

Michigan Intercity Rail Passenger Study and Intercity Bus User Comparison

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User travel patterns, socioeconomic characteristics, and service ratings of Michigan's intercity rail service in 1985 are compared with those of earlier years and with those of Michigan intercity bus users. More than 2,300 usable rail passenger survey responses, a 90 percent sample, are the basis for 1985 rail passenger data. The highest percentage of rail passenger trips (41.5 percent) is taken to visit friends and relatives. This figure is similar for previous rail users and intercity bus users. The percentage of female rail passengers remains about the same (63.3 percent); the percentage of female intercity bus users has decreased to 53.5 percent. Rail passengers' median family income is nearly twice that of intercity bus users. Bus users rate intercity bus service higher than rail passengers rate intercity rail service. Several interrelationships of intercity rail and bus service, such as market area, trip diversion, and interconnecting service, have been examined. For instance, the diversion from intercity bus to rail is 10 to 15 percent. Applications to date include demand estimation, new station potential analysis, service improvement analysis, market targeting, and service evaluation.

A myriad of issues confronts rail passenger service in Michigan and the nation (1). The uncertainty of federal funding threatens the continued provision of rail passenger service (Michigan Passenger Service Aide survey conducted July 1977). Some changes in Michigan service in the 1980s warrant continued monitoring, for example, the reduced weekday service between Detroit and Chicago (TOL-DET-CHI) (Michigan Passenger Foundation passenger survey, June 1980). Increasing interest in high-speed rail service in Michigan and the Midwest warrants an improved and current data base to help determine the potential of this idea (2). Changing ridership patterns need an in-depth analysis: the International train (TOR-PTH-CHI) has been attracting record numbers of riders during the past year; Pere Marquette (GRR-CHI) ridership has been a disappointment after a promising start (3). The turmoil induced by deregulation of the airline (1978) and intercity bus (1982) industries suggests the need to accurately assess the role of rail passenger service both now and in the future (Amtrak nationwide user survey, February 1979). Maintenance of a good data base with 5-year interval time series data dictated undertaking a survey in 1985 to complement surveys done in 1980, 1977, and 1975.

In recent years some specific questions have been raised about intercity rail passenger service in Michigan:

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- How do rail passengers view the location and quality of rail passenger terminals in Michigan?
- Why do so many board at Dearborn and relatively few at Michigan Central Depot in Detroit?
- What should be the focus of a promotional program to encourage use of rail passenger service in Michigan?
- Does intercity rail passenger service really divert passengers from intercity bus service? If so, to what degree?
- How important are interconnecting services? How many rail passengers actually travel to and from rail passenger terminals by intercity bus and local public transportation? How many would if service were better?
- What is the importance of being able to go to Chicago or Detroit, conduct business, and return on the same day? How many shopping or business trips are made with this in mind?

PREVIOUS STUDIES

Three studies of Michigan's intercity rail passenger system were conducted in the 1970s and 1980s. The first, a user survey conducted by the Bureau of Urban and Public Transportation (UPTRAN) in July 1975, is the only other study done by the Michigan Department of Transportation (MDOT) (1). Other surveys were undertaken by Michigan Passenger Service Aide in 1977 and the Michigan Passenger Foundation in 1980. The most comprehensive of these was the 1975 study.

STUDY AREA CHARACTERISTICS

Michigan had a 1985 population of approximately 9.1 million, an employment base of 3.9 million, and a college enrollment of some one-quarter million. Most of these people are located in the southern half of Michigan's lower peninsula, which contains 39 of Michigan's 83 counties and all 15 urbanized areas. This is the area served by rail passenger service.

Michigan's population is concentrated in the southeastern part of the state where Detroit is located. More than 3.9 million people, 42 percent of the state's population, are found in Detroit and its environs (Wayne, Oakland, and Macomb counties). An additional 40 percent is in the remainder of the southern half of the Lower Peninsula.

Most employment in Michigan is with the nearly 1,600 employers with more than 250 employees. A high percentage of these are located in the southern half of the Lower Peninsula; many are in communities served by rail passenger service.

Some 90 percent of Michigan's 4-year college students attend schools located in the southern half of the Lower Peninsula. Most of these attend the 35 of 38 Michigan universities and colleges with 1,000 or more students located in this part of the state.

RAIL PASSENGER SERVICE

The rail passenger system that existed at the time of the 1985 survey consisted of 626 route-miles, 540 in Michigan, and served 19 Michigan communities (Figure 1). The highest level

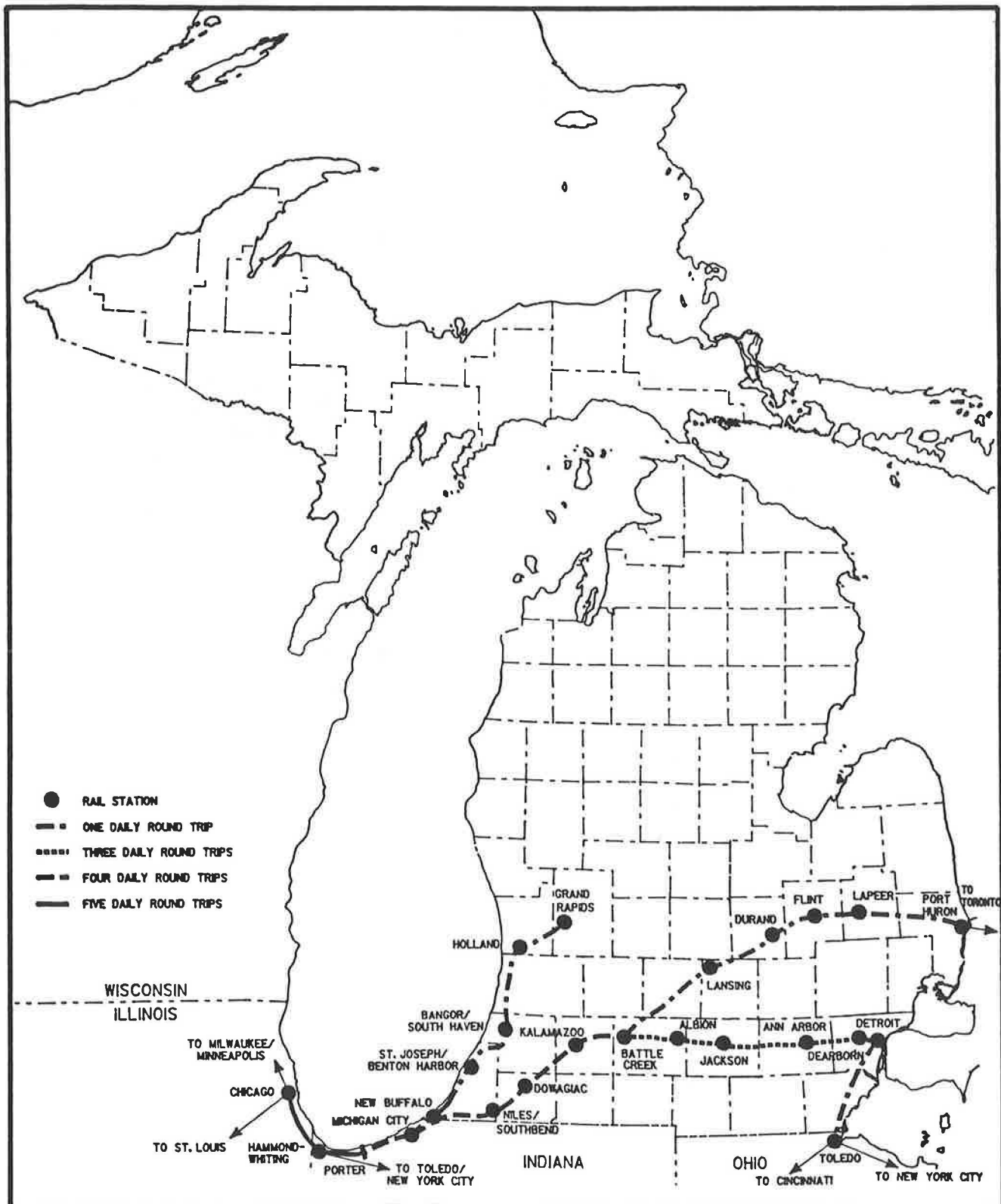


FIGURE 1 Intercity rail passenger system.

of service, three daily round trips at the time of the survey, was provided between Detroit and Chicago. One of these round trips continued beyond Detroit to Toledo, where connections are made with overnight train service to and from points throughout the northeastern United States.

