3-27-2006

The Feasibility of Establishing a Telecenter in an Urban Corridor: A Case Study of the SR 836/Dolphin Expressway Corridor in Miami, Florida

Anurag Komanduri

University of South Florida

Follow this and additional works at: http://scholarcommons.usf.edu/etd

Part of the American Studies Commons

Scholar Commons Citation


http://scholarcommons.usf.edu/etd/3851

This Thesis is brought to you for free and open access by the Graduate School at Scholar Commons. It has been accepted for inclusion in Graduate Theses and Dissertations by an authorized administrator of Scholar Commons. For more information, please contact scholarcommons@usf.edu.
The Feasibility of Establishing a Telecenter in an Urban Corridor:
A Case Study of the SR 836/Dolphin Expressway Corridor in Miami, Florida

by

Anurag Komanduri

A thesis submitted in partial fulfillment of the requirements for the degree of Master of Science in Civil Engineering
Department of Civil Engineering
College of Engineering
University of South Florida

Major Professor: Ram Pendyala, Ph.D.
Sisinnio Concas, ME.
Elaine Chang, Ph.D.
John Jian Lu, Ph.D.

Date of Approval:
March 27, 2006

Keywords: Telecommuting, Miami-Dade, GIS, Traffic, Congestion

© Copyright 2006, Anurag Komanduri
DEDICATION

This thesis is dedicated to my mother and sister. Their love, support and patience have seen me through some of my most difficult times and have made my happy moments more enjoyable.
ACKNOWLEDGEMENTS

I wish to express sincere appreciation to my major professor Dr. Ram Pendyala for his valuable guidance during the thesis work. I also wish to extend my gratitude to Mr. Sisinnio Concas for allowing me to be a part of this project and for his excellent support and invaluable inputs and ideas during the course of the thesis. Thanks also to Dr. Elaine Chang and Dr. John Lu for agreeing to serve on my graduation committee. I am also thankful to my roomies and to my friends from my undergraduate days who have taken a brunt of my mood swings and have seen me through.
# TABLE OF CONTENTS

LIST OF TABLES ................................................................................................................ iv

LIST OF FIGURES .................................................................................................................. v

ABSTRACT ........................................................................................................................ vi

CHAPTER 1 INTRODUCTION TO TELECOMMUTING AND TELECENTERS ....... 1

1.1 Telecommuting ........................................................................................................ 1

1.2 Telework Centers .................................................................................................. 4

CHAPTER 2 CLASSIFYING TELECENTERS ................................................................. 7

2.1 Single Employer Centers ....................................................................................... 7

2.2 Multi Employer Centers ....................................................................................... 8

2.3 Urban Executive Office Suites ............................................................................. 10

2.4 Other Telecenters ................................................................................................ 11

2.4.1 Rural Remote Work Centers ........................................................................... 11

2.4.2 Residential and Mixed-Use Developments ..................................................... 12

2.4.3 Non-Territorial Offices ................................................................................... 12

CHAPTER 3 TELECENTER EXPERIENCES ................................................................ 13

CHAPTER 4 CHARACTERISTICS OF TELECENTERS .............................................. 18

4.1 Goals and Objectives ............................................................................................ 18

4.1.1 Commute Trip Reduction .............................................................................. 18

4.1.2 Traffic Congestion Mitigation ........................................................................ 20
LIST OF TABLES

Table 1 Telecenters in the U.S.................................................................17
Table 2 Feasibility Matrix.........................................................................43
Table 3 Peak Hour SR 836 Telemeter Site .................................................54
Table 4 SR 836 Level of Service .............................................................55
Table 5 Southwest Cluster Places of Employment .................................61
Table 5 Southwest Cluster Places by Sector ............................................62
LIST OF FIGURES

Figure 1 Dolphin Expressway .................................................................51
Figure 2 AADT Distribution on Different Segments of SR 836 .................53
Figure 3 Commute Trip Patterns to Miami CBD ......................................57
Figure 4 Southwest Cluster ..................................................................58
Figure 5 Work-Trip Origin-Destination ..................................................59
Figure 6 Workers of Southwest Clusters Working at CBD .......................59
Figure 7 Density of Residents of Working Age (18 to 64) .........................63
Figure 8 Density of Households with No Children .................................64
Figure 9 Average Household Size per Census Tract ...............................65
Figure 10 Amenity Locations ................................................................68
Figure 11 Transit Stops ..........................................................................69
THE FEASIBILITY OF ESTABLISHING A TELECENTER IN AN URBAN CORRIDOR:
A CASE STUDY OF THE SR 836/DOLPHIN EXPRESSWAY CORRIDOR IN MIAMI, FLORIDA

Anurag Komanduri

ABSTRACT

Telecenters are alternate work locations and are used as a means to reduce the commute discomfort to employees. Telecenters provide advantages to both the employees and the employers and are a good Travel Demand Management measure. The history of telecenters is relatively new. Many telecenters were established in the early 1990’s with the support of the Federal and State Governments. While initial signs were encouraging, the inability of these telecenters to carry on running in the absence of continued funding made them cost intensive unsuccessful experiments. There have been fewer attempts by private individuals/ Governments to work with the concept of telecenters, since these failures; with home-based telecommuting being a more viable alternative to working from the office. There has been a recent revival of interest in telecenters owing to their ability to provide employees with more choice with their work place location. Also, extremely high congestion and long commute trips in many major cities are forcing authorities to look at alternate means to reduce trip lengths (and durations).
Authorities in Miami are looking at alternate means to reduce congestion in the city and the possibility of establishing a telecenter is one such idea. This study evaluates the feasibility of establishing a telecenter in Miami. The site chosen is a stretch along SR 836 (Dolphin Expressway). Various conditions that must be met before the telecenter can be established are discussed, and the site is assessed on its ability to attract employees to the center.
CHAPTER 1

INTRODUCTION TO TELECOMMUTING AND TELECENTERS

1.1 Telecommuting

The term "telecommuting" was coined by Jack Nilles in 1973, during a period when interest in the concept of working away from the main office was ever-increasing owing to the growth in computer technology and partly from the oil crises. Telecommuting was defined, in the early days as the use of telecommunications technology or other means to partially or completely replace the commute to the normal workplace (1).

Recent definitions for telecommuting include (2):

- Moving the work to the workers instead of moving the workers to the work.
- Periodic working out of the central office, one or more days of the week.

The new definition implies that telecommuting need not involve telecommunications at all. An employee reading and writing at home all day, without using the telephone or the computer, can be said to be telecommuting just as surely as the employee who is on-line for six or eight hours (3). The use of telecommunication technology to conduct work is now termed “telework” and is treated differently from telecommuting.
While telecommuting need not involve telecommunications, it is true however, that telecommuting has become more prevalent with the increased use of telecommunication technologies such as computers and the internet. The US EPA (Environmental Protection Agency) in a report states “Until the 1980s, most office arrangements required employees to be physically present to perform their jobs. However, with the ability to exchange documents over phone lines via modems, many jobs (in whole or in part) can be performed from remote sites. Such tasks as entering and analyzing data, writing and editing documents, and computer programming are no longer tied to specific locations” (4).

Telecommuting is perceived differently by various individuals. As suggested by Handy and Mokhtarian, in their report in 1995 (5):

- Transportation planners, along with other segments of the public sector, see telecommuting as a solution for mitigating urban traffic congestion, and as a way to conserve energy and improve air quality;
- Businesses, along with other segments of the private sector, see telecommuting as a way to increase productivity while decreasing overhead costs and retaining their employees;
- Individual workers see telecommuting as a flexible work arrangement that (among other potential advantages) helps to alleviate travel expenses, delay, and stress associated with most urban commute trips and increases time spent with the family.

Telecommuting gained much prominence in the early 1980’s, fueled in part by transportation and air quality legislations that encouraged innovate alternatives to the
single-occupancy vehicle commute; and also by requirements placed on employers to reduce their employees’ use of the automobiles for commuting, (6). In recent years, the drive has been voluntary, because, with dearth in skilled workers, most organizations are willing to try all methods to keep their workers on the job (7).

Telecommuting has been specified as a Travel Demand Management (TDM) solution along with other remedies as carpooling, vanpooling, use of HOV lanes, staggered work timings and rideshare programs, etc. or public policymakers, For policymakers "telecommuting is an attractive TDM strategy because it supports several agendas. It contributes to policies supporting: transportation, energy independence and conservation, improvement of air quality, employment for people with limited mobility (disabled, retired, low income, single parent), rural economic development, global competitiveness of American business, effective health care management, the American family and increased community involvement” (8).

Telecommuting is not suitable to every job, person, or situation. Whether an individual telecommutes, and how often, are results of the decisions of employer and employee, made within the constraints of the existing physical and institutional environment (9).

a) The job must be suited, at least in part, to performance at a remote location.

b) The capabilities and personal characteristics of the employee must be appropriate to working with little or no direct supervision.

c) The employing firm must accept telecommuting as a legitimate and desirable activity, provide necessary support, and have appropriate information technology in place.
d) The supervisor or manager of the employee must accept the concept and practice of telecommuting.

e) The employee must feel comfortable with telecommuting in terms of its suitability to his or her personal work habits and style, its effect on social interactions and on advancement and career.

f) The employee must have a suitable workplace and working time free of distractions (such as child care responsibilities).

g) Available technology, particularly telecommunications services, must be adequate and cost-effective for the work to be performed at home.

The potential of using telecommunications and other means to substitute travel has received attention from researchers from the early 1960’s (4). There are two major forms of telecommuting: working from home and working from a telecenter. Most of the early focus was on studying the potential of home-based telecommuting. It was only in the early 1990’s that the Government took notice of the possibility of establishing “telework centers” as an alternative means to promote telecommuting to reduce commuter travel.

1.2 Telework Centers

The definition of telework center stems from an abridged version of the phrase “telecommuting center,” which refers to “an alternative place of work” for employees. A telework center is an office facility, remote from the employer’ central office, that provides a formal working environment to telecommuters for a fee (2). A telework center can be privately or publicly operated, with most of the facilities
receiving limited government funding. In this report, the words telework center and telecenter will be used to define the same Transportation Demand Management (TDM) strategy.

While management of employees at the office location is a defining criterion for central offices, two criteria, namely remote management and commute trip reduction must be met for any remote office location to be termed a telecenter. Employees work out of a conventional office because that is where their job is, regardless of where they live, whereas employees work out of a telecenter because they live in its proximity (6). Telecenters are characterized by the absence of a self-contained pyramidal organizational structure; telecommuting staff report to off-site managers and telecommuting managers have at least one off-site staff reporting to them. Telecommuting centers have long been discussed in the TDM literature, even though practical application of the concept begun only in the 1990’s. The term “suburban work center” was used by Memmott, in his study in 1963, to describe a location closer to home than the main workplace from which an employee could carry out his tasks using telecommunications technology (10). The study describes, in depth, the various advantages of telecommuting and potential barriers to the idea. In 1968, Timothy Healy, in a study that studied the affect of communications on transportation and the work-place, used “neighborhood remote work center” to refer to a telecommuting facility within walking distance of one’s home (11). Harkness in 1977 conducted a technology assessment that examined the potential impact on energy consumption of working at home or in neighborhood centers close to home (12). The study estimated the potential savings in oil and gas that could be obtained
by telecommuting and reducing travel distances. Nilles in 1988 defined various types of telecenters based on the number of employer firms that they catered to (single/multi-employee telecenters), their location and the goal that they aimed to attain (13).

