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Feasibility Study and Premarket Analysis of Sites for a Sportsmedicine Facility

Deborah Anne Hardel

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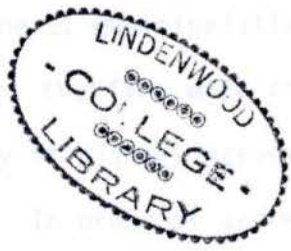
Deborah Anne Hardel, B.S.



An Abstract Presented to the Faculty of the Graduate School of Lindenwood College in Partial Fulfillment of the Requirements for the Degree of Master of Science

1989

ABSTRACT

The purpose of the study was to develop criteria for determining an advantageous site for a sportsmedicine facility from among 91 municipalities in greater St. Louis. Two types of clinics, referral base and doctor-in-house, were compared to select the most appropriate type of facility for the specific site.

To facilitate data collection, greater St. Louis was divided into four regions, including the city of St. Louis as one region and three other regions formed from 90 municipalities in the county. For each community, data were gathered on median household income, median age, real estate valuation, and number of schools and hospitals. Distributions for each set of data were established, and factors from one to six were assigned for each variable. A total score was determined for the 91 municipalities.

From the 91 municipalities in the sample, the five with the highest scores were targeted for further study of highway accessibility and public transporation availability. In order of scores, St. Louis and Town and Country tied for the number one position with 24 points, followed by Creve Coeur, Clayton, and Kirkwood. After all available data were considered, it was determined that Town and Country was the best possible site for a sportsmedicine clinic.

The advantages and disadvantages of referral base and doctor-in-house clinics were examined to establish the most appropriate

type of sportsmedicine facility for the community of Town and Country. Given the availability of schools and hospitals and highway accessibility, it was decided that a referral base sports-medicine clinic in Town and Country would have the best potential for marketing success.

Recommendations for further study included the development of a practical marketing plan for the specific clinic location and marketing plans for educating users to the services of sports-medicine clinics.

FEASIBILITY STUDY AND PREMARKET ANALYSIS OF SITES FOR A SPORTSMEDICINE FACILITY

Deborah Anne Hardel, B.S.

A Culminating Project Presented to the Faculty of the Graduate School of Lindenwood College in Partial Fulfillment of the Requirements for the Degree of Master of Science

1989

COMMITTEE IN CHARGE OF CANDIDACY:

Professor James Swift,
Chairperson and Advisor

Professor Marvin Burnett

Dr. Joan Warrington

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CHAPTER I

INTRODUCTION

This study contains a compilation of data from St. Louis City and County to determine a suitable location for a sportsmedicine facility. Demographic data from four regions will be analyzed, and recommendations will be made relative to the most feasible type of facility and its most desirable location, as indicated by the analysis of data. Some major factors in establishing a desirable site include the existing medical resources available, marketing areas for clientele, accessibility to the facility, and the economic base of the region. Based on a study of the data, recommendations will be made for the establishment of a specific type of sportsmedicine facility at a site determined to have the greatest value in terms of community service and the highest potential for financial success.

Need for the study

The sportsmedicine field is an area of medicine that is growing enormously. Because of its relative youth, medical professionals who had been reluctant to acknowledge its role in medicine now embrace it as an important inclusion in their practices. Many hospitals and doctors' clinics are also joining resources to offer a variety of services to accommodate the

aspects of sportsmedicine as a separate entity apart from the typical medical practice.

Expanded services make a sportsmedicine facility appealing to a broad range of users; e.g., secondary schools, colleges, and health clubs, whose memberships indirectly result in a large number of referrals. When a suitable location is established, the above factors must be considered, together with the location's ease of access from major thoroughfares and by public transportation. The economic level of the region will dictate its ability to support a sportsmedicine facility, but the need for one must be given careful consideration. Given the aforementioned factors, the ability to recommend a potential site and to establish the type of sportsmedicine facility best accommodated at the site provide a legitimate basis for this study.

Purpose of the study

Americans have entered an era of renewed interest in physical fitness and awareness; thus, it follows that new treatments and facilities must be developed to accommodate the medical problems that can result from participation in physical activity. Previous remedies that included "ice and rest for two weeks" are no longer adequate for the athlete who seeks an early return to competition or the sport enthusiast who wants to resume training. Thus, advancements in technology and diagnosis are facilitating the early and complete rehabilitation of active sport participants.

Since professionals in sportsmedicine have a greater understanding of sport-related injuries, their ability to provide quality care and rehabilitation has improved significantly.

Because of this dramatic improvement, persons actively participating in physical activity are turning from the general practitioner to a doctor with specialized skill and training in sportsmedicine. Athletes, in particular, tend to seek consultation and medical attention from a sportsmedicine physician whose expertise is concentrated on a particular anatomical part; e.g., the shoulder, knee, ankle, or elbow. With the need to provide specialized evaluation, medical personnel in a doctors' clinic or doctors who are hospital-affiliated may be required to diagnose sport-specific injuries that have varying degrees of severity.

Diagnosing the type and extent of injury is one phase of sportsmedicine; treatment and rehabilitation add another dimension to the services that can be provided by competent specialists in a sportsmedicine facility. Although some types of sportsmedicine clinics are not equipped to do in-house rehabilitation, their staff is prepared to make referrals to carefully selected departments of therapy in a hospital-related or independent facility. The main objective of both types of clinics is to ensure all patients of a speedy and complete recovery.

The purpose of this study is to use data collected from four St. Louis regions to determine an appropriate site and type of sportsmedicine facility relative to community needs and interest. Available research and existing information will be explored to select the type of sportsmedicine facility that is best accommodated by the results from analysis of data.

Terminology

Following is a list of terms with definitions that will be applied consistently throughout this study:

Athlete

An individual who engages in routine, vigorous, and specialized physical training for the purpose of developing the mind and body for athletic competition is defined as an athlete.

Participant

A person whose involvement with physical activity tends to be irregular in frequency, kind, and intensity and whose motivation is self-directed in terms of improved health, physical condition, and sociability is referred to as a participant.

Doctor-in-House Clinic

This type of medical facility has a staff of one or more physicians who are supported by several technical professionals. It may not necessarily have therapeutic resources within its own building.

Referral Base Clinic

A clinic that receives patients sent for treatment and/or rehabilitation by a physician from another medical facility is a referral base clinic.

Professionals

Doctors, physical therapists, athletic trainers, and exercise physiologists are all members of the professional staff that contributes to the total care of the athlete or participant.

Sportsmedicine Facility

This label is an all-inclusive term for a clinic, hospital, branch, or independent office that functions specifically for the care of persons with injuries resulting from physical activity or trauma.

Limitations

The selection of St. Louis as the site for this study was both an advantage and a limitation. On the one hand, St. Louis offered immediately available resources for data collection, as well as familiarity with its geographic boundaries. On the other hand, the city of St. Louis is a relatively small, large midwestern city, compared to its sprawling metropolitan counterparts on the East and West Coasts. Although St. Louis has most of the major problems of larger cities, the smaller population and area provide more limited data than would a comparable study of a large city.

The city of St. Louis is located near the population center of the United States, but its unique position at the confluence of two rivers gives it a peculiar configuration. The city, itself, is actually east of the county, and its eastern boundary is the Mississippi River. Across the river is a different state and a city that identifies more closely with St. Louis and Missouri than with East St. Louis and Illinois. Hence, the decision was made to collect demographic data from the city of St. Louis and its three contiguous regions, each with ill-defined boundaries.

Because of the nature of the study, computer hardware and

software were not used in the collection and tabulation of data. Thus, operating costs were minimized, and information was gathered by conventional means that facilitated the synthesis of results and the ability to draw conclusions.

CHAPTER II

BACKGROUND INFORMATION FOR THE STUDY

Types of Sportsmedicine Facilities

Sportsmedicine facilities can be classified into two general types of clinics, doctor-in-house and referral base. Within these broad classifications are many variations, such as a hospital, doctors' clinic, treatment center, or independent corporation.

The choice of the type of facility is determined by the patient's preference for a doctor. For the patient who is amenable to seeing a new or different doctor, a doctor-in-house facility is appropriate. For this patient, a staff doctor would diagnose the problem and recommend therapy, if needed. Therapy would be arranged either within the therapeutic department of the clinic or through the services of an independent group.

With a referral base clinic, the patient consults with a family physician. If therapy is indicated, the patient is referred to this type of clinic to receive rehabilitative treatment.

Doctor-in-house clinic

Role of the doctor

A doctor-in-house type of sportsmedicine clinic has doctors who regularly examine, diagnose, and treat sport-related injuries. Therefore, they must be knowledgeable and skillful in the following:

1. Taking a history and performing a physical examination

for orthopedic sports injuries.

2. Managing chronic orthopedic sports injuries featuring typical histories and physical findings.
3. Differentiating between sports injuries that require immediate surgery and those that can be treated without an operation.
4. Recognizing sports injuries for which a minor delay in treatment would be harmful.
5. Providing acute care, including on-field management, for orthopedic and other injuries occurring during competition.
6. Ordering and interpreting radiological examinations used to diagnose sports injuries, including specific views, tomograms, bone scans, arthrograms, and computed tomographic scans.
7. Using physical therapy modalities and judging "the appropriateness and efficacy of a treatment plan."
8. Performing diagnostic and surgical arthroscopy.
9. Treating or appropriately referring nonorthopedic problems that occur in sports medicine.
10. Recognizing the psychological effects of injuries, dealing with them, and selecting consultants to assist in managing them.
11. Prescribing and fitting sports equipment, particularly protective devices intended to allow the athlete to continue to compete, including helmets, protective pads,

knee braces, and foot orthoses.

The doctor-in-house type of clinic may have one or several doctors on staff. They may be doctors of medicine, doctors of osteopathy, podiatrists, chiropractors, orthopedic specialists, neurologists or other types of specialists. The nature of the patient's injury is a significant factor in the choice of facility. To receive optimal care the patient should understand the scope of treatment available at the clinic.

Role of the nurse

An important staff member in a sportsmedicine facility is the nurse. This person contributes to the patient's preparation for examination by taking a history of the injury and providing notes on the observations of the patient's condition. The nurse may also have responsibility for presurgery paperwork and laboratory work. Since this staff person is the primary communicator between patient and doctor, the ability to establish warm, courteous, professional rapport with the patient early in the first visit is essential for an effective professional relationship.

Role of the physician's assistant

The main concern of the physician's assistant is aiding the doctor. The assistant's responsibilities may also include recording patient histories, scheduling appointments, responding to patient inquiries, and assisting in patient care; e.g., suture and cast removal. While the physician's assistant generally works closely with the doctor, it is the nurse who may have the direct responsibility for overall patient care.

Role of the X-Ray technician

An important member of the support staff is the radiologist whose expertise in determining the best view and angle for taking an x-ray is invaluable to the doctor in diagnosis. For example, one view of a suspected ankle fracture may verify the doctor's preliminary diagnosis but may fail to reveal an associated injury in the vicinity of the fracture. A skilled technician will be cognizant of the relationship between the patient's age and type of injury; e.g., the frequency of hip fracture among the elderly.

The radiologist is another staff member who needs to be people-oriented. Since the patient will be put in awkward, uncomfortable, and often painful positions, the technician must be compassionate and empathetic toward the patient. An important ingredient in the doctor-in-house clinic is the sense of teamwork among the staff members if the patient is to develop trust and confidence in the medical care.

