An Analysis of Transportation Needs for Dialysis Patients in Fairfax County, Virginia

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Disclaimer:
This report has been prepared by students in the Transportation Policy, Operations, and Logistics program in the School of Public Policy at George Mason University for the Fairfax County, Virginia, Department of Community and Recreation Services, FASTRAN transportation service.

The views in this report are those of the authors and not necessarily those of George Mason University, FASTRAN, or the Fairfax County Government. This report is intended to inform interested parties of research and encourage discussion.
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Executive Summary

The nationwide dialysis patient population is growing at a rate of 10 percent annually. To accommodate the increase, existing dialysis treatment centers are being expanded, and new facilities are being planned and constructed. In many cases, dialysis patients are reliant on public transit for transportation to and from treatment. The increasing demand for dialysis transportation has created, and will continue to create, operational challenges for public transit providers. In addition, the rising cost of supplying the requisite transportation services to dialysis patients imposes an increasing financial burden on providers.

Fairfax County, Virginia’s dialysis patient population will continue to track the national trend-line. As a result, FASTRAN (the transportation service for the Fairfax County, Virginia Department of Community and Recreation Services), and other local transportation providers will have to expand their services to accommodate the growing pool of dialysis clients. To date, there are no plans to increase FASTRAN’s operating budget at a level commensurate with the rising costs implied by such service increases. Therefore, FASTRAN must find ways to either increase its operational efficiency, reduce its operating costs, or increase its budget if it is to accommodate future demand for dialysis transportation.

When a patient is diagnosed with End-Stage Renal Disease (ESRD) and must begin thrice-weekly dialysis treatment, the patient is assigned to (or in some cases chooses) a treatment facility. Transportation is usually an important but subordinate factor in this choice. A social worker from the patient’s hospital is normally responsible for setting-up a treatment schedule for newly diagnosed patients. While the goal is always to accommodate the patient as well as is possible, there are a few factors that weigh heavily in the center selection and shift scheduling procedures. In many cases, the patient’s insurance provider limits the facilities approved to treat the patients. Another factor is that many nephrologists have professional ties to one or more centers and tend to refer their patients to those facilities. After the above listed considerations, social workers try to locate open chairs at facilities that offer shifts that match the patient’s treatment time preferences. Finally, social workers make a concerted effort to assign patients to the center most convenient to their chosen pick-up and drop-off points. However, while social workers are familiar with the local transportation providers, they are not usually aware of the specific routes and schedules of those providers.

When a new patient is referred to FASTRAN, the referring social worker acts as liaison between the patient and FASTRAN. The patient requests transportation service at specific times on specific days for trips to and from his or her chosen facility. FASTRAN cross-references the request with its existing route schedule to determine the best match for the requested service and assigns the client to the appropriate route(s). FASTRAN does not operate a designated service for dialysis patient trips so the bus (route) to which the patient is assigned may well be transporting non-dialysis patients to locations other than dialysis treatment centers. Generally, FASTRAN does an admirable job of adhering to the schedule it sets and relays to its clientele.

While FASTRAN is currently able to provide adequate service to both its dialysis and non-dialysis clients, it is consulted neither by dialysis social workers in their facility and shift assignment procedures, nor by dialysis facility owners in their center location decisions. FASTRAN is thus left with the unenviable task of tying together all the loose ends, and the result
is a transportation system that is less efficient and more costly than it might be if better coordination could be implemented.

To better utilize its existing equipment and personnel, FASTRAN has recently invested in technology designed to aid in scheduling and routing. The software FASTRAN purchased, Trapeze, is in the implementation phase at FASTRAN and is proving to be beneficial. However, many of FASTRAN’s operating and bookkeeping procedures remain less than optimal and may be resulting in operational inefficiency.

At the conclusion of this document are recommendations to all stakeholders involved in providing dialysis treatment and supporting services to dialysis patients. The recommendations are intended to increase the overall level of transportation service for all dialysis patients receiving treatment at FASTRAN-served facilities, while allowing FASTRAN to continue to provide this critical service notwithstanding its limited resources. Recommendations include:

- Improved, more coordinated patient scheduling;
- Coordinating treatment shift times between dialysis centers and transportation providers;
- Encouraging dialysis providers to consider transportation when locating new facilities;
- Selling advertising space on FASTRAN buses;
- Land-use planning;
- Trip-zoning;
- “Incentivizing” dialysis centers through partnering;
- Improving technology and communications, including electronic collection of arrival and departure times; and enhanced performance tracking;
- Encouraging carpooling in lieu of the use of FASTRAN;
- Increased patient education and patient responsibility;
- “Last resort” options, including limiting trips for each patient, and prioritizing services through need-based criteria.
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1 Introduction

Transportation is a key component of the health care equation and health services cannot succeed unless supporting services, including transportation, are effectual. The U.S. Department of Health and Human Services’ Community Transportation Assistance Project conducted a study of the benefits of transportation services to health programs where the cost benefits of providing Medicare patients with affordable community transportation to medical appointments was shown to provide a potential annual cost savings in excess of $265 million.¹ Dialysis is a small percentage of this figure; however, the study validates the need for paratransit programs such as that provided by FASTRAN.

FASTRAN is a transportation program funded by Fairfax County for the benefit of County residents, and recent County budget hearings confirmed community interest and concerns regarding funding for human services, including long-term care needs in that community. Dialysis treatment, including the transportation required to the dialysis centers, is an important element in the scope of human services. Several commenters at the recent budget hearings highlighted the importance of providing the services needed by members of the community and the statements below show clear evidence of this critical function. Comments included the following:

“Over the years, as Fairfax’s population has grown, human service funding has not kept up with the demand or inflation. Now, for possibly the fourth straight year, our critically necessary human service network is in danger of being further degraded even as more people need help. Our appeal to you is: no more human services cuts! The well-being of our community will depend upon gaining more public and private resources to prevent or reduce the problems faced by its most vulnerable residents.”²

“The long-term care needs in our community are equivalent to what child care was 20 years ago. Today, we have as many child-care options as you can imagine, and we have been very successful in developing these programs. It is just as critical that we do the same for our elderly and adults with disabilities, and develop an innovative and responsive long-term care system that meets the individual needs of seniors, adults with disabilities and their families. But we don’t have 20 years to wait. The crisis is here and it is growing. The Long Term Care Coordinating Council asks that you carefully consider any changes or reductions in the budget that will further burden families struggling to keep their elderly and disabled family members in their home and community.”³

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³ Ibid.
In the fall of 2003, Mr. Steve Yaffe, Planning Manager of FASTRAN, approached Dr. Jonathan Gifford, Director of the Transportation Policy, Operations, and Logistics (TPOL) Program at George Mason University, with a request for a study into the dialysis transport services provided by FASTRAN. FASTRAN provides transportation services to the county to human service agency clients. FASTRAN’s Critical Medical Care Program is a segment of these services that provides transportation to and from dialysis centers primarily located within Fairfax County.

At this time, FASTRAN provides transportation services to and/or from dialysis centers for 86 riders. Dialysis patients also use Medicaid transportation providers through the Commonwealth of Virginia’s contract with LogistiCare, Inc. and MetroAccess paratransit service provided under provisions of the Americans with Disabilities Act through the Washington Metropolitan Area Transit Authority’s contract with LogistiCare, in addition to cabs and rides provided by family and friends. Some dialysis patients are still able to drive to and from treatments. Mr. Yaffe stated that demand for transportation to dialysis treatment has been increasing approximately ten percent annually, both locally and nationally, and funding for transportation to these essential services has not kept pace with demand. This study investigates measures that will enable FASTRAN to continue to provide these services without denying necessary services to this or other segments of its ridership.

Fairfax County has many distinguishing qualities and characteristics that combine to create a location with unique characteristics. The county is adjacent to Washington, D.C. and is highly urbanized with a population of over one million. The proximity to Washington, D.C. also creates a unique environment, including a high proportion of the population working in jobs supporting U.S. government agencies. The median age of Fairfax County residents is 35.9 years and the population aged 65 and older is approximately 9 percent of the total population. The area of Fairfax County is approximately 395 square miles with 2454.8 persons per square mile as of 2000, and the high density development within that area creates congestion problems, an additional situation seriously impacting transportation services provided by the County and other service providers. Fairfax County has the dubious distinction of being one of the most congested areas in the country and this also has an impact on all transportation providers in the performance of their services. Schedules are far more difficult to meet in this type of environment and the costs associated with congestion are an additional burden.

Figure 1.1 shows a map of Fairfax County and its surrounding area indicating the location of the dialysis centers currently served by FASTRAN. FASTRAN currently provides transportation to twelve dialysis centers in the area (including some outside the physical borders of the county). Those twelve centers are further detailed in the study and shown on the map below (there are additional dialysis centers in Fairfax County that are not currently served by FASTRAN however this is expected to change as Dialysis 13 has been added to the list of centers that FASTRAN will transport patients).

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There are a variety of challenges to providing dialysis transportation in regard to the patients as well. Many patients are critically ill and may no longer be ambulatory, requiring a wheelchair and increasing the time required to board and exit the bus. Providing services according to patient appointment schedules is an additional demand. There are also oftentimes competing concerns to be addressed when establishing the choice of dialysis center for a patient to attend. Factors to be considered include:

- The patient’s desire to use a center close to his or her home or place of work
- Restrictions imposed by the patient’s insurance company on eligible centers
- The need to place the patient in a center where his or her attending physician has privileges.
When these limitations are considered, one can see the difficulty facing paratransit providers, such as FASTRAN, in achieving efficiency and cost savings by trying to group dialysis patients traveling to the same center at the same time.

With static funding and an approximate 10 percent annual increase in demand for transportation to dialysis treatment centers, FASTRAN has requested examination of both the supply and demand aspects of their service. This study examines the existing supply systems and demand projections and develops recommendations aimed at improvements to the program. Examination of current policies and procedures of the program, related demand statistics, and information to provide potential recommendations for improving those functions are included. Additional areas being examined include issues such as historical and current use data and future use projections, pricing, potential alternative providers, zoning opportunities, and site location demands. Recommendations will center on improvements to the FASTRAN program to meet the growing demands of the program within the established funding limits.

This report is structured to present the results of the data collection efforts performed and then to discuss other factors considered in addressing this issue, and finally the recommendations derived from the research and analysis performed. This study contains twelve sections covering information on dialysis transportation. Section 2 defines the Study Area and Section 3 explains the Methodology used in this study. Section 4 provides a Literature Review, and Section 5 follows with Information on Kidney Disease and Dialysis. Section 6 presents a Socio-Economic Portrait of Fairfax County. Section 7 reports on Dialysis Treatment in Fairfax County, and Section 8 discusses the Current Level of Demand for Transportation to Kidney Dialysis Centers. FASTRAN’s Current Operations, Policies, and Finances are discussed in Section 9, with Section 10 discussing FASTRAN’s Service Quality Standards, including an Analysis of On-Time Performance. Section 11 describes Industry Best Practices, Policies, and Operations. Finally, Sections 12 and 13 present the Findings and Recommendations.
2 Study Area

The study area for this report is defined by the locations of the dialysis patients who use FASTRAN’s services and the dialysis centers served by FASTRAN. The geographic boundaries of the study area encompass Fairfax County and parts of Arlington County, the City of Alexandria, and Loudon County in northern Virginia. Fairfax County is one of main localities that make up the metropolitan Washington D.C. area. Fairfax County is bordered by Arlington County and the City of Alexandria to the East. With a population of over one million, Fairfax County is the most populous jurisdiction in both metropolitan Washington D.C. and Virginia. The citizens of Fairfax County are well educated and young relative to the general population. Ninety one percent of the population is under the age of 65. Fairfax County is home to many high-tech companies, helping to make it one of the wealthiest counties in the nation. In 2002, the median family income was $95,600. Surface transportation options in Fairfax County include parts of the Interstate highway system, an extensive local road network, and transit services including the Metrorail system. The map below depicts the study area.

Figure 2.1
Fairfax County, Virginia

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3 Methodology

In order to make recommendations to FASTRAN concerning the measures it could take to improve its efficiency and its ability to provide services to its dialysis patient riders, we needed to obtain an understanding of the nature of the illness affecting dialysis patients, processes for arranging transportation services to and from treatment centers for these individuals, the demographics of the service area, and future dialysis-need trends of Fairfax County, the types of operations provided by FASTRAN and other paratransit providers in the County, and the performance capability of FASTRAN itself.

To that end, as discussed below, we collected basic information on kidney disease and dialysis. We looked at the range of dialysis providers in Fairfax County and the services, and schedules offered by those providers. We also looked at the range of transportation options available to dialysis patients in the County, and, through a series of interviews with dialysis center directors, hospital social workers, and nephrologists, looked at the process through which patients are placed with paratransit providers. We collected data on the current level of demand for dialysis transportation services, by surveying dialysis centers, patients, and paratransit providers other than FASTRAN. We also collected and analyzed data on the distribution of dialysis patients, and dialysis centers, throughout the County, and attempted to forecast what the level of demand for dialysis transportation might look like in the future. In addition, we performed an on-time performance analysis of FASTRAN’s recent operations.

Finally, we examined available literature to identify similar studies conducted in the recent past that would provide guidance as to industry best practices and policy recommendations to institutions facing similar challenges.

Equipped with this information, we then were able to make the findings and recommendations, which appear in the latter sections of this study.

Several areas of our methodology merit further description and discussion are:

3.1 Placement of Dialysis Patients with Transportation Providers

In order to structure this study in a manner that would allow us to properly address the issues faced by FASTRAN and other dialysis transportation providers, we had to gain an understanding of the processes involved in securing transportation for dialysis patients. In addition to extensive reference research, we conducted field studies, including interviews with local personnel involved in various aspects of scheduling and providing dialysis treatment. Specifically, face-to-face interviews were held with directors of dialysis centers and hospital social workers, and telephone interviews were conducted with nephrologists. In addition to the interviews, written surveys were distributed to and completed by personnel and patients in the field. The interviews and survey responses provided invaluable information regarding the challenges faced by both dialysis patients and those who provide services to them. Additionally, we examined the corporate structures, finances and missions of the corporate entities that own and operate the dialysis centers in Fairfax County. The surveys used are explained below.
3.1.1 Interviews with Directors of Dialysis Centers

A series of questions was developed and administered to gather specific information from personal interviews with the directors of dialysis centers. The interview questions were designed to provide an understanding of how dialysis centers operate with respect to patient transportation issues. The questions sought the following information (See Appendix A for a complete list of questions):

- Owner and location of the dialysis center
- Number of patients served per shift
- Breakdown of patients by place of residence
- Patient waiting list for placement in dialysis centers
- Operating hours
- Any shift coordination with other dialysis centers
- Shift schedule adherence
- Future expansion plans of facility
- Factors influencing patient placement and scheduling (e.g., transportation service providers and patient preference)
- Economic burden on dialysis center caused by transportation providers that do not pick up patients on time or at all

3.1.2 Interviews with Hospital Social Workers

As hospital social workers are usually responsible for determining where, when, and how a patient will receive dialysis treatment immediately after the patient is released from a hospital. The questions asked of social workers were designed to obtain information that would provide an understanding of the process involved in arranging dialysis services for new patients. Social workers were polled for the following information (See Appendix A for a complete list of questions):

- Factors in selecting transportation provider for dialysis center trips
- Factors in choosing a dialysis center
- Importance of transportation mode to patients
- Level of social workers’ knowledge regarding transportation options
- Role of insurance (and Medicare/Medicaid) in facility and transportation service selection

3.1.3 Interviews with Nephrologists

The nephrologists were interviewed to determine the doctor’s role in arranging dialysis care. The questions asked of the nephrologists included the following (See Appendix A for a complete list of questions):

- Are patients typically referred to one dialysis center or given a choice of centers?
- If given a choice of treatment facility, how many centers are typically identified as options?
- What factors are considered when matching patients to dialysis centers?
- Are transportation options considered in determining the appropriate center for patients’ treatment?
- If transportation is considered, from where is the considered information obtained?
• What factors might prevent the referral of a patient to the most proximate or most accessible site?
• What is the role of the dialysis center social worker in addressing patient transportation needs?

3.2 Current Level of Demand for Transportation to Kidney Dialysis Centers

As part of our effort to gather data on the current state of the local dialysis center network and its clientele, we distributed surveys to 1) dialysis centers, 2) dialysis patients and 3) dialysis transportation providers. Each survey is discussed below.

3.2.1 Dialysis Center Surveys

A survey consisting of twelve questions was developed and distributed via email to the twelve dialysis facilities currently served by FASTRAN. The survey questions were designed to capture information, to evaluate current dialysis transportation services, and to forecast future transportation needs of dialysis patients. The following information was obtained from the completed surveys (see Appendix B for a copy of the survey):

- Current center contact information
- Number of facility chairs (center’s patient capacity)
- Dialysis shift times and number of employees per shift
- Number of ambulatory (including those using wheelchair or scooters) and non-ambulatory patients
- Total number of patients being treated and their average attendance rate
- Size of the centers’ waiting lists for dialysis treatment
- Number of patients by zip code of residence
- Plans for increasing dialysis facility capacity or opening new facilities
- Patients’ medical insurance coverage and impact of insurance providers on scheduling
- Facility policy regarding scheduling transportation for patients
- Financial impact of no-shows on the facilities
- Any comments and/or recommendations for improving dialysis transportation

Eight of the twelve surveyed centers (67 percent) provided responses.

3.2.2 Dialysis Patient Surveys

FASTRAN currently provides transportation for 86 dialysis patients, and serves twelve dialysis centers within Fairfax County. We designed a survey to obtain demographics of the dialysis patient group and to assess existing transportation demand for dialysis patients. The surveyed group was not limited to dialysis patients served by FASTRAN, but rather to all patients using FASTRAN served facilities. This was done to acquire data relevant to the entire local population of dialysis patients. Patient surveys were distributed to each of the FASTRAN served dialysis centers. Because many Fairfax County dialysis patients are Hispanic, the survey was provided in both English and Spanish.

A letter signed by Mr. Steve Yaffe, FASTRAN’s Planning Manager, and by Dr. Jonathan Gifford, the Director of GMU’s TPOL program of study, was provided with the patient survey.
forms. The letter explained the purpose of the study and identified the study participants. A copy of the letter has been included as Appendix C.