Several changes have occurred in Michigan's rail passenger system since the 1975 survey was conducted. Intercity rail passenger route mileage and communities served have increased, primarily because of the addition of the Grand Rapids to Chicago train in August 1984. Other changes include adjustment of the schedule for the TOR-PTH-CHI service to accommodate traveling to Toronto and addition of a round trip between Detroit and Chicago.

RAIL PASSENGER TRAVEL

Intercity rail passenger ridership increased by approximately 24 percent between 1975 and 1985:

Route	1975	1985	Change (%)
Grand Rapids-Chicago		60,595	
Toronto-Port Huron-Chicago	86,953	118,506	36.3
Toledo-Detroit-Chicago	349,982	386,257	10.4
Total	436,935	565,358	24.4

During this period bus use declined; air transportation and automobile use increased. Rail trip making continues to be oriented toward Chicago and intercity bus toward Detroit. Detroit and Chicago are the highest generators of intercity trips made in Michigan.

On weekends the three services combined carry more than twice the number of rail passengers they carry on weekdays.

The TOL-DET-CHI service has the greatest differential between weekday and weekend trips. The TOL-DET-CHI service carries 70 percent of the total ridership, TOR-PTH-CHI 19 percent, and GRR-CHI 11 percent. Friday is the heaviest day of travel, with nearly three times the ridership that occurs in the middle of the week.

The greatest concentration of users resides and begins or ends trips in the Detroit, Michigan, and the Chicago, Illinois, areas. Michigan counties that have a train station generally have the second greatest number of users. Nationwide, Michigan and its neighboring states have the largest concentration of users. However, states as far away as California and Florida were represented in the survey data, with between 10 and 49 user residences located in these two states.

TRAVEL CHARACTERISTICS

Number of Trips Using Amtrak in Past 12 Months

More than one-third (35.8 percent) of the respondents had made one or two additional trips in the previous 12 months. Approximately 10 percent made more than 11 trips; 21.4 percent had not made any trips (Table 1). The intercity bus user survey found 29.3 percent of the respondents had made one or two additional bus trips in the last 12 months; 16.8 percent had made more than 11 trips (2).

Expected Trips Using Amtrak in Next 12 Months

More than one-quarter (28.8 percent) of those responding planned to make one or two trips in the upcoming year. This was followed closely by 26.7 percent who planned to make no

TABLE 1 TRAVEL CHARACTERISTICS COMPARISON, 1985

Item	Bus %	Rail %
Station Access/Egress Mode		
Walk	12.2	7.2
Auto	60.3	64.8
Local Transit	10.1	3.0
Taxi	10.5	17.9
Intercity Bus	3.9	1.1
Intercity Rail	0.6	0.9
Trip Purpose		
Work/Business	10.4	14.4
Shopping	0.9	8.4
Personal Business	25.9	8.2
Vacation/Other Social-Recreational	14.2	22.6
Visit Family/Friends	43.9	41.5
Traveling Alone	80.3	52.2
First Time Users	18.4	21.4
Option If Service Were Discontinued		
Air	16.5	26.4
Auto	49.3	50.0
Bus/Rail	15.6	11.6
Not Take Trip	15.6	7.9

Source: MDOT, Bureau of Transportation Planning, Passenger Transportation Planning Section, Surface Systems Unit.

trips. Approximately 12 percent planned to make 11 or more trips (3).

Marketing of Intercity Rail Passenger Services

More than one-half (54.5 percent) of all respondents learned of the train service from friends or relatives. A single "traditional" advertising source was responsible for a substantial number of riders in only one case. Special newspaper promotions for the GRR-CHI service undoubtedly contributed to attracting nearly one-third (32.3 percent) of the respondents. Earlier surveys also found friends and relatives to be the major source of information about train service; 46.5 percent in 1979 (5) and 53.5 percent in 1980 (Michigan Passenger Foundation passenger survey, June 1980).

How Ticket Was Obtained

The majority (69.4 percent) of respondents, for the rail system as a whole, purchased their tickets from an Amtrak ticket agent. For the GRR-CHI service, 45.9 percent of the respondents obtained their tickets through a travel agent. There is no ticket agent at the Grand Rapids station. Therefore even those who answered "ticket agent" probably bought their tickets from the train conductor at the station.

Travel Time to and from Station

Nearly two-thirds (64.9 percent) of those responding traveled less than 30 min to reach the train station. More than half (59.0 percent) of these traveled less than 15 min. Nearly two-thirds (61.5 percent) of the respondents traveled less than 30 min to reach their final destination. Of these, 54.8 percent had travel times of 15 to 29 min.

Access to and from Train Station by Automobile

Seven of 10 passengers used the automobile to access the train station; nearly 6 of 10 reached their final destination by automobile (Table 1 and Figures 2 and 3). The 1985 intercity bus user survey also found the automobile to be the most popular method of accessing the station. Nearly two-thirds (63.7 percent) of the bus users reached the bus terminal by driving or as passengers in an automobile. Earlier rail studies also indicated that the automobile was the primary means of transportation to the rail terminal. In each case, at least 60 percent of the respondents used an automobile to access the station.

Access to and from Train Station by Taxi

Taxi service is the second most important mode of transportation, particularly from the train station to the final destination. Overall, 11 percent of the respondents arrived at the train station in a taxi; nearly one-quarter (24.8 percent) used a taxi to reach their final destination. The 1985 intercity bus user survey found the percentage of passengers using taxis and walking to and from terminals to be nearly equal. Other studies found the percentage of users accessing train stations by taxi to be similar to that found by the 1985 study. These ranged from 10.6 percent in 1980 to 16.5 percent in 1977.