Advantages and disadvantages

A doctor-in-house facility is advantageous because the doctor and staff deal exclusively with sport-related injuries. The staff is carefully selected in terms of training and experience to meet patients' needs. A rehabilitation department may be located within the facility. Access to a medical staff with a background in sportsmedicine is far more likely to result in an accurate diagnosis and to contribute to a rapid recovery. Repeated opportunity to evaluate sport-related injuries provides the doctor with valuable experience for diagnosing injuries.

Supplies in a sportsmedicine facility may include bracing, padding, and supportive devices that are frequently required for enhancing the recovery time and stability of injuries resulting from sport-related activity. The availability of an on-site therapy department enables the patient to receive immediate treatment and rehabilitation under the direction and supervision of the doctor. In-house therapy allows trainers and therapists to discuss the patient's care directly with the doctor and enables the doctor to monitor the patient's status. Modern equipment, techniques, and modalities will be available for use by the trained staff to hasten the patient's recovery time.

A disadvantage to a doctor-in-house clinic may be the patient's preference for seeing a family physician. A doctor on staff needs to see a patient before therapy can be arranged or before any bracing or supportive devices can be fitted. If the family physician should recommend therapy, the resources of an independent or referral base office would have to be used.

Another disadvantage of the doctor-in-house clinic occurs when the facility does not have a therapy department. Most, if not all, therapy and rehabilitation then must be done at an outside facility. Not only is this inconvenient for the patient, but it can contribute to a breakdown in communication between doctor, therapist, and patient.

For example, a doctor may prescribe a set of exercises that should be done in a specific manner for maximum benefit. Unless the doctor is specific about the content and performance of the

program, the exercise program may not help the patient to achieve the anticipated results. The doctor must be willing to communicate with the patient and the outside therapist on the specifics of the rehabilitation program.

A patient should take these factors into consideration before selecting a sportsmedicine facility. By asking a few basic questions, the patient will have an understanding of the operations of the facility and the services it offers. A small amount of research in the beginning may result in convenience, service, and effective treatment in the end.

Referral base facility

A referral base facility is an independent office, an office within a clinic, or a hospital unit that deals with treatment, manual therapy (stretching, resistive exercises, palpatation, massage), and rehabilitation (orthotron, cybex, home exercises).

With a referral base facility, the patient is first examined by his own doctor and then prescribed for treatment and rehabilitation at the facility of the patient's choice. The patient who has received care from the same physician for many years can benefit from a referral base clinic because of the bond of trust and confidence between doctor and patient.

Professionals at a referral base clinic have gained experience from working with injuries incurred by sports professionals and intercollegiate, high school, and weekend athletes. The degree and extent of an injury may vary extensively, but these

professionals are accustomed to working with injuries at all stages of recovery.

Role of the athletic trainer

While the athletic trainer has always been associated with athletes in the traditional training room setting, only recently has this professional been welcomed into the clinical setting. Previously, the athletic trainer was employed primarily by professional teams, colleges, and some high schools. A trainer's functions, clinical or traditional, can fall into any one of several categories:

1. Prevention of athletic trauma or conditions that adversely affect the health or performance of the athlete.
2. Management (First Aid, evaluation, treatment, and rehabilitation) of athletic trauma or other medical problems that affect the athlete.
3. Counseling the athlete in health-related areas such as:
   a. Nutrition.
   b. Relaxation and tension control.
   c. Personal health habits.[1]

The athletic trainer should be able to describe to the patient the type and degree of the injury, sensations the patient may feel, and limitations the patient will have through the vari-

[1]S. Roy and R. Irvin, Sportsmedicine: Prevention, Evaluation, Management, and Rehabilitation, (Englewood Cliffs: Prentice-Hall, 1983), pp. 1-2.

ous stages of recovery. A patient's complete confidence in the trainer's methods is vital if compliance with the recovery program is to be achieved.

Physical therapists and athletic trainers learn many of the same basic techniques for treating and rehabilitating injuries. Physical therapy is the utilization of heat, light, water, electricity, massage, exercise, and radiation for the primary purpose of effecting a healing and/or rehabilitative response.[2] Therapists provide treatment for individuals of any age and for a wide range of injuries.

All types of people with all kinds of needs seek the services of physical therapists. One specialty of therapists is the manipulation and alignment of the spine and adjacent joints; e.g., the shoulder and hip. Such injuries may or may not be sport-related, but they still need care and treatment by a professional. Proper follow-up rehabilitation can prevent the recurrence of an injury. As with the athletic trainer, a therapist must also understand the patient's needs and be able to communicate the importance of following the prescribed program of rehabilitation. Both therpaists and trainers need the type of personality that evokes the patient's confidence and persistence throughout the duration of treatment.

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[2]C. E. Klafs and D. D. Arnheim, Modern Principles of Athletic Training, (5th ed.; St. Louis: C. V. Mosby, 1981), p. 257.

Role of the exercise physiologist

An exercise physiologist is concerned with the functions of body parts--what they do and how they work.[3] The physiologist's role is to develop a strengthening program for the patient during the final phase of rehabilitation and a maintenance program for ongoing and continued use. A therapist or trainer works with the patient during the acute phases of treatment and then consults with the physiologist for the appropriate strengthening/maintenance program. This is the last stage of the process of rehabilitation.

Another important responsibility for the physiologist is to develop general conditioning programs for persons of all ages and levels of fitness. An understanding of muscles and their movement helps the physiologist to develop multi-dimensional, individualized exercise programs. To do this, however, the exercise physiologist needs to know the patient's fitness level, weaknesses, capabilities, and goals in order to generate an exercise program tailored to the patient's needs.

Advantages and disadvantages

Advantages for the patient who chooses the referral base clinic are that the patient may use his own physician for diagnosis and appointments can be arranged for the patient's convenience and accommodation. The staff at a referral base clinic deals specifically with rehabilitation of sport-related injuries

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[3]J. W. Hole, Jr., Human Anatomy and Physiology, (Dubuque: Wm. C. Brown Publishers, 1978), p.7.

and the needs of these patients. While the physician may be able to diagnose injuries, he may not be aware of new rehabilitation processes or new equipment to treat injury. The ability to refer a patient to a clinic that is professionally staffed and has the most innovative equipment and modalities is beneficial to both doctor and patient.

A referral base clinic generally has flexible hours for the convenience of the patient. Since some employers are unwilling to allow employees to leave during the work day, the patient who needs therapy is benefited by the flexible schedule of a referral base clinic. The patient is further accommodated when appointments for both the doctor and clinic create scheduling conflicts.

One disadvantage of a referral base clinic is that the patient must make two separate appointments, one with his doctor for diagnosis and one for followup. Another disadvantage is that trainers, therapists, and physiologists are unable to work directly with the attending physician. Lastly, since there are no doctors at a referral base clinic, it is the professional staff's responsibility to communicate the importance of the rehabilitation program to the employer.

The staff must keep careful records of the patient's adherence to the rehabilitation regimen and must track the progress to full recovery. Since the referral base clinic works with many physicians, prescriptions for therapy will vary considerably. Some doctors may be very specific regarding treatment, while others may simply make the diagnosis and leave decisions for

treatment to the good judgment of the professional staff. Still others may request that only a therapist or trainer work with the patient.

Initially, the trainer or therapist will need to make a concerted effort to communicate with the physician of the new referral. Through this process the staff learns the kind of exercise program desired by the physician and demonstrates its interest in providing appropriate care to the patient.

Since each case is different in terms of progress toward recovery, the staff must be willing to communicate with the physician when changes in treatment are indicated. The doctor may suggest a few basic treatments, but if a more thorough and extensive treatment program is needed, particularly for a competitive athlete, the patient should talk to the physician to fully explore the options for receiving follow-up therapy.

Related Services Provided by Sportsmedicine Facilities

Many sportsmedicine facilities provide services to area schools and the community relating to care and treatment of injuries to sport participants. Providing a wide range of services gives considerable visibility and enhances the success of the facility. Either type of facility previously described have the expertise to provide any or all of the related services that include coverage at athletic events, consultations, speeches, and assistantships.

Coverage at athletic events

Coverage at athletic contests assures that immediate care is

available to the injured athlete by a trained professional. To provide such medical assistance, a contract is negotiated between a school or school district and the sportsmedicine facility whereby the services of an athletic trainer, therapist, or doctor are employed. During the event, the staff person is situated at the sideline of the field or court to be available to respond immediately to the needs of the injured athlete.

When an injury does occur, the medical professional will evaluate the extent of the injury and initiate appropriate measures for treatment; e.g., bracing, splinting, stretcher, ambulance service. The athletic trainer, or whoever is the designated professional, will also make a decision about the athlete's readiness for further participation in the game. The presence of the trained individual transfers the burden of responsibility for treatment of the injury from the coach to the professional. Thus, the visibility of this person at the athletic event is one means of generating new referrals for the sportsmedicine facility.

Consultations

Another helpful service provided by the sportsmedicine facility is consultation on athletic injuries. Many high schools and some colleges cannot afford to employ a full-time athletic trainer. For the athletic program with this type of budget limitation, the sportsmedicine facility will provide a trainer or therapist, typically on a weekly basis, to visit the school to evaluate injuries. The sportsmedicine specialist then makes recommendations for treatment that may include followup examina-

tion by the athlete's regular physician.

Consultation provided in this manner can prevent small injuies from becoming more serious ones and thereby improve the athlete's playing potential. For the sportsmedicine clinic, consultation is another way to promote its resources and to gain new patient referrals.

Speeches and lectures

Speeches, lectures, and other similar presentations are tools for educating coaches, support staff, athletes, and parents to the importance of proper evaluation, treatment, and rehabilitation of athletic injuries.

Clinics for coaches

Clinic opportunities for coaches often feature basic techniques for evaluating, splinting, and taping injuries. Those injuries that occur during practice may initially require evaluation by a member of the coaching staff. Therefore, it is essential that coaches be able to recognize the signs, symptoms, and severity of typical injuries so that intelligent decisions can be made on behalf of the athlete. More extensive damage can result when an athlete continues to practice with an injury that has been poorly diagnosed or treated.

Career days at high schools

Frequently, high schools sponsor "Career Days" during which students gain exposure to a wide variety of career opportunities. Representatives from the professions, business, industry, and the military meet with interested groups of students to explore the

education, training, qualifications, salary, and conditions of employment for a specific career or job.

The medical profession with its many specialities is a popular selection for students interested in this type of career. Within this framework is the sportsmedicine professional who can use demonstrations to display the skills needed for working with injured athletes; e.g., taping an ankle, evaluating a knee injury, applying a splint, or recognizing the symptoms of concussion.

Whether the presenter is an athletic trainer, therapist, or physiologist, discussion will focus on the selection of a college or university that specializes in sportsmedicine. Some clinics even offer semester programs to high school students during which they gain exposure to and an understanding of sportsmedicine as a career. Such training is invaluable in helping the high school student to shape a career.

Workshops for student trainers

Student trainer workshops are another means of educating high school students to the skills needed for a position in sports-medicine. The workshop approach provides a hands-on opportunity for taping, evaluating, and treating various athletic injuries. Students at high schools without an athletic trainer on staff can benefit from this kind of workshop because they acquire experience to assist coaches in their daily practice sessions.

