

MASS TRANSPORTATION DEMANDS OF SCOTLANDVILLE RESIDENTS

Roosevelt Steptoe and Theodore Poister, Transportation Center, Southern University

This study was designed to develop the transportation research expertise of undergraduate students and to provide the local community with information and recommendations that would serve as a basis for improving the level of the local public transit service. The primary data for the report were gathered through home interviews with a view to determining the frequencies and origins and destinations of the various types of trips generated by the Scotlandville residents. A parallel objective of the study was to measure the money, time, and convenience costs involved in making these trips. These data were analyzed along with the street and residential patterns and the socioeconomic characteristics of the population. Massive rerouting of the public mass transportation system was strongly recommended as an outgrowth of the conclusion that many residents of this poor and essentially all-black town could not make the desired or necessary trips to the major work and service centers without the expenditure of an inordinate amount of time and money. The recommendations include a main line connecting with the CBD and a shuttle route serving only the study area and interfacing at various points with the Scotlandville portion of the main-line run. The recommended routing is based on the premise that public transportation should have a maximum of $\frac{1}{4}$ -mile walking accessibility for most residents. The recommendations were fully implemented by the local transit authority, and data from a follow-up study indicate that significant changes have occurred in the time and convenience factors as perceived by the transit riders. The various complaints registered against the system during the first phase of the study were essentially eliminated after the recommendations were implemented.

•THE purpose of this paper is to describe the approach and results of an inquiry made relative to the mass transit needs of a low-density black residential area of Baton Rouge, Louisiana. The first part of the inquiry resulted in recommendations for a greatly expanded transit service, which were almost completely adopted by the local transit authority. The paper also reports certain findings, related to attitudinal changes and revenue generation, obtained in a follow-up evaluation of this new service. The study was undertaken by the Transportation Center of Southern University, which is located in the study area, Scotlandville.

INITIAL STUDY

The decision to study the transit demands of Scotlandville residents was arrived at through a consideration of the following: Southern University received a federal grant for the establishment of a research and training program in urban mass transportation, and the administration of the university had recently established a goal of becoming more actively involved in local community problems; responsibility for the local transit service, previously provided by a private operator, had recently been assumed by

a quasi-public body, Capital Transportation Corporation (CTC); and CTC had a capital grants application under consideration by the Urban Mass Transportation Administration, and approval was expected. The capital grants application proposed to purchase the buses and businesses of the black transit operators who were providing bus service from Scotlandville to the central business district (CBD) of Baton Rouge. This action would eliminate these black independent operators and extend the transit service provided by CTC to the Scotlandville area. The objective was to establish one transit system for the greater Baton Rouge area and to provide more reliable transit service.

The regional planning commission and CTC agreed, after considerable deliberation with the university, that the extension of service to Scotlandville should be preceded by a careful study of the transit needs and, if deemed desirable, massive rerouting and rescheduling of the buses; casual observation indicated that both were needed. This research was thus begun with the expressed intent of making proposals for improving the level of transit service provided for the study area; there were sufficient reasons to believe that reasonable recommendations would be implemented.

The Scotlandville Community

Scotlandville is basically a residential area with a population of approximately 20,000. It is a low-density residential area located about 5 miles north of the CBD of Baton Rouge. Geographically, the area is bound by the Mississippi River on the west, an oil storage tank farm on the north, Ryan Airport on the east, Airline Highway on the south, and industrial plants also on the south and east. Casual observation readily reveals that the community developed in a piecemeal and haphazard manner as evidenced by dead-end streets, residential areas interspersed with commercial activities, vacant lots, open ditches, several unpaved streets, and few sidewalks. In the midst of this community are located two middle-to-high-income residential subdivisions, inhabited mainly by Blacks who are professionals. Except for these relatively new subdivisions, large tracts of underdeveloped land are scattered throughout the predominately residential areas. Great distances between connecting streets and strip development perpendicular to the streets on deep lots have resulted in haphazard street patterns, poor internal circulation and access, and small frontage.

This inefficient and disorderly pattern coupled with the low density of the population contributes to the transit problem of the area; the transit routes are restricted by the present dead-end and narrow street system, poor internal circulation, and wide dispersion of the population.