Access to and from Train Station by Walking

There are a small, but significant, number of passengers who walk to the train station and from the station to their final destination. Depending on the train route and trip end, from 3 to 14 percent of the passengers walk either to the terminal or from there to their final destination. Overall percentages of users who walked to and from intercity bus terminals were

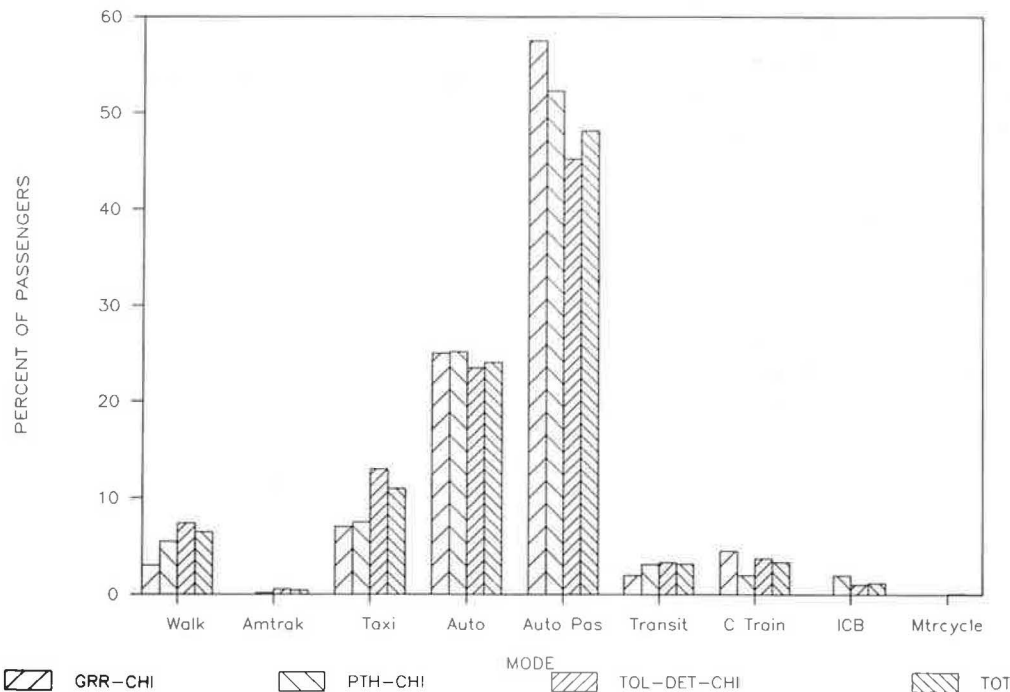


FIGURE 2 Access to train station, 1985.

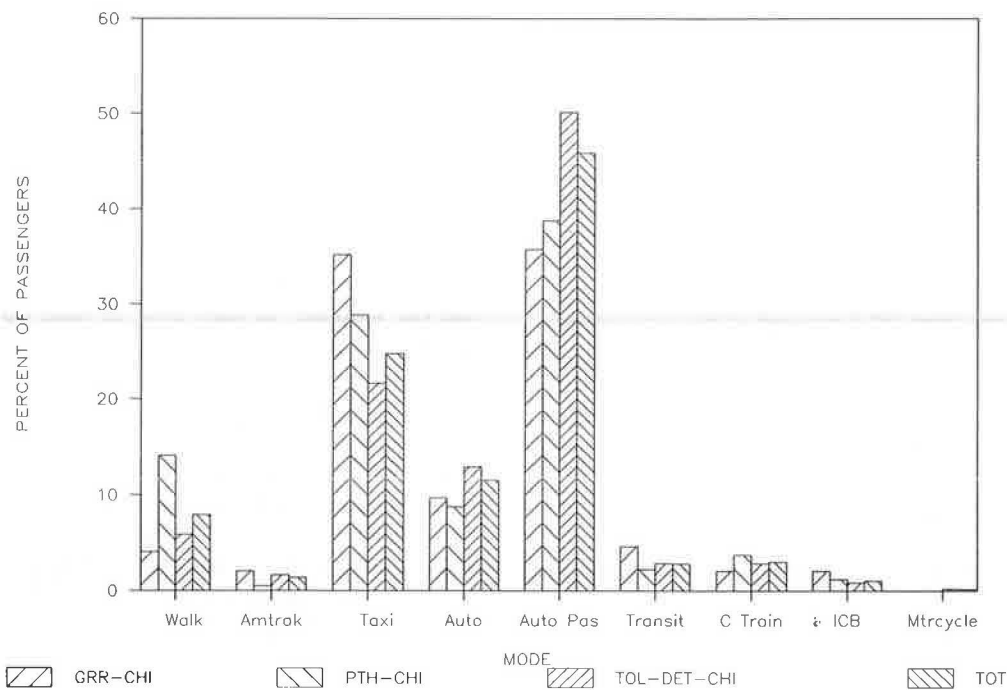


FIGURE 3 Access to destination, 1985.

somewhat higher. Results of the 1985 intercity bus survey indicated that slightly more than 1 of 10 (10.5 percent) passengers walked to the bus station; 13.8 percent walked from the station to their final destination.

Interconnecting Public Transportation Services

Some 8 percent of rail passengers use connecting public transportation services to access Michigan rail terminals or to reach their destination after using intercity rail. One-third of this use is associated with intercity bus and rail passenger services; two-thirds are associated with local bus or rail transit.

The 1985 intercity bus survey revealed that some 30 percent of intercity bus passengers used public transportation to access intercity bus services or destinations after using intercity bus services. This is nearly four times the percentage of rail passenger users. The intercity/local split of the 30 percent, however, was about the same as that of intercity rail users: one-third intercity and two-thirds local transit.

Use of interconnecting services by Michigan rail service users has declined from about 20 percent in 1975 and 1977 to about 13 percent in 1980 to 8 percent in 1985. Much of this reduction occurred in the "connecting Amtrak" category, which decreased from 10 percent to 2 percent; intercity bus remained essentially unchanged at 1 percent. Current schedules often make connecting with other intercity modes difficult.

Trip Purpose: Visiting Family and Friends

A large portion (41.5 percent) of intercity rail passengers use the train service to visit family and friends (Table 1). This was by far the most common response to the question about trip

purpose. Visiting family and friends combined with "vacation" (13.1 percent), "other social-recreational" (9.4 percent), and "shopping" (8.4 percent) account for well over two-thirds (72.4 percent) of the pleasure trips (Figure 4). The most common length of stay was 3 to 4 days. This supports the idea that many intercity rail passengers use the train for short pleasure trips. The 1985 intercity bus study also found visiting family and friends to be the primary trip purpose of intercity bus users. Previous rail studies of 1977 and 1980 had similar results.

Trip Purpose: Business or Work

Overall, 14.4 percent of intercity rail passengers are on some form of business or work trip (Table 1). The work trip was ranked second to visiting family and friends in only one case: 17.0 percent of the respondents on the TOL-DET-CHI route were on a business trip. Passengers on the GRR-CHI service ranked "shopping" as the second most popular trip purpose, and TOR-PTH-CHI riders chose "vacation" as number two.

The 1985 intercity bus survey found only 1 percent of all trips made to be business trips. The most popular purpose was to visit friends or relatives (43.9 percent), followed by personal business (35.3 percent) and vacation (11.1 percent).

Of the previous rail surveys conducted, only the 1979 nationwide Amtrak study found the largest group of users to be on business trips. One-third (33.6 percent) of the passengers were on a business or work trip, and 29.7 percent were visiting family or friends (Amtrak User Survey, February 1979). The 1985 Pennsylvania study found slightly more than one-half (52.3 percent) of the respondents using rail service for business or work trips (4). This high percentage occurs because service is primarily oriented toward commuter trips.