The centers’ willingness to assist in dispensing the surveys to patients varied considerably. The most common reason for reluctance to cooperate was that corporate policy for some centers prohibits “outside groups” from gaining access to patients. Centers also expressed concern over maintaining the confidentiality of patients’ medical records, which may have been a result of HIPAA legislation. Of particular concern were questions regarding insurance information. In order to protect patient confidentiality and proprietary information about centers, these data are presented only in aggregate. The patient survey requested the following information (see Appendices C and D for copies):

- Patient gender
- Patient income level
- Patient ethnic background
- Patient age
- Dialysis center where patient currently receives treatment
- Trip origin (work, home, school or other)
- Transportation provider to and from the dialysis centers (FASTRAN, MetroAccess, LogistiCare, taxi or personal vehicle)
- Reason for choice of current dialysis center
- The frequency with which transportation problems affected the patient’s ability to adhere to his or her dialysis treatment schedule

We received thirty-nine patient surveys, ten percent of which were the Spanish versions. While the patient survey response rate might have been higher if more response time had been allotted, our timeline did not allow for a larger window of time.

### 3.3 Survey of Transportation Providers Other than FASTRAN

As noted above, in our effort to determine the overall service level for dialysis transportation providers we endeavored to look beyond FASTRAN’s operations. Specifically, we surveyed both LogistiCare and MetroAccess. LogistiCare is a private company that provides transportation for Medicaid patients in Northern Virginia, and MetroAccess is a division of the Washington Metropolitan Area Transit Authority (WMATA) that contracts its service through LogistiCare. Because of the relationship between the two organizations, only one survey was required. The survey sent to MetroAccess and LogistiCare was designed to obtain data related to the current level of service provided by those entities. The survey requested the following information (see Appendix F for a copy of the survey):

- Total number of trips per day in April 2003;
- Total number of trips per day in October 2003;
- Cost-sharing or other financial arrangements that the organization has with any dialysis facility;

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• Hours of dialysis transportation service (including holidays);
• The level of assistance that the drivers provide to dialysis passengers;
• The proportion of the total number of paratransit rides that are for dialysis purposes;
• Any challenges that the organization has experienced in meeting dialysis transportation demand.

Additionally, we conducted telephone surveys with five volunteer organizations in Fairfax County.

3.4 Geographic Information Systems (GIS) or Mapping

The GIS work in this report was done using ArcMap. This software enables users to create thematic maps with demographic data on a base map as well as to create demographic data through geocoding. The dialysis centers were geocoded to the Census Bureau’s TIGER base map. The Topographically Integrated Geographic Encoded Referencing system provides a street network, Census Tracts, Traffic Analysis Zones, and Zip Code Tabulation Areas as well as many others geographical layers for analytical purposes.

In addition to geocoding the dialysis centers, FASTRAN’s clients from January – February 2004 were also geocoded and the patients reported by the dialysis centers were also categorized by zip code. In addition to TIGER and ArcMap, it was sometimes necessary to use ADC’s Northern Virginia Street Map, Microsoft’s Streets & Trips, and www.usps.gov in order to find precise locations for the centers and clients. For the centers that did not provide the number of patients in the zip code, an average was calculated for the other zip codes with precise numbers. The average was three; so three patients were assigned to each zip code for which we did not have data. Once the clients and patients were geocoded, they were used for analysis of their trips to the dialysis centers for efficiency. The FASTRAN clients were also rolled up to the tract level and zip code level for the purposes of presentation.

General information about the population of Fairfax County and Fairfax City and Falls Church was also mapped thematically.7

3.4.1 Metropolitan Statistical Areas

Metropolitan Statistical Areas are population centers that are tied together both economically and socially. Places of 50,000 people or more are at the nucleus of metropolitan areas and they are often considered to be the central city for a metropolitan area. Metropolitan Areas are made up of counties (except in New England where the townships, or minor civil divisions, are used to define metropolitan areas). Since some areas of a county can be quite urban while others can be rural in character, urbanized areas are constructed based on population and urbanized areas are not held to county boundaries. Urbanized areas, however, also must have at least 50,000 people. The designation of urban or rural (as well as metropolitan area designations) determines what types of funding local area governments are eligible for from the federal government.8

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7 “Summary File 3,” Census 2000. SF3 provides data at the tract level for many demographic variables.
8 “Geographic Terms and Concepts” Census 2000, http://www.census.gov/geo/www/tiger/glossary2.pdf. For more information on funding based on urban or rural designations and related funding, see www.omb.gov.
3.5 On-time Performance Analysis

In order to examine the on-time performance of FASTRAN dialysis transportation services, researchers collected sample data from scheduled FASTRAN dialysis patient pick-ups and drop-offs for standing-order trips in March 2004. Performance data was obtained by locating driver manifests within files at FASTRAN’s offices and then manually recording both scheduled arrival times and actual arrival times for pick-ups and drop-offs as documented in the manifests. Logistical considerations limited data sampling to Monday and Tuesday routes, but Monday routes are generally representative of Wednesday and Friday routes, and Tuesday routes are generally representative of Thursday routes. After data was collected we calculated average performance for pick-ups, drop-offs and a cumulative average. Frequency distribution within selected time ranges (e.g. >15 minutes late, 10-15 minutes late, etc.) for pick-ups and drop-offs were also calculated. Because Mon/Wed/Fri routes outnumbered Tues/Thurs routes operated in March 2004, we weighted data in both monthly average performance calculations and frequency distribution calculations in order to account for the discrepancy. Further information regarding data collection is found preceding our performance findings in Section 12.3.
4 Literature Review

In our endeavor to determine the best course of action for all involved stakeholders, we conducted extensive research to identify relevant sources from which to draw guidance.

4.1 Review of Paratransit Literature

In 2003, Multisystems, Inc., on behalf of the Ocean County, New Jersey Department of Transportation and Vehicle Services conducted a study, “Dialysis Transportation for Seniors,” to identify transportation issues associated with dialysis patients in the county. The primary goal of this study was to develop a set of strategies and best practices that could be implemented by both Ocean Ride (the local transit provider) and other agencies across the nation that are dealing with similar issues. Although the Ocean County study is relevant to our examination of dialysis transportation in Fairfax County, there are important differences between the two regions and the transportation providers that serve the respective communities. These are discussed in Section 12.9

In addition to this study, many other sources were consulted in order to identify the organizational structures, policies and practices of successful paratransit organizations. Some of the most pertinent documents reviewed are studies conducted with goals similar to ours.

Multisystems’ “Innovative Practices in Paratransit Services” report, conducted for the Easter Seals Project Action, delineated detailed suggestions for improvement of services for paratransit agencies on a national scale.10 While useful as a general guide, the report does not contain specific examples of agencies using the identified best practices, and the results those agencies achieved using those best practices.

The State of Vermont’s Department of Aging and Disabilities and Agency of Human Services publication “Statewide Needs Assessment of Dialysis Treatment for End Stage Renal Disease,” is a statewide report of currently offered dialysis services in Vermont along with research in future growth needs. Information contained in the report regarding home and mobile dialysis (which could be an alternative for some current FASTRAN users) was incorporated into our study.

Los Angeles County, California, studied many of the same funding and ridership issues in their “Access Services; FY 2003/2004 Paratransit Plan Access Services.” As Los Angeles County’s demographics are unlike those of Fairfax County, (Los Angeles is a disadvantaged urban service area) much of the information from that study was not applicable to our study area.

The Federal Transit Administration’s (FTA) “Framework for Action: Building the Fully Coordinated Human Service Transportation System,” has been much used by FASTRAN itself in its “United We Ride” plan for coordinated cost allocation for disabled services. This publication includes detailed surveys and plans for action at the community level. We relied on this report in forming our opinions and recommendations.

9 A summary of Multisystems’ study of Ocean Ride is included in Appendix G.
Jessica McCann’s report for the Community Transportation Association of America (CTAA), “Medical Transportation: Toolkit and Best Practices,” is a definitive guide to paratransit in the United States, and as such it covers all aspects of the field. The CTAA was a source for our research. The supplement has examples of documents useful for agencies as well as a useful section on current practices.

4.2 Review of Medical Literature

A search of medical research literature on dialysis and ESRD yielded only two articles in which transportation was discussed. Rocco and Burkart of Wake Forest University conducted a study examining the reasons for patients either missing dialysis treatments or cutting treatments short (both of which could adversely effect the health of the affected patients). The study found that transportation problems were involved in 7.7 percent of “early sign-offs”, an indication of the important role transportation plays in ensuring the health of dialysis patients.\textsuperscript{11}

Carolyn E. Latham of the Vanderbilt Dialysis Clinic examined barriers to adequate dialysis treatment, which has a significant impact on patient survival. Latham considered transportation as a contributing factor. Patient no-shows were reduced in areas that provided transportation assistance when compared to areas of limited or no assistance.\textsuperscript{12}

These studies illustrate the significance of transportation as a determinant of patient survival.

5  Information on Kidney Disease & Dialysis

The Centers for Disease Control and Prevention (CDCP) of the U.S. Department of Health and Human Services annually finds kidney disease to be one of the top ten causes of death by disease in the United States.\(^\text{13}\) Kidney disease causes the kidneys to slowly deteriorate, and, as they begin to deteriorate, they lose the ability to perform their normal functions. Dialysis is a treatment that can take the place of normal kidney function for persons suffering from kidney disease.

5.1 Definition/Characteristics of Kidney Disease, End-Stage Renal Disease, and Dialysis

Most people are born with two kidneys, which are bean-shaped organs located in the abdominal cavity that perform several vital life functions. Specifically, kidneys act to remove excess water and waste products from the body and to control blood pressure. Additionally, kidneys produce the active form of Vitamin D, which allows people to absorb calcium, and they produce erythropoietin, a hormone that acts to regulate the production and release of red blood cells from bone marrow.\(^\text{14}\)

The term “kidney disease” refers to any disorder that causes the kidneys to lose the ability to perform these functions to full capacity. There are numerous diseases and conditions, including diabetes, hypertension, renal cancer, lupus nephritis, glomerulonephritis, and polycystic kidneys. Some of the symptoms of kidney disease include high blood pressure, fatigue, swelling, frequent urination, bloody or dark urine, kidney stones, and protein in the urine.\(^\text{15}\)

Renal failure occurs when the kidneys are damaged to a degree that results in the loss of normal kidney function. The two types of renal failure are acute renal failure and chronic renal failure. Acute renal failure is the sudden loss of kidney function.\(^\text{16}\) Below are some of the common causes of acute renal failure:

- Heart Attack
- Severe Dehydration
- Infection
- An obstruction or blockage along the urinary tract
- Ingestion of certain medication that may cause toxicity to the kidneys

Chronic renal failure is a more gradual and progressive loss of kidney function.\(^\text{17}\) Some of the common causes of chronic renal failure include the following:

- Diabetes
- Hypertension
- Lupus
- A prolonged urinary tract obstruction or blockage
- Alport Syndrome

• Polycystic Kidney Disease

End-stage renal disease (ESRD), or renal failure-end stage, marks the end of the progressive deterioration of the kidneys. ESRD occurs when a patient’s level of kidney failure reaches the point where, absent dialysis or a kidney transplant, death would be imminent. Diabetes is the most common cause of ESRD, accounting for 44 percent of current cases. In 2001, there were 142,963 people in the United States requiring dialysis or having received a kidney transplant due to ESRD resulting from diabetes.\textsuperscript{18}

Dialysis is a process that involves the mechanical removal of substance and fluid from the body, as normally performed by the kidneys. There are two types of dialysis that may be performed on patients suffering from renal failure. They are hemodialysis and peritoneal dialysis.\textsuperscript{19} Hemodialysis is a process that involves the passage of the blood through a machine containing a special type of filter known as a dialyzer. The dialyzer filters out wastes and extra fluids from the blood.\textsuperscript{20} In peritoneal dialysis, a tube is placed in the abdomen. A cleaning solution, commonly known as dialysate, flows through the tube and allows for fluid exchanges that remove waste products and fluid from the body.

Once a person is diagnosed with ESRD, and if hemodialysis is the chosen method of treatment, the hemodialysis is typically done at a commercial dialysis center. The patient must visit the center three times a week for treatment, either on a Monday-Wednesday-Friday schedule or a Tuesday-Thursday-Saturday schedule. Treatments usually last approximately four hours. After treatment, patients often feel weak, and some may experience bleeding. Depending on the patient and the extent of his or her overall health, the patient may need to stay in the dialysis center for a period of time to recover before traveling home.

The level of health of dialysis patients varies widely. Some are ambulatory, and indeed can drive themselves to and from treatment. Some are mobile enough to walk to transportation providers that provide curbside pick-up. Others are non-ambulatory, are in wheelchairs, and require assistance to get from their residences to the transport vehicle.

5.2 National Trends

With over 20 million Americans already suffering from chronic kidney disease, the expenses associated with its treatment make kidney disease one of the costliest illnesses in the United States.\textsuperscript{21} According to the United States Renal Data System Report, the rate of reported incidences has increased steadily each year between 1980 and 2001 (See Chart 5.1, below).\textsuperscript{22} In keeping with the current trend, the projected number of patients with ESRD is expected to rise significantly over the next decade. Some other statistics of note are listed below:

• Men are more likely to develop ESRD than women.

\textsuperscript{19} “End-Stage Renal Disease (ESRD)” 2004, \url{http://www.stjohndm.org/healthinfo/adult.urology.endstage.asp}.
\textsuperscript{20} “Renal Disease Education” 2004, \url{http://www.vh.org/adult/patient/internalmedicine/faq/renaldisease.html}.
\textsuperscript{21} “Kidney Disease: Ten Facts,” 2003, \url{http://www.kidney.org/general/atoz/content/kidneyfacts.html}.
• African Americans and Native Americans develop ESRD at higher rates than the general population.\(^{23}\)
• African Americans develop ESRD at a higher rate than any other race.
• Diabetes continues to be the primary cause of ESRD.
• The number of patients diagnosed with ESRD caused by diabetes is projected to rise 600 percent from 41,000 in 2000 to 300,000 in 2030.\(^{24}\)
• By 2030, the number of patients with ESRD is projected to be 2.24 million.\(^{25}\)

Given these facts, it is evident that additional facilities, medical staff, and transportation services will be required to sufficiently care for the increasing number of patients that will develop ESRD in the future. Extensive study and careful planning will be required in order to ensure that dialysis patients continue to receive an adequate level of access to treatment centers.

Chart 5.1
Increase in Incident Rates of Reported ESRD in the United States, 1980-2001

Source: U.S. Renal Data System 2003 Annual Data Report

5.3 Local Trends

On a regional level, the Mid-Atlantic Renal Coalition found that the projected number of patients with ESRD is increasing at a nine percent level annually.\(^{26}\) This is close to the national average of ten percent.

As it pertains to gender and race, Virginia dialysis patient statistics are also consistent with the national and regional trends (See Chart 5.2, below.)\(^{27}\) As a result, the logical presumption is that the


\(^{24}\) US Renal Data System, op. cit.

\(^{25}\) Ibid.

The demand for dialysis treatment facilities in Virginia will grow at a rate equal to the projected nine percent annual increase for the entire Mid-Atlantic region. Accordingly, the projected ESRD occurrence rate in Virginia will create a need for increased facilities (in number, size or both), increased medical staffing, and more transportation services within the state.

**Chart 5.2**
**Virginia Dialysis Patient Population Characteristics**

Source: Mid-Atlantic Renal Coalition

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27 Ibid.
6 Socio-Economic Portrait of Fairfax County

In considering the state of dialysis transportation in Fairfax County, and the ability of FASTRAN to meet the current and future needs of the dialysis patients it serves, it is critical to gain an understanding of the demographics of the County and the likely trends in the growth of demand for the services provided by FASTRAN and other paratransit providers.

Fairfax County is a large, populous county and one of the wealthiest counties in the nation as measured by median household income. Despite Fairfax’s collective wealth, many of the services required by and provided to its residents are facing funding limits, including dialysis transportation.

The population of Fairfax County more than doubled between 1970 and 2000, growing from 455,021 to 969,749 people. While there is considerable population in all tracts of the county, the tracts in the western part of the county tend to have a greater number of residents.\(^{28}\) (See Figure 6.1 below for detail.)

Figure 6.1
2000 Population by Tract for Fairfax County

\(^{28}\) Census Tracts are geographical areas that are relatively permanent for the purpose of reporting statistical data. They generally encompass between 1500 and 8000 people.
There are variations among the different segments of Fairfax County’s population. In contrast to the greater distribution of the general population in the outer reaches of the county, the older residents of Fairfax tend to live either inside the Beltway, in southern Fairfax County, or in the independent cities of Fairfax City and Falls Church. In contrast, the tracts in the western sections of the county tend to have fewer older residents. (See Figure 6.2 below for detail.)

Figure 6.2
2000 Population of 65 and older by Tract for Fairfax County

Legend for Percent of Population 65 years and older

- 0 - 6
- 7 - 13
- 14 - 26
- 27 - 451
- 452 - 710

Data Source: US Census, Census 2000 Summary File 3

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29 Virginia contains a large number of independent cities that are county equivalents. However, Fairfax County provides services, including dialysis transportation, to Fairfax City and Falls Church making them part of this analysis.
The median household income also dramatically increased from $57,866 to $81,050\textsuperscript{30} between 1970 and 2000.\textsuperscript{31} Between 1990 and 2000, the percentage of households earning $75,000 or more has increased and the percentage of household earning less than $75,000 has decreased. (See Figure 6.3 below for detail.)

\textbf{Chart 6.1}

\textbf{Percentage of Households by Income: 1990}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{chart61_1990.png}
\end{figure}

\textbf{Percentage of Households by Income: 2000}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{chart61_2000.png}
\end{figure}

\textsuperscript{30} Income amounts are expressed in 1999 dollars.

\textsuperscript{31} “Historical Median Income Tables,” \textit{US Census Bureau},
\url{http://www.census.gov/hhes/income/histinc/county/cntytoc.html}. Accessed April 9, 2004. Historical median incomes from this source were converted into 1999 dollars using the Research Series CPI-U-RS conversion factors. For more information on converting income amounts, contact the Census Bureau at 301-763-3243.
Concentrations of wealth throughout the county are not entirely even. As shown in Figure 6.4 below, households earning less than $75,000 per year are concentrated in the areas inside Washington’s Capital Beltway, in southern Fairfax County, and in and around Reston, whereas households earning $75,000 or more are distributed throughout the county but they are particularly prevalent in the western part of the county where there are fewer households.

