration rather than relying on generalities.

Reasons for Using the Service

For the general-purpose-route sample as a whole, slightly over half the respondents (51%) listed “only transportation available” as a rea-

son for using the service. This proportion differed only slightly between the LIFT routes as a group (53%) and all the other general-purpose routes (49%), but again there was substantial variation within each sub-group. The highest reported incidence of “only transportation available” was 75%, and the lowest 33%. Respondents were allowed to indicate up to two reasons for using the service, so the totals of percentages for all reasons exceeded 100% on all routes. The second most common reason cited for using service was “convenience,” at 48% overall. On the LIFT system, 43% cited “convenience.” On all other routes, “convenience” was cited by 55%, exceeding “only transportation available.” The only other reason cited by more than 5% of respondents was “inexpensive way to travel,” at 19% overall (21% on the LIFT routes, and 18% on the rest).

These findings show that ridership on general-purpose suburban transit services is not limited to people with no other means of making the same trips. Nevertheless, trip-makers with other options are likely to be attracted to these services only if they are perceived as more convenient or more economical than the alternatives. None of the survey routes has service headways shorter than 60 minutes, and some of them have even less frequent service. Combined with the circuitous paths taken by many of the routes, this makes it very difficult to present an image of convenience greater than or equal to private transportation.

Age and Income

The sample as a whole included responses from passengers in every age range listed on the survey form, but the distribution of ages differed from that of the overall population in the areas served by these routes. The largest discrepancies were in the youngest and oldest ranges. Riders age 17 and under accounted for only about 6% of survey responses, compared with about 23% of the population of the areas served (based on 2000 census data). Because the surveys were conducted in summer months, few school trips would be taking place, but an increase in recreational travel by students might be expected. The responses may not reflect actual age distri-

bution completely, as young children are unlikely to fill out survey forms. The discrepancies between survey and census in the lowest age range were similar for the LIFT system and for all other systems combined.

At the opposite extreme, passengers age 65 and older accounted for 26% of the survey responses, compared with 13% of the population of the service area. The non-LIFT routes had the largest discrepancy, at 44% survey versus 15% general population. The LIFT route results were much more evenly matched, at 14% survey versus 11% general population. However, on LIFT 2, 26% of the responses were from passengers age 65 and over, compared with 13% of the population of Framingham.

To some extent, disproportionately low ridership in some age ranges (especially 25 to 34 and 35 to 44) may be a consequence of limited service hours that prevent the suburban routes from being used for commuting to and from work. Some of the survey routes have no peak-period service, and some have service in either the AM or PM peak but not both.

Survey respondents were primarily from lower-income households. For the general-purpose routes overall, 56% reported household incomes of under \$20,000, and only 4% were in the \$80,000 or more range. These figures differed little between subgroups, with 53% on the LIFT routes and 60% on the other routes in the lowest range, and with 5% on the LIFT routes and 3% on the other routes in the highest range. Figures for the general population in the service area are not readily available.

How Riders Learned of the Service

The majority of survey respondents on the general-purpose routes first learned of their routes from friends or relatives (41%) or from seeing a vehicle on the route (39%). These proportions differed slightly between the LIFT system routes (43% and 37%) and the other routes (38% and 43%). Information in newspapers had attracted only 6% of the riders, and e-mail or Web site information only 3%, with all of the latter being on the LIFT system. For this study, it was not determined what marketing strategies had

been tried on most of these systems.

Feeder Systems

The feeder systems surveyed were the Route 128 Business Council's Alewife and Needham shuttles, the Neponset Valley TMA's Rail Link #2, the Metrowest/495 TMA's Southborough Rail Link, the Peabody Transit Commuter Shuttle, the Clock Tower Place Shuttle, and Framingham LIFT Route 4 (subsequently discontinued). Each of these systems connects one MBTA rail station with one or more suburban employment locations. Service on these routes runs almost exclusively during peak commuting hours. The Needham, Neponset Valley, and Clock Tower Place routes carry passengers only toward the suburban work locations in the AM and only toward the MBTA station in the PM. The Alewife shuttle vehicles carry passengers between one apartment complex and the rapid transit connection on their return trips. (These trips are identified as the Windsor Village Shuttle.) The Southborough Rail Link also offers service between the commuter rail station and two designated stops, including one satellite parking lot. The Peabody Shuttle also offers (and LIFT 4 offered) AM service toward a commuter rail station and PM service away from a station from anywhere along the route. The surveys on all of these routes were conducted on the AM trips.

Distributions of Origins and Destinations

In contrast with the general-purpose routes, the feeder routes as a group depend mainly on transfers with their MBTA connections as their source of ridership. Overall, 90% of the outbound AM riders on the feeder routes transferred from a commuter rail, rapid transit, or MBTA bus route. The rest boarded feeder routes at the inner terminals, but accessed them by walking, bicycling, or getting dropped off.

Because of the transfer connections, the feeder routes served passengers from a much greater number of origins than the general-purpose routes did. Overall, 41% of the outbound AM riders on the feeder routes started their trips in Boston, 12% in Cambridge, and 9% in

Somerville. Another 28% had to travel into Boston or Cambridge from outlying areas on the way to one of the survey routes. The remaining 10% made their trips entirely outside the urban core.

Of the four feeder routes that provided inbound as well as outbound service during the AM operating hours, only the Alewife/Windsor Village shuttle carried a significant number of inbound riders. On the survey day, the inbound AM trips on this route carried a total of 114 riders, compared with only 77 on the outbound AM trips. The only inbound stops are at an apartment complex in Waltham. Most of these passengers (93%) transferred to the Red Line at Alewife, with another 3% transferring to MBTA buses. It is also possible to access rapid transit service from the apartment complex by MBTA bus, but the Alewife/Windsor Village shuttle provides a much faster connection. More than half of the inbound AM passengers on the this shuttle (55%) had final destinations somewhere in Boston; 37% were destined for Cambridge, and 6% continued through Boston to final destinations at outlying points.

Of the other three feeder routes that offered AM service in both directions, only the Southborough Shuttle did not have any inbound AM riders on the survey day. LIFT 4 (now discontinued) had 3 inbound riders compared with only 1 outbound. Of the inbound riders, 2 transferred to commuter rail to get to locations in or beyond Boston. The Peabody Transit Commuter Shuttle carried a total of 3 riders on four inbound AM trips, with all 3 transferring to commuter rail, and at least 2 having final destinations in Boston.

Trip Purposes

As would be expected, given the schedules and configurations of the feeder routes, 97% of the survey respondents on outbound AM trips were going from home to work; 2% were going to work from a starting point other than home, and only 1% were going to a destination other than work. Most of the inbound Windsor Village shuttle passengers (95%) were also

going from home to work, as were all of the inbound AM riders on LIFT Route 4 and on the Peabody Shuttle.

Reasons for Using the Service

Nearly half of the outbound AM respondents on the feeder routes (49%) checked “only transportation available” as a reason for using the service. This was slightly less than the 51% average on the general-purpose routes, but the range among feeder routes was much greater, with a minimum of 5% of a route’s riders and a maximum of 100% giving this reason.

“Convenience” was a much smaller attraction for outbound feeder-route riders (17%) than for general-purpose route riders (48%). Another 17% of the outbound feeder-route riders checked “avoid driving/traffic,” compared with only 4% of the general-purpose route riders. This difference reflects the longer average total trip lengths of the feeder bus riders and the need for most of them to make a portion of their trips within the congested urban core.

In contrast with the outbound feeder route responses, only 15% of the inbound AM riders on the Windsor Village Shuttle checked “only transportation available,” while 61% checked “convenience;” 23% checked “avoid driving/traffic.”

Age and Income

As would be expected, given the high proportion of work trips, most of the feeder-route survey respondents were in age ranges most common in the work force. Among outbound riders, the age ranges 17 or under and 65 or over each had only one survey response, or 1% of the total. The most common age reported was 25 to 34, at 37%, with the rest almost evenly divided between 18 to 24, 35 to 44, and 45 to 64, at 20 to 22% each. (It should be noted, however, that the number of years per range varies.) Inbound AM trips on the Windsor Village shuttle had no responses from riders age 17 or under or age 65 or older. There was a greater concentration in the lower age ranges than on the outbound routes, with 42% between 25 and 34 and 34% between 18 and 24. This probably reflects the age range in the

apartment complex where all of the inbound riders boarded.

Overall, survey respondents on the feeder routes had much higher household incomes than those on the general-purpose routes. Among outbound feeder-route riders, only 9% had household incomes under \$20,000, and 70% were above \$40,000, including 24% above \$80,000. Among inbound Windsor Village Shuttle riders, 12% had household incomes below \$20,000, but 73% were above \$40,000, including 36% above \$80,000. For comparison, on the general-purpose routes, 56% reported household incomes below \$20,000, and only 19% above \$40,000, including 4% above \$80,000.

How Riders Learned of the Service

The most common way that outbound AM riders on the feeder routes had first learned of the services they used was from their employers, at 82%. This reflects the sponsorship of most of the outbound routes by the employers served, the nearly exclusive use of these services for work trips, and the interest of the employers in justifying their investments. On the inbound Windsor Village shuttle trips, which carried passengers to numerous work locations that did not sponsor the service, only 10% had learned of it from employers. More than half of the inbound riders had learned of the service from the management of the apartment complex where they boarded, and another 15% had seen the shuttle vehicles there.



CHAPTER 4

CASE STUDIES

THE 128 BUSINESS COUNCIL'S ALEWIFE SHUTTLE

Introduction

Considered to be the first of thirteen TMAs created within Massachusetts, the 128 Business Council is a non-profit public/private partnership that seeks to help reduce traffic congestion by providing alternative transportation services and information for the Route 128/West area including Lexington, Waltham, and Needham. Over thirty member companies with an interest in the economic strength of the 128/West area provide nearly 100% of the funding for the Council's operations and programs.⁹ While transit services are not the main focus of the 128 Business Council, it has produced one of the most successful suburban systems in the Boston MPO area – the Alewife Shuttle.

Background

In 1985, the area of western Waltham along state Route 128/Interstate 95 experienced an enormous increase in corporate/commercial development. Several large companies such as GTE and Polaroid had constructed large office complexes, while other developers built several large and accommodating hotels to support the enormous influx of executives and predominantly white-collar workers needed to staff the corporations. Because all of this development was taking place in a low-density area adjacent to a high-speed limited-access facility, the urban form was entirely automobile dependent, and peak period congestion levels along Route 128 and adjacent routes quickly deteriorated.

Recognizing the impact that severe traffic congestion would have on both business and especially employment, three major corporations – The Nelson Companies, GTE Laboratories, and Polaroid Corporation – now firmly established in the area, commissioned a traffic study at their own expense in an effort to explore roadway improvements and to keep the 128/West region visible to the State Legislature and transportation officials. Additionally, these corporations sought the help of then-Governor Michael Dukakis, who requested that a single council be formed to represent all of the businesses in the Route 128/West area.

In 1986, the 128 Transportation Council was created with a charter to work with employers and property owners within the Route 128/West area to implement rideshare and ride matching programs, direct commuters to alternative modes such as rail or bus, create shuttle services, and provide a single lobbying voice for highway improvements within the corridor. The Council worked with employers to stagger work times, which helped reduce some peak period congestion.

⁹ The 128 Business Council does receive a small amount of short-term grant monies, but only on rare occasions.

However, companies were still having problems recruiting quality labor, most of which resided in the cities of Cambridge and Boston.

Both developers and company executives realized that luring choice workers out of the city for the workday would be difficult given the congested commuting conditions and the fact that many people living in the city simply do not own cars. As a result, in 1989 a rapidly growing desktop publishing company called Interleaf, Inc., decided to subsidize free transportation to and from their office as an employment incentive. Thus the company worked with the Transportation Council to initiate a one-bus shuttle operation between Alewife Station in Cambridge and the Interleaf office building in western Waltham.

In the first 4-years of operation, the Interleaf Shuttle was reported to have served up to 6,000 riders per year. Also during that period, demand for similar services from other companies began to increase heavily. In 1993, the Transportation Council began to offer the same service in to other companies in the Route 128/West area in return for subsidy. Renamed the Alewife Shuttle, service was increased in 1994 to three buses in order to meet the demand. A year later, in 1995, the Transportation Council was re-designated as the 128 Business Council and the shuttle began servicing Windsor Village apartments to maximize ridership and further the Council's pri-

mary objective of reducing congestion. At this time, service on the Alewife Shuttle was increased to four buses. This service increase ran until 1999 when service was reduced for a short time to three buses. Four-bus service resumed again in the year 2000 and finally discontinued in 2002. At the time of this case study in 2003, the Alewife Shuttle was again operating with three buses.

Description/Purpose

As noted above, the Alewife Shuttle began as a single corporation's shuttle. Now the shuttle is part of the 128 Business Council's ever-evolving strategy to reduce congestion and improve mobility for people commuting to and from the Route 128/West area, with the goal of providing a service that is both competitive with the automobile and responsive to businesses' needs.

The Alewife Shuttle currently consists of three mini-buses operating as a fixed-route reverse commuting system with essentially two express routes. As shown in Figure 4.1, the shuttle runs from the MBTA's Alewife Station on the Red Line west along Route 2 and exits onto Hayden Road to begin stopping at the office parks and buildings in the Route 128/West area. The Windsor Shuttle is the return leg of the trip, and runs from Windsor Village apartments back along Route 2 to Alewife Station. Each shuttle bus makes a total of three morning and

FIGURE 4-1
Alewife Shuttle Route Map
Route 128/West Area

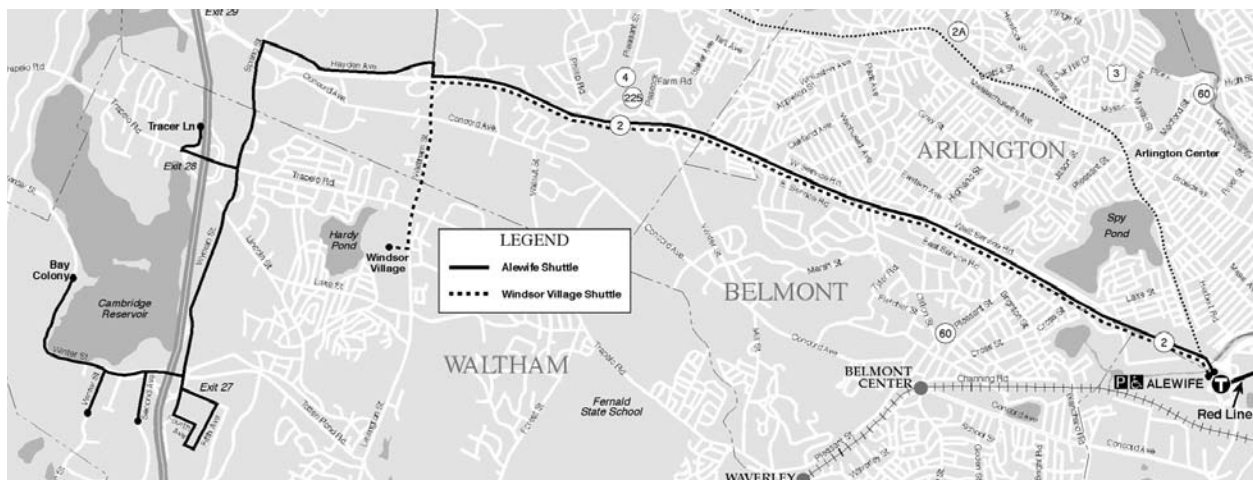


Table 4-1
2003 Monthly Boardings
128 Business Council – Alewife Shuttle

Month	Alewife to 128/West	Windsor to Alewife	Non- Member	Shuttle Total
January	3,021	4,488	73	7,509
February	2,796	4,001	62	6,797
March	2,645	4,192	51	6,837
April	2,521	3,690	42	6,211
May	3,127	4,219	59	7,346
June	2,558	3,746	167	6,304
Totals	16,668	24,336	454	41,458
Annual Daily Avg	131	192	4	326

three evening trips between Alewife and the 128/West area and Windsor Village.