According to a study of the International Telework Association and Council (ITAC), in 2000 there were about 16.5 million teleworkers, 7% were solely telework-center based, while 89% were home-based teleworkers, or telecommuters (14). Statistics also reveal that there are 45.1 million Americans worked from home last year (according to the 2004-2005 ITAC American Interactive Consumer Survey conducted by the Dieringer Research Group), a continuing growth trend.

Although telecenters cater to only a small percentage of the telecommuting population, they are still pursued as a TDM strategy, owing to their perceived advantages and convenience that they provide to employees.

The rest of the study describes in detail the features of telecenters, the goals, the advantages, some drawbacks and a detailed analysis of establishing a telecenter in the proposed corridor.
CHAPTER 2
CLASSIFYING TELECENTERS

Telecenters can be classified into two broad categories:

- Single Employer
- Multi-Employer

Within these two categories there are different types of centers, based on location, tenants’ characteristics, facilities and amenities provided:

- Government sponsored
- Rural or Urban Fringe Area
- Technology Promotion
- Pay-as-you-go

The broad classification is aimed at providing planners with consistent means to ranking telecenters to ascertain the goals, objectives, site location and marketing strategies and facilities that are consistent with each telecenter.

2.1 Single Employer Centers

These are centers that typically house employees of one organization. They provide 20 to 25 spaces, which are available on a drop-in basis. They are maintained by the parent organization and funded internally.
The first single employer telecenter in the US was the Pacific Bell telecenter, set-up in San Francisco, California, in 1985. The center housed 22 employees and was part of a successful telecommuting program organized by Pacific Bell. Owing to its success, Pacific Bell opened another telecenter in North Hollywood to encourage more employees to use their telecenters.

Single employer telecenters are difficult to establish and maintain as they are often seen as just another branch of the main office and are overlooked by most employers. They have their advantages of course, especially as each employer firm has the same work-ethic and principles that make it very easy to establish the telecenter as an alternate place to work. But, it is not a very cost effectual alternative for most employers and as a result, there have been very few attempts in the recent past to establish single employer telecenters.

### 2.2 Multi-Employer Centers

These are facilities that provide space to employees of more than one organization. Tenants can be employees from both the public and private sectors. The size of these centers depends on expected occupancy and utilization rates. The facility may be rented either by a self-employed individual or by an employer for his employees. While the typical size is about 20 to 25 spaces, there are some telecenters such as the Riverside County Telecommuting Center, California, designed to cater to the needs of more than 50 employees. Most telecenters also provide extra space for conference, and audio/video conferencing rooms.
A relevant share of the operating costs is fixed or independent of usage levels. These include leasing costs, depreciation expenses, and administrative overhead. This suggests that economies of scale must be attained in order to spread fixed costs over a large number of users. On the other hand, larger centers are more difficult to fill, and tend to lose their local area character as they must draw from a much larger commute pool. Understanding this simple dilemma is the key to assessing the market for center-based telecommuting.

The advantage of a multi-employer facility over a single employer work center is that multi-employer centers can cater to the surrounding area residents, who drop in at short notice and do not belong to any participating employer groups. But, preference is given to employers/individuals who rent out the facility on a long-term basis. Short-term, drop-by users are allowed to use the telecenter only if the telecenter facility is free for use and their schedules do not clash with the schedules of the long-term tenants.

These centers also work as information technology clearinghouses, in addition to providing commuter trip reduction benefits for regular users. They involve many challenges such as monitoring employee productivity, security, coordination and logistic issues among all the employers and employees, most of which exist with other forms of telecenters too (1). They also provide advantages that cannot be offered by other forms of telecenters, for example:

- They are best suited for small and mid size firms, which do not need and cannot afford setting up a satellite work center, but are willing to use the option of a shared telecenter to satisfy the needs of their employees;
They are also suited for large employee firms which are in the experimental phase of testing a telecommuting program. Multi-employer telecenters provide a low cost, low risk program, which can serve as a first step in establishing a company owned and managed.

The first multi-employer telecenter in the US was set up in Hawaii in 1985 in the island of Honolulu and was a hugely successful telecenter, which was in existence for 1 year before closing down owing to lack of public interest. There are many other cases of multi-employer telecenters like the Antelope telecenter, CA (set-up in 1993), Washington State telecenter (1991), and Ballard neighborhood work center, Washington (1990).

2.3 Urban Executive Office Suites

The major competitors to telecenters that provide alternative offsite offices are represented by executive office suites. These suites are found on prime commercial real estate and not necessarily close to residential areas (6). Executive suites are maintained and operated by private organizations and serve traveling executives, regional sales staff, and small business owners rather than non-supervisory employees (15). Unlike telecenters that provide an alternate place of work for telecommuting employees, executive suites constitute a primary place of business for an extended period of time. Executive suites providers range from small local companies to major international corporations. These global executive suites organizations also help corporations looking to expand abroad with their office set-ups (14).
Executive suites provide services such as secretarial, word-processing and receptionist support; in essence, an executive suite provides all the support services supplied in the main office. Telecenters provide an alternative work location with little or none of the facilities that are provided in the main office and most telecenter users have a parent work location which they can revert to at short notice—something that the clients of executive suite offices do not have.

With an increasingly competitive market, the difference between the two is beginning to blur. For example, the California Sierra foothills are a popular location for remote, sometimes unmarked, offices for workers of Sacramento and Silicon Valley employers. These successful office spaces have replaced telecommute centers which have folded in recent years (16).

2.4 Other Telecenters

There are other kinds of telecenters which are not applicable in the urban situation of telecenters, but which deserve mention owing to their unique characteristics.

2.4.1 Rural Remote Work Centers: Rural work centers work as community outreach and technological centers. Some possible advantages of these telecenters include creating an expanded labor pool for recruiting skilled labor, creation of more jobs and industry in the rural area, low overhead costs for employers lower employee turnover rates (6). These telecenters are called tele-cottages in Europe and in other parts of the world.
2.4.2 Residential and Mixed-Use Developments: This includes setting up of initial infrastructure such as telecommunications and data fibers into the construction of new units. This is idea from the early 1990’s, when technological advances were still being made.

2.4.3 Non-Territorial Offices: This involves the concept of “hoteling” and “floating offices”. Employees who are mobile and on-field do not need a permanent office most of the time are assigned temporary offices the days that they have to come into work to save space.
CHAPTER 3
TELECENTER EXPERIENCES

The first single employer telecenter was established by Pacific Bell in 1985 and the first multiple-employer center was lunched by the state of Hawaii in 1989 as part of a research study (6). The Hawaii center was primarily state funded, with additional grants from the private sector for equipment, and was located in a sub-urban technology park (called the Mililani Technology Park) in the main island of Honolulu. Established mainly to demonstrate the feasibility of remote working to address traffic congestion, office space constraints and parking constraints associated with the concentration of employment in Honolulu, the study was also motivated by the idea to explore the potential of telecommuting for economic development in remote island areas (17). Although it initially attracted a large number of users and reached its major goals, private companies involved in the experiment did not encourage their employees to telework, often being treated on a case by case basis. Owing to lack of funds, the center closed in 1990.

The Pacific Bell telecenter was established by Pacific Bell, the Bell Operating Company for California in San Francisco. Only employees of Pacific Bell were allowed to use the facility.
The telecenter aimed to improve the efficient use of existing office services and was located in the central business district of San Francisco, which was the earlier location of the company’s headquarters (18).

California is the state that has led the country in piloting telework programs. Telework centers were established as research undertakings between 1991 and 1997 under the Residential Area Based Offices Project (RABO). Under this program, 15 telecenters were set up and maintained as part of a research directive by the California Department of Transportation (CalTrans). Funding for the RABO telecenters ended in 1996. At the end of the funding period, 6 telecenters continued operations purely on public and user generated funds. All these telecenters closed between 1997 and 1999.

In addition, 26 telecenters were setup by private entrepreneurs and firms on a profit making basis. By the end of 1997, only 14 were operational and had diversified into various service centers, such as executive office suites and internet providing centers. These centers ceased to operate as telecommuting centers.

Telecenters were also established by the Federal Government since 1993 in the Washington metropolitan area, and served as demonstration programs to encourage telecommuting among Government employees (2). The centers are managed under the General Services Administration (GSA) Federal Telework Center program and are open to both private and public sector teleworkers.

Currently, there are 16 operational telecenters in the region, including 8 centers in Virginia, 7 in Maryland, and one in West Virginia. A 2004 telework study conducted by the U.S. Office of Personnel Management for all Federal agencies in
the region states that over 140,694 employees from different Federal agencies teleworked, representing a 37% increase from 2003. While this comprises all teleworkers, including home based teleworkers and center based teleworkers, it shows that employees enjoy the flexibility of being able to choose their workplace. These centers continued operating owing to the fact that they are funded by the GSA program, which is the sole source of revenue. Other telecenters in the area have been unable to compete with the low prices of the federal telecenters and have diversified into executive suites. The Preferred Office Club is the most popular among all the executive suites in the area, and has 6 locations in the Greater Washington Metro Area.

The first telecenters suffered from low revenue and inadequate occupancy levels. These telecenters were established to promote alternative forms of telecommuting to businesses and individuals and were financed with Federal or State subsidies or alternate forms of funding. These centers folded immediately after the funding period ended.

Telecenters established after the second half of the 1990’s realized the importance of establishing a steady revenue source, other than telecommuter based, to maintain commercial viability. These centers have found limited success due to less than full utilization and limited government funding issues. Several studies summarizing these experiences reiterate that telecommuting revenue should be an incidental, one of many sources of revenue for a telecenter (19).
Non profit telecenters (operated by public enterprises) now gain revenue from a variety of customer services such as video-conferencing, photocopying, conference room usage and computer usage from drop-in users.

For profit centers (operated commercially by private enterprises) focus on a wide variety of business services, such as executive suites and office space rental, and do not rely on telecommuting as a sole source of revenue. These facilities rent offices rather than cubicles, with a variety of services available for a flat rate, such as video conferencing and internet access. They also encourage the growth of ancillary businesses such as coffee shops, bakeries, within premises, to improve profitability.

Offices rented to employers are marketed as secure, private telecommuting sites which can be used by different employees on different days of the week. For example, the Blacksburg Electronic Televillage, Virginia, includes a privately operated business park that caters to high tech start-ups. Internet connectivity is marketed as an amenity.