**Figure 6.3**
Percentage of Income by Tract for Fairfax County: 2000
In addition to being large and wealthy, Fairfax County’s population is also ethnically diverse. Between 1990 and 2000, the number of Fairfax residents who identified themselves as Asian or of Hispanic Origin (of any race) in the U.S. census has increased dramatically. Asians grew from 7.1% of the population in 1990 to 12.7% in 2000, while Hispanics grew from 6.2% to 11.0% during the same period. African American and White populations grew much more modestly over the decade, and in fact the share of the population who identified themselves as White dropped by 11.7% between 1990 and 2000.\textsuperscript{32}

While the African American segment of Fairfax’s population has grown less dramatically in recent years, this segment still accounts for a significant slice of the pie. As noted in preceding sections, African Americans, along with Hispanic Americans, have an increased likelihood of developing diabetes relative to other ethnic and racial groups.

Fairfax County cannot be characterized as an older county, however the next 20 years will be very telling. The “baby boomers” have made significant impacts in each life-stage they have passed through to date, so it is likely that their retirement years will follow suit. Between 1990 and 2000, the population 45 and over increased by 45 percent and the population 65 and over increased by 61 percent. Despite these huge increases, people 45 and over were still only 33 percent of the population in 2000 and people 65 and over were only 9 percent of the population.\textsuperscript{33} Furthermore, the resident population of Virginia over the age of 65 is expected to double between 1995 and 2025 according to population projections from the Census Bureau.\textsuperscript{34}

As the number of dialysis patients is expected to grow by 10 percent per year nationally, that number of patients is likely to grow at least as fast in Fairfax County. Fairfax has a minority population of about 30 percent, and growing. Because the overall population in Fairfax County is both growing and aging, and because a considerable portion of the population is made up of African Americans and Hispanic Americans, who have an increased likelihood of developing diabetes relative to other ethnic groups, it is likely that Fairfax County will see a substantial increase in the number of dialysis patients.

\textsuperscript{32} “Census 2000 Summary File 3,” \textit{US Census Bureau}.
\textsuperscript{33} Ibid.
7 Dialysis Treatment in Fairfax County

The data collection and analysis phase of this project uncovered a number of key issues FASTRAN is currently facing concerning transportation for dialysis patients. The first part of this section presents some of the issues regarding the dialysis centers and their owners. Additionally, there is an overview of the dialysis centers’ financial outlook.

The second part of the section discusses patient placement practices, and demonstrates how simple changes to patient scheduling procedures can make a significant difference in the provision of dialysis transportation.

7.1 Overview of Dialysis Centers within the Scope of Operations of FASTRAN

The provision of dialysis services in Northern Virginia is a very competitive industry. Of twelve dialysis centers in the Fairfax County area that are currently being served by FASTRAN, all are operated on a for-profit basis. Ten are operated by one of four large corporations, two of which (Fresenius and Gambro) are multinational in scope. Information concerning these twelve centers is summarized in Table 7.1 below:

Table 7.1
Dialysis Centers served by FASTRAN

<table>
<thead>
<tr>
<th>Center</th>
<th>Address</th>
<th>Stations/Chairs</th>
<th>Owner</th>
<th>Initial Medicare Certification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fairfax Dialysis Center</td>
<td>8316 Arlington Blvd, Ste 108 Alexandria, VA 22031</td>
<td>28</td>
<td>Fresenius</td>
<td>9/1/1977</td>
</tr>
<tr>
<td>Alexandria Kidney Center</td>
<td>4141 Duke St Alexandria, VA 22304</td>
<td>26</td>
<td>Fresenius</td>
<td>11/1/1980</td>
</tr>
<tr>
<td>CDC-Springfield/Fairfax</td>
<td>8350 A Trafford Ln Springfield, VA 22152</td>
<td>12</td>
<td>DaVita</td>
<td>11/1/1985</td>
</tr>
<tr>
<td>Dulles Regional Dialysis Center</td>
<td>45662 Terminal Dr, Ste. 110 Sterling, VA 20166</td>
<td>8</td>
<td>Fresenius</td>
<td>5/1/1988</td>
</tr>
<tr>
<td>CDC-Sterling/Dulles</td>
<td>46396 Benedict Dr, Ste. 105 Sterling, VA 20164</td>
<td>15</td>
<td>DaVita</td>
<td>7/1/1988</td>
</tr>
<tr>
<td>Renal Carepartners-Reston</td>
<td>12330 Pinecrest Rd, Ste. 200 Reston, VA 20191</td>
<td>16</td>
<td>Renal Carepartners</td>
<td>7/31/2002</td>
</tr>
<tr>
<td>CDC-Alexandria</td>
<td>5999 Stevenson Ave, Ste. 100 Alexandria, VA 22304</td>
<td>14</td>
<td>DaVita</td>
<td>4/1/1992</td>
</tr>
<tr>
<td>Gambro Healthcare-Tysons Corner</td>
<td>8391 Old Courthouse Vienna, VA 22182</td>
<td>15</td>
<td>Gambro</td>
<td>7/27/1995</td>
</tr>
<tr>
<td>FMC-Fort Belvoir</td>
<td>8796 P Sacramento Dr. Alexandria, VA 22309</td>
<td>17</td>
<td>Fresenius</td>
<td>7/7/1997</td>
</tr>
<tr>
<td>Total Renal Care-Fairfax</td>
<td>8501 Arlington Blvd, Ste. 100 Fairfax, VA 22301</td>
<td>17</td>
<td>DaVita</td>
<td>7/27/1998</td>
</tr>
<tr>
<td>Renal Carepartners-Fairfax</td>
<td>3930 Walnut St, Ste. 100 Fairfax, VA 22030</td>
<td>17</td>
<td>Renal Carepartners</td>
<td>10/29/2003</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>205</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Two additional centers have recently opened: DaVita of Franconia, located at 5695 King Centre Drive in Alexandria, VA (22315) and DaVita of Reston, located at 1875 Commons Drive, Suite 100 in Reston, VA (20191). Though no FASTRAN customers currently use these new facilities, the centers may well become part of FASTRAN’s operations in the future as hospital social workers place new patients in these centers, or existing patients switch to these centers.

7.2 Summary Information on the Dialysis Providers

DaVita Guest Services is U.S.-based. It operates over 547 dialysis centers in the United States, serving nearly 47,000 patients in 33 states and the District of Columbia. DaVita states that it is the largest independent dialysis service provider in the United States, and that it is the only national dialysis company with a research facility as a wholly owned subsidiary.\(^{35}\)

Fresenius Medical Care North America is a subsidiary of Fresenius Medical Care AG, based in Bad Homburg, Germany. Fresenius AG operates 1500 dialysis centers worldwide, serving 115,000 patients. Fresenius is also the world’s leading provider of dialysis products such as hemodialysis machines, dialyzers and related disposable products.\(^{36}\)

Gambro Healthcare AB is based in Stockholm, Sweden. Gambro operates 700 dialysis centers worldwide, serving 53,500 patients. Gambro has traditionally been a product supplier of renal care products, and states that it has been the leading innovator in this field including being the first to introduce a computerized dialysis machine. Gambro states that it has now moved beyond its traditional role and provides needed services in renal care.\(^{37}\)

Renal CarePartners, Inc. is a private U.S. company that has set up a national network of dialysis centers through partnerships (such as joint ventures or management contracts) with nephrologists and nephrology groups. Renal CarePartners states that it provides assistance in areas such as patient care, clinical operations, financial management, vendor relations, regulatory and legal issues, marketing, new facility development and construction, development of ancillary services, outcomes management, and monitoring services and managed care contracting. Renal CarePartners further states that it has been involved with opening 95 new dialysis clinics in the United States.\(^{38}\)

7.3 Dialysis Centers’ Financial Outlook

All renal care/dialysis centers in Fairfax County are owned by for-profit organizations. As noted above, the dialysis treatment market is very competitive and all major players in the Fairfax County (DaVita, Fresenius, Gambro, and Renal CarePartners) vie for new customers (many of whom, it should be noted, are dependent on publicly-supported paratransit providers such as FASTRAN). Figure 7.1 below shows the average price of the 25 stocks of renal-related companies tracked each month in Nephrology News & Issues (NN&I), an industry trade publication. The chart demonstrates the fact that the trend for renal stock prices is upward. The January 2004 issue of NN&I contained a comparison of the stocks of DaVita and Renal Care Group, and noted that, as of December 5, 2003, the stock of DaVita was trading at $38.95 per share, and Renal Care Group at $41.01 (the upward trend has continued, and as of April 23,

\(^{38}\)“Renal CarePartners,” www.renalcp.com.
2004, DaVita was trading at $46.99 and Renal Care Group at $48.15). In addition, the NN&I article notes that, in general, the renal care companies expect to be able to maintain their current levels of performance in the foreseeable future, absent significant adverse shifts in government policy, physician practice patterns, or mix of commercial and government plan patients.

Chart 7.1
Renal Stock Average: 2003

Moreover, DaVita, in its most recent financial statement,\textsuperscript{40} states that more than 96 percent of its revenues are currently derived directly from providing dialysis services, of which 88 percent represents on-site dialysis services. Furthermore, DaVita's revenue is dependent on 1) the number of treatments, which is primarily a function of the number of chronic patients requiring three treatments per week, and 2) average revenue per treatment. The total patient base is a relatively stable factor, influenced by a demographically growing need for dialysis, DaVita’s relationships with referring physicians together with the quality of the clinical care, and the pace of opening and acquiring new centers.

Average revenue per treatment is determined by a number of factors, including 1) the mix of commercial and government (principally Medicare and Medicaid) treatment, 2) the mix and intensity of physician-prescribed pharmaceuticals, 3) commercial and government reimbursement rates, and 4) billing and collecting operations performance. The principal drivers for patient care costs are 1) clinical hours per treatment, 2) labor rates, 3) vendor pricing of pharmaceuticals, and 4) business infrastructure and compliance costs.

DaVita’s annual average revenue per treatment increased from $278 in 2001 to $291 in 2002 and to $303 in 2003. Similarly, in 2001, Renal CarePartners’ net revenue per treatment was $275, while total operating costs and expenses per treatment were approximately $226. Thus, on average, Renal CarePartners appears to be making a profit (revenues less expenses) of $50 per treatment.

7.4 Placement of Dialysis Patients in Dialysis Center

The procedures used to place dialysis patients in particular dialysis centers and in particular shifts at those centers are discussed below. The information represents aggregated information obtained from interviews with representatives of hospitals and dialysis centers, and with nephrologists.

7.4.1 Initial Placement

When a patient is hospitalized with acute renal failure, the hospital will assign the patient a social worker when it becomes clear that the patient will need dialysis on a long-term or permanent basis. The social worker’s job is threefold: 1) to assist the patient in selecting a dialysis center, 2) to place the patient in the selected center, and 3) to arrange for patient transportation services to and from the selected treatment center.

In conducting this task, the hospital social worker takes into consideration the patient’s insurance coverage, his or her location (either residence, workplace, or school), and the transportation services that may be available.

Insurance can be an overriding force in the center placement decision process. While Medicare and Medicaid are agency-neutral and will not dictate which dialysis center should be used for a particular patient, private insurance providers (such as Blue Cross, Aetna, and Kaiser Permanente) have contracts with one or more of the dialysis providers noted above. Under the terms of these contracts, the insurance companies require that, in order to qualify for full coverage, the patient must receive dialysis treatment from a center affiliated with the insurance provider. Therefore, the first consideration in placing a new dialysis patient is to determine the

pool of dialysis centers for which a patient is eligible (if the patient is not Medicare- or Medicaid-covered).

The hospital social worker will next look at where the patient lives, works, or goes to school (depending on which location will be the most frequent origin/destination point of the patient when the patient is traveling to and from the dialysis center), and will attempt to place the patient closest to this location, as space (a station or chair) at the dialysis center in question permits.

The third factor that enters into the decision-making process is the patient’s nephrologist. Nephrologists often have contractual affiliations with particular dialysis centers or center owners (DaVita, Fresenius, etc.) and may prefer or require that their patients go to one of these affiliated centers. While a patient could choose to change his or her nephrologist in order to receive treatment at a more conveniently located dialysis center, in practice such changes are often problematic.

After the hospital social worker has determined the range of dialysis centers the patient can practicably attend, and which of the qualifying centers have available space and shifts, he or she will begin to explore transportation options with the patient. Between ten and thirty percent of patients will be able to arrange one of the following transportation means: some will drive to and from treatment themselves (especially early in the treatment), some will arrange for family members to transport them on an ongoing basis, and some will elect to use private (cab) providers. The remainder of dialysis patients (seventy to ninety percent) will need to have transportation arranged by the hospital social worker. Private insurance and Medicare will not pay for transportation to and from dialysis treatment. Medicaid will pay for client transportation arranged by LogistiCare (a transportation broker under contract to the Virginia Department of Medical Assistance Services).

Insurance companies may provide eligibility for more than one group of dialysis centers. As a result, the hospital social worker can usually find a center fairly close to the patient’s home (within 10-15 miles perhaps 95 percent of the time). Whenever possible, the social worker does not recommend a center, but offers the patient a list of centers from which to choose. The nephrologist also plays a role in center selection, but the insurance company effectively has the last word (typically, insurance companies will pay 90 percent of the cost of the treatment if the patient uses an eligible center, but only 70 percent if the patient uses a center outside that insurance provider’s system).

41 Apart from contractual obligations, since the nephrologist must make on-site visits to his or her patients at the dialysis centers, there is an incentive on the part of the nephrologist to have all his or her patients treated by those dialysis centers which are most conveniently located from the nephrologist’s point of view.
42 According to one hospital social worker with whom we spoke, older dialysis patients are reluctant to change their doctors, while younger dialysis patients are more willing to make such a change in order to receive treatment at a center that better meets their scheduling needs. Since most dialysis patients are older individuals, changes in doctors for reasons of dialysis center selection appear to be infrequent.
43 Hospital social worker, interview by authors, February 26, 2004.
44 “Virginia Department of Medical Assistance Services,” http://www.dmas.state.va.us.
45 Hospital social worker, interview by authors, February 26, 2004, op. cit.
46 Ibid.
Once the patient and social worker agree on an eligible center that has space available, the hospital social worker will begin to initiate the actual transportation placement, if necessary. As noted, FASTRAN, MetroAccess, LogistiCare, and private cab services are options.

If it appears that the patient will need the services of FASTRAN, the hospital social worker will initiate the application process even before the patient has made a center selection. The social worker will fill out the application for the patient, which the patient will then sign. Should a patient ask for a center that is not the closest to his or her home, the hospital social worker will explore that request with FASTRAN.

The hospital social worker is involved only with initial placement (if a patient subsequently wishes to change centers or to change days or shift times at his or her chosen center, which is the responsibility of the dialysis center social worker). Transportation must be arranged quickly, as a patient discharged from the hospital on a Wednesday will need to be ready for his or her first visit to the dialysis center on Friday of the same week. Families will usually need to provide transportation for the first week of treatment until FASTRAN arrangements can be finalized.

Usually, the hospital social worker can find space (a “chair”) for a new patient at the dialysis center of choice, but often cannot schedule the preferred shift. Most people prefer Monday-Wednesday-Friday shifts, and the 11:00 time slot on those days. Few want Tuesday-Thursday-Saturday scheduling.

FASTRAN’s services are not available to all dialysis patients due to FASTRAN’s hours of operation. Specifically, FASTRAN does not provide transportation to early (e.g. 5:30 a.m.) dialysis shifts or from late (e.g. 6:00 p.m.) shifts, and it does not provide any service on Saturdays.

7.4.2 Subsequent Changes in Center, Days of Treatment, or Shift

Once the patient has been placed with a dialysis center, that patient may want to change some aspect of his or her treatment schedule. Often the patient will want to change the day and/or shift that was initially assigned. Any change will, of course, have a direct impact on FASTRAN’s operations, as transportation scheduling and/or routes may need to be altered in order to accommodate the change.

Post-center assignment changes in dialysis scheduling are handled by the dialysis center social worker. The process appears to be quite flexible. In practice, when an opening arises and an existing patient desires to “move up” to the newly available day or time slot, the dialysis center social worker simply contacts the transportation provider (whether FASTRAN, MetroAccess, or LogistiCare) and the provider makes the requested change to the transportation schedule. At present, there do not appear to be any attempts made by dialysis centers to coordinate these kinds of changes with the transportation providers (or, for that matter, changes involving the movement of a patient from one dialysis center to another.) That is, no effort is made to see whether proposed changes in are convenient for the transportation providers or to otherwise seek input from the transportation providers on matters involving patient schedule or center changes.
8 Current Level of Demand for Transportation to Kidney Dialysis Centers

As discussed above, survey results are provided in aggregate in order to protect sensitive confidential information. Where site-specific data is used, the facility will not be identified.

8.1 Dialysis Center Survey

During February 2004, a survey was conducted of all twelve dialysis facilities then served by FASTRAN. Six of the facilities are located in Fairfax County. In addition to the facilities located in Fairfax, there are two centers located in Sterling, three located in the City of Alexandria, and one located in the City of Fairfax. Eight out of twelve surveyed facilities responded.

8.1.1 Location of Dialysis Facilities

The responding centers have varying levels of tenure in Northern Virginia, from fifteen years to less than one year. More than one new dialysis facility will be opened within the Fairfax County boundaries in 2004.

8.1.2 Shift Times and Capacity of Facilities

The survey results show broad variation in shift times, number of chairs available per shift, and number of patients currently receiving treatment between facilities.

Six out of the eight respondent facilities offer three shifts on Monday, Wednesday and Friday (M/W/F), one provides two shifts and one provides four shifts. One facility did not specify hours, it identified patient load instead of shift time. Each of the eight facilities offers two shifts on Tuesday, Thursday and Saturday (T/Th/S). Three facilities have a morning shift from 6:00 am – 10:30 am on M/W/F. All other shifts’ start and end times vary substantially among facilities with a total of seventeen different treatment times on M/W/F (plus three unknown shift times) and eleven different shift times on T/Th/S (plus two unknown shift times.) The earliest shift offered is 4:45 am, and the latest is 10:30 pm; both are on M/W/F (shift time information is summarized in Tables 8.1 and 8.2). One of the newer facilities currently has patients scheduled only for M/W/F treatments, but plans to add T/Th/S shift times. Five facilities indicated that no patients were on their waiting lists, one facility had two patients on its waiting list, one facility had one patient on its waiting list, and one facility did not comment. Patient waiting lists can vary from day to day.