Ridership

Nearly 100% of the shuttle’s riders are making a home-based work trip. Typically, the Alewife Shuttle’s outbound ridership consists of full-time corporate employees and interns. The outbound travelers originate within the Cambridge-Boston area, and inbound riders are primarily residents of Windsor Village apartments located in northwestern Waltham. According to data from the 2003 Suburban Transit Service Passenger Survey conducted by CTPS, 100% of the outbound riders and 96% of the inbound riders are going to work. Surprisingly, over 30% of riders on both routes report making over \$80,000 per year.

The 128 Business Council maintains rider counts (manually taken by the driver) for each week of operation in spreadsheet form, but until recently Council management has been inconsistent with how they format, store and update the data. As noted in Chapter 1 of this report, this is typical of small suburban systems. However, despite these issues, Council management was able to provide reliable data

¹⁰ In an effort to enhance accuracy, Council management has recently begun tracking non-member ridership. This small group consists of riders who work within walking distance from one of the member corporations in the 128/West area that the shuttle services.

for 2003 and the previous five-years of operation.

Table 4-1 provides a summary of ridership for the first half of 2003. The ridership figures are broken down by four categories: outbound (Alewife to Route 128/West), inbound (Windsor to Alewife), non-member, and shuttle total.¹⁰ Note that the total average ridership per day is 326 passengers.

Table 4-2 depicts ridership for the last 5 years broken out the same way except for the non-member ridership. Note that the shuttle carried an average of 336 riders per day. Also, as seen in Table 4-1 above, the outbound Alewife to 128/West route carries only a third of this total. The Windsor Shuttle (inbound to Alewife) has apparently been accounting for the majority of riders. Overall, 2003 shuttle ridership seems consistent with the past 5-year period.

Planning

According to the Business Council’s executive director, planning for the Alewife Shuttle has been an evolutionary process. Initially, Council management performed an origination-destination (O-D) study. Benefiting from employer enthusiasm, the Business Council was fortunate in that companies were very willing to provide data on corporate riders. The Council requested and received postal zip codes of current riders

Table 4-2
5-Year Ridership Analysis
128 Business Council – Alewife Shuttle

Alewife Shuttle Boardings

Month	Year					Annual Averages
	1998	1999	2000	2001	2002	
Jan	3,366	2,689	1,865	2,073	2,177	
Feb	2,940	2,722	1,905	2,070	2,397	
Mar	2,761	2,466	2,239	2,688	3,347	
Apr	2,744	2,786	1,935	2,095	2,748	
May	2,831	2,088	2,171	2,554	3,347	
Jun	2,446	2,282	3,323	3,783	2,953	
Jul	2,753	4,101	2,939	3,055	2,804	
Aug	2,623	3,389	3,488	3,582	3,653	
Sep	2,364	2,974	2,805	2,910	2,720	
Oct	2,830	3,757	2,319	2,838	2,800	
Nov	2,370	2,553	2,354	3,055	3,454	
Dec	2,658	2,882	2,465	1,487	2,398	
Total	32,686	34,689	29,808	32,190	34,798	32,834
Monthly Avg	2,724	2,891	2,484	2,683	2,900	2,736
Annual Daily	129	137	117	127	137	129

Windsor Shuttle Boardings

Month	Year					Annual Averages
	1998	1999	2000	2001	2002	
Jan	5,485	5,205	4,137	4,644	2,791	
Feb	4,665	4,683	4,627	4,809	3,655	
Mar	4,366	4,741	5,622	5,521	5,172	
Apr	4,918	4,468	4,467	4,934	4,041	
May	6,130	4,330	4,628	5,235	4,787	
Jun	4,924	4,617	6,195	5,772	4,082	
Jul	5,503	3,797	5,056	4,615	3,792	
Aug	4,649	3,638	6,206	6,198	4,824	
Sep	4,573	4,391	6,328	4,665	4,216	
Oct	6,176	5,592	5,605	4,749	4,552	
Nov	5,281	4,058	5,788	5,179	5,364	
Dec	4,897	4,673	5,680	3,745	3,780	
Total	61,567	54,193	64,339	60,066	51,056	58,244
Monthly Avg	5,131	4,516	5,362	5,006	4,255	4,854
Annual Daily	242	213	253	236	201	229

Combined Shuttle Boardings

Month	Year					Annual Averages
	1998	1999	2000	2001	2002	
Jan	8,851	7,894	6,002	6,717	4,968	
Feb	7,605	7,405	6,532	6,879	6,052	
Mar	7,127	7,207	6,229	8,209	8,519	
Apr	7,662	7,254	6,402	7,029	6,789	
May	8,961	6,418	6,799	7,789	8,134	
Jun	7,370	6,899	8,112	9,555	7,035	
Jul	8,256	6,356	7,995	7,670	6,596	
Aug	7,272	5,117	7,827	7,826	6,730	
Sep	6,937	7,265	9,094	7,575	6,936	
Oct	9,006	7,566	7,924	7,587	7,352	
Nov	7,651	4,671	5,886	6,352	6,766	
Dec	7,555	5,797	6,365	3,626	4,354	
Total	94,253	79,849	85,167	86,814	80,231	85,263
Monthly Avg	7,854	6,654	7,097	7,235	6,686	7,105
Annual Daily	371	314	335	342	316	336

from their employers. The zip codes were then used as inputs for a GIS database (Maptitude), which was used to determine the general location of patrons and assist in route and pick-up/drop-off location planning.

If funding were available, Council management would invest in a more robust GIS system and the experience to run and maintain it. However, given the nature of its current funding system, the Council will need to rely on less technological, although practical, means of tracking ridership.

Council management uses less conventional methods of planning as well. Although the bus drivers are actually employees of the contracted service provider, the Council relies on them to act as eyes and ears in the field. Drivers provide feedback on things they see and hear such as new commercial developments occurring along their routes. This information is reported to management, which then sends a representative to the appropriate company/developer to familiarize them with the Council's services. This is one way that management stays on top of new developments in the area and helps the service maintain market responsiveness.

The Council also began conducting annual customer surveys. The surveys are used to determine customer satisfaction levels and uncover areas of service that require attention – such as the need for new stops or improvements in the general ride experience. Normally, approximately 10 to 15-thousand riders are given questionnaires while on board the shuttle or while at the workplace.

Operations/Budget

The Alewife Shuttle operates Monday through Friday, peak period only, and there is no weekend or holiday service. Thus, the shuttle operates approximately 254 days per year. Funding for the service comes entirely from corporate entities, although anyone can ride the service. Early on, the decision was made by Council management to expand service only if the requesting member company will commit to a one-year contract. The one-year commitment helps to avoid a wasteful service that runs for a

few months and then must be discontinued.

The contribution of each member company is determined through a formula that is somewhat different for each business. Each amount is a function of how many riders the participating company will have, how far off the current route the bus will need to travel, and whether or not the bus will be able to carry other customers. Carrying the employees of multiple firms allows the Council to spread out the cost, which helps to reduce the burden of each company in paying for the bus. Fares for corporate members are then set at \$2.00, which is sometimes paid by the respective corporation. In cases where companies pay their riders' fares, the Business Council issues the rider a special transit pass/ID card, which they show the driver upon boarding the bus. Nonmembers (the general public) pay \$3.50, and the Council is considering the use of prepaid passes for these riders.

Each bus costs the Council approximately \$125,000 annually, which includes all vehicle costs, staff, marketing, and overhead. With three buses, the total operating cost is approximately \$375,000 with the vehicles comprising 80%, staff 17%, and marketing 3%. The actual operation of the Alewife service is contracted to M & L Transit Services, Inc. The contract price includes maintenance, labor, insurance, fuel, and equipment.

Marketing

Having a marketing plan or strategy is emerging as the most important key to the long-term success of any suburban system. In 1993, the Business Council hired a new executive director. The new director was atypical in that she possessed a background in business marketing as opposed to being a public administrator, planner, or other transportation professional. This has proven to be a key asset.

When the new director took over, the first goal was to develop an identity for the shuttle that would enable both current and potential customers to become more aware of the service. Because the shuttle's namesake, the alewife, is a breed of fish, the decision was made to brand

the Alewife Shuttle with a logo depicting a “fish on wheels” and have the shuttle graphically painted with this logo. To support this branding effort, Council management began a campaign that included direct mailings to employers, which focused on riding shuttles with the fish logo. This gave the service notoriety and presence, which enabled both riders and potential riders to identify the service. Moreover, it gave member corporations a tangible way to see the fruits of their investment and caused them to become more excited about using the service.

However, in 1996 this campaign was abandoned after a major subsidizer ended its use of the service. Faced with a need for operating funds, Council management began “wrapping” each bus in the logo of a member corporation. (Bus wrapping was an advertising technique popular among transit agencies nationwide in the mid to late 1990s, in which the entire bus – including windows – was covered with a single, brightly colored advertisement.) This accomplished several things. First, the companies got an effective form of advertising along with their transit service. Second, charging the respective company for the advertising enabled the Business Council to recoup the lost subsidies. Finally, turning each bus into a rolling billboard generated greater awareness of the service.

Unfortunately, the practice of wrapping buses and vans was ended statewide after September 11, 2001. Currently, all 128 Business Council vehicles are painted in a plain, uniform fashion with only the name printed on the side, but the Council does plan to explore a more eye-catching approach in order to enhance the service’s visibility to both member corporations and the general public.

Another significant marketing strategy implemented by the new director was to begin working with real estate developers as early as possible. Throughout the 1990s, developers were enticing Cambridge corporations to relocate to

western Waltham. By becoming involved early in the process, the Business Council was able to get corporations/developers to incorporate Alewife Shuttle service into their plans from the start. For example, bus pull-ins and other stops on their property can be included in the site plan before construction rather than retrofitting after construction. Once a developer/corporation is signed up for service, the Council continues this relationship by ensuring that Council representatives attend local corporate events such as picnics or fairs to maintain visibility and advertise the service. This also enables the Council to speak directly with current and potential customers directly.



Finally, the Business Council does maintain a Web site, but like many systems observed in Massachusetts and around the nation, has had much difficulty keeping it current. As of August 2003, the existing page lacked key features such as a route map, or some other graphic depicting where riders can catch the shuttle at Alewife. Unfortunately, the Council staff lacks internal expertise in this area, and must hire a Webmaster to maintain the page. Based on current funding, this can only be on an “as needed” basis, which has caused gaps in the accuracy of page content. As will be discussed later in this case study, Council management is taking steps to remedy this.

Measuring Success

Conventionally speaking, transit systems are usually evaluated in terms of efficiency, i.e., benefit-cost analysis. In Massachusetts, the MBTA's approach is typical of the older north-eastern agencies in that the focus is on the "bottom line" – the cost per rider per day. However, in the suburban transit genre, there is no one single measure, either quantitative or qualitative, that will indicate success. Therefore, it is key to determine which criteria are appropriate for the particular service. Some of the quantitative evaluation criteria related to the goals typically established for suburban systems may be: ridership counts, air quality changes, numbers of disadvantaged population served, number of job positions filled within an area (such as in welfare-to-work programs), amount of congestion reduction, etc. Qualitative measures may be customer satisfaction, continued funding support from agencies or corporations, or a municipality's perception of the service's value to the community.

Because measures of success in suburban transit tend to vary from one service provider to another, it is difficult to quantify how successful the Alewife Shuttle is. Typically, overall ridership is the first statistic used to gauge a system's level of success. However, because the Alewife Shuttle serves the needs of employers, some of which only have two or three riders, ridership growth is not necessarily critical. As such, no ridership goals were ever established for the service.¹¹ However this does not mean that ridership should be ignored. Ridership can still be used as an "indicator" to subsidizers on the merits of their investment. None the less, in this case, the shuttle's purpose is more that of a very long commuter rail shuttle than of a service that is part of a larger congestion management program.¹² Thus, if the shuttle carries

ten or more passengers to the satisfaction of the subsidizing company, and the patrons are happy with the service, the service may be deemed a success.

Another measure could be the afore mentioned bottom line. Looking at the net cost per rider per day can be helpful. While not a definitive measure, this statistic can be used as part of an overall picture of how a system is doing. In the Alewife Shuttle's case, the net cost per rider reported by Council management is \$3.38, and is well within the range observed in peer systems.¹³

Because much of the Business Council's direction is set by the needs of its corporate subsidizers, the Council management believes that the best way to measure its success is in the form of continued support from the shuttle's sponsors. This support comes in the form of continued membership and payment for bus service. According to Council management, key to keeping this success going is open and constant communication with the member companies. To that end, Council management provides ridership figures that are broken down by company drop-off points and shared with those companies. This shows the corporation a tangible return for their investment. Another, and perhaps the most significant contributor to the continued success of the Alewife Shuttle is a newsletter published by the Council and sent to all member companies, who then pass them on to employees. The newsletter keeps them informed of any changes in service, routes, or stops, and even of upcoming transit related events.

The Future

In the near future, Council management will be working to improve several aspects of the Alewife Shuttle. Of course, much of this will

¹¹ Although it is important to note that there is a general minimum ridership threshold of approximately 10 passengers per trip. This threshold is used as a performance indicator to justify a corporation's funding. Note that this isn't 10 per corporation, but a total of 10 passengers per trip from any source.

¹² While Council management recognizes that the Alewife shuttle does not carry sufficient ridership to make a substantial impact upon congestion in the area overall, it can be said to have reduced some congestion in the segments along Route 2 where the Shuttle's 336 customers would normally be contributing to the traffic.

¹³ This cost will always be significantly higher in suburban systems than that of an agency like the MBTA. Observed ranges may vary quite a bit; however peer systems that continue to survive tend to have per rider net costs between \$2.50 and \$5.00.

depend on available funding. Areas for improvement identified during this study are communications with larger, public agencies, communication with patrons through media, better data collection and storage management, and new marketing campaigns to maximize ridership.

Communication

Recognizing that the Alewife Shuttle operates in a very large region with several other suburban systems, including the MBTA, the Council believes that it is necessary to work with these other agencies to both enhance the mobility options of patrons and to simply ensure cooperative efforts rather than competitive ones. To that end, the Council feels that communication with the MBTA needs improvement. Given the size differential between the two agencies it is often difficult for a smaller operator to sift through the many layers of bureaucracy typically found in large government agencies such as the MBTA. As a result, Council management feels that it would be useful to have a “champion” within the MBTA. This would be a single person who can rapidly respond to their needs, such as when the Business Council needs permission to use MBTA property or in other such interactions. If this person cannot help in some particular circumstance, they should know who can help and be able to put Council management in touch with that person. The major benefit of this is to not be routed through several different offices that might be unfamiliar with the service and its relevance to the region.

Another major area the Council seeks improvement in is the exploitation of Internet resources. This is perhaps the modern era’s most significant advance in communications technology, and the Business Council recognizes the significance of this resource for transit. They plan to increase the frequency of updates to the current Web site and include their new system map as well.

Data Management

The 128 Business Council utilizes ridership data for two reasons. Like any system manager, they use it to track growth or declines and as an

indicator of its customer’s needs. However, the Business Council also uses this data to provide comprehensive reports to their member companies on information including non-member company riders, revenue per run, and cost per rider, etc. As such, the agency recognizes that in order to increase accuracy and aid in future analysis, management needs to improve the quality of rider data collection, and especially, the storage methodology.

The Alewife Shuttle’s ridership reports are generated weekly from individual ridership report sheets submitted by the drivers. These individual sheets are compiled into one Microsoft Excel based master report by Council management. In addition, their contractor, M&L Transit Systems, Inc., also maintains a Microsoft Access database of the weekly ridership reports. Council management is planning to combine their database efforts with M&L’s, and begin use of the Access-based reports exclusively. This will provide for easier sorting capabilities and enable comprehensive revenue/ridership reports on a weekly basis. In addition, data entry time will be reduced through elimination of duplication of effort.

New Campaigns

The Council also plans to seek new corporate sponsorship and to encourage new nonmember ridership. According to CTPS research, 82% of outbound Alewife Shuttle patrons learned of the shuttle’s existence through their employer. Clearly, as a subsidizer of the shuttle, it behooves an employer to ensure that any and all employees eligible to use the service are aware of the service and are encouraged to use it. However, in order to begin capturing other types of riders – essentially breaking into a new market – Council management will need to initiate a much broader marketing campaign.

