TRANSIT DEVELOPMENT PROGRAM

MIDSTATE REGION

MIDSTATE REGIONAL PLANNING AGENCY

1978

A TRANSIT DEVELOPMENT PROGRAM

FOR THE

MIDSTATE REGION

PREPARED FOR

MIDSTATE REGIONAL PLANNING AGENCY

BY

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1.0 BACKGROUND

The Midstate Region is currently at a critical decision point in terms of public transportation services for the Region's population. As in many areas of similar characteristics throughout the country, private transit operators began service cutbacks in the mid-1960's to reduce operating costs in light of declining fare box revenues. This set in motion a vicious circle of revenue declines, followed by more service cutbacks, until finally all local transit service was eliminated in the Region. As time progressed, it became increasingly evident that certain groups of people in both the urban and rural parts of the Region were being denied full access to employment, social, medical and recreational opportunities because of the lack of public transit service.

Recognizing the mobility deficiencies created by the lack of a general public transit service in the Middletown, Portland and Cromwell areas and the increasing need for special transportation services throughout the entire Midstate Region, the Midstate Regional Planning Agency contracted with Alan M. Voorhees and Associates to evaluate existing transit services in the Midstate Region and prepare a 5-year action program to serve as a planning guide for future transit operations. This report describes the activities and analyses which were conducted as part of the study, and presents the recommended Transit Development Program for the Midstate Region.

2.0 PURPOSE OF STUDY

The overall goal of the Transit Development Program (TDP) is to balance transit needs and public costs in a manner consistent with local values. Commencing with a detailed analysis of existing transit services throughout the Region, the study then identifies the Region's transportation needs. A comprehensive program is then presented which addresses these needs of the general population and limited mobility groups, such as the elderly and handicapped.

During the course of preparing the Transit Development Program, several major issues surfaced through the public participation process and technical analysis component of the study. As the study progressed, these concerns evolved into the following goals statement, which helped guide the TDP:

- Provide and maintain a convenient, comfortable and realiable transportation system which meets the mobility needs of the transit dependent population.

- Suggest alternative institutional structures for operating transit in the Midstate Region which provides to the maximum extent possible, continuous operations and has the flexibility necessary to adjust services to meet changing needs.

- Improve the existing special needs transit services to be more responsive to the needs of elderly, handicapped and low income individuals.

- Provide alternatives for the operation of a soundly managed and fiscally responsible system whose costs do not exceed revenues from user charges and pre-established subsidy levels from participating communities.

- Reduce traffic congestion and air pollution in central cities and shopping areas, while increasing their accessibility. Help in the preservation of limited energy resources which will contribute to the viability of the Region's economic activities and the social mobility of its population.

3.0 EXECUTIVE SUMMARY

The major findings and conclusions of the Transit Development Program study are as follows:

3.1 Existing Public Transit System

- There is essentially no existing local transit service in the Region which can be used as a suitable base upon which to build a new local public bus system.

- Transit service offerings in the Region are primarily interregional in nature serving major urban area work trip desires.

- Mobility afforded by the limited local transit service is poor due to excessive headways and an extremely limited service area.

- Social service agencies are severely burdened in providing transportation for their clientele. The majority of the agencies interviewed indicated they have unmet needs. The amount these agencies must spend for transportation for the elderly and handicapped is expensive and a drain on their limited resources.

3.2 Public Transportation Needs

The results of the Transit Development Program's primary data acquisition activities are summarized in Table ES-1. From this table, the following major public transportation needs in the Midstate Region have been identified:

- The most apparent need for regular fixed route bus service is in the urbanized areas of Middletown, Portland and Cromwell. Such a service could also be used as a feeder to the existing line-haul service into Hartford. A possibility of special commuter service exists between the Middletown CBD and the industrial parks to the northwest and southwest.

- A high need for specialized transportation services for the elderly, handicapped, and low income ("special needs" services) is apparent in Middletown. A medium level need has been identified in Cromwell, Portland, East Haddam and East Hampton.

- A major need is evident to coordinate and provide support for the special needs transportation programs in the Region.

3.3 Organizational Structure

System Ownership and Management -- There are three basic transit ownership/management options open to the Region -- private ownership and management; public ownership and management; public ownership and private management.

Private Ownership and Management -- Under this option, the cost of operation is the responsibility of the private operator and no public subsidies would be involved. However, given the relatively poor success of such operations, it is doubtful that a private operator willing to assume operations in the Region can be found. Even if an operator were found, continuous transit service would not necessarily be assured. System continuity and coverage could be disrupted by eliminating unprofitable or marginally profitable routes.

Public Ownership -- An alternative to private ownership and management is public ownership of the system. Under public ownership, the system may be publicly or privately managed. There are three mechanisms for public ownership: municipal department - municipal or transit district - State agency.

TABLE ES-1

MIDSTATE REGION TRANSIT DEVELOPMENT PROGRAM
PUBLIC TRANSPORTATION NEEDS INVENTORY

Community	On-Board Bus Survey	Socio-Economic Screening Process	Employer Survey	Social Service Agency Survey	Activity Center Survey	Transit Operator Inventory	Community Official Interviews
Middletown	High CS	Med./High	High RR	High SN	High	Med. CS	High-Mini Bus Serv. CBD
Portland	NA	Med./High	Med. RR	Med. SN	Med.	NA	NA
Cromwell	High CS	Med.	Med. RR	Med. SN	Med.	Med. CS	NA
E. Hampton	NA	Low/Med.	Low	Med. SN	Low	NA	NA
Haddam	NA	Low	Low	Low	Low	Low SN	NA
E. Haddam	NA	Low	Low	Low	Low	Low SN	NA
Durham	NA	Low	Low	Low	Low	NA	NA
Middlefield	NA	Low	Low	Low	Low	NA	NA

RR = Regular Route
SN = Special Needs
CS = Commuter Service

Potential Need

High, Medium, Low

N.A. = Not Applicable

SOURCE: AMV & Associates Surveys, February, 1977.

TABLE ES-2

COMPARATIVE ANALYSIS OF PUBLIC OWNERSHIP FORMS

Evaluation Criteria	Public Ownership Form	Municipal Department	Transit District	State
Ability to Establish Regional Service		P	G	M
Flexibility In Choice of Management Structure		G	G	P
Flexibility In Choice of Level of Service		G	G	M
Potential for Local Involvement in Transit Operation		G	G	M
Availability of Experienced Transit Professionals		M	M	G
Granted Public Utility Commission Authority		NO	YES	NO
Additional Level of Local Government Required		YES	YES	NO

KEY:

G = Good
M = Medium
P = Poor

The financial implications in terms of eligibility for State and Federal funding programs and local tax dollars required are the same regardless of the form of public ownership employed. However, aside from the general and financial considerations of public ownership, there are some distinct differences between the forms of public ownership. Table ES-2 shows a comparative analysis of the three basic public ownership alternatives.

Management Under Public Ownership -- If a decision is made to publicly own the transit system, it may be operated by a public transit agency or by a private management firm under contract to the agency. Under public management, the transit agency would be directly responsible for the day-to-day operation of the system. It might be less costly than private management, since no management fee would be paid. However, unlike a private management company which has experienced transit managers ready to assume control of the system, the public agency would have to find and attract qualified personnel to manage the system. Also, without the profit motive working to induce economy and efficiency, public systems have often become more costly in the long-run as a result of this factor and the impact of political patronage and pressures.

Recommendation -- The Transit District form of ownership appears to offer the most advantages for the successful implementation and maintenance of public transit service in the Midstate Region by making the Region eligible for maximum State and Federal financial aid, while keeping actual transit operation under local control.

It is recommended that the system be managed initially by a private operator under contract to the Transit District. This will insure competent system management and operations, while allowing the Transit District to gain necessary experience in running a transit system.

3.4 Transit Service Alternatives

Responding to the previously identified transit needs, a four-tiered approach to providing transit service in the Midstate Region was developed: (1) regular fixed route service; (2) special commuter service; (3) special transit service for the Region's elderly and handicapped; and (4) extension of transit service to rural areas of the Region. The alternatives were framed in a "program package" concept. This approach allows the Region's communities to choose between clearly defined transit service programs to arrive at a level of transit service consistent with their transportation goals and financial resources.

Regular Route Service -- Using data provided by the Connecticut Department of Transportation (Conn. DOT) on the nature of travel patterns in the Midstate Region, as well as the socio-economic profile developed in Phase 2 of the transit study, a set of six basic transit travel corridors were identified. All corridors are radially oriented to the Middletown Central Business District (CBD), the focal point of the system.

Within each basic travel corridor, a number of specific routings were examined in terms of patronage costs and revenues. Two alternative route systems were identified -- a system of six routes which produce maximum coverage of the service area, and a system which produces an optimum revenue/cost ratio while still providing adequate coverage of the service area.

For each of these systems, three service levels were studied -- 30-minute service all day; 60-minute service all day; and 30-minute peak service with 60-minute off-peak service. Cost/revenue analysis for each system is based on 12.5 hours of operation per day (6:00 AM to 6:30 PM) and an adult fare of $ .35 per trip with provision for reduced elderly and handicapped fares.

System costs ranged from a low of $176,800 for the optimal revenue/cost route structure with 60-minute all-day service to a high of $413,400 for the maximum coverage route system with 30-minute service. Table ES-3 summarizes the cost/revenue analysis and tax implications for the various systems and service levels.

Special Commuter Service -- Travel data for the Midstate Region indicates that work trips are split approximately equally between intra-regional and inter-regional commuter trips. Of the intra-regional trips, the majority are oriented toward the Middletown CBD and can be accommodated by the proposed regular route service. However, there are some large employment concentrations on the outer fringe of the urbanized area which cannot be served by the proposed regular route system. To provide these employers with transit service, two alternatives were developed -- subscription bus service to Sawmill Brook Industrial Park and Pratt & Whitney, and shuttle bus service from Union Park to the two sites.

TABLE ES-3

ALTERNATIVE REGULAR ROUTE SYSTEMS
COMPARATIVE FINANCIAL ANALYSIS

ROUTE SYSTEM AND SERVICE LEVEL	FIRST YEAR STATISTICS Ridership	Cost	Revenue	Deficit	Percent Thru Fares	Local Share	Average Tax Per $1,000 Assessed Value
MAXIMUM COVERAGE SYSTEM							
30 Minute Service	390,000	$413,075	$116,766	$296,309	28.0	$65,500	$0.18
60 Minute Service	194,610	206,540	58,383	148,157	28.0	32,770	0.09
30/60 Minute Service	310,700	313,625	93,210	220,415	29.2	47,483	0.13
OPTIMAL REVENUE/COST SYSTEM							
30 Minute Service	357,240	$352,950	$107,172	$245,778	30.4	$52,300	$0.14
60 Minute Service	178,620	176,475	53,586	122,889	30.4	26,150	0.07
30/60 Minute Service	286,260	268,775	85,878	182,897	31.9	37,693	0.10

The subscription bus option would require four buses to each of the two employment centers to cover the three service area communities effectively. Two buses each in Portland and Cromwell, and the remaining four in Middletown. Each bus would operate on a semi-fixed route basis, looping through its respective service area to collect passengers and then running express to the employment site. Precise routings of the collection/distribution portion of the route would depend on the home locations of employees.

The shuttle bus option would require one bus to each of the two employment sites initially. The service would originate at Union Park and run express to both Pratt & Whitney and Sawmill Brook Industrial Park. Access to the shuttle would be provided by the proposed regular route system.

Table ES-4 summarizes the patronage, revenue, costs and tax impact of the two alternatives. These estimates assume that the commuter service is to be totally supported through user fares and federal, state and local subsidies. An alternative funding mechanism, which could be used to ease the amount of local subsidy required, would be to solicit funds from the employers of the two industrial parks being served.

Analysis of the inter-regional commuter services provided to the Region's residents indicate a high level of service is provided to a relatively small number of residents. While the TDP is limited to studying intra-regional services, accessibility to the inter-regional commuter services can be significantly improved by coordinating the two services. The proposed regular route system was designed to improve coordination and accessibility of transit services by developing a pulse system which could be scheduled to meet existing service to Hartford at Union Park and by servicing at least one of the existing express bus carpool lots. In the future, should demand warrant it, Union Park could also be made an express bus origin.

Elderly and Handicapped Services -- To provide an improved transportation service to the Region's elderly and handicapped, two basic improvement programs were developed -- coordination of existing services and increased services in the urbanized area of the Region. Under the proposed service program, the transit agency

TABLE ES-4

WORK COMMUTER SERVICE ALTERNATIVES
COMPARATIVE FINANCIAL ANALYSIS

FIRST YEAR STATISTICS

Service Option	Ridership	Cost	Revenue	Deficit	Percent Thru Fares	Local Share	Average Tax Per $1,000 Assessed Value
Subscription Service	62,400	$95,550	$21,840	$73,710	23.0	$17,676	$0.05
Shuttle Service	18,170	$16,250	$ 6,360	$ 9,880	39.0	$ 1,037	$0.002

would assume primary responsibility for providing specialized transportation services in the urbanized portion of the Region. (Middletown, Portland, and Cromwell.) The system would provide approximately 120-vehicle hours of service per week to the three communities. The cost of the service is estimated at $57,200 per year, while revenues based on a 30¢ fare are estimated at $17,550. The remaining deficit of $39,650 would be split equally between the transit agency and Conn. DOT. Table ES-5 shows the patronage, revenue, cost and tax impact of the service.

The primary advantage of this program is that it would allow financially burdened Middlesex County Transportation, Inc. (MCT) to reduce operating costs by reducing or eliminating service in the urbanized area of the Region and concentrating its services on the rural areas of the Region where there is a significant unmet demand. MCT could then function as a direct service between rural communities and the urbanized area, or as a feeder service to the proposed regular route service.

Demand Responsive Service to Rural Areas -- In rural areas where population densities are generally too low to support regular fixed route transit service, demand responsive service may be a feasible alternative. Demand responsive, or dail-a-ride service, as it is frequently called, has basically three modes of operation:

- Many (origins) to one (destination)
- Many (origins) to few (destinations)
- Many (origins) to many (destinations)

Each service has a different level of cost and convenience. "Many-to-one" is the least costly and least flexible, while "many-to-many" service is the most costly, but also most flexible.

Previous studies have indicated that, while population densities in the service area can be lower, there is a point below which it is not cost effective to provide this type of service. Given the size and spatial orientation of the Midstate Region, its cut-off point is approximately 2,075 persons per square mile.

The effective population densities of the five rural towns in the Region are in the range of 500-1000 persons/square mile -- far below the cost effective point.

TABLE ES-5

ELDERLY AND HANDICAPPED SERVICE

FIANANCIAL ANALYSIS

FIRST YEAR STATISTICS

Ridership	Cost	Revenue	Deficit	Percent Thru Fares	Local Share	Average Tax Per $1,000 Assessed Value
58,500	$57,200	$17,550	$39,650	30.7	$19,825	$0.05

To provide transportation service to the general public, it is recommended that serious consideration be given to using existing taxi service as the para-transit mode, at least initially. As densities and/or government subsidies increase, public demand-responsive service may become more cost effective in rural areas.

3.5 Recommended Transit Development Program

REGULAR ROUTE SERVICES

In response to community input and goals, and based on projections of demand and ridership, a system of four routes, initially serving the City of Middletown, is recommended. These routes are as follows:

- Washington Street North Loop -- designed to link residential areas north of Washington Street in Middletown to CBD retail and social opportunities. This route alignment was modified slightly from that presented as an alternative.

- Washington Street South Loop -- designed to serve residential areas west of the CBD, Wesleyan University, and major shopping opportunities.

- South Main Street Loop -- designed to provide service between southwest Middletown residential areas and educational facilities and the CBD.

- Saybrook Road/Silver Street Loop -- designed to provide service between low income housing complexes southeast of central Middletown and retail, medical and educational facilities along Saybrook Road.

Two routes, for future expansion of the system, are also proposed. These are:

- Main Street/Portland Loop -- designed to provide an alternative mode between the Town of Portland and City of Middletown.

- Main Street/Cromwell Loop -- designed to provide more frequent service to Cromwell residents desiring to take advantage of the educational, medical, social and retail opportunities available throughout the Region.

Figure ES-1 shows a map of the entire system.

MIDSTATE PLANNING REGION URBAN AREA

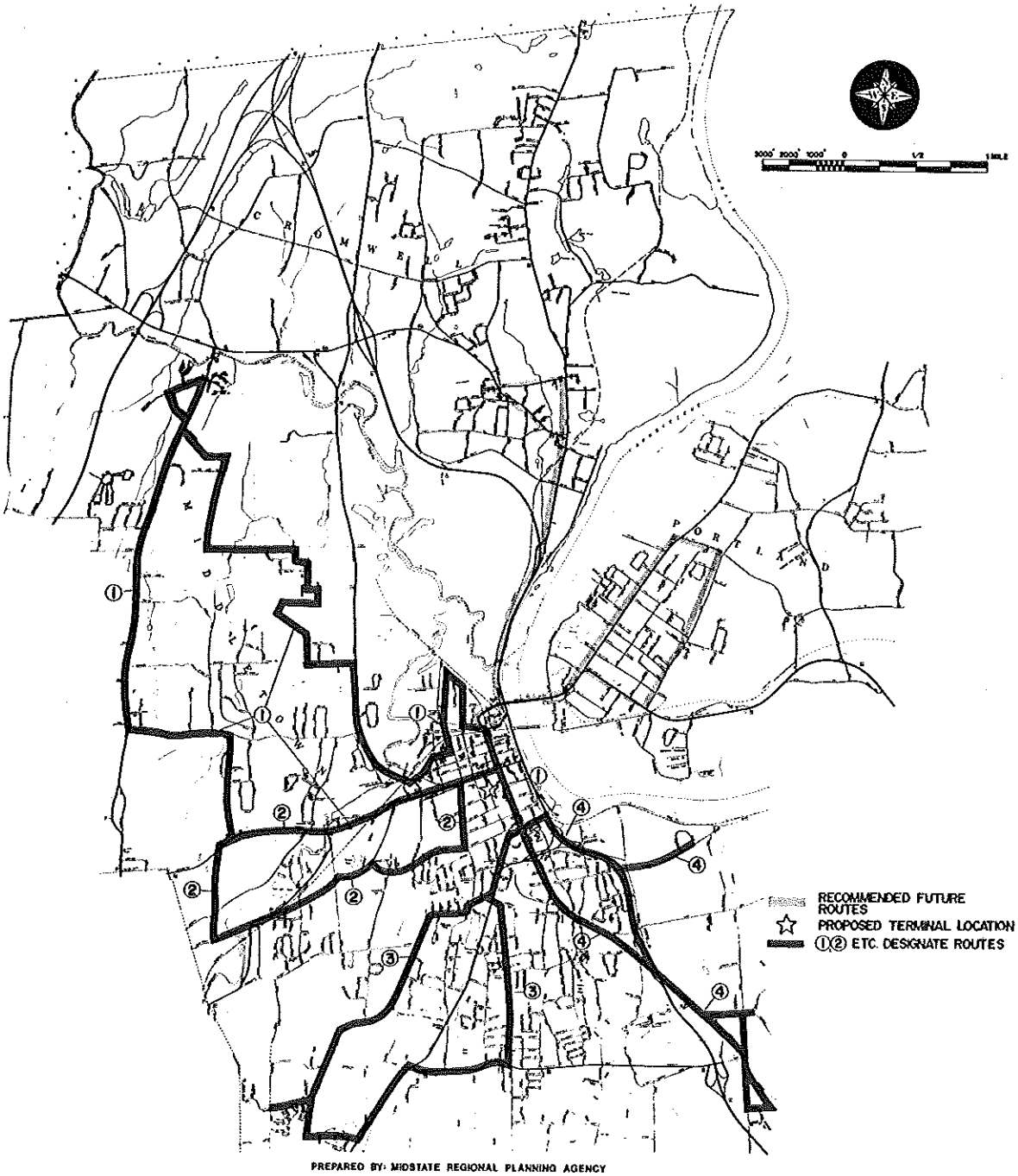

FIGURE ES-1

RECOMMENDED ROUTE SYSTEM

The proposed service would be every 30 minutes on all routes, Monday through Saturday. No Sunday, or Holiday, service would be offered initially.

The hours of operation are suggested to be 6:00 AM to 6:30 PM, Monday through Thursday and Saturday. Friday service would operate from 6:00 AM to 9:30 PM, to accommodate evening shopping desires.

All routes would converge on Columbus Plaza in Middletown, every half-hour, where they would exchange any transferring patrons before leaving on their respective runs once more. This is called a "pulse" system, and forms a convenience, especially for elderly and handicapped, by eliminating annoying waiting time between buses, an advantage in inclement weather. Transfers would be free.

Proposed fares are 35¢ for adults, 15¢ for elderly and children under 12.

The system has been designed to place an estimated 75 percent of Middletown's population within walking distance (one-quarter mile) of regular route service. The system has also been designed to service a majority of employers, shopping centers, health facilities, and activity centers in the City of Middletown.

Special Services for the Elderly and Handicapped -- Increasing the geographic coverage and frequency of regular route service will make the standard service more accessible to elderly and handicapped (E&H), as will half-fares and new buses designed to better accommodate elderly and handicapped.

Recognizing the mobility problems of these groups that may deter their use of regular route service, door-to-door demand-responsive service, similar to that offered to the clientele of many of the social service agencies operating in the Region, is seen as a necessity if mobility is not to be denied these groups, which comprise 17 percent of the Region's population.

Proposed E&H services, which could be provided by a combination of transit and taxi operators, to better match vehicle capacity to demand, under contract to the Transit District, consist of the following:

Subscription Service -- handles recurring trips to and from the same origin and destination on a regular basis, such as work and school trips.

Dial-a-Ride Service -- provides door-to-door shared-ride service when reservations are called in 24 hours in advance.

Duplication and overlap in social service agency transportation service could be reduced by coordination by the transit management agency and by permitting the agencies to purchase rides on the E&H services cited above for their clients.

Equipment used for the system would vary according to the number of service requests or the size of the group to be transported, varying from full-size buses through vans, or mini-buses, to taxicabs. Some of the equipment would be designed to accommodate wheelchairs. Fares are proposed to be 30¢ per one-way trip.

The City of Middletown, containing 48 percent of the Region's elderly and handicapped population, is proposed for the initial E&H service. Service in this area should be provided from 8:00 AM to 5:00 PM, with a minimum of 14 daily vehicle hours of service. It should be noted the Town of Portland has expressed an interest in contracting E&H services from the Transit District. A minimum of three daily vehicle hours of service would be required to meet projected demand.

Other communities may be added as experience is gained with the system, or as they join the Transit District.

3.6 Capital Requirements of the Recommended Program

New Vehicle Requirements -- To implement the regular route options proposed for Middletown will require five 18-passenger buses, with two spares for maintenance and back-up service. It is proposed that seven new buses be purchased for the service to enhance its image, safety and comfort, and its use by the elderly and handicapped. Should Portland and/or Cromwell elect to participate in the program, additional vehicles will be required.

Specifically for elderly and handicapped service need is foreseen for three 12-passenger vans to provide the required number of service hours in the proposed service communities. At least one of these vehicles should be equipped to handle wheelchairs.

In addition, the system will benefit from a number of additional capital improvements:

Waiting shelters at high volume boarding locations, especially those used by large numbers of elderly and handicapped	8 each
Two-way radios in all vehicles	10 each
Bus Stop signs	200 each
Fare boxes	10 each

The projected costs for the initial capital program are estimated to be approximately $396,220. This estimate does not include new garage or maintenance facilities.

Under the State's funding policy, a combination of State and Federal subsidies would be used to cover all capital costs associated with the project.

3.7 Patronage, Revenue and Cost Analysis of the Recommended Program

The following revenue cost analysis pertains only to the system elements proposed for the City of Middletown, as the Towns of Portland and Cromwell have voted not to participate in the program at this time.

Patronage Forecasts -- Patronage for the four new Middletown routes is projected to total 1203 weekdays and 247 Saturdays, for a total weekly volume of 6262, and an annual ridership of 325,620 in the first year of improved service. Elderly and handicapped service in Middletown is forecast to have a first-year patronage of 40,950 rides. Total first-year number of rides for all types of service is, therefore, expected to be 366,570.

Revenue Forecast -- Assuming a full fare of 35¢, and an elderly and school child fare of 15¢, revenues are expected to average 30¢ per ride. This will produce annual regular route service revenues of $97,684. Fares collected from E&H service would be approximately $12,285 based on 30¢ per ride. Total revenues from both regular and E&H service would then be $109,969.

Expense Forecast -- Based on the described level of service, it is expected that the regular route service will cover about 272,563 miles per year at an estimated per mile cost of $1.25, producing a total annual operating cost of $340,704. To this must be added an estimated $40,040 for elderly and handicapped service.

Total gross operating cost would be $380,744, which the above fare box revenues would reduce to a net cost of service of $270,596. Federal and State subsidies would pick up 75 percent of this net operating cost, leaving Middletown responsible for $67,246 in operating cost.

The ridership and financial data for each of the four proposed regular route services, as well as the E&H service, are shown in Table ES-6. The overall tax impact in Middletown, associated with providing the required local subsidy, would be approximately $ .27 per $1000 of assessed valuation. Broken down by service, the tax impact would be as follows:

TABLE ES-6

TRANSIT SERVICE FINANCIAL SUMMARY

	ROUTE	ANNUAL MILEAGE	1ST YEAR COST	1ST YEAR RIDERSHIP	1ST YEAR REVENUE	1ST YEAR DEFICIT	1ST YEAR LOCAL SUBSIDY
REGULAR ROUTE SERVICE	1	105,456	$131,820	144,560	$ 43,368	$ 88,452	$17,862
	2	52,728	65,910	53,362	16,008	49,902	11,769
	3	56,784	70,980	84,920	25,476	45,504	8,556
	4	57,595	71,994	42,776	12,832	59,162	15,182
	TOTAL	272,563	$340,704	325,618	$ 97,684	$243,020	$53,369
E&H SERVICE	--	--	$ 40,040	40,950	$ 12,285	$ 27,775	$13,877
GRAND TOTALS			$380,744	366,568	$109,969	$270,775	$67,246

	Net Local Cost	Tax/$1000 of Assessed Value
Regular Route Service	$53,369	$ .21
E&H Service	13,877	.06
	$67,246	$ .27

Ridership levels appear conservative based on the experience of other regions where ridership gains of 100 to 200 percent in the first years have been recorded. The estimates were kept conservative to depict a "worst case" situation so the communities would be aware of the maximum amount of obligation they might incur for subsidized service. After a period of long service decline, a dramatic reversal is desirable to turn the large scale "needs" identified in the study into effective demand.

3.8 Evaluation of Recommended Program

In addition to giving the Midstate Region quality public transportation services, the recommended transit development program has a number of additional benefits against which to measure the costs presented in the previous section. Among them are:

- Community Cohesion and Stability -- Greater access between neighborhoods and communities will provide more opportunities for social interaction and contribute positively to community activity levels, residential satisfaction, quality of life and property values.

- Mobility Improvement -- Those typically less mobile -- the elderly, very young, low income, and handicapped -- will benefit to greatest degree from improved transit. All other segments of the population stand to gain as well by the availability of alternatives to the automobile.

- Safety -- Transit service is 16 times safer than auto travel, according to national statistics.

- Employment and Income -- The Region will gain over one-quarter of a million dollars in added income from outside government subsidies, which will go to transit workers and goods and service providers in the Region -- increasing incomes and reducing unemployment.

- Economic Growth -- Good accessibility will improve shopping opportunities in commercial and shopping centers. Downtown Middletown, and its revitalization program, will be enhanced by good transit service. Access to employment opportunities will be upgraded. Housing market areas may be opened up by the proposed transportation improvements.

- Regional and Community Plans -- Such plans are supported by the complementary transportation services proposed.

- Revenues and Expenditures -- Local revenue outlays for transit subsidies are able to leverage 3 times the amount in outside governmental grants. If not claimed for the Region, the dollars will be spent elsewhere to aid other communities. Greater economic growth spurred by transportation improvement can gain added revenues to offset the local share of subsidy expenditures in the long run.

- Consumer Benefits -- If those using the transit system were forced by lack of service to rely on automobile transportation, they would spend over twice as much in one year. The lower consumer cost of transit service allows that money to be spent in other ways: food, shelter, education, medical care, with economic and social gains.

- Energy Conservation -- When carrying an average load, a transit bus will reduce fuel consumption for a trip to one-third that which would be consumed on the same trip made by automobile. As energy prices escalate, or shortages appear, communities that have alternative low-energy consuming transportation services in being will be least disrupted.

- Air Quality -- A diesel bus generates one-fourth the carbon monoxide created by an automobile. While creating higher levels of other pollutants, the net effect is often less when passenger load is taken into account.

CHAPTER I

INTRODUCTION

1.1 BACKGROUND

The Midstate Region is currently at a critical decision point in terms of public transportation services for the Region's population. As in many areas of similar characteristics throughout the country, private transit operators began service cutbacks in the mid-1960's to reduce operating costs in light of declining fare box revenues. This set in motion a vicious circle of revenue declines, followed by more service cutbacks, until finally all local transit service was eliminated in the Region. As time progressed, it became increasingly evident that certain groups of people in both the urban and rural parts of the Region were being denied full access to employment, social, medical and recreational opportunities because of the lack of public transit service.