The patient information obtained from the eight completed facility surveys identified 317 patients receiving treatment on M/W/F, which is approximately 73 percent of the total service capacity. The data show that 192 patients receive treatment on T/Th/S, which is approximately 64 percent of the total service capacity. Although none of the existing facilities are operating at 100 percent service capacity, new facilities are planned. This suggests that transportation demand could increase as these facilities begin providing services to dialysis patients.

8.1.3 Patient Characteristics and Shift Times

Survey results show that approximately 20 percent of the dialysis patients in Fairfax County are non-ambulatory, which means they use a wheelchair or mobility devices. However,
as one facility did not provide the number of ambulatory patients it serves, the 20 percent represents only patients of those facilities that responded. Non-ambulatory patients are typically paratransit-dependent. Based on the data collected, 89 percent of non-ambulatory patients are scheduled for morning treatment. The number of patients receiving morning treatment on M/W/F and T/Th/S are similar, even though the total aggregate data indicates an overall preference for M/W/F scheduling. Table 8.1 below depicts the breakdown of patient characteristics by shift for M/W/F treatment.

Table 8.1
Current Shift Time Summary for Centers and Patient Characteristics
(Monday/Wednesday/Friday)

<table>
<thead>
<tr>
<th>Shift Time (ex. 6:00 - 10:00am)</th>
<th>Employees per shift</th>
<th>Ambulatory Patients</th>
<th># Patients using wheelchairs or scooters</th>
<th>Total Patients</th>
<th>*Avg Attendance Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. 4:45am - 10:00am</td>
<td>4</td>
<td>5</td>
<td>2</td>
<td>7</td>
<td>100%</td>
</tr>
<tr>
<td>2. 5:45am - 10:45am</td>
<td>10</td>
<td>X</td>
<td>X</td>
<td>26</td>
<td>X</td>
</tr>
<tr>
<td>3. 6:00am - 10:00am</td>
<td>7</td>
<td>17</td>
<td>0</td>
<td>17</td>
<td>87.5%</td>
</tr>
<tr>
<td>4. 6:00am - 10:30am</td>
<td>13</td>
<td>26</td>
<td>6</td>
<td>32</td>
<td>100%</td>
</tr>
<tr>
<td>5. 6:30am - 10:45am</td>
<td>X</td>
<td>12</td>
<td>0</td>
<td>12</td>
<td>97.8%</td>
</tr>
<tr>
<td>6. 9:30am - 2:00pm</td>
<td>5</td>
<td>9</td>
<td>5</td>
<td>14</td>
<td>90%</td>
</tr>
<tr>
<td>7. 10:30am - 2:30pm</td>
<td>10</td>
<td>21</td>
<td>3</td>
<td>24</td>
<td>100%</td>
</tr>
<tr>
<td>8. 11:00am - 3:00pm</td>
<td>7</td>
<td>12</td>
<td>3</td>
<td>15</td>
<td>87.5%</td>
</tr>
<tr>
<td>9. 11:00am - 3:30pm</td>
<td>5</td>
<td>14</td>
<td>7</td>
<td>21</td>
<td>X</td>
</tr>
<tr>
<td>10. 11:15am - 4:15pm</td>
<td>10</td>
<td>X</td>
<td>X</td>
<td>26</td>
<td>X</td>
</tr>
<tr>
<td>11. 11:30am - 3:30pm</td>
<td>X</td>
<td>8</td>
<td>4</td>
<td>12</td>
<td>97.7%</td>
</tr>
<tr>
<td>12. 2:00pm - 6:00pm</td>
<td>4</td>
<td>6</td>
<td>4</td>
<td>10</td>
<td>90%</td>
</tr>
<tr>
<td>13. 2:30pm - 7:30pm</td>
<td>5</td>
<td>13</td>
<td>0</td>
<td>13</td>
<td>100%</td>
</tr>
<tr>
<td>14. 4:00pm - 8:00pm</td>
<td>4</td>
<td>7</td>
<td>2</td>
<td>9</td>
<td>87.5%</td>
</tr>
<tr>
<td>15. 4:00pm - 8:30pm</td>
<td>5</td>
<td>17</td>
<td>3</td>
<td>20</td>
<td>X</td>
</tr>
<tr>
<td>16. 4:00pm - 9:00pm</td>
<td>X</td>
<td>10</td>
<td>0</td>
<td>10</td>
<td>96.2%</td>
</tr>
<tr>
<td>17. 5:00pm - 10:30pm</td>
<td>4</td>
<td>10</td>
<td>0</td>
<td>10</td>
<td>95%</td>
</tr>
<tr>
<td>18. X</td>
<td>X</td>
<td>12</td>
<td>1</td>
<td>13</td>
<td>X</td>
</tr>
<tr>
<td>19. X</td>
<td>X</td>
<td>14</td>
<td>1</td>
<td>15</td>
<td>X</td>
</tr>
<tr>
<td>20. X</td>
<td>X</td>
<td>11</td>
<td>0</td>
<td>11</td>
<td>X</td>
</tr>
<tr>
<td>All Shifts</td>
<td>224</td>
<td>41</td>
<td>317</td>
<td>92.4%</td>
<td></td>
</tr>
</tbody>
</table>

X = No response

47 Perhaps non-ambulatory patients’ transportation dependency factors into their preference for morning shifts, as door-to-door public transportation access is available at that time of day.
Table 8.2 below depicts the breakdown of patient characteristics by shift for T/Th/S treatment.

### Table 8.2
Current Shift Time Summary for Centers and Patient Characteristics  
(Tuesday/Thursday/Saturday)

<table>
<thead>
<tr>
<th>Shift Time (ex. 6:00 - 10:00am)</th>
<th>Employees per shift</th>
<th>Ambulatory Patients</th>
<th># Patients using wheelchairs or scooters</th>
<th>Total Patients</th>
<th>*Avg Attendance Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. 5:00am - 10:00am</td>
<td>4</td>
<td>6</td>
<td>4</td>
<td>10</td>
<td>90%</td>
</tr>
<tr>
<td>2. 5:30am - 10:00am</td>
<td>X</td>
<td>10</td>
<td>2</td>
<td>12</td>
<td>95.8%</td>
</tr>
<tr>
<td>3. 5:45am - 10:45am</td>
<td>7</td>
<td>X</td>
<td>X</td>
<td>18</td>
<td>X</td>
</tr>
<tr>
<td>4. 6:00am - 10:00am</td>
<td>5</td>
<td>12</td>
<td>2</td>
<td>14</td>
<td>87.5%</td>
</tr>
<tr>
<td>5. 6:00am - 10:30am</td>
<td>9</td>
<td>26</td>
<td>4</td>
<td>30</td>
<td>100%</td>
</tr>
<tr>
<td>6. 9:30am - 2:00pm</td>
<td>X</td>
<td>7</td>
<td>6</td>
<td>13</td>
<td>88%</td>
</tr>
<tr>
<td>7. 9:30am - 3:30pm</td>
<td>4</td>
<td>9</td>
<td>5</td>
<td>14</td>
<td>90%</td>
</tr>
<tr>
<td>8. 10:30am - 2:30pm</td>
<td>5</td>
<td>6</td>
<td>6</td>
<td>12</td>
<td>100%</td>
</tr>
<tr>
<td>9. 11:00am - 3:00pm</td>
<td>5</td>
<td>11</td>
<td>3</td>
<td>14</td>
<td>87.5%</td>
</tr>
<tr>
<td>10. 11:00am - 3:30pm</td>
<td>5</td>
<td>9</td>
<td>10</td>
<td>19</td>
<td>X</td>
</tr>
<tr>
<td>11. 11:15am - 4:15pm</td>
<td>7</td>
<td>X</td>
<td>X</td>
<td>15</td>
<td>X</td>
</tr>
<tr>
<td>12.</td>
<td>X</td>
<td>X</td>
<td>12</td>
<td>0</td>
<td>12</td>
</tr>
<tr>
<td>13.</td>
<td>X</td>
<td>X</td>
<td>8</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td><strong>All Shifts</strong></td>
<td>116</td>
<td>43</td>
<td><strong>192</strong></td>
<td><strong>92.4%</strong></td>
<td></td>
</tr>
</tbody>
</table>

X = No response

Although seven facilities identified patient residence by zip codes, only five provided the numbers of patients residing in specific zip code areas. The patient population is distributed across multiple zip code areas located both inside and outside of Fairfax County. The densest patient population is located in and around the City of Fairfax, with eleven to twenty patients in each of the surrounding zip code areas. There are fewer patients in the zip code areas situated relatively far from the City of Fairfax, with most having one to five patients. The patient population outside Fairfax County boundaries is scattered and even less concentrated with five or fewer patients per zip code area. Figure 8.1 below depicts the patient population by zip code of residence, as reported by responding dialysis centers.
FASTRAN’s client population is distributed across multiple zip code areas as well, but its dialysis patient riders are concentrated within Fairfax County. The densest population centers are located northwest and southeast of the City of Fairfax (see Figure 8.2 below). An analysis of the geographic distribution of FASTRAN riders and their dialysis centers is contained in Appendix H.
Figure 8.2
FASTRAN Clients by Zip Code of Residence

Source: FASTRAN Client Trip Records
8.2 Dialysis Patient Survey

The dialysis patient survey (Appendix D) was designed to gather information regarding transportation services used by dialysis patients. The survey was distributed to the staff of each of the twelve FASTRAN-served dialysis centers along with self-addressed stamped envelopes for return of the individual surveys. As noted in the Methodology section above, a total of thirty-nine patient surveys were completed and returned to George Mason University. The results are summarized below.48

Approximately 61 percent of the patients that responded to the survey are over age 60 (See Chart 8.1 below). Medicare covers the medical expenses of more than half the patients at most of these facilities and fewer than 20 percent are covered by Medicaid. (Dialysis patients covered by Medicaid are eligible for reimbursement of transportation expenses, whereas Medicare patients typically must cover their own transportation costs.) The responses from the patient survey indicate that 83 percent of the patients have an income level of $25,000 or less. Eligibility for Medicaid is based on not only on income, but also on the number of family members, and the disability in regards to dialysis patients,49 which explains, in part, the weak correlation between low-income level and Medicaid benefit qualification.

Chart 8.1
Age of Patient Survey Respondents

![Chart 8.1 Age of Patient Survey Respondents]

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48 The Dialysis Patient Survey listed “Metro” as one of the possible choices. Four out of the six respondents who checked this box on the survey wrote in “MetroAccess.” For the purposes of this portion of the study, we are assuming that all of the six respondents checking the “Metro” box were using MetroAccess.

49 “Health Insurance Consumer Guide for Virginia,” [http://healthinsuranceinfo.net/va05.html](http://healthinsuranceinfo.net/va05.html).
8.2.1 Demographics of Respondents’ Trips To Dialysis Centers

According to patient survey results, 87 percent of the patients depart from their home when traveling to dialysis. Of the 13 percent that depart from locations other than their home, 8 percent depart from nursing homes, 2.5 percent depart from correctional facilities, and 2.5 percent did not identify their departure location for trips to dialysis treatment.

The patient survey also showed that 73 percent of the respondents receive dialysis treatment at the center closest to their trip departure point. The remaining 27 percent of the patients choose to travel a greater distance for dialysis than would be required if they received treatment at the most proximate facility.

8.2.2 Patient-Dialysis Center Alignment

The information gathered from the patient survey shows that 57 percent of the respondents selected their current dialysis facility because it was the facility that was recommended by their doctor. Thirty percent indicated their choice was based on the convenience of the facility location. Customer service was identified as the reason for selecting the facility on five percent of the respondents’ surveys. Two percent of the respondents cited insurance restrictions as the number one reason for choosing their dialysis facility. Finally, seven percent of the respondents identified “other” reasons including the following: in their opinion their current dialysis facility is superior to other facilities; a family member chose the center for the patient.

Fifty four percent of the respondents to our survey receive dialysis treatment in zip code 22304; 15 percent receive treatment in zip code 20191; eight percent receive treatment in zip codes 20164 and 22302; and ten percent receive treatment in zip code 22309. Five percent of the respondents did not identify their treatment facility. (See Figure 8.2 for zip code detail.)

8.2.3 Punctuality for Dialysis Appointments Due To Transportation:

Patient survey results showed that 39 percent of the respondents ride FASTRAN buses to dialysis and 38 percent use FASTRAN’s services following dialysis treatment. MetroAccess transported eight percent of the survey patients to dialysis and nine percent from dialysis. Other Medicaid Vendors transported eight percent of the respondents to dialysis and nine percent from dialysis. Sixteen percent of survey patients rode to dialysis in cabs 12 percent used cabs as their transportation mode from dialysis. Twenty-four percent of the respondents provided their own transportation to dialysis, and 26 percent of respondents provided their own transportation from dialysis. Other forms of transportation accounted for five percent of the respondents’ transportation to dialysis and six percent from dialysis. Chart 8.2 below contains the breakdown of transportation modes used by dialysis patients.
Dialysis patients were asked how often transportation-related problems caused them to be late for dialysis treatment. According to the responses, 63 percent were never late for dialysis due to transportation. Thirty-two percent of patients surveyed were late 1-3 times per month as a result of transportation problems, and 5 percent of the respondents were late more than 3 times per month because of transportation issues.

Of the 63 percent of respondents that were never late, 29 percent used FASTRAN as their transportation provider, 18 percent drove themselves, 8 percent relied on cabs, 5 percent used MetroAccess, and 3 percent used other forms of transportation to travel to dialysis. Chart 8.3 below contains a breakdown of on-time transportation providers.
Of respondents who indicated that they were late for dialysis one to three times per month due to transportation (32 percent), 3 patients used other Medicaid vendors, 3 patients used cabs, 3 patients provided their own transportation, and 3 patients relied on FASTRAN for transportation to dialysis. (See Chart 8.4 below for detail)
Of the 5 percent of respondents who were frequently late for dialysis due to transportation, 2.5 percent used MetroAccess and 2.5 percent used other forms of transportation. (See Chart 8.5 below for detail)

**Chart 8.5**

**Patients Frequently Late for Dialysis**

<table>
<thead>
<tr>
<th>TRANSPORTATION TYPE</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>MetroAccess</td>
<td>2.50%</td>
</tr>
<tr>
<td>Other</td>
<td>2.50%</td>
</tr>
<tr>
<td>FASTRAN</td>
<td>0%</td>
</tr>
<tr>
<td>Self</td>
<td>0%</td>
</tr>
<tr>
<td>Cab</td>
<td>0%</td>
</tr>
<tr>
<td>Other Medicaid Vendors</td>
<td>0%</td>
</tr>
</tbody>
</table>

8.3 Transportation Provider Survey

In order to determine the overall level of dialysis transportation demand in the FASTRAN service area, MetroAccess and LogistiCare were asked to provide data on their current level of dialysis trips to the twelve FASTRAN-served dialysis centers. Several volunteer organizations listed on the Fairfax County Human Resource Guide\(^50\) were polled by telephone.

MetroAccess is a paratransit service created by WMATA to comply with the requirements of the Americans with Disabilities Act (ADA).\(^51\) Four years ago, LogistiCare was awarded a six-year contract to broker transportation services for Medicaid-eligible clients. To achieve this end, LogistiCare contracts with local transportation companies to provide the transportation required by the contract. LogistiCare also provides other services as part of its contract with WMATA, including operating call centers, scheduling trip requests, dispatching trips, tracking vehicles and pick-up and drop-off times, and paying the transportation providers.\(^52\)

Although LogistiCare did not provide a breakdown of the percentage of its total trips used to transport dialysis patients, the table below shows the average number of dialysis trips per-day for the centers currently served by FASTRAN. (See Table 8.3 below)

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\(^52\) Ibid.
Press reports indicate that, significantly, overall trips on MetroAccess have increased by 77 percent in the past two years.\(^{53}\)

LogistiCare and FASTRAN do not compete for riders, as the two disparate entities serve distinct customer bases. In fact, FASTRAN and MetroAccess provide similar services to their respective clients, with the primary difference being that MetroAccess drivers provide curb-to-curb service, whereas FASTRAN drivers assist their riders from door-to-door.

While the telephone surveys of various Fairfax County volunteer organizations did not result in “hard numbers” (the information received was primarily anecdotal), they were useful nevertheless. For the most part, these volunteer organizations do not actually provide transportation. Rather, they are primarily referral services to FASTRAN and MetroAccess. However, in addition to their clearinghouse functions, some of the various volunteer organizations do provide rides for call-in requests, but the conditions vary among the organizations. Examples of ride conditions include the following: a three trip per month limit, one or two rides per month but only on an emergency basis, no transportation on holidays, limited hours of operation, and limited service areas (e.g., the drivers of one organization only transport riders within western Fairfax County while another organization’s drivers only serve Herndon and Reston).

Two of the volunteer organizations surveyed rely on private vehicles and require that riders, including dialysis patients, be ambulatory. Three of the volunteer organizations surveyed average zero dialysis trips per day in 2003. This may reflect the fact that some volunteer

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organizations do not keep detailed records of transportation requests, or it may be that some
dialysis patients are not aware that these organizations are available transportation options. As a
rule, it seems that the service provided by these entities is limited by hours, not available on most
holidays, and not accommodating to repeat riders.

For some elderly patients, FASTRAN or MetroAccess are the only available form of
transportation after dialysis treatment. In some cases, patients will leave against medical advice
rather than risk missing their ride.\textsuperscript{54} The volunteer organizations that do drive dialysis patients
typically provide a more personalized service than a public provider such as FASTRAN or
MetroAccess is able to offer. Despite potential liability issues, they may assist the patients into
and out of buildings as needed, and at least one organization will even stop at a pharmacy to fill
prescriptions on the way to a patient’s home. Obviously, volunteer drivers may have more
flexibility to wait for a patient who is not ready to be discharged than do bus drivers operating on
a scheduled route.