Key to this will be the Council’s plan to begin printing new, easier-to-read ride guides and new route maps. Both of these items are among of the most basic tools used to market a service. Distributed widely and wisely, guides and maps can significantly raise awareness of the system and help an agency begin to maximize ridership potential.

Summary/Conclusion

The Alewife Shuttle is something of an exception to most suburban services in that it is completely paid for by private funding sources. However, this does not mean other systems cannot learn from the techniques employed by the 128 Business Council in running the system. The following lessons learned can be useful to either new start-up services or long-time suburban operators who are looking to improve their systems.

- Shuttles can work well in areas with heavily congested roadway networks. Based on research conducted by CTPS staff, employer shuttles in particular do well under conditions where employees would rather not drive alone or even carpool. It is well known that traffic along Route 128/I-95 is extremely congested during both AM and PM peak periods. Also, while Route 2 is usually quite reasonable in the Waltham area, some segments can be difficult for commuters.
- Be aware of companies trying to lure choice labor to the suburbs. The economic boom of the '90s may have passed; however, companies still find that Cambridge and Boston contain the bulk of choice labor within the region. This is not surprising given the prestigious universities located within both cities. As companies continue to relocate away from the more expensive land rents found in traditional CBDs, it is likely that the need for reverse commute/ employer shuttle services will not abate, and that employers will continue to subsidize transportation as an incentive for employees. Suburban systems must seek to exploit this market.
- Work with area developers. It is important to approach developers early in the process of site planning and sell them on the idea of including or accommodating a suburban service. This requires knowledge of the local commercial and residential real estate markets, and the ability to communicate with corporate realtors and business people. This is also the ideal time to provide guid-

ance on transit-oriented or transit-friendly development.

- Consider hiring someone with a business management or marketing background. The Alewife Shuttle, and indeed the 128 Business Council, have benefited from the fact that the Council's executive director is not a public administrator, planner or other transportation professional, but instead comes from a business marketing background. As such, the director knows how to speak to businesses people and their needs, understands the need for flexibility, and most importantly can facilitate an open line of communication with the real estate development industry in the 128/West area.
- Always seek new sponsorship. The 128 Business Council recognizes that more corporate sponsorship means lower rates for everyone. As such, the Council is always looking for new additions. Both new and established service providers should be aware of companies and other types of businesses or activities that are benefiting from their service. This can be apartment complexes, office parks, hospitals, etc. Establish a dialogue with them and help them understand how they benefit from your system. Seek their sponsorship in return.
- It is useful to create a list of needed improvements broken down by priority. Much like a "wish list," agency management can use this to set their own spending priorities, and market their needs to subsidizers. For example, the 128 Business Council's management repeatedly stated that they could benefit from the use of a professional transportation planner – particularly one with GIS experience. If placed on a wish list that is circulated to a partner such as a TMA or even the MPO, this type of aid could be arranged for, even if only on a limited basis.

THE BURLINGTON BUS B LINE SYSTEM

Introduction

The Town of Burlington is located 13 miles from downtown Boston. The B Line bus system operates entirely within the town boundaries, and all of the system's routes radiate from the historic town center, where the town hall and various other municipal offices are located.¹⁴ Burlington is not served by the MBTA's commuter rail, but has several high-speed, limited-access highway connections that allow travel to either downtown Boston or any of the other suburban communities within the Greater Boston area.

The fact that Burlington is not served by commuter rail makes it unique among the other municipalities within the same distance of Boston. This is part of the reason why the town remained mostly agricultural prior to the construction of the highway network in the 1950s. Between 1950 and 1970, Burlington's population increased by a factor of 6.8, from 3,250 to 21,980. The population reached 23,302 by 1990, but it had declined to 22,876 by 2000, reflecting a trend toward smaller households along with a dwindling supply of undeveloped land.

The predominant form of land use throughout most of the town is now single-family homes, interspersed with a few low-rise apartment and condominium complexes. In contrast, the southern and western edges of the town along Route 128 and U.S. Route 3 are densely developed with office parks, shopping malls, and light industrial plants. These were largely responsible for total employment in Burlington in 2000 being 71% greater than total population, at 39,350 jobs. Thus, employers in Burlington must attract the majority of their workers from outside of the town.

Both residential and non-residential post-1950 development in Burlington has been depend-

¹⁴ These offices/services include: fire, police, the public library, and the post office. All are clustered in a small area along a village green.

ent almost entirely on automobile access. Prior to the establishment of the B Line in 1988, most sections of Burlington had never had any transit service suitable for travel between points within the town, and connections to and from outside locations were also very limited. Hence, the majority of people traveling to, from, or within Burlington were not accustomed to considering public transportation as a travel option. The absence of mass transit limited mobility for those too young, too old, or otherwise unable to drive, and for those able to drive but without a vehicle available. As of 2000, 14% of Burlington residents were age 65 or older and 24% were age 17 or younger.

Background

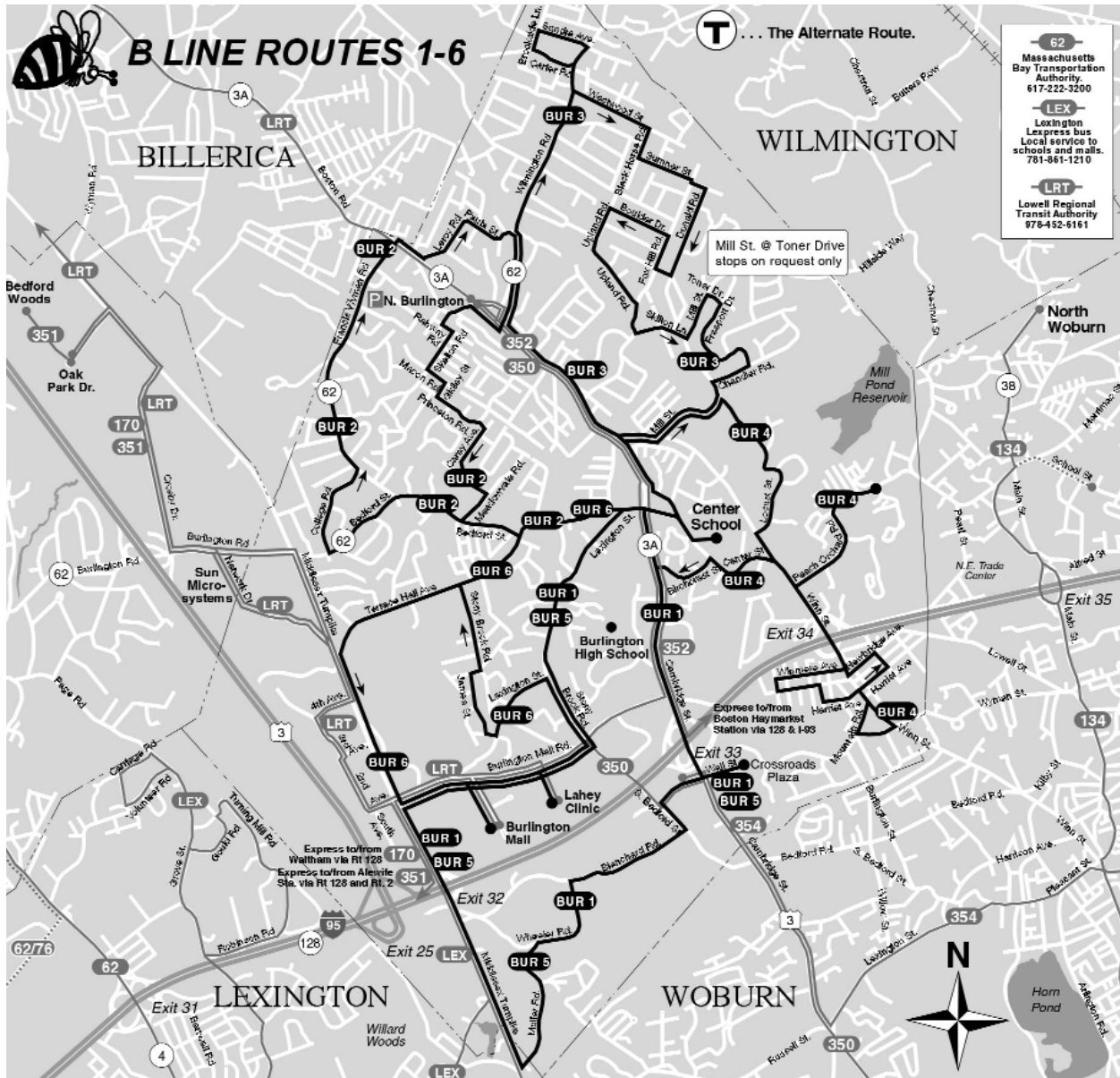
The Burlington Bus B Line system commenced operations in November 1988, and from inception has been funded by the Town of Burlington, with assistance from the MBTA's Suburban Transportation Program. The route layout, which has changed little since the system started, provides service to within one half mile or less of almost every point in the town. Buses stop on demand anywhere along each route rather than at formal designated stops. This service was originally meant to be available for general use, rather than being targeted to specific groups or trip purposes.

The Town, in consultation with the MBTA, determines routes, schedules and fares for the B Line. A private carrier selected through a competitive bidding process has always operated the service for the Town, under contract. The contract is re-bid every three years, but the current operator, Joseph's Limousine Service, Inc., has held the contract since 1990. The contractor is responsible for providing the vehicles.

Bus service to points outside of Burlington such as neighboring towns and downtown Boston is provided by the MBTA as well as other operators, and will be detailed further in the next section. Most of these routes pre-date the establishment of the B Line, but some were established or extensively revised after 1988.

As mentioned above, Burlington has no commuter rail stop, but residents do access the

FIGURE 4-2
Burlington Bus Route Map
Town of Burlington



nearby Lowell commuter rail. Most of Burlington residents who use this service access it by driving to the Wilmington station, the Anderson Regional Transportation Center (Woburn) or the Winchester Center station. There is no connecting transit service to any of these stations from Burlington.

Purpose and General Description

The original objectives of the Burlington B Line system were to enhance the quality of life in

the town, to reduce automobile emissions for compliance with Clean Air Act standards, and to alleviate traffic congestion. The route layout is intended to allow Burlington residents to travel between points throughout the town without the use of private automobiles. A passenger survey conducted by CTPS in July 2003 found that 84% of B Line riders were using the service to travel between origins and destinations within Burlington, and that 68% of these intra-town trips were being made between a

home and a work or shopping location. Although the proportion of riders age 65 or older was more than double that in the overall town population (39% versus 14%), riders under age 65 were still in the majority. Only 9% of survey respondents were under age 18, compared with the 24% in the general town population. (A higher proportion might have been found when schools were in session, but survey response rates from children and students tend to be below average in any case.)

The Burlington B Line system currently operates on weekdays only. (When first implemented in November 1988, the system operated seven days a week. Sunday service was eliminated in January 1989, and Saturday service was dropped in July of that year.) The system consists of six loop routes, all beginning and ending at the former Center School in Burlington Center, now used as offices by several of the town's human service agencies. The current route alignments are shown in Figure 4.2.1. Each loop has a scheduled running time of 30 minutes or less. All routes have hourly service during the operating day, except for a two-hour midday gap. Routes 1, 2, and 3 depart the Center School on the hour and Routes 4, 5, and 6 on the half hour. Three buses provide all service. The routes are paired, as discussed below, and each bus is assigned to one pair of routes. As of July 2003, daily first departure times on the six routes ranged from 7:30 to 8:30 AM and final departure times from 5:00 to 6:00 PM.

The present vehicle fleet consists of lift-equipped Goshen Coach mini-buses, each with 20 seats and two wheelchair spaces. Destination signs show the route numbers but not geographic destinations.

All B Line routes connect at one or more points with MBTA bus Route 350, providing a link to the Alewife Red Line rapid transit terminal in Cambridge. They also

connect with MBTA Route 352, which provides direct service to downtown Boston during AM peak hours and from Boston during PM peak hours. Three B Line routes (paired with the other three) connect at the Burlington Mall with Lowell Regional Transit Authority buses to Lowell, Bedford Local Transit buses to Bedford, and Lexpress buses to Lexington. Free transfers are permitted among B Line routes, but separate fares are required on the MBTA and other connecting services. Most of the bus stops within the Burlington Mall are unmarked, and the various bus systems serving the mall do not all stop at the same locations, resulting in some confusion for first-time or infrequent riders.

B Line cash fares are currently \$.50 for adults and \$.25 for students and senior citizens. Children under 6 ride free. Passengers can also purchase annual, six-month, or three-month passes. These are priced, respectively, at \$60, \$35, and \$20 for adults and at \$35, \$20, and \$11 for seniors and students. The cash fares have been in effect since 1988, except during 1993, when they were increased to \$.75 for adults, \$.35 for senior citizens, and \$.60 for students. Prior to 1994 there was a \$.10 transfer charge for all passengers.

As can be seen in Figure 4-2, each route follows a circuitous path, with most segments served in one direction only. Routes 1 and 4 are paired as the Red Line. Routes 2 and 5 are paired as the Green Line, and Routes 3 and 6 as the Blue Line. (These colors are used on the bus destination signs, but not elsewhere on the vehicles.) It should be noted that until September 2002

the present Route 2 was Route 3 and vice versa. Their pairings with Routes 5 and 6 were exchanged at that time to improve on-time performance, by having each pair include one long route and one short route. Other than that, there have been only minor revisions in route alignments since 1988.

Most changes have been made to add service to



new developments or to eliminate side diversions to locations with little ridership. Prior to 1994, the one-way loop on the present Route 3 (old Route 2) ran counter-clockwise instead of clockwise.

At present, Routes 1 and 5 have mostly the same alignment, but Route 1 runs clockwise, on the hour, and Route 5 runs counter-clockwise, on the half hour. These routes serve Crossroads Plaza, Middlesex Commons (mall), the Burlington Mall, and the Lahey Clinic, which are among the most common boarding and alighting points for B Line passengers. This also allows Routes 2 and 4 passengers to travel to and from these points without transferring. Route 6 serves the Lahey Clinic and Burlington Mall, also providing through service from Route 3, but does not serve Crossroads Plaza or Middlesex Commons.

Although transfers between B Line routes and MBTA bus routes are possible at several locations, the only such transfers reported in the 2003 survey were to or from Route 350 (North Burlington to Alewife Station) at the Burlington Mall. Such transfers were reported on 16% of the surveys, with most of these also transferring between Route 350 and the Red Line.

Planning

The B Line system is administered by a transportation coordinator employed by the town, in accordance with the terms of the service agreement with the MBTA. Planning for the system is the responsibility of a twelve-person advisory committee which meets monthly. Membership of the committee includes the transportation coordinator, a member of the board of selectmen, a member of the town planning board, and others appointed by the town moderator.

Service frequency and spans of operating hours have changed only slightly since B Line service was established in 1988. Originally Routes 1, 2, and 3 had hourly departures from 8:00 AM to 6:00 PM and routes 4, 5, and 6 had hourly departures from 8:30 AM to 6:30 PM. In 1992 the 8:00 AM trip on Route 1 was replaced with an 8:00 AM trip on Route 4. In 1993 the 6:30

PM trips on Routes 4, 5, and 6 were discontinued.

There were no further schedule changes until September 2002, when earlier morning service was added in an effort to attract more work trips. The expanded service started with a 6:00 AM express route with stops determined by request. New morning trips were added to Route 1 at 7:00 and 8:00, to Route 2 (old Route 3) at 6:30 and 7:00, to Route 3 (old Route 2) at 7:00, to Route 4 at 6:30 and 7:30 (with the 8:00 trip eliminated), to Route 5 at 7:30, and to Route 6 at 6:30 and 7:30. Most of the added trips attracted few riders, and in July 2003 all of these were discontinued except for the 8:00 trip on Route 1 and the 7:30 trips on Routes 4 and 6. At the same time, noon departures on Routes 2 and 3, 12:30 PM departures on Routes 4, 5, and 6, and the 1:00 PM departure on Route 1 were all discontinued in order to eliminate the expense of relief coverage during drivers' lunch breaks.

Ridership

Figures submitted to the MBTA by the town of Burlington indicate that, from 1995 to 2000, B Line ridership averaged 250 to 275 boardings per day. Since then there has been a decrease in ridership, for reasons that are unclear. As of September 2003, ridership was typically about 200 boardings per day.