Currently operating telecenters have evolved as executive office suites and offer a variety of clientele services to attract potential telecommuters, such as secretarial and receptionist services. Furthermore, these centers often rent out the entire facility to one tenant, thus ensuring a constant flow of revenue. In the process, though, the idea of providing telecommuting options to employees is bypassed. One such example, the Landmark telebusiness center in Anaheim, California. The center reinvented itself as an executive suites office to increase its revenue and now operates as a successful profit-making venture, in spite of having lost its government funding, owing to not complying with the conditions necessary to be deemed as a telecenter.
<table>
<thead>
<tr>
<th>Telecenter</th>
<th>Location</th>
<th>Dates of Operation</th>
<th>Reason for Closure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hawaii Telework Center</td>
<td>Honolulu, Hawaii</td>
<td>07/01/1989 , 1990</td>
<td>Self-sufficiency attained</td>
</tr>
<tr>
<td>Washington State Telework Center</td>
<td>North Seattle, Washington State</td>
<td>01/01/1991 , 02/01/1992</td>
<td>Expired Funding</td>
</tr>
<tr>
<td>Ballard Neighborhood Telecenter</td>
<td>City of Seattle, Washington State</td>
<td>04/01/1991 ,</td>
<td></td>
</tr>
<tr>
<td>Telebusiness Workcenter</td>
<td>Ontario, CA</td>
<td>10/01/1991 , 06/30/1996</td>
<td>lack of funding, not enough users</td>
</tr>
<tr>
<td>High Desert Telebusiness Center</td>
<td>Victorville, CA</td>
<td>10/01/1991 , unknown</td>
<td></td>
</tr>
<tr>
<td>The Telecommuting WorkCenter of Riverside County</td>
<td>Riverside, CA</td>
<td>11/01/1991 , 07/01/1995</td>
<td>Expired Funding</td>
</tr>
<tr>
<td>Antelope Valley Telebusiness Center II</td>
<td>Antelope Valley Fair, CA</td>
<td>01/01/1992 , unknown</td>
<td></td>
</tr>
<tr>
<td>Long Island Telecommuting Center</td>
<td>Mineola, New York</td>
<td>03/01/1993 , 03/01/1994</td>
<td>End of Demonstration</td>
</tr>
<tr>
<td>San Jose and Concorde Telecenters</td>
<td>San Jose and Concorde, CA</td>
<td>09/01/1993 , 02/28/1994</td>
<td>lack of funding</td>
</tr>
<tr>
<td>The Roseville Telecenter</td>
<td>Roseville, CA</td>
<td>09/01/1993 , 9/1/1995</td>
<td>Expired Funding</td>
</tr>
<tr>
<td>Valencia Corporate Telecommuting Center</td>
<td>Santa Clarita, CA</td>
<td>09/01/1993 , unknown</td>
<td></td>
</tr>
<tr>
<td>Coronado Telecenter</td>
<td>Coronado, CA</td>
<td>10/01/1993 , 06/31/1996</td>
<td>Disposal of Telecenter</td>
</tr>
<tr>
<td>Federal Alternative Worksite Centers</td>
<td>Winchester, Virginia</td>
<td>10/01/1993 , present</td>
<td></td>
</tr>
<tr>
<td>Federal Alternative Worksite Centers</td>
<td>Hagerstown, Maryland</td>
<td>10/01/1993 , present</td>
<td></td>
</tr>
<tr>
<td>Antelope Valley Telebusiness Center II</td>
<td>Antelope Valley Fair, CA</td>
<td>01/01/1994 , unknown</td>
<td></td>
</tr>
<tr>
<td>Sherman Oaks and Van Nuys Telecommuting Center</td>
<td>Ventura County, CA</td>
<td>02/01/1994 , 01/1995</td>
<td>Improper Site Location</td>
</tr>
<tr>
<td>Thousand Oaks and Westlake Telecommuting Center</td>
<td>Ventura County, CA</td>
<td>02/01/1994 , 01/1995</td>
<td>Improper Site Location</td>
</tr>
<tr>
<td>Santa Clarita Valley Telecommuting Center (US GSA)</td>
<td>Santa Clarita, CA</td>
<td>02/01/1994 , 1997</td>
<td></td>
</tr>
<tr>
<td>Grass Valley TeleBusiness Center</td>
<td>Grass Valley, CA</td>
<td>02/01/1994 , 1998</td>
<td></td>
</tr>
<tr>
<td>Pomona Telebuseness Workcenter</td>
<td>City of Pomona, CA</td>
<td>03/01/1994 , 1997</td>
<td></td>
</tr>
<tr>
<td>Santa Clarita Telebusiness Center</td>
<td>Santa Clarita, CA</td>
<td>03/01/1994 , 1996</td>
<td></td>
</tr>
<tr>
<td>Auburn Telecenter</td>
<td>Placer County, CA</td>
<td>03/15/1994 , early 1995</td>
<td>Not Specified</td>
</tr>
<tr>
<td>Ulatis Telecenter in Vacaville</td>
<td>Vacaville, CA</td>
<td>04/01/1994 , 06/1995</td>
<td>No users, Insufficient funding</td>
</tr>
<tr>
<td>Federal Alternative Worksite Center</td>
<td>Charles County, Maryland</td>
<td>05/01/1994 , present</td>
<td></td>
</tr>
<tr>
<td>Federal Alternative Worksite Center</td>
<td>Spotsylvania County, Virginia</td>
<td>05/01/1994 , present</td>
<td></td>
</tr>
<tr>
<td>Anaheim Landmark Telebusiness Center</td>
<td>Anaheim, CA</td>
<td>06/01/1994 , 1996</td>
<td></td>
</tr>
<tr>
<td>Antelope Valley Fair Telecommuting Center</td>
<td>Antelope Valley Fair, CA</td>
<td>08/01/1994 , 04/01/1996</td>
<td>Not enough users.</td>
</tr>
</tbody>
</table>
CHAPTER 4
CHARACTERISTICS OF TELECENTERS

4.1 Goals and Objectives

The first telecenters were initially set up to alleviate local traffic congestion, to serve as a focal point for an integrated access system to the Internet and information technology services, and to pursue business related purposes. Nowadays, telecenters work differently, aiming to achieve multiple goals and working in conjunction with other agencies to realize mutually desirable targets. The following sections explain in detail the most relevant reasons for establishing telecenters and some of the newer and locally suitable ideas and goals that some telecenters aim to achieve.

4.1.1 Commute Trip Reduction: Telecenters provide a shorter alternative to the home-work trip commute. It is argued that curbing travel demand reduces traffic congestion, energy consumption, and pollution emissions (5). The driving forces behind some of the early centers planned for trip reduction purposes were the Federal Clean Air Act of 1970 and its 1977 and 1990 amendments (1, 12). Continued funding for these early telecenters, in most states, depended on the mandatory trip reduction achievement evaluation and cost-benefit analysis.
However, with the reduction of many laws (such employer oriented commute trip reduction ordinances and air quality transportation management programs) to voluntary compliance, the initial enthusiasm attached to telecenters has faded (21).

The ordinances have been replaced with voluntary programs and other initiatives, such as scrap or improve “gross polluting vehicles” to achieve the desired reduction in emissions. The voluntary programs are difficult to monitor and the inducement for employers to pursue trip-reduction programs reduced greatly.

One of the defining features of telecenters developed to attain trip reduction standards was that almost all of them were government funded and supported by the local Transportation Management Association (TMA) or Environmental Protection Agency Agencies (EPA). These telecenters survived on public subsidies and grants from various agencies. Very few telecenters that associated trip reduction as their main objective attained self-sustenance.

The Grass Valley Telecenter, California, was set up as a direct consequence of increasing traffic problems in the Grass Valley. Grass Valley, a rural area experiencing one of the fastest growth rates in California, faced sudden increases in population and traffic movement. With prohibitively high costs to alter the regional highway network, the city was forced to look at alternative means to reduce the traffic congestion problem. The Grass Valley TMA prioritized the idea of addressing the severe parking congestion problem that the city faced. The telecenter did not charge its users for the use of the facilities in the first year of operations. The only cost was for additional services such as phone calls, faxes and stationery. After the first year, when the center approached its users with the proposal to charge rent for using the
services, most users backed out and the centers had to be closed owing to lack of enough users to support itself.

The first multiple-employer telecenter, set up in Hawaii, was implemented primarily to reduce travel demand. Reports on telecenter indicated that the average telecommuter who used the center traveled 9,000 fewer miles per year, saved $2,500 per year on travel costs and saved about 350 gallons of gas per year (18).

4.1.2 Traffic Congestion Mitigation: The Coronado Telecenter, in California, established by the Coronado TMA was set up to help reduce traffic congestion and to meet air quality and trip reduction requirements. The financing of the project was expected to come from employers who would use the facility to meet their legislative requirements. As the ordinances were reduced to voluntary requirements, the support expected from the local employers never came and the telecenter failed. Other telecenters established for this reason were more successful, as the funding was from primarily from government agencies. With increasing urban traffic, most of the current telecenters have been set up to lighten traffic congestion problems, especially in large urban areas. The federal government established telecenters in the Washington D.C. area, and has continued funding for its employees.

4.1.3 Air Quality Standards Improvement: Telecenters in Chula Vista, California, established through a joint effort of the California Department of Transportation (Caltrans) and San Diego Regional Air Pollution Control District (APCD), were maintained by the city. While the goals of Caltrans and APCD were to reduce the
emission standards, the city used these centers as a means to incorporate economic
growth and provide universal access to information technology for the general
community. As air quality ordinances became voluntary, the emphasis of the
telecenter switched to meet the communication and technology demands of the city.
Insufficient funding forced the closure of one of the two telecenters on April 1, 1997.
The second telecenter closed shortly afterward, owing to insufficient occupancy
levels (1).

4.1.4 Peak Hour Trip Reduction: Telecenters were established as a part of the city’s
Transportation Systems Management (TSM) Program in Vacaville, California, with
the primary objective of reducing peak-period auto traffic by making more efficient
use of existing transportation resources and emphasizing ride-sharing alternatives.
The city called all major employers to reduce their peak period trips by at least 30%.
The telecenter was established as a means to encourage more employers to address
the issue.

The center was supported by several local businesses and strongly marketed
by the local Government as well. Owing to the extensive publicity, and extremely
high funding, the centers opened to high occupancy levels. After the initial period,
the operators charged nominal fees for various services such as photocopying, fax and
telephone. This reduced the number of users. Once a fee structure for the rent was in
place, the centers hardly had any users. This center suffered during the transition
from a public service enterprise to a private profit making business and had to be
closed down (1).
4.1.5 Community Network and Universal Access Goal: Telecenters established in the early 1990’s promoted community network goals as one of the major reasons for setting up a center. The early 1990’s saw a rapid growth in internet and other modern telecommunications equipment use. Network access costs declined rapidly, and the availability of home based broadband internet connection made telecommuting a more attractive alternative.

In the current scenario, community network goal attain significance in rural and small urban areas, where advanced technology is not available at an individual level. Many studies have been conducted on the feasibility of setting up community network centers. For example a 1999 study conducted in Molalla, Oregon, revealed that about 66 percent of the families had a computer and that 41 percent of the population had Internet connection (22, 23). The study suggested setting up a telecommuting center would impart education to individuals interested in improving their understanding of the internet. The center was subsequently established and performed well.

Most telecenters established as “Universal Access Sites” are either located in public libraries or have been recommended to shift the telecenter to one as most individuals associate libraries with learning centers. Telecenters with such goals have been established in San Diego, California (East County San Diego Telecommuting Center) and Davis, CA (Birch Lane Telecenter) with the conceived idea of promoting them as access points to the Internet and to telecommunications services. The business proposal for both the Telecenters emphasizes the idea of providing “technical … leadership to both community residents and to employers (19).”
The Santa Clarita telebusiness center, in the Valencia Industrial Center, California, has easy access from Interstate 5, as well as convenient local roads. The telecenter offers telecommuting and video conferencing capabilities which are among the best in the United States. Amenities offered include a state of the art networking environment with Internet and internal local area network. Each workstation is customized to suit the needs of the particular user. State of the art networking software enables users to have access to the tools necessary for their own business and has encouraged the telecenter developers to use it as a distance learning center. The Center also offers wide area network connections to local schools, city offices, the hospital and other local services (1).