The ability to keep up with increasing travel demands is vital to both the transportation
providers and their riders. For disabled riders, unreliable transportation is much more than an
inconvenience. LogistiCare claims that in January 2003, it averaged a 93 percent on-time
performance.\textsuperscript{55} However, MetroAccess is currently the target of a class action suit in which
some of its riders contend that the transportation delays that they experience are resulting in
hardships.\textsuperscript{56}

\begin{flushright}
\footnotesize
\textsuperscript{54} Michael V. Rocco and John M. Burkart, “Prevalence of Missed Treatments and Early Sign-Offs in
Hemodialysis Patients,” \textit{op. cit.}
\textsuperscript{55} “Case Study: MetroAccess – ADA Paratransit” \textit{MetroAccess}, 2003
\end{flushright}
9 FASTRAN’s Current Operations, Policies and Finances

FASTRAN provides transportation services as a division of the Fairfax County Department of Community and Recreation Services. This chapter describes the operational details of FASTRAN.

9.1 Organization

FASTRAN is organized as a public-private partnership. Twelve Fairfax County employees administer, plan, schedule and monitor operations. Two private-sector companies drive and maintain county-owned vehicles. Operations are divided into two service areas, North and South.

9.2 Equipment

FASTRAN uses buses ranging from 20’ to 26’ in length. Of the total fleet of 140 buses, 104 are used during peak periods to transport adults with mental retardation to work; seniors to senior centers or adult day health care, individuals to mental health or brain injury rehabilitation day programs as well as enrollees in the Critical Medical Care Program (CMCP) to dialysis, chemotherapy, radiation, and other life-sustaining treatments. FASTRAN uses 25-30 buses between 10:00 am and 2:00 pm each weekday to provide CMCP rides, group shopping trips and Dial-a-Ride services to medical and social service appointments. Vehicles are matched to rider needs through the scheduling process. Lift-equipped vehicles are available for wheelchair riders as necessary. As discussed below, FASTRAN also utilizes specialized software (Trapeze) to enhance efficiencies in scheduling. Fairfax County has purchased all its equipment except for the (approximately) 10 percent of the fleet that was procured through the Federal Transit Administration Section 5310 grant program.

9.3 Private Partners

FASTRAN has two private partners that provide drivers, attendants, and direct supervision for field operations. Contracts are of three-year duration with options for two, one-year extensions. Contractors provide all required insurance.

Currently, the private partners each staff to average levels of 57 full-time and 6 part-time drivers for both the northern and southern areas. All drivers work a split shift and average 32 – 33 hours of peak period tours each week. Scheduling of midday and other events ensures additional work hours to provide 40-hour workweeks for full-time employees. FASTRAN requires a 10 percent standby work force to accommodate unscheduled incidents, including mechanical breakdowns and employee emergencies.

9.4 Scheduling

County scheduling staff develops schedules on a daily basis. Standing order rides, which include most dialysis trips, are consolidated into tours. Tours are vehicle assignments that are designed to pick up riders who are traveling in the same general direction in the same time frame. FASTRAN consolidates daily tours into peak period bus “blocks” that are printed on daily manifests that are provided to the contractors each afternoon for the next day’s assignment. The manifests are scheduled to accommodate the most riders using the fewest number of bus hours.57

Since April 2003, FASTRAN has utilized a software application called Trapeze\(^{58}\). This program provides scheduling and vehicle utilization data to enhance operational efficiencies. The software can automatically generate schedules, display itineraries including pick-ups, drop-offs and times for each run, and calculate accurate times of arrival. FASTRAN is not currently using all of the features of Trapeze, however, and human schedulers still manage and review the process to ensure efficiency and accuracy.

9.5 Communications

Currently, FASTRAN drivers receive route instructions at the start of their shifts. FASTRAN buses are not equipped with data communication devices that would allow dispatchers and drivers to dependably communicate while the buses are en-route. FASTRAN vehicles are accessible via Fairfax County's voice radio system, but when drivers assist passengers to and from building entrances, voice messages may not be heard, and while in traffic, drivers may not be able to properly note dispatcher directions.

9.6 Bus Depots

FASTRAN dispatches its fleet from a central location at Fairfax County Government Center. However, the buses depart from two bases. The northern base is co-located with dispatch and the southern base is situated at the contractor’s leased location on Edsall Road. These bases are the points at which all daily runs begin and end.

9.7 Cancellations and No-Shows

Riders who must cancel a standing order for service are requested to call 24 hours in advance and required to call at least an hour before the originally-scheduled pick-up, to give dispatch the opportunity to inform the driver.\(^{59}\) This allows schedulers the opportunity to reassign tours. If a rider shows a pattern of missing a scheduled pick-up (no-show), FASTRAN works with the rider to find a more appropriate means to accommodate his or her transportation.

9.8 Fees

FASTRAN provides special fares under its Critical Medical Care Program for Fairfax County residents who must undergo continuing dialysis, cancer treatments, or rehabilitative services on a space-available basis.\(^{60}\) Critical medical care users pay from nothing to $5.00 per one-way trip depending upon income.

9.9 Americans with Disabilities Act (ADA)

FASTRAN provides for both ambulatory and non-ambulatory (wheelchair) dialysis patients. However FASTRAN is not an ADA participant, unlike MetroAccess paratransit service, whose services have been specifically tailored for riders who are unable to use traditional fixed-route bus or rail service due to physical or cognitive disability or inaccessibility of facilities.

\(^{58}\) [http://www.trapezesoftware.com/PDFs/PassSellsheet.pdf](http://www.trapezesoftware.com/PDFs/PassSellsheet.pdf)


\(^{60}\) “Fairfax County, Virginia – Fastran General Information,” [http://www.co.fairfax.va.us/rec/FASTRAN/General_Info.htm](http://www.co.fairfax.va.us/rec/FASTRAN/General_Info.htm).
9.10 Financial Overview

FASTRAN is funded through Fairfax County Department of Community and Recreation Services. FASTRAN provided operating expense data for December 2003 was analyzed to determine FASTRAN’s average cost per dialysis trip, as discussed below.

The impact of Critical Medical Care Program (CMCP) dialysis services on FASTRAN’s bottom line is directly related to the amount of platform hours required to provide CMCP services and the number of trips provided. Therefore, FASTRAN can control its costs by controlling platform hours and trips provided.

FASTRAN provided operating expense data showed that FASTRAN allocates operating expenses on chargeable platform hours, or hours on the road. According to FASTRAN’s December 2003 data, FASTRAN allocated $42,442.52 to CMCP services, based on 1,087 CMCP platform hours, or 7% of all FASTRAN platform hours. The December 2003, allocation of $42,442.52 divided by the monthly platform hours results in a cost of $39.02 per hour of CMCP service. By reducing the number of platform hours dedicated to CMCP services, FASTRAN can reduce the per-trip cost of providing the services. This can be accomplished in a number of ways, including reducing the length of trips and/or grouping together trips from proximate origins to proximate destinations.

Of 2,211 dialysis trips scheduled in December, 491 were cancelled, resulting in a net of 1,720 trips. Additionally, there were 126 no-shows. When allocated CMCP expenses are divided by non-cancelled CMCP trips, the resulting cost per ride is $24.68 ($42,442.52 / 1,720). When allocated expenses are divided by all scheduled CMCP trips, the cost per scheduled ride is restated at $19.20 ($42,442.52 / 2,211). As FASTRAN is seeking a reduction in the per-trip cost in providing CMCP services, reducing the number of cancellations would provide cost savings on a per-trip basis. For example in December 2003, the CMCP program had a total of 617 trips scheduled that were not utilized. These 617 foregone trips represent a substantial portion of all scheduled trips. The 491 trip cancellations alone served to increase the per-trip cost by 29% from $19.20 to $24.68.

Medicaid reimburses FASTRAN for a small portion of the cost of rides provided. In December 2003, Medicaid dialysis patents represented 84.26 platform hours of service.
10 FASTRAN Service Quality Standards -- Analysis of On-Time Performance

A critical measure of the degree of success of a transportation provider is its on-time performance: whether it can meet its obligations to its consumers in a timely manner. This is particularly important for dialysis patients. If a dialysis patient arrives late for treatment he or she will receive a shorter dialysis treatment, which will be less effective in removing wastes from his or her blood and may adversely affect that patient’s health. If a transportation provider is late picking up a patient at the dialysis center, the patient will need to wait in the center, at a time when he or she will be feeling weak and/or unwell from the treatment.

A description of the basic methodology used in performing the analysis of FASTRAN’s on-time performance is contained in Section 3.5. As noted above, because 1) FASTRAN keeps driver manifests in hard-copy format, 2) dialysis patients receive treatment on either a Monday/Wednesday/Friday (M/W/F) or a Tuesday/Thursday/Saturday (T/Th/S) schedule, and 3) FASTRAN’s schedules for Monday, Wednesday and Friday are similar, as are the schedules for Tuesday and Thursday, we limited the data universe to FASTRAN’s scheduled routes for Mondays and Tuesdays during the first four full weeks of March, 2004. Twenty-five percent of dialysis pick-ups and drop-offs within these dates were then randomly selected for inclusion in the data sample. To measure on-time performance on each selected route, the actual arrival time for pick-up or drop-off was compared to the scheduled event time for each sampled event. Calculations using data from Monday routes was given a heavier (60%) weight in order to account for the fact that FASTRAN does not offer Saturday service.

A large amount of the data selected for collection was unavailable as a result of missing manifests (17 percent of selected pick-up/drop-offs), pick-up or drop-off data missing from reviewed manifests because of schedule changes or other issues (19 percent of selected pick-up/drop-offs), or canceled pickups/drop-offs (5 percent). In total, 58 percent of the randomly selected data was available and recorded. Despite 42 percent of sampled data being unavailable, the available 58 percent constitutes 14 percent of all pick-ups and drop-offs during the sample period and constitutes 4 percent of the estimated 3,544 dialysis pick-ups and drop-offs in March 2004. Sixty-six percent of the available observations were pick-ups and 34 percent of the observations were drop-offs.

Our analysis indicates that during the month of March 2004, on-time performance was favorable on average (measured by averaging the difference between scheduled arrival times and actual arrival times.) When data for pick-ups and drop-offs were combined to determine a cumulative monthly average, the analysis shows that FASTRAN buses arrived at their destinations on average less than a minute past their scheduled arrival time. Similarly, the average arrival time for pick-ups was almost exactly on schedule. Performance for drop-offs when measured independently was slightly worse. Drop-offs arrived at destinations an average of two and a half minutes past schedule, as shown in the table below.

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61 FASTRAN operated scheduled dialysis transportation on twenty-three weekdays in March 2004. Fourteen days were a Monday, Wednesday or Friday, and nine days were a Tuesday or Thursday. Data in both average performance calculations and frequency distribution calculations has been weighted to represent the larger number of Monday/ Wednesday/Friday routes during the month. Thus, Monday/Wednesday/Friday routes were given a weight of 60.9% (14/23) and Tuesday/Thursday routes were given a weight of 39.1% (9/23).
Table 10.1
FASTRAN’s Weighted Average On-Time Performance

<table>
<thead>
<tr>
<th></th>
<th>Pick-Ups</th>
<th>Drop-Offs</th>
<th>All Routes (Pick-Ups and Drop-Offs Combined)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weighted Monthly Average</td>
<td>½ min early</td>
<td>2 ½ minutes late</td>
<td>½ minute late</td>
</tr>
</tbody>
</table>

The above table shows that on average, FASTRAN is on time or close to on time, but further analysis was required to assess performance. In particular, cumulative averages offer limited insight into arrival patterns. In order to identify patterns, sample data for both pick-ups and drop-offs has been analyzed to determine frequency distribution for arrival times.

Distribution analysis confirms that FASTRAN pickups generally adhere to schedule. Over 50 percent of pick-ups arrived within five minutes (before or after) of their scheduled arrival time, and less than 10 percent of pick-ups arrived more than 10 minutes late. In addition to confirming schedule adherence, distribution data for pickups also indicate that early arrivals (e.g. a pick-up that arrives more than 15 minutes early) are not skewing the cumulative pickup average.

Chart 10.1
FASTRAN On-Time Performance – Pick-Ups

March 2004 FASTRAN Dialysis Pick-Ups: Ahead of Schedule vs. Behind Schedule

<table>
<thead>
<tr>
<th>Minutes Early</th>
<th>% of Pick-Ups</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;15</td>
<td>3.7%</td>
</tr>
<tr>
<td>15-11</td>
<td>8.9%</td>
</tr>
<tr>
<td>10-6</td>
<td>13.1%</td>
</tr>
<tr>
<td>5-0</td>
<td>27.7%</td>
</tr>
<tr>
<td>1-5</td>
<td>26.3%</td>
</tr>
<tr>
<td>6-10</td>
<td>10.5%</td>
</tr>
<tr>
<td>11-15</td>
<td>7.5%</td>
</tr>
<tr>
<td>&gt;15</td>
<td>2.3%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Minutes Late</th>
<th>% of Pick-Ups</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;15</td>
<td>0%</td>
</tr>
<tr>
<td>15-11</td>
<td>0%</td>
</tr>
<tr>
<td>10-6</td>
<td>0%</td>
</tr>
<tr>
<td>5-0</td>
<td>0%</td>
</tr>
<tr>
<td>1-5</td>
<td>0%</td>
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<tr>
<td>6-10</td>
<td>0%</td>
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<tr>
<td>11-15</td>
<td>0%</td>
</tr>
<tr>
<td>&gt;15</td>
<td>0%</td>
</tr>
</tbody>
</table>
FASTRAN on-time performance for drop-offs was not as consistent as its on-time performance for pick-ups. While almost half of drop-offs arrived early or within five minutes of their scheduled arrival, 38.6 percent of drop-offs arrived more than 10 minutes behind schedule in March 2004. In comparison, our research indicates that only 9.8 percent of pick-ups arrived more than 10 minutes late during the month.

**Chart 10.2**
**FASTRAN On-Time Performance – Drop-Offs**

This discrepancy cannot be definitively explained, but some potential contributing factors include the following: Non-dialysis FASTRAN services are provided on the same routes that serve dialysis clients, so it is possible that these other services may be delaying delivery of dialysis clients; and/or dialysis clients, particularly non-ambulatory clients (21 percent of measured drop-offs), may require extra un-scheduled time for loading. Data in this study focused on platform (bus) arrival times. If a bus departed late as a result of client-related loading delay and the delay negatively influenced arrival time at drop-off, the delay would be registered in drop-off data, but not in pick-up data. Further investigation into the cause of drop-off delays by FASTRAN may be warranted.

On the whole, this study’s research indicates that FASTRAN is generally successful in adhering to its schedule. FASTRAN’s dialysis services otherwise meets or exceeds its schedule requirements.
11 Industry Best Practices, Policies and Operations

As described in detail above, FASTRAN is faced with a serious dilemma as it relates to the service it provides to dialysis patients. Specifically, regional and local trends indicate that the demand for dialysis transportation will continue to grow in the future. To date, there are no indications that FASTRAN’s budget will be increased to offset the rising cost associated with providing more services. Further, the revenue generated through fares collected from this group of riders does not cover the cost of providing the services the riders utilize. This combination of circumstances serves to create a situation wherein FASTRAN must find a way to provide more services with relatively fewer financial resources.

Other than allowing the quality of service to deteriorate with the increase in clients, there are two potential solutions to FASTRAN’s problems as they relate to providing transportation services to dialysis patients. FASTRAN may either implement policies designed to increase operating efficiencies and reduce the cost of providing the service, or it may develop policies and practices that serve to generate more revenues to cover the growing costs. A third possibility is to do some of each; i.e., create efficiencies that lead to cost reductions while looking for innovative ways to increase revenues. In implementing any change, FASTRAN should, of course, be mindful of the possible negative impact on its ridership.

11.1 Methods Designed to Increase Operational Efficiency

The following are generally accepted industry best practices designed to maximize operational efficiency. In some cases FASTRAN is either already using the methods described here or is actively pursuing their implementation; however, many of these methodologies have not been implemented by FASTRAN to date, for various reasons.

11.1.1 Dispatch-Driver Communications

One of the most obvious operational challenges FASTRAN faces is communications. As noted earlier, drivers do not have the ability to dependably communicate with FASTRAN dispatchers while enroute. This hindrance prohibits flexibility with respect to re-routing vehicles in the event of an unforeseen incident or schedule change. FASTRAN management is well aware of the inefficiencies caused by this situation and has repeatedly attempted to procure funding to address this challenge. Management is optimistic that resources will be identified in the future for both voice and data communications. The incorporation of these and other technologies into FASTRAN operations would benefit both the organization and its riders.

11.1.2 Implementation of New Technology

FASTRAN may be able to increase operational efficiency by employing new, cutting-edge transportation technologies. In most cases, this option will necessarily increase operating costs in the short-term. In implementing new technologies, all planning related to equipment life cycle replacement should have a long-range focus. Changes should be made only if cost studies forecast significant savings within a pre-determined window of time. In addition to its recently implemented computer-assisted reservation, trip-routing and scheduling system, FASTRAN could employ Automated Vehicle Location (AVL) technology and use Mobile Data-Terminals (MDT) in fleet vehicles. Emphasis should be placed on the development of an “enterprise-wide” integration of the selected scheduling, reservation, and routing software so that system data may be analyzed in an effort
to identify existing inefficiencies and improve operations. Howard Ende, Vice President, Paratransit Division, NYC Transit, has said that New York is “continually reoptimizing its route schedules from four days up to one day prior to the ride,” and that, “The closer we get to [allowing scheduling] up to the day of service, the more productive we'll be.”\(^2\) In the New York case, for example, riders are able to send cancel requests via e-mail.

FASTRAN may choose to explore the feasibility of adopting any of several technology enhancements to improve its operational efficiency and reduce costs of providing service to not only dialysis clients, but to all FASTRAN riders. One such technology is the Automated Vehicle Location (AVL) system, which allows transport providers to be more demand-responsive. This is accomplished primarily through the provision of a real-time picture of field operations to dispatchers, which allows for coordinated and centralized navigation planning, which in turn improves drivers’ schedule adherence. AVL technology can also be used to provide FASTRAN clientele with updates regarding their bus route schedule and bus availability. This study indicates that FASTRAN trips are cancelled or otherwise affected by schedule changes 24% of the time. The high number of trip changes indicates that benefits to FASTRAN from the use of AVL and other technologies may be considerable. Another benefit of AVL is that as AVL use increases efficiency, the number of required street supervisors, dispatchers and other support staff may decrease.