In the figures above, passengers traveling past the Center School either by transferring between routes or by staying on buses on through-routed trips (such as from Route 1 to Route 4) are counted twice. Therefore, the actual number of passenger trips is lower. In January and February 2001, all-day B Line boarding and alighting counts were conducted for three consecutive days. With through and transfer riders double-counted as above, boardings on the three days ranged from 170 on a Wednesday to 215 on a Thursday, with a three-day average of 197. Within these totals 42% of all boarding passengers were counted twice because they remained on buses past the Center School. Counting only actual boardings, ridership on the three days ranged from 123 to

152, with an average of 139. These results still do not indicate how many of these boardings were really transfer re-boardings.

The July 2003 CTPS survey was distributed on all B Line routes on all trips from the start of the day until the 2:30 or 3:00 PM departure. This is the same strategy used in other MBTA surveys in recent years. The reason for not surveying later trips is that the vast majority of riders on those trips will already have received survey forms on earlier trips and will not complete more than one. Control counts taken during the survey span showed a total of 99 boardings, or slightly more than the 88 found up to 3:30 PM in the 2001 counts. Survey forms were filled out by 45 passengers, or 45% of the number counted boarding. Because some passengers made more than one trip during the count span, the returns represented more than 45% of the individuals who used the B Line from the start of service to 3:30 PM.

Survey question 2 found that 84% of the respondents were using the B Line both to travel to and return from their destinations. Applying this figure to the 139 average boardings found in the 2001 counts implies that 80 different individuals board on a typical day, with 58 making two trips each and 22 making one trip each. The survey responses did not show any transfers between B Line routes at the Center School (or any other connecting points), but the surveyors did report seeing some transfers. Therefore, the number of individuals served on a given day would be somewhat less than 80.

The number of different individuals riding over the course of a week would be greater than the number on a single day, as there are some day-to-day changes. In the survey, the most frequently reported usage frequency was five days a week, at 38%, but 42% reported riding three or fewer days per week. With this distribution, the number of individuals using the service in a week would be 1.8 times as great as the number on a given day. With an upper estimate of 80 individual riders per day, this would make 144 different riders over a week. Of the survey responses, 98% were from Burlington residents.

This implies that on average about 0.6% of all Burlington residents used the B Line at least once in a given week.

The most common trip purpose found in the survey was shopping, with 42% of respondents reporting this as the activity at either the boarding or alighting location, but not both. The boarding and alighting counts on the survey day indicated that about 6% of all boardings were for trips between the Burlington Mall and Middlesex Commons. The only surveys filled out for these short links came from riders who had transferred from MBTA buses at Burlington Mall and were going to work, but some others were apparently making multiple-stop shopping trips.

The second most common trip purpose was work, with 33% of respondents going to or from a work location. The opposite end of most such trips was home. The third-largest number of survey responses, at 16%, was for trips between homes and activities other than work, shopping, school, or medical appointments. The survey form did not provide for further description of such "other" trips, but ridecheck results indicate that destinations included the public library, the recreation and senior centers, and the cinema.

On the survey form, passengers were asked to indicate one or two of their main reasons for using B Line service by circling reasons listed on the form and/or writing in a space labeled "Other." The most common reason marked, out of six options was "convenience," cited by 55%. However, none of these respondents also indicated "speed/travel time" as an attraction. (Not surprisingly, given the circuitous paths of the bus routes between most points, "speed/travel time" attracted only 2.5% of all respondents.) The second most common reason cited for using the B Line was "only transportation available," at 38%, including 8% who also cited "convenience." Most of those that checked "only transportation available" either did not have driver's licenses or did not have automobiles available for their trips. (Overall, 31% of B Line riders had driver's licenses, but only 6% had autos available on the survey day.)

Overall, 80% of B Line riders previously made the same trip by some other means of transportation, but 20% did not make the same trip before. Of the latter, about half had no other means of transportation available. Among those who previously made the same trip, the most common prior mode was getting a ride, cited by 43%, followed by walking, at 31%, and driving alone, at 9%.

Operations/Budget

The Burlington Bus B Line system currently operates on a budget of about \$250,000 per year of which about \$10,000 (4%) is covered by fare revenue. Under terms of a three-year contract effective July 1, 2002, the MBTA funds up to 65% of the difference between operating cost and revenue, but the MBTA share is capped at \$80,000 per year. Application of the 65% MBTA funding commences with the fiscal year and continues until the \$80,000 cap is reached. For example, in FY2003, MBTA funding lasted from July into the first week of December. The remaining net cost is paid for entirely with town funds appropriated at the Town Meeting.

With an average of 139 boardings a day (excluding double-counting of riders whose trips include segments on multiple routes) the average cost per passenger trip is about \$7.20. Of this, the passenger pays an average of \$0.30 and the town/MBTA pay the balance of \$6.90.

The present budget reflects a reduction of about \$37,000 a year compared with the cost of service operated prior to September 2002. These savings were attained by eliminating service formerly operated on holidays and by discontinuing one midday trip on each route. An alternate proposal to cut back the number of vehicles from three to two, which would have required more service reductions, was rejected.

The experimental early morning service, which operated between September 2002 and June 2003, was funded from a special \$36,000 appropriation for that purpose voted at the Town Meeting.

Marketing

The Burlington bus system originally operated under the name "The People Mover." During the first five years of operation schedule cards were produced and distributed by the town. A single card contained street-by-street descriptions of each route, with first-trip departure times and frequencies. Starting times of subsequent trips and times at intermediate points were not shown, and there was no map. Printing costs were partly covered by advertising for the bus operator's charter services.

In an effort to improve marketing, the MBTA began producing schedule cards for the Burlington bus in 1992. Three separate cards were created, one for each pair of routes served by the same bus (1 and 4, 2 and 5, 3 and 6). Each card showed starting times of all trips from the Center School, and also showed times at three other selected points. Each card included a map, drawn approximately to scale, labeling most streets served by the route pair, but not showing connecting services. The "B Line" name and bee symbol were adopted at that time in place of the People Mover name. These cards were issued four times a year, at the same time as MBTA schedule changes, and were available wherever MBTA schedules were distributed and at some locations in Burlington.

The 1992 MBTA schedule format was used until 2003. At that time, the three separate forms for the three route pairs were replaced with a single form that included schedules for all six routes. The map in this form also shows all B Line routes, and also shows connecting MBTA, Lowell Regional Transit Authority, and Lexpress (town of Lexington) bus routes. The morning peak inbound schedules for MBTA bus Routes 350 (North Burlington - Alewife Station) and 352 (Burlington - Boston Express Bus) are also included.

In addition to the schedule cards, information about changes in Burlington Bus schedules, fares, and routes have been publicized by means of photocopied flyers posted or distributed at various points in the town and mailed out with the Council on Aging newsletter. The Burlington town Web site has a B Line page

containing a very general description of the system, which does not include schedules or a route map. No updates have been made to this page over the past two years.

The CTPS survey found that the most common way in which passengers first heard about the B Line was from a friend or family member (48%) or an employer (7%). Another 41% had seen a B Line bus before learning of it another way. Only 5% had learned about the B Line from a newspaper, and none from the Internet. These findings imply that marketing efforts employed by the town have had limited success in attracting new riders. However, some of the friends, relatives, or employers who informed passengers about the B Line may have learned about it through various promotional efforts.

Measuring Success

The initial B Line goal of improving the quality of life for Burlington residents is difficult to measure quantitatively. For those who have come to depend on it, it is viewed as an improvement over other alternatives. As calculated in the ridership section, however, the number of individuals using the service in a given week is only about 0.6% of the total population of the town. Consequently, its benefits are not felt in terms of air quality improvements or reduction of traffic congestion.

Earlier-morning service was run in 2002–2003 on a trial basis in an effort to attract more commuting trips both within the town and to outside destinations via connections to MBTA bus service. This was done in response to rider requests, but the new trips attracted only two or three riders per day. One of the reasons cited for low ridership was that during winter months, these trips ran before daylight, presenting safety concerns for passengers waiting at the side of the road to flag buses.

Except for short-lived experiments such as the one cited above, the B Line routes and schedules have changed little since the system was established nearly 15 years ago. This implies that Burlington's elected officials and Town Meeting voters consider the benefits of the B Line to be sufficient to justify maintaining the

present level of service even if the majority of residents seldom have occasion to use it themselves.

The Future

At this writing, there are no immediate plans to change B Line routes or schedules. However, this service can be maintained only as long as adequate funding is provided. The current sources of funding are the Town of Burlington and the MBTA Suburban Transportation Program, both of which are under continual pressure to control costs. Although it does not specifically refer to the B Line, the following statement from the 2002 Annual Report of the Board of Selectmen of the Town of Burlington is pertinent:

“The town will need to deal with a number of costly items in the very near future which affect the quality of life our residents have come to expect and the dilemma we as elected officials face is how we meet those needs while fully understanding the financial stress many families are dealing with in today's environment.”

B Line holiday service and some midday service were recently been eliminated in order to reduce the town's share of the cost. Further cost cutting would require reducing the number of vehicles in service from three to two. This would necessitate either dropping one route pair entirely or increasing the headways on some segments from one hour to two hours.

In the past, special weekend B Line service has been run during the Christmas shopping season with direct funding from the merchants in the various malls in Burlington. Given the high proportion of shopping trips in weekday ridership, a case might be made for additional funding of weekday service by the merchants, along with promotional tie-ins.

Given the present low fares on the B Line system and the length of time they have been in effect, an increase in fares could be justified. However, since fare revenue now covers only about 10% of the system's operating costs, a very large fare increase would be required to

reduce dependence on other funding sources significantly.

Summary/Conclusions

The experience of the Burlington B Line bus system illustrates the difficulties inherent in trying to establish public transportation systems in suburban areas that have previously had little or no transit service. To attract riders, any transit system must be perceived as more convenient or less costly than the other alternatives available. For most residents of a town such as Burlington, the alternative to new transit service is the private automobile, which can provide departures on demand via the most direct routes.

Given the road layout and population distribution of a town such as Burlington, any individual transit route between residential areas and major trip attractions (such as shopping malls or office parks) would serve only a small percentage of all origin-destination pairs in the town if it were as direct as private auto travel between the same points. In absolute terms, the number of people who would have need of such a route would also be low. Long one-way loop routes, such as those of the B Line and many other suburban systems, succeed in bringing bus service to within reasonable walking distance of most origins and destinations in one town, but at the expense of travel times that are much longer than driving times for most trips. Therefore, they generally attract the few town residents who have no other means of transportation, and those for whom travel time is not a determining factor in travel mode choice.

Despite the obstacles cited above, the B Line does have a number of strengths that could be built on to improve performance. Because it has now been in operation for 15 years, with an annual budget that must be approved by Town Meeting members, the existence of the B Line is probably known to most Burlington residents whether they use the service or not. Consequently, promotional efforts can concentrate more on informing residents of how the B Line may be of use to them than on building

awareness that it exists. The B Line already runs directly to several large shopping centers within the town, but there, as elsewhere along the routes, stop locations are unmarked. (Officially passengers can hail a bus anywhere along a route by waving to the driver.) Clearly delineated stops along with conspicuous posters in stores might encourage some shoppers who have arrived there by other means (such as driving, walking, or being dropped off) to try the B Line on future trips.

Some improvements in travel times on the B Line system may be attainable by eliminating route segments that generate very few boardings or alightings and replacing them with more direct routings. The Center School in Burlington Center, where all B Line trips now begin and end, is not an origin or destination for most B Line riders. Many of the riders make trips that include segments on both halves of paired routes, on opposite sides of the Center School. These riders are delayed while arriving buses wait for their next scheduled departure times. Changing the route endpoints to a location such as the Burlington Mall, where many passengers are starting or ending their trips, would improve average travel times.

The Burlington Mall may have untapped potential as a transfer center between B Line buses and bus routes of the MBTA, the Lowell Regional Transit Authority, Bedford Local Transit, and Lexpress (Lexington) that now stop there. Like the B Line, these routes stop at unmarked locations, some of which are different from B Line stop locations. Steps to maximize transfer ridership would include establishment of at least one clearly marked common stop with amenities such as a shelter and benches, and coordination of schedules to minimize waiting times during transfers. Schedule coordination could prove to be the more difficult problem, as it is likely that arrival and departure times on the present routes are subject to other operational constraints. Even well coordinated and highly visible transfer services will only attract riders if they can take people where they want or need to go to.

All of the MBTA bus routes that serve Burlington can be used for travel to Boston, either directly or via a transfer to Red Line rapid transit service at Alewife Station. The commuter rail stations nearest to Burlington are Wilmington, Anderson Regional Transportation Center (Woburn), and Winchester Center. There is no public transportation service from Burlington to any of these stations. Taking into account access and transfer times, a combination of feeder bus service and commuter rail would not provide faster total trip times from Burlington to Boston than existing through bus service does. Other recent attempts at providing feeder services to MBTA commuter rail lines have had little success in attracting riders, even in locations where there is no direct competition from through bus service. Therefore, expansion of the B Line system to provide commuter rail connections should not be a high priority.

LOCAL INTRA-FRAMINGHAM TRANSIT (LIFT), ROUTE #7

Introduction

The Town of Framingham operates a relatively large suburban service called the Local Intra-Framingham Transit (LIFT) system. The system is administered by the Town of Framingham's planning department, and presently operates 5 routes (2, 3, 5, 6, and 7). Routes 2 and 3 operate exclusively within Framingham, while routes 5, 6, and 7 provide service to adjacent communities. Funding for service comes from several sources, including town funding (only for routes 2 and 3), funding from two MBTA programs, and some federal funding sources.

While Framingham maintains 5 routes in the LIFT system, the focus of this case study will be on Route 7, which is conventionally referred to as LIFT 7. This is a linear route starting in downtown Framingham, traveling through the town of Southborough, and ending at the Solomon Pond Mall in the city of Marlborough.

LIFT 7 was introduced in February 2000. The route connects in Framingham with the MBTA Worcester-Boston commuter rail line, and with

the other four LIFT bus routes, which were initiated between 1984 and 1992. Prior to the creation of LIFT 7, Framingham LIFT operated a local route within Framingham from downtown Framingham to Temple Street and the Framingham industrial Area. This route, called LIFT 1, followed Union Avenue and Route 9. Most of LIFT 1, was incorporated into the new LIFT 7, with the exception of a loop segment to California Avenue which was discontinued.

The service area of LIFT 7 includes the older downtown areas of both Framingham and Marlborough, the industrial area of Framingham along Route 9, the lower-density suburb of Southborough, the developing commercial areas of Marlborough along Route 20, and a large recently built mall complex in Marlborough.



Framingham is located 21 miles west of Boston, and Marlborough is 25 miles west of Boston. Framingham is the largest of the three communities served by LIFT 7 with a year 2000 population of 66,910. Marlborough is the second largest with 36,255 residents, and Southborough has a population of 8,781. In addition to having the largest population, Framingham also had the greatest number of jobs in 2000 (45,892), followed by Marlborough with 28,869, and Southborough with 6,277. Population density is also greatest in Framingham, with 2,620 residents per square mile, followed by Marlborough with 1,644 and Southborough with only 569. Southborough leads the three communities with the largest percentage growth in population between 1990 and 2000, with a 32% increase, followed by a

14% increase in Marlborough, and a 3% increase in Framingham.

Background

Prior to the establishment of LIFT 7, there had been no weekday bus service between Framingham and Marlborough, nor any local weekday bus service within the city of Marlborough since 1973. It should be noted, though, that a private carrier has continued to provide Saturday service between Marlborough and Framingham to serve shoppers. This Saturday service is currently provided by Gulbankian Bus Lines.

Some of the initial motivations for establishing a new weekday service linking Framingham and Marlborough were calls and letters to the Town of Framingham planning department and the City of Marlborough mayor's office from residents and social service providers. By 1988, the population of both communities included a high percentage of recent immigrants who needed access to jobs, schools, and social service agencies, but did not have ready access to automobiles. A large retail mall complex had also opened in Marlborough, but lacked access to public transit.

The Town of Framingham also desired to find a way to expand ridership on their already existing LIFT 1 service, which connected downtown Framingham to business and industrial areas along Route 9 in Framingham, but did not cross the town line into any other community.