Former Transit Service

When the first phase of this study was begun, the primary bus line serving the area was operated by a loose association of individual operators, and there was no company or transit authority regulating the service provided to the community. Local governmental control existed only in the form of temporary permits granted by the city to individual owner-operators. Most of the operators were poor Blacks who owned vehicles that were noticeably unreliable and unsafe. Without describing the buses or their schedules or routes, suffice it to say that the service was unreliable, inconvenient, uncomfortable, and unsafe. The university agreed at the outset that, in the interest of better service to the total community, publicly owned and operated buses for the area should not be discouraged. Our survey later revealed that the community was generally in agreement with this attitude. Both the community and the university insisted and received assurances that the independent bus drivers would not lose their jobs. These privately owned buses operated only with the revenue from the fare box and had been forced to constantly cut service to many areas in order to break even. The total system ceased operating after 7:00 p.m. each day. The users of this system not only were without transit service after 7:00 p.m. but did not, without time-consuming transfers to the city system in the CBD, have access by these buses to most of the hospitals, shopping centers, and other work and activity centers during normal working and shopping hours. When transferring between the two systems in the CBD, the passenger paid the full fare twice.

Research Methodology

Mass transit service was almost nonexistent in the area. The problem, therefore, was to answer the following questions: What are the origins and destinations of desired transit trips? What are the trip types and frequencies? What is the modal split of the total trip-making for the community? What is the cost distribution of transportation for the various subgroups in the area population? More specifically, what are the desired transit trips that are not possible on the existing system, and in what ways may the community be better served?

All of the planning documents that described various components of the community infrastructure were studied for background information. We surveyed the physical characteristics of the area—street layout, location of residential areas and distances between them, and distances between residential areas and attractors of transit trips. A travel-time study was conducted to ascertain the travel time to various points from the center of Scotlandville, and these data were used in simulating mass transit schedules. The area was then delineated by a series of traffic zones taken from the State Highway Traffic Zone Map. In collecting and analyzing these data, some of the traffic zones were broken down into parts to delineate areas of high socioeconomic status in an effort to further stratify trip-generating characteristics. Sample households were randomly selected. The instrument for the home-interview survey, the primary source of data for this study, was designed by student and staff participants.

Community Profile

Scotlandville is not a community that is in sociological transition. A breakdown of the tenure status of the household (based on a sample of 210 households) indicates that 69 percent owned or were buying their places of abode; the other 31 percent were renters. About one-third of the occupied houses would generally be considered substandard (4, p. 51). The Interstate bypass, which will cut through the community within the next 2 years, is the only foreseeable development that will appreciably alter the proportion of substandard houses and the composition of the total population. Though the bypass will have a minimum displacement effect, approximately 250 houses, mostly in the substandard category, will be destroyed. In further substantiating our contention that there are few factors contributing to migration, it should be emphasized that only 12 percent of the household heads expressed some degree of willingness to move outside of the area.

The average household size is 4.14 members. Although most households had 2 members, a significant proportion (70 percent) of the population was in households of 3 or more members. Children of school age and younger constitute a fairly large proportion of the total population. The median annual income of the households is \$4,674. This average is significantly influenced by the fact that about 20 percent of the applicable household heads in the labor force are professional workers, mostly university and public school teachers. Rough calculation of the coefficient of correlation reveals no significant relation between household size and family income.

Twenty-three percent of the applicable household heads are service workers, including private household workers. The breakdown of the employment statuses of household heads shows that about 60 percent are full-time workers, and about 25 percent are either retired, disabled, or unemployed and have an income that is less than the median.

The data show that age significantly influences employment status. The unemployed, retired, and disabled are mostly the aged with the unemployed appearing among the young and the elderly. Because some relation exists between age and employment status, it follows that the same pattern between age and income should also emerge, and the data substantiate the inference that the aged and very young are heavily concentrated in the lower income groupings. The median age of household heads is 43, and the median population age is 24.

A definite relation exists between education and occupation; the professional workers have a median education of 16.41 years, and no other occupational group's average education is more than 12 years. Education, therefore, does exert some influence on income, and the relation that emerges is positive. The median income of those having completed 9 or more years of education is more than \$5,000.

Travel Patterns

The average number of trips per household head per week is 11, whereas the average is 33 for all members of the household. This is quite low in comparison with the overall Baton Rouge area, for which the average daily number of trips per household is 8.8 (5). The frequency of trips per household appears to be positively influenced by household size and income. Education was also found to be positively related to trip-making. The age of a person appears to have a slight positive correlation with trip-making until age 55; at the ages above 55, it decreases significantly.