Student trainers who work with athletes in this environment will see a wide range of injuries. Even with limited experience, they are able to conduct a general evaluation and begin the taping

or splinting procedures dictated by the symptoms. Practical application of knowledge is the best way for the student trainer to learn about the complexities of sportsmedicine.

Liaison with booster clubs

As discussed earlier, visibility of the professional at athletic events and interaction with athletes and their parents are vital to the process of securing new patient referrals to the sportsmedicine facility. Since a school's boosters need to be educated to the role of the athletic trainer or therapist, speaking to such groups at the beginning of the season will help them to understand the services that have been contracted.

Giving first-hand information about the professional's qualifications and experience will establish a foundation of confidence and trust in the trainer's expertise. Without this kind of interaction, there may be a misunderstanding of the fundamental difference between the sportsmedicine specialist and the emergency medical technician. Provided with sound information, however, athletes and parents are far more likely to accept recommendations for treatment, rehabilitation, or referral when they are made by the trained professional.

Good rapport with boosters and other support groups translates into concern for the proper care of athletes and a good working realtionship to benefit the entire school and community. The importance of care and prevention of injuries by qualified professionals will become obvious to all concerned and may result in financial gain to the school in the form of such therapeutic

equipment as a whirlpool, hydrocollator, or ice machine.

Internships and assistantships

As the sportsmedicine field continues to grow and change rapidly, new professionals entering the field need access to state-of-the-art equipment and methodology. Sportsmedicine clinics and large universities are two resources for the graduate assistant or intern who seeks to use the most recently developed equipment or to apply the newest technique to an injury, or even to use his own creativity in exploring new frontiers. The highly trained professional in this kind of learning environment is a very marketable person in the chosen career.

Many sportsmedicine facilities are able to offer both tuition and stipend to the graduate assistant or intern who wishes to learn about clinic operations at the source. Hands-on experience with rehabilitative equipment and opportunities for developing interpersonal skill with patients are two avenues by which the future sportsmedicine specialist can complete a well-rounded education.

CHAPTER III

REVIEW OF LITERATURE

Since the field of sportsmedicine is relatively new, much remains to be written about the implications for sportsmedicine as it takes its place alongside its relatives in the science of medicine. Only recently have authors begun to submit articles for publication in journals and periodicals to share information related to sportsmedicine and its developmental aspects. One such example is the sportsmedicine clinic, which has received some attention on the general problems of operating a clinic but almost no data on site selection for a successful clinic.

In the early 1980's, findings from a marketing study reported that the number of participants in sports had doubled between 1961 and 1981.[1] The impact of the fitness boom has affected numerous markets from athletic clothing, to sports equipment, to exercise/diet programs, to care and treatment for sport-related injuries. Parallel with the number of participants, growth has been seen in the number of sportsmedicine facilities being established throughout the country as the thrust to be fit and healthy continues.[2]

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[1]Robert Roos, "Plan for Accrediting Fellowships Worries Sports Orthopedists," The Physician and Sportsmedicine, Vol. IV (April, 1987) 151-160.

[2]Thomas G. Weidner, PhD, ATC, "Sportsmedicine Centers: Aspects of Their Operation and Approaches to Sportsmedicine Care," The Journal of the National Athletic Trainers Association, (Spring, 1988), pp. 22-26.

The changing configuration and complexity of sportsmedicine are a mandate to professionals to communicate their programs and services to the users and the users to be informed about the importance of proper treatment of sport-related injuries. The fact is that many participants launch into vigorous activity with little or no understanding of the body's anatomy and physiology and even less knowledge of injuries and who should treat them.

On the other side of the issue are doctors whose training has prepared them to be physicians or specialists but whose background for sports and whose training specific to sport-type injuries may be limiting factors in their ability to function as sportsmedicine specialists. At this point in time, any physician can hang out a "shingle" that identifies him as a sportsmedicine doctor because no standards have been established for certification of this type of specialization. "Primary care physicians need more training in the area of sports and exercise medicine,"[3] asserts Kevin M. Patrick, MD, director of General Preventative Medicine Residency Program at San Diego State University.

"At this point, the public does not have good guidance as to how to choose the right physician. The solution? The American College of Sportsmedicine curriculum, which will ensure that all sportsmedicine practitioners have the same base of knowledge,"[4] according to Lyle J. Micheli, MD, Director of the Division of Sportsmedicine at Children's Hospital Medical Center in Boston.

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[3]"Sportsmedicine: Where do we go from here?" The Physician and Sportsmedicine, Vol. 16 (June, 1988), 170-181.

[4]Ibid.

Bob Adams, DO, a physician at Lake Washington Sport Clinic, predicts that quality control of sportsmedicine physicians will improve, perhaps by the implementation of a board of certification in sportsmedicine.[5]

According to Allan J. Ryan, MD, Director of Sportsmedicine Enterprise, such certification would "identify them [physicians] as specialists who are particularly well qualified to advise, supervise, and treat recreational and competitive athletes; to test and otherwise evaluate persons who are interested in developing and maintaining physical fitness; or who require rehabilitation after an injury or illness; and to develop exercise programs for persons who need them."[6] A program of certification has potential for reaching new graduates from medical schools, but it is highly unlikely that certification requirements would be imposed on established physicians.

The importance of accreditation for sportsmedicine professionals should not be minimized if this specialized field is to achieve legitimacy as a recognized entity. However, beyond the qualifications of the professional staff are the core decisions for the services to be made available at a sportsmedicine facility. The proposed scope of services will dictate the size and type of clinic that is constructed, staffed, and equipped.

In their text on athletic training, Klafs and Arnheim state

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[5]Weidner, loc. cit.

[6]"Sportsmedicine: Where do we go from here?", loc. cit.

that "services provided by these clinics vary considerably. Some specialize in therapy and rehabilitation; others include exercise physiology testing and biomechanics testing and analysis. Some of these programs are managed by a physician, others by a registered or licensed physical therapist."[7] The importance of referral to a therapy clinic is stressed, when therapeutic services are not available within the sportsmedicine clinic. The advantage for in-house therapy is the resulting continuity of care when the doctor can follow the patient's progress from diagnosis to treatment to rehabilitation.

The emerging sportsmedicine field with its potential for providing services for sport-related injuries has opened many new publishing avenues for journals and periodicals. The present dearth of information available to the reader/researcher is a clear indication of the need for practitioners to publish their creative technology and to share ideas with would-be participants. Most lacking is substantive material on the specifics of site planning for sportsmedicine facilities.

As more sportsmedicine specialists enter the profession, articles and reports should appear in greater numbers addressing issues in the development of sportsmedicine clinics, the architects who design them, the contractors who build them, the professionals who staff them, and the clients who use their services.

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[7]C. E. Klafs and D. D. Arnheim, Modern Principles of Athletic Training, (5th ed.; St. Louis: C. V. Mosby, 1981), p. 257.

CHAPTER IV

PROCEDURES

Demographic data on the population

The first step in the data collection process required the gathering of data from a variety of sources. Considering the marketability of a sportsmedicine facility and the previously described populations who would use such services, it was determined that the desirable location would need to meet several population criteria, a dis- cussion of which follows.

Average income

Given the rising cost of medical services coupled with increasingly expensive health insurance, it is generally understood that services at a sportsmedicine facility are not affordable by everyone. Therefore, the typical patient would be one whose insurance is paid, to a large extent, by the employer or some other agency; e.g., the high school or college represented by the athlete. Lacking such coverage, the patient's income would need to be adequate to be able to absorb possible long-term medical expenses.

Information on household income was gleaned from the 1980 Bureau of the Census data broken down by community and categorized under General Social and Economic Characteristics. This study used the median income per household to facilitate comparison between

communities. The greater the median income, the more desirable was the community for consideration in the site selection process.

Seen on a continuum, the scale for average income has the following appearance (figures expressed in thousands of dollars):

Income	Below 20	20-24	25-29	30-34	35-39	Above 40
Factor	1	2	3	4	5	6

Age

As previously explored, the age of the potential user of services at a sportsmedicine facility can range from very young to very old. However, the profile of the typical patient falls somewhere between middle school/high school/college age during which the most intense athletic competition takes place and early middle-age where participation in physical activity is personally motivated.

From the age data gleaned from St. Louis County tables, the median age for municipalities ranged from 21.3 to 45.9. Within that range, a medium age of 31.3 was noted. To facilitate the formation of groups, the total range was divided into six intervals of five ages each and weighted according to three criteria: 1) affordability of services, 2) likelihood of children in the high school/college age group, and 3) the likelihood of adults' participation in physical activity.

Each age range was then assigned a weighted factor from 1 to 6 based on consideration of the three criteria as they relate to existing patterns of the typical family unit.

Expressed on a continuum from 1 to 6, the weights and age ranges appear as follows:

Age	21.3-25.3	41.8-45.9	25.4-29.4	37.7-41.6	29.5-33.5	33.6-37.6
Factor	1	2	3	4	5	6

Table 1 summarizes the age ranges to which factors were assigned and the criteria that were used to weight the ranges. The median age of 31.3 for the distribution appears in the range of 29.5-33.5 to which a factor of "5" was assigned.

Property Valuation

The most recent data on property valuations were examined to develop a rating scale for the 91 municipalities that comprise St. Louis and St. Louis County. Source of the data was the "Assessed Valuation of Municipalities in St. Louis County Including Board of Equalization Adjustments as of August 1, 1988." For ease of compilation, it was decided to use the regular base figures for real estate before local and state taxes are added. This decision facilitated the handling of data and eliminated the need for computation, especially given the fact that local taxes are not assessed universally in all communities.

The relationship between family income and real estate ownership is a fundamental one. Generally, the greater the income, the more desirable for a family to own its home. Similarly, a larger income accommodates a more extensive search for "something better" and subsequently results in a more expensive purchase. Attendant with the decision to own a new home are such factors as proximity to schools, hospitals, and shopping centers

TABLE 1

SUMMARY OF WEIGHTED FACTORS AND ABILITY TO MEET CRITERIA FOR EACH OF 6 AGE RANGES

Range	Factor	Ability to Meet Criteria
21.3-25.3	1	While this group is most likely to contain adult participants, it is highly improbable that children would be a factor in parents' need for sportsmedicine services. It is less likely that income could accommodate specialized services.
25.4-29.4	3	Persons here may also be active in sport; however, young children would also begin to be sport participants in formal and informal activity. Income should show improvement over the previous age group.
29.5-33.5	5	Pluses for this group include larger salaries, children approaching high school age, and adults' continued direct or indirect participation in physical activity. The median age is found here.
33.6-37.6	6	All criteria are met here, including stable income, physically active children of middle school/high school/ college age, and parents still young enough to engage in sport-related activity themselves.
37.7-41.6	4	Persons in this group may still be participants, but with greater risk of injury. Their children will be secondary school/ college age and will be seeking work. Parents will be nearing the upper levels of income for their vocations.
41.8-45.9	2	In this age group are families with incomes that have stabilized and children who have grown, found employment, and married. Revised priorities for parents in this age group include retirement plans and interest in grandchildren.

and ease of access to work and recreational activities. Therefore, it is consistent with the stated purpose of this study to examine the real estate base of a municipality as one variable for determining a suitable location for a sportsmedicine facility. Data from the tax tables referenced above yielded a broad range of property values.