AVL implementation involves, among other things, replacing aging radio systems with Mobile Data-Terminals, which serves to reduce voice traffic and cut down the number of lost calls.\(^3\) While either MDTs or AVL systems may be used separately, they are best used in concert. Vehicle operators must have constant information and communications with the central dispatching office for AVL to be of best use to them. Without the MDTs, they cannot receive the full AVL picture. As stand-alone systems, AVL or MDTs become primarily passive without actively enabling the full benefits of either to surface. MDTs should serve as the drivers’ link to the system, and can be used to process passenger and vehicle information in real-time, performing tasks such as automatic passenger counting, automated fare collection/payment and vehicle component monitoring.\(^4\) Another technology regularly integrated with AVL as part of enterprise-wide communication systems is computer-aided dispatching software, which stores and manages routing, vehicle, and passenger data. FASTRAN has recently begun the use of TRAPEZE computer-aided dispatching software (but without full implementation of all available functions at this time). Integrating new AVL and MDT systems with the dispatching software could improve FASTRAN’s operational efficiency.

11.1.3 Grouping Dialysis Trips by Patient Location and Time

Shifts at dialysis centers could be scheduled with greater consideration for coordinated transportation. Shift scheduling based in part on patient location could increase efficiency for transportation providers. Perhaps trips of other riders could be scheduled to coincide with those of dialysis patients. For example, trips to centers for seniors or the mentally disabled could be


\(^4\) Ibid.
coordinated with trips to proximate dialysis centers. By comparing passenger shift times and routings, coordinated scheduling could be attempted for two or more dialysis centers in the same area. Dialysis centers could aid the transportation planning process by giving shift-scheduling priority to transit riders over those with more transportation options. FASTRAN already makes concerted efforts to group trips where possible. However, because FASTRAN often has no input with respect to their clients’ transportation scheduling decisions, a high level of efficiency remains out of reach. While scheduling all patients requiring public transportation on certain days and/or shifts is not currently practical, it is a model worth studying and may provide a template for long-term shift planning.

11.1.4 Establishing Limits on Trip Length for Dialysis Patients (Zones)

A system of geographical zones could be created within FASTRAN’s service area. This zoning structure may require that a FASTRAN dialysis patient use, to the extent practicable, a dialysis center located only within his or her own zone or a neighboring zone. This model would likely shorten dialysis trip lengths for some patients, which would decrease costs of providing the service. According to the survey results, 27 percent of surveyed patients do not use the dialysis facility closest to their pick-up point. Reducing the trip length for that portion of the dialysis patient pool may have a substantial impact on FASTRAN’s costs.

Rather than refusing service to patients who request out-of-zone transport, a schedule of graduated fare increases could be created for out-of-zone trips. However, as patients’ choice of center is influenced by factors other than transportation options, such as doctor preference, treatment center amenities, insurance requirements, etc., FASTRAN must place heavy consideration on patients’ ability to pay service premiums before implementing a zone system.

11.1.5 Patient Responsibility Definition and User Education

It is important that riders are aware of their “patient responsibilities” when using a transit service. Good policy includes making clear where service begins and ends from the beginning of the client-provider relationship. Riders should be made aware of any deviation from schedule (time) that is considered to be normal and acceptable. Riders must also be made accountable for any of their actions that lead to degeneration of the overall service offered by the provider. For example, riders should be responsible for notifying transit providers when scheduling changes are necessary. Most people are upset when their bus is “late,” but not everyone realizes that their no-show will often cause a similar problem for other users on their route. Additionally, riders should understand their financial responsibilities, including, for example, required payments for no-shows. While this survey provided no evidence of a lack of patient responsibility awareness, this inexpensive precaution is worth noting.

11.1.6 Location of New Facilities in Consultation with Transportation Service Providers

Dialysis providers should be made aware that transportation problems might be created by inefficient facility location. Though in some cases the parent companies of dialysis centers they may not have total control over where their facility is located (due to zoning restrictions, for example), it is important that they are cognizant of transit and paratransit availability, and the constraints that exist on those services. Further, ownership groups would ideally strive to become involved in, or at least aware of, the transit planning process. Access problems may be
created for center clients by the centers themselves in cases where transportation system requirements are not considered in facility location decisions.

Health care centers should also be aware of the spatial requirements of transit providers. Physical impediments may interfere with fluid transportation service. For example, less than ideal bus turn-around space or low overpass heights may cause problems in accessing a facility. If a bus turn-around is located more than a few steps from the facility front door, the stop time at that facility will be unnecessarily long. While these considerations may seem too obvious to mention, they are not infrequently problematic.\(^{65}\)

### 11.2 Methods Designed to Increase Revenues and/or Decrease Costs

The following are generally accepted industry best practices designed to reduce operating costs or increase revenues associated with providing transit services. In some cases FASTRAN is either already using the methods described here or is actively pursuing their implementation, however, many of these methodologies have not been utilized by FASTRAN to date, for various reasons.

#### 11.2.1 Creating Graduated Fare Structure Based on Trip Length

FASTRAN could implement a fare policy wherein clients are charged more for trips to centers outside the zone in which their residence/workplace is situated. This structure would be part of the geographical zone model discussed above. In this model, clients would incur additional charges as they cross through pre-determined zones en route. A financial arrangement between dialysis centers and FASTRAN could be reached for transportation of patients to out-of-zone centers. FASTRAN should be sensitive to patients’ ability to pay in implementing such a policy.

#### 11.2.2 Premium Services

FASTRAN could create a special rate for its non-ADA required services. The ADA allows for a value-added fee structure and many agencies currently make use of one. Examples of such services include charging fees for “extra” trips on a per-week or per-month basis, and charging a fee for the curb-to-curb service required by ADA, for riders without disabilities. The goal of this model is to offer services that increase revenue with no corresponding cost increase to FASTRAN.

#### 11.2.3 Cost-Sharing between Dialysis Centers and Transportation Providers

The establishment of a special agreement between dialysis centers and transportation providers may be explored. The goal of such an arrangement would be to create a win-win situation for plan participants. Specifically, patients of member centers may receive special transportation benefits and privileges not available to non-member centers. A reservation

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\(^{65}\) Jessica McCann, “Medical Transportation: Toolkit and Best Practices,” ed., Scott Bogren, *Washington, D.C.: Community Transportation Association of America (CTAA)*, (2001), 1-188. “A transportation provider in New York provided trips for a certain dialysis center for years. When the center moved, a nearby low overpass prevented transit vehicles from approaching the center. Many regular patients had no way of accessing the center.”
hotline, onsite standing order reservations, and first-in-line priority are some of the benefits that may be offered to the dialysis centers as an incentive.

There are examples of such relationships from which FASTRAN and local dialysis centers may draw a framework. Specifically, “The paratransit provider in St. Louis has a contractual agreement with at least fifteen dialysis centers in which the centers pay the portion of the trip cost above what is reimbursed by Medicaid.” In Baltimore County, Maryland, CountyRide receives $6.25 for each one-way trip to fifteen local hospitals, from the hospitals involved. “The hospital clients also must pay regular CountyRide fares, but are guaranteed rides on a subscription basis. Clients going to other CountyRide destinations cannot guarantee rides using subscriptions.”

11.2.4 Increased Revenue from Other FASTRAN Users’ Associations

FASTRAN may wish to conduct or commission studies to evaluate the extent to which dialysis and other patient funding is being utilized. FASTRAN’s diverse ridership may provide an opportunity acquire funds from a wide variety of government and non-profit organizations. FASTRAN may look into auditing their current group of funding sources to determine whether any currently neglected funding sources are available.

11.2.5 Capital Planning and Government Funding

There may be room for the Metropolitan Washington Council of Governments (COG) short and long-range plans and/or the Virginia Transportation Improvement Plan to include funding structures designed to supplement FASTRAN’s capital budget (replacement of vehicles, etc.). TEA-21 reauthorization, the federal, multi-year funding bill for transportation, may be finalized with proposed dedicated funding for ADA paratransit intact. FASTRAN should make efforts in concert with other local transit organizations to take full advantage of any and all available funding. Additionally, FASTRAN should determine whether it is fully using the Federal Transportation Administration (FTA) program that was designed to meet the special transportation needs of the elderly and persons with disabilities (80 percent Federal aid with 20 percent local funding).

11.2.6 Advertising

A review of the literature indicates that vehicular advertising (mobile media) in paratransit is an untested idea, although it is widely used in general-purpose bus services. While FASTRAN vehicles do not currently carry any form of external or internal advertising, FASTRAN may wish to explore the possibility such advertising as a means to enhance its revenues.

Advertising agencies and their clients recognize the effectiveness of advertiser coverage via bus or van-side mobile billboards. Such displays can offer either broad or extremely targeted

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67 Ibid, 106.
69 For example, Fairfax County’s Fairfax Connector buses currently carry exterior advertisements.
outdoor messaging solutions designed to reach consumers. Transit service providers are visible at all hours, and particularly during rush hour.

Every road in Fairfax County has a consumer population associated with it. Whether a city street, suburban roadway or interstate highway, all types of transportation arteries have potential advertising viewers. In particular, since FASTRAN buses travel on populated streets in commercial and residential areas, an advertiser’s potential audience expands simply as a result of the buses’ repetitive circulation.

In a 2001 Arbitron Inc. Outdoor Study,\textsuperscript{70} drivers reported that, on average, they traveled 302 vehicle-miles (based on their most recent seven day experience.) Not surprisingly, much of this travel was devoted to traveling to and from work, with an average daily round-trip commute of 54 minutes. The study indicated that pedestrian traffic has also increased. According to the study, media that target vehicle drivers and passengers reaches 96 percent of Americans weekly and outdoor media that target pedestrian traffic reaches 79 percent weekly. These findings are especially important because of the inverse correlation between time spent traveling and exposure to other forms of local media.

The primary value of paratransit advertising is simple: FASTRAN buses go where people go; where they live, work, shop, and, finally, where they go for dialysis.

\textbf{11.2.7 Home Dialysis}

Hemodialysis may be performed at a patient’s home. In fact, “approximately 1.5 percent of patients nationwide perform home hemodialysis.”\textsuperscript{71} In such cases, the patient, with aid from a trained assistant, is responsible for his or her own care. Whether friend, relative, or compensated caregiver the assistant must complete an eight-week-long home dialysis training program in order to be deemed competent to administer the treatment. The dialysis machine, reverse osmosis equipment (a component of the water treatment system), dialysis chair and all supplies necessary to perform the dialysis are covered by Medicare and by most insurance companies. However, the patient must pay the costs for an assistant. Enrolling more patients in home dialysis would obviously decrease the number of patients needing transport.

It should be noted, however, that the costs of hemodialysis are greater than the combined dialysis center/FASTRAN cost at this time. Hemodialysis has not been fully developed and costs may decrease in the future, and if demand continues to grow for demand-responsive services and FASTRAN or other providers are unable to meet them, hemodialysis may become a more viable option.

Mobile Dialysis is an intriguing new concept that brings all the necessary dialysis equipment to the patient’s home. This system would carry an assistant and the required equipment to the area of need instead of to a fixed location. At the time of printing, “there are no mobile dialysis units in existence.”\textsuperscript{72} Obviously this technology would not eliminate the need for

\textsuperscript{70} “Roadmark: Truck Advertising, Bus Advertising and Other Mobile Media – Fleet Advertising Works,” \url{http://www.roadmarkinc.com/}.


\textsuperscript{72} Ibid.
transportation. It would, however, redefine the patient-treatment provider-transportation provider relationship.

11.2.8 Patient Prioritization

Paratransit operators have imposed eligibility requirements for their riders, requiring pre-applications, in-person interviews, and testing, with the goal of limiting services to those meeting ADA standards. Those capable of using alternate services have been allocated to other providers. One working example of this kind of arrangement is in the Seattle area. Though King County Metro Transit had to absorb a $200 per person cost for the required in-person visits for physical and cognitive evaluations, the cost was more than offset by the reduction in the per-year expense associated with providing its overall services.\(^{73}\)

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12 Findings

Below is a summary of the findings resulting from our research and analysis. In reading these findings, and the recommendations that follow, the reader should keep in mind that there are a number of statutory, regulatory, and structural constraints that limit the ability of paratransit service providers such as FASTRAN to conduct their operations in what would otherwise be the most efficient manner. Some of these constraints are:

HIPAA: Issues of Security and Privacy of Health Information

HIPAA, The Health Insurance Portability and Accountability Act of 1996, requires, among other things, the security and privacy of health information. Healthcare providers must review the requirements of this statute and exercise strict compliance. This statute has altered healthcare providers’ ability to convey detailed patient-specific information that may be useful to FASTRAN.

Americans with Disabilities Act

The Americans with Disabilities Act of 1990 prohibits, among other things, state and local governments from discriminating against individuals with disabilities in a wide range of areas. Title II, Public Services, includes Section 223: Paratransit as a complement to fixed route service. This regulation provides that it is considered discrimination for a public entity that operates a fixed route system to fail to provide paratransit and other special transportation services to individuals with disabilities, to the extent practicable, to the level of designated public transportation services provided to individuals without disabilities using such system. The ADA provides detailed policies outlining requirements applicable to public entities in avoiding discrimination in the case of the disabled.

Dialysis Industry Structure and Facility Location

Renal care is a very specialized field, with large, oftentimes international or multi-national for-profit firms, taking the lead in providing the care for patients in need of dialysis. Interaction of these major corporations within Fairfax County with FASTRAN appears minimal. In addition, new dialysis centers are located or opened where demand for service is determined and county zoning permits the facility to be built. FASTRAN has no input into these locational decisions, and thus cannot make future plans based on a knowledge of what specific centers it will need to serve (although it could provide dialysis centers, and their corporate parents, with information they might otherwise not have about dialysis transportation in the County).

Insurance

Insurance companies enter into contractual relationships with physicians and other health care providers such as dialysis centers apparently without regard to transportation considerations. Insurance companies may not cover a dialysis patient’s treatments at a facility not in the insurance company’s provider network. This means that a patient may be required to travel farther from home or work to receive treatment at a dialysis center with a contractual relationship with the patient’s insurance provider, and
that FASTRAN must transport the patient farther than is necessary from a purely geographic point of view.

**Physician/patient relationship**

Patients generally wish to keep their current physicians. Physicians, like insurance companies, have relationships with medical treatment facilities including dialysis centers, and therefore their patients may choose centers that are not the closest to their residences, but where their physician has privileges, resulting, again, in FASTRAN needing to transport these patients farther than is optimal.

**Patient Preferences**

Some patients prefer to have dialysis Monday, Wednesday and Friday at the first shift while others prefer the evening shift on the same days. Usually, the Tuesday, Thursday and Saturday dialysis times are less desirable. These preferences impact FASTRAN scheduling as patients attempt to reschedule their treatments to more preferred shifts over time. As FASTRAN has no say in the rescheduling process, it makes it difficult for FASTRAN to group patients traveling from the same area to the same center, and to maintain groupings that are possible and practical.

**Social Worker Transportation Knowledge**

Social workers prioritize the patient’s needs when helping to set up dialysis outside the hospital. Considerations include: insurance coverage, proximity to home, work or school, physician preferences, dialysis chair availability, and transportation. However, the scheduling and operational challenges facing FASTRAN and other transportation service providers are likely unknown to social workers and social worker decisions are thus often not made with these challenges in mind.

**Driver Training and Qualifications**

Driver training and qualifications are well-defined issues in paratransit transport. FASTRAN specifies training and qualification requirements in each of its two contracts with private partners for the provision of drivers. While this situation may, in practice, have only a minimal potential for constraining FASTRAN’s operations, it is an important aspect of the system and merits close attention and periodic review so that FASTRAN can be assured that the levels of training and qualifications of its drivers (for example, whether they have had CPR training) are consistent with legal and regulatory requirements and consistent with the needs of its paratransit riders.

**12.1 Relevancy of Ocean Ride Experience to that of FASTRAN**

In 2003, Ocean County, NJ Department of Transportation and Vehicle Services conducted a similar study on transportation for senior dialysis patients. Although the Ocean County study is similar to this study in terms of its goal of improving the transportation options for senior dialysis patients, there are important differences between the two regions and the transportation providers that serve the respective communities that make the Ocean County study of limited usefulness in making recommendations for FASTRAN in Fairfax County.
There are notable demographic differences between Ocean County, New Jersey and Fairfax County. The first is that Fairfax County is one of the largest (in terms of population) and richest counties in the nation. This is due in part to Fairfax County’s being part of the Washington D.C. metropolitan area, which is the seventh largest metropolitan area in the country. In contrast, Ocean County is largely rural containing several areas that are suburban in character. The second notable difference is in the population make up of each jurisdiction. Only nine percent of Fairfax County’s population is over the age of 65, in comparison with 27 percent of Ocean County residents over the age of 60.

Finally, the dialysis market in Metropolitan Washington, D.C. appears to differ somewhat from that in Ocean County, New Jersey. The large corporations mentioned earlier own and operate the centers in Fairfax County, while in Ocean County many of the centers are still privately owned. That is changing, however, and newer clinics are being opened by large entities such as Renal CarePartners.  

12.2 Profile of Dialysis Patients

The social worker is typically the primary medical employee aiding dialysis patients in arranging for long-term dialysis treatments. There are four essential issues considered in arranging dialysis treatments: residence/work site of patient, patient insurance coverage, patient physician’s association with centers, and transportation. These are all critical elements to every dialysis patient. However, the first three are often more firmly established factors, typically in place prior to addressing the issue of transportation. The transportation element is very important to the patient but it is frequently perceived as the most flexible. Dialysis treatment consumes four to six hours of a patient’s day three times a week. This is a sizeable portion of his or her everyday life and the more options that can be provided to a patient, the better he or she will be able to adapt to and manage this treatment.

12.3 On-Time Performance

In order to examine the on-time performance of FASTRAN dialysis transportation services, researchers collected sample data from scheduled FASTRAN dialysis patient pick-ups and drop-offs for standing-order trips in March 2004. On average FASTRAN buses arrived at their scheduled stops less than a minute past their scheduled arrival time when both pick-ups and drop-offs were measured. When pick-ups and drop-offs were measured independently, the average arrival time for pick-ups was almost exactly on-schedule, and drop-offs arrived an average of two and a half minutes past schedule.