The aggregate travel demand for the area varies in some ways from the norm. As usual, the most frequent trip purpose is home-return (48 percent). Although the proportion of work trips (21 percent) would appear to be about average, that for school trips (12 percent) is very high. This may be explained by either one or both of 2 factors: Many Southern University students live in the study area and commute to school; and, although total trip generation in the area is relatively low, school attendance rates for children are normal—hence school trips constitute a large proportion of total trips.

The hourly distribution of trips is quite sharply peaked—roughly 18 percent of total trips occur in both the morning and afternoon peak hours in spite of the fact that shift-work and irregular work hours result in a wider distribution of work trips throughout the day. This can be attributed to the importance of school trips coupled with the relatively low volume of discretionary trips, which tend to be made during off-peak periods. Furthermore, the afternoon peak hour centers on 3:00 p.m., the time when the public schools recess.

Roughly 66 percent of all these trips were made by private automobile or truck, and about 9 percent were made by public transit. The other 25 percent were accounted for by other modes, primarily school buses. It is interesting to note that the destinations of trips originating in Scotlandville are almost evenly divided between Scotlandville and other parts of the Baton Rouge area, 51 percent and 49 percent respectively, but that about 79 percent of the bus trips were destined outside Scotlandville.

Automobile ownership in Scotlandville is comparatively low; 35 percent of the households own no automobile, and only 20 percent own 2 or more automobiles. In addition, 35 percent of the household heads indicated that they use the Scotlandville bus system, and, of the total number of persons making some use of the system, 57 percent used it either frequently or fairly often.

We infer that about one-third of the population desires and needs—on the basis of income, location of work site, and availability of private transportation—to make frequent use of the transit system for work and shopping trips. It has been pointed out that about 23 percent of the household heads are service workers. These service jobs are invariably located outside the Scotlandville area, and the average income from these jobs is such that the high costs of taxi and other transportation modes tend to discourage work and/or employment-seeking. Significantly, most of these workers reported that their transportation costs are too high. There is some reliance on taxi service and special bus runs to hospitals, motels, hotels, and restaurants, which is financially burdensome for the low-income service worker.

Need for a New Transit System

The need for an improved level of transit service was verbally expressed throughout the survey. The car pool is an alternative not used by Scotlandville residents. The data suggest that the work places of the poor are too dispersed, and too few of the poor own automobiles for this alternative to be used. For the other income classes, low traffic congestion and transportation costs do not induce appreciable multiple-car occupancy for the work trip.

Data generated relative to reasons for not riding the bus revealed that the lack of accessibility to the buses and the fact that they were not routed through many places of work, shopping, and other service centers decreased ridership. The conclusion was reached that the frequency of use and the proportion of the population using the transit system would increase when the new system and routes are introduced. The low level of service of the then existing system necessitated the development of alternative means

of transportation, many of which were not permanent arrangements. Rerouting and re-scheduling were expected to increase the number of all types of transit trips. It was discernible from the data that trip frequencies and patterns were somewhat restricted by the present routes and level of service. It was anticipated that the new transit service would reduce the transportation hardships of the aged, the working and nonworking poor, and the occasional transit rider. Sixty-five percent of the households owned automobiles, which indicates that Scotlandville has low automobile ownership. Transit in the area is important—not a marginal need or service. However, we did not anticipate that more reliable transit service would induce more transit trips among persons who have access to private automobiles. The people who did not ride the bus gave the ownership of an automobile as the main reason for not riding. The inaccessibility of the present system was the next major reason followed by general dislike of transit, inability to travel, and lack of flexibility of the system. Of those who rode the local transit system, 80 percent were dissatisfied with the service, and the chief complaint was unreliability. Only 16 percent expressed satisfaction with the present service.

Ninety-five persons who used transit ranked the system for complaints on a rating scale of 1 to 5. Although reliability was most frequently registered as a first complaint, comfort emerged as the most frequent complaint when second and third complaints were taken into account. The other complaints that were cited often included untidy and unsafe conditions and lack of service at certain hours.