Recognizing the mobility deficiencies created by the lack of a general public transit service in the Middletown, Portland and Cromwell areas and the increasing need for special transportation services throughout the entire Midstate Region, the Midstate Regional Planning Agency contracted with Alan M. Voorhees and Associates to evaluate existing transit services in the Midstate Region and prepare a 5-year action program to serve as a planning guide for future transit operations. This report describes the activities and analyses which were conducted as part of the study, and presents the recommended Transit Development Program for the Midstate Region.

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- Suggest alternative institutional structures for operating transit in the Midstate Region which provides to the maximum extent possible, continuous operations and has the flexibility necessary to adjust services to meet changing needs.

- Improve the existing special needs transit services to be more responsive to the needs of elderly, handicapped and low income individuals.

- Provide alternatives for the operation of a soundly managed and fiscally responsible system whose costs do not exceed revenues from user charges and pre-established subsidy levels from participating communities.

- Reduce traffic congestion and air pollution in central cities and shopping areas, while increasing their accessibility. Help in the preservation of limited energy resources which will contribute to the viability of the Region's economic activities and the social mobility of its population.

1.2 POLICY GUIDANCE

As the initiator and sponsor of the Transit Development Program for the Midstate Region, the Midstate Regional Planning Agency accepted responsibility for ensuring broad based community participation in its formulation. Two mechanisms were used to achieve it.

1. Midstate Regional Planning Agency

The Midstate Regional Planning Agency (MRPA) is the Metropolitan Planning Organization for the Midstate Region, as designated by the Governor of Connecticut in accordance with regulations of the U.S. Department of Transportation. As such, the Agency, in cooperation with the State and with publicly owned operators of mass transportation services, is responsible for carying out comprehensive, multi-modal transportation planning within the Region. It was in recognition of this responsibility that the Agency initiated the technical study leading to the preparation of this Transit Development Program.

As the Metropolitan Planning Organization, the Agency is also responsible for endorsing the plans and programs developed in the transportation planning process. The Agency is comprised of representatives of each of the eight towns which constitute the Midstate Region; therefore, Agency members themselves have provided a measure of policy guidance for the Transit Development Program in fulfillment of the Agency's overall transportation planning responsibilities.

There is a second facet of the Agency's role as the Metropolitan Planning Organization which has provided for important policy guidance in preparing this Transit Development Program. The Agency's responsibilities include acting as a forum for cooperative

decision-making by principal elected officials of local government. The Agency regarded this as a particularly important element for successful implementation of the Transit Development Program. Since the Program will require the financial support of communities in the proposed service areas, it was considered absolutely essential that the elected officials of these communities be engaged in choosing among service and management alternatives to select options tenable on political and fiscal grounds. Accordingly, Agency staff kept local officials informed of the study's progress and presented details of service and management alternatives and accompanying cost/revenue analysis preparatory to their deciding whether to support the Transit Development Program. Agency staff met individually with the governing body of elected officials of each of the three towns within the urbanized area, and with officials of rural towns in joint meetings. Following such preliminary discussions, a common meeting was held with all town elected officials invited to openly discuss support for the Program and the details of its implementation.

2. Technical/Citizen Advisory Group

While the Midstate Regional Planning Agency provided policy guidance of its own and worked with elected officials to win their support for the Transit Development Program, a Technical/Citizen Advisory Group was formed to bring together staff from other public and social service agencies which logically have an interest in transportation, citizens, members of elderly citizen clubs, representatives of civic organizations, and representatives of major employers and retailers. The Agency staff believed that by combining technical staff, citizens and other community representatives into one advisory body, an information and technical base common and understandable to all would be assured. Since all participants were to have an equal opportunity to contribute to the final product, this mechanism was considered to be an effective means to obtain feedback from the diverse elements of the community.

The TCAG was convened on four occasions. These meetings coincided with the achievement of significant milestones in the study's progress, at which points policy guidance and constructive feedback were considered essential. The Agency staff purposely limited the number of TCAG meetings to avoid desensitizing invited participants through attendance at regular meetings for general discussions and progress reporting. Agency staff believed that such meetings would have proved self-defeating in terms of sustaining the high level of community involvement that was sought. Accordingly, the TCAG was convened at the following milestones in the study's progress:

1) At the conclusion of the system inventory and data collection stage, at which point identified transit needs were articulated in a Needs Memorandum.

2) At the stage where preliminary management and service alternatives were formulated and policy guidance was necessary to develop final Program recommendations.

3) At the stage where the final recommended Transit Development Program was completed in draft form.

4) At the conclusion of the draft review process, at which point comments were evaluated and adjustments were recommended for submission of the final draft to the Metropolitan Planning Organization for endorsement.

Representatives of the following organizations and governmental agencies were invited to serve on the TCAG, together with unaffiliated citizens who expressed concern about, or interest in, public transportation in the Midstate Region:

--Urban Mass Transportation Administration, Region 1

--Connecticut Departments of Transportation, Environmental Protection, and Labor

--Midstate Regional Planning Agency

--Chief Elected Officials of Cromwell, East Haddam, Middlefield, Middletown and Portland

--Planning/Community Development Staff of Middletown and Portland

--Middletown Transit District

--Middlesex County Transportation, Inc.

--Valley Cab Company

--Municipal Agents for the Elderly

--Elderly Citizen Clubs

--Midstate Regional Committee on Aging

--Eastern Connecticut Area Agency on Aging

--Community Action for Greater Middletown

--Middletown Human Relations Commission

--Portland Foundation

--Interagency Council of Middlesex County

--Black Women's League of Middletown

--Greater Middletown League of Women Voters

--MUJER

--Northern Middlesex Chamber of Commerce

--Connecticut Valley Hospital

--Wesleyan University

--Middlesex Community College

--YMCA of Northern Middlesex County

--Russell Library, Middletown

--Pratt and Whitney Aircraft

--Lyman Products

1.3 REPORT CONTENTS

The comprehensive technical study of public transportation in the Midstate Region was initiated in July of 1976. This report is a product of the combined efforts of the transit study team (MRPA and AMV professional staff) and the Technical/Citizens' Advisory Group members.

The remainder of the report consists of the following:

- Chapter II: Regional Overview

  This chapter provides the basic background on the Region's socio-economic characteristics and land use.

- Chapter III: Existing Transit Services in the Midstate Region

  This chapter describes the current status of public transportation in the Region. Conclusions are drawn regarding the level of service currently provided.

- Chapter IV: Public Transportation Needs in the Midstate Region

  Using information obtained from the primary transit surveys performed, secondary source interviews, and the Citizens' participation forums, this chapter identifies particular transit needs in the Region's urban and rural areas.

- Chapter V: Transit Ownership and Management Alternatives

  This chapter describes the transit ownership and management alternatives available in the Midstate Region, indicating potential advantages and disadvantages of each alternative.

- Chapter VI: Examination of Public Transportation Service Alternatives

  This chapter assesses the impact of a set of potential service alternatives developed to meet the transit needs identified in Chapter IV.

- Chapter VII: Recommended Transit Development Program

  The recommended Transit Development Program for the Midstate Region is detailed in this chapter. It includes a description of routes and services, an implementation schedule, a capital improvement plan, and a five-year expense/revenue forecast.

- Chapter VIII: Transit Monitoring and Marketing Plan

  This chapter details the monitoring and marketing plan for the proposed transit system for the Midstate Region. Techniques for informing the general public of available services and evaluating their response are defined.

- Technical Appendices as referenced in text.

CHAPTER II

REGIONAL OVERVIEW

2.1 INTRODUCTION

A clear understanding of the Midstate Region's social, economic, and demographic character is essential to planning transit service for its residents. Certain socio/economic and demographic variables which, when known, enable the planner to be sensitive to the transportation needs of the various population groups and activity centers in the Region.

Demographic characteristics, such as population and household densities, age distribution and projected population growth, are key variables in identifying where transit service is a viable alternative to the auto and estimating present and future demand. Transit service is only viable where household and population densities are high enough to support it. High density levels, however, are not a sufficient indication that transit service is a viable alternative. The age distribution of the population must be considered as well. Previous studies have shown that the majority of transit users fall into one of two age groups. They are the less than 16-year age group who are too young to drive and the 60+ years old group who are very often physically and/or economically unable to operate an automobile. These groups are considered transit captives (i.e., no alternative mode available). A third determinant of transit need is the income distribution of the population. Households on low or fixed income are less able to own and maintain an automobile. Areas of the Region with significant concentrations of such households have a greater need for alternatives to the auto than more affluent areas of the Region.

All of the previously mentioned variables describe potential transit trip origins. It is equally important to identify potential trip destinations. Knowing the type, size, location and operating times of major regional trip attractors is essential to providing transit service which is sensitive to the travel desires of the Region's residents. Transit service to retail activity centers must reflect the needs of employees as well as the patrons. Similarly, service to an industrial park must be sensitive to the various shift changes.

The information documented in this chapter then, serves to guide the Transit Study Team in the identification of the Region's transit needs and subsequent service alternatives.

2.2 SOCIO/ECONOMIC ACTIVITY

A. The Region

The Midstate Planning Region includes the Towns of Cromwell, Durham, East Haddam, East Hampton, Haddam, Middlefield, Middletown,

and Portland in Northern Middlesex County (Figure II-1). These eight towns encompass approximately 666 square kilometers (257 square miles). The City of Middletown is the center of activity of the Region and of the urbanized area which includes most of Cromwell and a portion of Portland.

B. Population

The household population of the Midstate Region was estimated at 88,400 as of January, 1976. 1/ Of the eight towns, Middletown's household population of 40,050 comprised 45.3 percent of the regional total. Cromwell, the next most populous town, had an estimated 10,400 residents, or 11.8 percent of the regional total. Approximately 63 percent of the regional household population, or 55,700 persons, reside in the urbanized portion of the Region as shown in Figure II-1.

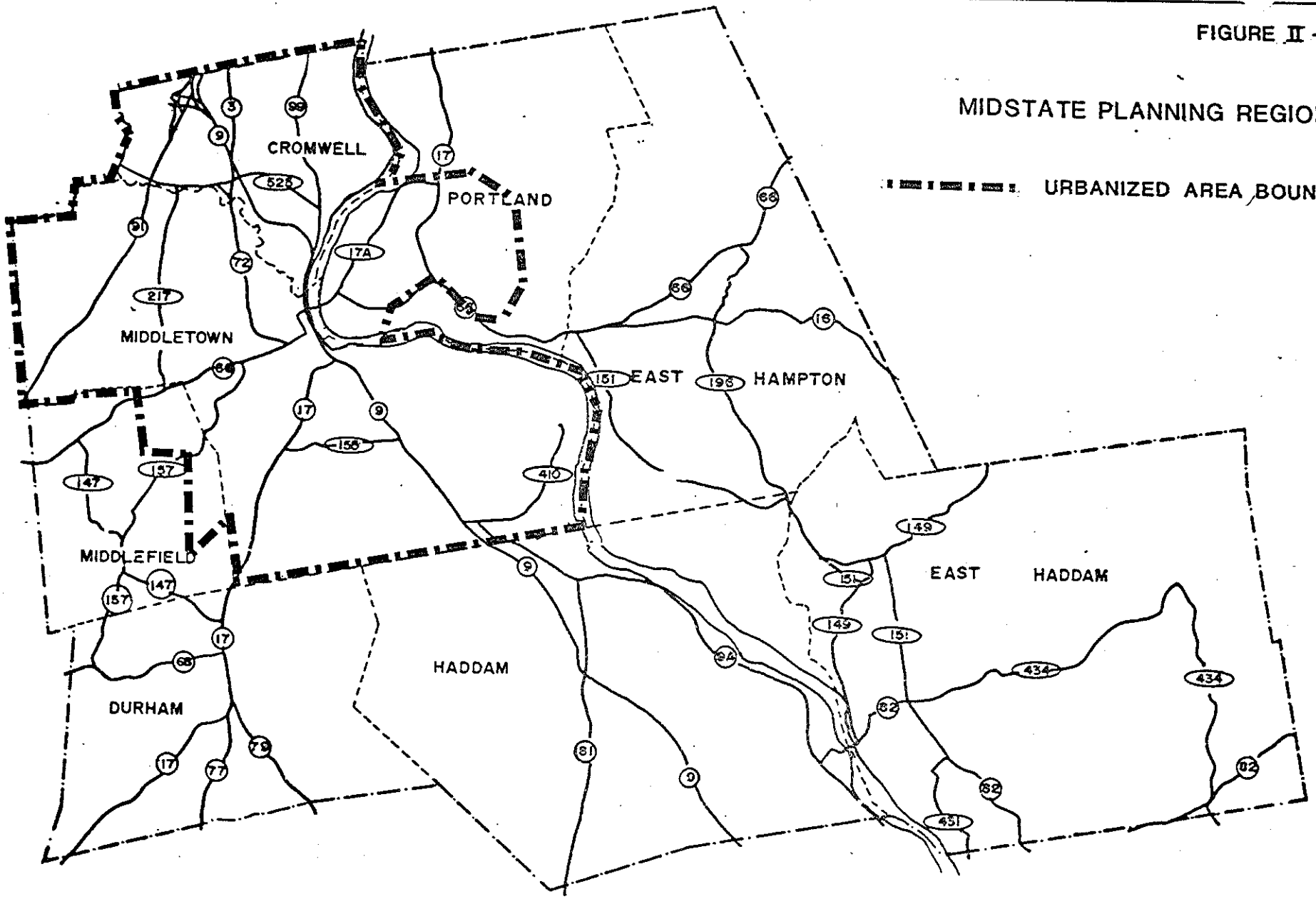
By 1980, the Region's household population is projected to reach 97,600 persons. 1/ This represents an average annual growth rate of 2.6 percent, and an overall growth rate of 10.4 percent from 1976 to 1980.

Over the four-year period, 1976 to 1980, Cromwell is expected to experience the highest growth rate of all towns in the Region. The population is projected to increase from its present level, 10,400, to 13,400 by 1980, or 28.8 percent. The population of Middletown is expected to increase 6.1 percent in the same period, from 40,050 to 42,500. Other towns likely to experience significant growth during this period are Durham, 15.6 percent (from 5100 to 5900), Haddam, 14.7 percent (from 6100 to 7000) and E. Haddam, 11.5 percent (from 5200 to 5800).

By 1980, the proportion of the regional population residing within the urbanized area is projected to increase to 71.5 percent, which represents slightly more than 63,000 persons.

Approximately 11,700, or 13 percent, of the Region's population are over 60 years of age. Sixty-eight percent of these reside in the urbanized area. Table II-1 shows the distribution of elderly by Town.

FIGURE II - 1



MIDSTATE REGION TRANSIT DEVELOPMENT PROGRAM

2.5 0 2.5 MILES

APPROX. SCALE

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PREPARED BY

ALAN M. VOORHEES & ASSOCIATES

MIDSTATE REGIONAL PLANNING AGENCY STAFF

1977

TABLE II-1

DISTRIBUTION OF THE ELDERLY IN THE MIDSTATE REGION

Town	Number of Persons Age 60 Years and Over	Percent of Population Age 60 Years and Over
Middletown	5509	12.8
Portland	1187	13.2
Cromwell	1440	14.2
E. Hampton	1031	12.4
E. Haddam	911	17.5
Haddam	788	12.9
Durham	418	9.4
Middlefield	438	10.3
	11722	12.9

SOURCE: U.S. CENSUS OF POPULATION, 1970.

Estimates of projected 1980 elderly population are not available. However, if present trends continue, there will be over 12,500 elderly citizens in the Region by 1980.

Recent estimates by Middlesex County Red Cross indicate that there are over 3,000 physically, emotionally or mentally handicapped persons residing in the Midstate Region. This represents approximately 4 percent of the total population. Approximately half of these persons live in the City of Middletown. More detailed information concerning the Region's handicapped residents has not been collected.

C. Income

Median household income is fairly uniform among the eight towns of the Midstate Region. In 1970, it ranged from a low of $8,074 in East Haddam to a high of $10,083 in the area of Portland's Town Center. The remainder of the Region fell in the $9,000-$10,000 range. By 1980, median household income had been projected to rise by about 27 percent. This will be reflected in a range extending from a low of $10,254 to a high of $12,806. In most of the towns, median household income will range between $12,000 and $12,500.

Connecticut median household income was $10,877 in 1970 and is projected to be $13,079 in 1980. 2/ Thus, it appears that the Midstate Region falls below the Statewide median for household incomes. This is probably due to the large number of low income.

The percentage of households with income below the proverty level in 1970 ranged from 8.6 percent (Durham) to a high of 21 percent (Middletown). In numerical terms, the Census reports 4,239 households in the Region below the $5,000 poverty level income. Projections to 1980 are not available.

D. Car Ownership

In 1970, a total of 33,062 cars were registered to residents of the Midstate Region, an average of 1.4 cars per household. 2/ This average holds true for all eight towns, with only slight variation. It is projected that by 1980, there will be 44,598 cars registered in the Region, an increase of almost 35 percent, and an average annual increase of 3.5 percent. 2/ Based on the total population projected for the Region for 1980 and the average household size, car ownership per household is expected to remain at 1.4 cars per household.

The Study Team estimates that there are 2,775 non-auto households and an additional 11,990 single auto households in the Region. Approximately 73 percent of these households lie within the urbanized portion of the Region. This statistic is one of the strongest indicators of transit need. Members of non-auto and often times, single auto households, are frequently left without transportation. Hence, only essential trips are made and only then by either walking or being driven by a friend or neighbor.

2.3 LAND USE ACTIVITY

A. Employment Centers

The number of people employed in the Region has risen from 25,757 in 1970 to 29,710 in 1975, a 15 percent increase in the first half of the decade. By 1980, it is estimated that the number of jobs in the Region will approach 38,000, or an additional growth in employment of 30 percent over 1975 levels. Approximately half of this increase is projected to be within the City of Middletown. Most of this growth is expected to occur in the already developing Saw Mill Brook Industrial Area in the northwest corner of the City. 2/

Other major growth areas in the Region are the Town of Cromwell, where the number of jobs is expected to nearly double the 1975 number by 1980, and the Town of Portland, where a 50 percent increase is expected. Table II-2 shows the Region's employment by town for the years 1970, 1975, and 1980. Figure II-2 shows specific major employment concentrations in the Region. Table II-3 lists the concentrations and estimated employment.

TABLE II-2

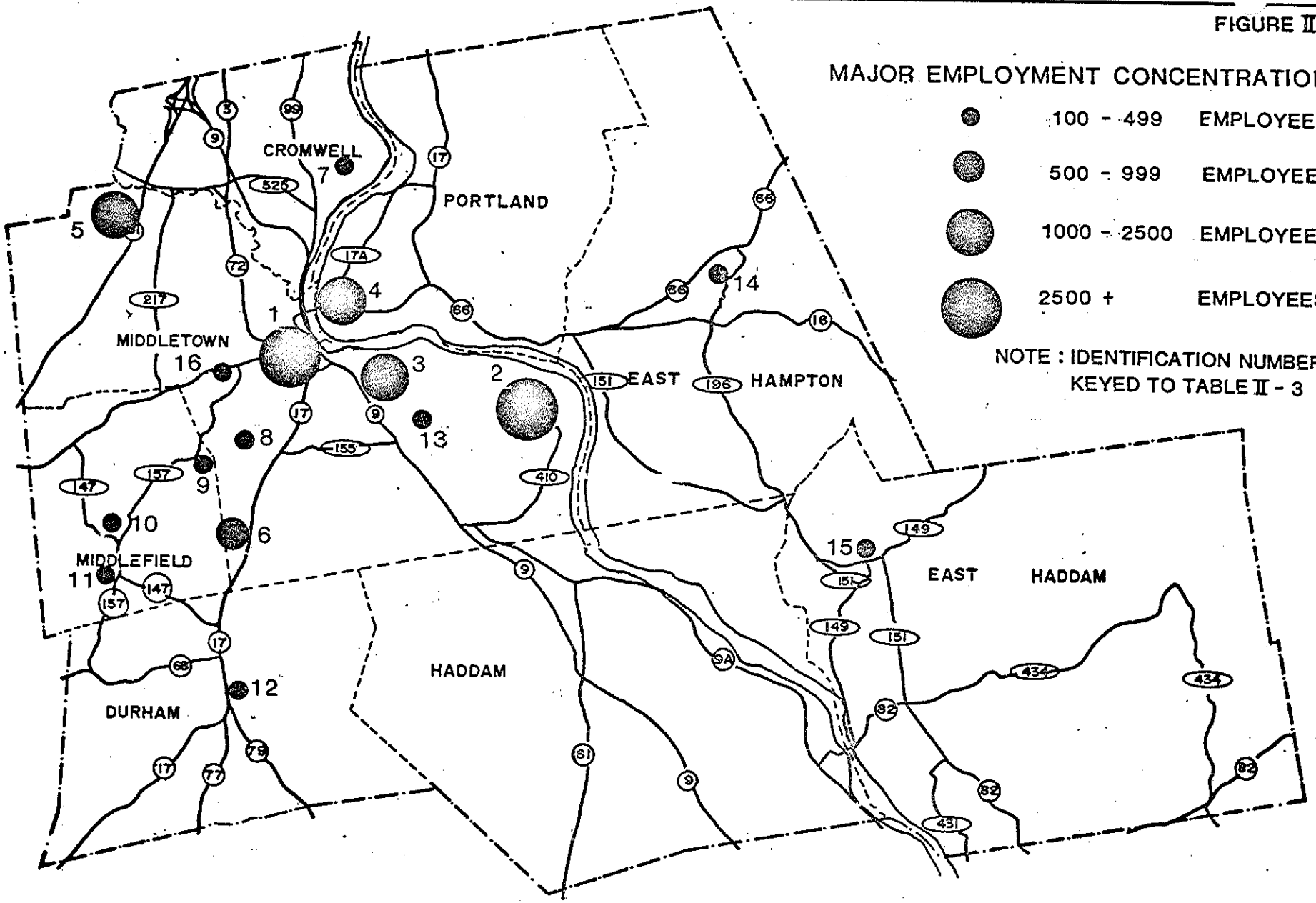
MIDSTATE REGION

NUMBER OF PERSONS EMPLOYED BY TOWN, 1970-75-80

	1970 (Actual)	1975 (Actual)	1980 (Projected)
MIDDLETOWN	19,666	20,550	25,625
PORTLAND	1,976	2,330	3,221
CROMWELL	930	1,510	3,558
EAST HAMPTON	812	1,210	1,354
MIDDLEFIELD	625	950	1,432
DURHAM	602	850	1,482
HADDAM	588	1,170	1,170
EAST HADDAM	558	1,140	1,140

SOURCE: Conn. DOT Regional 1980 Socio/Economic Projections

FIGURE II - 2



MIDSTATE REGION TRANSIT DEVELOPMENT PROGRAM

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APPROX SCALE

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PREPARED BY

ALAN M. VOORHEES & ASSOCIATES

AND

MIDSTATE REGIONAL PLANNING AGENCY STAFF

1977

TABLE II-3

MAJOR REGIONAL EMPLOYMENT CENTERS

Map Key # (Figure II-2)	Employment Center	1975 Employment
1	MIDDLETOWN CENTRAL BUSINESS DISTRICT	2500
1	WESLEYAN UNIVERSITY	800
1	MIDDLESEX MEMORIAL HOSPITAL	1350
2	SOUTH MIDDLETOWN-RIVER ROAD AREA	3950
3	CONNECTICUT VALLEY HOSPITAL	1400
4	BROWNSTONE INDUSTRIAL AREA	1000
5	SAWMILL BROOK INDUSTRIAL PARK	1200
6	LAUREL GROVE INDUSTRIAL AREA	200
7	RIPLEY COMPANY	150
8	XEROX PUBLICATIONS	250
8	VINAL REGIONAL TECHNICAL SCHOOL	58
9	LONG LANE CORRECTIONAL SCHOOL	250
10	MIDDLEFIELD-BLACK POND AREA	210
11	MIDDLEFIELD - ROUTE 157 AREA	160
12	DURHAM CENTRAL BUSINESS DISTRICT	250
13	MIDDLESEX COMMUNITY COLLEGE	100
14	EAST HAMPTON CENTRAL BUSINESS DISTRICT	210
15	MOODUS AREA	200
16	KINGS PLAZA	200

SOURCE: MIDDLESEX COUNTY DEVELOPMENT COUNCIL

B. Activity Centers

The major activity centers in the Midstate Region can be grouped into four categories: Retail/Commercial; Educational; Medical; and Social/Recreational.

There are four major retail/commercial activity centers in the Region, the largest being the Middletown Central Business District (CBD) with well over 100 establishments. The remaining three are suburban shopping centers, all but one of which are located within the City of Middletown. These are:

- King's Plaza, located approximately one mile west of the Middletown CBD, consisting of two major discount chains and two grocery chains and thirteen small specialty shops.
- Stop & Shop/Bradlee's shopping center located approximately one mile south of the Middletown CBD.
- K-Mart/Grand Union Plaza located three miles north of the Middletown CBD in Cromwell at the junction of Route 3 and 72.

There are three major educational facilities in the Region, all of which are located in Middletown. They are:

- Wesleyan University, adjacent to the Middletown CBD.
- Middlesex Community College, two miles southeast of the CBD.
- Vinal Regional Vocational Technical School, 2.7 miles southwest of the CBD.

Two hospitals provide medical service to the Region. Connecticut Valley Hospital (CVH), a state run sanitarium, serves not only the Midstate Region, but all of the Middlesex County and a large portion of the South Central Connecticut Region. In addition, CVH runs an outpatient clinic which serves primarily Middletown residents.

Middlesex Memorial Hospital is a privately run hospital serving the general medical needs of Middlesex County and the Midstate Region. The Hospital is located on the southern edge of the Middletown Central Business District.

There are several social/recreational centers scattered throughout the Region, including:

- a 48-acre ball field/outdoor recreation area
- a 33-acre picnic/outdoor recreation area
- a 15,000-acre state forest
- three 200+ acre state parks
- two senior centers, one in Portland and one in Middletown. Daily usage is 25 and 50 persons/day, respectively.
- a YMCA in the Middletown CBD with a daily attendance of 750-900 persons/day.
- one ice arena located in Middletown on the Wesleyan campus. Daily attendance averages 250-300 persons/day.
- one ski area located on Powder Hill Road in Middlefield. Attendance is seasonal and averages 200 persons/day during the winter.

Figure II-3 shows the location and type of activity centers in the Region. Each center is listed by name and keyed to Figure II-3 and Table II-4.

C. Housing Density

The Midstate Region is primarily rural in character. This is reflected in the lower-than-average regional housing density compared to Statewide averages. The Midstate Region has an average density of 1.54 Housing Units per Gross Acre (HU/GA), as compared to the state average of 0.306. Only Middletown, at 0.423 HU/GA, has an average housing density which exceeds the state average. However, several sections of towns within the urbanized area of the Region have significantly higher densities. Figure II-4 is a map of housing densities by regional traffic zone, as defined by the Connecticut Department of Transportation, Bureau of Planning. As illustrated in Figure II-4, much of the urban core has densities in excess of 1.00 HU/GA.

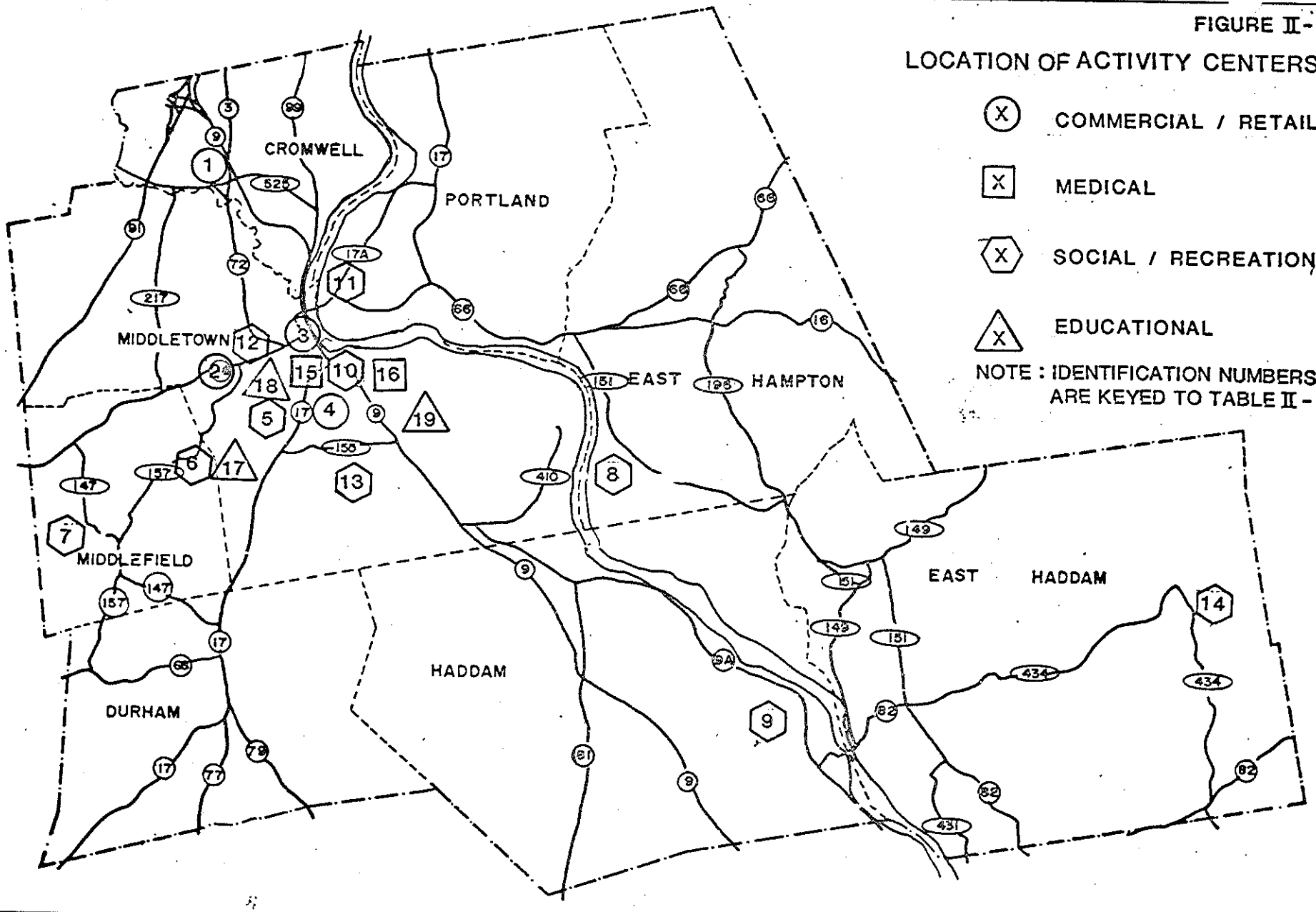
There has been a significant increase in housing unit construction in the Region. Several Planned Unit Developments (PUD) have been built since 1970, most notably, Cromwell Hills Condominiums, and the West Lake section of Middletown. Figure II-5 shows the location of major housing concentrations in the Region by type of unit. Table II-5 is a list of specific housing developments keyed to Figure II-5.

