

# Chapter X

## Metropolitan Experience

Previous chapters have been national in perspective; this chapter presents a brief view from the metropolitan areas. This chapter contains a brief discussion of the experience of local transit operations during recessions and the energy crisis and also examines the ability of the operators to expand service.

Chapter X completes the evaluation of the relationship between transit, the economy, and energy.

The last chapter discusses the national policy issues and possible initiatives which are appropriate to deal with the concerns raised by this evaluation.

### INTRODUCTION

A limited sampling of the experience in several large metropolitan areas has revealed the following information, which is discussed below:

1. Ridership increases experienced during the energy crisis and the ridership decreases experienced during the recent recession conformed in general to the results of the national analyses discussed earlier.
2. Several transit operators in the cities sampled also revealed the existence of plans to increase transit service in order to respond to severe energy shortages.
3. Based upon the experience in Washington, D. C., and Atlanta, Ga., the construction of a rapid transit system can significantly reduce the levels of unemployment in a large metropolitan area.

This information was gathered largely through a questionnaire distributed to the transit planners and operators in the nine metropolitan areas included in this study. The questionnaire (see Appendix B for a copy) elicited information on the experience of the metropolitan areas during the energy crisis and the ability of the transit systems to respond to assumed future energy conditions. Responses to the questionnaire varied in completeness, with most respondents willing to share their past experience, but

only a few willing to predict their requirements and ability to respond to future energy conditions,

### Ridership Changes Due to Changing Energy and Economic Conditions

Recent changes in transit operations, such as increased service or decreased fares, in most metropolitan areas have a noticeable effect on ridership, which is difficult to distinguish from the effect of the energy crisis. Thus, it is difficult to establish a causal relationship between ridership changes and gasoline shortages and economic conditions, since so many other factors play a significant role in determining ridership in each metropolitan area. However several trends in ridership increases can be detected during the energy crisis (late 1973 and early 1974) which conform closely to the national trends which were observed and reported in previous chapters. Four cities provide excellent examples of the effect of the energy crisis on ridership.

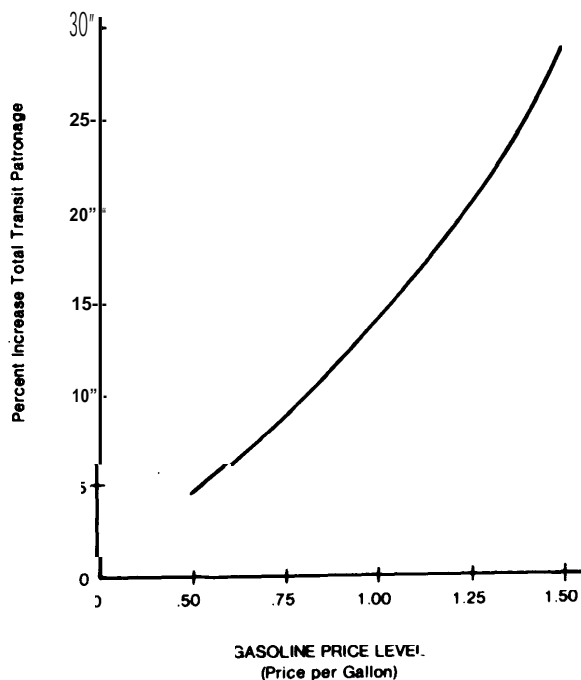
Both Atlanta and Minneapolis have had ridership increases during the energy crisis which conformed to the national estimates. In both cities transit officials commented directly on the relationship of energy conditions and ridership. In Minneapolis, it was estimated that the energy crisis was responsible for a 6 percent increase in transit ridership. In Atlanta, it was hypothesized that the energy crisis was responsible for continuing a 10 percent annual growth in ridership for a longer period than would have been the case without the energy shortage.

Monthly ridership for Seattle's Metro and San Francisco's Muni, respectively, exceeded and fell short of the 6 percent national ridership increase of 1974. The annual ridership increase during the first 4 months of 1974 averaged 22 percent in Seattle, while a 16 percent average increase was experienced for the first 10 months of the year. San Francisco's Muni also experienced much greater ridership increases during the energy-short first 4

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<sup>1</sup>A strike in November 1974 makes increases for the full Year difficult.

**FIGURE 16**  
**EFFECT OF FUEL COSTS ON**  
**TRANSIT RIDERSHIP**



Note Base gasoline cost is .35 per gallon

SOURCE "Impact of Pricing Policies on Transit Use" CATS  
Research News, vol 17 #1, April 1975

months of 1974 than the whole year. In the first 4 months of 1974 ridership increased by over 7 percent while for the whole year ridership averaged only a 4 percent increase.