None of the residents thought that the bus fare was too high. The median cost of transportation per week was \$7.29 (approximately 8 percent of median income), and the median work trip length was 16 minutes with an average mileage of 6.5. In anticipating a new transit system for Baton Rouge, the residents were asked if they would support a shuttle service to feed the main-line systems into Baton Rouge. Eighty-five percent of the people indicated they would do so, and 90 percent of them indicated that they would pay up to 25 cents for one fare.

The foregoing information served as a basis for our conclusion that an extension of the public transit service to the study area was warranted. The next step was to determine the areas that should be specifically covered and the routing of the buses. The population density and household income of the areas along with the trip data generated by zones enabled us to map the routes and recommend headways.

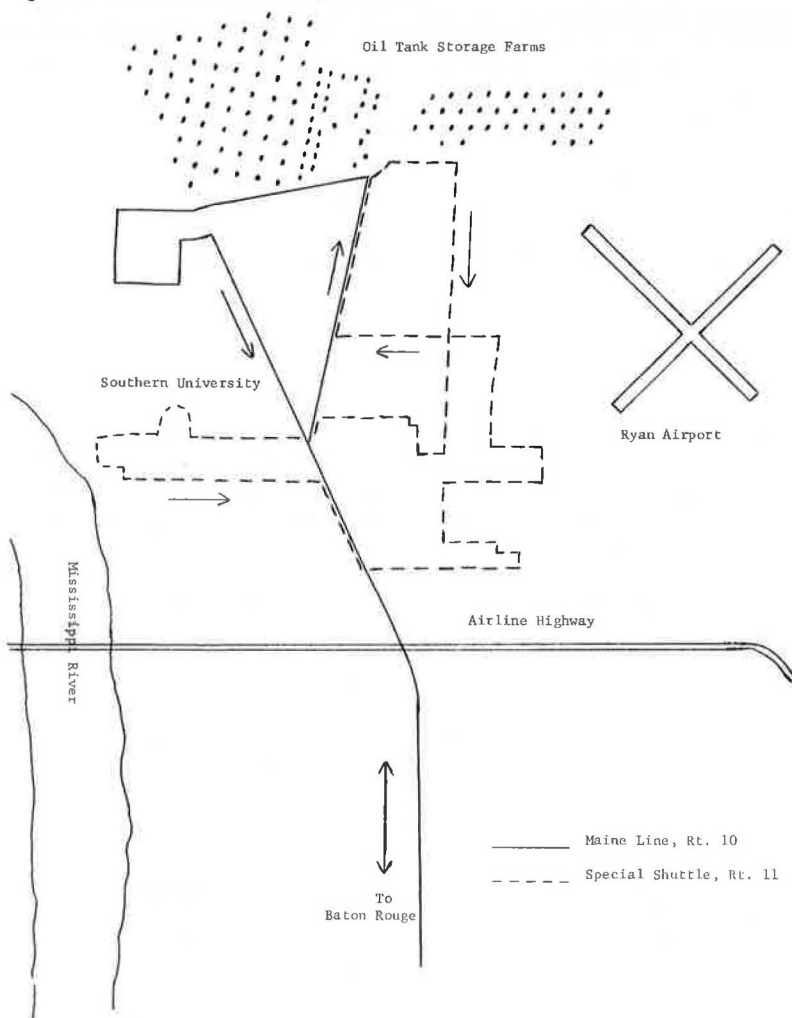
Alternative Actions

On the basis of these data, routes for a main line and a shuttle service to feed it were developed (Fig. 1). Strategic points were pinpointed for transfer from the shuttle to the main line. A graphics technique was used to determine the location of the routes. The rationale for the graphics was the concept that an individual should be no further than $\frac{1}{4}$ mile from a bus route and not more than 3 blocks from a bus stop. Routes were developed and then tested by actually driving them and checking the feasibility of route locations and bus stops.

The corridor concept fixed the route location, whereas the stops were pinpointed by the accessibility concept. The most favorable stops were selected from the overlapping 3-block cells of accessibility. Favorable routes were chosen based on the trip production information by zones and accessibility by the largest concentration of likely transit users. Natural constraints and street conditions and patterns also influenced the final routing plan. Analysis of our data enabled us to make route predictions of the transit needs by zones and to establish routes that would make the service reasonably accessible to the largest possible number of residents.