FIGURE II - 3

LOCATION OF ACTIVITY CENTERS

- (X) COMMERCIAL / RETAIL
- [X] MEDICAL
- ⬡X⬡ SOCIAL / RECREATIONAL
- △X△ EDUCATIONAL

NOTE : IDENTIFICATION NUMBERS ARE KEYED TO TABLE II - 4



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AND
MIDSTATE REGIONAL PLANNING AGENCY STAFF
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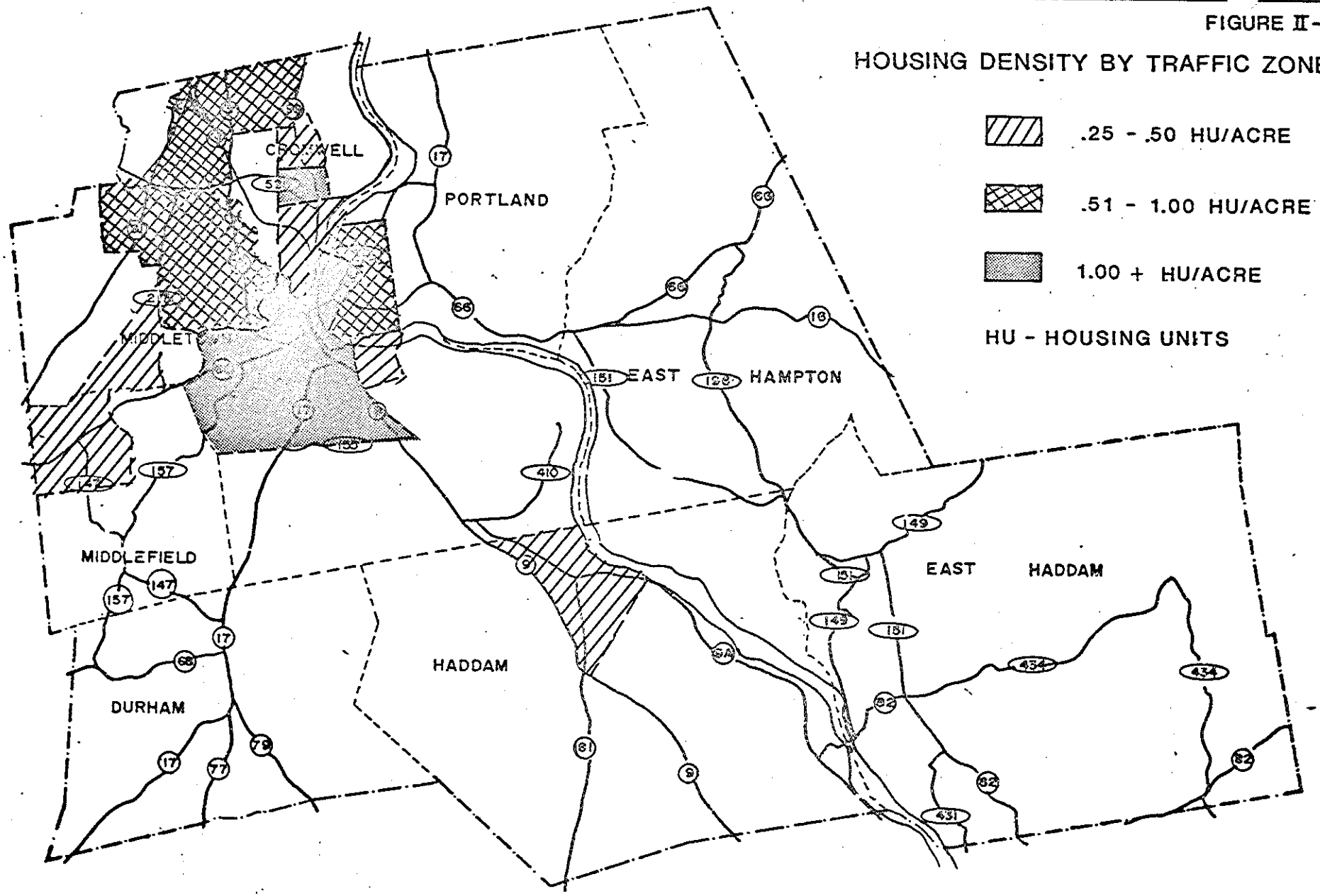
TABLE II-4

MAJOR ACTIVITY CENTERS

MAP KEY #	
	Commercial/Retail
1	K-MART/GRAND UNION PLAZA
2	WASHINGTON STREET SHOPPING CENTER
3	MIDDLETOWN CENTRAL BUSINESS DISTRICT
4	STOP & SHOP/BRADLEES SHOPPING CENTER
	Social/Recreational
5	WESLEYAN UNIVERSITY ICE ARENA
6	WADSWORTH STATE PARK
7	POWDER RIDGE SKI AREA
8	HURD STATE PARK
9	CHCHAPONSETT STATE FOREST
10	MIDDLETOWN YMCA
10	MIDDLETOWN SENIOR CENTER
11	PORTLAND COMMUNITY CENTER
12	VETERANS PARK/PLAYGROUND
13	CRYSTAL LAKE STATE PARK
14	DEVIL'S HOPYARD STATE PARK
	Medical
15	MIDDLESEX MEMORIAL HOSPITAL
16	CONNECTICUT VALLEY HOSPITAL
	Educational
17	VINAL REGIONAL TECHNICAL SCHOOL
18	WESLEYAN UNIVERSITY
19	MIDDLESEX COMMUNITY COLLEGE

FIGURE II-4

HOUSING DENSITY BY TRAFFIC ZONE



MIDSTATE REGION TRANSIT DEVELOPMENT PROGRAM

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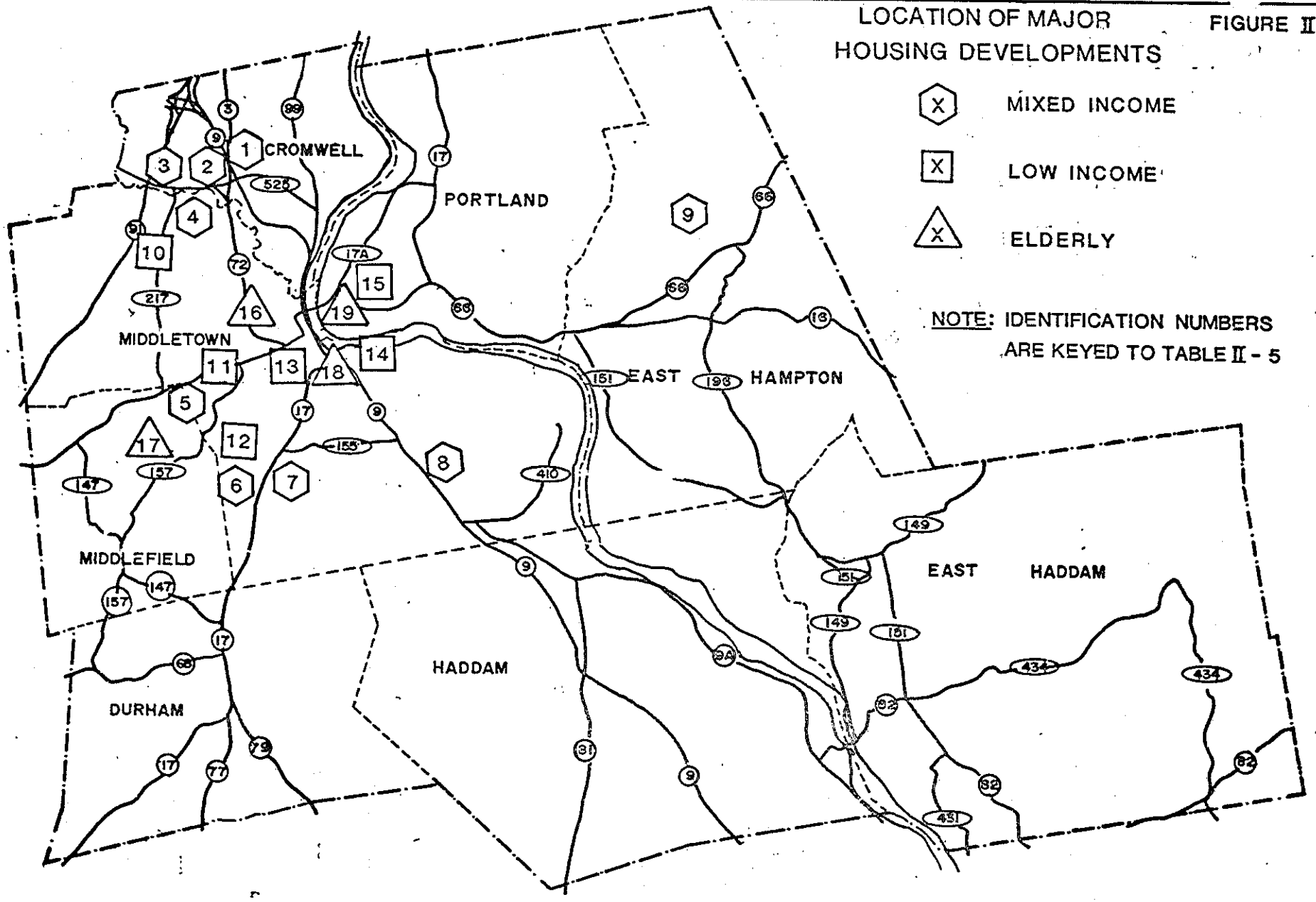

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TABLE II-5

MAJOR HOUSING DEVELOPMENTS

KEY #	Mixed Income	# UNITS
1	WOODLAND APARTMENTS	184
2	CROMWELL GARDENS/HILLS	708
3	COUNTRY SQUIRE	113
4	WEST LAKE	559
5	SUTTON TOWERS	212
6	WESLEYAN HILLS	110
7	STONEGATE APARTMENTS	179
8	SUMMERHILL/WOODBURY	322
9	EDGEMERE HILLS	156
	Low/Moderate Income	
10	HIGHLANDS	202
11	NEW MEADOWS/BAYBERRY CREST	343
12	WADSWORTH GROVE	45
13	WESLEYAN STUDENT HOUSING/TRAVERSE SQUARE	176
14	MAPLEWOOD TERRACE/LONG RIVER VILLAGE	248
15	CHATHAM COURT	50
	Elderly	
16	NEWFIELD/STONYCREST TOWERS	200
17	CEDAR STREET APARTMENTS	30
18	SBONA TOWERS	129
19	QUARRY HEIGHTS	50

SOURCE: MIDSTATE REGIONAL PLANNING AGENCY HOUSING ELEMENT, 1973.

2.4 REGIONAL TRAVEL PATTERNS

In 1975, an estimated 194,245 person trips per day originated in the eight towns of the Midstate Region. Of these, 47.2 percent originated in Middletown and 38.6 percent had a final destination in Middletown; 26.7 percent had a destination in one of the other seven towns of the Region, and 34.7 percent had a destination outside the Region. In all, 65.3 percent of all trips generated within the Region represented trips internal to the Region.

Work-related trips (home-to-work) accounted for 41,444 of the estimated daily total of 194,245, or 21.3 percent, in 1975. Middletown generated 18,913 (45.6 percent) of the daily work trips, while 14,332 work trips (34.6 percent) generated by all eight towns were destined for Middletown; 51.4 percent of all regionally-generated work trips remained internal to the Region.

Clearly, of those trips which originate within the Region for work or some other purpose, the majority are intraregional in nature (65.3% total; 51.4% work). As would be expected, Middletown is both the major trip generator and the major trip attractor of all regionally generated trips.

A broader analysis of 1970 work trips which either generated or terminated outside the Region reveals that a large majority (about 80 percent) involved travel to or from the five Standard Metropolitan Statistical Areas (SMSA) of Hartford, New Britain, Meriden, New Haven, and Bristol, in order of relative magnitude.

In 1970, the Hartford SMSA drew almost 67 percent of that portion of the Midstate labor force which commuted to jobs outside the Region, and accounted for about 54 percent of all those who commuted into the Region from outside. The New Britain, Meriden, and New Haven SMSA's each attracted in the neighborhood of eleven to ten percent of the Region's out-commuting work force, and generated between 17 and 10 percent of the in-commuting workers. The Bristol SMSA accounted for only about two percent of external commuter travel in either direction.

In summary, the majority of work and general purpose trips originating in the Midstate Region are oriented to the Region, while trips crossing into or out of the Region are heavily oriented toward the Hartford SMSA.

2.5 FUTURE PLANNING CONSIDERATIONS

Several large-scale development projects are taking shape in the Middletown area which, if brought to fruition, will significantly impact travel behavior in and through the Midstate Region.

A. Sawmill Brook Racetrack

Probably the most significant of these is the proposal to construct a thoroughbred horse racing facility in the northwestern section of Middletown. The Sawmill Brook Racetrack, if built, will occupy 360 acres of industrially zoned land, eventually employ nearly 2000 people, and would attract approximately 12,000 patrons (4,850 vehicles) on weekday racing days; 16,000 patrons (5,200 vehicles) for weekend races; and nearly 33,000 patrons (8,950 vehicles) on days scheduled for special events.

The racetrack, as a high trip-attracting facility, could be expected to meet the threshold requirements for sustaining direct feed transit services. Although the points of origin of racetrack patrons will be distributed over a vast area, high density trip corridors have been identified. There is a high probability that these corridors would support special transit services connecting the facility with outlying collection points, such as existing commuter parking lots. It would be appropriate to consider such services to and from the commuter lot newly constructed in Middletown on Connecticut Route 9 and to the lot off Connecticut Route 72 in Cromwell, depending on the hours of peak parking demand and the degree of conflict with normal commuter parking demand.

For its part, the State Traffic Commission has required assurances from the racetrack owners that public transportation will serve the facility sufficiently to carry 20 percent of the estimated patronage on days scheduled for special events, and that feature races be scheduled at times of the day such that patron traffic does not coincide with peak hour commuter flows.

B. Museum of Connecticut History

Efforts have been underway for over a year to designate a site in Middletown as the location for a future museum of Connecticut History. At this time, the Middletown site has not yet been sanctioned by the Connecticut legislature, but the possibility of such approval remains strong.

The site itself lies on the fringe of the Middletown Central Business District, in close proximity to both the Connecticut River and an existing, large activity center, Connecticut Valley Hospital. Together with planned waterfront improvements and the possibility of substantial redevelopment activity in the downtown area of Middletown, both discussed below, a great deal of new activity may be focused in and around Middletown's core. If these plans are realized, transit may play an essential role in linking both the new and the existing activity centers in Middletown and the Region.

C. Waterfront Improvement and Activity

Middletown historically has been closely oriented to the Connecticut River. Although its ties to the river diminished greatly during this century, the City is taking steps to reassert a commercial and recreational focus on its waterfront. Transit may play a role in that process. Immediate plans call for major bulkheading of the shoreline adjacent to the core area, construction of a lighted boardwalk and boat docking facilities along its length, installation of boat launching ramps, general landscaping, and refurbishment of an existing structure for recreational use. This work was scheduled to get underway by the summer of 1977.

Ultimately, this riverfront area is intended to become a major recreational center. The long-range design concept includes pavilions for picnicking and special events, game and play areas for all age groups, and a row boat rental facility.

If implemented, it is highly likely that additional recreation-based enterprises will be attracted to serving the site. Connecticut River excursion boat lines, which operate primarily out of Haddam, may institute direct service to Middletown. It is also possible that the Valley Railroad, a steam excursion line presently operating along a lower stretch of the river, may ultimately extend its operation to the waterfront area. The construction of the historical museum nearby and renewed waterfront activity would certainly create a favorable climate for these ventures.

Depending upon the circumstances which develop and the level of activity which evolves, public transportation should be viewed as a tool and asset which might be used to generate public acceptance and use of any new facilities or services, especially among those otherwise restricted in their mobility.

D. Redevelopment in Middletown

Redevelopment activity in Middletown presently affects approximately 125 acres within or near the Central Business District (CBD). All but about 15 acres have been committed to a specific use and development sequence, and efforts to commit the remaining 15 acres are underway.

The significance of redevelopment to transit development, and vice versa, is that 125 acres of vacant or underutilized land in the City's core is, or will be, programmed for more intensive use. Whether developed exclusively for commercial enterprise or mixed commercial/residential use, once completed the resulting activity will greatly increase the dimension and volume of activity in the CBD area and add that much more market potential to transit operations once they, too, are underway. Transit, in turn, may be viewed as a means of extending the market area of CBD retail and service functions and capturing the latent market potential.

E. Industrial Park Development

New or ongoing industrial park development and promotion are underway in three towns within the Region. Resulting new employment concentrations may generate additional market potential and need for transit.

In Middlefield, two industrial parks are in active stages of planning and engineering. One, on Laurel Brook Road, will potentially make use of approximately 50 acres as the site for the expansion of an existing plant of almost 10,000 square feet to upwards of 100,000 square feet over the next five years, with ultimate potential expansion to 200,000 square feet. This expansion, if realized, might generate an employment increase of up to 270 persons over the initial five-year period, and up to 570 persons if fully implemented.

A second industrial park created by the Town near the Durham Town Line would utilize approximately 23 acres. With gross plant floor area projected at 174,000 square feet, approximately 435 new jobs would be created at that location.

In Middletown, the Sawmill Brook Industrial Park, covering an area of nearly 875 acres, is approximately 20 percent developed. If built, the Sawmill Brook Racetrack would consume 360 of the remaining uncommitted acres. Development of the residual acreage is uncertain at this time, but in all probability, would not be a significant factor affecting future transit development or service.

A smaller industrial park is currently under development off Route 17 in Middletown. Encompassing 154 acres, about 30 percent of the available sites are developed.

Portland is the third town actively promoting an industrial park. Part of Portland's Urban Renewal Program, the park comprises 20.5 acres near the Connecticut River, of which almost 19 acres remain uncommitted. When fully developed, it is estimated that approximately 500 new jobs will have been created.

F. Housing for the Elderly and Handicapped

Several new special housing projects are in various stages of planning and, in one case, construction. Ground-breaking for 108 units took place in Cromwell in March, 1977. Architectural and engineering work is currently underway for 30 units to be constructed in Middlefield. In Middletown, sites for new construction have been designated at two locations for a combined total of 189 additional units. Renovation of the vacant, former Middletown High School building may produce an additional 64 units at that location.

Taken together, the number of existing and proposed housing sites for elderly and handicapped residents of the Region offers a significant potential market for transit service.

CHAPTER II REFERENCES

1. Midstate Region Planning Agency
   Housing and Land Use Element #7 1977

2. Connecticut Department of Transportation
   1980 Regional Socio-Economic Projections

CHAPTER III

EXISTING TRANSIT SERVICE IN THE MIDSTATE REGION

The principal objectives of this chapter are: (1) to summarize the existing public transportation services being provided to Midstate Region residents, and (2) to identify all potential transit resources available that could be incorporated in an improved system. Currently, there is no comprehensive intra-regional service in operation in the Region. Public transit service is directed toward the interregional commuter. Several commuter bus services are operated by various companies between Middletown and surrounding urban areas, particularly Hartford. However, Urban Mass Transportation Administration guidelines on preparing a transit development program do not consider interregional service within the scope of the TDP. For this reason, existing public services are only briefly described and no detailed financial or route analysis are performed.

This chapter will also focus on identifying alternative forms of transportation available to the Region's residents, particularly to those with transportation needs not currently being fulfilled. For familiarization with the events leading to the current state of public transportation in the Midstate Region, a brief history is presented in the following paragraphs.

3.1 PUBLIC TRANSIT SERVICE EXPERIENCE IN REGION

Middletown, like most small urban areas, has experienced difficulty in recent years supporting a public transit system. Decreased patronage due to greater auto availability, rising incomes, improved highway accessibility, increased transit operating costs and fares and the high turnover in private operators are but a few of the factors responsible for the system's decline.

Over the past ten years, several private carriers have operated regular route public transit service in the Midstate Region. Prior to 1967, the H&W Transit Company operated an extensive fixed route system serving Meriden, Middletown, Portland, Southington and Wallingford. Ten routes were operated at an estimated annual deficit that reached $60,000 in 1967. 1/

On August 8, 1967, the H&W Transit Company filed a petition with the Connecticut Public Utilities Commission (PUC) to discontinue service on the ten routes serving the Region. At that time, The Connecticut Company, a Hartford based carrier, expressed a desire to take over operation of the system and a transfer of the Certificate of Operation was arranged. On October 28, 1967, The Connecticut Company began operating the Region's regular route service.

In an attempt to improve systemwide operation, and increase line patronage, The Connecticut Company hired a private transportation consulting firm to review existing route systems and schedules and recommend changes or improvements. Subsequently, five of the ten original routes were discontinued and minor route and schedule changes were made on the remaining routes. Nevertheless, the company sustained losses of over $55,000 in its first eight months of operation in 1967-1968. This prompted company officials to seek a municipal subsidy agreement with service area towns. After negotiations failed to reach a workable subsidy agreement, The Connecticut Company filed a petition with the PUC to cease services on all of its remaining routes in the Region with the exception of its Hartford to Middletown route. This request was granted on September 19, 1968.

In the months immediately following the termination of The Connecticut Company service, on all intra-regional routes, a referendum authorizing the creation of a local transit district was approved by Middletown voters. The newly formed transit district signed an agreement with Edward P. Hayes and Sons Company of Rocky Hill, Connecticut to provide regular route service to the City of Middletown.

The Hayes Company experimented with a number of different services from December, 1968, to May, 1969. Each of these experimental routes suffered from low patronage and high operating costs. Subsequently, the Hayes Company elected to discontinue all local service within Middletown and concentrate on maintaining inter-town service to Meriden. However, lack of patronage and substantial operating losses forced the discontinuance of even this service in June, 1974. This essentially left the Midstate Region without any form of local intra-regional public transit service.

3.2 EXTENT AND FREQUENCY OF REGULAR ROUTE SERVICE

At the present time, there is only limited public transit service in the Midstate Region, all of which is interregional in nature. Connecticut Transit Company, the state-owned operator, as well as several private operators, provide express commuter service between Hartford and regional towns and cities on a daily basis. In addition, Conneciticut Transit operates a service between Middletown and Hartford that makes local stops enroute. Each of the services provided are discussed individually in the following paragraphs.

3.2.1 Local Route Service

The Connecticut Transit Company, formerly The Connecticut Company, is the only provider of regular route local service in the Region. The so-called Middletown "M" route, runs between

Middletown and Hartford making local transit stops in Middletown, Cromwell, Rocky Hill, Wethersfield and Hartford. The basic route begins at Union Park in Middletown and follows Main Street through the CBD to King Street, stopping at all major cross streets in the CBD. The route then proceeds north on Route 9 to Route 99 through the Town of Cromwell and on into Hartford. Major stops in Cromwell are at Cromwell Center, Piersons Greenhouses and Court Street. Figure III-1 shows a map of the "M" Route and 24-hour ridership counts taken at all major stops enroute broken down by trip direction.

There are two variations to the primary route alignment which are used at certain times of the day to serve major activity centers. The first variation is actually an extension of the route from Union Park along East Main Street and Silver Street to the Connecticut Valley Hospital and back along the same route. The second variation is a diversion from the basic route. Instead of following Route 9 to Route 99, the bus takes a right from Main onto Washington Street, right on to Berlin Street and follows Route 72 to serve the K-Mart/ Grand Union Plaza and Cromwell Hills Condominiums. From there, the bus proceeds east along West Street to Cromwell Center and follows the basic route on into Hartford. The return trip variation follows the same routing.

Schedules and Schedule Reliability

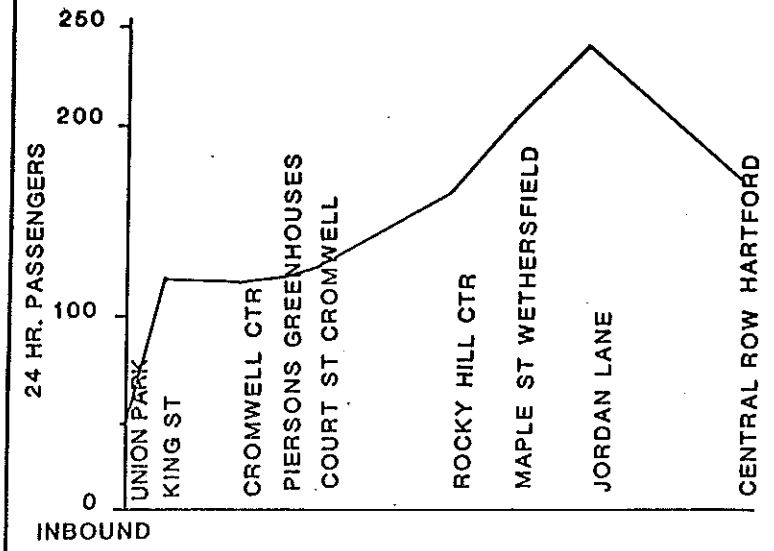
Headways on the route are approximately 60 minutes during off-peak travel periods. During peak hours of 6-8 AM and 4-6 PM, additional buses are added to the line to produce approximately 30-minute headways. A detailed schedule is shown in Figure III-2. Scheduled arrival times are very irregular at key stops; therefore, it is difficult for patrons to commit schedules to memory.

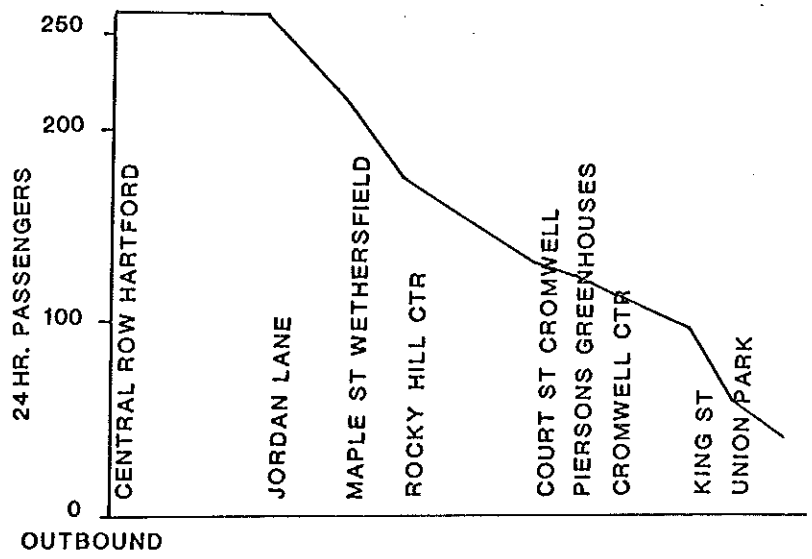
During the on-board survey of this route, a schedule check was conducted to determine the reliability of printed schedules. A standard performance measure for defining "on-time" services is: no early departures and not over two minutes late.

Based on the data gathered during the survey, it was possible to compare 34 observed bus departures against the scheduled departure times. Using the established criteria, 22 of the 34 departures (65%) were on time. Eleven were late departures averaging seven minutes behind schedule, and one departure was early. In that most transit systems achieve a better than 90 percent on-time performance, this level of reliability appears seriously deficient.

Fare Structure

Route fares are determined on a fare zone system. Within the first zone, normal adult fare is 35 cents. In the second zone,





SOURCE - AMV ON - BOARD BUS SURVEY, FEB. 1977

ROUTE FREQUENCY

WEEK-DAYS (OFF PEAK)	60 MIN.
WEEK-DAYS (PEAK)	30 MIN.
SATURDAYS	VARIES
(AM)	20 MIN. - 90 MIN.
(PM)	30 MIN. - 120 MIN.