In 1999, the Town of Framingham applied to the MBTA for funding to initiate the LIFT 7 service through the MBTA Interdistrict Transportation Service Program. This program has existed since 1987, and is a way for the MBTA to provide funding for bus services operating from points outside the original pre-1999 MBTA service district to points within the original MBTA service district. Funding for the program initially came from the Executive Office of Transportation and Construction (EOTC) with the MBTA only overseeing the distribution of EOTC funds. However, since 2000, the money for this program has been provided directly by the MBTA from their budget.

Although the program primarily funds pre-existing private carrier services, an opportunity was available for Framingham to apply for funds to initiate a completely new service.

Purpose and General Description of LIFT 7

LIFT 7 operates between Framingham Center and Solomon Pond Mall in Marlborough. In Framingham, it travels via Union Avenue to state highway Route 9. In Southborough, it travels via White Bagley Road, Boston Road, and Marlboro Road. Then in Marlborough, the bus travels via Main Street, Pleasant Street, Lincoln Street, and Boston Post Road. The route was modified in 2002 to directly serve Staples Drive in Framingham. Some trips continue beyond downtown Framingham to Beaver Park in Framingham (see map in Figure 4-3).

LIFT 7 buses operate only on weekdays from 6:30 AM to 6:30 PM. A private carrier provides similar service on Saturday. Service had originally operated later in the evening to 9:00 PM using matching funds (provided by the City of Marlborough and a Congestion Mitigation and Air Quality Enhancement grant). However in 2002, Marlborough was no longer able to provide the town's share of the matching grant, therefore in 2002 the hours of operation were reduced. In June 2003, because of budget constraints, bus service between 9:30 AM and 1:30 PM was reduced from a frequency of every 60 minutes to a frequency of every 120 minutes. Two vehicles are required to run service when it operates every 60 minutes and only one vehicle is required to operate service every 120 minutes.

The original application to the MBTA from the town of Framingham for LIFT 7 funding identified several objectives for the service. A primary objective was to provide frequent transit service between Downtown Marlborough (Route 20/Main Street) and Downtown Framingham (Route 126) via Southborough, and to link with rail service to Boston and bus service to other Metrowest communities. Providing public transit within Marlborough between shopping/office/industrial complexes in western

Marlborough and downtown Marlborough was another objective. Reducing congestion and hydrocarbon emissions, as required by the Clean Air Act, was a third objective. A final objective was to ensure that additional, affordable public transportation services would be available to all segments of the Metrowest population, including those with disabilities, the elderly, and students.

Several target markets were identified as generating potential riders. Local commuters traveling within the corridor to Framingham, Marlborough, Natick, Holliston, Hopkinton, and Southborough employment centers were one of the primary groups identified. Commuters traveling to Boston from Marlborough, Southborough, and Framingham via the commuter rail network and utilizing LIFT 7 as a feeder service to the train were also identified. Marlborough and Southborough clients of social service agencies based in Framingham were identified by social service agencies as potential customer bases needing transit service. Students attending multiple institutions (Marian High School, Keefe Vocational Technical High School, Street Mark's School, Assabet Valley Regional Vocational School, Framingham State College, Massachusetts Bay Community College, Fisher Junior College, and Newbury College) were considered potential riders. And finally, the application identified as potential customers the growing recent-immigrant populations in Marlborough and Framingham who were seeking transportation that would allow them entry into the job market.

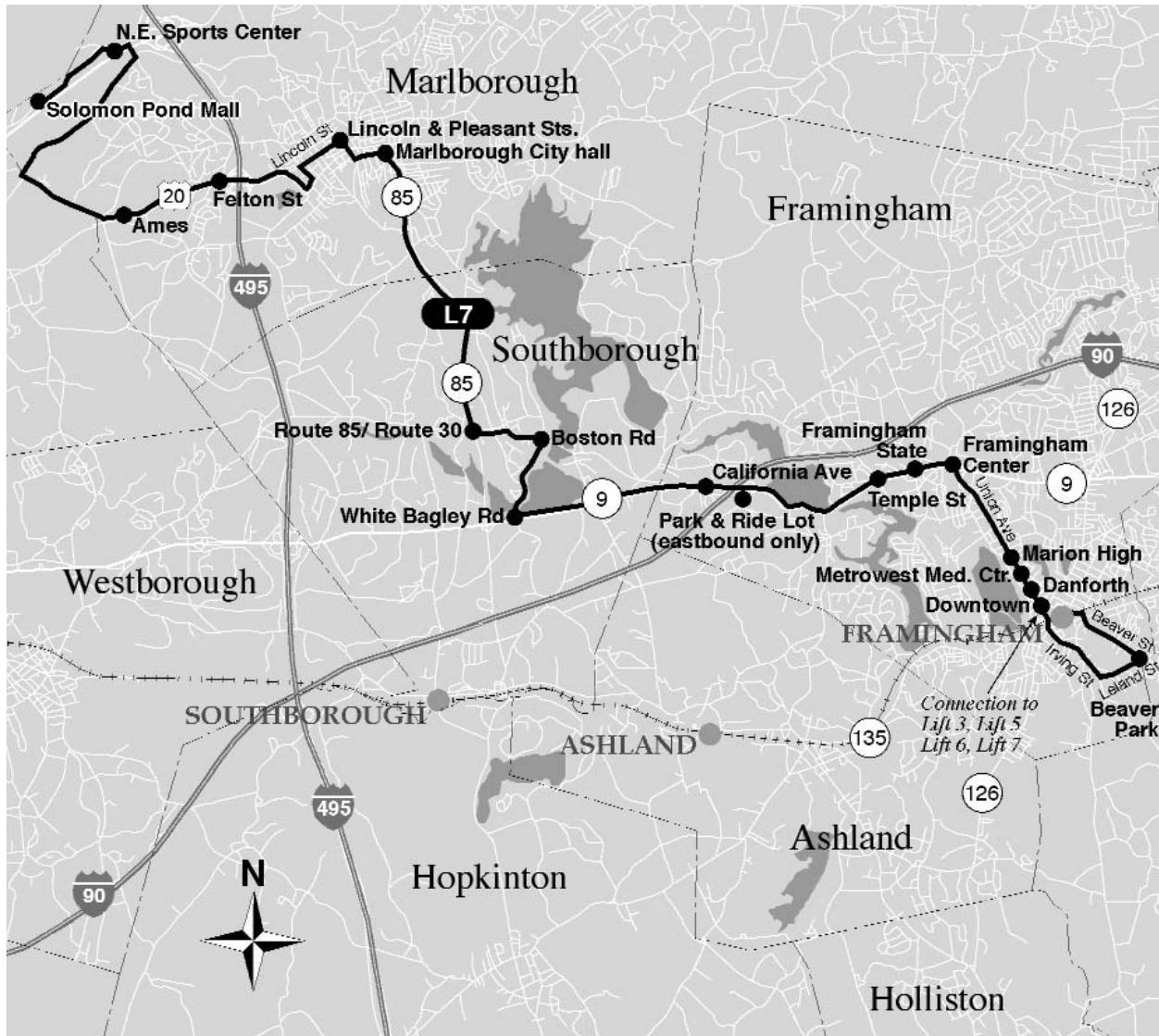
Multiple traffic generators were identified along the route. The "Golden Triangle" retail area along Routes 9 and 30 in Framingham (including Shopper's World and Sherwood Plaza) was identified as a target destination using transfers at Downtown Framingham to other LIFT services. Downtown Framingham was also identified as a major traffic generator, since it includes government and medical facilities (including the Metrowest Medical Center) as well as numerous restaurants and retail stores. Hotel and convention facilities along Route 9 in Framingham as well as Route 20 in

Marlborough were both identified, because of the many support staff employed as those locations. Both employees and students of Framingham State College, which has facilities located along the route, were considered potential riders. The line also provides service to businesses on California Avenue and the western part of Route 9 in Framingham, both formerly served by Framingham LIFT 1. LIFT 7 also provided access to those locations from the west (Southborough and Marlborough) not available prior to the creation of LIFT 7. Marlborough was also identified as having several potential traffic generators located directly along the route including the UMass Memorial Health Care, office and industrial parks along Route 20 in Marlborough, and the large Solomon Pond Mall.

Other Public Transit Service

Local Framingham LIFT bus service operating within Framingham has been provided since 1984. Previous local service within Framingham provided by a private carrier had steadily reduced its service levels through the late 1970s, and the route network had been gradually reduced by 1984 to just a single route that connected downtown Framingham with the Shopper's World mall complex. The creation of LIFT in 1984 restored local bus service to various Framingham neighborhoods. In 1987, LIFT began operation of LIFT 5 between Framingham and Hopkinton. This restored service over a route that had been discontinued by a private carrier several years earlier. In 1992, LIFT took over the administration of a route between Framingham and Milford, which also had previously been operated by a private carrier (which they renamed LIFT 6). The former provider of the route had discontinued operations when the owner of the firm retired. In September 2002, LIFT introduced a new rush-hour commuter route, designated LIFT 4 between Milford and Framingham and service on LIFT 6 was reduced to midday only in response. LIFT Route 4 was discontinued in September 2003, as ridership was below expectations, and LIFT Route 6 was restored in the peak.

FIGURE 4-3
LIFT 7 Bus Route
Framingham LIFT System



Both LIFT 5 and 6 are funded through the MBTA Interdistrict Transportation Service Program. LIFT 2 and 3, which provide local service within Framingham, are funded by the MBTA's Suburban Transportation Program and other funds obtained directly from the town of Framingham.

Passenger rail service from Framingham to Boston has operated since 1834. From the 1960s through the 1970s, service was limited to peak periods. Service was expanded during the 1980s to include a greater level of off-peak service on weekdays and weekend service was

introduced in 1992. Commuter rail service beyond Framingham to Worcester was discontinued in 1975, but was restored to Worcester in 1994. There were no intermediate stops between Framingham and Worcester prior to the opening of Grafton Station in February 2000, followed by Southborough and Westborough Stations in June 2002 and Ashland Station in August 2002. Presently there are 10 round-trips a day on weekdays between Worcester and Boston with an additional 11 inbound and 10 outbound trips between only Framingham and Boston. Saturday and Sunday service is also provided, but at reduced levels.

Three different operators provide private carrier bus service to and from Boston in the Metrowest area. Peter Pan Bus Lines operates three round trips between Worcester and Boston with stops in Framingham at Edgewater, Temple Street, Framingham Center, Georgetown/Granada, and Shopper's World (Flutie Pass). Peter Pan buses also make an additional round trip between Shopper's World and Boston. All four daily round-trips run non-stop between Shopper's World and Boston. Peter Pan also operates intercity bus service between Boston, Worcester, Springfield, Hartford, and New York with a stop at Shopper's World. Gulbankian Bus Lines operates two morning and two afternoon round-trips between Marlborough, Southborough, the Framingham Route 9 park and ride lot, and Boston. One of the morning trips and both afternoon trips continue to or from the town of Hudson. Cavalier Coach provides one morning and one evening round-trip between Northborough and Boston, operating via Route 20/Boston Post Road, which serves Marlborough, Sudbury, Wayland, and Weston. All three of these commuter carriers receive funding from the MBTA Interdistrict Transportation Service Program.

Gulbankian Bus Lines also continues to operate a Saturday-only local bus service between Marlborough and Framingham. This route originally operated between Marlborough and Shopper's World in Framingham. In 1998, Gulbankian reconfigured the service to operate between Solomon Pond Mall in Marlborough and Downtown Framingham. With the opening of the mall in Marlborough, there was less need to provide direct service to the mall in Framingham for shoppers from areas west of Framingham. Gulbankian also receives a subsidy from the MBTA Interdistrict Transportation Service Program to operate this service.

Planning

LIFT is administered by the Town of Framingham's Planning Department. The staff of the planning department makes decisions on scheduling or routing changes. The City of Marlborough has a transportation task force, which meets monthly, and also participates in

scheduling and routing decisions via a Framingham planning department representative who attends their meetings.

The initial application for MBTA subsidies for funding the start-up of LIFT service included census data to help justify the new service. The data showed the population and job growth taking place in the region, the amount of trip activity taking place within the Marlborough-Southborough-Framingham corridor, and the numbers of commuters traveling from Marlborough and Southborough to Framingham to ride commuter rail to Boston. Those numbers showed 6800 home-to-work and work-to-home trips between Framingham, Marlborough, Southborough, Natick, Holliston, and Hopkinton in 1990. The 1990 data also showed 702 daily commuting round-trips trips from Marlborough to Boston and 555 from Southborough to Boston.

Since implementation, the town of Framingham has conducted an on-board survey of passengers and has used this information to "tweak" schedules, and also to provide planners with a profile of users and their needs.

Operations/Budget

Funding for LIFT 7 comes from two primary sources, the MBTA Interdistrict Transportation Service Program, which provides \$98,438 per year and Job Access and Reverse Commute (JARC) funding, which provides \$112,244. This results in a total cost of service for fiscal year 2003 of \$311,558, which was off set by \$59,737 from passenger revenues. The net cost, therefore was \$251,821. The average number of passengers per weekday was 201 for FY 2003, and the net cost per passenger was \$5.02. The average net cost per passenger for LIFT was slightly higher than the average for the MBTA Interdistrict Transportation Service Program as a whole, whose net costs per passenger ranged from a low of \$1.43 to a high of \$16.13. The average cost of LIFT 7 was lower than LIFT routes 5 and 6, which are also funded through this program. The majority of the other services funded by this program are private carrier express bus routes that operate to and from Boston only during peak periods.

The LIFT 7 bus service contractor provides the equipment for LIFT 7. Framingham LIFT has utilized three different contractors since the service was initiated. The present operator is Mass Bay Limousine service of Ashland. The equipment consists of small (26 seat) buses that are equipped with wheelchair-lifts.

Marketing

Part of the JARC grant for LIFT includes funds specifically earmarked for marketing. The funding for marketing averages \$70 per service day. The original application for JARC funding identified marketing as an important component for successful implementation of the service. LIFT has hired a marketing firm to develop a new marketing campaign, which they hope to initiate later in 2003. The campaign will include distribution of timetables and maps, developing new bus stop signs, establishing joint efforts with businesses along the route to promote the service, developing promotional events at strategic locations, and coordinating marketing efforts with the Metrowest TMA

Past marketing efforts included a variety of promotions and special events. In February 2002, a LIFT marketing event was held at the Framingham MBTA commuter rail station. Passengers were given coffee, a copy of a Metrowest public transportation map, and LIFT bus schedules. In the spring of 2002, a LIFT 7 promotion was held at the 9/90 Corporate Center to inaugurate peak-hour service to the Staples employee entrance.

Also in Spring 2002, the Metrowest/495 TMA held a major LIFT 7 promotion for office parks along the route. Existing LIFT 7 riders were encouraged to “sell the service” to two of their fellow employees in exchange for prizes. LIFT also partnered with the Marlborough Chamber of Commerce to promote the route at hospitality centers, motels, and office parks along Route 20 in Marlborough. Framingham distributes copies of the schedules to Clark University (the Framingham Campus), Framingham State College, the Sheraton Tara Hotel, Motel 6, Chapel Hill Apartments, Edgewater Hills

Apartments, Edgewater Terrace Apartments, and Edgewater Village Apartments.

As part of the modification of the route to include a stop at the employee entrance of the Staples complex, Staples agreed to install a bus shelter and lighting there.

The town of Framingham has LIFT schedules on the town Web site and the MBTA has recently placed LIFT schedules on their Web site as well. The MBTA also has made LIFT 7 schedules available at timetable distribution kiosks at the subway stations at Government Center and Park Street in Boston, as well as the State Transportation Library, located at 10 Park Plaza in Boston.

LIFT sells 10-ride adult passes for \$11.00 and 20-ride passes for \$22.00 offering a savings of \$0.40 per ride compared to the regular cash fare of \$1.50 per ride. Passes may be ordered by mail from the Town of Framingham Transportation Coordinator. Free transfers are available to and from other LIFT routes. The elderly and persons with disabilities may ride at a reduced rate of \$0.75. Framingham LIFT, like many transportation providers in the metropolitan area, also accepts Commuter Checks. Commuter Checks are vouchers that are redeemed for bus tickets. They are provided tax-free by employers in amounts up to \$100 per month.