From the lowest base of $376,450 to the highest at $295,082,870, the 90 municipalities were rated on a scale from 1 to 6. The size of each cell was established to ensure a relatively normal distribution. The midpoint of the distribution occurred between $15,464,570 and $15,781,670.

Municipalities with a real estate valuation of $15,000,000 were placed at the low end of the range for a "4" rating. Thus, 44 communities fell between 1 and 3 on the rating scale, while 46 were distributed in the upper half of the continuum from 4 to 6. The following rating scale shows the weighted values applied to real estate base valuations expressed in millions of dollars:

1M and Below	2-5M	6-14M	15-59M	60-150M	151M and Above
1	2	3	4	5	6

The resulting distribution for 90 municipalities in St. Louis County yielded the following profile:

1M and Below	2-5M	6-14M	15-59M	60-150M	151M and Above
9	17	18	21	15	10

Data related to regions and municipalities

Establishment of regions

The logical procedural step following data collection on population was the assimilation of data to facilitate meaningful

comparisons. To achieve this process, a map of the city of St. Louis and its vast county territory, which contains 90 municipalities, was divided into four quadrants. St. Louis city was isolated as one region, and the remaining territory was further divided into three equal geographical areas with no absolute delineation of boundaries. As a result of this division, 37 communities were assigned to the North Region, 30 to the West Region, and 23 to the South Region.

Thereafter, each region was plotted to determine the locations of municipalities, schools, medical facilities, and major highways and thoroughfares. A standard map was used to plot the communinities and major highways in each region. For medical facilities; i.e., hospitals and doctors' clinics, the sources for data included the Directory of Hospitals and Related Health Services, The Physician and Sportsmedicine, and the St. Louis County Fact Book.

Lastly, the secondary schools in each region were identified by the Directory of the Missouri State High School Association, while colleges were targeted and assigned to regions from information in the National Directory of Community and Small Colleges and the National Collegiate Athletic Association Membership Directory.

Schools and colleges

Previous chapters expanded on the significance of schools and their locations for the purpose of the study. Secondary schools, particularly those with intensely competitive athletic programs,

were the major consideration because of their students' potential as users of sportsmedicine facilities. Also included were those junior/community colleges and small colleges that sponsor both intercollegiate and club programs out of which possible clinic users can emerge.

Within the 90 municipalities in the 3 regions are school districts that service students from several communities; that is, not every community has its own secondary school. Thus, the North Region with its 37 municipalities has only 13 secondary schools. By contrast, the West Region has 30 municipalities and 27 schools, but a large number of these are private secondary schools. Within the South Region's 23 municipalities are 17 schools, more than half of these private. The city of St. Louis has 19 schools.

The prohibitive cost of private education is another indicator that family income plays a measurable role in the selection of a site for a sports-medicine facility that can be profitable and capable of servicing the needs of its clientele. Therefore, the community in which one or more schools are situated offers a more viable site location than does one void of educational opportunities beyond grade school. Given this background, the education variable was placed on a continuum from 1 to 6 for the purpose of ranking each municipality on the availability of secondary schools and colleges.

Number of Schools	0	1	2	3	4	5	6 and Above
Rank	0	1	2	3	4	5	6

Hospitals and medical clinics

Earlier discussion focused on the importance of articulation of services between doctors, hospitals, and sportsmedicine specialists. Since both the referral base and doctor-in-house clinics depend on local hospitals, to a large extent, as a source for staff and patients, the proximity of a hospital to a sportsmedicine clinic warrants consideration.

Therefore, the last variable for inclusion in the study is the number of hospitals and clinics and the potential impact of their locations on the selection of a site for a sportsmedicine facility. St. Louis city and county are fortunate that several large hospitals, some with schools of medicine, are well situated throughout the area. Parallel to the discussion of schools, however, is the fact that not every community has its own hospital, while some have the luxury of more than one. Unlike the variable of schools, people's need for hospital services is generally infrequent and usually of short duration. Thus, the ease of accessibility to a hospital, while important, has a lower priority than does the location of schools.

A centrally located hospital can accommodate large numbers of patients from many communities, but the municipality with a major hospital in its own "backyard" has the most advantageous situation for meeting the medical needs of its citizens. For consistency in this study, the number of hospitals in a community was placed on a continuum from 1 to 6 in order to rank each one of 91 municipali-

ties on its medical resources.

Number of Hospitals	0	1	2	3	4	5	6 and Above
Rank	0	1	2	3	4	5	6

Data compilation and site selection

In order to select one site from among 91 municipalities, the city of St. Louis and the commmunities in the North, West, and South regions were rated on five variables including Age, Average Income, Real Estate Property Valuation, Number of Schools, and Number of Hospitals. Factors were totaled for each municipality, and a maximum score of 30 indicated that all criteria were met at the highest possible rating. The four municipalities with the top scores were selected for further consideration for the single most desirable site to locate a sportsmedicine facility.

Availability of highways, major thoroughfares, and public transportation comprised the constants around which each of the four municipalities was studied for the advantages and disadvantages of location. An important factor in the success of a sportsmedicine clinic is its accessibility by personal and public transportation. Therefore, the overall network of highways and major roads and the routes serviced by the bus system required careful attention before a final site could be selected.

Included in the final scrutiny was the proximity of hospitals and schools to determine the most advantageous site, given all available factors. To facilitate the decision-making, highway maps, street maps, and route systems for the Bi-State Transit

Authority were studied, and map overlays of schools and hospitals were introduced for comparison. From all available data, a site for a sportsmedicine facility was selected that would meet the needs of potential users and that would be a profitable financial investment for its developers and staff.

CHAPTER V

ANALYSIS OF DATA

Discussion of factor scores

The purpose of the study was to select an advantageous site for a sportsmedicine facility from among 90 municipalities in the county and the city of St. Louis. Having established the most favorable location, the study also sought to determine the type of clinic; i.e., referral base or doctor-in-house, that would provide the best services for the needs of potential users.

To facilitate the decision-making process, a map of the 91 municipalities was divided geographically to yield four regions. The city of St. Louis became one region, while three others were established in the county. Of the 90 county municipalities, 37 were assigned to the North Region; 30 to the West Region; and 23 to the South Region.

Five variables for each municipality were researched in order to determine the most favorable site from among the 91 possible choices. Rationale for the variables to be studied was explored previously, but the importance of economics was a major factor in dictating the variables for inclusion. These variables selected were the median household income, median age, total real estate valuation, number of schools in the community, and number of hospitals.

Each variable was scrutinized separately, and a distribution was developed for which ranges were determined and factors from one to six were assigned. Except for the median age, factors and ranges were parallel; i.e., lower ranges yielded lower factor scores.

Because of the relevance of the user's age to the need for sportsmedicine services, ranges for the age variable were weighted based on the perceived affordability of services, children of high school and/or college age, and the extent of adults' participation in physical activity.

The decision to use the number of schools and hospitals as variables has also been discussed earlier. Their importance to the selection of a site is based on the likelihood of high school and college age persons to be sport participants and the accessibility to hospitals for the specialized resources they can provide. Obviously, not every community has its own schools and/or hospitals; therefore, many void cells were recorded in the data for these two sets of ranges. Similarly, at the high end of the continuum, very few communities have six or more schools and/or hospitals. See Table 2 for a summary of the ranges that were established and the factors assigned for each of the five variables.

An analysis of the data for median household income yielded a range from a high of $75,001 for Huntleigh and Country Life Acres to lows of $8,174 for the community of Kinloch and $9,372 for Wellston. Other high income communities included Ladue at $57,230

TABLE 2

RANGES ESTABLISHED AND FACTORS ASSIGNED FOR FIVE VARIABLES INCLUDING MEDIAN HOUSEHOLD INCOME, MEDIAN AGE, PROPERTY VALUATION, SCHOOLS, AND HOSPITALS

Factor	Distribution
Median Household Income	
1	Below $20,000
2	20,000 - 24,000
3	25,000 - 29,000
4	30,000 - 34,000
5	35,000 - 39,000
6	Above 40,000
Median Age	
1	21.3 - 25.3
2	41.8 - 45.9
3	25.4 - 29.4
4	29.5 - 33.5
5	37.7 - 41.7
6	33.6 - 37.6
Real Estate Valuation (Expressed in Millions of Dollars)	
1	1M and Below
2	2M - 5M
3	6M - 14M
4	15M - 59M
5	60M - 150M
6	151M and Above
Number of Schools	
1	1
2	2
3	3
4	4
5	5
6	6
Number of Hospitals	
1	1
2	2
3	3
4	4
5	5
6	6

Clarkson Valley with $55,802. Town and Country was in fourth place in the sample with a median household income of $52,203.

The median age variable yielded far different results. The oldest median age was found in Westwood at 45.9. Bellefontaine, Grantwood Village, St. George, and Wilbur Park joined Westwood at the high end of the continuum. Youngest of the communities was Peerless Park at 21.3 followed by Wellston at 23.6 and Champ and Pine Lawn at 24.0.

The wealthiest communities based on regular total real estate valuations were found in the city of St. Louis with a valuation of $1,661,431,000 and Maryland Heights with $295,082,870. Next in order were Clayton at $269,608,410, Florissant at $244,864,500, and Creve Coeur at $240,545,570. At the lowest end of the entire distribution was Bridgeton Terrace with an assessed valuation of $376,450. Second and third lowest totals went to Pacific and Glen Echo Park, respectively, each with a real estate valuation at less than $800,000.

The variables of schools and hospitals were more easily studied because two-thirds of the sample lacked one or both of these facilities. Of the 91 municipalities, 28 had secondary schools and/or colleges within their boundaries, and only 11 had hospitals located within their geographic limits.

The city of St. Louis led all communities in the number of schools, 22, and the number of hospitals, 13. Town and Country followed with 6 schools and 2 hospitals. Creve Coeur with its 3 hospitals had only 1 school. Tied for fourth on the list were

Florissant and Kirkwood, each with 3 schools and 1 hospital.

After factors had been assigned for each set of ranges for each variable, totals were determined for the sample. From a maximum score of 30 possible points, the top 5 communities were identified. A first place tie was recorded for St. Louis and Town and Country, each with 24 points. In second place was Creve Coeur with 21 points, followed by Clayton and Kirkwood who tied with 19 points each to finish in third position. A summary of factor totals for the city and county sample is presented in Table 3.

The West Region was represented by Town and Country, Creve Coeur, and Clayton. Kirkwood with its 19 points came from the South Region as did Webster Groves with 18 points. The North Region's leading representative was Florissant whose 18 points put it in a fourth place tie with Webster Groves.

The results were consistent with population patterns in St. Louis County. North and west regions are the fastest growing areas in terms of land and property development. Since two of the variables focused on the financial prosperity of families, it is not surprising that municipalities with high scores were located in the West Region. The large number of private and public schools in that region also helped to bolster individual scores.