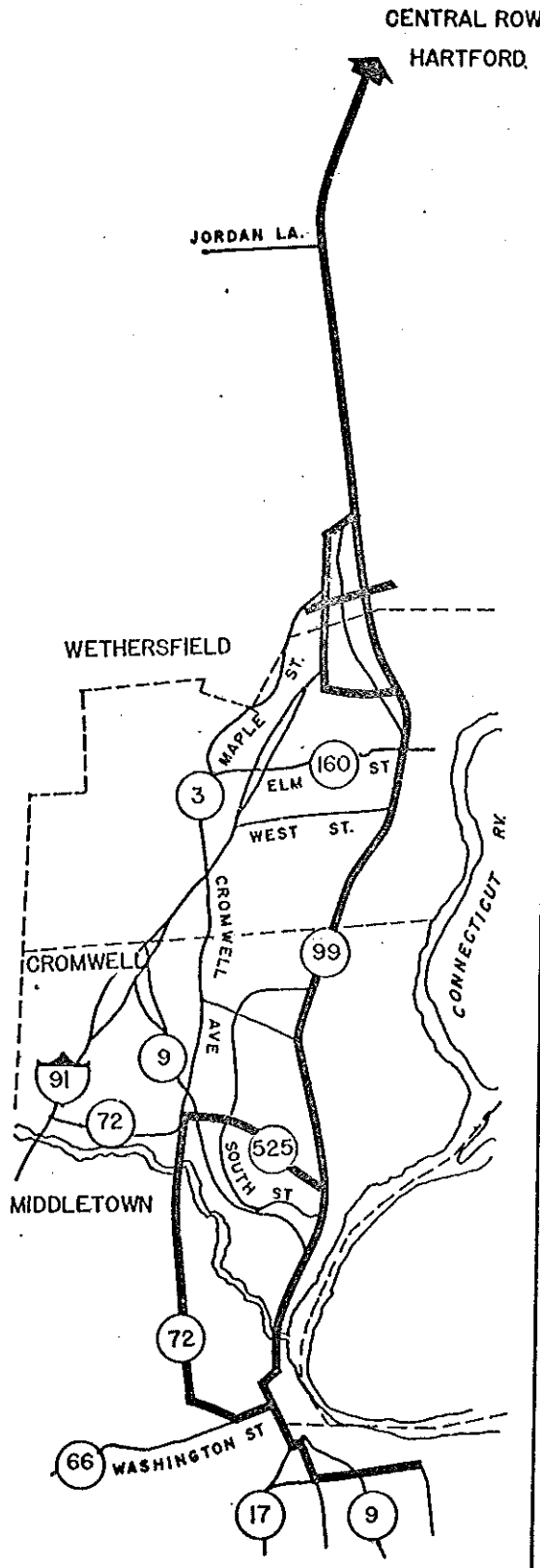


FIGURE III - 1

MIDDLETOWN "M" ROUTE SUMMARY DATA

BUS ROUTE "M"

MIDDLETOWN
HARTFORD TO MIDDLETOWN

WEEKDAYS		SATURDAYS		
AM	PM	AM	PM	
6.17	T12.00	P7.20	G1.30	SUN. & HOL. Not Operated
PT6.47	PET1.00	T7.40	T4.10	
T7.17	T2.00	G9.30	TP4.40	
PR7.57	PET3.00	G11.30	.....	
8.27	T3.40	.....	.....	
PET9.00	PT4.10	.....	.....	
T10.00	T4.40	.....	.....	
PT11.00	PT5.10	.....	.....	
.....	P6.10	.....	.....	

R—To Rocky Hill Center only.
T—To Conn. Valley Hospital.
P—Via Parsonage Road.
G—To Gilbert & Elm St., Rocky Hill.
E—Via Reg. Route to Cromwell Center, via West St.
Route #72 Newfield St. Berlin St. to Washington St.
All other trips run to Union Park, Middletown.

Average running time between:

Central Row and Jordan Lane ..... .17 Min.
Jordan Lane and Maple ..... .06 Min.
Maple St. and Rocky Hill ..... .09 Min.
Rocky Hill Ctr. and Piersons, Cromwell ..... .07 Min.
Pierson, Cromwell and Union Park, Middletown ..... .11 Min.
Union Park, Middletown and Conn. Valley Hospital, Middletown .... .08 Min.

CONNECTICUT TRANSIT

THE CONNECTICUT DEPARTMENT OF TRANSPORTATION

53 Vernon Street Hartford, Conn. Phone 525-9181

BUS ROUTE "M"

MIDDLETOWN
MIDDLETOWN TO HARTFORD

WEEKDAYS		SATURDAYS		
AM	PM	AM	PM	
P5.27	T12.53	P8.10	G12.00	SUN. & HOL. Not Operated
5.55	PET1.53	T8.35	G2.00	
PT6.18	T3.03	G10.00	T4.57	
6.55	PET4.03	.....	TP5.30	
PT7.27	T4.33	.....	.....	
T8.00	PT5.03	.....	.....	
PR8.28	T5.33	.....	.....	
9.09	PT6.03	.....	.....	
PET 9.53	P7.00	.....	.....	
T10.53	.....	.....	.....	
PT11.53	.....	.....	.....	

R—Leaves Rocky Hill Center.
T—Leaves Conn. Valley Hospital.
P—Via Parsonage Road.
G—Leaves Gilbert & Elm Streets, Rocky Hill.
E—Via Berlin St., Newfield St., West St. to Main St. in Cromwell.

All other buses from Union Park, Middletown

Average running time between:

Conn. Valley Hospital and Union Park, Middletown ..... .07 Min.
Union Park, Middletown and Main & King St. ..... .05 Min.
Main & King St. and Piersons, Cromwell ..... .12 Min.
Piersons, Cromwell and Rocky Hill Ctr. ..... .06 Min.
Rocky Hill Ctr. and Maple St. ..... .09 Min.
Maple St. and Jordan Lane ..... .08 Min.
Jordan Lane and Central Row ..... .08 Min.

The Company will not be held liable for errors in time table and inconvenience or damage resulting from delayed buses or failure to make connections, subject to change.

8-77

FIGURE III - 2

"M" ROUTE SCHEDULE

fares are increased by 15 cents to 50 cents. Monthly passes are available at the cost of $14 for the first zone, and $17 for the second zone. Special discounts are given to the elderly, handicapped persons with Medicare Cards, and students with school identification cards. Transfers are free and may be used at any point where bus routes intersect. Transfers must be used within fifteen minutes or whenever the next connecting bus is scheduled.

Patronage

The on-board bus survey of the "M" route, completed by Alan M. Voorhees in February, 1977, revealed that approximately 660 one-way trips are made daily. Of these, approximately half have origins and/or destinations in the Midstate Region. Table III-1 gives a complete breakdown of trip origins and destinations by Town. The survey also showed that the majority of passengers (55%) use the service for commuting between home and work. A summary of the destination trip purpose data is shown in Table III-2.

3.2.2 Commuter Express Service

In addition to the "M" route local service, Connecticut Transit also runs commuter express service between park-and-ride lots within the Region and downtown Hartford. Four buses are used in the morning peak period, while five buses are used in the evening peak. Two of the morning buses stop at both commuter lots in the Region as well as at Cromwell Hills. Of the remaining two morning buses, one runs express from the Davis Lumber commuter lot, while the other stops only at Cromwell Hills and the I-91 commuter lot. In the afternoon, all buses make all stops.

Schedule

Figure III-3 shows the express bus schedule in effect as of this date. Information on the reliability of scheduled departure times was not surveyed.

Fare Structure

Fares on the express service are equivalent to a two-zone local fare, or 50 cents one-way. In addition, monthly passes are available at the cost of $17.00.

Patronage

Patronage counts taken in January of 1977, place daily line usage at 350 one-way trips. This amounts to an increase of 20 percent over the previous six months (since June, 1976). Figure III-4 shows service patronage over the previous three years, 1973-1976.

TABLE III-1

"M" ROUTE ORIGINS/DESTINATIONS

ORIGINS BY TOWN	#	%
Hartford	255	39
Rocky Hill	81	12
Wethersfield	70	11
Cromwell	38	6
East Hampton	1	0
Middlefield	1	0
Middletown	142	22
Portland	4	1
No Answer	69	10
	661	100

DESTINATIONS BY TOWN	#	%
Hartford	238	36
Rocky Hill	70	11
Wethersfield	91	14
Cromwell	31	5
East Hampton	1	0
Middlefield	0	0
Middletown	135	20
Portland	2	0
Killingsworth	1	0
No Answer	92	14
	661	100

SOURCE: AMV ON-BOARD BUS SURVEY, FEBRUARY, 1977.

TABLE III-2
"M" ROUTE
DESTINATION TRIP PURPOSE SUMMARY

	# Trips	%
Home	244	37
Work	210	32
School	10	1
Shopping	58	9
Personal Business	38	6
Social/Recreation	25	4
Medical	6	1
Other	23	3
No Answer	47	7
	661	100

SOURCE: AMV ON-BOARD BUS SURVEY, FEBRUARY, 1977.

FIGURE III-3

CONNECTICUT TRANSIT COMPANY
COMMUTER EXPRESS SCHEDULE

A.M. Departs Commuter Lot	P.M. Departs Pearl and Ann Streets
7:05 A.M. - Rt. 72 Cromwell Hills	4:05 P.M.
7:10 A.M. - Express+	4:15 P.M.
7:10 A.M.++	4:20 P.M. at Aetna**
8:10 A.M.+	4:35 P.M.*
	5:15 P.M.

All buses except 7:10 A.M. Express stop at Cromwell Hills on Route 72 and at the carpooling lot at the intersection of Route 72 and I-91. All buses except 7:05 A.M. stop at the Davis Lumber Yard.

\+ Bus makes additional stop at Bushnell Memorial

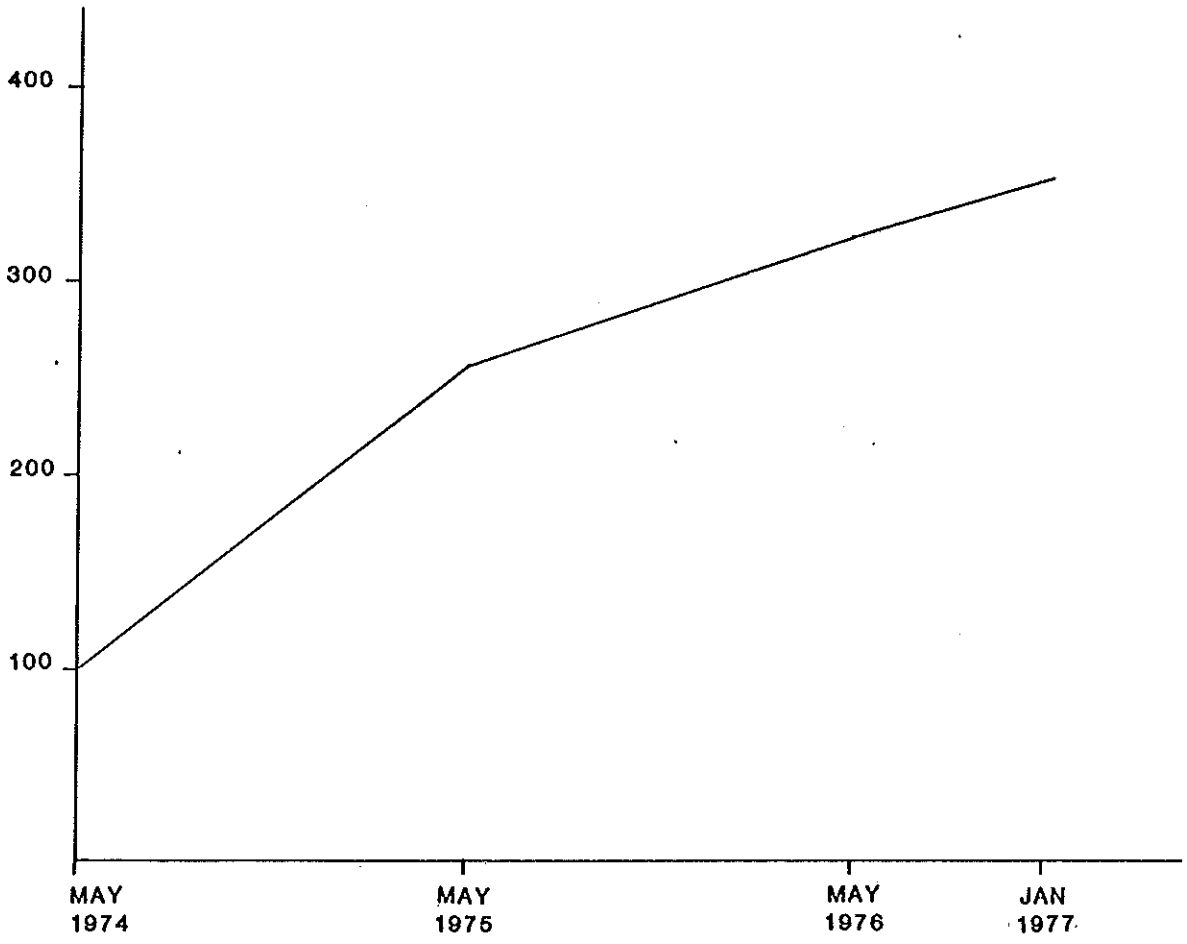
++ Bus makes additional stop at Aetna then to Bushnell Memorial.

** Bus proceeds to Pearl and Ann Streets

* Bus originates from Bushnell Memorial before Proceeding to Pearl and Ann Streets.

EXPRESS TRIP TIME: 30 Minutes

REGULAR TRIP TIME: 40 Minutes



SOURCE = CONN. DOT RIDERSHIP SURVEYS

FIGURE III- 4

COMMUTER EXPRESS BUS HISTORICAL PATRONAGE

Rolling Stock and Facilities

A complete inventory of the Hartford Division of the Connecticut Transit Company rolling stock is shown in Appendix A of this report.

3.3 PRIVATELY OPERATED SERVICE

3.3.1 New Britain Transportation Company

Currently, New Britain Transportation Company operates three different services within the Region. The primary service is a commuter route between Middletown and Bristol. The bus leaves Middletown at 5:45 AM and the return run arrives in Middletown at 4:30 PM. Stops are made enroute in Meriden and Southington.

In addition to the commuter route, the Company runs a special "tripper" service between New Britain and the Plainfield racetrack daily during the racing season stopping in Middletown at 6:20 PM and returning at 11:20 PM. Occasionally, special services to other racetracks in New England also stop in Middletown.

The third service operated by the Company within the Region is a special charter service to transport some Midstate Region handicapped persons to the Constructive Workshop in New Britain on a daily basis. One 36-passenger bus begins the route in Middletown at 7:00 AM and stops in Portland, Cromwell, and Middlefield on the way to New Britain. It returns to Middletown at 5:30 PM. Patronage on the route is approximately 15 passengers per day.

A detailed inventory of the Company's capital stock is given in Appendix A.

3.3.2 Corbin Coach Lines, Inc.

Corbin Coach Lines provides a commuter charter service between Hartford and New London stopping daily in Middletown at 6:00 AM and on the return trip at 5:10 PM.

3.4 SCHOOL BUS SERVICE

Private school bus operators, because of the nature of their rolling stock, cannot be considered as a resource in terms of providing regular route public transit service in the Region. However, they should not be overlooked as a potential management resource for any service which may be developed. Therefore, these operators were identified and considered in developing management alternatives.

At the present time, there are two private carriers providing school bus service in the Region. They are:

- Nichols Bus Company of East Hampton, Connecticut, in Portland and Cromwell
- Walls Transportation Company of Wallingford, Connecticut, in Middletown

In addition, the City of Middletown also owns and operates its own fleet of school buses.

3.5 PARA-TRANSIT SERVICE

Currently, there are three taxi/limousine operators serving the Midstate Region. The most active of these is the Valley Cab Company of Middletown. Having recently purchased the operation of its competitor The Yellow Cab Company, Valley Cab is the only provider of door-to-door taxi service throughout the entire Region.

Old Lyme-Saybrook Taxi Service, Inc. operates a door-to-door service, but is is confined to East Haddam and Haddam.

Central Connecticut Limousine Service, Inc. is a New Haven-based company specializing in transportation to Bradley International Airport. Its only service to the Region is a stop at the Lord Cromwell Inn in Cromwell along a route between New Haven, Connecticut, and Bradley.

3.6 SPECIAL NEEDS TRANSPORTATION SERVICE

The Midstate Region has a rather extensive and well-coordinated transportation program for its "special needs" citizens. Three non-profit agencies service the majority of the special transit needs in the Region. They are Middlesex County Transportation, Inc. (MCT/Red Cross), Community Action for Greater Middletown (CAGM), and Middletown Senior Affairs Committee. In addition, the Towns of East Haddam and Portland provide limited volunteer operated transportation service to elderly and low income residents.

Middlesex County Transportation, Inc.

MCT/Red Cross is a non-profit transportation agency sponsored by the American Red Cross and Community Action for Greater Middletown with financial assistance from several regional agencies and institutions as well as from State and Federal grants. Free transportation is available for all trip purposes to all Region residents who are over 60 years of age and/or physically handicapped.

A dial-a-ride door-to-door service is operated Monday through Friday, from 8:30 AM to 4:30 PM, and longer, if necessary. Reservations are on a first-come first-served basis and are accepted up to 24 hours in advance of the desired departure time. However, this requirement is often waived for emergency cases. A daily schedule, shown in Table III-3, has been developed for service to each town in the Region.

Service is provided by three state-owned vans and two agency-owned station wagons. All vehicles are equipped with two-way radios and dispatched through a central coordinator. Application has been made for funds to add another van to the fleet in the near future.

Community Action of Greater Middletown (CAGM)

In addition to its participation in Middlesex County Transportation, Inc., CAGM also provides free transportation to elderly and low income citizens of Middletown, Portland and Cromwell participating in CAGM-sponsored programs. Five vans and six station wagons operate on a semi-fixed route basis, Monday through Friday, as needed. Vehicles are not equipped with two-way radios, but daily schedules are coordinated by the MCT/Red Cross dispatcher.

Middletown Senior Affairs Committee

The City of Middletown funds free transportation for the City's elderly citizens, Monday through Friday, from 8:30 AM to 4:30 PM. Dial-a-ride service is provided for medical trips through use of an agency station wagon. Whenever possible, this service is coordinated with MCT service. General purpose travel is provided by a 24-passenger van operating on fixed routes. Route and schedule information is shown in Table III-4.

Other Transportation Services

The Town of East Haddam funds a dial-a-ride service for its elderly residents. Operating times are not specified since the service is manned by volunteers on an as-demanded basis.

The Friends in Service Here (FISH) volunteer organization of Portland, provides transportation to both elderly and low income residents. The service is manned by volunteer drivers using their own vehicles. Recent increases in the cost of operating an auto have led to decreased ability on the part of volunteers to provide a free service. As a result, the transportation function of the organization is declining.

TABLE III-3

MCT DIAL-A-RIDE SCHEDULE

DAY	TOWN	TIME
Elderly:		
MONDAY	Durham & Middlefield	8:30 - 12:00
	Middletown	1:00 - 4:30
	East Hampton & Portland	8:30 - 4:30
TUESDAY	Haddam	8:30 - 4:30
	Cromwell	8:30 - 12:00 Intown
	Middletown	1:00 - 4:30
WEDNESDAY	Durham & Middlefield	8:30 - 4:30
	East Hampton & Portland	8:30 - 4:30
THURSDAY	Haddam	8:30 - 4:30
	Cromwell	8:30 - 4:30
FRIDAY	Durham & Middlefield	8:30 - 12:00 Intown
	East Hampton & Portland	8:30 - 12:00 Intown
Handicapped of All Ages		
MONDAY	Durham & Middlefield	8:30 - 4:30
TUESDAY	Cromwell & Middletown]	8:30 - 4:30
WEDNESDAY	East Hampton & Portland	8:30 - 4:30
THURSDAY	Haddam	8:30 - 4:30
FRIDAY	Middletown	8:30 - 12:00 (Longer if necessary)

TABLE III-4

MIDDLETOWN SENIOR CENTER
TRANSPORTATION PROGRAM

FROM NEWFIELD STREET AREA (11 pass. van; 24 pass. bus)

MONDAY and FRIDAY MORNINGS

9:00 Pick up Newfield St., passengers for Washington St., Plazas.
10:30 Return Washington St., Plazas passengers to Newfield St.
11:15 Return downtown passengers to Newfield St.

11:30 Pick up Newfield St., passengers for an afternoon at Senior Center and downtown.
3:45 Return 11:30 passengers to Newfield St.

WEDNESDAY MORNING

9:00 Pick up Newfield St. passengers for S. Main St., Plazas.
10:30 Return passengers from S. Main St., Plazas to Newfield St.

FROM DOWNTOWN AREA

TUESDAY AND THURSDAY MORNINGS (LARGE BUS)

9:00 Leave Senior Center, Church St., Broad St., College St., north on Main St., St. Johns, Stack St., Pease Ave., Spring St., High St., Washington St., to Washington St., Plazas.

8:30 (MINI BUS) Main St. Ex-., Cooley Ave., East Main St., Silver St., Evergreen Ave., left on Frisbee St., Denison Rd., Russell St., Ridge Rd., Prout Hill Rd., Margarite Rd., Hunting Hill Ave., Russell St., to Stop and Shop and Grand Union.

9:00 Down South Main St., to Hunting Hill Ave., down Lake St., to Grand Union and Stop and Shop.

10:00 Return passengers from both 8:30 trips.

10:45 Return passengers from 9:00 trip.

THURSDAY AFTERNOON

1:00 Main St. Ext., Cooley Ave., East Main St., Silver St., to Long River Village, Evergreen Ave., left on Frisbee St., Denison Rd., Saybrook Rd., Bartholomew Rd., south to Woodbury Circle, Saybrook Rd., Russell St., Ridge Rd., Prout Hill Rd., Margarite Rd., Hunting Hill Ave., Russell St., to Stop and Shop and Grand Union.

In addition to the services already mentioned, four ambulance services operate in the Midstate Region. They are:

- The Professional Ambulance Service,
- Colchester Emergency Communications, Inc.,
- Cromwell Ambulance Service, Cromwell,
- Durnham Volunteer Ambulance Corporation, Durham.

These operators provide emergency service and general medical transportation to non-ambulatory persons.

CHAPTER III REFERENCES

1. Report on Bus Operations
Meriden, Middletown and adjacent communities
December 1967
Simpson and Curtin Transportation Engineers

CHAPTER IV

PUBLIC TRANSPORTATION NEEDS IN THE MIDSTATE REGION

4.1 THE CONCEPT OF PUBLIC TRANSPORTATION NEEDS

In considering public transportation needs, it is important to understand the full spectrum of planning concerns. Public transportation, by definition, implies conventional regular route "transit" service for the general public, as well as specialized transportation services for specific subgroups of the Region's population, such as the elderly, handicapped and low income. In addition to various user groups (general public versus special needs groups), the Transit Development Program examines a broad range of service types (i.e. regular route, dial-a-ride, route deviation) and equipment options (full size buses, mini-buses, vans). The idea behind this broad comprehensive approach is that the variation in transportation needs of individual user groups necessitates flexibility in program development.

Because of the unique attributes of individual population subgroups, public transportation needs are difficult to define and quantify. Various groups and individuals in society often view transportation desires and demands from different perspectives and with different values. As a consequence, it is generally not possible to identify a single list of transportation needs with assigned priorities that will be readily accepted by everyone in a particular area. Recognizing this, the transit study team attempted to use information derived from a wide variety of sources to develop a comprehensive public transportation needs statement for the Midstate Region.

By comprehensive, it is meant that the statement is intended to reflect the needs, or perceived needs, of a broad cross section of the Region's residents. No attempt is made in this statement to assign priorities, or values, to the stated goals and objectives. These values will require assessment by the Region's population and official representative bodies. The resulting determinations will then be embodied implicitly into the recommendations of the Transit Development Program.

Before commencing the discussion on the data acquisition activities and the resulting identification of needs, several points require elaboration at this time.

Criteria for Defining Needs

From the perspective of providing efficient transit service in the Midstate Region, it is equally important to determine the absence, as well as presence, of need. Therefore, subsequent analyses focusing on individual communities include discussions of geographic areas and population sectors where need for public transit is not apparent as well as those where the need is apparent.

A comprehensive statement of public transportation needs in a region must be supported by factual information as well as the input of study participants, including public officials, public agency representatives, general public participants, and local planners. Using these criteria, the study team has employed a very objective and practical evaluation of Regional transit needs. The advantage of this approach is that the necessity of value judgments was minimized. Where some question did arise on the determination of need, it was so identified.

Need Versus Demand

Need within the context of the TDP is defined as a potential dependence on public transportation to provide mobility in fulfilling social and economic requirements. Need cannot be equated with demand, which is defined as an actual desire to use the specific service provided. The distinction between needs and demands requires substantial local policy input in conjunction with technical analyses of observed transit usage patterns. A concerted effort is made to verify, through analysis of factual and qualitative data, any translation of needs to demands.

Use of Identified Needs

Upon review of the public transportation needs statement for the Midstate Region, a set of goals and objectives can be formulated to guide the policy decisions to be made in developing individual components of the recommended transit action program. Essentially, aggregate estimates of need by user group provide benchmarks for public policy decisions.

The incremental approach to program development helps to overcome limitations in forecasting how potential riders might respond to expanded and qualitatively superior service. How people will behave in a given situation must be estimated through development of correlations with comparable experiences modified by qualitative judgments.

4.2 DATA ACQUISITION ACTIVITIES

Within the framework of the TDP, three major data acquisition activities were completed:

(1) An on-board bus passenger survey on all regular route transit service.

(2) Review of socio-economic characteristics of the Region's population.

(3) Informational surveys of transit operators, employers, activity centers, and social service agencies.

Each of the data acquisition activities provided the study team with information relevant to the identification of the transportation needs of particular population groups. The on-board passenger survey obtained very detailed quantitative information concerning present transit users. The operator, taxi and social service surveys enabled completion of a detailed inventory of existing transit operators in the Region, covering types of services provided, operating characteristics, and existing usage. The employer and activity center surveys helped to indicate how transit could be supportive to economic activities in the Region. The socio-economic screening process indicated areas of potential need based on the primary demographic and economic characteristics of communities.

From each of the data acquisition activities, findings relative to public transportation needs in the Midstate Region were identified. A correlation was then developed between the findings to substantiate and prioritize needs. Table IV-1 presents an overview of the data acquisition activities of the TDP. A detailed description of each activity follows, covering technical procedures, outcomes and findings.

4.3 MIDSTATE REGION SOCIO-ECONOMIC SCREENING PROCESS

4.3.1 Procedural Overview

In order to quantify transit demand in the Midstate Region, it is first necessary to define where in the region a transit market exists. Therefore, a procedure was developed to screen the region and identify those areas which hold the highest potential for transit usage.

The procedure is based on the premise that certain socio-economic characteristics of a population are good indicators of that population's propensity to use transit. A series of socio-economic indicator variables are used in identifying the transit market.

Variables were selected for their availability on a uniform level (i.e. Traffic Analysis Zones) and their ability to describe transit users in general. Using these guidelines and recent reports describing socio-economic characteristics of typical transit patrons, seven variables were chosen for use in the screening procedure. They are:

- percent of households with 0 cars
- percent of households with 1 car
- percent of households below the poverty level ($5,000)
- persons 60 years and over per acre
- persons 10-16 years per acre
- females 16-24 years per acre
- number of dwelling units per acre

Data from the 1970 Census was used as a base condition and expanded to reflect both normal and site specific growth between 1970 and 1976. The procedure used to expand the data is detailed in the following sections.

TABLE IV-1

TDP DATA ACQUISITION ACTIVITY OVERVIEW

Activity	Scope	Application
Socio-Economic Screening Process	Midstate Region (8 communities)	• Stratify region for transit potential • Identify areas for detailed examination • Determine general magnitude of need based on demographic and economic data screening
On-Board Passenger	Middletown, Cromwell	• Detail quantitative information concerning present transit users
Informational Surveys	Midstate Region (8 communities)	• Inventory of existing transit operators • Evaluate the "state" of transit service in region • Identify social and economic needs for transit service
Citizen Participation Element	Midstate Region (8 communities)	• Obtain qualitative data concerning population groups. • Augment informational surveys with data inputs from participants

4.3.2 Socio/Economic Data Update

Since the last census was conducted in 1970, the Midstate Region's population has been growing at a rate of 3 percent annually to its present level of 88,400. This represents a 19 percent increase between 1970 and 1976. Any analysis incorporating use of the Region's socio-economic characteristics should reflect this growth. Therefore, before the transit potential screening technique could be used, a procedure had to be developed to take the available 1970 census data and expand it to account for the Region's growth.

Expansion Procedure

Growth in the Region can be classified into two categories: (1) growth due to normal trend conditions (natural increase, inmigration) and (2) site specific growth, such as construction of Planned Unit Developments (PUDs). The expansion procedure is based on the premise that under normal population growth conditions, the distribution of socio/economic characteristics does not change (i.e. 10 percent increase in population would indicate a 10 percent increase in zero car households). Further, where site specific growth can be identified and is of a general nature, it is simply added to the zonal population, and the characteristic distributions remain unchanged. If however, the site specific growth is of a specialized nature (i.e. low income or elderly housing), the distribution of certain population characteristics will change and must be accounted for in expanding to 1976 conditions.

As a first step, then, it was necessary to identify the magnitude of population growth on a town-by-town basis. The 1976 Midstate Regional Planning Agency (MRPA) population estimates were used to determine growth since 1970. Next, the magnitude of site specific growth (both general and specialized) within each town was identified and deducted from the six-year growth figure and assigned to the appropriate traffic zone within the town. For planning purposes, special projects which have been committed to construction were included in the adjusted population figures. The remainder of the unassigned growth represents normal growth in population from 1970 to 1976. This normal growth was then apportioned to a traffic analysis zone system according to Connecticut DOT's 1980 zonal population projections. Table IV-2 shows these calculations for the Town of Cromwell.