Results from a CTPS passenger survey of LIFT 7 indicate that 43% of riders surveyed found out about the service from a friend, 32% from seeing the vehicle, 13% from a newspaper, 5% from an Internet source, and 6% from their employer. The high percentage of riders who found out about the service by seeing the bus, suggests that it is important for vehicles to be clearly marked with destination signs and the name of the service (LIFT) on the sides of the bus.

Measuring Success

The ridership on LIFT 7 has exceeded that of the much more established LIFT Routes 5 and 6. LIFT 7 monthly ridership rose from 2,181 in March 2000, to 2,941 in March 2001, and to over 4000 in March 2002. The slowdown in the

economy and the reduction of service due to budget constraints kept ridership from increasing after 2002.

A high percentage of LIFT 7 passengers use the service to travel to work. Results from a CTPS passenger survey indicates that 49% of riders were traveling to or from work, 16% were going shopping, 6% were traveling to or from medical appointments, and 28% were traveling for other purposes. Most LIFT riders are of working age: 61% are age 35-64. LIFT 7 does not carry a high percentage of senior citizens: only 8% are 65 years or older. The survey indicated that only 38% of riders had a valid driver's license, and only 7% had an auto available to make the trip; therefore it's likely if LIFT 7 bus service were discontinued, many of the riders would be unable to make their journeys at all without getting rides from other people.

LIFT has had success attracting "reverse commuters" traveling from the Boston area via commuter rail and then transferring to LIFT 7 service to reach their job locations in Framingham, Southborough, and Marlborough. Results from a CTPS passenger survey of LIFT 7 riders suggest that 18% of morning LIFT riders transfer in Framingham from commuter rail to buses.

LIFT 7 has had less success attracting peak-period riders connecting from LIFT 7 buses to the commuter rail service at the station in Framingham to travel to Boston in the morning. According to the CTPS survey, only 5% of morning riders transferred to commuter rail to travel to Boston. The availability of existing direct peak-period private-carrier express bus service to Boston along part of the same corridor reduces the potential for LIFT 7 to attract as much of this type of ridership in the peak, although LIFT 7 does offer an alternative in midday hours when the express bus services do not operate.

Additional CTPS passenger survey results for LIFT 7 can be found in Chapter 3 of this document.

The Future

The need to identify future funding to support the service is a major concern for LIFT and the towns it serves. The elimination of late evening service and the reduction of midday service both resulted from financial constraints, but LIFT would like to restore service to past levels if funding can be identified. It should be noted that LIFT's contractor in the first quarter of 2003 developed financial problems, and the quality of service deteriorated as a result and a new contractor took over operations in September 2003. LIFT uses this same contractor on all of its other routes, and are hopeful that service reliability on LIFT 7 will return to the acceptable levels that existed in the past. With only a small staff overseeing the entire LIFT network, it is difficult to monitor contractor performance on a day to day and trip to trip basis, so LIFT must rely on feedback from customers to identify contractor service quality issues.

Summary/Conclusion

LIFT 7 has succeeded in providing an alternative for those without automobiles to reach employment. The route connects corridors that have substantial employment opportunities with dense residential areas in Framingham and Marlborough. Almost half of the LIFT 7 riders are people traveling to and from work. The route has also improved access to shopping facilities, medical facilities, schools, and social service providers. The lack of direct local transportation between Metrowest communities has also been addressed through the introduction of LIFT 7. The only previous service available through much of the corridor was limited express bus service to Boston. Ridership loss, after a period of initial growth, occurred after service was reduced because of difficulties in identifying funding sources and a slow down in the economy.

Service has been focused on hubs, including the commuter rail station in Framingham and the Solomon Pond Mall. Marketing is a required component of the initial funding grant agreement. Employers along the route

have been contacted and encouraged to inform their employees about the service. Linkage is provided to the commuter rail network and to other LIFT bus routes.

Monitoring the quality of service provided by contractors has been an issue. Since 2000, there have been three different contractors for the service. Coordinating with other private carrier transit services has also been a challenge for LIFT 7. Direct one-seat ride express bus service to Boston operates through some of the same catchment areas as LIFT 7. This has reduced the potential for LIFT 7 to attract Boston-bound riders who would connect to commuter rail at Framingham station. However, LIFT 7 does provide reverse-commute and midday connections that are not provided by the private carrier services.

THE NATICK NEIGHBORHOOD BUS

Introduction

The Natick Neighborhood Bus operates within the Town of Natick, and is an integral part of that community's municipal services. Located along the Massachusetts Turnpike 17 miles from downtown Boston, Natick is home to lower-density, family-oriented neighborhoods, several high-tech corporations, and a compact and picturesque town center. Town officials and many planners believe that all of these factors combine to make Natick a highly desirable community for both living and working.

Despite having two commuter rail stations, Natick is essentially an automobile-oriented community and as such has several high volume roadways. These include the limited-access Massachusetts Turnpike/I-90, and state Routes 9, 135 and 16, which all pass through Natick and drive much of its economy. While the Turnpike operates within acceptable Levels of Service (LOS) during both peak and off-peak periods, Route 9 tends to be more congested. There are also some smaller arterials that handle large amounts of traffic each day.

As is typical in such suburban communities, certain segments of the population face mobility challenges if they either do not have access

to an automobile, or have only one auto per household. Typically, the most challenged segments are the elderly, indigent, or those too young to drive. In Natick, where 14% of the population is over the age of 65, many residents do not have sufficient transportation to fulfill their basic human needs. Also, according to Natick town planners, there are a significant number of poor, transit dependent persons within the community as well. Along with commuters, these groups comprise Natick's potential transit service market, and the town is dedicated to assisting them.

Background

The Neighborhood Bus was created in 1975 as part of the MBTA's suburban transit pilot program. At the time, Natick was interested in exploring general transit options for the town and also had a significant number of transit-dependent elderly residents who needed the service. Thus, the town took advantage of the 50% matching grant offered as part of the pilot program and created the Neighborhood Bus.

Initially, a private contractor, with planning assistance from the town, operated the bus service. However, in 1989, planners and town officials determined that the bus service needed to be more responsive to local needs and that the service would be more effective if the town took over complete operation of the Neighborhood Bus. Because Natick is dedicated to assisting all of its residents, town planners and officials wanted the Neighborhood Bus to be considered an asset to every segment of the town's population. All residents, not just the elderly or transit dependent, should have access to the service.

In order to accomplish these goals, it was important to town planners and officials serving the general population be considered during the route planning process. This meant that planners had to accommodate the transit dependent population in a way that enabled them to make their service-oriented trips, but also needed to facilitate commuting. To that end, free transfers were set up with Framingham's LIFT service, and the

Neighborhood Bus was tied into the MBTA's commuter rail service in the town center, and the suburban circulator service for primarily non-work related trips such as medical appointments, shopping, and in some cases, purely recreational purposes.¹⁵

However, over time, because of budget constraints, the service became overburdened in pursuit of this goal. Additionally, there were operational procedures that caused confusion among the system's users resulting in the loss of some of the few commuters who were actually using the service.

In an effort to remedy the situation and provide better mobility for their residents, the Natick Board of Selectmen appointed a Transportation Task Force in April 2002 to investigate all facets of the service's operation, and to recommend ways to improve the Neighborhood Bus.¹⁶ A critical caveat provided by the Selectmen was to improve the service while remaining within the existing budget. As such, the Task Force had to find a way to maximize ridership, ensure quality, and improve responsiveness without additional funding. In September of 2002, the Task Force published its recommendations, and planners are now in the final stages of making radical operational changes to the bus service that will go into effect in late 2003.

Purpose and General Description

As stated above, the primary purpose of the Neighborhood Bus is to provide transportation for residents with mobility challenges.

¹⁵ The town planner explained that oral surveys of riders determined that some elderly residents take the bus simply to get out of the house and "go for a ride." Further the Bus has allowed some of these residents to explore parts of Natick, the town center for example, for the first time in years – perhaps since they ceased driving.

¹⁶ The 10 Task Force members were selected by the Town of Natick Board of Selectmen and consisted of: the Director of the Senior Center, the then-Natick Transportation Coordinator, a Financial Committee member, a bus driver, a taxi cab company representative, two Planning Board members, the then Planning Director, Natick resident and Mass Highway Director of Planning (Ken Miller), and a commuter. The Task Force received technical assistance from the Natick Department of Community Development and TransAction Associates.

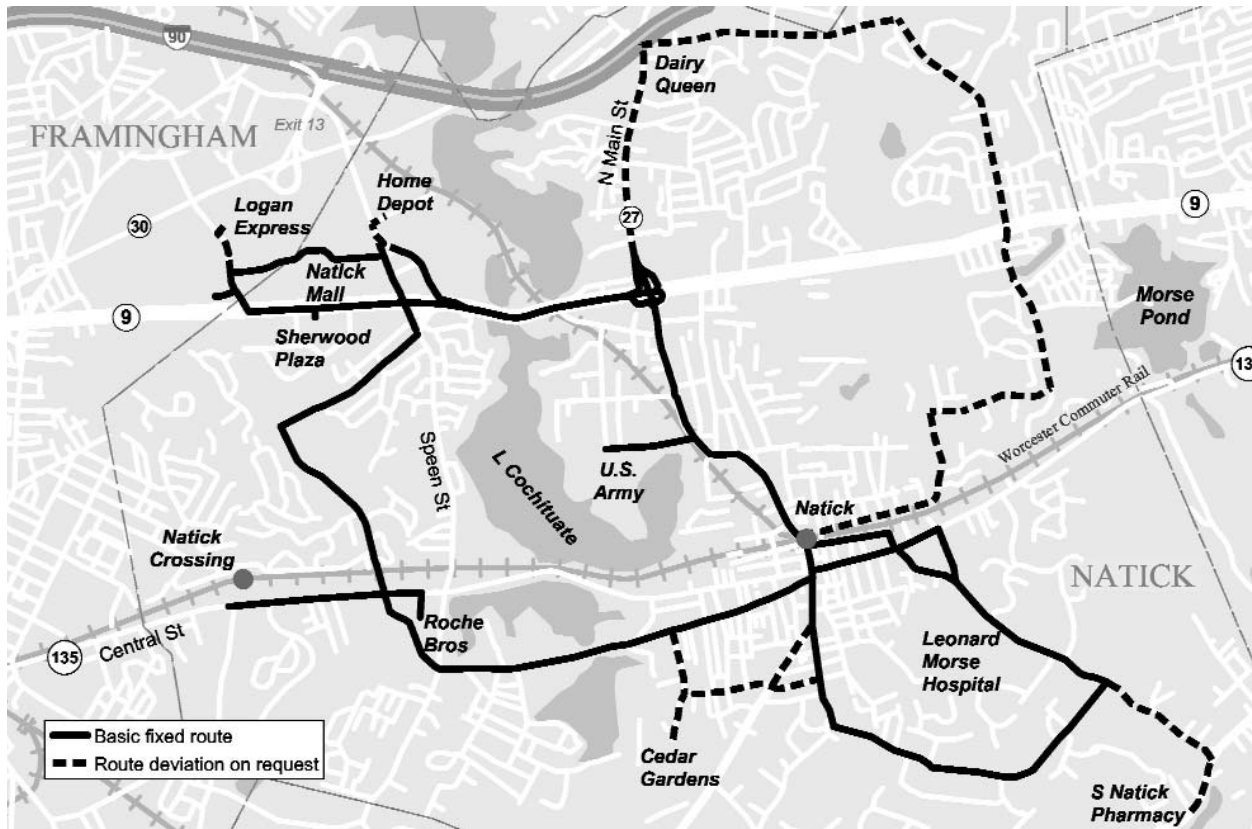


However, every attempt is made to accommodate all residents who wish to utilize the system. To accomplish this, Natick currently maintains a fleet of four buses and one van. The van is used for a sub service provided by the Neighborhood Bus appropriately called "The Van," and is designated for elderly or disabled residents who have no other means of transportation. The Van is a demand response system that provides a door-to-door service for which residents must call for in advance and pay a \$2.00 fare per one-way ride.

The Buses operate daily, and currently traverse two routes: the Northeast Bus, which runs from 9:45 am to 4:45 pm, and the Southwest Bus, which runs from 7:15 am to 5:15 pm. Fares for either route are currently \$1.00 per adult rider and \$0.50 for children over 6 and Senior Citizens. As mentioned above, the buses continue to operate as a circulator system connecting both transit dependent, and non-transit dependent residents to local services and transfer hubs where riders can access Framingham's LIFT system and the MBTA's commuter rail system. As can be seen in Figure 4.1, each bus takes a circuitous route through Natick connecting residents with major destinations. Also pictured in Figure 4.1 is the "request only" service that Natick offers as an attempt to serve as many residents as possible. The aspects of this part of the bus service will be explained further in the "Planning" section of this case study.

In addition to its normal service, the Neighborhood Bus is also used for Natick Emergency Operations Center contingencies. In the case of a major disaster or other calamity, Neighborhood Buses would potentially be used

FIGURE 4-4
Neighborhood Bus Routes Including Request Stops
Natick Neighborhood Bus Study Area



to evacuate citizens, or for other logistical purposes determined by the Operations Center.

Ridership

Research conducted prior to this study found that many suburban systems have difficulty collecting and maintaining accurate ridership data. Natick is no exception. The only ridership data obtainable from Natick planners was for the month of October 2002, and then it was only available in hardcopy format. Totals for that month are in listed Table 1 below. Note that seniors, who were the primary reason this service was started, accounted for approximately 75% of the monthly ridership, and adult commuters (including transfers and passes) account for only 22%.

At the time of this writing, the Town of Natick had hired a new Transportation Coordinator. The town planner filled this position for two purposes. First, the coordinator will take charge

of all customer service and scheduling issues. Second, the coordinator will be responsible for data collection, analysis, and storage. A follow-up visit would be necessary to gauge what effect the new coordinator will have in these areas.

Planning

The Department of Community Development is the governmental body responsible for planning in Natick and is also responsible for the planning and administration of the Neighborhood Bus. The department, with guidance from the town’s Board of Selectmen, has sought to plan and manage the Neighborhood Bus as an extension of the community’s values. As such, town planners are committed to providing transportation for Natick’s mobility challenged population, while not neglecting those residents who are simply seeking an alternative to the automobile.

TABLE 4-3
October 2002 Ridership
Natick Neighborhood Bus

<u>Route</u>	<u>Adults</u>	<u>Seniors</u>	<u>Students</u>	<u>Transfers & Passes</u>	<u>Total</u>
Northeast	334	1,322	46	41	1,743
Southwest	376	1,324	81	37	1,818
Total	710	2,646	127	78	3,561

Route planning was conducted by identifying the locations of Natick’s transit dependent population and determining likely stop locations within reasonable walking distance of their homes. Then service hubs (major service trip attractors such as Leonard Morse Hospital) were identified throughout Natick and were matched them with the residential origin. Natick GIS assisted in this process by identifying population densities, locations of specific age groups, types and densities of development, and major trip attractors.

Major trip attractors (destinations) included transfer hubs at Natick’s two MBTA commuter rail stops; the service hub at the Leonard Morse Hospital; the Natick Mall, which doubles as a service and transfer hub for the LIFT Bus, and two employment hubs, the U.S. Army Soldier System Center and Roche Brothers supermarket.

Based on this information, planners chose to operate the Bus as a fixed-route system. However since there appeared to be some latent demand for certain non-major destinations, planners devised an unusual “request stop” feature that, much like demand response systems, enabled residents to call in advance to schedule special pick-ups and drop-offs at the non-major destinations. As can be seen in Figure 4.4.1, buses deviate from the normal fixed route to accommodate such service requests. When there is a special request, the schedule for the remaining stops on that route is delayed, creating much confusion for service users since there is no way for riders to know what time their bus will arrive. However, because this service feature enables planners to create a service in keeping with the town’s value-based serv-

ice standard, this method has been continued. Unfortunately, this values-driven approach may have led planners to address too many needs within their limited budget and available assets.