The widely dispersed population of the area forced us to recommend a main line, connecting with the CBD, and a shuttle route serving only the study area and interfacing with the main line at various points. If the main line, which connects directly with the CBD, covered the total area, the headways would be much higher, and this would be intolerable on the line-haul portion of the Scotlandville run. The main-line routes do traverse the portion of the area that generates the greatest number of transit trips. Fifteen-minute headways were recommended for the main line, but slightly higher headways were considered quite acceptable for the shuttle, which covers a much larger

Figure 1. New transit routes in Scotlandville.



portion of the area. The university campus is included in the recommended shuttle routes—the first time it is being served by the public transit buses on a scheduled and regular basis. In addition, we suggested that Scotlandville residents be connected by transit directly with an area that can be described as a corridor in which are located the major shopping centers serving the area and the service-oriented jobs of many of the poor. Currently, area residents must travel to the CBD and transfer to a line that serves Airline Highway—but Airline Highway is closer to Scotlandville than it is to the CBD.

Implementation

The new transit system, with its extension of service to Scotlandville, will significantly improve the level of service to the area. The shuttle service, operating through widely dispersed residential sections of the area where there was no prior transit service, was expected to barely meet the cost of its operation. However, the shuttle and the main line together would not be a financial drain on the system. The shuttle must be given time to build its ridership because, where there was no prior service, other means of transportation have been developed by most of the residents. However, the

revenue from the main line was expected to be substantial from the outset. Fortunately, the entire Baton Rouge system is partially subsidized with revenue from parking meters, a factor that will allow management to maximize service to the community.

One week after these recommendations were made, the manager of the transit company made a physical check of the recommended routes along with the director of the Transportation Center. He adopted the recommended routes, except for a few minor adjustments due to street conditions, and announced that the new service would be extended to Scotlandville beginning the following week. The direct service to Airline Highway was deferred pending further study and the acquisition of additional buses. Special transit service for workers along this highway is being provided once in the morning and once in the afternoon by one of the old independent operators.

FOLLOW-UP STUDY

The continuing research project at the Transportation Center involves a follow-up study of the recently implemented transit service in two respects: It compares the new transit service in the Scotlandville area with the previous service and attempts to assess the ridership response to this presumed improvement; and it extends the former study by reevaluating the criteria on which the routing of the special shuttle is based. This study also analyzes the need and justification for a second main line connecting Scotlandville directly with other parts of the greater Baton Rouge area, especially to points (other than the CBD) outside the study area that attract a significant number of trips originating in Scotlandville. The follow-up study also employed a home-interview survey, which included all those households interviewed last year that are occupied this year by the same residents.

Although the bulk of the data obtained in the household survey is detailed trip information, the information that to date has been tabulated from the field forms relates to the residents' opinions and attitudes toward the changes in the transit service and the level of service of the present system. Although this information is intended to fit into the larger framework of the study, it might prove to be interesting if looked at separately.

Public Awareness

The total sample in the survey was 249 households, and of these 96 percent indicated an awareness that some changes had been implemented in the transit system serving Scotlandville. It should be noted that this awareness results primarily from the visibility of the service itself, spread further by word of mouth; no special promotional campaign was mounted to publicize the changeover in an effort to increase ridership.

Of the total sample, however, not all had noticed the same specific changes. Predictably, the presence of new buses was the change most strongly felt. About 81 percent of the total sample noticed this change. In terms of actual service, the most important change is the operation of the buses on totally new routes and schedules, and as expected this change was also observed by a high percentage of the respondents although not by as many as noticed the new buses. About 71 percent of the sample responded that they were aware of the new routes and schedules.

Another difference between the old and new services, about which the residents were questioned, was the change in fares. It should be noted that, in terms of fares, the public takeover of transit service in the greater Baton Rouge area did not affect Scotlandville residents in the same way that it affected transit riders within the city limits of Baton Rouge. With the assumption of responsibility for transit service by the CTC, a standard one-way fare of 30 cents was set for all routes in the system. Although this meant that there would be no change in fare for previous customers of the city system, the fare for the riders of the independent line serving Scotlandville was 25 cents; thus, Scotlandville transit riders were faced with a slight fare increase of 5 cents, albeit for better service. A total of 70 percent of the respondents indicated that they were aware of this fare increase.