TABLE IV-2

CROMWELL POPULATION GROWTH BY TRAFFIC ZONE

Zone	1970 Pop.	% of 1980 Projected Town Pop.	Site Specific Growth	Normal Growth	Town Total Pop. Growth	1976 Adj. Pop.
1	86	1	0	2	2	88
2	139	2	0	4	4	143
3	811	11	2330	23	2353	3164
4	2066	28	0	58	58	2124
5	374	5	464	11	475	847
6	299	4	0	9	9	310
7	1818	24	162	49	211	2029
8	832	11	0	23	23	855
9	976	) 13	0	27	27	1033
		100	2956	206	3162	10562

SOURCES: Connecticut DOT 1980 Regional Socio/Economic Projections
Midstate Regional Planning Agency, Housing Element #7, 1977

The final step in the procedure was to categorize site specific growth within the zones as general or specialized. If all of the site specific growth within a zone is general in nature (i.e. representative of the present zonal population), then it can be added to the normal growth increment and a zonal expansion factor equal to 1976 Adjusted Population/1970 Population calculated. For example, shown here is the calculation for Cromwell Zone #3:

$$\text{Zonal Expansion Factor} = \frac{3164}{811} = 3.90$$

Therefore, 1970 data on socio/economic characteristics of Zone 3 population can be factored by 3.90 to represent 1976 estimates.

In Zone 7, however, site specific growth was entirely of a specialized nature (i.e., elderly housing). Therefore, a two-step process was used to determine 1976 estimates. First, a zonal expansion factor was calculated to account for normal growth:

$$Z.E.F. = \frac{\text{1976 Adjusted Population-Specialized Site Specific Growth}}{\text{1970 Population}}$$

$$= 2029-162/1818 = 1.02$$

Using this factor, 1976 estimates due to normal growth alone can be calculated.

Factors describing the distribution of socio/economic characteristics of special groups, such as the elderly or low income, have been calculated on a national basis and can be applied to special site specific growth. The resulting numbers can be added to the 1976 normal growth estimates to produce the 1976 overall socio/economic character estimates.

The major steps used in the update procedure are presented in outline form in Table IV-3.

4.3.3 Screening Process

The screening procedure developed for the Midstate Region employs a mathematical screening function. This function has the form of:

$$\text{Transit Potential} = a_1 \; x_1 + a_2 \; x_2 + \text{-----} + a_n \; x_n$$

where:

x_n = socio-economic indicator variables

a_n = weighting describing the relative importance of each socio/economic variable

The updated socio/economic data estimates were grouped into ranges and assigned a rating of one (low transit potential) to three (high transit potential). These ranges are shown in Table IV-4.

Each of the variables were then assigned a weighting factor. This was done by allocating a total of 100 points according to the importance of each variable. The resulting weights are also shown in Table IV-4.

The results of this screening are shown in Table IV-5 and Figure IV-1. Of the 65 zones examined in the screening procedure, 8 showed high potential, 11 showed moderate potential and the remaining 46 showed low or no transit potential. All but two of the 19 zones which showed some degree of transit potential fell within the urbanized areas of Middletown, Cromwell, and Portland. The exceptions were: East Haddam Zone 6 and East Hampton Zone 5, both of which showed moderate transit potential.

It should be noted at this point that, in the case of East Haddam Zone 6, its ability to support transit is actually very low due to its low population numbers and densities. Since the screening technique is based, in part, upon percentages of the population with specific characteristics, a small population with many zero car households can receive a high transit potential rating when in actuality it has a low transit potential. In any case, a quick review of the magnitude of the screening variables will identify such situations and appropriate adjustments made.

TABLE IV-3

SOCIO/ECONOMIC DATA UPDATE PROCEDURE

1. Determine Town population growth from 1970 to 1976 by formula: 1976 Est. Population minus 1970 Census Population.

2. Determine portion of total growth which is site specific. The remainder is normal growth.

3. Assign site specific growth to appropriate traffic zones.

4. Apportion normal growth according to Connecticut DOT's 1980 zonal population projections.

5. Sum of Steps 3 and 4 is the 1976 adjusted zonal population.

6. Determine zonal socio/economic variable expansion factors:

   A) If all growth in a zone is normal or all site specific growth is of a general nature, the zonal expansion factor equals:

      1976 ADJ. POP./1970 POP.

   B) If site specific growth is of a specialized nature (i.e., low income, elderly):

      (1) the zonal expansion factor for normal growth equals:

      $$\frac{\text{1976 ADJ. POP.} - \text{SPECIAL SITE SPECIFIC GROWTH}}{\text{1970 POP.}}$$

      (2) Socio/economic characteristics of the specialized growth are obtained from national statistics.

7. Determine 1976 estimates of socio/economic indicator variables:

   A) For zones which fall into Category "6A" above, simply multiply 1970 data by the zonal expansion factor.

   b) For zones which fall into category "6B" above:

      (1) Multiply 1970 data by the normal growth factor

      (2) Add to that result the increases due to special site specific growth

TABLE IV-4

SOCIO-ECONOMIC SCREENING VARIABLES

VARIABLE	WEIGHTING FACTOR	RANGE RATINGS 1 (Low Potential)	2 (Moderate Potential)	3 (High Potential)
Percent of Households with 0 cars	25	0-10%	11-20%	20+%
Percent of Households with 1 car	15	0-40%	41-60%	61+%
Percent of Households Below Poverty Level	10	0-4.9%	5-9.9%	10+%
Persons Age 60+ ›r Acre	10	0-.49	.50-1.49	1.5+
Persons Age 10-16 Per Acre	10	0-.30	.31- .90	.91+
Females Age 16-24 Per Acre	10	0-.30	.31- .90	.91+
Dwelling Units Per Acre	20	0-1.0	1.0-3.0	3.0+
TOTAL	100 Points			

SOURCE: AMV & Associates Surveys

TABLE IV-5

SOCIO-ECONOMIC VARIABLES AND ASSIGNED RATINGS

Town	Zone	HH Per Acre	Tr. Pot.	%HH w/0 Car	Tr. Pot.	%HH w/1 Car	Tr. Pot.	% HH Below P.L.	Tr. Pot.	Pers. 60+/ Acre	Tr. Pot.	Pers. 10-16/ Acre	Tr. Pot.	Females 16-24/ Acre	Tr. Pot.	Total Score	Transit Potential
Cromwell	1	.04	1	0	1	38	1	27	3	.01	1	.02	1	.01	1	120	L
	2	.08	1	0	1	38	1	19	3	.02	1	.04	1	.02	1	120	L
	3	.69	1	2	1	38	1	16	3	.18	1	.31	2	.15	1	130	L
	4	.61	1	3	1	27	1	12	3	.23	1	.28	1	.11	1	120	L
	5	.23	1	1	1	33	1	13	3	.10	1	.12	1	.05	1	120	L
	6	.26	1	12	2	37	1	22	3	.14	1	.08	1	.04	1	145	L
	7	1.57	2	10	1	42	2	35	3	1.30	2	.55	2	.29	1	175	M
	8	.31	1	11	2	49	2	31	3	.21	1	.11	1	.08	1	160	M
	9	.12	1	15	2	34	1	7	2	.03	1	.08	1	.03	1	135	L
Durham	1	.04	1	6	1	20	1	8	2	.01	1	0	1	.01	1	110	L
	2	.15	1	3	1	35	1	7	2	.05	1	.10	1	.04	1	110	L
	3	.06	1	5	1	39	1	13	3	.02	1	.04	1	.01	1	120	L
	4	.08	1	0	1	31	1	8	2	.02	1	.06	1	.02	1	110	L
East Haddam	1	.11	1	9	1	48	2	18	3	.06	1	.06	1	.03	1	135	L
	2	.05	1	10	1	31	1	25	3	.03	1	.03	1	.01	1	120	L
	3	.05	1	0	1	34	1	4	1	.03	1	.03	1	.01	1	100	L
	4	.07	1	15	2	32	1	15	3	.04	1	.02	1	.01	1	145	L
	5	.03	1	16	2	32	1	16	3	.02	1	.01	1	.01	1	145	L
	6	.00	1	22	3	27	1	0	1	.00	1	.00	1	.00	1	150	M
East Hampton	1	.03	1	0	1	43	2	16	3	.02	1	.01	1	.01	1	135	L
	2	.21	1	9	1	44	2	20	3	.08	1	.09	1	.04	1	135	L
	3	.11	1	6	1	40	1	16	3	.05	1	.05	1	.02	1	120	L
	4	.07	1	2	1	34	1	23	3	.03	1	.04	1	.02	1	120	L
	5	.15	1	12	2	48	2	22	3	.05	1	.06	1	.03	1	160	M
	6	.10	1	5	1	45	2	19	3	.04	1	.06	1	.02	1	135	L
Haddam	1	.01	1	0	1	48	2	3	1	.00	1	.01	1	.00	1	115	L
	2	.04	1	2	1	47	2	6	2	.01	1	.02	1	.01	1	125	L
	3	.32	1	3	1	41	2	15	3	.14	1	.14	1	.05	1	135	L
	4	.06	1	2	1	43	2	18	3	.03	1	.02	1	.01	1	135	L
	5	.08	1	3	1	36	1	16	3	.03	1	.03	1	.01	1	120	L
	6	.03	1	4	1	38	1	15	3	.01	1	.01	1	.00	1	120	L
	7	.07	1	3	1	54	2	20	3	.03	1	.03	1	.02	1	135	L
	8	.03	1	4	1	55	2	22	3	.01	1	.01	1	.00	1	135	L
Middlefield	1	.03	1	3	1	39	1	5	2	.01	1	.02	1	.01	1	110	L
	2	.30	1	6	1	37	1	18	3	.12	1	.19	1	.08	1	120	L
	3	.01	1	13	2	26	1	13	3	.00	0	.00	0	.00	1	125	L
	4	.07	1	8	1	29	1	14	3	.03	1	.03	1	.02	1	120	L
	5	.24	1	9	1	34	1	6	2	.07	1	.14	1	.05	1	110	L

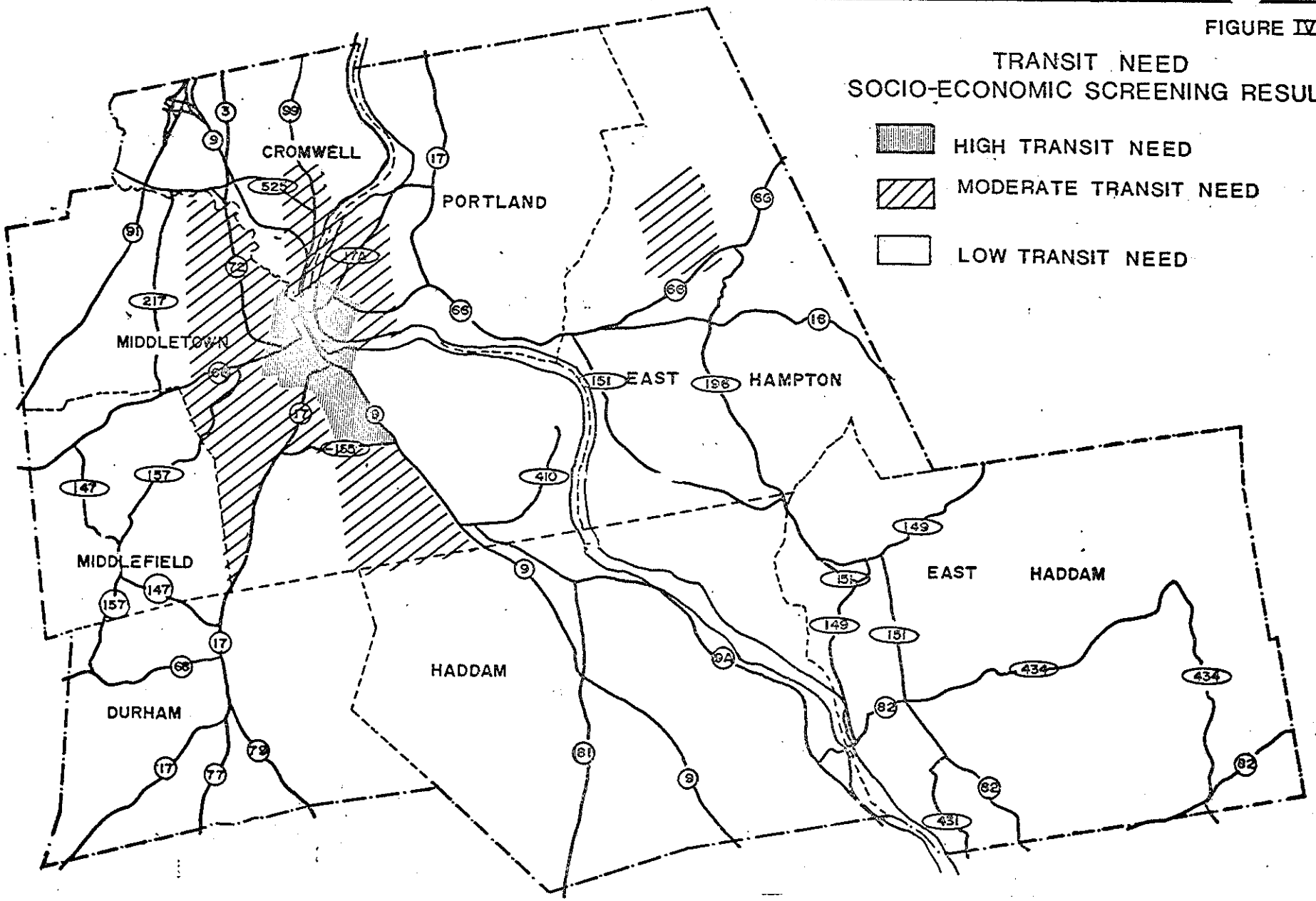
TABLE IV-5 (Cont.)

Town	Zone	HH Per Acre	Tr. Pot.	%HH w/0 Car	Tr. Pot.	%HH w/1 Car	Tr. Pot.	% HH Below P.L.	Tr. Pot.	Pers. 60+/ Acre	Tr. Pot.	Pers. 10-16/ Acre	Tr. Pot.	Females 16-24/ Acre	Tr. Pot.	Total Score	Transit Potential
Middletown	1	.08	1	1	1	28	1	9	3	.02	1	.02	1	.06	1	120	L
	2	.68	1	5	1	30	1	18	3	.07	1	.04	1	.20	1	120	L
	3	.27	1	6	1	35	1	35	3	.07	1	.09	1	.14	1	120	L
	4	.75	1	9	1	52	2	51	3	.21	1	.16	1	.33	2	145	L
	5	2.18	2	20	3	55	2	32	3	1.32	2	.51	2	.55	2	220	H
	6	1.32	2	13	2	47	2	40	3	.34	1	.32	2	.56	2	190	M
	7	3.74	3	23	3	62	3	31	3	1.82	3	.89	2	.82	2	280	H
	8	2.40	2	23	3	48	2	44	3	1.90	3	.73	2	.76	2	255	H
	9	5.48	3	26	3	52	2	57	3	3.00	3	1.28	3	.99	3	285	H
	10	2.41	2	23	3	53	2	37	3	.74	2	.71	2	.90	2	235	H
	11	.43	1	8	1	48	2	15	3	.16	1	.13	1	.25	1	135	L
	12	.11	1	7	1	48	2	14	3	.04	1	.03	1	.06	1	135	L
	13	.01	1	7	1	48	2	11	3	.00	1	.00	1	.00	1	135	L
	14	.23	1	19	1	50	2	57	3	.05	1	.04	1	.12	1	160	M
	15	1.60	2	11	2	48	2	17	3	.94	2	.37	2	.47	2	210	H
	16	1.74	2	9	1	50	2	13	3	1.20	2	.35	2	.56	2	185	M
	17	1.05	2	10	1	55	2	35	3	.33	1	.28	1	.58	2	165	M
	18	.21	1	6	1	5	1	16	3	.08	1	.05	1	.12	1	120	L
	19	.07	1	1	1	64	3	21	3	.03	1	.02	1	.05	1	150	M
	20	3.92	3	27	3	49	2	60	3	2.56	3	.66	2	.66	2	265	H
Portland	1	.13	1	9	1	38	1	19	3	.06	1	.06	1	.03	1	120	L
	2	.03	1	3	1	34	1	13	3	.01	1	.02	1	.01	1	120	L
	3	.08	1	2	1	30	1	5	2	.02	1	.05	1	.02	1	110	L
	4	.15	1	0	1	31	1	8	2	.06	1	.09	1	.03	1	110	L
	5	.89	1	11	2	37	1	16	3	.41	1	.41	2	.17	1	155	M
	6	1.01	2	24	3	44	2	55	3	.61	2	.31	2	.19	1	225	H
	7	.89	1	11	2	39	1	19	3	.39	1	.58	2	.18	1	155	M

*Transit Potential = Total Score Ranges: Low (L) 100-125; Medium (M) 130-190; High (H) 195-285

SOURCES: U.S. Census of Population 1970 (Adjusted); Midstate Regional Planning Agency, Housing Element #7, 1977
AMV & Associates Surveys

FIGURE IV - 1



MIDSTATE REGION TRANSIT DEVELOPMENT PROGRAM

2.5 0 2.5 MILES

APPROX. SCALE

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PREPARED BY
ALAN M. VOORHEES & ASSOCIATES
AND
MIDSTATE REGIONAL PLANNING AGENCY STAFF
1977

4.4 ON-BOARD PASSENGER SURVEY

On Wednesday, February 23, 1977, the Study Team conducted an on-board passenger survey of Connecticut Transit's "M" Route, which serves the towns of Middletown and Cromwell. The data obtained during this survey was used to assess the transportation needs of present riders and the extent of their reliance on public transportation.

The major findings resulting from an analysis of the survey returns are:

- Of the 660 one-way transit trips made on the "M" route, 287 (43%) had at least one end of the trip in the Midstate Region. Forty-nine trips (7%) originated and terminated within the Region. Ninety-five trip-makers (14%) gave no response.

- The majority of trips were of an essential nature. Seventy-one percent of the trips were between home and work, shopping, medical appointments, or school.

- The majority of riders, 65 percent, are female.

- Fifty percent of the riders fall into the 25-59 year age group, while 17 percent fall into 60+ year age group.

- The majority of riders are from households with low to moderate income. Fifty-three percent of those responding to the question reported earnings of $10,400 per year or less. Thirty-two percent earn less than $7,800/year.

- The majority of riders reported they have no alternative means of travel available for their trip. Thirty percent of the users do not have a driver's license and 30 percent come from households with no cars. An additional 40 percent come from households with one car. In total, 70 percent of the users did not have a private automobile available for their trip.

These results indicate the present "M" route serves the transportation needs of a number of Midstate Region residents, the majority of which are in middle income brackets and have no alternative means of travel available.

It should be emphasized that these findings do not describe a "profile" of the "typical" local transit rider in all respects. Previous studies have indicated that the typical local (vs. long distance) patron is more likely to fall in the under 16 or over 60 age groups than any other and more likely to be in the under $5,000 income bracket than some other.

The survey results clearly indicate the "M" route is a commuter-oriented service with riders that are predominantly middle age and middle income and thus not typical local transit riders. Therefore, no attempt was made to identify a general "profile" of the typical transit rider using on-board survey data. The data is presented here simply to point out the needs of this particular segment of the Region's population.

It should also be pointed out that a considerable portion of the Region's long distance commuter needs are met by Connecticut Transit's express bus program which provides approximately 550 one-way trips per average weekday. These buses were not surveyed as this service is exclusively interregional and outside of the scope of this study. It is mentioned here, to further emphasize that there is a high level of need for commuter oriented service between the Midstate Region and Hartford.

4.5 INFORMATIONAL SURVEYS

A series of informational surveys were performed to obtain data on existing and potential transit usage from specific groups within the Region. Groups surveyed during the TDP include:

Transit Operators:	Connecticut Transit Company
	New Britain Transportation Company
	Corbin Coach Lines
Taxi and Limousine Operators:	Valley Cab Company
	Old Lyme-Saybrook
	Central Connecticut Limousine Service
Social Service Agencies:	Major providers of transportation for their clients throughout the Region.
Employers:	All employers with 50 or more employees
Activity Centers:	Central Business Districts
	Hospitals
	Colleges
	Shopping Centers
	Recreational Centers

4.5.1 Transit Operators

For the three major bus operations in the Midstate Region, Connecticut Transit, New Britain Transportation Company, and Corbin Coach Lines, an inventory of rolling stock and capital facilities was conducted. The results of these inventories can be used to assess the available transportation resources of the region. In the event a local transit service is desired to serve the region, the transit district may wish to draw on the operations or management capabilities of these operators. The inventory results are included in Appendix A of this report.

Since none of the operators mentioned provide comprehensive local fixed route service, any further analysis of bus operations in the region would not contribute significantly to the identification of regional transportation needs. Therefore, no financial or operational analysis was performed. Instead, the study proceeded on a "no existing public transit service" assumption.

4.5.2 Taxi and Limousine Operators

The three taxi-limousine companies operating in the region were asked to complete survey questionnaires concerning their operations in the Midstate Region. This survey revealed that only one company, Valley Cab Company, operates an on-call, door-to-door service throughout the entire region. In addition to servicing the general public, Valley Cab is also relied upon by the Connecticut Department of Social Services to provide transportation for clients of that agency.

The Old Lyme-Saybrook Taxi Service provides on-call door-to-door service for residents of Haddam and East Haddam within and between the towns and to other points in the region. In addition, they offer special discount fares to senior citizens, the company's predominant clientele.

The Central Connecticut Limousine Service operation is limited to providing airport transportation to Bradley International Airport. Only one stop is made in the region at the Lord Cromwell Inn in Cromwell along a route between New Haven and Bradley. An inventory of each company's rolling stock is provided in Appendix A.

4.5.3 Special Needs Transportation Inventory

In every major urban and rural area, there are large numbers of citizens whose travel is severely restricted and who, without special attention to their needs, would consequently be denied access to essential goods and services and active participation in community life. In the Midstate Region, a variety of special transportation services for the elderly, handicapped and economically disadvantaged, are being provided. In most cases, the social service agencies themselves have had to become providers of transportation as their clients' needs would not otherwise be served. To obtain specific and up-to-date information on these special needs transportation services, a three step inventory process was carried out as follows:

(1) Review existing informational documents pertaining to social service agency transportation services.

(2) Conduct personal interviews with representatives of those social service agencies most active in providing transportation to their clients.

(3) Follow up interviews with a detailed evaluation questionnaire for completion by all social service agencies providing transportation services in the region.

Specific objectives of the review of existing documentation and personal interviews with agency representatives were:

(1) To identify the extent of services available to the region's transportation-disadvantaged residents.

(2) To determine the extent of coordination between agencies providing services.

(3) To identify major problems as the agencies perceive them.

Personal Interviews

Two agencies in the region, MCT and CAGM, account for approximately 85 percent of the Special Needs transit trips currently being provided by social service agencies. Both of these agencies utilize the same transportation coordinator, Ms. Linda Jodoin.

Members of the study team personally interviewed Ms. Jodoin to assess her satisfaction with the present system and solicit her views on how the system could be improved.

Ms. Jodoin indicated a general satisfaction with the system operation. However, she did indicate that additional vehicles could be used to handle the growing demand for the service, particularly in rural areas of the region.

When questioned about the possibility of improving service by coordinating operations with other agencies, Ms. Jodoin indicated that there was already limited and informal coordination between several agencies, but stressed that a formally coordinated program is mandatory for providing efficient Special Needs transportation.

Special Needs Transportation Survey

To augment data gathered from interviews and existing documentation, a formal survey was administered to seven social service agencies, seven school districts, and four private providers of Special Needs transportation throughout the Midstate Region.

The primary objective of the survey was to verify documentation of existing services, including program description, equipment utilization and operational characteristics. Secondly, data provided by the surveys enabled the study team to assess the demand for these services. Finally, the survey provided a format for those agencies not personally interviewed to express their concerns over the quality of Special Needs transportation in the region. Of the 18 surveys mailed out, 6 were returned by agencies indicating they were active in providing transportation to their clients. One agency, the Connecticut Department of Social Services, indicated that they did not provide transportation services, but that they do reimburse taxi operators who transport clients. Five school districts responded. No responses were received from private operators.

Table IV-6 summarizes the inventory results of the social service survey. Of the 10 survey forms returned, 8 contained trip information which could be used to indicate levels of usage of the transportation services. Table IV-7 summarizes this information for the 8 agencies reporting.

Information contained in Table IV-7 serves as an indicator of the level of special needs transportation being provided and for what purposes. The need for these services is evidenced by the high proportion of trips being made by the elderly, handicapped, and low income, for the essential purposes of shopping, school, work, and medical appointments.

Based on these results, it can be seen that a relatively high level of Special Needs transportation is provided within the urbanized area of the Midstate Region. Still, several agencies indicated that they were unable to meet current demand, particularly among low income residents.

In the rural areas of the region, the level of Special Needs transportation provided is limited. The two agencies which serve rural clients have also indicated that there is a sizable unmet demand. All of the agencies indicated that better coordination of services was not only possible, but essential, and all indicated they would cooperate with a coordination effort.

4.5.4 Employer Survey

One significant locational determinant for industries and businesses which have settled in Connecticut has been the availability of labor with skills appropriate to their needs. To determine the importance of transit in tapping the labor pool and whether the lack of transit has created any problems for firms in satisfying their labor requirements, an employer survey questionnaire was mailed to 148 firms, institutions, and businesses which employ fifty or more persons (114 of these were also surveyed as activity centers).

TABLE IV-6

SPECIAL NEEDS SURVEY RETURNS

Agency	Area Served	Group Served	Type of Service	Type of Vehicle	Special Equipment	Driver Training Reg'ts.	Hours of Operation	Type of Operation
Middlesec County Transportation Inc.	Midstate Region and Middlesex County	E, HC, LI	Dial-a-Ride	3 vans 2 wagons	E	E	M-F	A
Community Action for Greater Middletown	Midstate Urban-ized Area	E, LI	Fixed Route Bus	5 vans 6 wagons	N	N	M-F	A/C
Middletown Senior Affairs	Middletown	E	Dial-a-Ride & Fixed Route Bus	1 van 1 wagon 1 bus	L	E	M-F 8:30-4:30	A
Town of E. Haddam	E. Haddam	E	Volun-teer	1 van	N	N	as needed	A
Portland Fish	Portland	E, LI	Volun-teer	Pers. Auto	N	N	24 hours/ day	A
Portland Board of Education	Portland	HC	Fixed Route Bus	2 Carry-alls	N	L	M-F 7:30-9 AM 2-3:30 PM	C
E. Haddam Board of Education	E. Haddam	HC	Fixed Route Bus	Carryalls Autos	N	L	M-F 7:30-9 AM 1:30-3:30 PM	C

TABLE IV-6

(Cont'd.)

Agency	Area Served	Group Served	Type of Service	Type of Vehicle	Special Equipment	Driver Training Req'ts.	Hours of Operation	Type of Operation
Town of Cromwell Public Schools	Cromwell	HC	Fixed Route Bus	9 buses 1 van	N	L	M-F 7-10 AM 2-4 PM	C
Regional School District #17	Haddam	HC	Fixed Route Bus	4 vans	L	L	M-F 6 AM-6 PM	A/C
Middletown Board of Education	Middletown	HC	Fixed Route Bus	12 Carry-alls	N	L	M-F 7 AM-4 PM	C

E -- ELDERLY
HC -- HANDICAPPED
LI -- LOW INCOME

N -- NONE
L -- LIMITED
E -- EXTENSIVE

A -- AGENCY OPERATED
C -- CONTRACT SERVICE

Source: AMV & Associates Survey, February 1977.

TABLE IV-7

SPECIAL NEEDS TRANSPORTATION INFORMATION

(EIGHT PROGRAMS)

	Elderly	Low Income	Handicapped
Total Number of Trips/Week	636	625	712
% Shopping	13	1	0
% School	0	56	95
% Work	0	32	0
% Medical	28	5	5
% Social/Recreational	9	1	0
% Personal Business	9	1	0
% Other or Not Specified	41	4	0

SOURCE: AMV & ASSOC. SURVEY, FEBRUARY, 1977.

The survey questionnaire requested information on number of employees by work shift, their travel mode, the availability of public transit, whether the lack of transit has been a factor in hiring and maintaining personnel, and whether improved transit could help their operation.

Table IV-8 summarizes the information obtained from the 47 survey forms that were returned. Of those returned, 21 were from industrial firms, two each were from educational and medical facilities, and one each was received from a correctional institution and a municipality. Also represented were seven retailers and thirteen office, business or service enterprises.

The 10,846 employees represented by the 47 respondants to the survey represents 36.5 percent of the total of 29,710 employees in the Midstate Region. Approximately one employer in three reported that lack of transit has caused hiring problems. Additionally, 57 percent felt that improved transit service could help their employees. With spiralling fuel, insurance, and maintenance costs of operating an automobile, this is becoming a common response by employers.

Employers were also asked whether they would actively support a bus system if one was implemented. The responses shown in Table IV-9 were received to questions on the survey form concerning supportive actions.

TABLE IV-9

EMPLOYER SUPPORT OF TRANSIT

Questions on Supportive Actions	Number of Responses (N=47)		
	YES	NO	NO RESPONSE
• Would you help guage interest for service by surveying employees?	40	4	3
• Would you help promote service through distribution of schedules, route maps?	42	2	3
• Would you provide data for planning service by detailing employee home locations?	36	6	5

SOURCE: AMV & ASSOC. EMPLOYER SURVEY, FEBRUARY, 1977.