Only the transit operator in the Twin Cities was willing to forecast the actual ridership changes they expected under the energy futures described in chapter 4. However, a Chicago study by CATS<sup>2</sup> provided forecasts of transit ridership increases in response to fare reductions and gasoline price increases which could be compared with the forecasts developed in this study. Both the Chicago and Twin Cities' forecasts are in conformance with the national forecasts discussed earlier.

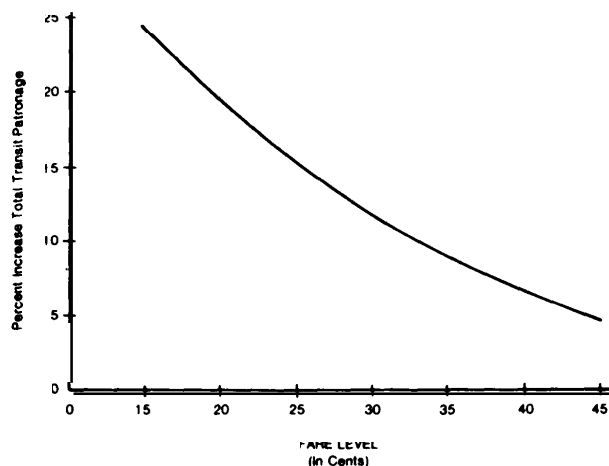
Twin Cities' transit use was forecast to increase 5 percent by 1976, 8 percent by 1977, and 20 percent

<sup>2</sup>Chicago Area Transportation Study, *Record News*, April 1975. "Impact of Pricing Policies and Transit Use."

by 1980 for the mild, moderate, and severe energy futures. These forecasts are lower than the national estimates contained in Chapters VII and IX, however, they are in addition to sizeable transit ridership increases due to increases in transit service programed for the area. If energy conditions alone (without increases in the level of service) are considered, it can be assumed that many of those new riders forecast to be drawn to transit by improved service would have also been drawn to transit under energy shortage conditions. Thus, the effect of energy shortages alone would have attracted more riders, possibly as many as was forecast nationally.

The "Impact of Pricing Policies on Transit Use" by the CATS staff forecast changes in ridership due to increases in gasoline price and decreases in fares as shown in Figures 16 and 17. The CATS analysis indicated that a 50 percent increase in gasoline cost would result in about a 5 percent increase in transit ridership, which is the same approximate figure developed in Chapter IX. The CATS analysis of the relationship between fare reductions and ridership did not consider free fares, however, a very rough extrapolation of the relationship between fares and ridership increases would

**FIGURE 17**  
**EFFECT OF FARE ON TOTAL**  
**TRANSIT RIDERSHIP**



Note Base is with existing fare structure

Revised fares ● pply 10 ● ll CTA service ● d suburban buses

sourceImpact on Transit Use," CATS,e  
Research News, vol 17#1, April 1975

indicate a 30-35 percent increase in ridership with zero fare. If additional ridership can be expected due to the convenience of no fare (as opposed to the inconvenience of paying even the smallest fare), a ridership increase of 40-50 percent could be expected in conformity with this study's forecast of 40-60 percent increase.

In Atlanta, comments from MARTA presented the view that the ridership increases forecast by this study were low, if no restraints upon transit service were assumed. This study has assumed that energy shortage conditions accompanied by improvements in the level of transit service would result in increases in ridership above that expected from energy shortages alone. In addition, MARTA's recent experience in attracting new riders and its well run transit operations would lead the transit operators there to expect greater than average ridership increases.

The comment from Atlanta merits a comment about the forecasts developed for this study. These are average national figures. In response to local conditions, it can be expected that many cities will exceed the average ridership increases and others will experience less increases.

Although most cities could not estimate the effect of increased unemployment on transit ridership, some figures from Atlanta tend to support the national figures discussed above. In Atlanta in September 1974, the unemployment rate was 5.0 percent while transit ridership was increasing at a 9.1 percent annual rate. By March of 1975 the unemployment rate in Atlanta was over 10 percent, and the growth in transit ridership was reduced to 5.3 percent. Thus a very large (5 percent) increase in unemployment corresponds to only a relatively small (3.8 percent) decrease in the growth rate of transit ridership; these figures tend to confirm that the unemployment rate has only a small effect upon transit ridership.

#### Ability of Metropolitan Areas To Deal With Ridership Increases

Information was gathered on the ability of metropolitan transit operators to deal with ridership increases in four metropolitan areas: Atlanta, Seattle, Twin Cities, and Washington, D.C. Only Washington has developed plans for dealing with severe energy shortages, which are discussed following a summary of the abilities of the other cities. It should be cautioned that this is a very

limited sample of cities and their responses may not reflect national trends.