FASTRAN is on time or close to on time for a majority of its scheduled dialysis services, but further analysis was conducted to further assess performance. Sample data for both pick-ups and drop-offs was analyzed to determine frequency distribution of actual arrival times relative to scheduled arrival times. Distribution analysis confirmed that FASTRAN pick-ups overwhelmingly adhere to schedule. Over 50 percent of pick-ups arrived within five minutes of scheduled arrival time, and less than 10 percent of pick-ups arrived more than 10 minutes late. While the majority of drop-offs arrived early or within five minutes of their scheduled arrival, an

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74 Multisystems, op. cit., 48.
estimated 38.6 percent of drop-offs arrived more than 10 minutes behind schedule. In comparison, only 9.8 percent of pick-ups arrived more than 10 minutes late.

On the whole, this study’s research indicates that FASTRAN is generally successful in adhering to its schedule. Further attention to arriving at drop-offs on schedule may be desired, but FASTRAN’s dialysis services otherwise meets or exceeds its schedule requirements.

It must be noted that the analysis of on-time performance is severely hindered by FASTRAN’s current record-keeping procedures. Specifically, pick-up and drop-off times are manually recorded in hard-copy driver manifests and stored at FASTRAN’s offices in a filing system that is not conducive to expedient data analysis. Data must be manually transcribed from the manifest sheets before they can be analyzed. Analysis of individual route performance and individual client performance, and the preparation of monthly or weekly on-time performance reports are not readily producible because of the laborious processes required.

12.4 Land Zoning

In the debate on how to improve patient transportation to renal care centers, land zoning can play an essential role. Patterns of development in Fairfax County change continually, as Fairfax strives to optimize land-use patterns. The County ultimately has control over what kind of structures can be built, where, when, and by whom they may be constructed.

Transportation planners are increasingly cognizant of the impact of land-use patterns on transportation behavior. Recently developed policy deals with transportation problems through intervention in land-use and development. For example, mixed-use development (co-locating residential and commercial development) is viewed as a means to alter existing land-use to reflect a greater mix of complementary uses, thereby reducing vehicle-trip demand without reducing person-trip demand. Similarly, infill development is regarded as a means through which to maximize use of transportation modes such as public transit by making them more convenient to more users.

While dialysis center owners may be unaware of the implications of their location decisions on transportation service providers’ operations, they are surely aware of land zoning policies in areas they plan to build facilities. It may be necessary for county planners to change land-zoning patterns in order to accommodate the need of transportation providers to optimize their operations by dictating renal care center location.

The rezoning process in Fairfax County consists of a detailed review and analysis of any rezoning proposal by staff, the Fairfax County Planning Commission (PC), and the Fairfax County Board of Supervisors (BOS). Any owner or contract purchaser of land in Fairfax County may apply for a rezoning. The process begins by filing an application with the zoning evaluation division of the Department of Planning and Zoning (DPZ). An application must meet the submission requirements of the Zoning Ordinance, including submission of a development plan that depicts the general design and layout of the proposed development. Currently dialysis centers are evaluated on a case-by-case basis.
13 Recommendations

Below are several recommendations to FASTRAN, dialysis center owners, dialysis facility managers, social workers, and nephrologists. If implemented, these recommendations could enable FASTRAN to improve its operational efficiency while at the same time better serve its dialysis patient clientele.

13.1 Coordinated Patient Scheduling

One way to achieve operational efficiency is to make transportation a more heavily weighted factor in the patient-center assignment process. Dialysis centers could coordinate more closely with FASTRAN in arranging trip scheduling that incorporates grouping of patients by location and dialysis treatment shifts (especially as the centers add on “shoulder” shifts at non-traditional times).

Another way to improve efficiency would be by implementing a more formalized transportation planning process, particularly for new patients, with hospital social workers. This could benefit FASTRAN and its clients by assuring the patient there will be transportation options readily available. This may serve to reduce the time patients are reliant on family for transportation in the first several weeks of treatment. For example, by placing patients, where possible, on existing Metrobus and Fairfax Connector bus routes, “Dial-a-Ride” capacity could be opened up for other trip types or to serve more dialysis patients. The range of transportation options are patient specific and would dictate the range of options considered for each patient on a case-by-case basis. Transport service providers should be consulted before changes to dialysis schedule are made in order to ensure there is enough lead-time for the transportation provider to alter service its schedule.

13.2 Coordinated Shift Times

FASTRAN and other paratransit providers could also work with dialysis centers to see if, where feasible, the centers could alter their shift times to more closely meet the paratransit providers’ transportation scheduling needs. As can be seen in Tables 8.1 and 8.2, dialysis centers in Fairfax County currently have a range of start/stop times for their morning, midday, and afternoon shifts. Coordination between and among the centers and transportation providers, and, if possible, hospital social workers and existing patients, could lead to changes in shift times that could substantially improve the efficiency of the transportation providers while not unduly inconveniencing either the dialysis centers or the patients they serve.

13.3 Location of New Dialysis Facilities

When considering alternative locations for new facilities, dialysis providers could pay more careful attention to the transportation options available at those locations. Ideally, new facilities could be placed within walking distance of the existing (non-paratransit) bus system (if one exists), so that using this system is at least an option for some patients. Additionally, since patients tend to follow their doctors, the dialysis providers could look carefully at where the majority of the doctors’ patients reside and attempt to locate facilities close to these patients’ homes. By doing so, the length of trips served by FASTRAN might be shortened, which could allow it to provide more trips with the available capacity.
13.4 Advertising

As discussed in Section 11.2.6 above, selling advertising space on FASTRAN buses, as is now done on Metrobus and Fairfax Connector buses, represents an untapped source of revenue to FASTRAN that could help its financial position. Should FASTRAN opt to make its vehicles available for advertising, strict guidelines and policies must be imposed to assure that message content is appropriate, and that the advertising does not alter the appearance of the FASTRAN buses in a manner that would confuse its riders, in particular those riders with cognitive or other disabilities.

13.5 Land-use planning

Fairfax County planners could be urged to make an effort to implement land zoning restrictions (or incentives) for medical treatment centers such as dialysis facilities in order to ensure that increased transportation demand resulting from future facilities is located along existing public transit corridors, to the extent possible, or near population centers in an effort to reduce the distances FASTRAN must transport dialysis patients.

13.6 Trip-Zoning

As many dialysis patients require more than door-to-door, or even curb-to-curb service, FASTRAN may be able to persuade dialysis patients to accept zoning (i.e., dividing the county into zones and requiring that, in order to be eligible for FASTRAN service, a patient agree to use a dialysis center within the zone in which he or she lives) or other routing and scheduling changes in exchange for improved levels-of-service in the form of providing more physical assistance to riders, particularly after dialysis treatments. As noted earlier (section 8.2.1), patient survey results indicated that 27 percent of respondents choose to receive dialysis treatment at a center that is not the closest to their trip departure point. While this is clearly not the majority of dialysis patients and it is unknown if the center that is closer is significantly closer, it does represent a significant number of individuals. If those who are FASTRAN riders could be persuaded to alter their behavior and receive dialysis treatment at the closest center, it could have a positive effect on FASTRAN’s operations.

13.7 “Incentivizing” Dialysis Centers through Partnering

FASTRAN could offer to partner with one or more centers, giving them enhanced services, such as allowing the participating center’s patients to make trip changes on shorter notice than it would allow patients from non-participating centers. FASTRAN, with its broad, systemwide view of dialysis transportation issues in Fairfax County, could also provide partnered centers with insights that they may not be able to gather elsewhere. These enhanced services could be attractive to centers, given the very competitive nature of the dialysis industry in Fairfax County. In exchange for these benefits, the participating centers would agree to compensate FASTRAN, in a non-monetary fashion, by, for example, agreeing to give FASTRAN’s schedulers advance notice of shift time changes, expansions in existing centers, or the construction of new centers. Centers could also agree to consult with FASTRAN before allowing patients to change their shift day or time, so that changes could be made with a minimum of disruption to FASTRAN’s operations.
13.8 Technology and Communications

FASTRAN could make it a priority to equip its buses with two-way radios, provide its drivers with cellular phones or invest in other communication and vehicle tracking technologies to become more responsive and reactive to the dynamic arena in which it operates. FASTRAN could also explore whether it would be economically feasible to equip its vehicles with electronic scanners that could serve to debit patients’ accounts and track rider attendance.

13.9 Performance Tracking

FASTRAN should implement “complaint cards” or some other system designed to assess customer satisfaction and system performance. Armed with this information, FASTRAN could better assess the impact on its ridership of any changes it makes to its operations in the pursuit of efficiency.

13.10 On-time Performance: Further Examination of Drop-offs

Study findings regarding on-time performance indicate that FASTRAN is generally successful in adhering to its schedule for dialysis services, but the agency should consider undertaking additional analysis to determine the cause of its relatively poorer performance in on time drop-offs as observed in sample data. The discrepancy in performance between pick-ups and drop-offs cannot be immediately explained, but some potential contributing factors merit attention. For example, non-dialysis FASTRAN services are undertaken on the same routes that serve dialysis clients, and particular non-dialysis services or clients may be delaying delivery of dialysis clients. Another potential cause of delay could be that certain dialysis clients, particularly some non-ambulatory clients (21 percent of measured drop-offs), may require extra unscheduled time for loading and thus might negatively influence arrival time at drop-off. FASTRAN currently schedules additional time for non-ambulatory clients, but further analysis could identify exactly which clients regularly need time beyond the period allotted for their loading or unloading. FASTRAN will need to collect further information regarding individual route performance in order to complete the required analyses. However, this type of data is not easily accessible within current FASTRAN records.

13.11 On-time Performance: Electronic Collection of Arrival and Departure Times

Electronic recording and storage of arrival times and departure times would greatly expand FASTRAN’s ability to monitor on-time performance. Electronic collection would allow for expedient analysis of the performance measures and preparation of the reports noted above. Electronic collection would also help FASTRAN identify missing trip documentation. During this study’s data collection, 17 percent of manifests that were selected for analysis were missing from or misplaced within FASTRAN records. Improvement of the accessibility of this data would allow FASTRAN to benefit from additional on-time performance analysis.

For example, London currently tracks and posts a monthly record of all trips and complaints as part of their Taxi Card program. The complaint list is broken down by complaint type (i.e. driver, no-show, late taxi, operator error, route, etc.) and performance is measured regularly. Like FASTRAN, the Taxi Card program is designed for people with mobility impairment and the vehicles are wheelchair accessible.
13.12 Carpooling

FASTRAN could initiate a program whereby it actively encouraged patients to use carpooling when possible between and among patients’ family members. This could ease the burden on FASTRAN (by reducing the number of patients who must rely on FASTRAN services), and could also have the side benefit of creating a buddy system for patients and a support network among their families. This could help improve the quality of life at little cost. Cooperation from social workers would be necessary.

13.13 Patient Education and Patient Responsibility

FASTRAN could implement measures to educate dialysis patients concerning its schedules, procedures, pick-up and drop-off points, and the need for patients to be on time in order to avoid delays for other patients later in the day. FASTRAN could concurrently adopt a penalty system for patients who are consistently not present or not ready at the scheduled pick-up time.

13.14 “Last Resort” Options

The following options are not our primary recommendations to FASTRAN, but rather are intended to identify the sorts of drastic steps that may be necessary in the future if demand for paratransit services continues to outstrip supply, and if other operational changes cannot be incorporated. Before making such changes, FASTRAN or the County should obtain public input, perhaps through public hearings, on which service-limiting measures would cause the least disruption to the affected parties. FASTRAN and/or the County should be mindful that service cutbacks, if not properly managed, could result in some patients being unable to get to their dialysis centers for treatment.

13.14.1 Trip Limitations

FASTRAN could place a limit on the number of trips offered on a per week basis, in order to reduce unnecessary rides, thereby freeing space for other essential services. Baltimore County’s CountyRide paratransit service limits its passengers to a maximum number of trips per week, which has the effect of forcing its clients to prioritize their use of paratransit services. CountyRide also limits the number of demand-responsive trips per patient per week in order to dedicate more equipment and personnel to standing order (regularly scheduled) trip service. CountyRide’s program, which was designed for all hospital trips, only allows two round trips per week per rider, but allows three per week for members of its hospital partnership program.76 If this policy were to be implemented by FASTRAN, allowances would need to be made for the indigent (but even in such cases FASTRAN could serve only as a last resort provider; i.e. other nonprofit groups should first be explored by the clients’ social workers).

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76 “Community Transportation Association: Current Practices of CountyRide, Towson, Maryland,”
http://www.ctaa.org/ntrc/medical/practices/md_countyride.asp. Under this program, certain hospitals contribute to the costs of CountyRide’s services.
### 13.14.2 Need-Based Patient Prioritization

In the event that FASTRAN is not able to keep pace with future transportation demand, it could establish eligibility requirements for FASTRAN riders, of the kind implemented by King County Metro in Seattle and discussed in Section 11.2.8.

### 13.15 Impact Assessment

Table 13.1 below includes all recommendations made in this report, along with an assessment of the impact of each recommendation on the various stakeholders.

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Criteria (FASTRAN/Fairfax County)</th>
<th>Cost (FASTRAN/Fairfax County)</th>
<th>Convenience (Patient)</th>
<th>Treatment Effectiveness (Patient/Center)</th>
<th>Facility Utilization (Center)</th>
</tr>
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<tbody>
<tr>
<td>Trip Grouping</td>
<td>+</td>
<td>-</td>
<td>0</td>
<td>+/-</td>
<td>+/-.</td>
</tr>
<tr>
<td>Shift Times</td>
<td>+</td>
<td>+/-</td>
<td>0</td>
<td>+</td>
<td>+/-</td>
</tr>
<tr>
<td>Facility Location Planning</td>
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<td>+</td>
<td>0</td>
<td>+</td>
<td>+/-</td>
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<tr>
<td>Advertising</td>
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<td>0</td>
<td>0</td>
<td></td>
<td>0</td>
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<tr>
<td>Land Zoning</td>
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<td>+/-</td>
<td>0</td>
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<td>+/-.</td>
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<tr>
<td>Trip Zoning</td>
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<td>-</td>
<td>0</td>
<td>+/-</td>
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<tr>
<td>“Incentivizing”</td>
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<td>+/-</td>
<td>0</td>
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<td>+/-.</td>
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<tr>
<td>Updated Vehicle Technology</td>
<td>+/-</td>
<td>+</td>
<td>+</td>
<td>0</td>
<td></td>
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<tr>
<td>Upgraded Customer Satisfaction Tracking</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>0</td>
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<tr>
<td>Upgraded On-Time Performance Tracking</td>
<td>+/-</td>
<td>+</td>
<td>+</td>
<td>0</td>
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<tr>
<td>Car Pooling</td>
<td>+</td>
<td>+/-</td>
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<tr>
<td>Patient Education</td>
<td>+/-</td>
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<tr>
<td>Trip Limitations</td>
<td>+</td>
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<tr>
<td>Patient Prioritization</td>
<td>+</td>
<td>+/-</td>
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#### Key

<table>
<thead>
<tr>
<th>+</th>
<th>Positive Impact</th>
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<td>-</td>
<td>Negative Impact</td>
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<tr>
<td>0</td>
<td>Neutral Impact</td>
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<tr>
<td>+/-</td>
<td>Mixed Impact</td>
</tr>
</tbody>
</table>
APPENDIX A

Interview Questions Asked of:

I. Directors of Dialysis Centers

How many patients do you have in each shift?

What is their breakdown according to residence?

Is there a waiting list?

Are the operating hours adequate (how many shifts/days per week)?

Are shifts/days coordinated with other centers?

How strict is the policy of adhering to the predetermined shift schedule?

Does your facility/company have any plans to construct or acquire any new treatment facilities in Fairfax County? If yes, has patient transportation been considered?

Do insurance provider/social worker/nephrologists/patient home location/patient preference affect decisions about placement and/or scheduling?

Does patient transportation affect current procedures and if so, how?

You are a for-profit organization. Have you ever considered making a bona fide charitable contribution to FASTRAN (provided that it would not constitute a violation of applicable laws or regulations)?

II. Hospital Social Workers

What are the determining factors, and their priority, in choosing transportation for dialysis patients?

What are the determining factors, and their priority, in choosing centers?

Is transportation mode an important consideration for the patient(s)?

What knowledge do social workers have of transportation options? Preferences?

What role does insurance/Medicare/Medicaid have in transportation decisions?
III. Nephrologists

1. When patients are beginning dialysis treatment, what are your primary concerns?

2. When you first discuss dialysis treatment with patients, how informed are they regarding dialysis centers?

3. Do you recommend your patients to specific dialysis centers? If so, what are the major issues or considerations on which your recommendation is based?

4. Does the quality of care vary between dialysis centers?

5. Is transportation for dialysis patients a consideration for you?

6. How many choices of dialysis centers might a patient have when beginning treatment?

7. If a patient requests a specific center, are there reasons why they might not be able to use the site they request?

8. How much do you rely on the social worker to address the transportation needs of your patients?
APPENDIX B

Survey of Dialysis Facilities
Operating Within Fairfax County

Contact Person:
Name of Facility:
Mailing Address:
    Telephone #:                             FAX #:

Current Facility Characteristics

1. Number of Chairs:

2. How long has your facility been in operation?

3. Please show the distribution of your patient load.

<table>
<thead>
<tr>
<th>Shift Time (ex. 6:00am-10:00am)</th>
<th>Employees per shift</th>
<th>Ambulatory Patients</th>
<th># Patients using wheelchairs or scooters</th>
<th>Total Patients</th>
<th>*Avg. Attendance Rate</th>
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</thead>
<tbody>
<tr>
<td>1.</td>
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<td>4.</td>
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<td>Total</td>
<td></td>
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</table>

Current Shift Time Summary and Patient Characteristics

Tuesday/Thursday/Saturday

<table>
<thead>
<tr>
<th>Shift Time (ex. 6:00am-10:00am)</th>
<th>Employees per shift</th>
<th>Ambulatory Patients</th>
<th># Patients using wheelchairs or scooters</th>
<th>Total Patients</th>
<th>*Avg. Attendance Rate</th>
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<td>Total</td>
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</tbody>
</table>

*Percentage of dialysis appointments missed
4. How many patients do you have on a waiting list for your facility?

5. Provide a breakdown of current Fairfax County patients according to home zip code of residence.

<table>
<thead>
<tr>
<th>Zip Code of Residence</th>
<th>#</th>
<th>Zip Code of Residence</th>
<th>#</th>
<th>Zip Code of Residence</th>
<th>#</th>
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</table>

6. Does your facility have any specific plans to add treatment days or operating times?

☐ Yes  ☐ No  ☐ Unknown

If yes, please identify the specific operating times.