Distance learning has been one of the most successful of the alternative uses explored by the center directors at the city of Chula Vista Eastern Telecenter (21). Partnerships with the University of Phoenix and National University resulted in classes being conducted at the centers via videoconferencing; San Diego State University followed suit in 2000. In the case of the University of Phoenix, the telecenter director reports that students taking classes at the center would generate an additional 4,080 miles per month if they had to travel to the University's regional campus (21).

4.1.6 Other Goals: In California, some telecenters were established as a direct consequence of a major earthquake, with the notion that they would enable employees to continue working even in the case of loss of major road and transit corridors.
Telemedical project development has been a major focus of growth potential for some centers. The Los Baños Telecenter, a profit-driven center serving rural central California, developed a roster of physicians and medical centers who participate with their patients in video conferencing diagnostic consultation sessions with the University of California at Irvine (20).

One of the primary objectives of TDM policies, which include telecommuting, is to reduce the number of single occupancy vehicles during the commute trip. While this is true in the case of solutions such as carpooling and vanpooling, the same cannot be expected in the case of telecenters. A case study of the Washington State Telework Center, states that while 57% of telecommuters (individuals using the telecenter) drove alone to work in the main office on days when they did not use the telecenter, 83% drove alone to the telecenter (24). While these statistics look detrimental, careful study must be carried out to see whether the distance that the employee drives to the telecommuting center is matched by the distance that user travels to reach the carpool or vanpool, before concluding that telecenters increase single-occupancy vehicle commute distances.

In certain cases, however, centers are established both as trip reduction strategies and as engines for economic development. As enforcement of regional commute reduction regulations relaxed, these centers that had been originally established as a trip reduction strategy for air quality attainment programs began to develop different services to ensure economic viability over the long term.

While telecenters have the potential to attain multiple goals, there is also the prospective of complete failure when trying to attain too many goals. There is an
understandable tendency for project planners to list as many goals as possible in connection with a telecenter, for initial funding and support. The danger lies in overselling a specific facility for fulfilling a large number of publicly popular but collectively unrealistic goals (6).

4.2 Benefits

The benefits of a telecenter are not just restricted to the employers and employees. While these groups profit the most, there is much to gain in terms of transportation impacts and air quality improvements for the society in general. In addition to lower congestion and reduce air pollution, potential benefits include decreased national petroleum use, fewer highway accidents, and eased transportation infrastructure requirements. Some of the major advantages to employers, employees and to transportation infrastructure are listed below.

4.2.1 Advantages for Employees: Telecenters encourage telecommuting and improve the quality of life for workers in terms of enhanced productivity and increased job satisfaction (25). In a survey conducted on 3,400 workers in the Washington, D.C. area, 16 percent stated telecommuting as the best perk that could be offered by their employers (26).

Employees, faced with childcare or eldercare constraints, are willing to work from a neighborhood telework center as they remain close to home (12). Additionally, mobility-impaired persons can greatly benefit from telecommuting by allowing them to be gainfully employed when they would otherwise be excluded from consideration
Telecenter users require fewer days of sick leave, gaining increased productive work time, and even requiring less disability leave because of their telecenter experience (25).

Telecenters provide employees with adequate space to work, which may not be available at home (3); also, they are a good alternative to individuals who wish to telecommute, but cannot do so owing to constraints at home. Necessary software and technological support is also provided in a telecenter which cannot always be provided at home by the employer.

With increased awareness of safety at work, employers are concerned about the working environment at home for many employees. These concerns can be mitigated by the use of a telecenter. Employees often work at kitchen tables at home, without ergonomically designed furniture or lighting (2) producing inefficient and low quality work.

Telecommuters save on gas, depreciation, general wear and tear on their vehicles (4), and meals (which are found to be taken at home in many cases) (9). They also spend less time in traffic on congested roadways (25).

Professional and social interaction that is not possible in home-based telecommuting occurs in a telecenter. Since the supervisor is no longer present while work is done, telecommuting often results in greater job autonomy and may change performance evaluation procedures to focus on work output instead of the appearance of working (27). The added flexibility in a telecommuter's life, as a result of the relaxation of time-space constraints, often leads to positive changes in the travel behavior of not only telecommuters but also their household members (28).
4.2.2 Advantages for Employers: Employers look at telecenters primarily as an employee benefit, and not as a cost or space saving measure (4). Such policies help employers in retaining employees and gain employee loyalty. Improved retention can also save the organization money spent on the recruitment, relocation, and training of new employees (27).

Increased employee productivity is one of the major gains for both employees and employers. Employers gain from reduced absenteeism (as employees need not take the whole day off to run errands close to home) and turnover due to telecommuting programs (29). Employers state that telecommuters take fewer sick days off and show markedly higher levels of motivation (9).

Many employers state that if a telecommuting program is run properly, it leads to savings in the demand of office space and, as a result, lower costs of acquiring and maintaining office space (4). Managers are assured of the fact that their employees are in an office setting and are provided the same conditions to work as in the main office (25).

Implementing a telecommuting program can fulfill some requirements of clean air mandates that require employers to reduce the pollution caused by its employees during their commutes (30).

For employers who suffer from acute parking shortage, setting up of a successful telecommuting program will help solve their problem (4).

Security issues which are a problem in home based telecommuting are easier to monitor in a telecenter (3). Many centers provide employees with keys to private offices and also provided individual computers with passwords for access.
Telecenters provide a more professional image than home-based telecommuting and also offer a more conventional worker and property liability context than does home-based telecommuting (3).

4.2.3 Transportation Improvements: Telecommuters enjoy reduced commute distance and decreased travel times. Owing to this reduced commute distance, telecenter users tend to traverse the shorter distances after the peak periods, thus, reducing the peak hour congestion (31). With increased commute trip flexibility, commuters tend to modify their activity schedule such that they make trips in those times of the day when there is less congestion. Other indirect transportation costs include accidents and insurance premiums, the degradation or loss of employee productivity, employee turnover, which are all reduced.

Trips to telecommuting centers avoid the congested, urbanized corridors of the region which improves traffic flows and average travel speed, indirectly reducing emissions (4). "Telecommuters tend to shift activities to destinations closer to home. Interestingly, telecommuters, as well as members of telecommuter households, show a contracted activity space, indicating that they are not making the longer-distance trips formerly engaged in by the telecommuter (8)". This suggests a learning process by which new destinations which are closer to home are discovered and (more or less) permanently adopted (9).

Owing to the short distances that telecenter users have to commute, employees tend to conduct single task trips rather than trip chaining which is characteristic of long distance commutes (28). This increases the number of cold starts and affects air
quality standards, but reduced emissions from making shorter commute trips more than balances the potential disadvantage of increased number of cold starts (4).

Studies (15) reveal that telecenter users tend to make more single-person vehicle trips rather than home-based telecommuting employees; while home-based telecommuters make more person trips than center-based telecommuters. There is a case of studying the relative benefits by each method applied.

The number of transit trips and trips made by modes such as carpooling or vanpooling decreased for center-based users. This is not necessarily a disadvantage as the distance traveled by the carpool users to reach the carpool by their private vehicle might be longer than the trip made to the telecenter. It is only when telecommuting contributes to the disintegration of the entire ridesharing arrangement, so that multiple vehicle trips are made instead of one that negative consequences result (24). The number of trips made by bike and walk increase as the number of neighborhood trips increase (32).
CHAPTER 5
FEASIBILITY REQUIREMENTS

Successful telework centers share similar characteristics, such as proximity to telecommuters’ residences, ability to accommodate multiple users, and flexible work stations allocation. Some of the most important elements and necessary conditions for the planning phase for establishing a telecenter are discussed below.

5.1 Location

The location decision plays a determinant role during the planning and operational phases. In theory, the decision is dictated on the need to locate nearby or within the residential areas where target employees reside, based on the premise that this reduces the need to commute (6). In practice, it is always not possible to locate within residential neighborhoods, due to zoning restrictions. Most residential centers are located in small strip developments adjoining residential neighborhoods. Some centers are located in the downtown central business districts (CBD), while others are located in suburban locations.

Smaller towns choose to establish their telecenters in their downtown area for easy accessibility (1). Examples include telecenters in the small cities of Chula Vista, Anaheim, California and Grass Valley, California.
Some telecenters are located in secondary business districts, especially in larger cities. This stems from the hypothesis that in high density, large employment areas, more companies allow their employees to work from the telecenters, thus reducing travel flow in and out of the CBD.

While most planners choose their site location based on these criteria, some others suggest that the location of the center in the city must be based not on the immediate future, but also by keeping in mind, the continuity of the project. There must be proper time allocated for planning and building a sustainable program, rather than acquiring space, equipment and customers immediately (1), and pursuing the idea on a short span basis.

Other major issues include assuring that telecenters are not located in close proximity to each other to avoid hampering growth. The Ballard Facility in the Puget Sound Area, Washington, suffered from a lack of users as the state run Washington State Telework Center was available only a few miles away and whose rents were much lower (33).

Many reports state that the time available for planning and set up often influence the location of the building (1). For example, the location decision of centers launched in the city of Chula Vista, California, was based on the ready availability of building infrastructure.

5.2 Employee Mix

The most important demographic characteristic is the employment mix of the target teleworkers. Certain jobs are more suited to telecommuting than others (2). Data
entry, clerical and managerial occupations are expected to be most suited for telecommuting. As an example, it would be illogical to set up a telecenter in an area where most of the employees are factory workers or specialized health care personnel.

The first monthly report from the “Anaheim Landmark TeleBusiness Center” stated that “demographic analysis of the area near the proposed site supported selection based on the type and density of information workers in the area, such as administrative support and managerial workers. Density maps showed a relatively heavy concentration of administrative support workers with commutes in excess of 30 minutes residing within one mile of the proposed center” (1).

5.3 Employment Density

Another variable of particular interest is occupational density, that is, the number of workers near the proposed site. This gives an idea of the potential clientele target for the telecenter. This is important when targeting the number of employees that may be housed in the telecenter.

5.4 Household Size and Composition

Workers within larger households are assumed to be more likely to telecommute because of having young children or other family responsibilities (6). Single member households are less likely to telecommute from home (because of the need for social interaction fulfilled by the workplace), but may be willing to do so from a center.
Studies hypothesized that greater the need to balance work and family demands, greater would be the propensity to telecommute. Therefore, single parents are more likely to telecommute or use a telecenter. In addition, the greater the number of full-time workers, the higher is the chance that a worker will telecommute (owing to fewer vehicles in the household, higher responsibilities shared) (22).

Reports state that the lower the ratio of autos to licensed drivers within a household, the greater the incentive for the worker to telecommute. However, vehicle availability is correlated with income, and while the desire to telecommute may be greater among workers in lower-income households, the ability to telecommute falls disproportionately to higher-income workers (6, 20). Other socio-economic variables such as availability of public transit are considered relevant.