Transit operators in Atlanta, Seattle, and the Twin Cities responded to questions concerning their ability to handle increases in ridership due to each of the three assumed energy futures—mild, moderate, and severe.

All three agreed that the energy shortages would cause much greater peaking of demand for transit services, with the severe energy conditions being the most peaked. This assumption conflicts with this study's forecast. This study assumed that under the severe energy future significant numbers of off-peak as well as peak riders would be attracted to transit thus lessening somewhat the peak-to-base ratio. This study assumed that in an extended period of severe energy decreases, people would shift some of their discretionary offpeak trips to transit. This assumption is contrary to observations during the short-lived energy crisis of last year, when individuals gave up many discretionary trips. It is likely that the transit operators based their peak-to-base ratios on recent short term experience and did not consider the long term implications used in this study.

Any large increases in ridership, especially in the peak hours would severely erode the financial picture of the transit operators. MARTA estimated that the mild energy future would require more subsidy, the moderate energy future—much more subsidy and the severe energy future—very much more subsidy. Seattle's Metro stated that their financial picture would be "impossible" under any of the future energy conditions.

Each operator estimated that buses, drivers, and mechanics required would be roughly equivalent to peak hour increases, thus under the most severe conditions Seattle would require 1,000 buses; Atlanta, 358; and Twin Cities, 380.

The time required to meet the increased transit demand varied greatly. Under the mild energy conditions the acquisition of additional buses and the training of drivers would require about a year in both Atlanta and Seattle. In Minneapolis/St. Paul the increases in ridership could be handled in 2 months since 160 old buses are held in reserve, eliminating the delays of ordering new buses.

In response to a question on the ability of the metropolitan transit agency to expand its capital program in response to a Federal program to create employment opportunities, both Twin Cities and Seattle could not get construction underway for about 3 years. Twin Cities estimated that they could

increase their capital program by about \$50 million, including \$10 million raised locally. Seattle indicated that they could possibly increase their program by 10 percent (\$16 million) but could raise no additional local money. Atlanta indicated they could spend an additional \$1 billion (20 percent local share), however, that additional \$1 billion would be in the form of a Federal commitment to complete the whole Atlanta rail system, rather than the partial commitment which UMTA currently has offered.

The Washington Metropolitan Area Transit Authority has prepared two brief studies which outline the ability of the transit service to deal with conditions of severe energy shortages. While these studies do not respond directly to the questionnaire, they provide interesting examples of the actions which would be necessary to respond to significantly increased ridership.

The most recent of the two Washington Metropolitan Area Transit Agency (WMATA) energy crisis studies mentioned above was done in February of 1974.<sup>3</sup> This study was based on the assumption of "sudden notice of almost complete unavailability of gasoline for private automotive use," and was designed with the objective of "development of emergency action program to provide maximum transit service, " In order to achieve the increased transit service several assumptions were required. One of the most important was that work hours would be much more staggered, resulting in rush hour **bus** service of 4-1/2 hours in both the morning and afternoon. (Currently the rush period bus service is 2 hours.) It was assumed that exclusive use of suburban arterials and city streets would be granted to transit buses. Load factors were to be increased on all transit buses. Additional buses would be required, some coming from the use of school buses, sightseeing buses, and military buses; and others coming through accelerated delivery of new buses. Although the study does not state so explicitly, it is assessed that these measures would result in the transit system being able to handle most of the work trips in the Washington area. It was assumed that these conditions could only be temporary. Thus the extensive use of overtime for drivers and mechanics was envisioned, without the use of additional drivers and mechanics. This extensive use of overtime labor, as well as the increase in peak hour traffic resulted in a severe increase in costs over revenues. The study's prelimi-

ary estimate of increased operating deficit was about \$100,000 per day.

The second energy related study done by the WMATA Office of Planning in June 1973, was predicated on the assumption of reductions in auto driver trips of 10, 20, and 30 percent in the years 1975, 1980, 1985, and 1990. Unlike the other study, it was assumed that the transit agency would have at least a year to prepare for the reduction in auto trips. The factor which required the year delay in implementation of increased service was the training of new bus drivers. The study assumed that there would be increased occupancy on the buses, and under conditions of 20 and 30 percent reductions in auto trips the rush period was extended from 2 to 3 hours. These assumptions resulted in increased transit ridership of approximately 33, 44, and 67 percent in 1975 for auto trip reductions of 10, 20, and 30 percent respectively. For the years 1985 and 1990, transit ridership (bus plus rail) was forecast to increase, 22, 39, and 60 percent for the assumed set of auto trip reductions. The lesser increase in transit ridership for the later years is due to the fact that the subway system would be in operation and would be carrying a greater proportion of all trips under ordinary conditions, thus the additional number of passengers diverted from automobiles (the assumed 10, 20, and 30 percent reductions) would be a smaller percentage of total areawide trips and a smaller increase in ridership than for the presubway period. Additional buses would be required under all assumed conditions ranging from **371** to **620** buses for the entire 15-year period, and only under the 30 percent reduction in auto trips were any additional rail cars required. Operating deficits were reduced in nearly all of the years and under all of the assumptions, in fact, in some situations the transit operation actually made a profit.