7. Are there any changes anticipated in the current treatment schedules that may impact the provision of transportation service (e.g. duration/length, frequency of treatment-number of days/weeks, etc.)?

8. Does your facility have any specific plans to construct or acquire any new treatment facilities in Fairfax County?

☐ Yes  ☐ No  ☐ Unknown

If yes, provide a specific location, anticipated patient capacity, and an anticipated timeline for facility opening.

9. Of your current patient population, how many are covered by:

   Medicaid -
   Medicare -
   Private Insurance -
10. Please describe any impacts caused by insurance providers that affect decisions about placement and/or scheduling of dialysis treatment consumers?

11. Please indicate any transportation providers you work with to arrange transportation for patients besides Fastran (e.g. private taxi, volunteer organizations, etc.)?

12. Approximately, how much money does it cost your center annually to cover the costs of late or no-show rides from transportation providers? (e.g. overtime to staff that have to wait with patients who are waiting for rides)

Comments/Recommendations:

Thank you for taking the time to complete this questionnaire. We are working to improve transportation services for patients who receive dialysis, and appreciate your help.

Please return no later than March 12, 2004 to:

(name omitted)
February 5, 2004
Re: George Mason University Evaluation of FASTRAN Dialysis Transport
To Whom It May Concern:

George Mason University’s School of Public Policy is conducting an evaluation of the dialysis transport services that are provided by FASTRAN under the Critical Medical Care Program. This evaluation is a semester-long research project conducted by students in George Mason’s Transportation Policy, Operations & Logistics (TPOL) program. The evaluation began in mid-January and will continue until May 15.

As part of the evaluation, George Mason is investigating several subjects associated with FASTRAN dialysis transport. The project is examining the effectiveness and efficiency of FASTRAN’s current services from both institutional and customer viewpoints; it is attempting to make an estimate of future demand for dialysis transportation services in Fairfax; and it is examining the feasibility of new service models for FASTRAN’s dialysis transport.

This letter authenticates the participation of the following students in the project:

Washington H. Carlisle
Peter K. Gremer
Anthony Gibson
George Janek
Kasondra K. Johnston
James E. Mock
Debra J. Moore
Regina S. Moore
Robert Mulolland
Brian M. Powell
Jerome E. Pryuns
Timothy E. Reilly
Clara A. Reschovsky
Jennifer D. Salyers
Lonnie Tebow
George L. Wellington

Each of these students has signed a confidentiality agreement pledging not to use, discuss, disseminate, or otherwise distribute confidential records or information, including protected health information (PHI) records that are subject to strict confidentiality requirements imposed by state and federal law including HIPAA – 42 USC 201, et seq., and 45 CFR Parts 160 and 164; and (2) Va Code – Title 32.1, Health, § 32.1-1 et seq.

Your cooperation with these research efforts would be deeply appreciated. If you have any questions, please feel free to contact either of us.

Sincerely,

[Signatures]

Steve Yaffe
Planning Manager
FASTRAN Division
Fairfax County Department of Community and Recreation Services
703-324-7075
steven.yaffe@fairfaxcounty.gov

Jonathan Gilford
Associate Professor and Director
Master of Transportation Policy, Operations & Logistics
School of Public Policy
George Mason University
703-993-2278
gilford@gmu.edu
APPENDIX D

Dialysis Patient Survey

1.) SEX:  
  □ MALE  
  □ FEMALE

2.) AGE:  
  □ UNDER 20  
  □ 21-40  
  □ 41-60  
  □ 60-70  
  □ 70+

3.) WHERE DO YOU TYPICALLY DEPART FROM WHEN YOU TRAVEL TO DIALYSIS?  
  □ WORK  
  □ HOME  
  □ SCHOOL  
  □ OTHER ____________________________

4.) WHAT LOCATION DO YOU RECEIVE DIALYSIS AT? ____________________

5.) IS THIS THE CLOSEST CENTER TO YOUR DEPARTURE POINT?  
  □ YES  
  □ NO

6.) HOW DO YOU GET TO DIALYSIS? HOW DO YOU TRAVEL FROM DIALYSIS?  
  □ FASTRAN  □ FASTRAN  
  □ METRO  □ METRO  
  □ OTHER MEDICAID VENDOR  □ OTHER MEDICAID VENDOR  
  □ CAB  □ CAB  
  □ DRIVE SELF  □ DRIVE SELF

COMMENT:  ________________________________________________

________________________________________________

7.) WHY DO YOU CHOOSE THIS CENTER? RANK 1-5 (1-MOST IMPORTANT, 5-LEAST IMPORTANT)  
   ______ DOCTOR RECOMMENDATION  
   ______ INSURANCE  
   ______ CONVENIENCE  
   ______ CUSTOMER SERVICE  
   ______ OTHER ____________________________________________

69
8.) HOW OFTEN ARE YOU LATE FOR YOUR DIALYSIS DUE TO TRANSPORTATION PROBLEMS?

☐ FREQUENTLY (OVER 3 TIMES PER MONTH)
☐ SOMETIMES (1-3 TIMES PER MONTH)
☐ NEVER

COMMENT: ______________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________

9.) WHAT IS YOUR RACE?

☐ WHITE
☐ BLACK
☐ HISPANIC
☐ OTHER ______________________________________________________

10.) WHAT IS YOUR ANNUAL INCOME?

☐ BELOW $25,000
☐ $25,000- $49,999
☐ $50,000- $80,000
☐ GREATER THAN $80,000

Thank you for taking the time to complete this questionnaire. We are working to improve transportation services for patients who receive dialysis, and appreciate your help.
APPENDIX E

“Cuestionario para pacientes de Dialysis”

1.) SU SEXO: □ M  □ F

2.) CUANTOS AÑOS TIENE? □ MENOS 20
□ 21-40
□ 41-60
□ 60-70
□ MAS DE 70

3.) DE DONDE LE RECOJEN CUANDO USTED VA A DIALYSIS?
□ TRABAJO
□ CASERO
□ ESCUELA
□ OTRO ________________________________

4.) EN QUE LOCAL USTED RECIBE DIALYSIS? _______________________

5.) ES ESTO EL MAS CERCANO A SU PUNTO DE SALIDA?
□ SI
□ NO

6.) COMO VLAJA A DIALYSIS?  COMO VLAJA DE DIALYSIS?
□ FASTRAN  □ FASTRAN
□ METRO   □ METRO
□ TAXI    □ TAXI
□ OTRO  □ OTRO

COMMENTARIO: _____________________________________
_____________________________________
_____________________________________

7.) PORQUE ELLEGE ESTE CENTRO? USAR NUMEROS 1-5 (1 ES MAS IMPORTANTE , 5 ES MENOS IMPORTANTE)
___ RECOMENDACION DEL DOCTOR
___ SU SEGURO
___ CONVENIENCIA
___ SERVICIO DE CLIENTE
8.) DEBIDO A LOS PROBLEMAS DEL TRANSPORTE. CUANTAS VECES LLEGA TARDE PARA SU DIALYSIS?

☐ SIEMPRE (MAS DE 3 VECES POR MES)
☐ A VECES (1-3 VECES POR MESES)
☐ NUNCA

COMENTARIO: ____________________________________________
________________________________________________________
________________________________________________________
________________________________________________________
________________________________________________________
9.) CUAL ES SU RAZA?

☐ HISPANCO
☐ BLANCO
☐ NEGRO
☐ OTRO

10.) QUE ES SU SALARIO ANNUAL?

☐ MENOS DE $25,000
☐ $25,000 – 49,999
☐ $50,000 – 80,000

Gracias por llenar el cuestionario. Estamos trabajando para mejorar el servicio del transporte para los pacientes que reciben dialisis. Gracias por su ayuda.
Contact Person and Title: ____________________________________________________________

Telephone #: _________________________________ Fax: _______________________

1.) Please estimate trips for dialysis patients in the following table:

<table>
<thead>
<tr>
<th>10</th>
<th>Dialysis Facility</th>
<th>Total number of trips per day – April 2003</th>
<th>Total number of trips per day – October 2003</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fairfax Dialysis (Dialysis 1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>8316 Arlington Boulevard Suite 104, Fairfax, VA 22031</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fresinius Dialysis (Dialysis 2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4141 Duke Street, Alexandria, VA 22304</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Continental Dialysis of Springfield (Dialysis 3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>8350A Traford Lane, Springfield, VA 22152</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>BMA of Sterling (Dialysis 4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>45662 Terminal Drive, Suite B, Sterling, VA 20166</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Davita Dialysis (Dialysis 5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>46396 Benedict Drive, Suite 100, Sterling, VA 20164</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Renal CarePartners of Reston (Dialysis 6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>12330 Pinecrest Road, Reston, VA 20191</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Davita Dialysis of Alexandria (Dialysis 7)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5999 Stevenson Ave, Suite 100, Alexandria, VA 22304</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gambro Health Care (Dialysis 8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>8391 Old Courthouse Road, Suite 160, Vienna, VA 22182</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>BMA of Fort Belvoir (Dialysis 9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>8796-P Sacramento Drive, Alexandria, VA 22309</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
3.) Does your organization provide transportation to all of the dialysis facilities listed in the table above?
________________________________________________________________________
________________________________________________________________________

4.) Does your agency/County have a cost-share or financial agreement with any dialysis facility?  YES_______  NO _________
______________________________________________________________________________
______________________________________________________________________________

5.) What are your organization’s hours for providing dialysis transportation service?
M: _____________________________________________
T: ______________________________________________
W: ______________________________________________
Th: ______________________________________________
F: ______________________________________________
Sat: _____________________________________________

6.) With the exception of Christmas, does your organization provide dialysis transportation on holidays?
7.) **Do your drivers assist dialysis passengers from:**

   - Door to Door? _______
   - Curb to Curb? _______
   - Other? __________

   If your drivers provide door-to-door assistance to patients, do the patients generally find this service to be adequate after their dialysis treatments?

8.) What proportion of the total number of rides that you provide are for dialysis transportation? ______________________________________________________________

9.) Has your organization had difficulty in meeting demand for transportation for dialysis patients? We would be interested in your thoughts and comments on this issue.

   ______________________________________________________________
   ______________________________________________________________
   ______________________________________________________________
   ______________________________________________________________
   ______________________________________________________________
   ______________________________________________________________
APPENDIX G

The Ocean County/Ocean Ride Experience

In its April 30, 2003 study, “Dialysis Transportation for Seniors”, Multisystems, Inc. looked in detail at paratransit services provided in Ocean County, New Jersey. Ocean Ride, which is operated by the Ocean County Department of Transportation and Vehicle Services, provides transportation service for residents of and visitors to Ocean County. In addition to general public bus service, Ocean Ride provides transportation for seniors and people with disabilities by way of its flexible route and paratransit services.  

Ocean County, the second largest county in New Jersey (in terms of area), has a high proportion of seniors in its population, though it is largely rural and suburban in character. The Multisystems’ study noted that the large physical size of the county and its rural/suburban nature made efficiently and effectively meeting transportation needs, particularly those of seniors who require regular medical treatment such as hemodialysis, a daunting task.  

Dialysis services in Ocean County have been increasing in recent years, reducing the need for Ocean County residents to travel outside of the county for services. As a result, dialysis transportation has been a growing segment of the service provided by Ocean Ride. It is a segment with specific transportation needs and demands, particularly with respect to trip scheduling. Despite the County’s proactive efforts to address the increasing demand for dialysis transportation, Ocean Ride continues to face challenges in meeting this demand.

The results of the study highlight a number of specific challenges Ocean Ride must meet in order to optimize its transportation services for seniors on dialysis.

Ocean County has experienced a steady increase in the number of seniors residing within its borders, and Multisystems expected this trend to continue in the future. The number of dialysis patients was expected to increase in concert with the aging population, possibly limiting Ocean Ride’s ability to provide trips for to other riders. As the number of dialysis patients has risen in Ocean County, the number of facilities has grown rapidly to meet the increased demand for dialysis treatment. However, the study concluded that it was unlikely that Ocean Ride would be able to keep up with the growth in demand for dialysis transportation.

Analysis of Ocean Ride’s trip data indicated that dialysis patients did not always use the facility closest to their homes. Thus, Ocean Ride often transported dialysis patients farther than necessary, from Ocean Ride’s perspective.  

In addition to being geographically inefficient for Ocean Ride, some of the dialysis trips provided by Ocean Ride were also inefficient for the operator with respect to time. The Ocean County.

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78 Multisystems, op. cit., p. 2.
79 Multisystems, op. cit., p. 113.
80 Ibid.
study showed that the early-morning treatment times of some dialysis patients, while perhaps more convenient for the patients involved, required Ocean Ride to begin providing service earlier in the day than it otherwise would. Early morning trips resulted in higher costs to Ocean Ride, due to a salary premium for drivers. While some dialysis trips occurred in the early morning, most occurred between the hours of 9:00 am and 4:00 pm, which was the busiest time period for other trip requests.\textsuperscript{81}

Another source of temporal inefficiency was dialysis patients’ shift placement. While some case workers attempted to group patients, analysis of Ocean Ride’s trip manifests indicated that this often does not occur with any significant frequency. Grouping trips is a straightforward way to improve efficiency.\textsuperscript{82}

One of the key findings of the study was that the dialysis trips being provided by Ocean Ride were significantly less efficient than other “reserve-a-ride” trips offered by the operator. Dialysis trips cost Ocean Ride approximately $4 more per one-way passenger trip to provide than non-dialysis trips, partly because drivers had to sit idle at dialysis centers while waiting for patients to become ready for transport. The study found that over one-third of the trips originating at dialysis centers are more than 10 minutes late. Multisystems, the author of the study, recommended that Ocean Ride implement a zoning system in order to decrease the average dialysis trip length.

While the study found that dialysis trips were more expensive for Ocean Ride to provide than other reserve-a-ride trips, it noted that dialysis patients may pay as much as $100 each way for dialysis trips if they used a private transportation provider. Therefore, even if Ocean Ride were to significantly change its current fare structure, there would still be a considerable cost savings to some patients associated with using Ocean Ride.\textsuperscript{83}

Adding to the financial burden experienced by Ocean Ride is the fact that the county could be losing a significant amount of its Federal Section 5311 funding, based on the 2000 U. S. Census.\textsuperscript{84} The 2000 Census showed that the rural area in Ocean County has decreased by more than 25 percent, which will dramatically decrease the level of 5311 funding the county receives.\textsuperscript{85}

At the time of the study, Ocean Ride had a 69-vehicle fleet, nine of which had already exceeded their useful life according to FTA guidelines. Another 28 of the vehicles were scheduled for replacement in 2007, four in 2010, two in 2011, and three in 2015. Thus, the age of Ocean Ride’s vehicle fleet was a significant issue. Funds for replacement vehicles had not yet been earmarked, and, with the impending cuts in 5311 funding, the study found that Ocean County might have difficulty in securing funding to replace its vehicles.\textsuperscript{86}

\begin{footnotes}
\begin{enumerate}
\item Multisystems, op. cit., p. 114.
\item Ibid.
\item Multisystems, op. cit., p. 115.
\item Administered by the Federal Transit Administration, Section 5311 Non-urbanized Area Formula Program makes available Federal funds that can be used for, among other things, public transportation in nonurbanized areas with populations less than 50,000.
\item Multisystems, op. cit., p. 115.
\item Ibid.
\end{enumerate}
\end{footnotes}
APPENDIX H

FASTRAN Clients and Their Dialysis Centers

The following maps display the census tract of residence for the clients attending each of the FASTRAN-served dialysis centers (the subject centers are depicted as red symbols in each of the maps, and they are identified by number in Appendix F.) The purpose of this appendix is to show the geographic distribution of patients relative to their treatment centers. The maps demonstrate that some clients do not receive treatment at the center closest to their pick-up/drop-off point. Though it may be favorable from a routing perspective to reassign some clients to more proximate centers, this appendix does not include specific recommendations as to client-center realignment. Rather, this appendix is intended to be demonstrative of the fact that the current client-center alignment imposes operational burdens on FASTRAN and other transportation service providers, and that they may result in less than optimal service levels for dialysis patients.

Clients receiving treatment at Dialysis 1 are located to the east and west of the center along major arteries. They could be best accommodated if clients to the east and to the west were grouped by shift day and time.
Clients in southern Fairfax County have many choices as to proximate dialysis centers at which to receive dialysis treatment. As most of the clients receiving treatment at Dialysis 2 are located to the south of the center, it may help FASTRAN’s operational efficiency if the clients located north of the center were to receive treatment at alternate centers, again presuming the clients to the south of Dialysis 2 could be grouped by shift day and time.

Dialysis 3 clients are located close to the center along major roadways. From a transportation perspective, their center affiliation is efficient. FASTRAN’s operations may be improved by grouping the clients who live close to each other by shift day and time.
Clients attending Dialysis 4 (in Loudon County) are located near the northwestern boundary of Fairfax County. Some have closer alternatives within Fairfax County.

As with Dialysis 4, some Dialysis 5 clients have closer alternatives. As above, better grouping of clients by day and shift time would help FASTRAN’s operations.
The distribution of clients using Dialysis 6 is reasonable given the distribution of dialysis centers in western Fairfax County.

As with Dialysis 2, it may be beneficial to transportation providers for clients in southeastern Fairfax County to be realigned and grouped by day and shift time.
Dialysis 8 clients are distributed throughout central Fairfax County. Clients furthest to the west and south could be better served if they utilized more proximate centers.

The location of this center’s clients is conducive to efficient transportation provider operations, provided efficient trip grouping.
As above, the residents of southeastern Fairfax County have a great deal of choice in where they receive treatment. Client-center realignment could improve transportation efficiency, especially if combined with coordinated shift scheduling.

Dialysis 11 clients are widely distributed. FASTRAN’s operational efficiency could be improved and its service improved if some Dialysis 11 clients sought treatment elsewhere.
At the time this report was produced, there was a single FASTRAN client receiving treatment at Dialysis 12. As this center is relatively new, its client base will undoubtedly change substantially in the near future. This center could serve as a pilot to test the impact of coordinated client scheduling on transportation provider operations and patient level of service.
Appendix I – Report Authors

George Mason University
School of Public Policy
Transportation Policy, Operations & Logistics
Practicum in Transportation Policy, Operations & Logistics (PUBP 722)
Spring 2004

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