5.5 Commute Trip Characteristics

Telecenter planners must be aware of which commuters are more likely to make a switch to telecommuting. A 2000 study conducted by the International Telework Association and Council (18) concluded that the one-way commute distance for teleworkers averaged 19.7 miles, versus 13.3 miles for non teleworkers. The teleworkers’ daily round trip commute times averaged 63 minutes versus 45 minutes for non-teleworkers. Other studies (20, 34) also reiterate the fact that commuters with longer travel times and distances show a preference to telecommute. A necessary step in a feasibility assessment is to analyze the commute trip patterns of the target population.
It is suggested that individuals who take transit, carpool, or vanpool to work should be targeted with other innovative ideas such as telecenters. It is expected that since they have a knowledge and understanding of TDM strategies and goals, they would more readily realize the advantages of working from a location closer to home. On the other hand, rideshare and transit users are less likely to rideshare or take transit to the telecenter (possibly with detrimental impacts on existing shared-ride arrangements) (6), which must be studied carefully before implementation. Studies stress the need for pushing solo drivers to use the telecenter as greater congestion and air quality benefits can be achieved.

### 5.6 Availability of Amenities

While part of the solution lays in reducing commute distances, there is also an incentive to reduce trip frequency. The majority of studies concluded that there must be various services available at a short distance from the telecommuting center to capture the essence of telecenters.

Studies show the presence a transit stop very close to the telecenter being one of the major considerations while selecting the site. This indicates the importance of interlinking telecenters with other modes to attain trip reduction goals. Some telecenters, set up in campuses like the Moorpark and Ventura Community College Telecenters, California, (Ventura College is located near the Pacific Coast, north of Los Angeles, while Moorpark is a bedroom community located in the hills separating Ventura County from Los Angeles) had transit stops at the entrance of the telecenters. However, care must be taken in actually evaluating the effectiveness of the transit
stop close to the telecenter. In many cases, geographical nearness might not reflect accessibility.

As a particular instance, the Washington State Telework Center was established very close to a transit stop. However, the transit stop was separated from the telework center by a major arterial, which made using transit a highly unattractive proposition for most of the center’s users. Furthermore, transit stops at the center must match those at the residences of the center’s users (35).

Employees make trips during the lunch hour to restaurants and other eateries. While such trips do not occur in home-based telecommuting, they cannot be avoided by telecenters users. Most of the telecenters considered in this report had restaurants within one mile of the telecenter; grocery stores and supermarkets located within a short distance; to encourage telecenter users to make short trips and reduce overall travel distances.

Other facilities that the telecenters’ planners place importance on while designing the center include banks, ATMs, post offices, shopping malls, child care centers, health and fitness centers, drug stores and convenience stores (1, 6).

5.7 Start-up Funding

Start-up costs are recognized to include land, parking provision, building lease or purchase, and any interior or exterior tenant improvements to the facility, (including Americans with Disabilities Act (ADA) compliance), and lease or purchase of equipment and furnishings. While costs should be minimized as much as possible, it
is desirable to have a range of facility configurations, which might encourage employers to select the telecenter as an alternate work-site for their employees.

There are few funding sources of public funding for telework center development. Under the goal of reducing commuting federal funding is available. The federal government also provides grants to establish telework centers that increase employment options for people with disabilities. Also, state department of transportation provide funding to reduce the negative externalities generated by single occupancy vehicle commuting.

While public funding may represent an option to cover some of the fixed costs, private partnership is considered as essential in successfully operating centers in the long run. Publicly funded telecenters can partner with an anchor tenant. An anchor tenant is any employer supportive of telecommuting who will supply a significant number of telecommuters. It is assumed this should probably be a major employer such as the state or local government or a technology corporation. Having an anchor tenant ensures occupation of the facility during a highly publicized opening, and enhances the marketability of the telecenter to other prospective employers by removing the potential discomfort of being the first or only tenant. In other words, the anchor serves as a magnet to attract other employers. Being supported by a large employer with a telecommuting plan in place reduces the burden of scouting for potential users and also serves as a strong advertising campaign.

Other potential sources and types of contributions include donation of equipment by private corporations, service donations and general expertise in the form business plan designing, and other sources of local marketing or training.
expertise. All these must be well established in the early planning phase to provide good backbone support for the center.

5.8 Other Factors

While primary location, household characteristics, commute trip patterns, funding, and amenities are the major concerns in establishing a telecenter, they do not comprise an exhaustive set of conditions to locate a within a specific area. Political considerations play a major role in the site selection (1). In addition, legal restrictions such as land use laws and zonal regulations must be addressed before deciding upon a site location (36). The American Disabilities Act also influences the decision of the kind of building that is chosen to house the telecenter.

In other cases, the preferences of an anchor tenant influence site selection and also site specifications. In return, the center has increased marketability owing to site occupation. In some instances, telecenter planners conducted interviews with employers of potential telecommuters to mutually decide on the location of the site.

Telecenters often work on grants from public and private institutions. In some cases, the grants included providing the telecenter developers with a building free of cost for a certain period of time. Such actions have also been known to influence the location of telecenters. The Ballard Neighborhood Telework Center was located in excess space of a building owned by a private firm (Market Street Computer Systems, Inc.), who made the space available for an indefinite period of time (until the firm needed the space back).
5.9 Challenges to Implementation

Most telecenters established in the US suffered failures and closures in a very short span of time. Between 1991 and 1997, 45 centers opened, 21 closed and one was expected to close in California. (37). Many of the remaining telecenters also became dysfunctional by the end of 1998. While there are many reasons for the possible failures of telecenters, some reasons stand out as being common to most telecenters. These failures are discussed below.

5.9.1 Funding Alternatives: The primary reason for closure of telecenters in the 1990’s was inadequate funding (1). In 1992 funding became available under Congress appropriation to the General Services Administration for federal employees’ telework center set up and operation in the Washington, DC, area. Subsequently, in 1997 the appropriation was increased from $5 million to $11 million with funding availability extended to the private sector. In recent years, due to low occupancy levels, cost-benefit assessment, most of the funding has been reduced and used to maintain the telework centers in the Washington metropolitan area.

In the state of California, most of the telecenters were closed after the initial demonstration period. Center users typically did not have to pay any fees during the demonstration period and expected such a structure to exist afterward. At the end of the demonstration phase, centers could not attract users to continue using the facility while having to pay the fee. They were also inadequate in introducing other ways to improve their income, thus facing closure.
5.9.2 Poor Site Selection: Some telecenters were established at the sites of existing offices. The disadvantage with this was that these offices could be closed at any point of time when the parent company needed the space, resulting in immediate closure of the center. The Sonoma County Transit Telecommute Center was opened in December 1994 in the California State University at the Sonoma campus. On June 30, 1996, the center was closed when the university required the space for its own operations.

Sites established after conducting careful research of the neighboring area for potential users were often found to attract much fewer users than expected, thereby not being to able to justify their existence and closed down.

The federal government began its telecommuting program in the Washington DC area and intended to study the East coast program before expanding it across the country. Very limited information was available regarding the number of federal employees living near the three sites selected, how many of those employees would be interested in using the facilities, or which of the federal agencies and managers in those areas would be willing to allow their employees to use the sites. This lack of detailed information in site selection was a significant factor in the eventual closure of some centers (37).

5.9.3 Insufficient Demand: Many telecenters, after the demonstration period, were expected to be self sufficient, but owing to price increases many telecommuters dropped out of the program leading to the closure of the centers. The Coronado Telecenter was one such telecenter that closed in 1996 owing to lack of funding and
insufficient occupancy levels (1). The Antelope Valley Fair Telecommuting Center, in California, was open from August 1, 1994 to the summer of 1996. In April 1996 there was only one telecommuter using the facility on a regular basis and no active recruitment was taking place and subsequently closed down (37).

The Ballard Neighborhood Telecenter, Washington and the Washington State Telework Center were in the vicinity of each other and owing to lower rental rates charged by the State Telework Center, the Ballard Telecenter had to close down in 1996. In July 1995, two centers that existed in Vacaville (Ulatis and Three Oaks telecenters), California, were consolidated, and the equipment from the Ulatis telecenter was relocated to the Three Oaks/Alamo facility. It was determined that the Ulatis center would have soon been shut due to facility maintenance requirements. However, after considering facility costs, client usage and other resource variables, the decision to consolidate the two telecenters into one was agreed as the best course of action (1).

5.9.4 Inadequate Marketing and Recruitment Policy: Most telecenters were set up with minimal marketing and recruitment policy. The telecenter managers of the RABO project in California stated that with a better marketing and recruitment policy the centers could have attracted more clients (1). Most telecenter developers were just interested in acquiring space and furniture and getting the center operational without conducting a formal analysis.

Marketing for telecenters included distributing flyers to individual households, conducting information sessions to employers, and seeking political help.
Most telecenters were well publicized, but the employees of the center complained of too much work and inadequate support from the participating agencies, often causing high employer turnover.

5.9.5 Employer Resistance: Telecenters are still an untried and relatively new concept as opposed to other strategies such as vanpooling and carpooling, commuter trip reduction, flex-time and telecommuting from home. The project manager for the telecenters in Concord and San Jose, California attributed the low usage rates to the difficulties involved in conveying the concept of telecommuting from centers to employers, and identified one major barrier to the success of telecommuting as lack of trust from employers toward their employees (37).

Many employers support the idea of telecommuting and telecenters, but do not want to support the costs that are associated with them. When the costs of using the telecenter at the Washington State Telework Center were low (from $0 to $100), employers were ready to allow their employees to use it, but when this center closed owing to discontinued funding, the employers did not allow their employees to use the Ballard Neighborhood Telework Center as they were not ready to pay the actual rental costs of additional office space (33).

In a study of approximately 275 telecommuters at telework centers in California, 50 percent stopped telecommuting within nine months (38). Most reasons were stated to be job related rather than issues that the employees themselves had to face (4). Also, turnover was found to be higher at telecenters than for home-based telecommuters, and some telecenter users found it is just as easy to work at home.
5.9.6 Inadequate Staffing and High Turnover: Many telecenters operated with only one full time manager and at most with two staff members. These individuals were expected to be well versed in various tasks such as marketing, planning, maintenance activities and attending to the needs of the telecommuters. Many managers quit from the job citing high stress and inadequate compensations (1). The Anaheim Telebusiness Center, in California, closed down due to high turnover rates in the receptionist and administrator positions, as there was a lack of continuity in understanding telecommuting issues and reporting requirements to the University (6).

5.9.7 Other Reasons: Other reasons for failure include incomplete definition of goals and loss of interest. Many managers set very high targets and goals to achieve from the telecenter. This was often done to gain improved funding for the center, but often led to setting of unattainable targets for the telecenters (32). Telecenters that were set up by private individuals motivated by profit suffered as the individuals soon lost interest owing to poor income generated by the telecenters.