The Department of Community Development has conducted formal, written surveys for the Neighborhood Bus, but the number of returned surveys tends to be very low. As a result, planners have found such surveys to be non-representative and thus not useful. However, Natick planners do ride the bus from time to time and informally poll the ridership. While not scientifically significant, this method allows the planners to have direct contact with riders, listen to their concerns and give direct responses. Additionally, this method has the added benefit of making riders aware of the fact that town officials are very interested in what they have to say, and how Natick can make the service better.

As previously stated, because the transportation budget is tight, maximizing the transit market has become critical. Planners needed to find a way to serve those transit-dependent segments of the community, provide a desirable service for nondependent segments, and stay within the existing operations and capital budget. The recommendations of the Transportation Task Force have been invaluable for planning future service and will be addressed in the “Future” section of this study.

Operations/Budget

The Natick Neighborhood Bus operates on an annual budget of \$180,000. The majority of this funding comes from the Town of Natick’s

municipal budget, but a sizable \$76,000 comes in the form of a grant from the MBTA Suburban Mobility program. It is unlikely that Natick would be able to operate this service without the MBTA grant.

For capital purchases, Natick received one-time payments from the developers of the Natick Mall, Pace Stores, and TJX Corporation to compensate for the transportation impacts of their developments. This funding enabled Natick to purchase their current bus fleet. It is not yet clear how Natick will replace this now-aging fleet. Town planners are exploring various options including government grants and continued contributions from corporations such as TJX. In addition to owning the buses, the town also owns the maintenance facility and hires its own drivers.

Average ridership on the Neighborhood Bus varies between 65 to 75 passengers per day, and the net cost per passenger per day range of \$2.88 to \$3.53 was determined from data acquired from the Department of Community Development.

As mentioned in the “Purpose and General Description” section, Natick does charge a fare for service. The fares have remained at the same rate for many years and provide \$24,000 in annual revenue. However, given the tight budget, and the desire to improve and expand service, there has been pressure to raise the fares. This was a major issue explored by the Transportation Task Force in 2002, which considered Natick’s fare rates to be below market value. There was apparently much disagreement amongst members of the task force as to whether or not fares should be increased, and if so, by how much. The majority of the task force recommended that fares not be increased until 3 months after the other improvements have been implemented. They reasoned that 90 days would allow a better evaluation of service change impacts without the additional trauma of a fare increase. The task force recommended that after the 3-month period, fares be raised by no less than 50%.

Marketing

The Natick Neighborhood Bus does not currently dedicate funding for marketing purposes such as advertising, branding, or promotions. However, they do generate various products that are considered to be a form of marketing by the current literature. These products include bus schedules and route maps, short descriptions of the service in tourism brochures, and a listing on the Town of Natick Web site. The Web site describes the services offered by the Neighborhood bus, lists the schedule, and provides a printable complaint form. The complaint form cannot be filled out online, but must be printed first, filled out, and then mailed to the Department of Community Development at the customer’s expense.

Measuring Success

As with all suburban systems, determining to what degree the Natick Neighborhood Bus has or has not been successful is a highly subjective process. The Town of Natick, through its Board of Selectmen, made the decision to operate a service that would help their mobility challenged residents maintain a respectable quality of life, as well as assist those who are seeking an alternative to their current commuting arrangement – no matter what the cost. This decision was the product of Natick’s “home-town values” that are centered on caring for all of its residents regardless of income level, age, or other demographic category.

In cases like this, if the service does help disadvantage segments of the population and is seen by the bulk of residents as a useful and necessary service, and those residents who use it are pleased with the service; most agencies would consider the service a success. However, the Board of Selectmen and especially the planners at the Department of Community Development are realistic about the fact that suburban transit systems are expensive and must be run efficiently to remain within their budget.

Because of their budgetary concerns, Natick planners have worked hard to keep costs down. The town has accomplished a great deal within

their total annual budget of \$180,000. As noted above, the Natick Neighborhood Bus maintains a net cost per rider per day of \$2.88 to \$3.53, which is within a reasonable tolerance – under the observed top end of \$5.00. However, given Natick’s existing budget, a significantly expanded service would definitely be a strain.

In the end, Natick planners believe that the Neighborhood Bus is a success. As proof, they point to two things. First, the Board of Selectmen’s continued funding of the service shows that they view the Neighborhood Bus as a vital service for those residents who need it, and are willing to continue the service. Second, planners point to the positive feedback received from patrons as well as their continued and growing use of the service.

The Future

Based upon the recommendations of the Transportation Task Force, the Natick Department of Community Development plans to implement several changes to the Neighborhood Bus. All of the changes fall into two categories: direct service improvements and cost saving/Revenue raising.

Direct Service Improvements

Planners are working to encourage more and more of Natick’s residents to utilize the Bus as a means of general mobility. To accomplish this, Natick will begin the important marketing task of clearly marking all bus stops with tasteful, and easily noticeable signage. Additionally, they plan to include information about routes at the stops, and especially the schedules for each route.

Then beginning in late 2003, Natick will implement a major service improvement that is very similar to the OmniLink services described in Chapter One, and will change the current route system dramatically. During the morning and evening peak periods, the Neighborhood Bus will be dedicated to primarily transporting commuters. There will be two routes: one called Natick Resident Commuters and the other called Reverse Commuters. Each route will be designed to coordinate with specific

commuter rail schedules for both inbound and outbound trains. There will be one bus per scheduled train and the routes will operate between residential areas and Natick’s commuter rail stops, Logan Express, and the large corporate offices along the Massachusetts Turnpike. During the off-peak hours, the buses will return to the normal fixed route circulator system, but the confusion causing “request stop” feature will be eliminated. The new routes are depicted in Figure 4.4.2 and are scheduled to go into effect in the autumn of 2003. The Natick planning department has already begun printing new route maps and schedules that will be distributed prior to the change.

In an effort to maximize ridership sources, as well as to achieve other social goals, Natick planners and town officials have decided to begin using the Neighborhood Bus to transport school children when the new system starts. Essentially, a new stop will be added by the High School where the students can use the bus either for trips home or to other after school activities.

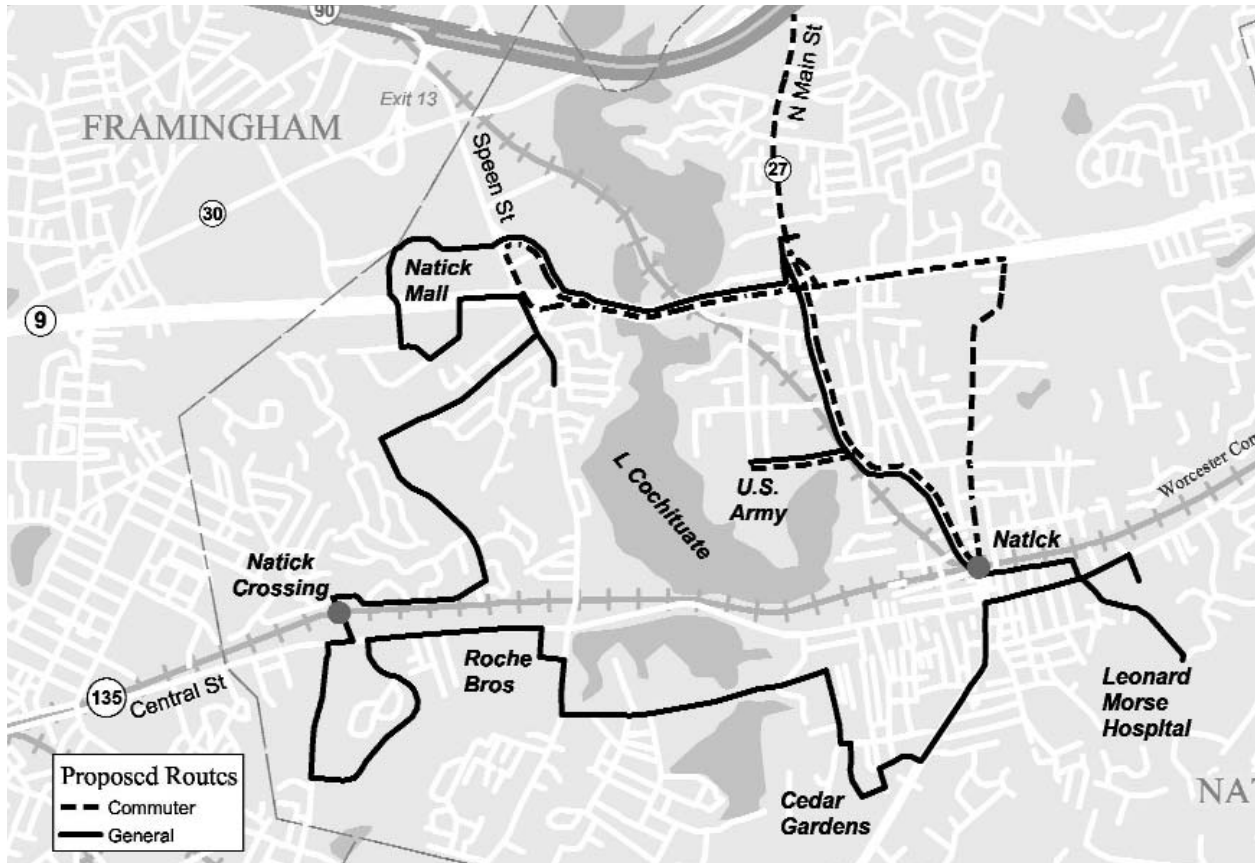
Finally, in an effort to offer more mobility to both residents and non-resident corporate employees, Natick planners will examine the possibility of instituting a “Lunch Shuttle” that will run from the large corporate complexes to either the town center or the Natick Mall.

Cost Saving and Revenue Raising

In an effort to reduce the cost of labor, Natick is examining the possibility of replacing their bus fleet with vans. Buses require a driver with a Commercial Drivers License (CDL) where as vans do not. By eliminating the need for this requirement, the cost of paying drivers become less and increases the chances of retaining drivers.

In another cost saving effort – also based on the Task Force’s recommendations – planners will do two things. First, the Transit Coordinator position will be dissolved and its duties combined with those of the Dispatcher. Second, the new combined position will be

FIGURE 4-5
New Neighborhood Bus Route System
Effective in Late 2003



made part-time, with hours just prior to and during peak service.

Additionally, the task force recommended utilizing the town's recreational vehicle as a supplement the bus/van service. This will accomplish two things. First, it will enhance service when more capacity is required, and second it would put to use a town asset that costs money even while sitting idle.

Finally, one of the most important improvements will be when Natick planners begins soliciting funds from companies that the bus services during peak hours. Learning from the 128 Business Council's example show earlier in this chapter, Natick's planner recognizes the potential gains from achieving a partnership with local corporations. Considering Natick's tight transportation budget, and the value of this service to local employers, it is essential that Natick seek additional contributions.

Summary/Conclusion

The Natick Neighborhood Bus is an example of a suburban system owned and operated by a municipality. This case study highlights the differences between the ways in which municipal transit systems view their service and their obligations to the community as opposed to how a privately run service views them. As is typical with such systems, the goals and objectives tend to revolve around serving a disadvantaged segment of the population. Recognizing this as a costly endeavor, the municipality then seeks to encourage ridership from other segments of the population in order to bolster the service – as well as meet the goal of providing service to all of the municipality's residents. The Neighborhood Bus experienced much of this during its first 28 years of life, and the following list of items can be viewed as lessons learned from their experience:

- Seek to maximize ridership by including segments of the population other than the transit dependent. Researchers Farwell and Marx demonstrated in the Transportation Research Record #1557 that suburban transit systems could maximize ridership by combining both the human service and commuting markets. The Neighborhood Bus experience provides an example of this practice. The Town of Natick was committed to serving the elderly and transit-dependent population, but had to consider that non-transit-dependent residents had to be included. By doing so, they could help foster a better sense of community and possibly minimizing the negative effects of traffic congestion on other segments of the community. By aggressively seeking to serve both markets, they were able to increase ridership and generate greater excitement and interest in the service.
- Avoid inadvertent “branding” a service as a “senior shuttle” or a bus for the “disadvantaged.” Planners in Natick found that a service perceived as specifically designed for human services did little to gain the interest of either the potential commuter market, or especially the young, school aged market. In order to succeed, a service must be marketed in a universally appealing way. However, the individual markets must still be targeted separately. This is important to consider when luring choice commuters or teenaged riders out of their automobiles.
- Utilize “shared town resources.” Natick owns the buses and hires its own drivers. However the maintenance facility is a central resource for all of the town’s vehicles, and Natick planners believe that utilizing this facility for the Neighborhood Bus has enabled the Town to save money.
- Buses must be on time. Timeliness is major part of competing with the automobile, and Natick planners learned this lesson due to the “request stop” feature of their original route system. Because of the uncertainty this feature caused, customers could not reliably tell when a bus would arrive at a particular stop. This caused riders to began leaving the system. Now, town planners recognize that timeliness is vital to establishing a solid reputation among both current and future riders, and they have made this a top priority for the new service.
- Utilize the smallest vehicle possible. While being careful to avoid capacity shortages, bus service providers should use small vehicles for two reasons: maintenance is usually easier, and vehicles under certain classes of smaller vehicles do not require CDL drivers licenses. Drivers with CDLs command higher salaries than non-CDL drivers and thus cause a strain on budgets. Also, they are hard to retain because they tend to be lured away by higher salaries offered by trucking companies. This causes much turn over, and therefore, potential service interruptions.
- Don’t be afraid to seek contributions. Often times, as in Natick’s case, large corporations or other businesses benefit from a suburban bus service. Municipal agencies must seek contributions from such entities. Suburban systems can offer “free” advertising on the buses as a “trade” for their generous corporate contributions.
- Have a consistent, electronic means of storing and retrieving data. According to research conducted by CTPS, small suburban agencies are well noted for having difficulty maintaining ridership records and other data in an efficient, consistent, and readily accessible form. Natick is no exception to this trend, and did have difficulty providing substantial ridership data for analysis. While not always critical in suburban transit, ridership data are important for many reasons. Moreover, other data such as demographic information and survey results must also be stored in a manner conducive with easy retrieval for analytical use.



CHAPTER 5

SUMMARY OF FINDINGS

As discussed in the previous chapters, providing successful suburban transit service is a difficult challenge, but is not impossible. The exhaustive review of the current literature from both local and national sources combined with the round table discussion, the survey results, and the case studies of local systems within the MPO region, together indicate that successful suburban services have learned through trial and error a number of similar lessons that can be applicable to both new and existing suburban operations. The key findings of these lessons are presented below.

THINK LIKE A BUSINESS

Perhaps the most significant finding of this study is that, suburban transit service providers must emulate the planning and operational aspects of a business. Indeed, there really is little difference between an entrepreneur starting a small business and a municipality or TMA running a small bus service. The planning, financing, and managing functions are very similar, and there is also the notion that if an agency starting a new service adopts a business-like mentality, they will tend to take more “ownership” of the process. Thus, the agency’s management will work even harder to ensure the success of their product – suburban mobility.

This finding has three key implications. First, management needs to instill a customer service mentality throughout the agency – from top to bottom. Suburban transit providers must think of and treat riders as customers that they want to see again and again. Moreover, they must try to view their service through the eyes of a customer. By always considering the rider’s perspective, and by actually putting themselves in their customer’s shoes by riding the system on a regular basis, management will be in a much better position to keep the service responsive to their customer’s needs.

Second, management must develop a mission statement. Planning for suburban transit requires a highly detailed approach. The reason for this is readily visible. Suburban transit markets are often-times very small, and the cost of providing service can be quite high. This leaves little margin for error. By planning in detail, potential service providers can avoid costly mistakes. All those involved in planning a suburban system should remember the Five Ps: Prior Planning Prevents Poor Performance. However, before any agency can begin the planning process, it is necessary for them to have a clear understanding of the new service’s purpose – i.e. the service’s mission.

Most suburban systems are planned by, and some operated by, municipalities. However, local governments, e.g. the elected officials and public servants who advise them, have a natural predilection for attempting to assist all residents within their community – and rightly so. This is why they are there. However, this causes municipalities to sometimes set goals and objectives that are far too broad for any one system to accomplish effectively, especially with a tight budget. For example, a small suburban system established to provide transit to the predominantly automobile-oriented general population, as well as assist the community’s elderly, poor, and/or other transit dependent groups, will certainly be stretching resources well beyond reasonable limits. Thus, experience indi-

cates that it is critical for municipalities and their planners to limit their expectations to one or possibly two focused, realistic goals that their system will be capable of addressing. This should be reflected in a concise mission statement that specifies the purpose, goals, and commitments of the system. This statement is both the agency’s touchstone and “message” to the public, and should also form the basis for all further system planning and marketing.