The city of St. Louis offered some challenging data to the study. Largest of the municipalities in terms of population, the city tied with Town and Country for high score. With 19 high schools, 3 colleges, and 13 hospitals, it received highest scores on these variables. It also scored a resounding "6" on real

TABLE 3

SUMMARY OF 91 MUNICIPALITIES WITH THEIR FACTOR SCORES ON FIVE VARIABLES WITH TOTALS

Municipalities	Income	Age	Property	Schools	Hospitals	Total
			North Region			
Bellefontaine Neighbors	3	2	1	1	0	7
Bellerive	5	4	4	1	0	14
Bel Nor	3	6	3	0	0	12
Bel Ridge	2	3	3	0	0	8
Berkeley	2	3	5	1	0	11
Beverly Hills	2	6	2	0	0	10
Black Jack	4	3	4	0	0	11
Bridgeton	3	5	6	0	1	15
Bridgeton Terrace	2	5	1	0	0	8
Calverton Park	3	3	2	0	0	8
Champ	NA	1	1	0	0	2
Cool Valley	2	3	3	0	0	8
Country Club Hills	2	6	2	0	0	10
Dellwood	3	5	4	0	0	12
Edmundson	2	3	4	0	0	9
Ferguson	2	5	5	1	0	13
Flordell Hills	1	6	2	0	0	9
Florissant	3	5	6	3	1	18
Glen Echo Park	3	3	1	0	0	7
Greendale	3	6	2	0	0	11
Hazelwood	3	5	5	0	0	13
Hillsdale	1	1	2	0	0	4
Jennings	2	6	4	2	0	14
Kinloch	1	1	2	0	0	4
Moline Acres	2	5	3	0	0	10
Normandy	2	5	4	1	1	13
Northwood Court	2	5	2	0	0	9
Northwoods	3	5	4	0	0	12
Pasadena Hills	3	6	3	0	0	12
Pasedena Park	3	6	2	0	0	11
Pine Lawn	1	1	3	0	0	5
Riverview	2	5	3	0	0	10
St. Ann	2	5	5	0	0	12
Uplands Park	2	5	1	0	0	8
Velda Village	2	3	2	0	0	7
Velda Village Hills	2	5	2	0	0	9
Woodson Terrace	3	3	4	0	0	10

TABLE 3--Continued

Municipalities	Income	Age	Property	Schools	Hospitals	Total
West Region						
Ballwin	3	5	5	0	0	13
Breckenridge Hills	2	3	4	0	0	9
Brentwood	2	6	5	2	0	15
Charlack	2	3	2	0	0	7
Clarkson Valley	6	5	4	0	0	15
Clayton	3	5	6	3	2	19
Country Life Acres	6	6	1	0	0	13
Creve Coeur	5	6	6	1	3	21
Crystal Lake Park	4	6	3	0	0	13
Des Peres	5	6	5	0	1	17
Ellisville	4	5	5	0	1	15
Frontenac	6	2	5	2	1	16
Hanley Hills	2	5	3	0	0	10
Huntleigh	6	4	3	0	0	13
Ladue	6	2	6	3	0	17
Manchester	4	3	4	1	0	12
Maryland Heights	NA	NA	6	1	0	7
Olivette	4	4	5	0	0	13
Overland	2	5	5	1	0	13
Pagedale	2	3	4	0	0	9
Richmond Heights	2	6	5	1	0	14
St. John	2	5	4	1	0	12
Sycamore Hills	2	4	2	0	0	8
Town and Country	6	4	6	6	2	24
University City	2	5	6	2	0	15
Vinita Park	2	3	4	0	0	9
Vinita Terrace	3	5	1	0	0	9
Wellston	1	1	3	0	0	5
Westwood	5	2	3	0	0	10
Winchester	3	3	3	0	0	9
City of St. Louis						
St. Louis	1	5	6	6	6	24

TABLE 3--Continued

Municipalities	Income	Age	Property	Schools	Hospitals	Total
			South Region			
Bella Villa . . .	2	2	2	0	0	6
Crestwood	4	6	5	1	0	16
Eureka	3	3	4	0	0	10
Fenton	4	5	5	0	0	14
Glendale	4	6	4	0	0	14
Grantwood Village	5	2	3	0	0	10
Kirkwood	3	6	6	3	1	19
Lakeshire	2	5	3	0	0	10
Mackenzie	2	2	1	0	0	5
Maplewood	1	5	4	0	1	9
Marlborough . . .	2	5	3	0	0	10
Oakland	4	2	3	0	0	9
Pacific	NA	3	1	0	0	4
Peerless Park . .	2	1	1	0	0	4
Rock Hill	3	5	4	0	0	12
St. George . . .	2	2	3	0	0	7
Shrewsbury . . .	2	5	4	1	0	12
Sunset Hills . .	3	4	5	2	0	14
Twin Oaks	4	6	2	0	0	12
Valley Park . . .	2	5	4	1	0	12
Warson Woods . .	5	2	4	0	0	11
Webster Groves	3	6	6	3	0	18
Wilbur Park . . .	3	2	2	0	0	7

estate valuation at $1,661,431,000, a result that is not surprising since the city is the corporate center of greater St. Louis.

Another unexpected result was the factor score of "5" on the median age of 31.5 for St. Louis. Apparently the city is atypical compared with other large urban cities where a higher median age is more common. Not surprising, however, was the median income of $11,511 that netted the lowest factor score for that variable. Even though sizable salaries are garnered in the corporate sector of St. Louis, paychecks are carried to homes in the county and across the river in Illinois.

Because of the great diversity in the populations of the 91 municipalities, population figures were not used as a variable for determining site selection. Generally, the total population throughout St. Louis and the county is dense; only extreme West County and parts of South County depart from this population profile.

Populations range from a high of 450,000 in St. Louis to a low of 28 for the tiny municipality of Champ. It joins 20 other communities, more than one-fifth of the sample, with fewer than 1,000 residents. Conversely, 5 county municipalities have populations over 20,000, only 2 of which, Florissant and University City, have more than 40,000 residents. Further, a total of 50, more than one-half of the total sample, have 1,000-10,000 residents and 34 of these have populations of 5,000 or less. The population of St. Louis County numbers more than 900,000 people, a

figure that is twice that of the city of St. Louis.

Thus, five municipalities were identified as possible sites for a sportsmedicine facility. Town and Country and St. Louis occupied the top position for consideration followed by Creve Coeur, Clayton, and Kirkwood. The final stage in site selection for this study involved a map study of accessibility to the location by public and private transportation and ease of access over major highways and thoroughfares.

Discussion of highways and transportation

The configuration of St. Louis city and county presents an irregular highway pattern. Waterways form natural barriers east of the city and north and west in the county. Five major highways connect Illinois with Missouri through the downtown area. One major connector north to south and two roads east to west help to alleviate major congestion during peak hours, but car and bus travel are generally inhibited at these times. Therefore, both highway accessibility and parking facilities are important considerations in the final selection process.

The city of St. Louis has the most favorable road system with five interstates and 7 major highways. It also has the best service for mass transit because of the vast network of Bi-State Transit bus routes. A serious problem for St. Louis, however, is the volume of traffic coupled with limited and expensive parking facilites. For the sportsmedicine clinic user, public transportation may not be a viable alternative if the person's impairment requires the use of crutches, cane, or wheelchair.

The remaining four semi-finalists were county municipalities that have problems similar to St. Louis but to a lesser extent. Town and Country has two interstates, two highways, and parking facilities to accommodate business needs. Clayton is also well-situated for highway accessibility, but as with St. Louis, parking problems are numerous. Creve Coeur has one interstate and two highways, but public transportation is minimal. The city of Kirkwood is also serviced by Bi-State Transit, but it is the least accessible from major highways and the most congested on its local road surfaces.

The last phase in the process for site selection was the determination of the specific location in a municipality for the clinic to be established. Constraints of time, money, and resources made it prohibitive in this study to identify the precise location because marketing studies would need to be undertaken before closure could be reached on the decision.

Selection of the municipality

After consideration of all criteria, it was determined that the community of Town and Country had the best potential for the success of a sportsmedicine clinic. Along with St. Louis, it had the highest total score on five variables, recording "6" on median household income, real estate valuation, and schools, "4" on median age, and "2" on hospitals. Based on a map study, it also seemed the most capable of responding to the need for highway accessibility by public and private transporation. Lastly, its central location in the greater St. Louis area suggested that it

would attract users from surrounding communities whose growth projections promise continued prosperity for the immediate area.

Discussion of the type of sportsmedicine clinic

The two-fold purpose of this study was to select a site for a sportsmedicine facility and to determine the most suitable type of clinic based on the location that was identified from the data.

High schools, colleges, doctors' offices, and hospitals are good sources for clients; therefore, the selection of Town and Country with its several schools and medical facilites makes a referral base clinic highly suitable for this location. A strong correlation exists between the number of hospitals and the number of doctors' offices in the vicinity of hospitals.

Where established medical practices are operating, it is difficult for a doctor to start a new practice. Thus, a doctor-in-house type of clinic would have problems attracting clients. However, established physicians might be eager to work with a rehabilitation department in a referral base clinic as an alternative to having a new doctor begin practice. Moreover, these same physicians might see a referral type sportsmedicine clinic as a less expensive means of expanding their own medical practices.

Extensive discussion has been presented on the importance of schools and colleges to the success of a sportsmedicine facility. Town and Country received the highest factor score possible on the number of schools in the community. The physical education programs and athletic departments in these schools have significant potential for referral clients.

Those schools with team physicians and athletic trainers on staff are sources of large numbers of referrals for testing, rehabilitation, bracing, etc. Schools without such medical staff very likely would want to contract with the referral base clinic for such services as coverage at athletic events and consultations. Clinics, workshops, and other special events would also be contracted, especially where the use of qualified medical supervision and expertise would alleviate the pressure of a school's liability for personal injury.

Much has been stated about the importance of the ability of clients to pay for services. As one of the most affluent communities in the sample, Town and Country has residents who not only could afford the clinic services but who would avail themselves of opportunities to receive quality care.

Decision on the type of sportsmedicine facility

Results from the study indicated that the optimal location for a sportsmedicine facility was Town and Country, a community of well-educated families with high incomes in an area of significant growth and development. Such a community has a demonstrated need for high quality, high technology services in a location that offers easy access between home, school, office, and businesses.

The referral base sportsmedicine clinic is appropriate for Town and Country because of the community's schools and hospitals and its commitment to the quality of life. Its residents have the insight to understand the benefits derived from a referral base operation and the financial ability to afford clinic services.

Quality of care, confidence in the clinic staff, availability of services, and ability of the clinic to meet user needs are the factors that make Town and Country the optimal site for a referral base sportsmedicine clinic.

The tasks that remain for a marketing firm are to study existing conditions in the community, speculate on population trends and land development, explore the availability of possible sites within the constraints of zoning ordinances, and make a specific recommendation for the construction of a referral base sportsmedicine clinic in the community of Town and Country.

CHAPTER VI

SUMMARY AND RECOMMENDATIONS

Selection of the site

Focus for this study was the developing field of sportsmedicine and the need for referral base and doctor-in-house clinics for the treatment of sport-related injuries. The study sought to identify criteria for evaluating potential clinic sites and to use these criteria to select a prime location in greater St. Louis. Moreover, data relative to the municipality that was targeted for selection were also studied for the most appropriate type of clinic for that community.

Based on hard data and the variables of highway accessibility and public transportation, the community of Town and Country was selected for the development of a referral base clinic. The sample consisted of the city of St. Louis and 90 municipalities in the county of St. Louis, which were divided into 4 regions to facilitate the handling of data. Five variables were researched, and factors from one to six were assigned for median household income, median age, real estate valuation, number of schools, and number of hospitals.