General Opinions

Fifty-five percent of the 248 persons interviewed said that they had used both the old and the new bus services and thus were in a position to make comparisons. Almost all of them, 98 percent, responded that the service is better now. We can safely infer that virtually the entire community is in agreement on this point. Fully 93 percent of those interviewed said that their total door-to-door travel time for trips made regularly by transit is less now than with the old service. Also, 66 percent of the respondents said that the walking distance from their home to the bus stop is less now than before. Reductions in total travel time and walking distances can be explained by the fact that the new system has many more route-miles within the Scotlandville area and that waiting time is decreased due to the increased frequency of buses running on these routes.

Exactly 50 percent of the persons interviewed said that some member of the household rides the bus regularly at present. About 89 percent of these respondents were of the opinion that the distance walked from their home to the nearest bus stop was a reasonable distance. They were then asked how many blocks this distance was. About 75 percent of these households (123 subjects responded) are located within 2 blocks of a bus stop and almost 95 percent within 4 blocks. Three to four blocks ($\frac{1}{4}$ mile) is generally considered to be the maximum distance that regular transit riders should be expected to walk to the bus. The Scotlandville run, therefore, would appear to measure up very well in this respect. This is not at all surprising because the special shuttle was designed primarily to extend transit service from the main line over broader sections of Scotlandville, a relatively dispersed area; and its routing was based on the corridor-cell concept in order to obtain complete coverage in the community.

Some 47 percent of this same group of present-day transit riders indicate that they now make some trips regularly by transit that they formerly made by other modes. This should represent a substantial increase in overall ridership, and it will be interesting to see whether the trip information, now being tabulated, confirms this. These people were also questioned as to whether there are destinations outside the study area to which they travel that at present cannot be reached either at all or directly by transit. In total, 14 percent answered in the affirmative.

Significantly, many of the destinations cited correspond with the Airline Highway route alignment previously mentioned. The feasibility of such a route, which would connect Scotlandville directly with many of Baton Rouge's most prominent outlying shopping centers, service-oriented job centers, and affluent residential areas employing domestic workers, will shortly be under study by the technical committee of the transit company. One objective of this research project, therefore, is to determine the potential Scotlandville-based ridership for such a line.

In terms of numerical significance with regard to the total population, the survey sample cannot be considered to be accurate with respect to specific locations and travel destinations; however, it can be validly interpreted in terms of general areas or groupings of destinations. The results of this inquiry would appear to indicate that there is still a need for transit service connecting residents to areas along or adjacent to the Airline Highway and the eastern segment of Florida Boulevard. The area to the north of Scotlandville, including the outlying communities of Zachary and Baker, was mentioned by a few respondents and is a possible problem area for further study. Detailed analysis of current travel patterns with respect to trip purposes, frequencies, and modes, to be performed later on in this study, should fill out the dimensions of this travel demand and provide a better basis for any possible recommendations for increases or changes in service.

Comparative Ratings

Some of the questions on opinions and attitudes included in the first-year home-interview survey were repeated verbatim this year to facilitate a comparison of attitudes toward both the old and the new services. These questions are somewhat more objective than the one previously discussed in that they do not ask the respondent to make a comparison himself. Rather, they ask the sample groups in each year to evaluate the existing service in a number of ways, and then these assessments, made before and after the implementation of new service, were compared and analyzed.

In one question, present-day bus riders in each year (1970 and 1971) were asked to rate the overall service on a scale including the following possible responses: extremely satisfied, satisfied, no opinion, dissatisfied, and extremely dissatisfied. In 1970 only 15 percent of those interviewed responded that they were extremely satisfied or satisfied with the old bus service; in 1971, 96 percent said that they were either satisfied or extremely satisfied. Conversely, the percentage of respondents answering that they were dissatisfied was reduced from 62 percent in 1970 to only 2 percent in 1971. Whereas 19 percent felt extremely dissatisfied with the old bus service in 1970, no one answered extremely dissatisfied in 1971.

We at the Transportation Center feel that to some degree this may be an overstatement of the current level of satisfaction with the existing transit service; i.e., some respondents may have felt that we were looking for a positive reaction and thus shaded their answers accordingly. This kind of procedural problem is difficult to avoid in a situation where the service being evaluated is implemented based primarily on recommendations of the investigators themselves, but, in the main, this tremendous upward shift should be considered a valid reflection of the community's attitudes.