TABLE IV-8

MIDSTATE REGION TRANSIT DEVELOPMENT PROGRAM

EMPLOYER SURVEY RETURNS

Employer Location	No. of Facilities	No. of Employees	Currently Served By Transit	Lack of Transit Has Caused Hiring Problems	Improved Transit Would Help Employees
Middletown CBD	26	4135	57%	30	46%
Industrial Park	9	5592	0%	22%	78%
Remainder of Region	12	1119	0%	42%	67%
	47	10846			

SOURCE: AMV & ASSOC. SURVEY, FEBRUARY, 1977.

The response to survey questions in conjunction with comments received during the survey indicate that a local bus service serving the Middletown CBD and outlying industrial parks could be supportive of employer operations.

4.5.5 Activity Center Survey

To determine the importance of public transportation to the operation of the region's major activity centers, detailed survey questionnaires were mailed to 16 regional facilities. In addition, 105 retail, office and service enterprises, representing the Middletown CBD as an activity center, were also asked to complete questionnaires. The survey requested information pertaining to facility patronage, travel mode and characteristics of patrons, availability of public transit, and importance of public transit to the activity center.

Table IV-10 summarizes the information obtained from the 27 survey forms that were returned. The completed surveys represented 10 regional centers and 17 CBD facilities. These are broken down by type of facility as follows:

- 17 commercial/retail facilities
- Five social/recreational facilities
- Two medical facilities
- Three educational facilities

The response to the survey is summarized as follows:

- Only the Middletown CBD, the Middletown YMCA, and Connecticut Valley Hospital are currently served by public transit. Two recreational facilities, Wesleyan University Arena and Powder Ridge Ski Area, indicated that a portion of their patrons arrive by charter bus.
- Five of the centers, including the CBD, reported that the lack of public transit has hurt the center's operation.
- All but one of the centers reported that provision of a transit service could help the facility. The most frequently suggested service was a local service between the Middletown CBD and surrounding communities.

The results of the Activity Center Survey statistics, added to comments received with it, provided insight to the study team in the development of transit alternatives that are sensitive to the medical, social and educational needs of the Region's population. Some of the appended comments were as follows:

TABLE IV-10

ACTIVITY CENTER SURVEY RESPONSES

Activity Center	Type of Activity	Daily Usage	Age of Predominant Clients	Income* of Patrons	Transit Availability	Has Lack of Transit Hurt Operation?	Could Improved Transit Help Operation?	Type of Improvement Most Needed
Middlesex Memorial Hospital	Medical Care	3000	All ages	All incomes	NO	YES	YES	Bus service to surrounding areas for Low Income & Elderly Patients
Middlesex Comm. College	Higher Education	1500	Young Adult	Low-Mod. Income	NO	YES	YES	Bus service between CBD and MXCC
Wesleyan Univ. Arena	Recreational	300	Young & Young Adult	Mod. Income	NO	NO	YES	---
Wesleyan Univ.	Higher Education	Varies	All ages	All incomes	NO	NO	YES	Shopper Service for Students
Powder Ridge Ski Area	Recreation	Seasonal 200	Young Adult Adult	Mod. Income	NO	NO	YES	Seasonal Bus Service
Connecticut Valley Hospital-Outpatient Clinic	Medical Care	40	Young Adult & Adult	Low Income	YES	NO	YES	Low cost shuttle at higher frequency
Russell (Public) Library	Public Library	230	All ages	All incomes	NO	NO	YES	---
Middletown CBD	Commercial Retail	N/A	All ages	All incomes	YES*	YES*	YES*	Inter-town * & Shuttle Service
Middletown YMCA	Recreational	900	Young to Adult	All incomes	YES	YES	YES	Expanded Service - to outlying communities
Middletown Senior Center	Social/Rec.	50-100	Elderly	Low income	NO	NO	NO	---
Portland Community Center	Social/Rec.	25	Elderly	All incomes	NO	YES	YES	Local collector service

SOURCE: AMV & ASSOCIATES SURVEY, FEBRUARY, 1977.

N/A -- NOT AVAILABLE

* MAJORITY OPINION

- Middlesex Memorial Hospital

  "Improved transit may prove helpful in reducing the Hospital's shift change parking shortage and in making the health care services provided by the Hospital and community physicians more accessible to lower-to-middle income and elderly patients."

- Middlesex Community College

  "Students are forced to commute by car and many have trouble finding rides."

- Wesleyan University

  "Transit Service might make local shopping more convenient to students, most of whom have no car."

- Kabels Luggage Shop, Inc.--Middletown

  "Public Transit service would free up parking stalls now taken up by employees, thus providing for more customer usage."

- Middletown YMCA

  (If transit service were improved) ... "teenagers and youngsters could come to the 'Y' without parents or without having a driver's license. More senior citizens and one-car families could be better served. Expanded service, especially to outlying communities, would be helpful."

4.6 SUMMARY OF NEEDS STATEMENT

The most meaningful way to illustrate the concept of "need" for public transportation in the Midstate Region is to define, on a community basis, those segments of the population that are termed "transit dependent." In considering dependency on transit, a series of criteria were utilized:

- Households with no cars - the best single indicator of transit dependency.
- Households below the proverty level - an annual income of $5,000 was used as a reference point in defining poverty level.
- Number of people 60 years and older - Elderly sectors of the population are typically more dependent on transit for personal mobility than any other sector.

Figure IV-2 graphically illustrates the relative level of potential transit dependency by community. As indicated by the magnitude of variables in Figure IV-2, the following communities have the highest ranking of the statistics in the Region:

Community	No. of Households with No Car	No. of Households Below $5,000/year	No. of Persons 60 Years +
Middletown	1	1	1
Portland	2	4	3
Cromwell	5	3	2
E. Hampton	3	2	4

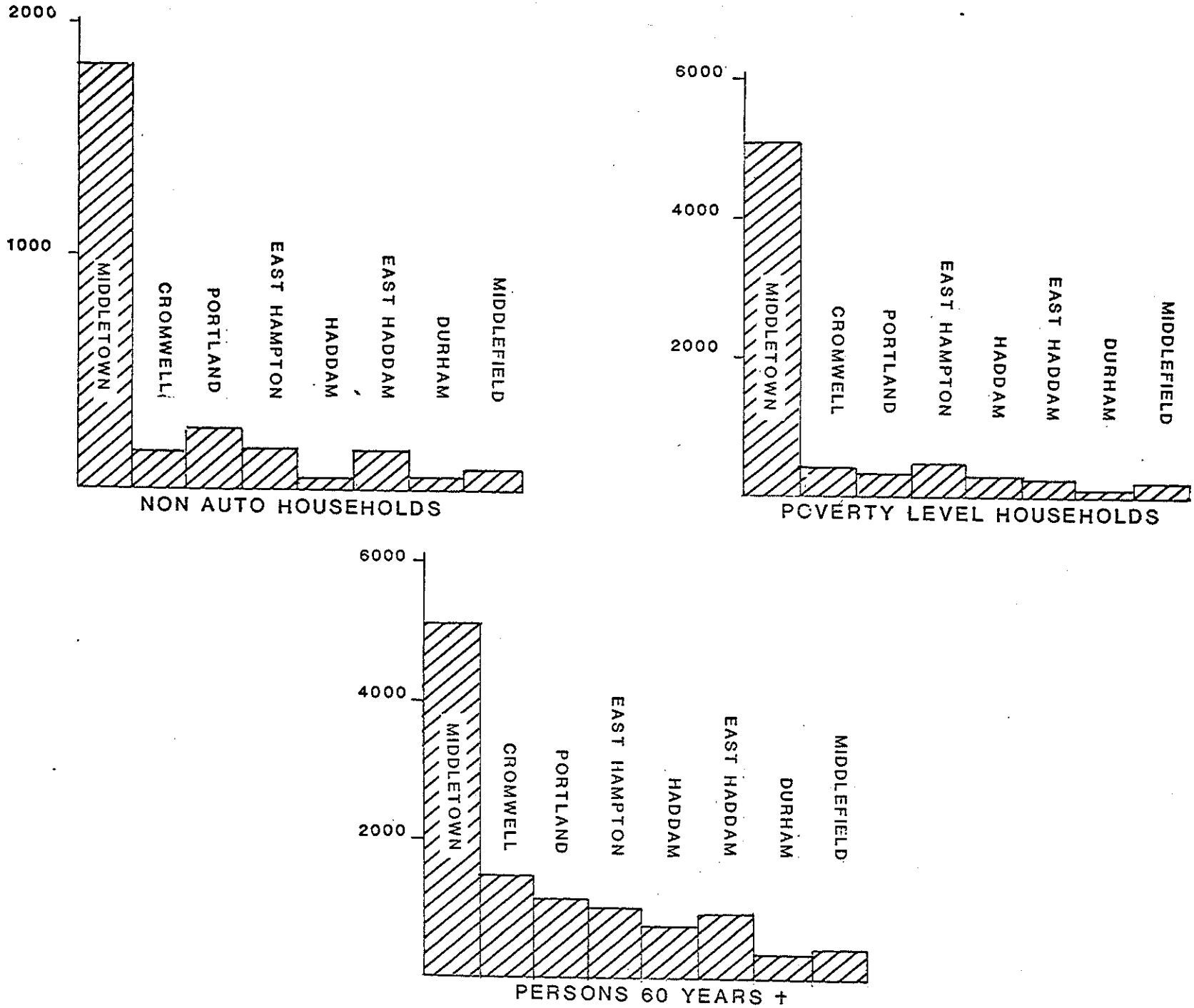
As described earlier in Chapter IV, the data acquisition activities of the TDP can be grouped into four functional areas:

- On-Board Passenger Surveys
- Socio-economic Variable Screening Process
- Primary Informational Surveys
- Citizen Participation Process

A correlation is made between the results of the above activities to indicate in the most meaningful way, the need for public transportation. Table IV-11 illustrates the conclusions reached by community from each of the data acquisition efforts.

From Table IV-11, the following conclusions can be reached:

- The most apparent need for regular fixed route bus service is in the urbanized areas of Middletown, Portland and Cromwell. Such a service could also be used as a feeder to the existing line-haul service into Hartford. A possibility of special commuter service exists between the Middletown CBD and the industrial parks to the northwest and southwest.
- A high need for specialized transportation services for the elderly, handicapped, and low income ("special needs" services) is apparent in Middletown. A medium level need has been identified in Cromwell, Portland, East Haddam and East Hampton.
- A major need is evident to coordinate and provide support for the special needs transportation programs in the Region.



TRANSIT DEPENDENT POPULATION POTENTIAL
SUMMARY OF STATISTICS

FIGURE IV - 2

TABLE IV-11

MIDSTATE REGION TRANSIT DEVELOPMENT PROGRAM
PUBLIC TRANSPORTATION NEEDS INVENTORY

Community	On-Board Bus Survey	Socio-Economic Screening Process	Employer Survey	Social Service Agency Survey	Activity Center Survey	Transit Operator Inventory	Community Official Interviews
Middletown	High CS	Med./High	High RR	High SN	High	Med. CS	High-Mini Bus Serv. CBD
Portland	NA	Med./High	Med. RR	Med. SN	Med.	NA	NA
Cromwell	High CS	Med.	Med. RR	Med. SN	Med.	Med. CS	NA
E. Hampton	NA	Low/Med.	Low	Med. SN	Low	NA	NA
Haddam	NA	Low	Low	Low	Low	Low SN	NA
E. Haddam	NA	Low	Low	Low	Low	Low SN	NA
Durham	NA	Low	Low	Low	Low	NA	NA
Middlefield	NA	Low	Low	Low	Low	NA	NA

RR = Regular Route
SN = Special Needs
CS = Commuter Service

Potential Need

High, Medium, Low

N.A. = Not Applicable

SOURCE: AMV & Associates Surveys, February, 1977

It is important to realize that the Urban Mass Transportation Administration's (UMTA) guidelines clearly state that the choice of a particular alternative is a local decision to be made by the community receiving the service. UMTA's capital and operating assistance can be applied to both regular route as well as special needs transportation programs. Within the context of the TDP, the transportation needs of all sectors of the Region's population must be considered. This includes the general public, the elderly, and the handicapped.

CHAPTER V

I. OWNERSHIP AND MANAGEMENT ALTERNATIVES

The success of a transit system depends in large part on the efficiency of the management structure behind it. Yet no single management structure can be considered best under all conditions. The form of management best suited for a particular transit system will depend on the state of existing transit services, the scope of the new service - regional or local - the political climate in the service area, and funding opportunities. The purpose of this chapter is to describe the potential mechanisms for owning and operating a transit system in the Midstate Region and to discuss the operating and financial implications of each.

There are three basic ownership/management options open to the region. These are:

- Private ownership and management
- Public ownership and management
- Public ownership and private management

The advantages and disadvantages of each of these ownership/management forms are identified in the following sections.

5.1 PRIVATE OWNERSHIP/MANAGEMENT

Until recently, this combination of ownership and management was the most widely practiced in the United States. All of the transit systems which formerly operated in the Midstate Region were private enterprises -- H&W Transit, The Connecticut Company, to name two. Under this option, a private company owns, operates, and manages the transit system.

The major concern associated with privately owned and operated transit systems is their ability to remain economically viable in light of the low levels of regular route patronage experienced throughout the country. Often, private operators are unwilling to invest in new capital equipment because of uncertainty over the profitability of the system. Fares are increased and service reduced in an attempt to combat deficits. These factors, in combination, lead to lower patronage and revenues forcing further service cutbacks which lead to even lower patronage. This vicious spiral usually results in complete cessation of privately operated public transit service, as has occurred in the Midstate Region.

In summary, the potential advantages of private ownership and management are:

- The cost of operation is the responsibility of the private operator. Normal financial incentives of private enterprise act as control on costs and services provided.

- Transit employees would not be paid out of public monies.

The potential disadvantages include:

- Transit service can probably not be restored in the Midstate Region on this basis due to lack of profit potential.

- If restored, continuous transit service would not necessarily be assured. System continuity and coverage could be disrupted by eliminating unprofitable or marginally profitable routes.

- The flexibility of the transit system and its ability to change in response to shifting demands and needs is dependent on financial capabilities of the transit company.

- Advantage could not be taken of State and Federal subsidy dollars available for use in the Midstate Region or local tax exemptions.

5.2 PUBLIC OWNERSHIP

An alternative to private ownership and management of transit service in the Midstate Region is public ownership of the system. Basically, there are three potential mechanisms for public ownership of transit -- municipalities as a municipal department, a regional transit district or the State. The relative advantages and disadvantages of each of these forms of ownership will be discussed below. It should be noted at this point that by choosing a public ownership option, the choice of management form is not restricted. Management of the system may be private (through contract to a management firm) or public

In general, the advantages of public ownership include:

- The transit operator would have an explicit obligation to operate the system in a manner which best serves the public interest.

- Full advantage could be taken of state and Federal transit subsidies and local tax exemptions.

- Continuous public transit service would be assured.
- Potentially, other publicly provided transportation services could share facilities or be integrated with the transit operation.

The disadvantages of public ownership may generally be summarized as follows:

- The potential for political interference in transit system operations would exist.

Financial Implications of Public Ownership

In order to be eligible for all state and federal funding programs for mass transit, the system must be publicly owned. Each of the three basic alternatives mentioned previously would qualify as public ownership and be eligible for support.

Current federal and state programs provide for 100 percent of the capital costs for transit projects. The Urban Mass Transportation Administration (UMTA) through its "Section 3" funding program, assumes 80 percent of the costs while the state picks up the remaining 20 percent.

In addition to capital grants, a publicly owned transit system is eligible for substantial operating subsidies. The state, using UMTA "Section 5" funds and state matching funds, will provide the first 40 percent of the operating costs of the system. The remaining 60 percent is expected to be made up through user fares. However, in the event that fare revenues do not equal 60 percent of the costs, the state will share equally with the service area communities any remaining deficit.

Consider the following hypothetical example:

Anytown Transit has $100,000 annual operating cost. Its annual fare box revenue totals $40,000. The subsidies received and resulting local share would be as follows:

Annual Operating Costs	$100,000
Less 40% State/Federal Subsidy	40,000
Less Fare Box Revenue	40,000
Remaining Deficit	$ 20,000
Less State Share of Deficit	10,000
Local Share	$ 10,000

or 10% of operating costs.

In other words, for each dollar the local communities invest in the Anytown Transit system, the system receives $5.00 in state and federal subsidy money. The amount of this subsidy will increase in fiscal year 1978 if the recommendations of the Commissioner of Transportation are accepted by the Connecticut Legislature. The Commissioner has recommended that the first 50 percent of the system operating cost be subsidized and that the state continue the policy of splitting the difference of any remaining deficit with the local communities.

5.3 BASIC PUBLIC OWNERSHIP ALTERNATIVES

Aside from the general and financial implications of a public system there are distinct differences between the various forms of public ownership. A thorough understanding of the advantages and disadvantages of each form is essential to selecting the most effective ownership and management option for transit in the Midstate Region.

5.3.1 Municipal Ownership

One alternative for public ownership is for a municipality to own the transit system directly and either operate the system as a public department or contract with a management firm to operate the system.

Under this option, the system would retain all of the general advantages and disadvantages of public ownership previously discussed. However, there are some additional pros and cons unique to this scheme which should be set forth.

Advantages include:

- Utilization of support services of other town departments such as planning or maintenance could provide cost savings to the system.
- Municipal ownership would allow greater flexibility in selecting the form of system management as opposed to state ownership which, under current practices implies, private management.
- Like other public services, the management and administration of the transit system could be carried out with scrutiny and control of budgets, revenues and expenditures.

Disadvantages include:

- Coordinated service on a regional scale could be difficult. The system would be limited in its ability to implement new services of modify existing services if such services were to cross municipal boundaries.

- A municipal agency, unlike a transit district would not hold regulatory powers over other forms of transportation in the Region, making coordinated regional transit even more difficult.

- A municipal agency would add an additional department to town government which could require financial support from tax collars.

- The lack of private enterprise incentives and pressures for unwarranted service could create inefficiencies in the transit operation.

- Citizen support for expenditure of local tax dollars on transit service might be difficult to obtain.

5.3.2 Transit District Ownership

Another optional form of transit system ownership for a region such as Midstate is ownership by a transit district. The 1972 Act concerning the Powers of Transit Districts (General Statutes of Connecticut CH 103A Sec. 7-273) provides for the establishment within the State of Connecticut of transit districts composed of one or more municipalities. Such a district has the following powers and responsibilites once established:

- The member municipalities must appoint a board of directors consisting of at least one member from each of the district communities.

- The district may assume all powers of the public utilities commission to regulate and supervise the operation of transit systems within the district.

- The district may use grants, loans or other revenues for subsidies to any transit system operating under private ownership within the district.

- The district shall fix the terms and conditions upon which transit service shall be provided whether operated directly by the district or indirectly by contract.

- A transit district has the power to acquire real property and interest rights in real property by eminent domain.

- The transit district may issue bonds or other interest-bearing obligations.

- It may regulate fares, schedules, franchising agreements and routings of transit facilities within its boundaries.

The transit district is controlled and managed by a board of directors whose members are appointed by the governing bodies of each participating community, the chief executive in the case of a city and the board of selectmen in a town. The exact number of directors from each community depends on its population. Municipalities with a population of between 25,000 and 100,000, according to most recent Federal census, shall have two directors while municipalities with fewer than 25,000 have one director each.

The legislative body of any municipality may vote to establish a transit district or to join with any one or more municipalities to form such a district. In this regard, the City of Middletown has already voted and formed a transit district which presently functions in an advisory capacity with Conn. DOT and Connecticut Transit who operate express and local bus service to Hartford.

The enabling legislation also provides for other municipalities to join the transit district if its legislative body votes to do so and if accepted by a majority vote of the board of directors.

In summary, the advantages of Transit District ownership include:

- The infrastructure for a regional transit district already exists in the Middletown Transit District. Experience gained by the directors and members of the District would be a valuable local asset to the transit system.

- The transit system under regional transit district control could be most flexible in its ability to quickly implement new services or modify existing services to accommodate local or regional shifts in need or demand.

- This form of ownership would allow flexibility in selecting a management form.

- The transit district may assume regulatory and supervisory powers over all forms of mass transit within its boundaries to provide coordinated and efficient transit service to the region.

The flexibility allowed in the enabling legislation creates a situation where there is only one significant disadvantage to ownership by a regional district other than those already mentioned for public ownership in general. It is:

- The administrative costs of operating an active transit district might have to be subsidized by participating local governments.

5.3.3 State Ownership

A final alternative form of transit ownership in the Midstate Region is state ownership. Under this option, the state would own and maintain all capital assets and contract with a private management firm to operate the system.

The advantages of such an arrangement would include:

- The state through Conn. DOT and its management firm would be able to provide in-house planning operations and management expertise which may not be readily available to a municipality or regional transit district.
- No additional governmental authority need be established.

The disadvantages include:

- The level of service provided is controlled by the state and therefore, not as flexible in its ability to implement changes in service to meet shifting demands.
- Local involvement in the provision of transit service would be on an advisory basis only and then only through a governmental mechanism such as a transit district.

5.4 MANAGEMENT ALTERNATIVES

If a decision is made to publicly own transit in the Midstate Region, a form of system management must be selected. The two basic alternatives are public management and private management. Each of the public ownership alternatives (with the exception of state ownership) discussed in the previous section, could be compatible with either public or private management.

5.4.1 Public Management

Under this alternative, the management of the public transit agency (transit district, or municipalities) would be provided by employees of that agency. The possible advantages of public management include:

- Local governments are experienced in the art of managing public services.

- Management would be directly responsible to the governmental body of the public transit agency.

- Public management might be somewhat less costly than private management since no management fee would be paid.

Possible disadvantages of public management include:

- It may prove to be difficult to find and attract qualified personnel to manage the system who will be available when public acquisition occurs.

- Political pressures might affect day-to-day management.

- If the number of management personnel is kept to the minimum number necessary to conduct day-to-day operations, the system will be extremely dependent on key personnel who might at some future date become unavailable on short notice (for example, due to ill health).

- The system will not be large enough to support management personnel in certain specialized areas (for example, planning and scheduling).

5.4.2 Private Management

Under a management contract, a public agency can retain a private transit management firm to provide experienced day-to-day system management. These contracts are generally three to five years in length with a management fee that is often fixed, or alternatively a percentage of gross revenues (with a guaranteed minimum). Occasionally, the fee is supplemented by an incentive amount based upon ridership. The management firm provides a small group of permanent management personnel (sometimes only a general manager and specialists on an "as needed" basis. Usually, all other transit workers are employees of the public transit agency, although transit management firms are willing to employ all transit workers if necessary.

The advantages of private management include:

- A management firm guarantees competent system management continuously for the duration of the management contract.

- A private management firm can establish competent management on short notice and provide specialists "as needed." (i.e. planning, operations, maintenance)

- If necessary or desired, transit workers could be employed by the management firm rather than the public agency.

Disadvantages of private management include:

- Systems costs under private management may be greater than costs under public management.
- Management contracts must be periodically renegotiated hence continuous management is not necessarily assured.
- The key to successful operation still rests primarily with the competency and presence of qualified management personnel. A management firm, although it may be held responsible, may have as much difficulty as the transit agency in acquiring and retaining personnel.

5.5 STATE POLICY CONCERNING OWNERSHIP/MANAGEMENT

The state does not maintain a definitive policy on ownership and management of transit systems. Rather it allows communities contemplating transit improvements a high degree of latitude in the selection of an appropriate form of transit system control. However, it is the intent of the Connecticut Department of Transportation to encourage local ownership of transit systems if the local agency is also the operator. This type of arrangement exists in Westport where the transit district owns, operates, maintains and manages the fixed route system.

In areas where transit service is provided by State-owned buses, the Department involves local transit districts on an advisory basis only. However, since the State provides the majority of subsidy, the Department has the ultimate say over the level of service provided and any modifications of service that would affect State subsidy levels. This form of ownership/management is used in the Meriden urban area. It should be noted, however, that the recently completed Meriden TDP has recommended that the transit district assume ownership of the system and contract with a private operator to manage it.

CHAPTER VI

PUBLIC TRANSPORTATION SERVICE ALTERNATIVES

6.1 PLANNING OVERVIEW

The inventory of existing transit services and summary of transit needs in the Midstate Region indicated that a significant segment of the population is restricted in their mobility. For residents with income or physical limitations, the basic choice of whether or not to make a trip is influenced by the lack of alternative modes of transportation to the personal auto. Previous evaluations indicated that approximately 2800 of the Region's 28,000 households have no automobiles. This fact, coupled with the almost total lack of local transit service, results in a severe restriction in intra-regional mobility for many residents.

Similarly, the prospect of interregional travel is limited for many residents. Even though a relatively high level of transit service is provided between the Midstate Region and Hartford, the largest of the external trip attractors, the line haul routes are accessible to a relatively small segment of the population. Express bus service is only available to those residents who have access to the commuter carpool lots or are within walking distance of the facilities. Local mid-day service is only available to those residents who live within a reasonable walking distance (1/4 to 1/2 mile band for an urban area the size of Middletown) of the "M" route service.

Finally, there is a significant number of elderly and handicapped persons in the Region who are either without an automobile or are physically unable to drive and for whom conventional transit service is not an alternative. Special transportation services such as those provided by Middlesex County Transportation, Inc. (MTC), are essential to providing these disadvantaged groups with a level of mobility consistent with their social and economic needs. The services of this nature being provided in the Region are good when compared to similar services in other areas. However, there is a certain degree of inefficiency associated with overlapping services particularly in the urbanized portion of the Region.

Furthermore, the social service agencies must use a portion of their limited financial resources to support these special transportation services. Hence, money which could be better spent on health care, nutrition programs or recreational activities is now being used to purchase transportation for a relatively small segment of the total elderly and handicapped (E&H) population. A coordinated public system could relieve some of the tranpsortation cost burden from the social service agencies.

Ensuing sections of this chapter define and evaluate a number of transit service alternatives that address these transit needs,

ranging from fixed regular route service to demand-responsive special needs service. Each alternative is described in detail and patronage and cost/revenue estimates are developed. Finally, the specific advantages and disadvantages of each alternative are discussed to allow a clear, rational choice of a final Transit Development Program.

The alternatives are presented in a "program package" format. This approach allows the Region's communities to choose between clearly defined courses of action as illustrated in Figure VI-1. Four distinct packages are presented: (1) Local transit service consisting of a fixed route system through heavily populated areas which exhibit regular travel patterns, (2) Special Work Commuter Service, (3) Special transportation services consisting of an on-call door-to-door service for the Region's elderly and handicapped, and (4) Rural demand-responsive service.

Each package may be implemented alone or in concert with one or both of the remaining options. In this manner, the Region can purchase a level of service consistent with its transportation goals and financial resources.

6.2 REGULAR ROUTE SERVICE

6.2.1 Travel Patterns

For a fixed regular route service to be effective, it must be sensitive to the travel desires of the prospective service area residents. A three-step process was used to assess specific travel desires and enable the study team to establish efficient route alignments as follows:

1. Identify locations, size and type of major trip generators.

2. Review socio/economic profile of prospective service areas.

3. Obtain specific travel information on a traffic zone basis.

The information for Steps 1 and 2 was gathered during the initial phases of the Study. Because of the lack of existing transit service, no information concerning transit trip travel patterns was available. However, a good idea of the geographic orientation of general travel

FIGURE VI-1

MIDSTATE REGION

PUBLIC TRANSPORTATION SERVICE OPTIONS

	PACKAGE OPTIONS:			
	I	II	III	IV
	LOCAL TRANSIT SERVICE	COMMUTER SERVICE	ELDERLY AND HANDICAPPED SERVICE	RURAL TRANSIT SERVICE
Service Type	Regular Fixed Route Service	Special Fixed Route or Para-transit Service	Demand-Responsive Service	Demand-Responsive Service
Application	High Demand Densities with Regular Travel Patterns	Service to Major Employment Concentrations	Service to both Urban and Rural Elderly and Handicapped	Moderate demand densities mixed travel patterns
Equipment	Mid-Size Buses or Mini-Buses	Private Autos (Carpools) Employer-Owned or Leased Vans or Mini-Buses	Mini-Buses, Vans, Taxis, Limousines	Mini-Buses, Vans, Taxis, Limousines

patterns can be gained by examining auto trip patterns in the Region. Tables VI-1 and VI-2 show the major auto trip movements between towns for the work trip and all other trips respectively. From these tables, Figures VI-2 and VI-3 showing travel desire lines were developed.

As seen in the desire line sketches, travel in the Region is heavily oriented toward the Middletown Central Business District (CBD). Six primary access corridors to the downtown are clearly identified. These are:

- Newfield Street/Washington Street
- Washington Street west
- Route 17/South Main Street
- Route 9/Saybrook Road
- Route 17/Main Street, Portland
- Route 9/Main Street, Cromwell

These travel corridors provided the framework for determining specific transit route alignments.

6.2.2 Basic Service Features

Before any actual routes could be sketched out, some basic decisions regarding service area, type and frequency of service had to be made. Regular route service is only viable where population densities are sufficiently high and/or where there are large concentrations of "transit dependent" population. The socio/economic profile developed previously for the "needs statement" was used to define service area boundaries. As a starting point, those areas of the Region which show a moderate to high potential for transit usage were considered as part of the service area. (See Figure IV-1.)