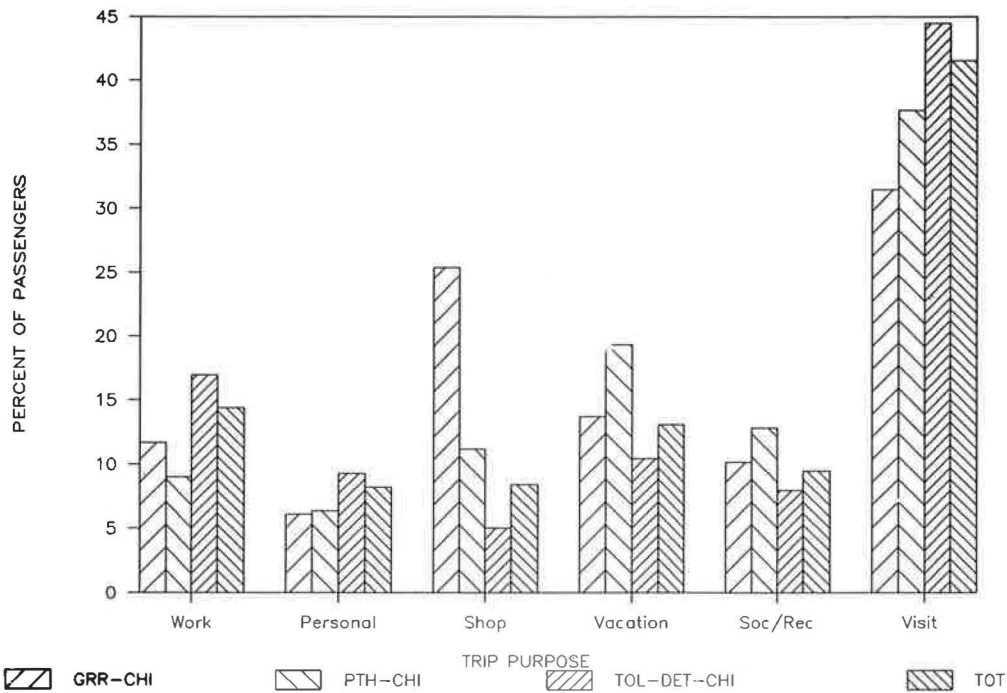


FIGURE 4 Trip purpose, 1985.

Length of Stay

The most common response to this question was “3 to 4 days” (43.9 percent). Only 0.1 percent of the respondents did not plan to stay even 1 day, and 16.9 percent were staying 5 days or longer (Figure 5).

Number of People in Party

More than one-half (52.1 percent) of those responding were traveling alone (Table 1). GRR-CHI was the only route that had a greater number of two-person parties (40.9 percent) than single-person parties (38.7 percent).

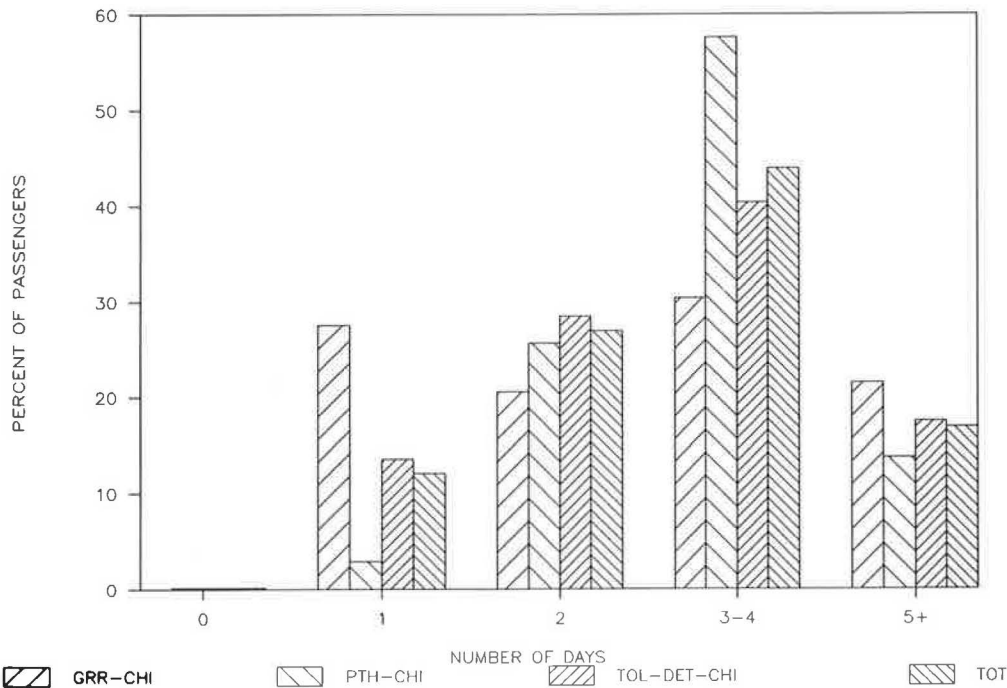


FIGURE 5 Length of stay, 1985.

Number in Party Under 12 Years of Age

The majority (87.5 percent) of respondents did not have any children under the age of 12 traveling with them.

Reason for Choosing Amtrak

Overall, the most popular reason for choosing Amtrak (Figure 6) was "to relax" (17.6 percent). This was followed by "to save money" (15.6 percent), "convenient schedule" (15.2 percent), and "convenient station location" (14.8 percent). The responses for TOR-PTH-CHI and TOL-DET-CHI were ranked in similar order. GRR-CHI responses were ranked as follows: "convenient schedule" (18.5 percent), "to relax" (17.6 percent), "convenient station location" (14.9 percent), and "comfort" (11.6 percent).

Option if Train Were Discontinued

One-half (50.0 percent) of those responding would use an automobile to make the trip if train service were discontinued (Table 1 and Figure 7). Commercial airline was the second highest choice (26.4 percent), and intercity bus was third (11.6 percent). Those responding to the intercity bus user survey chose the automobile as the most popular alternative if bus service were discontinued (36.5 percent); commercial airline was second (16.5 percent), and Amtrak and not taking the trip were tied for the third most popular alternative (15.6 percent).

Higher-Speed Service

Users prefer more frequent service to higher-speed trains (55 percent compared with 45 percent). The 1980 Michigan Pas-

senger Foundation Survey revealed a similar preference: 57 percent preferred more frequent service and 43 percent preferred faster trains. User comments reflected a similar pattern. Approximately 7 percent of the responses to the question "What one thing would you like to change about the train service?" pertained to higher-speed rail service; reduce the number of stops (1.1 percent) and reduce travel time (5.6 percent). The percentages were notably higher in the TOL-DET-CHI corridor, 2.4 and 13.2 percent, respectively.

Weekday Versus Weekend Travel

The majority of intercity rail travel takes place on weekends. Nearly three-quarters (71.2 percent) of the weekly passenger volume during the survey period occurred on Friday and Saturday. Friday, Saturday, and Sunday are considered weekend days, and Monday through Thursday are considered weekdays. The typical weekend traveler was female, 18 to 24 years old, employed full time, and using intercity rail service to visit family or friends. The typical weekday traveler had the same characteristics with the exception of age group; the typical respondent was 25 to 34 years of age.

Frequent Versus Infrequent Users

Nearly three-quarters (74.2 percent) of the survey respondents were infrequent users; they had made fewer than five trips by rail in the past year. Characteristics of the typical frequent and infrequent user (trip purpose, employment status, and family income) were similar. Each was visiting family or friends, was employed full time, and had a family income in the \$30,000 to \$35,000 range.