Parenthetically, it is also our subjective judgment at this point that the high level of satisfaction with the current service is itself an overstatement of the level of service being provided. Complete rerouting and substantial upgrading of schedules, along with the provision of new and air-conditioned buses, night and weekend service, and, in general, a more business-like operation, are obviously a great improvement over the old, loosely run service, but that is not to say that the new service is completely meeting the area's transit needs. Part of the reason why 96 percent of the respondents indicated that they were satisfied with it may be the extremely low base on which the comparison is made; the old service was almost nonexistent, and, conditioned by this fact, the residents might be expected to be overenthusiastic toward any attempt to provide a new and improved service. In general, though, such a favorable response should be interpreted as reflecting the great magnitude of change in service levels provided by the old and new systems.

Present-day transit riders in both years (1970 and 1971) were also asked about their complaints regarding the transit service. Several possible complaints were suggested, and other kinds of complaints not specifically suggested could be registered as "other." Significantly, no single complaint was voiced by more than 6 percent of the respondents regarding the new transit service, whereas in 1970 there were many large percentages.

The biggest single complaint (50.8 percent of the respondents) in 1970 was that the buses were uncomfortable. In 1971 this was reduced to only 4 percent. Probably the most important factor regarding this difference is that the new buses are air-conditioned and give a much smoother ride. The complaint of unreliability went from 39.3 percent in 1970 to only 3.2 percent in 1971, undoubtedly a reflection of CTC's insistence that the drivers maintain the schedule. Also, schedule control under the old service was very loose, and when machines broke, which was frequently, they could not be replaced in the schedule. Two complaints, untidy and hazardous and unsafe, were mentioned by 33.6 percent of those interviewed in 1970; in 1971 these figures were 2.4 and 0 percent respectively. Both the new machines and the management's concern about maintenance are certainly responsible for the vastly reduced intensities of these complaints.

Complaints about bad drivers, which were never very numerous in comparison with other kinds of complaints, decreased from 9.8 to 3.2 percent. Although many of the current drivers are former drivers of the old blue buses, the reduction of the frequency of the complaint can be attributed to the much closer supervision provided by CTC management. Two complaints, bad headways and bad times, might seem somewhat ambiguous, but they are intended to measure two different aspects of the service. Headways refer to schedule frequency, and this complaint, surprisingly low last year in view of the fact that headways were fairly high, was reduced from 6.6 percent in 1970 to 3.2 percent in 1971. Bad times refers to times of the day or week; more specifically this complaint relates to the lack of service at night or on Sundays, and it went from a high of 27 percent (in 1970 the buses stopped running at about 7:00 p.m.) to a low of 5.6 percent in 1971. This complaint was registered in 1971 more than any other single complaint, probably a reflection of the shuttle not running on Sundays and reduced service at night.

Interestingly, the only complaint that was registered more times in 1971 than in 1970 was that the service is expensive. This can be attributed to the increase of main-line fare from 25 to 30 cents. Expense is now the second highest complaint after bad times. The category for "other complaints" was not included in the 1970 questionnaire, hence its score of 0 percent. In 1971 it was included to give people a chance to relate complaints that were not specified in the questionnaire. This catch-all category had a high percent, 6.4 percent. The most common complaint in this category was that certain destinations were not easily accessible by transit.

In summary, this comparison shows very significant changes regarding both the level and the kinds of complaints made by Scotlandville transit riders. Regarding the old independent bus service, complaints were very frequent, especially with reference to discomfort, reliability, untidiness, safety, and times of operation. In 1971, the level of complaints was generally much lower—no complaint is more than 6 percent—with the exception of expenses, which actually rose. Also, other complaints, primarily regarding routing, were registered with a relatively high frequency.

In both years, participants in the survey who were not transit riders were asked their reasons for not riding the bus. In both years, the main reason given was that respondents owned their own automobiles or trucks and preferred to use these for their daily transportation. This is certainly not surprising, as automobile ownership is usually seen as the prime determinant of modal split, and, as has been pointed out previously, it is low automobile ownership that makes Scotlandville important in terms of mass transit ridership.