The type of service provided depends largely on the nature of travel patterns in the service area. As previously stated, regional travel patterns are heavily oriented toward the Middletown CBD. The optimum type of service to fit these travel desires is a radial system extending from outlying residential areas to the CBD.

However, there are still some trips which do not terminate in the CBD, but rather pass through it. These trips should also be provided with service where justified on the basis of volumes. The most direct method of servicing these desires is with a circumferential service around the CBD. However, given the low magnitude of this travel desire such a separate service appears infeasible at this time.

A second and more viable alternative to direct service for cross-region trips is a system which provides coordinated transfers

TABLE VI-1

1970 WORK TRIPS BY AUTO

FROM \ TO	Middletown	Portland	Cromwell	Middlefield
Middletown	6700	150	---	---
Portland	775	350	---	---
Cromwell	525	---	155	---
Middlefield	125	---	---	125

SOURCE: Connecticut DOT 1970 Auto Trip Distribution Summary

TABLE VI-2

1970 GENERAL PURPOSE TRIPS BY AUTO

FROM \ TO	Middletown	Portland	Cromwell	Middlefield
Middletown	43,700	2,800	1,270	500
Portland	4,200	4,800	100	100
Cromwell	2,725	400	875	100
Middlefield	1,200	100	100	1,100

SOURCE: Connecticut DOT 1970 Auto Trip Distribution Summary

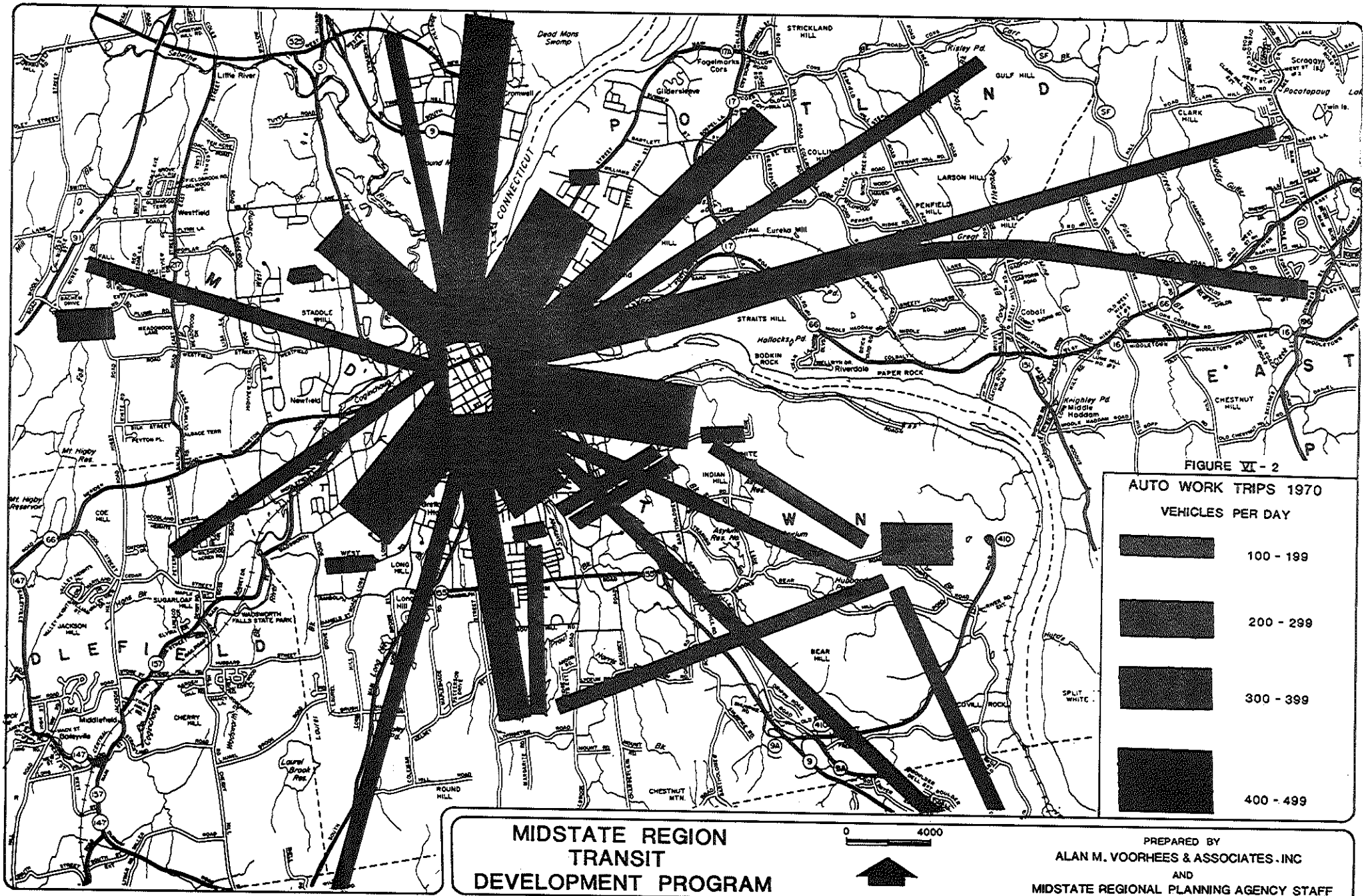

AUTO WORK TRIPS 1970
VEHICLES PER DAY
100 - 199
200 - 299
300 - 399
400 - 499
0
4000
MIDSTATE REGION
TRANSIT
DEVELOPMENT PROGRAM
PREPARED BY
ALAN M. VOORHEES & ASSOCIATES, INC
AND
MIDSTATE REGIONAL PLANNING AGENCY STAFF

FIGURE VI - 2

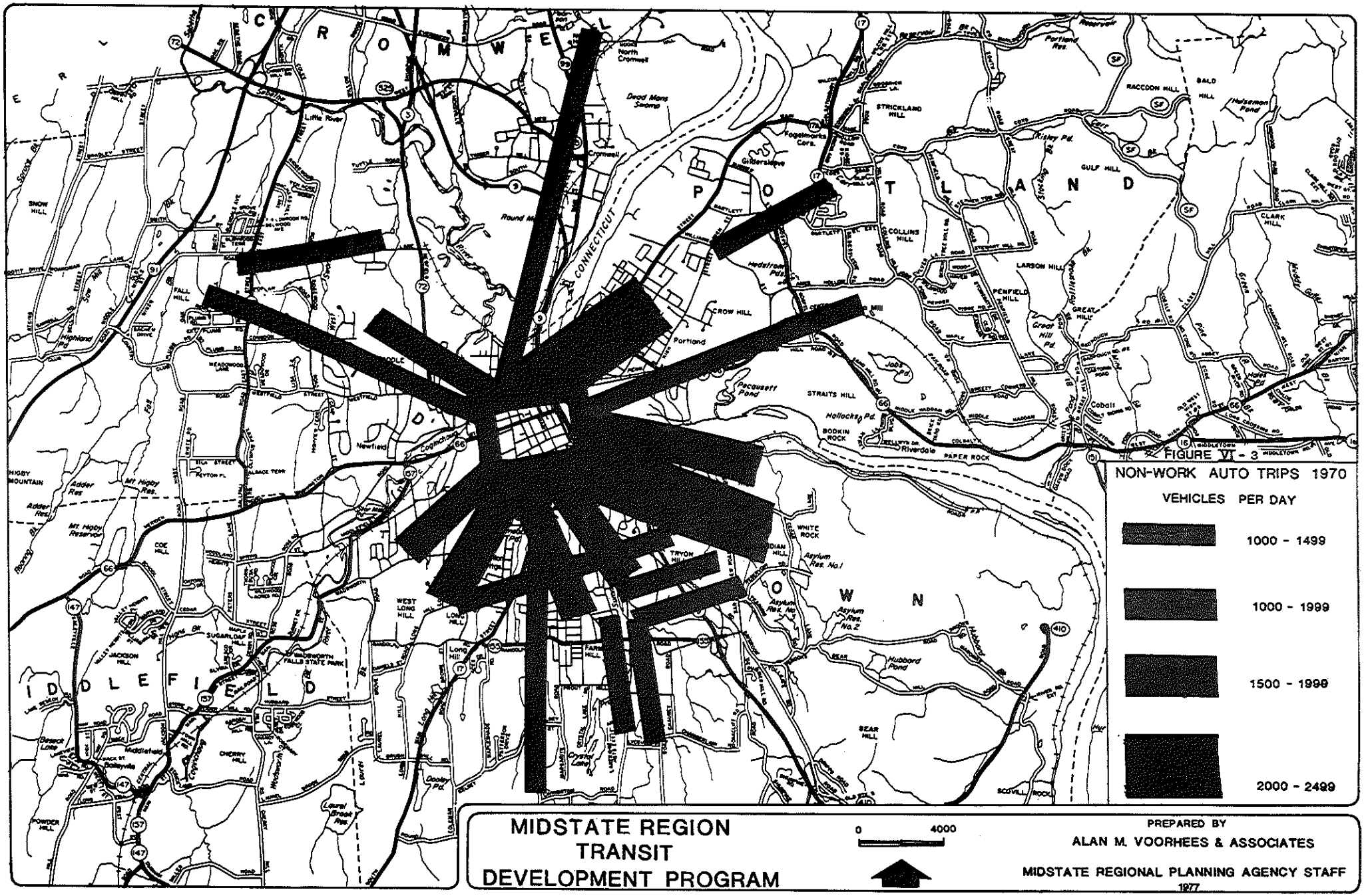


FIGURE VI - 3
NON-WORK AUTO TRIPS 1970
VEHICLES PER DAY
1000 - 1499
1000 - 1999
1500 - 1999
2000 - 2499
MIDSTATE REGION
TRANSIT
DEVELOPMENT PROGRAM
0
4000
PREPARED BY
ALAN M. VOORHEES & ASSOCIATES
MIDSTATE REGIONAL PLANNING AGENCY STAFF
1977

between radial routes. This type of service could be provided by employing a technique known as "pulse scheduling." In a pulse-scheduled operation, all buses in the system begin service at the same time and place, circulate on their respective routes and return to the starting/terminal point simultaneously for immediate and convenient transfer of passengers between routes. Such a focal point could be established at Union Park in Middletown. The only limitation in such a system is that all routes must be able to be completed in a similar amount of time.

The principal advantage of this type of scheduling is that it increases the overall level of mobility and geographic coverage provided by the system by allowing easy transfers for cross town travelers. Depending on the demand for cross town travel and the level of service desired, routes can be combined to form "bus runs" providing direct cross town service and eliminating or reducing the need for transfers.

The frequency of service provided depends on a number of factors such as size of the service area, demand for service, operating times of major generators, shift change times of major employers, etc. However, a good rule of thumb is that headways be no longer than 60 minutes and 30 minutes or less wherever feasible. In an urbanized area the size of the Midstate Region, where most major activities are within a 15 to 30 minute auto trip, transit headways in excess of 30 minutes will not be competitive with the auto. Service with headways of 30 to 60 minutes will generally be used by the true transit dependents. If headways are longer than 60 minutes, transit dependents tend to search for alternative such as a ride with a friend or, if the trip is not essential, forego the trip completely.

The hours of operation of a service are, for the most part, governed by the temporal distribution of regional travel patterns, which, in turn, are governed by the operating times of major traffic generators such as employment centers, shopping centers, and activity centers. In Regions such as Midstate with a strong industrial base, as well as sizable commercial-retail and service organization employment, the work commuting period tends to begin earlier in the morning than in most major urban areas, generally around 6:00 AM. Similarly, many retail establishments remain open until 5:30 or 6:00 PM and many employees remain even later. Therefore, it is proposed that any regular route service should operate from 6:00 AM to 6:30 PM to accommodate varying travel desires.

6.2.3 Service Options

Having identified an initial service area, operating period, and type of service, some basic route alignments were sketched out using the previously identified travel corridors as initial alignments together with data on the location of major trip generators in the service area.

The routes were designed to provide total coverage of the medium and high transit potential areas. For several of the basic routes, one or more optional alignments were developed. These alternatives, as opposed to the basic route structure which maximizes coverage, attempt to optimize the cost/revenue ratio.

Each of the basic routes and options can be covered in approximately 25 minutes at practical operating speeds. Allowing time for make-up and layover at route terminals, each route would require 30 minutes to complete at a minimum. Using the previously stated rule-of-thumb, that headways should be 30 minutes where possible and no longer than 60 minutes, three possible level of service options are generated. The first is to provide 30 minute headways on each route. For an area such as the Midstate Region, this is a reasonably high level of service. The second service option is to provide a somewhat lower level of service with 60 minute headways on each route. A third service option, which is more of a compromise between the two extremes, is to provide 30 minutes service during the peak travel period and 60 minute service during the off-peak period.

Alternative route alignments evaluated are shown in Figures VI-4 through VI-16. A brief description accompanies each figure.

ROUTE #1: WASHINGTON STREET NORTH LOOP

LOCATION: MIDDLETOWN

DESCRIPTION: Union Park, Broad Street, Washington Street, Camp Street, Ridgewood Road, Mile Lane, Newfield Street, Washington Street, Main Street, Union Park.

REASON FOR SERVICE:

1. Provide service between elderly housing on Newfield Street and services in the CBD.

2. Provide service between CBD and King's Plaza Shopping area.

3. Provide service between Medium Density areas of Ridgewood Road, Camp Street and Westfield Street and the Middletown CBD.

4. Travel patterns indicate this corridor to be heavily traveled throughout the day.

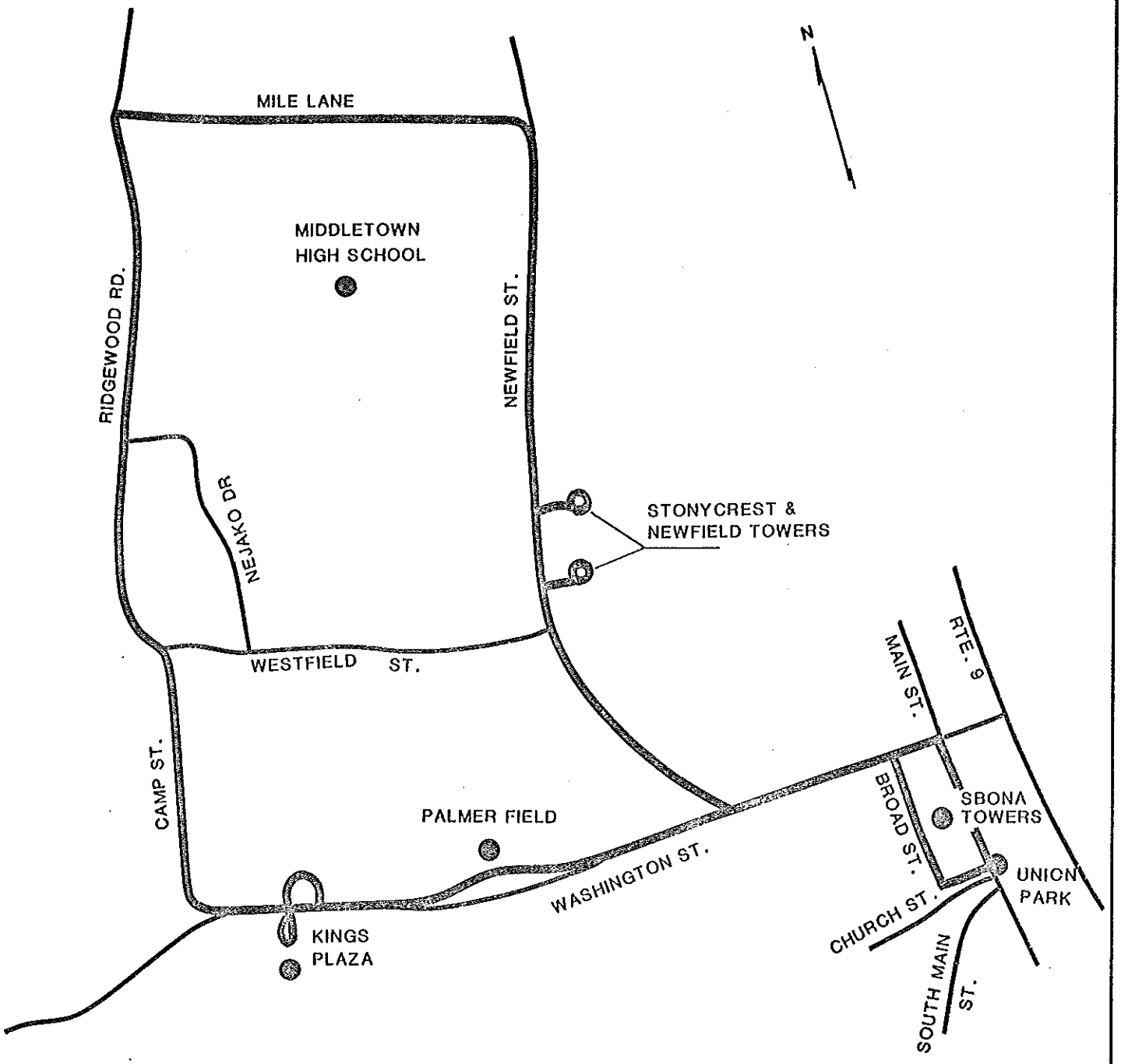
PROBLEMS:

1. Congestion on Washington Street and Main Street during peak hours increases route travel time.

2. Left turns from Newfield Street to elderly towers and high density housing are time consuming and hazardous.

OPTIONS:

1. To reduce route travel time and decrease the number of uncontrolled left turns, the route could leave Ridgewood Road at Nejako Drive to Westfield Street, Newfield Street to elderly housing, Newfield Street to Washington Street, Main Street and Union Park.



ROUTE # 1

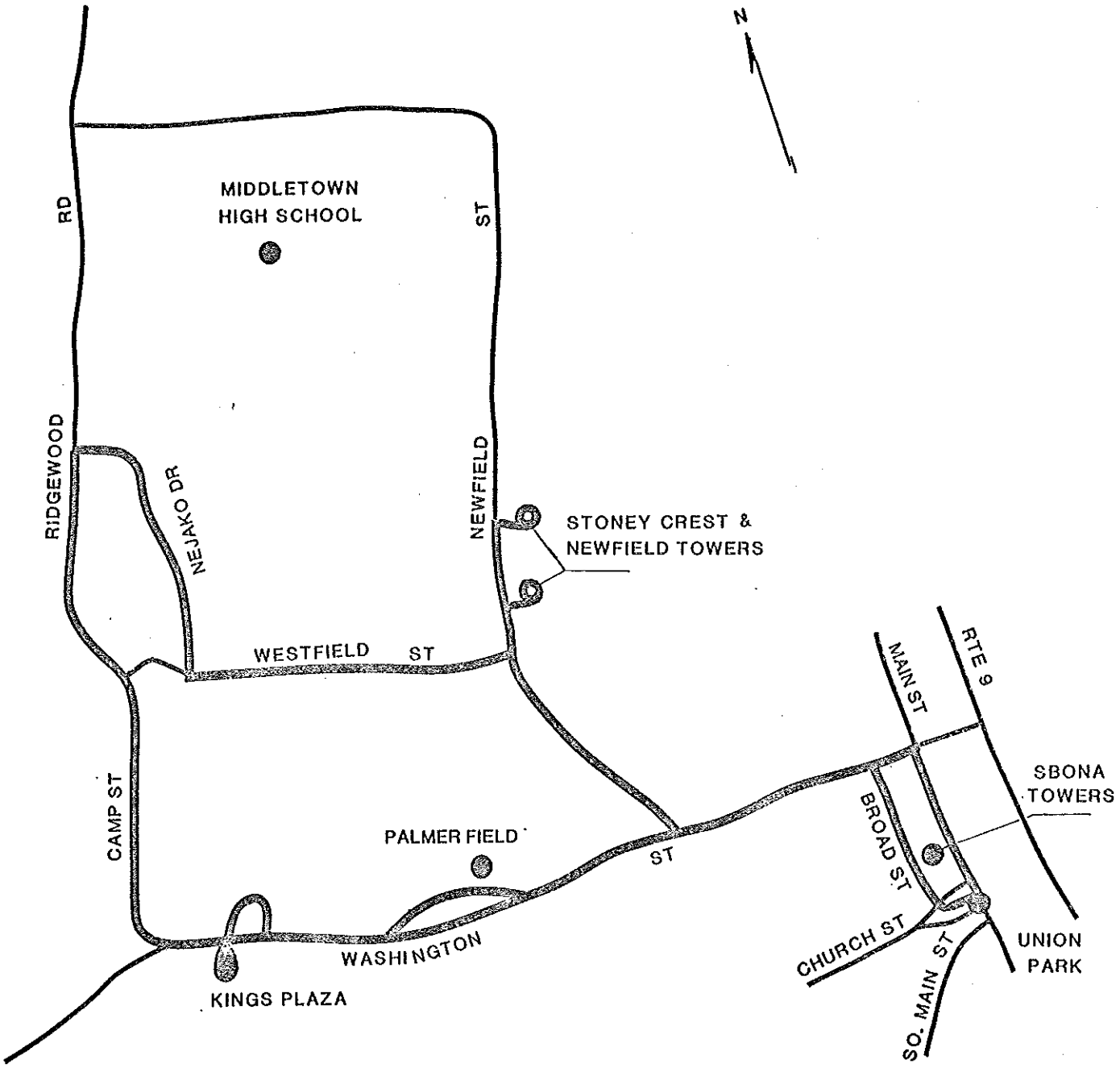
ROUTE NAME WASHINGTON ST. NORTH LOOP

LENGTH - 8.7 MILES

OPERATING SPEED - 20 MPH.

TRAVEL TIME - 26 MINUTES

FIGURE VI - 4



ROUTE # 1 - OPTION 1

ROUTE NAME - WASHINGTON ST NORTH LOOP

LENGTH - 7.7 MILES

OPERATING SPEED - 20M.P.H.

TRAVEL TIME - 23 MINS.

FIGURE VI - 5

ROUTE #2: WASHINGTON STREET SOUTH LOOP

LOCATION: MIDDLETOWN

DESCRIPTION: Union Park, Church Street, Butternut Street, George Street, Washington Street, High Street, Church Street, Union Park

REASONS FOR SERVICE:

1. Service to Wesleyan University complex

2. Service between high population density areas west of CBD and the CBD, King's Plaza Shopping Center, and Palmer Field.

3. Service to low income and minority concentrations in the Butternut Street/West Street area.

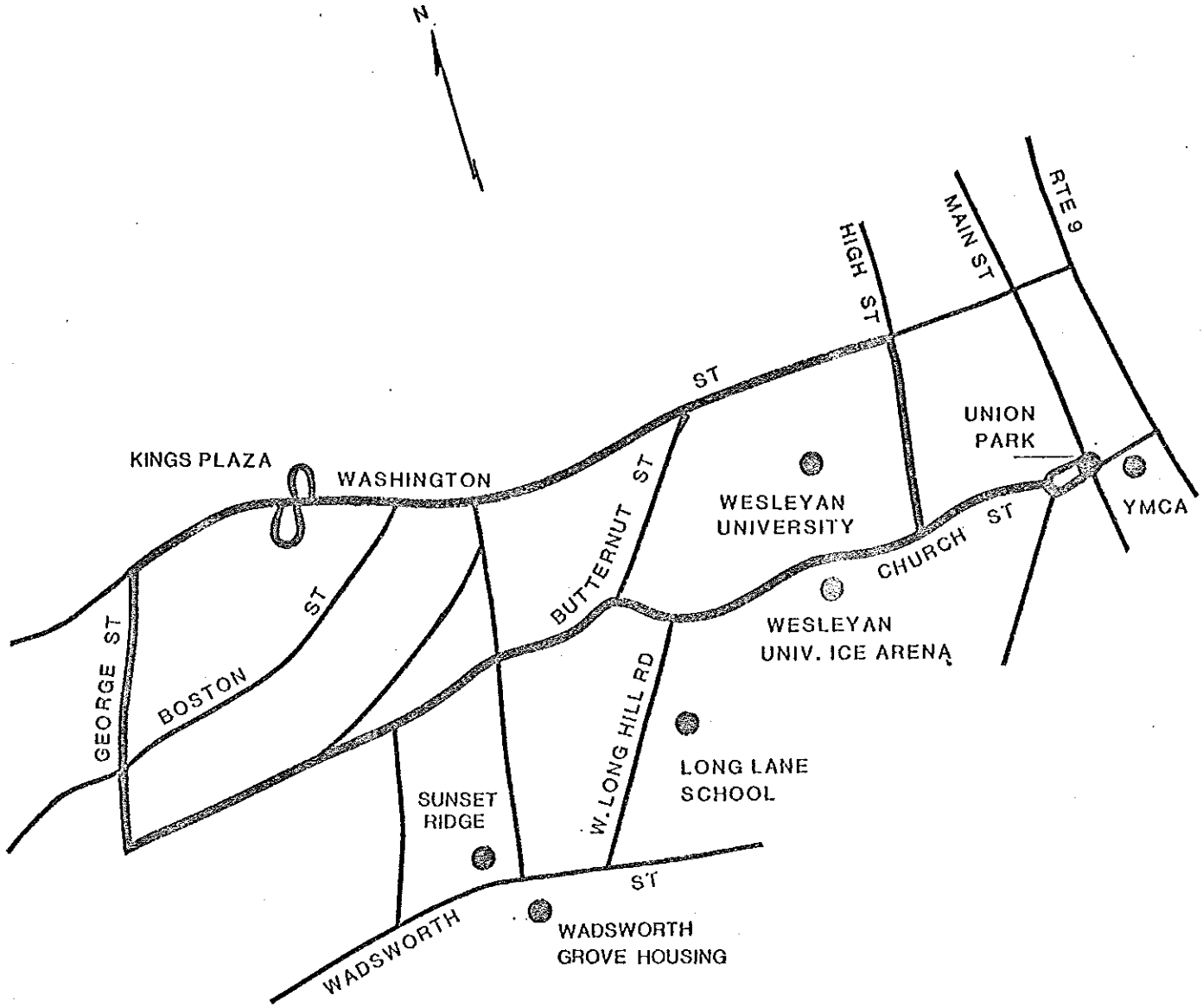
PROBLEMS:

1. Pavement condition on George Street is fair to poor.

2. Congestion on Washington Street during peak hours increases travel time.

OPTIONS:

1. Butternut Street, West Street, Wadsworth Street, Hendley Street to Butternut Street.



ROUTE # 2

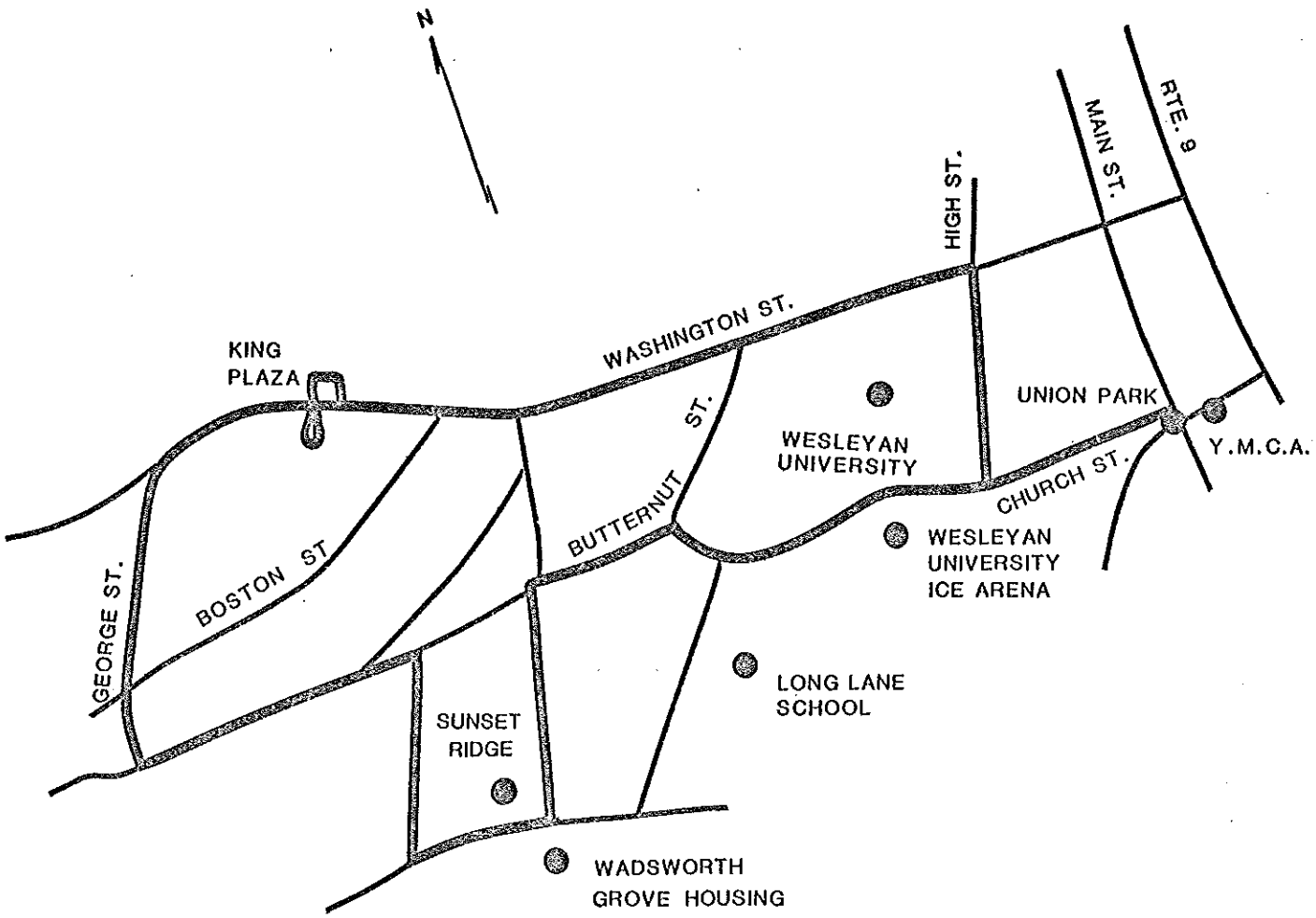
ROUTE NAME - WASHINGTON ST SOUTH LOOP

LENGTH - 6.5 MILES

OPERATING SPEED - 18 M.P.H.