5.10 Feasibility Matrix

Based on the analysis carried out in the previous section, a summary of the most relevant characteristics that can be used to assess the feasibility of implementing a telecenter are summarized. The matrix described in Table 2 provides a synopsis of the pros and cons associated with this TMD strategy and will be used in the analysis described in the next section.
### Table 2 Feasibility Matrix

<table>
<thead>
<tr>
<th>FEASIBILITY FACTORS</th>
<th>CONSTRAINTS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PHYSICAL</strong></td>
<td></td>
</tr>
<tr>
<td>Location</td>
<td></td>
</tr>
<tr>
<td>Within or in proximity of target residential area</td>
<td>Poor site selection, conflicting goals and short planning phase</td>
</tr>
<tr>
<td>Secondary business district</td>
<td>Zoning restrictions</td>
</tr>
<tr>
<td>Program Type</td>
<td></td>
</tr>
<tr>
<td>Single and Multiple Employer</td>
<td>Recruiting anchor tenant as major funding and usage level contributor</td>
</tr>
<tr>
<td>Space</td>
<td></td>
</tr>
<tr>
<td>Ability to accommodate multiple users</td>
<td>Employer reluctance to pay for double office space</td>
</tr>
<tr>
<td>Flexible workstation allocation</td>
<td>Ability to meet Americans with Disability Act requirements</td>
</tr>
<tr>
<td>Amenities</td>
<td></td>
</tr>
<tr>
<td>Presence of Transit stops close to the telecenter</td>
<td>Transit stops separated by major arterials; e.g., nearness does not mean accessibility</td>
</tr>
<tr>
<td>Interlinkage with other modes</td>
<td>Absence or paucity of close by amenities</td>
</tr>
<tr>
<td>Presence of banks, ATMs, post offices, shopping malls, eating places, child care centers, health and fitness centers</td>
<td></td>
</tr>
<tr>
<td><strong>ECONOMIC</strong></td>
<td></td>
</tr>
<tr>
<td>Funding</td>
<td>Ideal public/private partnership</td>
</tr>
<tr>
<td>Marketing/Recruiting</td>
<td>Aggressive, targeted, advertising is necessary to sustain planned usage levels</td>
</tr>
<tr>
<td><strong>SOCIO-DEMOGRAPHIC</strong></td>
<td></td>
</tr>
<tr>
<td>Residential Density</td>
<td>High density target residential areas with similar commute trip patterns are more likely to telework</td>
</tr>
<tr>
<td>Household Composition</td>
<td>Workers within larger households are more likely to telework</td>
</tr>
<tr>
<td>Employee Mix</td>
<td>High prevalence of: Data entry, Clerical/Administrative, Managerial</td>
</tr>
<tr>
<td></td>
<td>Positions that do not require ongoing supervision</td>
</tr>
<tr>
<td><strong>COMMUTE PATTERNS</strong></td>
<td></td>
</tr>
<tr>
<td>Commute Time/Distance</td>
<td>The longer the distance the higher the likelihood to use a telecenter</td>
</tr>
<tr>
<td></td>
<td>The longer the commuting time the higher the likelihood to use a telecenter</td>
</tr>
</tbody>
</table>
CHAPTER 6
ANALYSIS

As part of this study, the Miami-Dade MPO (Metropolitan Planning Authority) was interested in assessing the feasibility of implementing telework centers in Miami-Dade County, in particular around the areas along the SR-836 (Dolphin Expressway) corridor. The analysis is carried out in two main steps. First, areas potentially suitable for telework centers are identified.

Then, a suitability analysis is carried out, based on an assessment of the socio-economic characteristics and checked against the feasibility matrix developed in the previous section. The second and final step deals with commenting on the merits of establish telecenters in the identified areas.

Assuming that commute trip reduction or trip duration reduction remains the primary goal of the telecenter, the analysis consists of:

- Analyzing the corridor for potential traffic related problems.
- Assessing potential site locations based on SR 836 commute trip patterns;
- Analyzing employee commute trip origin-destination patterns for different residential areas in the vicinity of the suggested sites;
- Classifying commuters by job position held; and,
- Assessing the presence and characteristics of amenities to establish convenience factors.
The analysis utilizes many different applications, such as Geographic Information Systems (GIS), the Florida Geographical Data Library (FGDL), and the U.S. Census Bureau Local Employment Dynamics (LED) tool. A discussion of the various databases and modeling packages is presented in the next sections of this report.

6.1 Analysis Tools/Softwares

The report utilizes many different applications for the analysis. The primary focus remains on mapping the existing geographic conditions and obtaining traffic/travel reports for the area. Reports which perform extensive geographic analysis use GIS (Geographical Information Systems) software to provide accurate solutions to the different questions. This report extensively uses different forms of GIS softwares to evaluate the site for solutions.

Other tools used in the study include the Highway Capacity Model (HCM, 2000) and Traffic Data for the Florida provided by Florida Department of Transportation (FDoT). These sources are used for accurate traffic information on SR 836 (Dolphin Expressway) and to perform Level of Service (LOS) studies for the roadway.

6.1.1 GIS Data and Applications: GIS (Geographical Information Systems) is a technology that manages, analyzes, and disseminates geographic knowledge. GIS links location to information (such as people to addresses, buildings to parcels, or streets within a network) and layers that information to give a better understanding of
how it all interrelates. The metadata, which explains the accuracy of the data used, is available as an appendix to the study.

GIS information is chosen from four different data libraries for the study. The data used ranges from layered data used to plot thematic maps, to specialized applications used to obtain extremely specific information for the research.

a) FGDL (Florida Geographical Data Library): The FGDL is a mechanism for distributing satellite imagery, aerial photographs and spatial (GIS) data throughout the state of Florida. The FGDL is compiled from data and images collected from numerous state and federal governmental agencies, as well as some nonprofit organizations and private companies. The Florida Department of Transportation (FDOT) is the lead agency contributing to the development of FGDL. The Florida Department of Environmental Protection (FDEP) has also contributed a great deal to the FGDL.

The FGDL is warehoused and maintained at the University of Florida's GeoPlan Center, a GIS Research and Teaching Facility. Different GeoPlan Center projects have included the development of databases that have subsequently been added to the FGDL. These projects include the Cross Florida Greenway Project, The Statewide Greenways Planning Effort, The National Pollutant Discharge Elimination System (NPDES), the FDoT (Florida Department of Transportation) Environmental GIS Database Development Project, and the FDOT Efficient Transportation Decision Making Project.

There are currently over 350 layers of GIS data in the FGDL. The data is organized by county, state, and coastal areas. Data for the Miami- Dade County is
chosen from the existing data sets. Information freely available from the data library includes road network data, location of various personal and recreational centers, population maps and census blocks in Miami-Dade County.

b) FDoT GIS Resources: The Florida Department of Transportation (FDoT) maintains GIS data for various traffic features such as highways/major roads, and annual average daily traffic (AADT’s), and maximum speed limits. The data is coded in standard longitude-latitude coordinates, which can be used readily. These layers are used for the traffic report section of the report (reference FDoT GIS downloads). FDoT updates the data sets regularly to maintain an accurate dataset for use in projects.

c) US Census Bureau LED: The Census Bureau has developed a GIS (Geographic Information Systems) based tool to present LED (Local Employment Dynamics) maps. Local Employment Dynamics (LED) is a voluntary partnership between state labor market information agencies and the U.S. Census Bureau to develop new information about local labor market conditions at low cost, with no added respondent burden, and with the same confidentiality protections afforded to census and survey data (refer US Census Bureau LED). The Local Employment Dynamics (LED) recently released a new beta version of the pilot-mapping tool called “On-The Map”. For the first time in the project, all 14 pilot states (California, Colorado, Florida, Idaho, Illinois, Minnesota, Missouri, North Carolina, Oregon, Pennsylvania, Virginia, Washington, Alabama and Texas) are now included in the application.

This online data library is best suited to represent to show the origin-destination trip patterns for commuters residing in a particular area (reference the
LED site). The dataset may also be used for locating the residential location of employees in a particular location.

This dataset is used in the most crucial part of the analysis. The study portrays the high density trip attracting zones (major office locations) for residents living in the vicinity of SR 836. This analysis gives a good understanding of the utilization of SR 836 by commuters.

d) Employment Demographics: Employment information is obtained from the InfoUSA dataset. InfoUSA datasets are the most accurate among the many datasets used to map employer locations. The data for employment location is obtained using the following sources:

- Nearly 5,200 Yellow Page and Business White Page Directories are perused to obtain accurate up-to-date information about the businesses.
- 17 million phone calls are made every year to verify information regarding business location and size. Every business is called anywhere between one to four times a year.
- County Courthouse and Secretary of State Data are also studied to ensure the filtering of misinformation.
- Leading business magazines and newspapers, Annual Reports, 10Ks and other SEC filings are also examined for relevant information.
- New business registration and incorporations are taken notice of, because new businesses must be incorporated into the data set regularly for quality purposes.
- Postal service information including National Change of Address, ZIP+4 carrier route and Delivery Sequence Files are scanned for business location purposes.
This data set has information about different businesses and users can obtain diversified information about the businesses including and not limited to:

- **Location** - ZIP Code, Neighborhood, City, Metro Area, County, Area Code, State.
- **Type of Business** - Yellow Page Heading, Major Industry Group, SIC Code or Professionals (doctors, dentists, etc.).
- **Business Size** - Number of Employees, Sales Volume.
- **Credit Rating**.
- **Location Type** - Corporate Headquarters, Headquarters of a Subsidiary, Branch.
- **Phone and Fax Numbers**.
- **Key Decision Makers/Executive Names**.

### 6.1.2 HCM (Highway Capacity Manual) 2000:

The *Highway Capacity Manual* (HCM) is the most widely distributed publication of the Transportation Research Board (TRB). It presents fundamental information and computational techniques on the quality of service and capacity of highway facilities. The HCM provides a stepwise methodology to analyze a roadway for different characteristics. An up-to-date compilation of this information is vital to an expanding array of public policy, planning, fiscal, land-use regulation, design, operational, and educational applications. The HCM is employed in this study to estimate the Levels of Service of different segments of the roadway and to obtain an estimate of the extent of congestion on SR 836.
HCM 2000 (U.S. customary units) is a completely revised, updated, and expanded edition that reflects the results of a multiyear, multimillion-dollar research effort by NCHRP (National Cooperative Highway Research Program), FHWA (Federal Highway Administration), TCRP (Transit Cooperative Research Program), and TRB (Transportation Research Board).

TRB's Committee on Highway Capacity and Quality of Service were the principal investigators in the development of the manual. The content and format of HCM 2000 incorporate major changes and improvements in analysis methodologies from the previous manuals.

6.1.3 Florida traffic information CD-ROM: A complete set of current traffic data reports is available on the Florida Traffic Information 2004 CD-ROM. This CD contains information available in the 2003 version along with the following major improvements requested as a result of the 2003 customer survey:

- Multiple synopsis reports
- Historical K30, D30, and T%
- Color-coded volumes for AADT and Truck Flow maps

The CD contains information regarding the traffic levels on major roads in Florida. The Annual Average Daily Traffic and traffic counts by hour at different locations on SR 836 are employed in the study.
6.2 Site Description and Existing Traffic Conditions

Congestion levels in Miami are among the highest in the country. According to the Texas Transportation Institute Urban Mobility Report 2005, Miami-Dade County is ranked 13th in the US in congestion levels, with an average delay of 51 hours per traveler per year.

State Road 836, locally known as the Dolphin Expressway, is a 55-mile-per-hour, 13-mile-long six-line divided tollway, extending from US 1 (SR 5) and SR A1A in Miami westward past Miami International Airport to the Homestead Extension of Florida's Turnpike (SR 821) in Sweetwater. It is maintained and operated by the Miami-Dade Expressway Authority.