These two studies indicate that it would not be difficult to increase the capacity of the transit system in the Washington, D.C. area. In the very short run, the limiting factor in increasing the capacity is the availability of trained drivers and mechanics. Additional buses are probably of secondary importance, assuming that by staggering work hours more efficient use could be made of the existing fleet. If the bus system was given at least a year to prepare for significant increases in ridership this could be accomplished at a minimal cost, with a substantial decrease in the operating deficit after the full impact of the severe energy shortage is felt. In the

<sup>3</sup>Unpublished data from the Office of Planning, WMATA

short run, Federal assistance would probably be required to help absorb the operating deficit incurred. The magnitude of this required assistance depends primarily on the relative timing of the buildup of staff and equipment as compared with the rate of impact of the fuel shortage. If it were possible to optimally time the buildup (hiring, training, and acquisition of new equipment) with the timing of the fuel shortage impact, the additional operating deficit to WMATA would be very modest compared to the costs of either (1) having no warning and being forced to pay excessive overtime, etc., or (2) incurring the costs of building too early with respect to the fuel shortage impact before the substantial compensating revenues are realized. The Federal Government, as the major employer, would have to take the lead in changing to more staggered work hours, particularly during the transition period as transit operations are shifted to accommodate the fuel shortage.

The possibility of speeding up the construction of the Washington Metro subway system to meet increased transit ridership demands due to decreases in gasoline availability is not very great. It is very likely that the time required to complete construction of the system has been understated just as the cost of the system has been. The completion of the total system has already been moved back a couple of years, and currently additional money is required just to maintain the current construction schedule. It is likely that increases in Federal capital assistance in the Washington, D.C. area will improve the chances of the construction schedule being met. However, it is not likely that the construction schedule could be significantly shortened unless additional amounts of Federal money were to become available at earlier dates. Even if this were to happen there would be serious constraints on the degree to which the speed up could be accomplished including:

- a) inability of local and State governments to accelerate funding.
- b) lack of qualified additional supervisory staff at WMATA,
- c) capacity of suppliers to meet earlier delivery dates for certain critical materials and equipment,
- d) capacity of local contractors to speed up operations.

In summary, in the Washington, D.C. area, the transit system could handle substantially increased ridership resulting from auto use reductions of up to 30 percent with moderate additional cost, if

- (1) at least a year's notice is provided before increased capacity is required,
- (2) the timing of the buildup can be dovetailed with the timing of the fuel shortage impact, and
- (3) Federal responsibility for major staggering of working hours is achieved.

#### Employment Generated in Metropolitan Areas by Mass Transit Construction

Information indicates that the employment generated by the construction of regional rapid rail transit systems in both Washington, D.C., and Atlanta could equal 3 percent of the regional labor force. In Washington, there are currently about 8,000 construction workers plus 1,000 WMATA employees and consultants working on the new rapid rail system. Assuming that the local multiplier adds 80 percent more jobs, the total number of Washington area jobs related to the subway construction is over 16,000. This is more than 1 percent of the total Washington, D.C. labor force and may be responsible for keeping the unemployment rate much lower than the national average. A senior official in a large engineering consulting firm working with WMATA indicated that the reason the unemployment level in the construction industry in Washington, D.C., is very low compared to the national average of 18 percent unemployed is because of the existence of the construction jobs on the new subway.

In Atlanta, a recent study<sup>4</sup> showed the increase of employment attributable to the construction of MARTA in the five-county Atlanta SMSA would be over 21,000 jobs for 10 years. This figure indicates that the construction of a rapid transit system in Atlanta would directly or indirectly employ 2 percent of the Atlanta labor force for 10 years.

The Atlanta figure is not based upon any actual construction and thus may be slightly high. The

<sup>4</sup> Larry D. Schroeder, David L. Sjoquist, and Paula E. Stephan. *Impact on Income and Employment Resulting from MARTA Construction Expenditures*, prepared at the request of Robert W. Nelson, Assistant General Manager for Finance and Administration, MARTA, February 1975.



View o Me o unne Cons u on

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## SUMMARY

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