Finally, the municipality or agency needs to consider the availability of existing services. Identify other services, if any, in the local area that might already be providing a service very similar to the new one being planned. Duplication of effort is costly in any business, and it is very costly for suburban transit. Both the existing and new systems would suffer losses as they directly competed with one another. For transit planners, this means conducting a thorough analysis of the existing conditions, including highway conditions, to ensure no duplication will occur. If such conditions exist, the municipalities and agencies involved should conduct a dialogue on how to create alternatives to direct competition.

CONDUCT THOROUGH SERVICE PLANNING

Detailed Mission Analysis

Again, planning for suburban systems necessitates a detailed approach, thus the agency’s

technical staff should conduct an analysis of the mission statement to determine what is required to fulfill it. All specified and implied tasks or questions should be spelled out and answered before proceeding further. This could include some of the following steps, which are listed in Table 5.1 below. Note that the list echoes the findings from Chapter 1’s Literature Review and defines the purpose of the service, the target market, and the location of activity centers.

While all of the steps represented in Table 5-1 are important, research and practical application by such services as the Natick Neighborhood Bus, LIFT, and the Alewife Shuttle, suggests that it is critical for planners to emphasize two things. First, as mentioned above in the discussion above on mission statement development, planners must ensure their efforts are focused on the target market. Planning a service for an entire town is probably far too lofty a goal for a new service. Planners should focus on niche markets such as the elderly, and, if necessary and the opportunity is present, try to combine more than one niche market for maximum efficiency and ridership.

Second, planners must seek to connect customers to activity hubs rather than individual activity sites. As described in Chapter 1, hubs are destination-density focal points. They consist of business office parks, apartment complexes, train stations, shopping malls, or even bus transfer locations and commuter rail stops.

TABLE 5-1
Detailed Mission Analysis
Thorough Service Planning for Suburban Transit

Analysis Step	Aspects	Examples
Demographics: Identify market to be served based on the Mission Statement.	Who are the customers? Where do they live? How many are there?	Seniors, commuters, transit dependent Expected number of riders
Identify the nature of travel	Why and when are they traveling? Where are they traveling?	Trip purposes: Medical, shopping, recreation, school, work, etc.
Identify the destinations	Focus on hubs (activity centers)	Hospitals, malls, transfer points, office parks, etc

Focusing on such centers can help suburban systems maximize ridership and provide maximum mobility options for customers. For example, the Neighborhood Bus connects its customers with two MBTA commuter rail stops (transfer hubs), the Leonard Morse Hospital (service hub), the Natick Mall (combination service/transfer hub) – where customers can access the Lift Bus system, and the U.S Army’s Natick Laboratory and Roche Brothers (employment hubs). The Alewife Shuttle connects its customers from the MBTA Red Line rapid transit station (transfer hub) to various office complexes (employment hubs) and one major apartment complex (people hub).

Course of Action Development

A detailed mission analysis should provide planners with the critical “who, what, when,

and where” needed to develop potential courses of action (COA). COA development is a process where up to three different plans can be developed for analysis. These plans are compared and ultimately a decision maker or decision-making body chooses which COA is the best plan to proceed with. For suburban transit planners, these plans should focus on serving the most critical market first and then any other identified markets can be incorporated into the second or third COA.

Note that a critical part of each COA will undoubtedly be the financial component. Sound financial analyses lead to realistic budgets. Inflows and outflows of capital should be forecasted in detail and cost per passenger per day considered. A review of suburban transit systems both nationally, and in Massachusetts indicates that a reasonable target range for the

TABLE 5-2
Course of Action Development
Suburban Transit Planning

Step	Action	Description
Identify capacity needs	How many seats are needed? How many trips are needed?	Type of vehicle Frequency of service
Calculate costs and budget	Capital, operational, maintenance, overhead, marketing, etc.	Develop budget.
Identify funding sources	Government funding Corporate partnerships Fare box	List, in detail, sources of funding and the amount. Indicate if the amount is guaranteed or expected.
Develop courses of action (COA)	Identify the type of service appropriate for the market and budget. Create two or three relatively detailed plans.	Circulator, demand response, employer shuttle, etc. Bus, mini-bus, van, etc.
Analyze COAs	Model or “war game” them.	Run through iterations of mock operations designed to show how system would operate, the cost, etc.
Choose and present to decision makers.	Choose COA that best meets the goal(s) and customer’s needs. Present COA to stakeholders for comments/approval.	Choice will often be budget vs. public need.
Finalize the plan	Complete draft of the plan	

net cost per passenger to be achieved after the first year of operation should be between \$2.00 - \$5.00.

Table 5.2 presents an example of how suburban agencies might generate their comparative courses of action.

DEVELOP AND MAINTAIN AN AGGRESSIVE MARKETING STRATEGY

Many suburbanites tend to be unaware of transit service operating in their town, and even when they are aware, few actually know how to access it. Thus, marketing has emerged as a tremendous part of creating a successful service, and should not be confused with simply advertising a service. Marketing includes much more: broadly speaking, marketing is the art of transmitting the agency's "message" to both its current and potential customers and to the general public, who support the system with tax dollars. Marketing is effective in: creating consumer awareness, disseminating important information, causing trial or increased ridership, enhancing the service's image, and by extension, enhancing public support. For suburban transit operators, marketing has been shown to be key in the creation of a brand identity, the development of contact avenues or lines of communication, and creating promotional strategies. Because lack of information is often a barrier to suburban transit use, marketing's primary purpose should be to raise awareness of the service and its benefits among current and potential customers, potential sponsors, and even the general public.

This should be an aggressive campaign that must include all information necessary to inform both the target market(s) and the general public as well. This should include activities such as: the creation of a "brand" image for the service, the creation and distribution of materials such as route maps and schedules that include both the brand image and mission statement, direct mailings to potential riders introducing the service and including schedules and route maps, promotional offers to potential customers and sponsors, and especially the

clear marking of stops along the transit route. Additional marketing activities that have been found in case studies to work well are the staging of events such as Rider Appreciation Days, and attending employer or community-based events such as cookouts or fairs.

Table 5.3 provides a listing of marketing techniques seen in the research and case studies. While they are broken down into three categories, it is important to note that all of these techniques are valuable and services should be attempting them all. The categories are defined as: "Must have" critical items that any agency should definitely be engaged in; "When available" activities that service providers should definitely seek to do but must wait for the opportunity to implement; and "If budget allows" items that agencies would certainly benefit from, but which may require additional funding to initiate.

DEVELOP AND MAINTAIN PARTNERSHIPS

As mentioned in the marketing section above, partnerships are important for the benefits they bring in terms of both technical help and financial assistance. Suburban transit providers should know that they are not alone. There are agencies such as TMAs, RPAs, as well as state and federal agencies that can assist them with technical expertise when needed in areas such as modeling, GIS, or other data-intensive activity.

Research and case studies have indicated that seeking public/private partnerships with large corporations or other types of businesses that benefit from the suburban agency's service is invaluable in terms of sharing costs. Agencies should always be aware of such opportunities within the range of their service. Moreover, such partnerships could facilitate service expansion under the right set of circumstances. (for example, when suburban corporations look to lure employees away from downtown employers.)

It has also been shown that agencies should endeavor to work with area land developers. Whether publicly or privately operated, subur-

TABLE 5-3
Marketing Techniques or Items
Suburban Transit Marketing Planning

Priority	Technique or Item	Description
Must have	Ride schedules and route maps	Distribute schedules and maps widely
	Clearly marked bus stops	Ensure stops are well marked and present attractive high quality appearance
	Employer/business outreach Working relationships with land developers Brand image	Contact local businesses to seek partnership
When available	Display vital information on town Web site.	Display routes and schedules, contact numbers, other directions
	Attend community events	Maintain a high level of visibility for the service
If budget allows	Newspaper/media advertising	
	Agency-specific Web site	Agency having its own Web presence is helpful.
	Wrapped vehicles	Paint buses in noticeable ways, which can be advertising for sponsors.
	Rider Appreciation Day	Provide free rides and gifts promoting the service.

ban transit planners need to be aware of what new real estate developments are taking place within the community. Whether these are for residential or for high-end commercial uses, a suburban transit system will be more successful in serving that development if accommodation is made for its buses or vans early on in the planning process. Moreover, developers can be a communications resource for identifying potential corporate sponsors/partners.

Another form of partnership that is particularly important is coordination with adjacent systems such as the MBTA. Planners should ensure that new suburban systems are well recognized by the much larger MBTA, and seek a “champion” within that agency. By identifying someone who will represent the smaller suburban agency’s interests in matters requiring MBTA support, much time and administrative energy

can be saved. This is not easy, but suburban providers within the MPO area have noted this as necessary and important.

COMPETE WITH THE AUTOMOBILE

Automobiles are the most dominant form of transportation in the suburbs, and are very difficult to compete with. The automobile industry is vast and has many decades worth of marketing, financing, subsidizing, and regulatory support to give it strength. However, that does not mean suburban transit operators cannot penetrate the suburban transportation market. Research indicates that agencies seeking to provide suburban transit should adopt a competitive attitude and make every effort to ensure that their services seek to emulate as many of

the automobile's characteristics as possible.

There are realistically two areas that suburban systems can readily compete in. The first is reliability. Endeavor to make the service above reproach in terms of reliability. Always be on schedule – no excuses. If a bus is disabled, immediately send out a spare to pick up the stranded travelers.

The second is image. While this report does recommend frugality in regard to vehicle purchases, there is value in addressing the look or image of suburban transit vehicles, including their interior amenities. In competing with the automobile, it is vitally important that agencies ensure that vehicles are kept exceptionally clean inside and out. In larger vehicles that transport commuters, agencies should consider adding tables, such as those found on commuter rail cars and airliners. Providing newspapers or other amenities such as free coffee and donuts on a specific day – such as the last Friday of the month – can go a long way in generating customer appreciation for the service and raise the service's reputation.

CONTINUE TO INFLUENCE LAND USE CHANGE

For decades, planners and other transit professionals have decried the effects of sprawling suburban development and its effects on providing mobility for the community. They have tried with varying degrees of success to influence the way in which communities develop. Land use intervention is important for creating transit-friendly environments, as well as for the ongoing efforts to maintain the character of old New England communities in the face of suburbanization.

However, land use changes do not occur overnight, and certainly not without a great deal of political discourse. Truly effective changes of this type come very slowly. Planners must battle not only those who believe the current form of development is appropriate and “what people want”, but also half a century of marketing, legislation, and financial incentives that have ingrained low density development in the hearts and minds of most Americans.

Meanwhile, suburban transit agencies, and especially those with a significant customer base that has come to count on their services, have to struggle on. Given this, nearly all of the research being conducted today is directed toward finding new or innovative ways to make transit work in the current built environment of the suburbs. However, this is not to say future land use intervention is not important, or a waste. On the contrary, land use intervention remains as important as ever to suburban transit.

As discussed in Chapter 1, there are two key methods through which suburban transit providers can stay involved in land use changes. First, planners can develop transit-friendly design guidelines specific to their communities for the use of public works engineers. These guidelines inform engineers about critical technical aspects of transit operation. Examples include, turning radii for buses, the provision of bus pull-ins, etc. Additionally, these guidelines can provide information on pedestrian-friendly environments to community officials, such as the inclusion of sidewalks, their appropriate size, etc.

The second key method that suburban transit providers may employ to stay involved in land use changes is to develop transit-oriented land use guidelines. Unlike design guidelines that are highly technical and at the micro level of planning, land use guidelines are more at a macro level. They are written for local officials and planners, and explain what types of land use are best served by transit and how to locate them in clusters around transit access points. Moreover, the guides should include some information relating to how transit can influence land values and development within a community.

Given that many smaller suburban services may not have the expertise to develop such guidelines internally, it is recommended that agencies seek assistance from a variety of sources such as the MBTA, RPAs or the MPO. By assembling this knowledge, suburban agencies should be able to provide influential guidance to their community leaders.



APPENDIX A

LITERATURE REVIEW: KEYWORDS AND WORKS CITED

Sources were identified via three means: Internet searches, library searches, and the bibliographies of other works. General searches conducted via the Internet (Google, National Transit Database, Transportation Research Board) and at the State Transportation Library of Massachusetts used the terms listed below. Specific references found in the literature such as the Pace Development Guidelines were looked up on the web directly.

General search terms:

- Suburban mobility
- Suburban transit
- Maplewood Jitney
- Jitney
- Reverse commuting
- Employer shuttle
- Transit-oriented development/transit-focused development
- Suburban transit efficiency

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APPENDIX B

EXAMPLE SURVEY

Suburban Transit Service Passenger Survey

No.

This survey is being conducted by the Boston Metropolitan Planning Organization to help plan future suburban bus services. The information collected in this survey will be used to help project demand for new routes and determine ways to improve mobility for suburban residents and employees.

After completing this survey, please return it to the data collection staff member on board your bus.

1. How did you hear about this bus service? (circle one)

From my employer -1 Newspaper -2 E-mail/Web site -3
From a friend -4 Saw it -5 Other _____ -6

2. Do you usually take this bus BOTH going to and coming from your destination? (circle one) Yes No (If "No," how do you travel in the other direction? _____)

3. At which stop did you get on this bus?

(address or intersection or landmark) (City/Town, State, Zip Code)

4. Where are you coming from? (circle one)

Home -1 School -2 Work -3
Shopping -4 Medical Appt. -5 Other -6

4a. Where is that located (the place in Question 4)?

(address or intersection or landmark) (City/Town, State, Zip Code)

7. On average, how many days a week do you ride this bus? (circle one)

Less than 1 day -0 1 day -1 2 days -2 3 days -3
4 days -4 5 days -5 6 days -6 7 days -7

8. How did you make this trip before the bus service began? (circle one)

Drove alone -1 Walked -2 Got a ride -3
Carpool/vanpool -4 Bicycled -5 Did not make trip -6
Public Transportation -7 Other _____ -8

9. If you are going to work, is there free parking there? Yes No

10. Did you have an auto available for this trip? Yes No

11. Do you have a valid driver's license? (circle one) Yes No

12. What are your main reasons for riding this bus? (circle no more than two)

Convenience -1 Parking cost/availability -2
Speed/travel time -3 Environmentally responsible -4
Avoid driving/traffic -5 Only transportation available -6
Inexpensive way to travel -7 Other _____ -8

13. What is your gender? _____ M F

4b. How did you get from there to this bus? (circle all that apply)

Walked -1 Drove myself -2 Got dropped off -3
Subway -4 Commuter Rail -5 Another bus -6

5. At which stop will you get off this bus?

(address or intersection or landmark) (City/Town, State, Zip Code)

6. Where are you going? (circle one)

Home -1 School -2 Work -3
Shopping -4 Medical Appt. -5 Other -6

6a. Where is that located (the place in Question 6)?

(address or intersection or landmark) (City/Town, State, Zip Code)

6b. How will you get there from this bus? (circle all that apply)

Walk -1 Drive myself -2 Get picked up -3
Subway -4 Commuter Rail -5 Another bus -6

14. What is your age? (circle one)

17 or under -1 18-24 -2 25-34 -3
35-44 -4 45-64 -5 65 or over -6

15. Several measures of service quality are listed below. Please circle the number after each measure to indicate how well you think this bus service performs. Then, place a check mark beside the one measure that is most important to you.

	<u>Good</u>	<u>Average</u>	<u>Poor</u>	<u>Most Important</u>
Reliability (on time)	1	2	3	___ -1
Courtesy of drivers	1	2	3	___ -2
Frequency of trips	1	2	3	___ -3
Travel time	1	2	3	___ -4

16. What is your annual household income? (circle one)

Under \$20,000 -1 \$20,000-\$29,999 -2 \$30,000-\$39,999 -3
\$40,000-\$59,999 -4 \$60,000-\$79,999 -5 \$80,000 or more -6

17. Do you have any additional comments or suggestions about this bus service? If so, write them below.

Thank you for your time!