Figure 1 Dolphin Expressway
As shown in Figure 1, SR 836 (also known as the Dolphin Expressway) runs through the north and northwest planning areas of Miami-Dade County, connecting some of the major trip attracting areas such as Downtown Miami, Doral and Coral Gables (high employment areas), with major trip production sites such as Central Miami (residential areas) in the East-West direction. There are major highways, which run in the North-South direction (Palmetto Expressway (SR 826), I-95), but SR 836 is the only East-West bound expressway. Because of its unique direction and the areas that it connects, the road is affected by near capacity flows in the peak periods of 6 to 9 a.m., and 4 to 7 p.m., most commonly in the stretch between LeJeune Road (SR 953) and the Palmetto Expressway.

6.2.1 Average Annual Daily Traffic (AADT) and Peak Hour Traffic: Figure 2 reports the Annual Average Daily Traffic (AADT) count volumes for both directions, as well as two-way volumes. AADT on SR 836 varies from 95,000 vehicles per day on the first 1.2 miles of the roadway from the western side, to about 207,000 vehicles per day on the widest portion of the expressway.

AADT is the total volume of traffic on a highway segment for one year, divided by the number of days in the year and represents a measure of congestion. AADT’s for SR 836 are obtained from the FGDL shape files. Separate counts are made for every non-homogenous segment of the roadway. Non-homogeneity occurs either due to differing number of lanes, entry or exit ramps, or different speed limits.
Hourly traffic counts for SR 836, obtained from the FDOT Florida Traffic Information CD are used to calculate peak hours for each direction. Peak hour traffic is necessary to determine the performance of the roadway under extreme conditions. These hourly counts are used to determine peak hour traffic for weekdays and the results are presented in Table 3\(^1\).

The peak hour for the eastern leg is 8-9 am, nearly 72% of the days. Most of the traffic passes on the eastbound direction in the morning peak period of 7-10 am (nearly 25%) of the overall traffic. The peak hour for the western leg is 5-6 pm for 88% of the study period. Such a peak distribution is pretty common, owing to the

---

\(^1\) Data for 193 weekdays of 2003 are used to compile Table 3.
location of the highly employment-centric CBD in the eastern end of SR 836, and the
residential locations in the westbound areas.

<table>
<thead>
<tr>
<th>Table 3 Peak Hour SR 836 Telemeter Site</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Peak Hour</strong></td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td>7-8 am</td>
</tr>
<tr>
<td>8-9 am</td>
</tr>
<tr>
<td>9-10 am</td>
</tr>
<tr>
<td>11-12 pm</td>
</tr>
<tr>
<td>3-4 pm</td>
</tr>
<tr>
<td>11-12 am</td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>

6.2.2 **Congestion:** Congestion at a disaggregate level, i.e. at the roadway level is
evaluated for this report. For freeways and multi-lane urban highways, the measure
of effectiveness of a road network in maintaining congestion levels is obtained by
analyzing the Levels of Service (HCM, 2000).

Roadway level of service (LOS) is a stratification of travelers' perceptions of
the quality of service provided by a facility. Much like a student's report card, LOS is
represented by the letters "A" through "F", with "A" generally representing the most
favorable driving conditions and "F" representing the least favorable (FDoT website).

To study the LOS of highways, vehicular density remains the primary
parameter of study. Density defines the proximity of vehicles to each other, which is
the principal influence on freedom to maneuver. LOS calculations can also be carried
replacing density with “maximum volume to capacity” ratio as the i.e. the flow to
capacity ratio in the peak hour. This v/c ratio is used for evaluation of the roadway in
this report. Traffic engineers focus on the peak-hour traffic volume in evaluating a
roadway because it represents the most critical time period, when the roadway is most choked with traffic.

<table>
<thead>
<tr>
<th>Beginning Length Length</th>
<th>Ending Length Length</th>
<th>Segment Length Length</th>
<th>Eastbound AADT (veh/day)</th>
<th>Eastbound No. of Lanes</th>
<th>LOS</th>
<th>Westbound AADT (veh/day)</th>
<th>Westbound No. of Lanes</th>
<th>LOS</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>0.4</td>
<td>0.4</td>
<td>47,500</td>
<td>2</td>
<td>E</td>
<td>47,500</td>
<td>3</td>
<td>D</td>
</tr>
<tr>
<td>0.4</td>
<td>0.5</td>
<td>0.1</td>
<td>47,500</td>
<td>3</td>
<td>D</td>
<td>47,500</td>
<td>3</td>
<td>D</td>
</tr>
<tr>
<td>0.5</td>
<td>0.8</td>
<td>0.4</td>
<td>47,500</td>
<td>3</td>
<td>D</td>
<td>47,500</td>
<td>2</td>
<td>E</td>
</tr>
<tr>
<td>0.8</td>
<td>1.2</td>
<td>0.4</td>
<td>47,500</td>
<td>3</td>
<td>D</td>
<td>47,500</td>
<td>3</td>
<td>D</td>
</tr>
<tr>
<td>1.2</td>
<td>3.3</td>
<td>2.0</td>
<td>67,653</td>
<td>3</td>
<td>E</td>
<td>67,653</td>
<td>3</td>
<td>E</td>
</tr>
<tr>
<td>3.3</td>
<td>4.2</td>
<td>1.0</td>
<td>56,750</td>
<td>3</td>
<td>D</td>
<td>56,750</td>
<td>3</td>
<td>D</td>
</tr>
<tr>
<td>4.2</td>
<td>4.8</td>
<td>0.5</td>
<td>98,500</td>
<td>3</td>
<td>E</td>
<td>98,500</td>
<td>3</td>
<td>E</td>
</tr>
<tr>
<td>4.8</td>
<td>6.3</td>
<td>1.6</td>
<td>98,500</td>
<td>3</td>
<td>E</td>
<td>98,500</td>
<td>3</td>
<td>E</td>
</tr>
<tr>
<td>6.3</td>
<td>7.9</td>
<td>1.6</td>
<td>103,500</td>
<td>3</td>
<td>F</td>
<td>103,500</td>
<td>3</td>
<td>F</td>
</tr>
<tr>
<td>7.9</td>
<td>8.4</td>
<td>0.5</td>
<td>77,500</td>
<td>3</td>
<td>D</td>
<td>77,500</td>
<td>3</td>
<td>D</td>
</tr>
<tr>
<td>8.4</td>
<td>9.4</td>
<td>1.0</td>
<td>91,750</td>
<td>3</td>
<td>E</td>
<td>91,750</td>
<td>3</td>
<td>E</td>
</tr>
<tr>
<td>9.4</td>
<td>10.6</td>
<td>1.1</td>
<td>80,500</td>
<td>3</td>
<td>D</td>
<td>80,500</td>
<td>3</td>
<td>D</td>
</tr>
<tr>
<td>10.6</td>
<td>11.0</td>
<td>0.5</td>
<td>68,250</td>
<td>3</td>
<td>E</td>
<td>68,250</td>
<td>3</td>
<td>D</td>
</tr>
<tr>
<td>11.0</td>
<td>11.4</td>
<td>0.3</td>
<td>61,750</td>
<td>3</td>
<td>D</td>
<td>61,750</td>
<td>3</td>
<td>D</td>
</tr>
<tr>
<td>11.4</td>
<td>11.8</td>
<td>0.4</td>
<td>61,750</td>
<td>2</td>
<td>E</td>
<td>61,750</td>
<td>2</td>
<td>E</td>
</tr>
<tr>
<td>11.8</td>
<td>13.0</td>
<td>1.3</td>
<td>51,750</td>
<td>2</td>
<td>F</td>
<td>51,750</td>
<td>2</td>
<td>F</td>
</tr>
</tbody>
</table>

The LOS depends on peak rates of flow occurring within the peak hour because substantial short-term fluctuations typically occur during an hour. Common practice is to use a peak 15-minute rate of flow and extrapolate to obtain an hourly flow. The HCM method for estimating LOS is followed. As a default value, the roadway is assumed to have a peak hour factor (PHF) value of 0.92 (as per HCM recommendations), when peak hour traffic counts are used. For volume calculations, each direction of the roadway is treated separately and the Levels of Service (LOS) are calculated for the respective peak hour flows.

The analysis suggests that SR 836 experiences extremely high volume flows, almost near capacity flows, in peak hours. Furthermore, poor LOS values exist during the peak hours, with some segments having a LOS of E, indicating high congestion. Two portions of the roadway have LOS F, indicating inadequate capacity.
to satisfy demand. Clearly, congestion relieving measures are necessary to ease peak hour traffic.

6.3 Site Identification

The traffic analysis shows that SR 836 congestion is characterized by a commute trip pattern that generates a.m. peak hour traffic congestion with a predominant east-west flow. The next step is to spatially assess the trip generation and attraction zones. Assuming a monocentric approach, that is that commuters mostly travel from residential areas across the county to the Miami central business district (CBD), the first step is to ascertain where the workers employed at the CBD reside.

To correlate CBD workers to their residences, and thus establish commute trip patterns, the US Census Bureau’s Local Employment Dynamics (LED) was employed, a prototype GIS-based tool that allows mapping origin-destination trip patterns. LED employs the Census Bureau’s demographic and economic databases to spatially correlate workers’ homes to their place of work.

Figure 3 shows a 3-mile radius buffered selection around Miami’s CBD, highlighted in yellow. This buffer represents the employment area, which comprises 7,476 employers hosting 191,960 jobs (private and public sectors). The blue dots represent the places where workers live and are located in the middle of each census block. Larger dots indicate that more of the workers from the employment area live within a given block.
Figure 3 shows that although workers employed in the 3-mile buffer reside all over the county, two clusters can be identified close to SR 836. These clusters are characterized by the largest dots, indicating a density of 145 to 480 workers per census block, all traveling to the CBD. The near proximity to the western leg of expressway indicates that these individuals are highly likely to use the facility to commute in the am hours to commute to work.

The largest cluster is located in the areas stretching from the southwest end of SR 836, east of Florida Turnpike SR 821 through the Palmetto Expressway, North of 8th Street (Tamiami Trail), and immediately adjacent to SR 836 (highlighted in green). A smaller cluster is located between at the intersection of SR 821, south of 8th Street. Assuming that the residents of this area are most likely to utilize SR 836 to commute to the CBD, the ensuing analysis focuses on these clusters, which are combined and defined as the southwest cluster. Figure 4 provides a close-up of the southwest cluster.
To complete the commute trip pattern analysis of the southwest cluster, all of the cluster residents’ trips to the CBD must be taken into consideration. This is accomplished by isolating the southwest cluster residents who work within the 3-mile radius around the CBD and analyze the industry sectors where they are employed. This allows checking for suitability of positions that are most likely to be impacted by a local telework center intending to alleviate traffic conditions on SR 836.

Figure 5 shows the two poles of attraction, depicting the southwest cluster commute pattern flow to the CBD. There are 5,291 cluster residents working within the downtown 3-mile buffer, representing 14 percent of the southwest cluster residents, and 2.8 percent of all CBD workers.
Figure 5 shows that, within the CBD buffer, there are few major employment sites with a number of workers ranging from 73 to 480 employees. A close up of the CBD buffer is shown in Figure 6.
6.4 Employee Mix

Certain jobs are more suited to telecenter usage than others. Jobs which require physical presence on job site, such as specialized healthcare assistance, legal counsel, construction and factory workers all are unsuitable for telecenter attraction, as they require presence at the job location. Other sectors include direct wholesale and retail trade, arts, entertainment, and food services. Jobs like office and administrative support, management and other such jobs are more suited for telecommuting and telecenter use. While the data set does not provide individual employee job descriptions, it is a reasonable assumption that larger firms have employees who are specifically employed for administrative, support, management positions.