Ranking equally with Town and Country with a total of 24 points was the city of St. Louis, but the variable of median household income was a knockout factor for the city. Since the

study's criteria placed heavy emphasis on a community's financial base, the median income of $11,511 for St. Louis was a serious constraint compared to Town and Country's income of $52,203.

The fundamental premise for the study was that the financial success of a sportsmedicine clinic was directly related to the user's ability to pay for services. Such ability to pay was measured in household income and real estate values that were, in turn, reflective of persons with good salaries and the resources to purchase property and support their schools. It was also determined that higher than average income would yield families who would seek quality services and who could afford to pay for what they needed and wanted.

The study also placed importance on the median age in a community. Indeed, the data yielded a relationship between the median age of the community's population and the median household income. While not demonstrated statistically, this observation did give credence to the premise that life styles of persons in established communities impact on every aspect of the community's environment. Not only do parents participate in a variety of activities, but their children can also afford to belong to several social/recreational groups. When the participation is sport-related, the need for a quality sportsmedicine facility is established.

Observations growing out of the study

Early in the research phase of the study, the lack of documentation in sportsmedicine was identified. While many journals

and publications contain articles on the sportsmedicine field, most of these concentrate on the need for clinic facilities, quality control, and promoting the field as a legitimate entity in the medical profession. Little has been written about criteria for site selection, although marketing studies have been undertaken for the purpose of identifying suitable locations.

Another important observation that emerged from this study is the need to develop sportsmedicine facilities in communities where the concept of affordability can be replaced by medical services for all economic levels. Given the high cost of medical insurance and liability insurance, clinics cannot afford to provide services for indigent patients. Although some clinics may have installment payment plans for individuals lacking insurance or affordable income, this approach is fast disappearing in the face of rising costs and unpaid medical bills. The challenge to clinic developers is to find creative ways to make their services available to everyone without sacrificing the potential for financial success.

The need to locate sportsmedicine facilities in areas accessible to many users is another observation that became apparent during the course of the study. The current pattern reveals that established physicians are incorporating aspects of sportsmedicine into their existing practices. Frequently, their offices are located in buildings close to the hospitals with which they are associated. While this arrangement may be advantageous for some patients, the vast majority of potential users are denied

access to the services for reasons of money, transportation, or lack of information about the available services. The establishment of specific criteria for developing clinic sites and universal certification standards for professional staff would do much to enhance opportunities for all potential users, rather than limiting services to the affluent.

As the sportsmedicine field becomes more diversified, the need for physicians to have an orthopedic specialty for sportsmedicine is vital. A properly accredited clinic can offer a residency, internship, or fellowship to the young doctor who seeks to develop expertise in the nature of injuries, diagnosis, treatment, and rehabilitation. Staffing a doctor-in-house clinic with such professionals may be one cost-effective way to make the services of a sportsmedicine clinic universally available to persons at all income levels.

Of the several major observations that became apparent during the study, none was more obvious than the need for dissemination of information to potential users of clinic services. Sport participants require an understanding of the roles played by nutrition and physical conditioning when vigorous activity is undertaken. They also need to know the ramifications of injuries that go untreated, self-treated, or misdiagnosed.

Practitioners in the sportsmedicine field must assume responsibility for their areas of specialization by distributing literature about the nature of sport-related injuries and by writing articles for journals and periodicals about new developments in

the field. Having too little knowledge is risky for the patient who purchases an ill-fitting brace from a drug store and applies it to an injured knee, the patient who makes his own decision about the application of ice or heat to a sprained ankle, the patient who self-diagnoses an injury based on symptoms that "sound like" the ones related to a friend's shoulder problem, the patient who "plays through the pain," or the one who uses steroids or other performance-enhancing drugs without medical consultation.

In its developmental stages, the sportsmedicine field is prime for creating new approaches to treatment, developing innovative techniques for rehabilitation, and sharing findings with colleagues in the field. Effective communication between doctors, rehabilitation therapists, sports physiologists and psychologists, and athletic trainers will help to improve medical care and to ensure continuity of treatment from the onset of injury to the patient's return to physical activity.

Recommendations for further study

From all that has been written previously, it is apparent that the field of sportsmedicine offers bright opportunities for the future researcher. Valuable contributions can be made to the existing pool of knowledge by a well-organized study. While the possibilities are limited only by the imagination and resources of the researcher, the few suggestions that follow are based on findings and needs that emerged from this study.

Since marketing studies are essential to site selection, an area for further development is the implementation plan for the

actual marketing of the product, from the larger site selection; i.e., the municipality, to the more specific location; i.e., the city block, street, building to house the clinic. Factors in the marketing plan would need to include familiarity with zoning ordinances, projected growth patterns, development of surrounding commercial properties, and proximity to competitors, to mention a few.

Another area needing attention is the development of a standardized instrument for determining site selection. Through a sophisticated statistical study, valid and reliable criteria could be identified for inclusion in the instrument. Thereafter, studies could be conducted using the instrument to facilitate comparisons between cities and regions of a city. The statistical treatment of the variables is essential to the preparation of the instrument and its application to data analysis. With reference to data, the use of computer technology for collection and analysis should play an important role in this kind of research.

Innovative ways to operate sportsmedicine clinics must be defined in order to meet the needs of large numbers of people at all levels of the economic scale. High school and college athletes from low income families, for example, should have the same access to sportsmedicine services as do those whose parents can readily afford specialized services. Whether the alternatives rest in payment plans, satellite clinics, internships, time-sharing, or "storefront clinics," creative study must be directed toward opportunities for the financially disadvantaged to use

sportsmedicine facilities.

The concept of standardization/certification has broad ramifications for research. On the one hand, clear definitions and standards are needed for referral base and doctor-in-house clinics so that a uniform understanding of their differences can be achieved. Further study could make meaningful contributions to the standardization of criteria for these two types of facilities.

On a somewhat different track is the sensitive issue of certification of sportsmedicine professionals because of its subsequent impact on established medical practices, curricula in schools of medicine, licensing of practitioners, and approval by various professional agencies. While certification standards are vital to the credibility of the emerging field of sportsmedicine, such an approach does not have universal support from its members. Nevertheless, the fact that the subject of certification may generate controversy should not deter efforts to study and refine plans for implementation.

Lastly, research into marketing techniques for educating potential users to the benefits of sportsmedicine services must be initiated in the near future. The success that has been achieved through communicating the "down side" of substance abuse, for example, can be duplicated for the "up side" of sportsmedicine. Pamphlets, flyers, media messages, journal articles written for the lay person, and public awareness meetings are several avenues for promoting the field. Thus, this type of marketing effort offers an interesting challenge for further study.

Regardless of the particular focus, the sportsmedicine field is young, open, exciting, challenging, and rewarding. This study has concentrated on one small aspect of the field; it remains for present and future practitioners to participate in the development of sportsmedicine to its full potential.

APPENDIX A

SUMMARY OF DATA FOR 91 MUNICIPALITIES ON MEDIAN HOUSEHOLD INCOME, MEDIAN AGE, REAL ESTATE VALUATION, SCHOOLS, AND HOSPITALS

Municipality	Median Household Income	Median Age	Real Estate Valuation	Schools	Hospitals
Ballwin	24,438	29.6	92,897,140	0	0
Bella Villa	17,826	45.5	3,355,620	0	0
Bellefontaine Neighbors	21,063	43.7	52,800,700	1	0
Bellerive	37,857	39.8	1,970,150	1	0
Bel-Nor	24,536	37.5	9,283,650	0	0
Bel-Ridge	17,072	27.5	10,275,910	0	0
Berkeley	18,175	25.4	91,573,270	1	0
Beverly Hills	14,948	33.9	2,240,830	0	0
Black Jack	27,052	28.9	28,106,410	0	0
Breckenridge Hills	15,833	27.9	19,110,520	0	0
Brentwood	17,547	34.0	91,360,660	2	0
Bridgeton	22,664	31.9	185,429,090	0	1
Bridgeton Terrace	17,554	30.6	376,450	0	0
Calverton Park	22,389	29.0	5,343,600	0	0
Champ	NA	24.0	962,350	0	0
Charlack	15,666	28.2	5,510,240	0	0
Clarkson Valley	55,802	32.6	38,340,460	0	0
Clayton	24,299	29.8	269,608,410	3	2
Cool Valley	15,789	27.5	7,680,120	0	0
Country Club Hills	15,022	35.8	4,277,610	0	0
Country Life Acres	75,001	36.7	1,940,720	0	0
Crestwood	26,241	37.0	104,077,640	1	0
Creve Coeur	37,532	36.3	240,545,570	1	3
Crystal Lake Park	29,375	33.8	6,476,760	0	0
Dellwood	21,823	33.1	23,570,580	0	0
Des Peres	35,165	33.8	112,216,460	0	1
Edmundson	18,800	28.0	15,464,570	0	0
Ellisville	26,362	32.2	60,350,260	0	0
Eureka	21,094	27.6	31,166,700	0	0

APPENDIX A--Continued

Municipality	Median Household Income	Median Age	Real Estate Valuation	Schools	Hospitals
Fenton	26,108	32.1	96,642,850	0	0
Ferguson	18,892	31.3	98,437,120	1	0
Flordell Hills	13,990	34.4	2,938,160	0	0
Florissant	23,332	29.7	244,864,500	3	1
Frontenac	54,460	42.4	74,686,520	2	1
Glendale	20,761	35.4	3,548,570	0	0
Glen Echo Park	23,750	26.7	705,360	0	0
Grantwood Village	40,720	45.6	10,124,060	0	0
Greendale	20,761	35.4	3,548,570	0	0
Hanley Hills	18,282	30.5	6,792,660	0	0
Hazelwood	21,402	29.6	142,692,100	0	0
Hillsdale	12,007	24.1	5,375,450	0	0
Huntleigh	75,001	40.4	10,839,850	0	0
Jennings	16,005	33.6	59,572,130	2	0
Kinloch	8,174	24.1	5,020,510	0	0
Kirkwood	23,149	35.4	221,285,250	3	1
Ladue	57,230	41.8	195,657,110	3	0
Lakeshire	18,761	31.5	9,383,020	0	0
Mackenzie	18,125	42.2	790,030	0	0
Manchester	26,534	28.5	49,776,140	1	0
Maplewood	12,691	29.6	51,852,120	0	1
Marlborough	14,695	30.0	13,456,080	0	0
Moline Acres	19,949	32.1	10,276,100	0	0
Normandy	17,152	30.4	20,615,080	1	1
Northwoods	22,349	31.4	15,781,670	0	0
Northwood Court	17,822	33.4	3,643,130	0	0
Oakland	26,010	44.7	8,764,930	0	0
Olivette	27,707	37.9	79,509,130	0	0
Overland	18,360	32.3	105,640,540	1	0
Pacific	NA	26.7	539,790	0	0
Pagedale	15,293	26.5	16,579,650	0	0
Pasadena Hills	25,221	35.4	6,835,800	0	0
Pasadena Park	21,500	35.1	2,509,540	0	0
Peerless Park	19,375	21.3	1,380,730	0	0
Pine Lawn	13,119	24.0	11,394,670	0	0