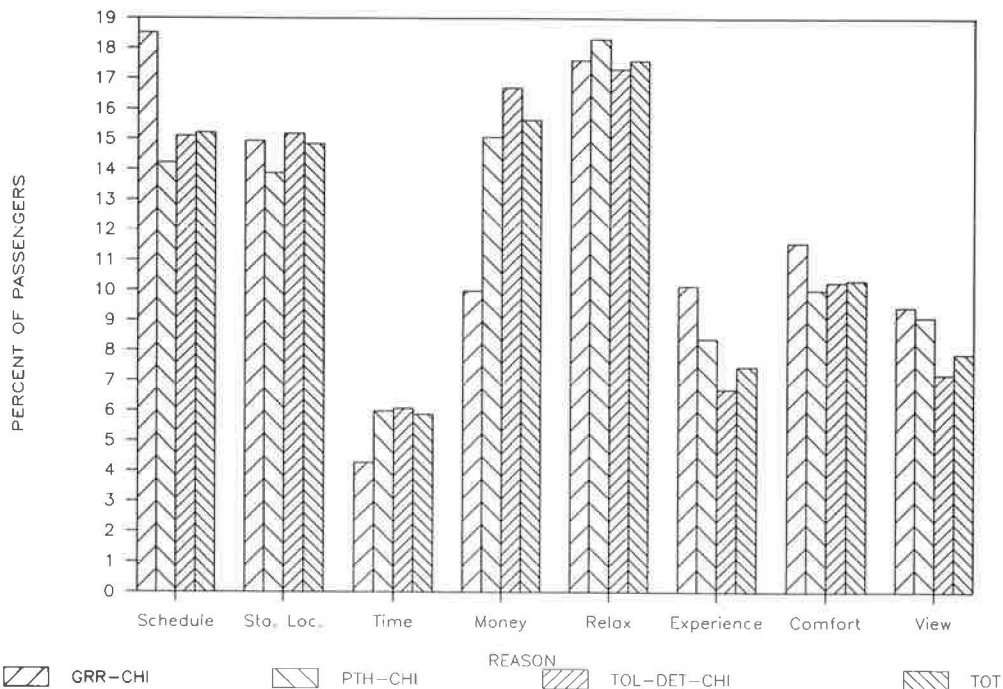


FIGURE 6 Reason for choosing Amtrak, 1985.

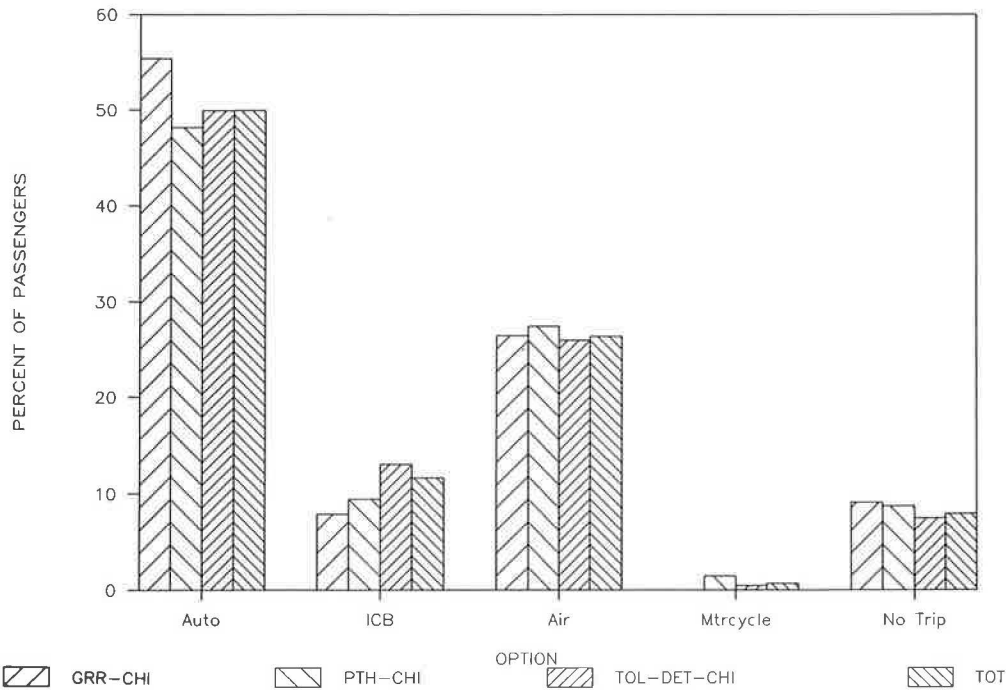


FIGURE 7 Option if train discontinued, 1985.

USER CHARACTERISTICS

Vehicles per Household

More than one-third of the users had two vehicles in their household; 15.2 percent had none. Of intercity bus users, 25.4 percent had two vehicles and 23.8 percent had none in their household.

Users' Employment Status

More than 5 of 10 users are employed, 2 of 10 are college students, and 1 of 10 is retired (Figure 8). The 52.3 percent employed figure is notably higher than the 42.6 percent intercity bus figure: for college students the figures are about the same (17.7 percent versus 17.4 percent); they differ more for retired users (10.2 percent versus 15.3 percent). The employed figures are nearly the same as those found by earlier rail passenger surveys: 52.3 percent in 1985, 57.5 percent in 1980 (Michigan Passenger Foundation passenger survey, June 1980), 50.0 percent in 1977 (Michigan Passenger Service Aide survey, July 1977), and 49.3 percent in 1975 (1). College student percentages are also similar. The number of retired users, however, has increased: 10.2 percent in 1985, 8.2 percent in 1980, 4.0 percent in 1977, and 7.2 percent in 1975.

Age

The largest age group for males and females alike is 18 to 24 (2.5 of 10 in this group), followed by the 25 to 34 age group (2 of 10 in this group); about 1 of 10 (8.9 percent) is 65 or older. The absence of any of Michigan's largest universities (10,000 or more enrollment) caused the GRR-CHI corridor percentages and median age to differ from those of the other two corridors.

The intercity bus user survey found that 3.5 of 10 users were in the 18 to 24 age group, and 1 of 10 was in the 65 and older age group. No comparison can be made with the 25 to 34 age group in Michigan, although in other states the rates are between 1 of 10 and 2 of 10. The median age of the intercity bus user is 33. The 18 to 24 age group remained about the same as it had been in earlier rail passenger surveys; the 25 to 34 group decreased by about 5 percent, and the 65 and older group increased by the same amount. Median age has increased steadily: 28.7 years (1975), 30.9 years (1977), 31.1 years (1980), and 32.4 years (1985).

Sex

Nearly two-thirds (63.3 percent) of the respondents were female. This differs from the findings of the intercity bus user survey that indicated that only 53.5 percent of the respondents were female.

Family Income

One of 10 rail passengers has a family income less than \$10,000, 4 of 10 have less than \$30,000, and nearly 3 of 10 have more than \$50,000 (Figure 9). There is some variance among the three corridors as reflected by the median income difference: about \$3,000 from one corridor to the next with TOL-DET-CHI the lowest and TOR-PTH-CHI the highest. The median family income of all rail users was \$34,200.