Table 5 shows the workers’ characteristics of the southwest cluster. Of the 37,953 workers residing within the cluster, about 15 percent are employed in the city of Miami, and about 50 percent are scattered throughout the unincorporated areas of the County.
Table 5 Southwest Cluster Places of Employment

<table>
<thead>
<tr>
<th>Resident Held Jobs</th>
<th>2003</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Count</td>
</tr>
<tr>
<td>Number of Jobs</td>
<td>37,953</td>
</tr>
<tr>
<td>Cities/Towns Where Residents are Employed</td>
<td></td>
</tr>
<tr>
<td>Unincorporated Areas</td>
<td>18,673</td>
</tr>
<tr>
<td>Miami</td>
<td>5,807</td>
</tr>
<tr>
<td>Coral Gables</td>
<td>1,860</td>
</tr>
<tr>
<td>Hialeah</td>
<td>1,594</td>
</tr>
<tr>
<td>Miami Beach</td>
<td>873</td>
</tr>
<tr>
<td>All Other Locations</td>
<td>9,147</td>
</tr>
<tr>
<td>Counties Where Residents are Employed</td>
<td></td>
</tr>
<tr>
<td>Miami-Dade</td>
<td>29,489</td>
</tr>
<tr>
<td>Broward</td>
<td>2,733</td>
</tr>
<tr>
<td>Palm Beach</td>
<td>1,101</td>
</tr>
<tr>
<td>All Other Locations</td>
<td>4,592</td>
</tr>
</tbody>
</table>

Table 6 shows the workers profile by industry sector. By eliminating all unsuitable sectors, about 30% or 11,575 of the 37,953 southwest cluster residents can be considered as potential teleworkers.
<table>
<thead>
<tr>
<th>Industry</th>
<th>2003</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Count</td>
</tr>
<tr>
<td>Agriculture, Forestry, Fishing and Hunting</td>
<td>152</td>
</tr>
<tr>
<td>Utilities</td>
<td>76</td>
</tr>
<tr>
<td>Construction</td>
<td>1,746</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>2,353</td>
</tr>
<tr>
<td>Wholesale Trade</td>
<td>3,378</td>
</tr>
<tr>
<td>Retail Trade</td>
<td>5,655</td>
</tr>
<tr>
<td>Transportation and Warehousing</td>
<td>3,226</td>
</tr>
<tr>
<td>Information</td>
<td>1,328</td>
</tr>
<tr>
<td>Finance and Insurance</td>
<td>1,898</td>
</tr>
<tr>
<td>Real Estate and Rental and Leasing</td>
<td>1,025</td>
</tr>
<tr>
<td>Professional, Scientific, and Technical Services</td>
<td>2,429</td>
</tr>
<tr>
<td>Management of Companies and Enterprises</td>
<td>417</td>
</tr>
<tr>
<td>Administration &amp; Support, Waste</td>
<td>4,137</td>
</tr>
<tr>
<td>Management and Remediation</td>
<td></td>
</tr>
<tr>
<td>Educational Services</td>
<td>569</td>
</tr>
<tr>
<td>Health Care and Social Assistance</td>
<td>3,719</td>
</tr>
<tr>
<td>Arts, Entertainment, and Recreation</td>
<td>417</td>
</tr>
<tr>
<td>Accommodation and Food Services</td>
<td>4,061</td>
</tr>
<tr>
<td>Other Services</td>
<td>1,366</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>37,953</td>
</tr>
</tbody>
</table>

### 6.5 Residential Population Density

Figure 7 depicts a (16 to 64) density map residential population of working age for the southwest cluster. The following inferences can be made:

- There is extensive residential development close to SR 836, with high density development located within the cluster;
These areas have pockets of high population densities, of the order of 4,315 to 16,209 persons per census tract.

6.6 Household Size Distribution

According to various studies, household size is an important variable in estimating potential telecommuters. Households with children are expected to be more receptive to alternative strategies to reduce their commute time and prefer home-based telecommuting, as opposed to center-based telecommuting for young individuals who are either single or married. Figures 8 and 9 show density maps of households with
“no children” and “average household size”, respectively. Households with large number of members are expected to encourage different forms of telecommuting to ease their responsibilities.

![Southwest Cluster Density Map](image)

**Figure 8 Density of Households with No Children**

Both figures indicate that the southwest cluster possess household characteristics suited for telecenter usage.
6.7 Commuter Trip Patterns

The Census Transportation Planning Package (CTPP, 2000) profiles the commuter trip characteristics for different districts in the country. The CTPP package describes the mode splits of working commuters in Miami-Dade County. Nearly 74% of commuters drive alone, 20% carpool or use public modes of transportation to commute to work, and only 3% work from home.

Despite the fact that the average travel time for carpool is only about 3.5 minutes greater than the average travel time for single occupancy vehicle (SOV) travel times, SOV’s outweigh all other modes for commuters. While there is no exact data available for the study area, it is reasonable to estimate that the study area shares
a similar mode share split. The percentage of SOV commuters is high percentage and measures to reduce the number of SOV commuters are necessary. While a telecenter cannot reduce the number of SOV commuters, it can reduce the Vehicle Miles Traveled (VMT) by SOV vehicles.

The CTPP package also describes the county average travel time for commuters on the commute trip. With average mean travel time of about 30 minutes and with nearly 22% of all commuters having travel times greater than 45 minutes, Miami-Dade has one of the highest average mean travel times to work.

To obtain the average travel time for the commuters residing in the southwest clusters, an analysis using the HCM 2000, based on the LOS of the roadway and the free-flow speed (FFS) of 55 mile-per-hour was carried out.

These values are found to be approximately 15 minutes and 11 miles for individuals residing in the area immediately to the southwest of SR 836, and 17 minutes and 13 miles for those residing in the area close to 8th Street.

The total travel times and distances of the commute trip for the employees are much greater, depending on the exact residence and employment location of the employees. The travel times and the commuter distance traveled are calculated solely on SR 836. Also, travel times and average commute distances of only those commuters who work in the CBD and residing in the southwest cluster are calculated.

6.8 Amenity Locations
As part of the evaluation process, the site location is also studied for the existence of various amenities in the neighborhood. The primary aim of the telecenter is to reduce
peak hour commute trip lengths and times. Various studies state that the telecenter users must have enough facilities (such as restaurants, libraries, gas stations, schools, day care centers, fitness centers, transit stops etc.) in the vicinity of the proposed site location to encourage participation and to make the traffic impact effect actually noticeable.

SR 836 is a busy part of Miami-Dade city and has many facilities in its near neighborhood. Figure 10 shows a facility count within a 1-mile buffer around SR 836 using FGDL data.

The figures shows that are a large number of daycare centers, schools and shopping centers and other facilities within and in the immediate surroundings of the cluster. Though there are more establishments in the eastern edge of the telecenter, there are still a sufficiently large number of amenities in the other areas of SR 836. Studies on commute behavior report that while personal preferences do play an important role in the ultimate choice of lifestyle (different activities pursued at different places), it is reasonable to estimate that commuters will choose convenience (shorter time of travel, reduced costs) in most situations owing to constraints (39).

A closer look at the southwest cluster revealed the presence of a recently developed business area, the Waterford Business Park. The center is located on 5201 Blue Lagoon Drive, and hosts executive suites with key facilities and amenities, such as meeting rooms, broadband internet connectivity, video conferencing studios, recreation facilities, and cybercafés. A necessary step, not part of this research endeavor, should be to physically assess the availability of space within this or other nearby business parks for location.
Figure 11 shows the presence of transit stops within or in the proximity of the southwest cluster. The study area is well connected by different transit routes.
When checked against the feasibility matrix, the analysis shows that the southwest cluster possesses the physical, socio-demographic, and commuter trip pattern characteristics for potential implementation of a telework center.

Further analysis, beyond the scope of this study, is required to assess the funding capabilities, and zoning requirements. These are necessary steps that take place in conjunction with an implementation decision, a process involving both public and private support.
CHAPTER 7
CONCLUSIONS AND RECOMMENDATIONS

The analysis shows that the study area has all the feasibility elements that are necessary to be checked before a telecenter is established. But, the checklist is a preliminary feasibility report that overlooks several other factors that must be taken into consideration before implementing a telecenter. On all these points, the telecenter scores poorly and the idea should be discarded.

• PAST SUCCESSES: To date, telecommuting centers have found only limited success. The majority of centers opened in the 1990’s have ceased to exist or evolved into more competitive concepts (such as urban executive office suites), due to lack of subsidized public and private funding, rising competition from alternative telecommuting strategies, employer resistance, and changes in telecommunication technology. At present, the majority of the operating telework centers are federally sponsored and used solely by federal workers. These centers are also facing constant scrutiny and funding constraints owing to persistent low usage levels.
• HOME-BASED TELECOMMUTING: The shift has been toward home-based telecommuting, as an inexpensive, productive, alternative. The challenged faced by telework centers is that routine telecommuter’s still represent a relatively small percentage of the workforce. These individuals tend to prefer making arrangements with the employer to conduct home-based telecommuting.

• INTERNET AT HOME: Another major change from the early 1990’s when Telecenters, as a concept, blossomed has been the advent of the internet. Internet was still a relatively new technology and was not easily accessible to all individuals in the 1990’s. Owing to its novelty, telecenters offered something over home-based telecommuting. In the present day scenario such an advantage for telecenters has been nullified. With employers ready to pay for high speed broadband internet connection for their employees to work from their homes, home-based telecommuting has gained more prominence and has become even more wide-spread. Other travel demand management strategies such as vanpooling, carpooling, staggered work hours have also gained importance owing to lower costs of implementation and relatively higher success rates.

• SITE-BASED ISSUES:
  o At a micro level; considering the site at hand, there are certain drawbacks associated with the establishment of the telecenter in the suggested location. Telecenters established for reducing commute lengths typically target populations that travel long distances to work. If
commute trip reduction is the major goal for the telecenter, then it must be located in the suburban area with similar characteristics as the study area to actually attain this goal.

- Residents living in the study area work all over the county; however, the major center for employment remains the Central Business District, which is roughly 13 miles away from these areas. While there are potential advantages to be tapped by establishing the telecenter, employer firms might not find it feasible to relocate some of their employees to such nearby locations.

- Further, only a small percentage of workers in the CBD actually reside in the selected southwest clusters. Hence, attempting to reduce commute distances for such a small percentage of employees seems irrelevant, especially if the commute distances for employees residing in other areas are left unaltered in the context.

- SR 836 is extremely congested during peak hours. If congestion alleviation is deemed to be the main goal of the telecenter, then simply by establishing a telecenter for housing a few employees will not solve the problem. By studying the changes in LOS for a potential decrease in 200 (a rough estimate of an average sized telecommuter might house 200 individuals at most, highly unlikely but possible) trips in the peak hour, it was found to be immaterial and the LOS remained unchanged. To achieve this goal, other TDM strategies, such as home-based
telecommuting promotion/implementation, vanpooling etc. must be employed in conjunction with the proposed telecenter.
REFERENCES


36) Janet Jones Works. *If We Build it Will They Come? - Needs Assessment and Telecommunity Center Feasibility Analysis.* Clackamas County Telecommunity Project Team, October 1999.