Some additional reasons that were registered were "don't like the bus," "inflexibility," and "other." These are minor complaints, however, and another possibility, discomfort, was not cited at all. It is significant that in 1971 the reasons for not riding the bus were more concentrated in the categories "own transportation" and "don't travel," reasons that do not directly reflect on the transit service itself. In 1970 the second most important reason cited was the lack of accessibility of transit, at 10 percent; in 1971 no one gave this as his reason for not using the bus service.

Revenue Analysis

The ratio of revenue to miles traveled for the Scotlandville line compares favorably with other lines in the Baton Rouge system and gives some measure of the response to the service and the need for the same. The Scotlandville line, serving a sparsely populated residential area, is the fourth most revenue-generating line in the system of 12 lines. The fact can be explained simply because of the relatively low median income level in the area. One must be cognizant of another fact in interpreting these revenue per mile data: The 5-mile distance between the city limits and the CBD consists of "dead miles" for the Scotlandville line because there is little pick-up of passengers over this range on the inbound trip and little discharge of passengers on the outbound trip. The average revenue per mile is around 67 cents and 64 cents respectively for the Scotlandville line and the system as a whole.

Research in Progress

In addition to the home-interview survey, an on-board passenger survey and a boarding and alighting count are planned as part of the follow-up study. Travel information obtained from these three sources will be compared with data from 1970 to analyze the change in level of service in terms of total travel time, waiting times, and walking distance. Ridership response to the change in service will be calculated in terms of passenger volumes, and the patterns of transit trips, frequencies of trips for various purposes, and geographic distribution of trips will be examined.

The level of service provided by the present system, measured by total travel time, will be evaluated on the basis of its comparison with that provided by private automobiles. The feasibility of a second main-line route and express bus service, two potential ways of reducing travel time, will also be studied. Finally, the shuttle line will be analyzed in detail to determine whether a more favorable route can be found that would reduce headways, provide more direct transportation between origins and destinations, and increase ridership.

CONCLUSION

The results available to date are extremely favorable regarding the newly operating integrated transit service. Awareness in the community of the change in service, specifically relating to the highly visible new buses, the changed routes and scheduling, and the fare increase, is much more widespread than actual use of the system; many people who do not ride the new system have, in a short time span, become aware of its existence. Virtually the entire community appears to be in agreement that the new service is an improvement over the previous service, and overwhelming majorities said that their walking distance to bus stops was shorter, that the time spent waiting for the bus was less, and that their total travel times were shorter.

A comparison of bus ratings by transit riders in 1970 and 1971 reveals a tremendous shift upward in the general level of satisfaction with the new service, with 96 percent of the residents saying that they were satisfied or extremely satisfied with it. On the other hand, the number of most complaints regarding service decreased sharply with the new service. The only complaint that was registered more frequently in 1971 than in 1970 concerned expense, and this can be attributed to the slight fare increase sustained by Scotlandville transit riders. Among nontransit users, the most frequent reason for not riding the bus in 1971 is the preference for private transportation. Complaints about the lack of accessibility of the service were completely eliminated in 1971.

Although we will be analyzing hard data measurements of the operating characteristics of the new transit service, it is equally important to understand what the community's attitude is toward this service. How the residents perceive their travel needs and the effectiveness of the service in meeting these needs may be quite different from the way we judge them according to our "objective" criteria. It could be the case, for example, that the new service is providing only marginal improvement in terms of decreasing actual travel time, and yet the high visibility of the new buses and changes in operations have promoted an extremely positive initial response that is totally disproportionate to this slight improvement in terms of travel times.

Is the overwhelmingly favorable response garnered in the home-interview survey a reflection of real improvements in the service provided according to our objective measures, and does it mean that more discretionary trips are made by transit and that more trips are made by transit when other modes of transportation are available? These are questions that we intend to examine further in the course of this research project. Possibly, we will find that there is little correlation between an evaluation based on the standard objective criteria and the way the riders and nonriders perceive the service, an indication that there are other, less tangible factors at work in the formation of people's attitudes toward transit and their daily decisions about their own travel habits.

The point is that, besides objective evaluation of service capabilities, we need to understand how people in the community feel about the service. With this in mind, we at the Transportation Center have begun to investigate the community's attitudes. Admittedly, this is a very modest first effort; but this is an area in which we intend to devote more time and resources in future research and one that will play a more important role as attention gradually shifts from providing transit almost solely as a service for captive riders to promoting its attraction in a wider market.

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