Intercity bus services have 3.5 of 10 users with a family income of less than \$10,000, less than 1 of 10 with more than \$50,000, and a median family income of \$18,100, about half that of the intercity rail passenger. Michigan's median income was approximately \$28,000 in 1985. Rail passengers' median family income has approximately doubled since 1977; this

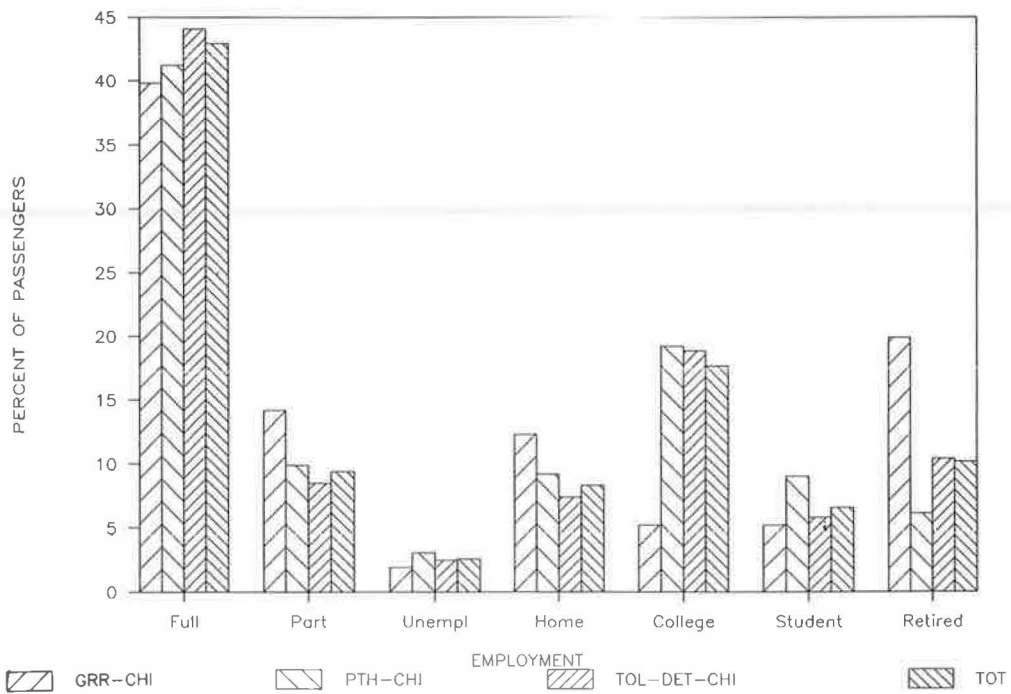


FIGURE 8 Employment status, 1985.

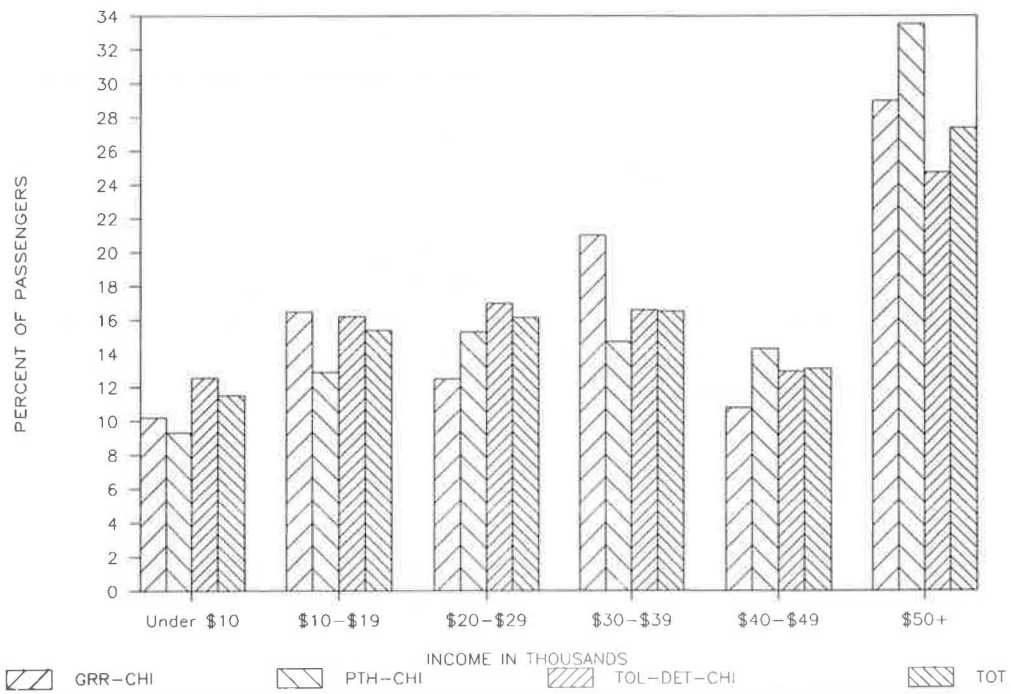


FIGURE 9 Passenger family income, 1985.

increase is somewhat greater than the increase for Michigan as a whole. At the same time, the median family income of intercity bus users in Michigan increased by less than 10 percent.

Typical User

The typical 1985 intercity rail passenger was female, approximately 31 years old, and from a household of 3.3 persons with 2.2 operating vehicles. She was employed full or part time and had a family income of approximately \$34,200 (in 1985 dollars). The typical 1985 intercity bus user was female, approximately 33 years old, and from a household of 2.7 persons with 0.8 operating vehicles. She was employed full or part time and had a family income of approximately \$18,100 (Table 2).

SERVICE RATING

Users were asked to rate rail passenger service for food and beverage quality, car comfort, car cleanliness, on-time arrival and departure, frequency of service, station condition, station parking, fares, courtesy of employees, and convenient arrival and departure times. A brief summary of the most frequent responses follows.

Food and Beverage Quality

This feature had the largest percentage of "don't know" responses (29.7 percent) of the 10 categories, which indicates that many people chose not to use the on-board food and beverage service. Of those familiar with this service, nearly 90 percent (89.8 percent) found it to be satisfactory or better.

Car Comfort

This feature received high ratings on all three routes with a combined total of 71.4 percent rating it good to excellent.

GRR-CHI was rated highest; 83.3 percent of the respondents thought that comfort was good (51.3 percent) or excellent (32.0 percent).

Car Cleanliness

This feature received the second highest rating of the 10 categories; 79.3 percent of the respondents rated it good or excellent. GRR-CHI received the best rating with 82.4 percent responding good (44.7 percent) or excellent (37.7 percent). This is similar to the ratings for intercity bus service, for which 83.8 percent of the respondents considered the condition of the buses to be good or very good.

Coach Car Quality

The comfort and cleanliness of Amtrak coaches received high marks from rail passengers in Michigan. More than 95 percent of respondents on all three routes rated both car comfort and cleanliness as satisfactory or better; more than 70 percent rated them as excellent or good. Less than 5 percent rated these features as poor or unsatisfactory. Comments made on coach car quality constituted about 8.5 percent of all comments. These pertained to the need for cleaner trains, cleaner bathrooms, and improved seating. Because smoking and nonsmoking cars are provided, smoking was not thought to be a major problem on trains, but 6 percent of intercity bus service users considered smoking on buses a problem.