APPENDIX A--Continued

Municipality	Median Household Income	Median Age	Real Estate Valuation	Schools	Hospitals
Richmond Heights	17,122	34.2	109,080,160	1	0
Riverview	14,934	32.9	11,070,190	0	0
Rock Hill	20,071	32.2	30,914,650	0	0
St. Ann	17,829	29.6	88,561,340	0	0
St. George	18,829	45.8	6,980,870	0	0
St. John	17,997	32.3	29,823,390	1	0
St. Louis	11,511	31.5	1,661,431,000	22	13
Shrewsbury	18,628	33.0	51,203,920	1	0
Sunset Hills	22,744	41.1	75,885,700	2	0
Sycamore Hills	16,971	38.6	2,950,160	0	0
Town and Country	52,203	39.2	183,253,380	6	2
Twin Oaks	29,270	33.6	5,347,270	0	0
University City	18,034	32.3	202,209,170	2	0
Uplands Park	17,750	31.8	1,342,210	0	0
Valley Park	14,528	29.7	18,007,540	1	0
Velda Village	15,212	27.8	4,014,110	0	0
Velda Vill. Hills	18,309	29.7	3,124,310	0	0
Vinita Park	16,232	29.3	20,022,140	0	0
Vinita Terrace	21,667	31.3	1,265,990	0	0
Warson Woods	32,216	42.7	24,234,890	0	0
Webster Groves	23,175	34.8	173,021,830	3	0
Wellston	9,372	23.6	8,277,640	0	0
Westwood	48,174	45.9	6,966,310	0	0
Wilbur Park	20,909	45.5	2,464,300	0	0
Winchester	22,956	28.6	8,677,610	0	0
Woodson Terrace	20,008	28.7	26,810,890	0	0

APPENDIX B

SUMMARY OF SCHOOLS, COLLEGES, AND HOSPITALS BY REGION AND CITY OF ST. LOUIS

High Schools	Colleges	Hospitals
North Region		
Aquinas Mercy	St. Louis Community College at Florissant Valley	Christian Northeast
Berkeley	University of Missouri - St. Louis	Christian Northwest
Hazelwood Central		DePaul
Hazelwood East		Normandy North
Hazelwood West		
Incarnate Word		
Jennings		
McCluer		
McCluer North		
North County Tech.		
Riverview Gardens		
Rosary		
West Region		
Brentwood	Maryville College	Faith Fam. Forum
Chaminade	Missouri Baptist	Jewish West
Christian Brothers	Washington University	Mo. Baptist
Clayton	Fontbonne College	Normandy South
Country Day		St. John's Mercy
DeSmet Jesuit		St. Louis Memorial
Eskridge		St. Luke
John Burroughs		St. Mary's Health Center
J.F. Kennedy		St. Mary's West
Lafayette		Shriners
Maplewood-Richmond Heights		
Mary Institute		
Neuwoehner		
Parkway Central		
Parkway North		
Parkway South		
Parkway West		
Pattonville		

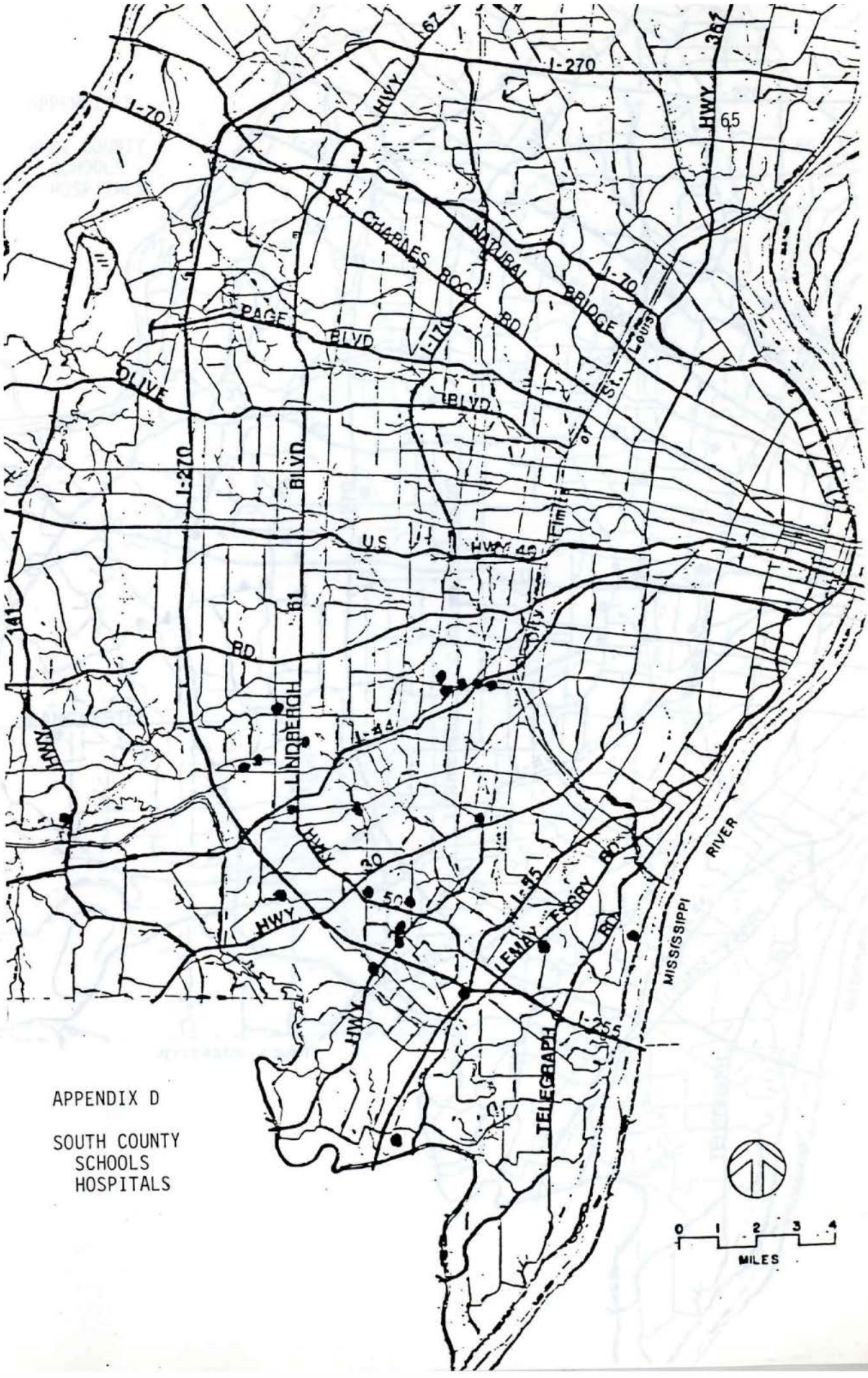
APPENDIX B--Continued

High Schools	Colleges	Hospitals
	City of St. Louis	
Academy of Science and Math	Harris-Stowe College	Alexian Brothers
Beaumont	St. Louis Community College at Forest Park	Barnes
Bishop DuBorg	St. Louis University	Bethesda
Central Visual Performing Arts		Cardinal Glennon
Cleveland		Central Me. Center
Hancock		Children's
McKinley		Deaconness
Northwest		Firmin De-Loges - St. Louis Med. Cen.
O'Fallon Tech		Incarnate Word
Roosevelt		Jewish
Rosati-Kahn		Lutheran
St. Elizabeth		Malcolm Bliss
St. John		St. Louis Regional
St. Louis Univerity High		
St. Mary		
Soldan		
Southwest		
Sumner		
Vashon		
	South Region	
Bayless	St. Louis Community College at Meramec	St. Anthony
Cor Jesu	Webster University	St. Joseph of Kirkwood
Kirkwood		
Lindbergh		
Lutheran South		
Mehlville		
Nerinx Hall		
Notre Dame		
Oakville		
St. Louis Prep. South		
St. Joseph's		
South County Tech.		
Ursuline		
Valley Park		
Vianney		
Webster Groves		