Dining Car Quality

The quality of food and beverages served on Amtrak trains received above average marks. Approximately 90 percent of respondents rated this feature satisfactory or better, and about half of those using dining car services rated them excellent or good. Comments made on food and beverage quality accounted for 4.9 percent of all responses made to the question "What one thing would you change?" The percentage of

TABLE 2 USER CHARACTERISTICS COMPARISON, 1985

Item	Bus %	Rail %	Michigan %
Household Size	2.7	3.3	2.8
Operating Vehicles/Household	0.8	2.2	1.7
Family Income (\$000)	18.1	34.2	24.2
Female (%)	53.5	63.3	51.2
Age (median)	33.0	31.0	29.0
Employed Full Time (%)	29.2	42.9	42.7
Unemployed (%)	9.9	2.6	9.9
College Students (%)	17.4	17.7	5.6
Retirees (%)	15.3	10.2	10.9

Source: MDOT, Bureau of Transportation Planning, Passenger Transportation Planning Section, Surface Systems Unit.

comments was significantly higher for the GRR-CHI (14.2 percent) and TOR-PTH-CHI (8.0 percent) trains than for the TOL-DET-CHI trains (2.0 percent). (This feature did not apply to intercity bus service.) Food and beverage quality was also an important concern to Michigan rail passengers in 1980 (20.4 percent) (Michigan Passenger Foundation passenger survey, June 1980) and 1975 (9.1 percent) (1).

On-time Service

Nearly 15 percent of rail passengers consider on-time performance to be inadequate on the TOL-DET-CHI route. Only 58 percent considered it good or excellent. These figures contrast with the far more favorable on-time performance ratings of the GRR-CHI (85.5 percent excellent/good) and TOR-PTH-CHI (72.1 percent excellent/good) services. In addition, there were more than 50 comments indicating dissatisfaction with late TOL-DET-CHI trains.

Frequency of Service

Overall, approximately 14 percent of rail passengers consider service frequency insufficient. Service frequency was considered more of a problem by users of the TOR-PTH-CHI and TOL-DET-CHI services (rated poor/unsatisfactory by 14.9 percent and 14.2 percent, respectively) than by those using the GRR-CHI service (12.2 percent poor/unsatisfactory). This pattern was corroborated by the ratings of convenience; 10.5 percent of the users considered convenience to be poor/unsatisfactory. User remarks about service frequency constitute a similar percentage. Approximately 25 percent of all written comments pertained to service frequency: improve frequency of service (9.5 percent), change arrival and/or departure times (5.3 percent), and increase number of trains (10.1 percent).

Station Condition and Parking

The condition of rail passenger terminals and their parking areas received above-average marks from rail passengers. Approximately 90 percent of those rating these features considered them satisfactory or better. More than half rated them excellent or good. One aspect of these features that should be addressed, however, is parking at stations in the TOR-PTH-CHI and TOL-DET-CHI corridors where more than 15 percent considered them less than satisfactory. Written comments about terminals constituted 2.5 percent of all responses, and one-third of these pertained to the Detroit station. Convenience of station location, parking at the station, and station comfort and cleanliness were major concerns of rail passengers in 1980 (34.9 percent, 14.1 percent, and 18.7 percent, respectively) and to a lesser extent in 1977 (13 percent) and 1975 (4.9 percent).

Track Condition

There was relatively little user concern for track condition. Although the questionnaire did not include track condition in the list of features to be rated, nearly 2 percent of the users indicated it was the one thing they would like to change about

the train service. An additional 1 percent made similar statements under "other comments." These referred to a noisy, swaying, bumpy, and uncomfortable ride.

Fare Structure

Most passengers are satisfied with the fare structure. More than 90 percent rated it as satisfactory or better, and more than half considered it excellent or good. This is corroborated by the second highest reason for choosing Amtrak—to save money. Only 8 percent of respondents rated fares as poor or unsatisfactory. Somewhat ironically, the only route that had an off-peak fare program in effect at the time of the survey, TOL-DET-CHI, received the poorest rating and had the highest percentage of fare comments (12.4 percent). In contrast, more than 30 percent of intercity bus users thought fares were too high. This difference in fare satisfaction is partly due to the higher income of rail passengers and the greater percentage of business trips made using rail passenger service.

Courtesy of Employees

Nearly 98 percent of the respondents considered employee courtesy satisfactory or better. Fully 100 percent of the GRR-CHI users rated this item as such. Intercity bus users were also satisfied with courtesy of employees. Nearly 85 percent (84.9 percent) rated this item good or very good. Although the service ratings indicate a high overall degree of satisfaction with employee courtesy, users' written comments give a different impression. Terminal ticketing agents and food service employees are thought to be discourteous by some of the passengers. Written responses to this item were primarily complaints and constituted slightly more than 1 percent of the user comments. This appears to make it a small problem (especially considering the high degree of satisfaction of a majority of passengers rating this item). Employee courtesy has a direct impact on passengers and their impression of intercity rail service and is an important consideration.

SELECTED RAIL/BUS INTERRELATIONSHIPS

Rail/Bus Market Area

The median access time for the large metropolitan area stations (Detroit and Chicago) is 29 min. For the smaller metropolitan areas of Michigan (such as Flint, Grand Rapids, and Lansing) and other communities (such as Albion and Niles) that have rail passenger stations the median access time is 20 min. The time it takes to reach destinations from the station after disembarking the train is somewhat greater than the access times: 32 min for large metropolitan areas and 23 min for smaller metropolitan areas and other communities.

There are no comparable access time data for intercity bus users. However, information on means of transportation to and from intercity bus stations is available. This could be used to indicate time-distance differences. For instance, the percentage of walking and local transit trips to intercity bus stations is more than double the percentage to intercity rail passenger stations. This suggests shorter trips to access intercity bus stations. Conversely, taxi trips are nearly 100 percent higher

for intercity rail, which indicates a longer time-distance to access intercity rail passenger stations.

Rail/Bus Diversion

Approximately 12 percent of the respondents indicated that they would use intercity bus service if train service were discontinued. This ranks third as the predominant alternative to rail service with 1 of 2 passengers choosing automobile and 1 of 4 air travel. A somewhat higher percentage (15.6 percent) of intercity bus users indicated that they would use Amtrak should intercity bus service be discontinued. Twelve percent is approximately half the 23 percent figure obtained in the 1979 and 1980 rail surveys. More rail users choose the automobile and flying as alternatives today than previously. Another factor that affects diversion is the user profile. The intercity rail service user is significantly different from the intercity bus user. The typical 1985 intercity rail passenger had an average family income nearly twice that of the intercity bus passenger and came from a larger household with nearly three times more operating vehicles (Table 2).

Rail/Bus Interconnection

Approximately 1 percent of Michigan's intercity rail passengers use intercity bus service as their access or egress mode. The percentage of bus passengers using rail service for part of their trip is less (0.6 percent). This is not particularly surprising because Michigan's intercity bus and rail passenger schedules are not usually coordinated so that one can feed the other. Also, as mentioned before, the typical intercity rail and bus user profiles are significantly different. This contributes to, or may be the product of, the low transfer percentage.

Rail/Bus Users' Service Perspectives

Rail and bus users rated their respective services in terms of on-time performance, service frequency, vehicle condition, terminal condition, and employee courtesy. In every case, intercity bus users gave higher marks to their mode than did rail passengers. In addition, the "poor" percentage was lower for bus than rail in four of the five categories; employee courtesy was the exception (Table 3). The difference is greatest for frequency of service. This is understandable because two of Michigan's three rail passenger routes offer only one round trip daily. The second highest differential is for on-time performance. At the time of the rail survey, on-time rail performance was a problem for the Detroit-Chicago service and, to a lesser extent, for the International (TOR-PTH-CHI) service. The third-ranking category is terminal condition. Most rail passenger terminals are in good condition with the exception of Detroit's Michigan Central Depot; intercity bus terminal condition varies considerably. Another possible explanation for the difference is that rail users may have higher expectations because of their higher income and vehicle ownership levels.