MAJOR HIGHWAYS

APPENDIX C

NORTH COUNTY
SCHOOLS
HOSPITALS



APPENDIX D

SOUTH COUNTY
SCHOOLS
HOSPITALS

APPENDIX E

WEST COUNTY
SCHOOLS
HOSPITALS

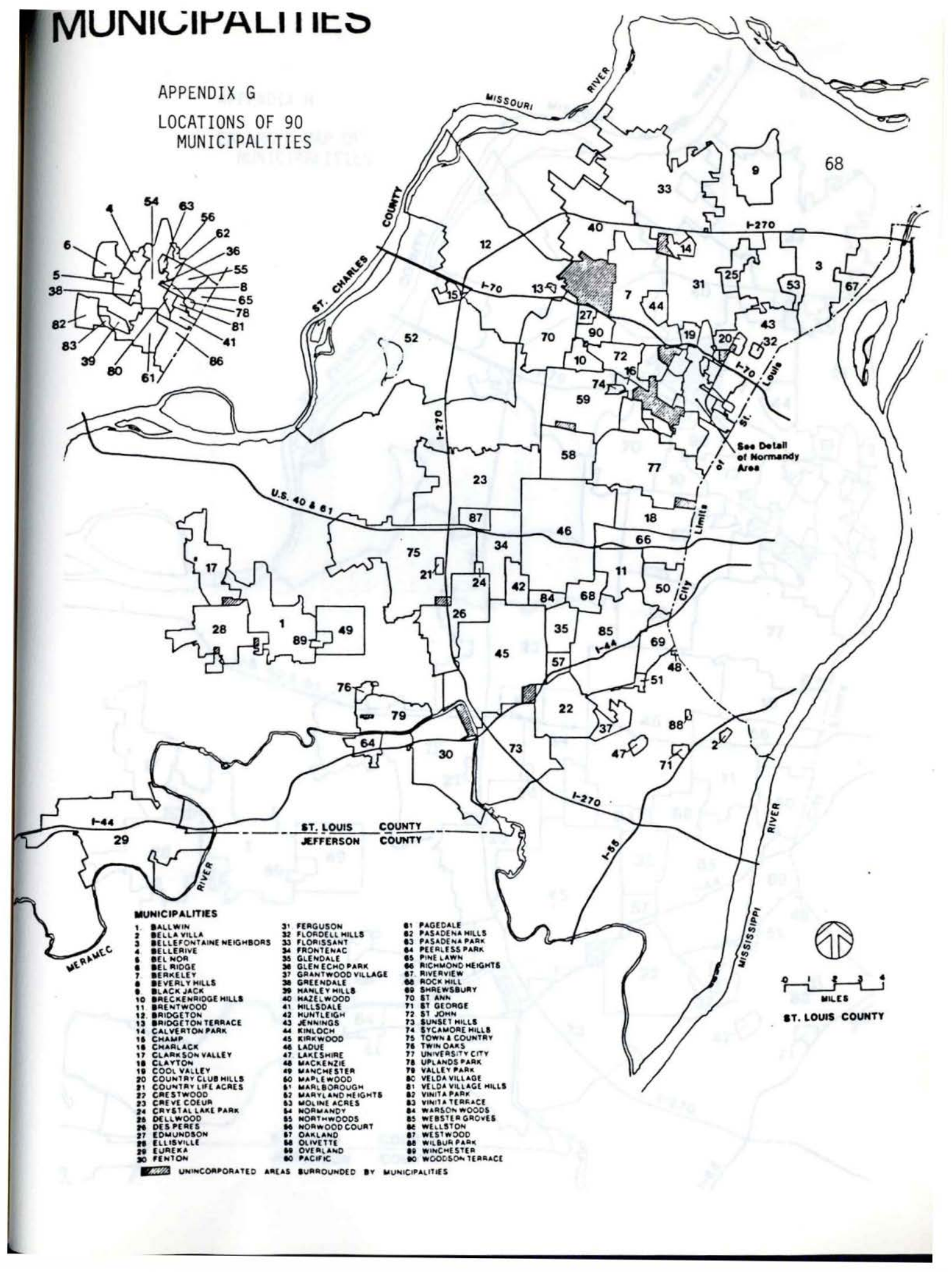
APPENDIX F

CITY OF ST. LOUIS
SCHOOLS
HOSPITALS

MUNICIPALITIES

APPENDIX G

LOCATIONS OF 90 MUNICIPALITIES



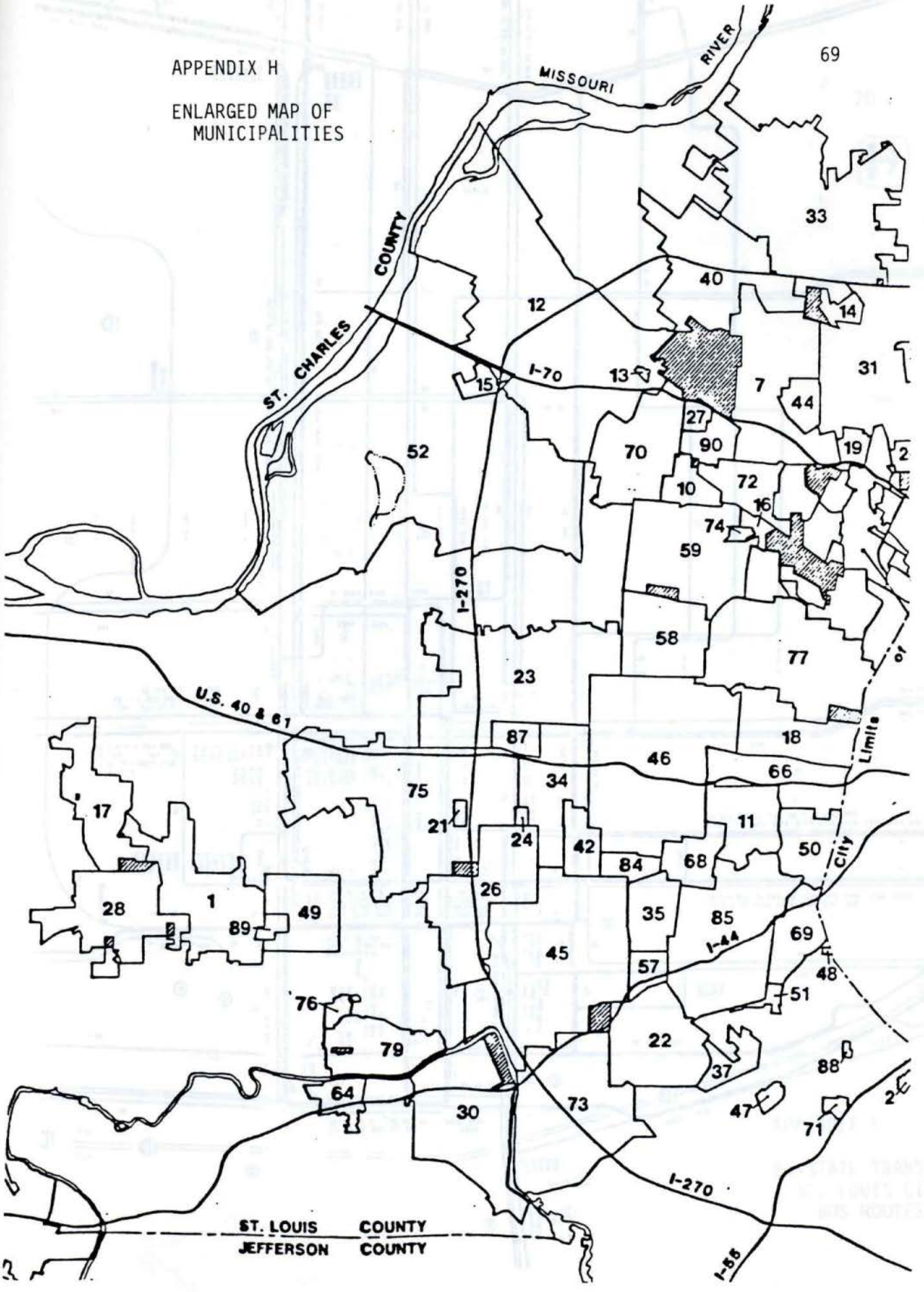
MUNICIPALITIES

1. BALLWIN
2. BELLA VILLA
3. BELLEFONTAINE NEIGHBORS
4. BELLERIVE
5. BEL NOR
6. BEL RIDGE
7. BERKELEY
8. BEVERLY HILLS
9. BLACK JACK
10. BRECKENRIDGE HILLS
11. BRENTWOOD
12. BRIDGETON
13. BRIDGETON TERRACE
14. CALVERTON PARK
15. CHAMP
16. CHARLACK
17. CLARKSON VALLEY
18. CLAYTON
19. COOL VALLEY
20. COUNTRY CLUB HILLS
21. COUNTRY LIFE ACRES
22. CRESTWOOD
23. CREVE COEUR
24. CRYSTAL LAKE PARK
25. DELLWOOD
26. DES PERES
27. EDMUNDSON
28. ELLISVILLE
29. EUREKA
30. FENTON
31. FERGUSON
32. FLORDELL HILLS
33. FLORISSANT
34. FRONTENAC
35. GLENDALE
36. GLEN ECHO PARK
37. GRANTWOOD VILLAGE
38. GREENDALE
39. HANLEY HILLS
40. HAZELWOOD
41. HILLSDALE
42. HUNTLEIGH
43. JENNINGS
44. KINLOCH
45. KIRKWOOD
46. LADUE
47. LAKESHIRE
48. MACKENZIE
49. MANCHESTER
50. MAPLEWOOD
51. MARLBOROUGH
52. MARYLAND HEIGHTS
53. MOLINE ACRES
54. NORMANDY
55. NORTHWOODS
56. NORWOOD COURT
57. OAKLAND
58. OLIVETTE
59. OVERLAND
60. PACIFIC
61. PAGEDALE
62. PASADENA HILLS
63. PASADENA PARK
64. PEERLESS PARK
65. PINE LAWN
66. RICHMOND HEIGHTS
67. RIVERVIEW
68. ROCK HILL
69. SHREWSBURY
70. ST. ANN
71. ST. GEORGE
72. ST. JOHN
73. SUNSET HILLS
74. SYCAMORE HILLS
75. TOWN & COUNTRY
76. TWIN OAKS
77. UNIVERSITY CITY
78. UPLANDS PARK
79. VALLEY PARK
80. VELDA VILLAGE
81. VELDA VILLAGE HILLS
82. VINITA PARK
83. VINITA TERRACE
84. WARSON WOODS
85. WEBSTER GROVES
86. WELLSTON
87. WESTWOOD
88. WILBUR PARK
89. WINCHESTER
90. WOODSON TERRACE

UNINCORPORATED AREAS SURROUNDED BY MUNICIPALITIES

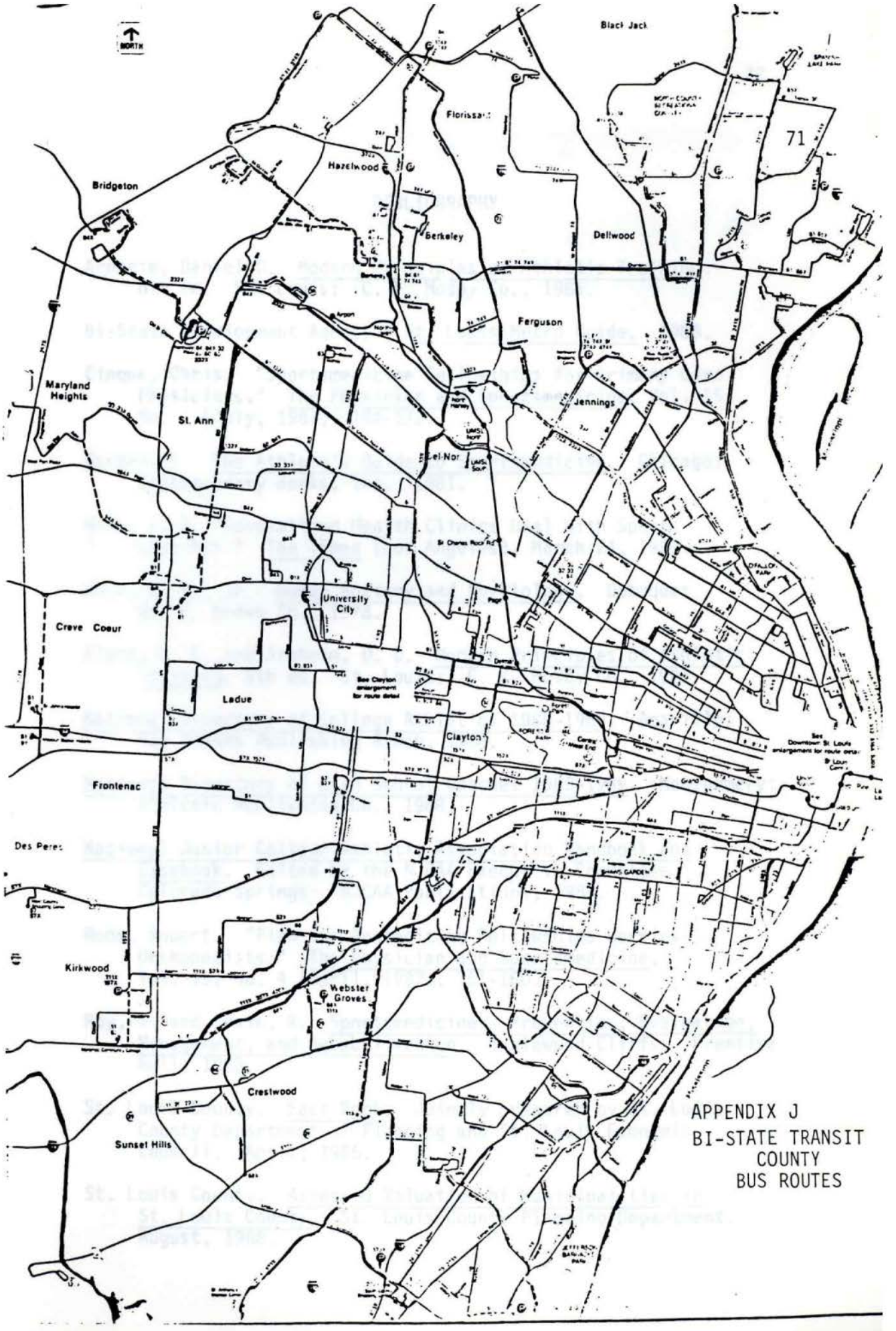
APPENDIX H

ENLARGED MAP OF
MUNICIPALITIES



APPENDIX I

BI-STATE TRANSIT
ST. LOUIS CITY
BUS ROUTES



APPENDIX J
BI-STATE TRANSIT
COUNTY
BUS ROUTES

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