Rail/Bus Trip Similarities and Differences

Aspects of rail and bus trips include station access and egress, trip purpose, size of traveling party, first-time travelers, and travel options (Table 1). Rail trips are preceded or followed more often by a taxi ride than are bus trips and less often by walking or trips on local transit. Rail trips are made more frequently for business, shopping, and vacations than are bus trips and less frequently for personal business. Rail trips are more likely to be made traveling with a family member, friend,

TABLE 3 USERS RATING COMPARISON, 1985

Item	Bus 2/ %	Rail %
Arrive/Depart on Time	79.6/5.2	63.9/11.4
Frequency of Service	69.5/4.8	42.2/14.2
Condition of Vehicle	83.8/1.5	73.6/3.2
Condition of Terminal	67.0/5.8	56.3/10.2
Courtesy of Employees	84.9/3.0	82.2/2.4

Notes: 1/ Intercity bus rating choices were very good, good, fair, and poor. Intercity rail rating choices were excellent, good, satisfactory, poor, and unsatisfactory. Different rating choices could distort comparisons between the bus and rail modes.

2/ The number to the left of the slash is "Very Good" plus "Good" and to the right of the slash is "Poor" for bus; for rail the number to the left is "Excellent" plus "Good" and to the right is "Poor" plus "Unsatisfactory."

Source: MDOT, Bureau of Transportation Planning, Passenger Transportation Planning Section, Surface Systems Unit.

or associate than are bus trips. Air is the most likely option (other than automobile) if the rail trip could not be made; no option (other than automobile) dominates if the bus trip could not be made. Twice as many bus as rail travelers would not make the trip at all.

LIMITATIONS

- Because the user survey questionnaire was completed independently by the user, and not in a personal interview setting, it is possible that erroneous data were reported. This could be because of sensitive data like age and income, a lack of understanding, inadequately defined terms in the question, or poorly structured questions. For instance, respondents were asked to rate the station, but the questionnaire did not indicate which station—the one at the trip origin or the one at the trip destination. This problem was reduced somewhat by making the people distributing the questionnaire available to answer questions and provide direction. Their availability was limited, however, because only two surveyors were present on any given train.

- The user survey did not reflect year-round travel patterns and trip purposes. Because the survey was conducted in October and November, summer travel patterns and purposes are not precisely represented. For instance, the number and percentage of trips made by university students is higher than in the summer when the universities are not in session or enrollment is less. The number of users traveling with children would have been higher had the survey been done during the summer months. Also, the number and percentage of vacation and business trips would probably be different in the summer when more vacation trip making occurs.

- Comparison of 1985 user survey data with those from the earlier rail passenger surveys may be distorted by variations in questionnaire wording, terms, and response categories. The 1985 survey data have been compared with data collected in the 1980, 1977, and 1975 rail user surveys conducted in Michigan as well as results of selected other non-Michigan-specific surveys (Amtrak user survey, February 1979; 4; 5). One of these surveys (1975) uses different age categories. Two (1980 and 1977) use household income instead of “family” income, and one (1975) reports individual income instead of either household or family income. One survey (1975) reports the top 10 responses about rail improvements; another (1980) reports the top 5 to keep service rated at a high level; the 1985 survey asked what one thing users would change about rail passenger service.

- Wording of questions regarding user trip origin and destination may be confusing. There appears to be some confusion on the part of survey respondents about trip origin and destination. Daily trip origin and destination are desired. However, some users assume their trip origin or destination to be their home location or final trip destination rather than where they started or ended their trip that day.

APPLICATIONS TO DATE

Demand Estimation

Demand estimation for rail passenger service has been undertaken in the past using trip length, time series data, and

ridership on rail services similar to the proposed service. Little or no attention has been paid to trip purpose, user characteristics, schedule, and quality of service. The 1985 survey data are being used to estimate demand for the extension and reconfiguration of existing Michigan rail passenger services. These data also are serving as one basis for developing elasticities for use in a soon-to-be-operational microcomputer demand estimation model. For example, one route has a schedule that accommodates same-day round-trip rail travel for business and shopping. Survey results indicate how many trips are for these purposes and the types of persons making them.

New Station Potential Analysis

Knowing the origin and destination of rail passenger trips has been instrumental in developing new station justifications. For example, selected station analyses have been undertaken of boardings and deboardings in terms of their trip origins and destinations. This resulted in determining how many existing trips would use the new stations and how many new rail trips would be generated.

Service Improvement Analysis

Knowing how many business travelers are using rail service now and what their travel patterns are helps scheduling. It is one basis for determining whether additional trains or an adjusted schedule, or both, would increase business traveler use significantly.

Market Targeting

Knowing the array of users and trip purposes has been useful in identifying key segments of the rail service market. These include user groups such as business travelers, college students, and retirees. Major trip purposes include visiting friends and relatives, vacation, business, and shopping. Advertising can be oriented toward these groups and accommodating these trip purposes. Michigan data have been used by Amtrak and MDOT for this purpose.

Service Evaluation

The user rating of the service offers one basis for making facility and service improvements. Items rated include food and beverage quality, car comfort, car cleanliness, on-time performance, frequency of service, station condition, station parking, fares, employee courtesy, and service convenience. The state of Michigan and Amtrak are taking steps to improve such features as scheduling and frequency of service.

FUTURE DIRECTIONS

Attitudinal Survey

Some attitudinal data were collected in the 1985 study. Included were questions about attitudes toward various features of the service (on-time service, frequent service, comfort, etc.) and preference questions (what one thing would you change, higher speeds versus more frequent service). Additional attitudinal data are needed to ascertain modal trade-off

potential for use in determining long-range elasticities. These data would be obtained using a survey technique referred to as "enveloping," that is, asking two or more questions about the same item to ensure that the attitude toward that item is being accurately measured.

Time Series Survey

One justification for the 1985 rail passenger study was to maintain a good data base with 5-year interval time series data. To continue this update frequency, a comprehensive user survey and study should be undertaken in 1990. That 1990 is a census year further underscores the desirability of conducting the study then.

User Group Analysis

Various dimensions of business travel have been examined, specifically, what percentage of today's business travel is accommodated by rail service and what travel patterns prevail within the constraints of Michigan's existing rail passenger service. More can be done for the business traveler. For instance, what are the characteristics of the business traveler who uses rail passenger service compared with the characteristics of the whole spectrum of business travelers? Similarly, more can be done for frequent users and weekday users. The same analysis can be applied to other key users of rail passenger service including college students and retirees.

Economic Impact Assessment

Certain economic benefits of rail passenger service accrue to the state, the communities served, the users of the service, and the general public. These should be documented and equated to their cost. The data and findings of the 1985 study provide one basis for this assessment.

Rail/Bus Coordination

Michigan's intercity rail and bus passenger schedules are not usually coordinated to allow one to feed the other. Only about

1 percent of Michigan's intercity rail and bus passengers use the other mode to access or egress the train or bus station. It appears that the two modes are not in direct competition with one another to a high degree because the amount of diversion that exists between the two is only 10 to 15 percent. It would therefore benefit each mode if intercity bus feeder services to and from rail passenger stations were improved through better schedule coordination.

On-Time Performance Improvements

Users in the TOL-DET-CHI corridor perceive on-time performance to be inadequate; approximately 15 percent rated it unacceptable. Efforts should be made to improve on-time performance in this Michigan corridor.

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