TRAVEL TIME - 22 MINS.

FIGURE VI - 6



ROUTE # 2 OPTION 1

ROUTE NAME WASHINGTON ST. SOUTH LOOP

LENGTH – 7.2 MILES

OPERATING SPEED – 18 M.P.H.

TRAVEL TIME – 24 MINUTES

FIGURE VI - 7

ROUTE #3: HOSPITALS/SOUTH MAIN STREET LOOP

LOCATION: MIDDLETOWN

DESCRIPTION: Union Park. E. Main, Silver, CVH, Silver, Saybrook, Union Park, S. Main, Wesleyan Hills Rd., Long Hill Road, Pine Street, Bretton Road, S. Main, Union Park

REASONS FOR SERVICE:

1. Link CBD to Post Office complex and Connecticut Valley Hospital.

2. Link high density low income housing to Middlesex Memorial Hospital, and CBD shopping opportunities.

3. Provide service to Vinal Regional Technical High School.

4. Provide service between one-auto households in Wesleyan Hills and CBD shopping opportunities.

PROBLEMS:

1. Route length is excessive.

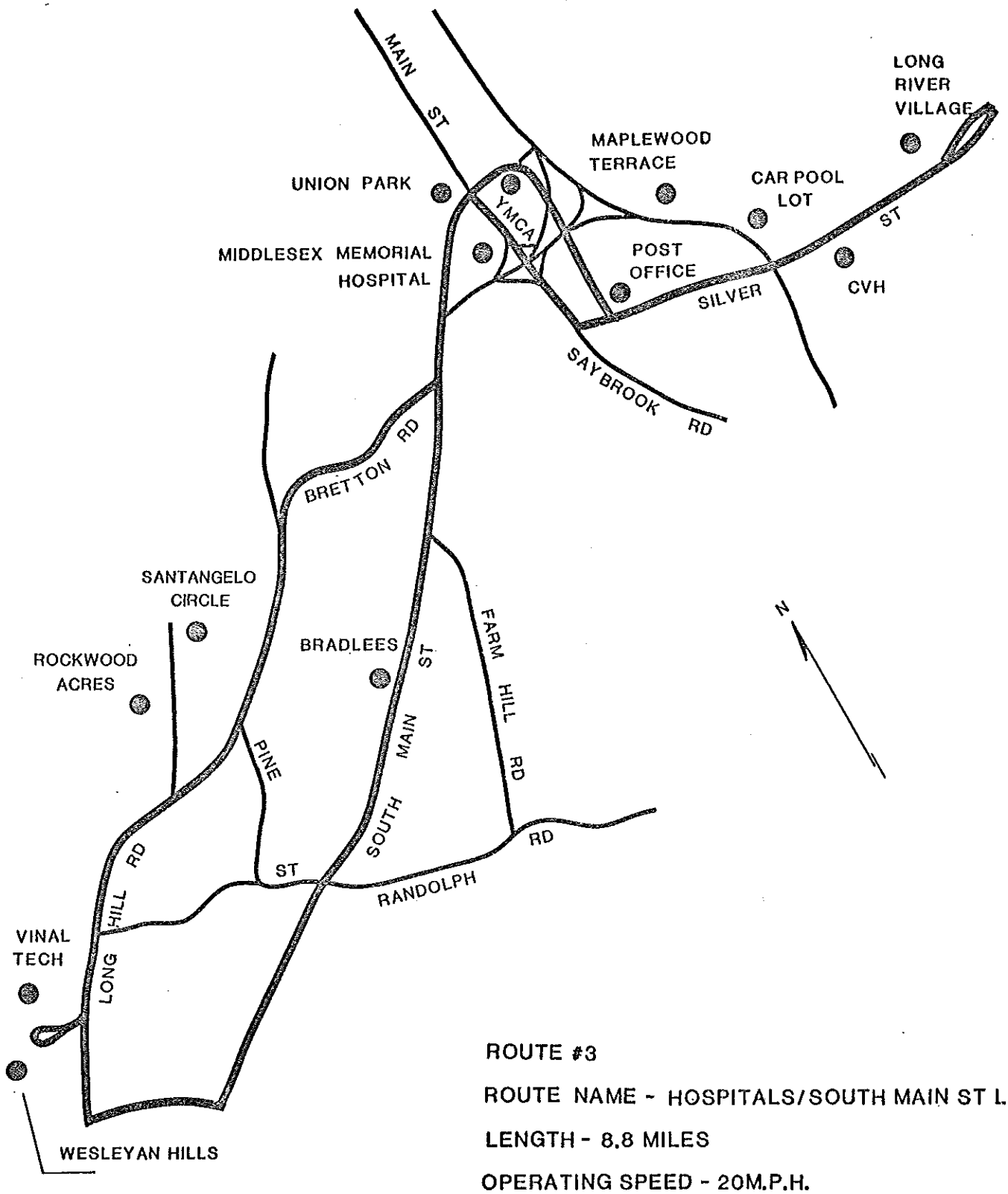
2. Coordination of transfers between other buses in the system for all patrons is difficult.

3. Steep grades on Wesleyan Hills and Long Hill Roads.

OPTIONS:

1. No service to VRT and Wesleyan Hills

2. Combine this service with the Saybrook Road/Randolph Road/Hunting Hill Road Loop, forming two new routing alignments. (1. South Main/Hunting Hill/Wesleyan Hills Loop, and 2. Long River Village/CVH/Saybrook Road Loop.)



ROUTE #3

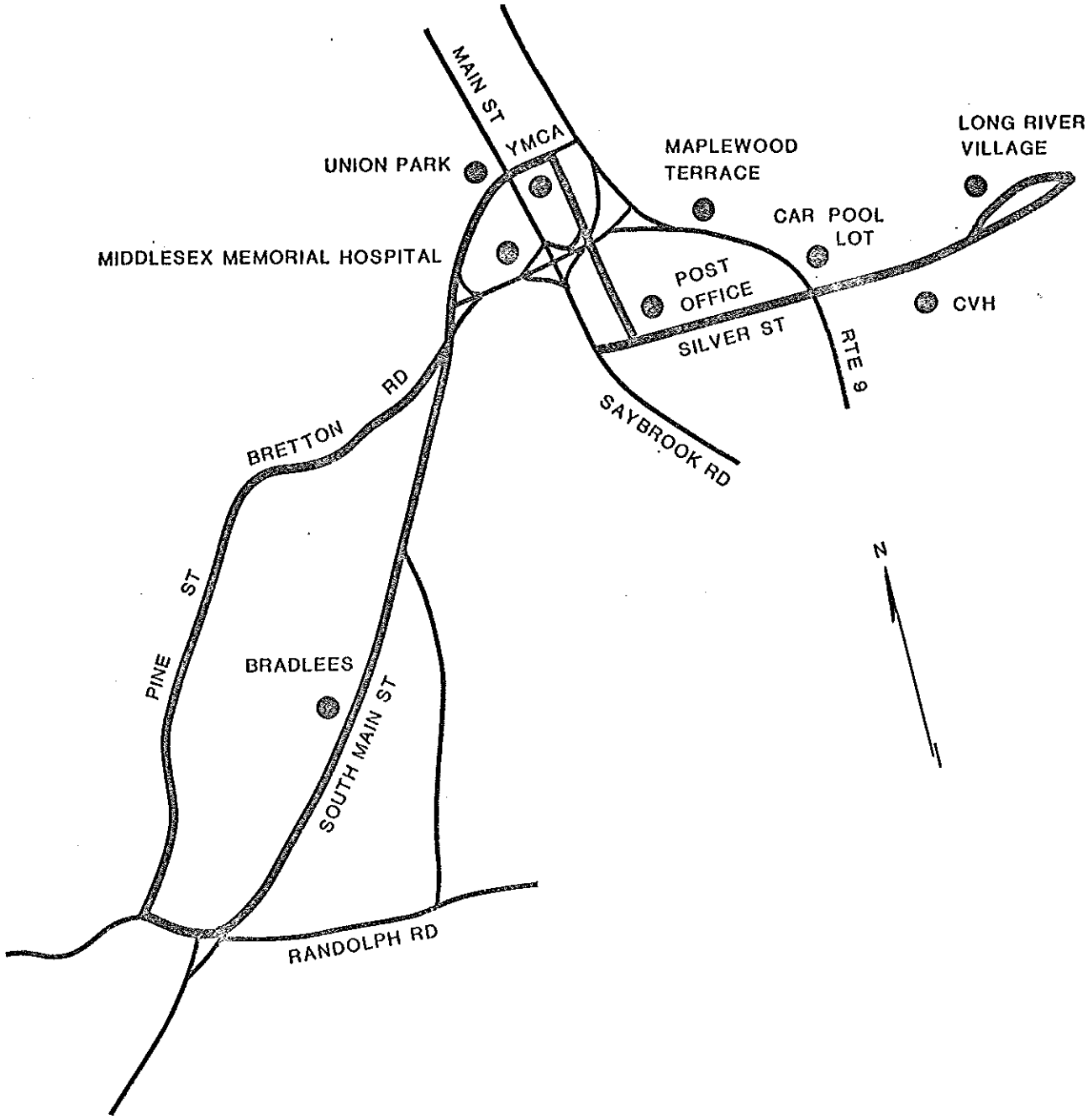
ROUTE NAME - HOSPITALS/SOUTH MAIN ST LOOP

LENGTH - 8.8 MILES

OPERATING SPEED - 20M.P.H.

TRAVEL TIME -26 MINS.

FIGURE VI - 8



ROUTE # 3 - OPTION 1

ROUTE NAME - HOSPITALS / SOUTH MAIN ST LOOP

LENGTH - 7.4 MILES

OPERATING SPEED - 20 M.P.H.

TRAVEL TIME- 22 MINS.

FIGURE VI - 9

ROUTE #3: OPTION 2

LOCATION: MIDDLETOWN

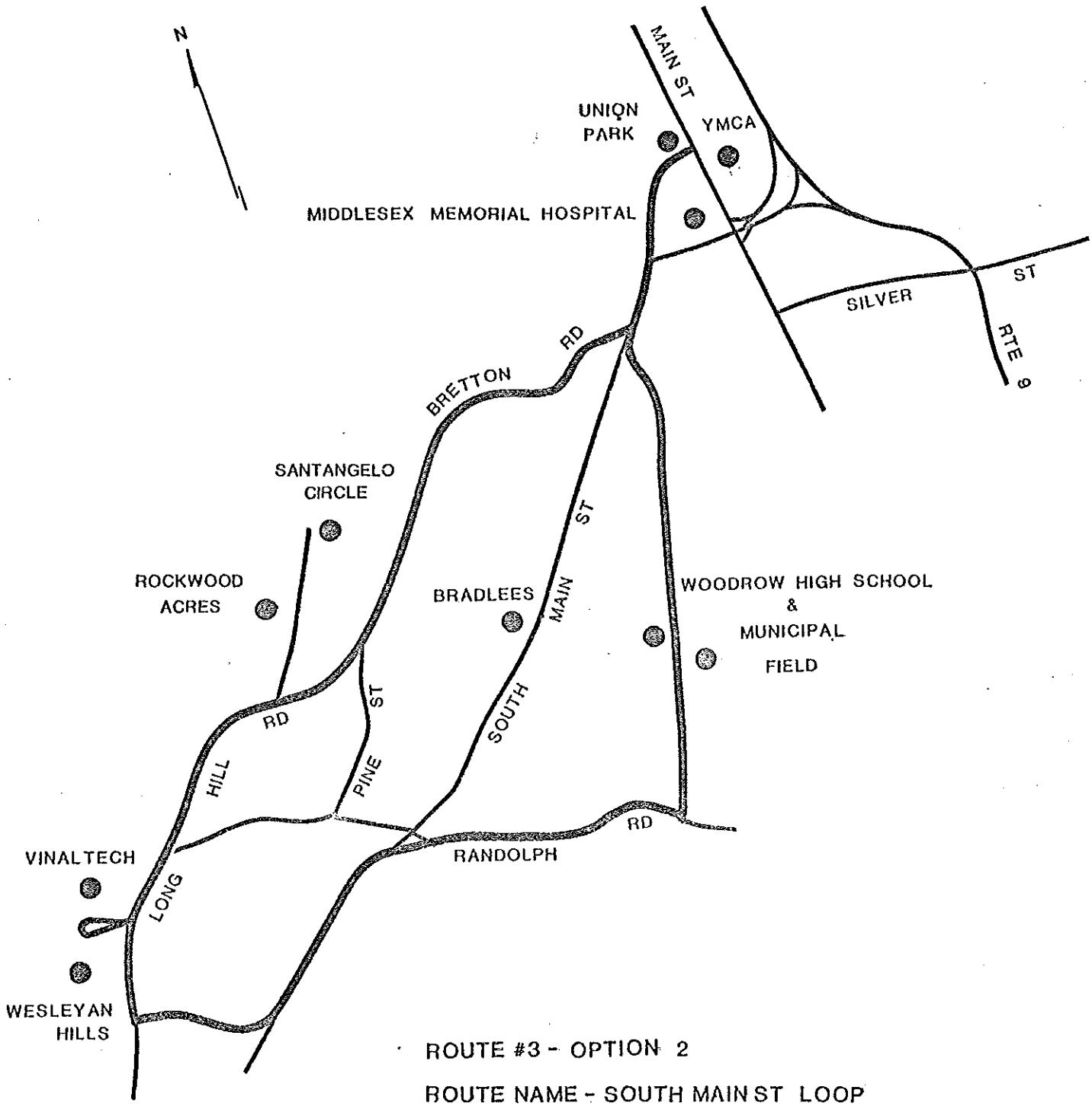
DESCRIPTION: Union Park, S. Main, Hunting Hill, Randolph Road, S. Main, Wesleyan Hills Road, Long Hill Road, Pine Street, Bretton Road, South Main, Union Park.

REASONS FOR SERVICE

1. Provide service to Junior High/High School Complex.
2. Provide service to Vinal Regional Technical School.
3. Provide service between one-auto households in Wesleyan Hills Area and CBD shopping opportunities.

PROBLEMS:

1. Service to Rt. 17 shopping areas eliminated.
2. Steep grades.



ROUTE #3 - OPTION 2

ROUTE NAME - SOUTH MAIN ST LOOP

LENGTH - 7.0 MILES

OPERATING SPEED - 20 M.P.H.

TRAVEL TIME - 21 MINS.

FIGURE VI - 10

ROUTE #4: SAYBROOK ROAD/HUNTING HILL ROAD LOOP

LOCATION: MIDDLETOWN

DESCRIPTION: Union Park, Saybrook Road, Randolph Road, Hunting Hill Road, Russel Street, Ridge Road, Saybrook Road, Union Park.

REASONS FOR SERVICE:

1. Link medical clinics on Saybrook Road and Middlesex Community College to Middletown CBD.

2. Provide service to the Junior High/High School Complex.

3. Provide service between medium and high population density areas and CBD.

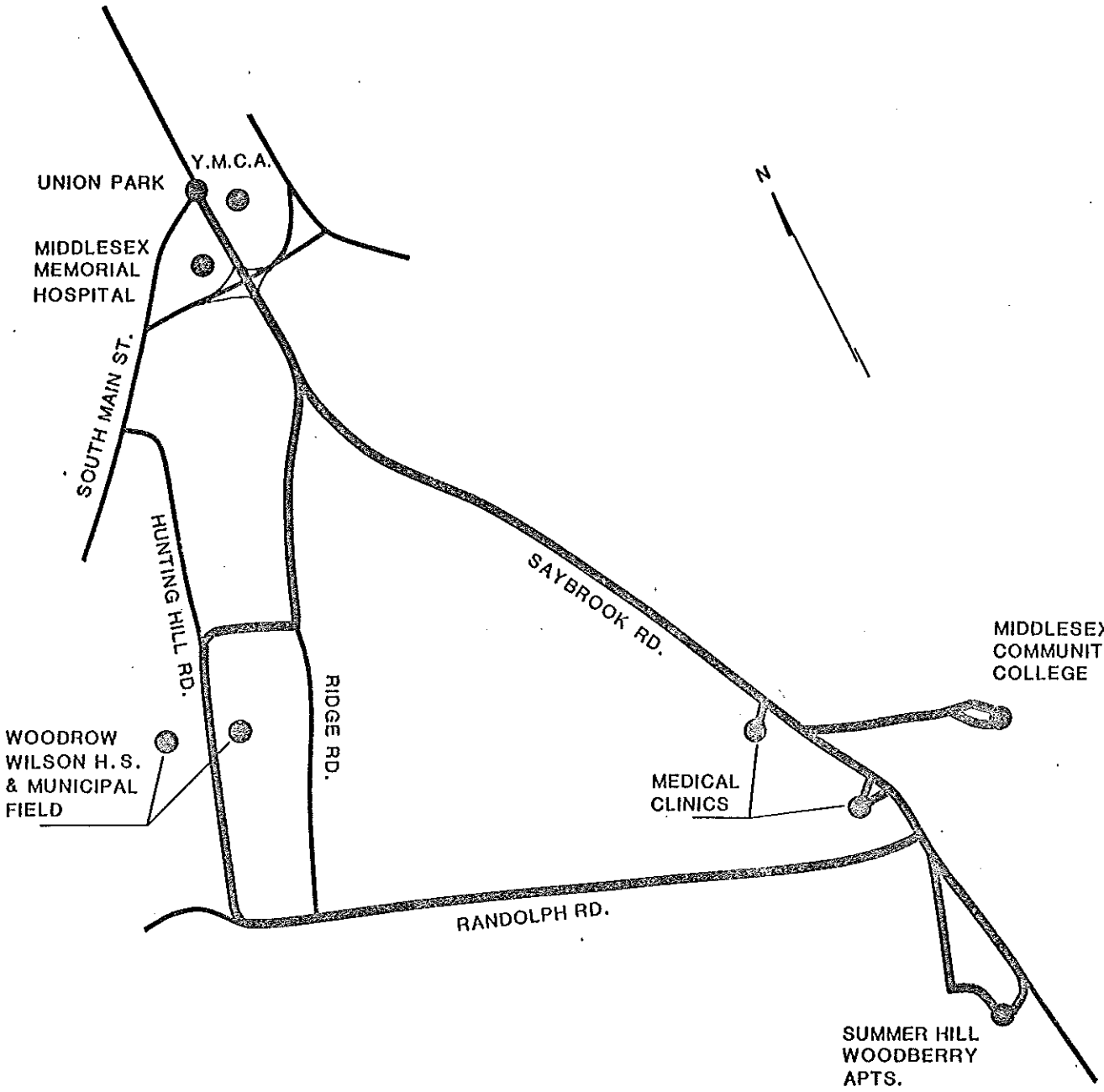
PROBLEMS:

1. Poor turning geometrics from Saybrook Road to Randolph Road.

2. Excessive loop width.

OPTIONS:

1. Eliminate service to Randolph Road Hunting Hill Road area, add service to CVH and Long River Village (see Route #3 Option 2.)



ROUTE # 4

ROUTE NAME SAYBROOK / HUNTING HILL RD. LOOP

LENGTH - 7.5

OPERATING SPEED - 20 M.P.H.

TRAVEL TIME - 2.3 MINUTES

FIGURE VI - 11

ROUTE #4: OPTION 1

LOCATION: MIDDLETOWN

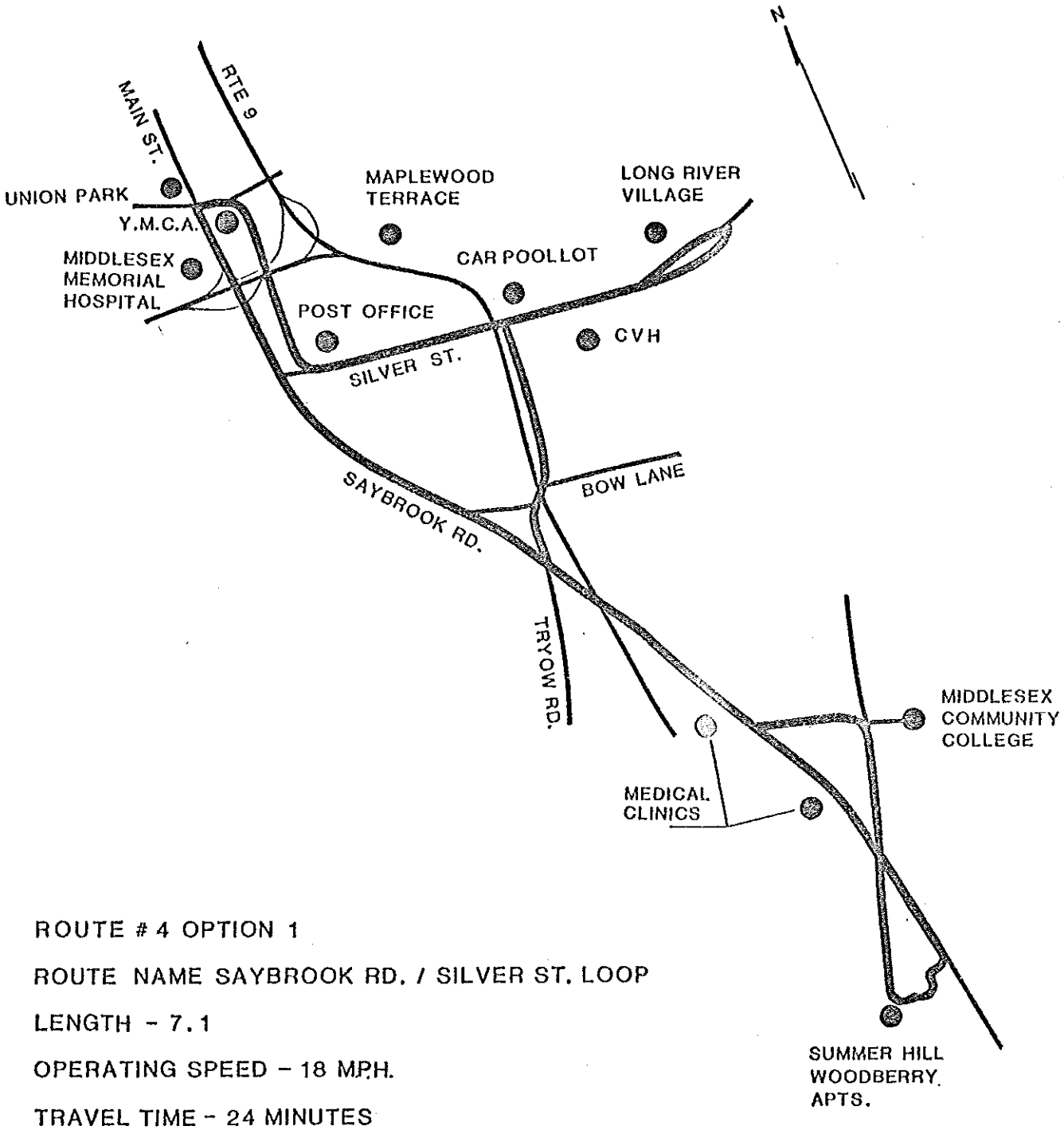
DESCRIPTION: Union Park, Saybrook Road, Summer Hill Apartments, Saybrook Road, Tryon Street, Eastern Drive, Silver Street, E. Main Street, Union Park

REASONS FOR SERVICE:

1. Service to medical clinics on Saybrook Road
2. Service to Middlesex Community College
3. Service to Connecticut Valley Hospital and Post Office Complex.
4. Service between low income/minority concentrations and Middletown CBD.

PROBLEMS:

None



ROUTE # 4 OPTION 1

ROUTE NAME SAYBROOK RD. / SILVER ST. LOOP

LENGTH - 7.1

OPERATING SPEED - 18 M.P.H.

TRAVEL TIME - 24 MINUTES

FIGURE VI - 12

ROUTE #5: MAIN STREET/HIGH STREET LOOP

LOCATION: PORTLAND

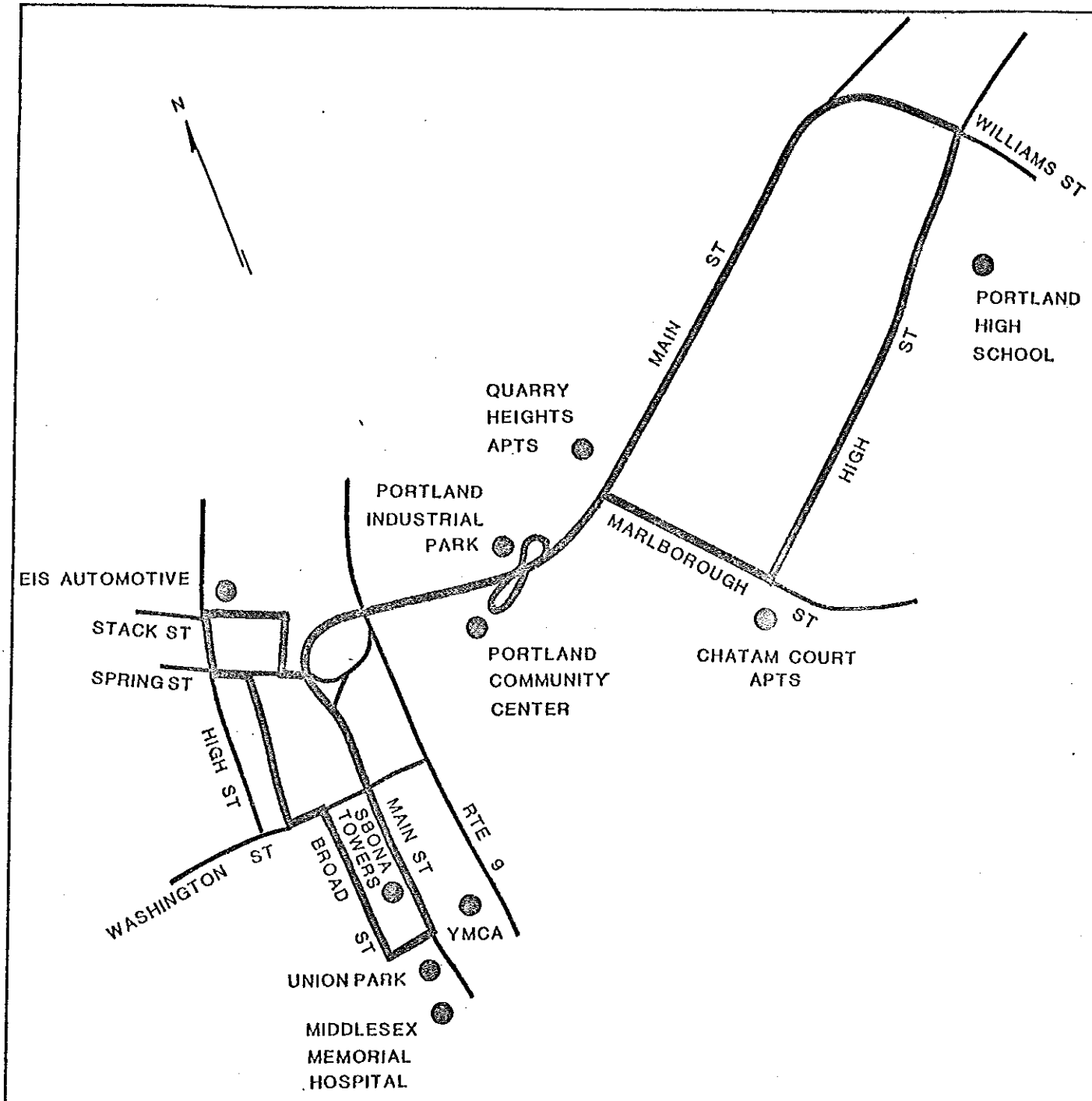
DESCRIPTION: Union Park, Main St., Middletown, Main St., Portland, William Street, High Street, Marlborough Street, Main St. Portland, Spring Street, Stack Street, Pearl Street, Broad Street, Union Park

REASONS FOR SERVICE:

1. Intra-town travel desires of Portland.
2. Improved access to Middletown Shopping/employment opportunities from Portland.
3. Service to low income and elderly housing in Portland.
4. Service to Portland Industrial Park, Middletown Industrial area, and Portland Community Center.

PROBLEMS:

1. Steep grades on High Street and access roads to Portland Industrial Park.



ROUTE #5

ROUTE NAME -MAIN ST/PORTLAND LOOP

LENGTH -8.0MILES

OPERATING SPEED -20 M.P.H.

TRAVEL TIME -24 MINS.

FIGURE VI- 13

ROUTE #6: MAIN STREET/WEST STREET LOOP

LOCATION: CROMWELL

DESCRIPTION: Union Park, Main Street, Middletown, Main Street Cromwell, Court Street, Washington Street, West St, Union Park

REASONS FOR SERVICE:

1. Improve access to Middletown shopping/employment opportunities from Cromwell.

2. Service to future elderly housing in Cromwell.

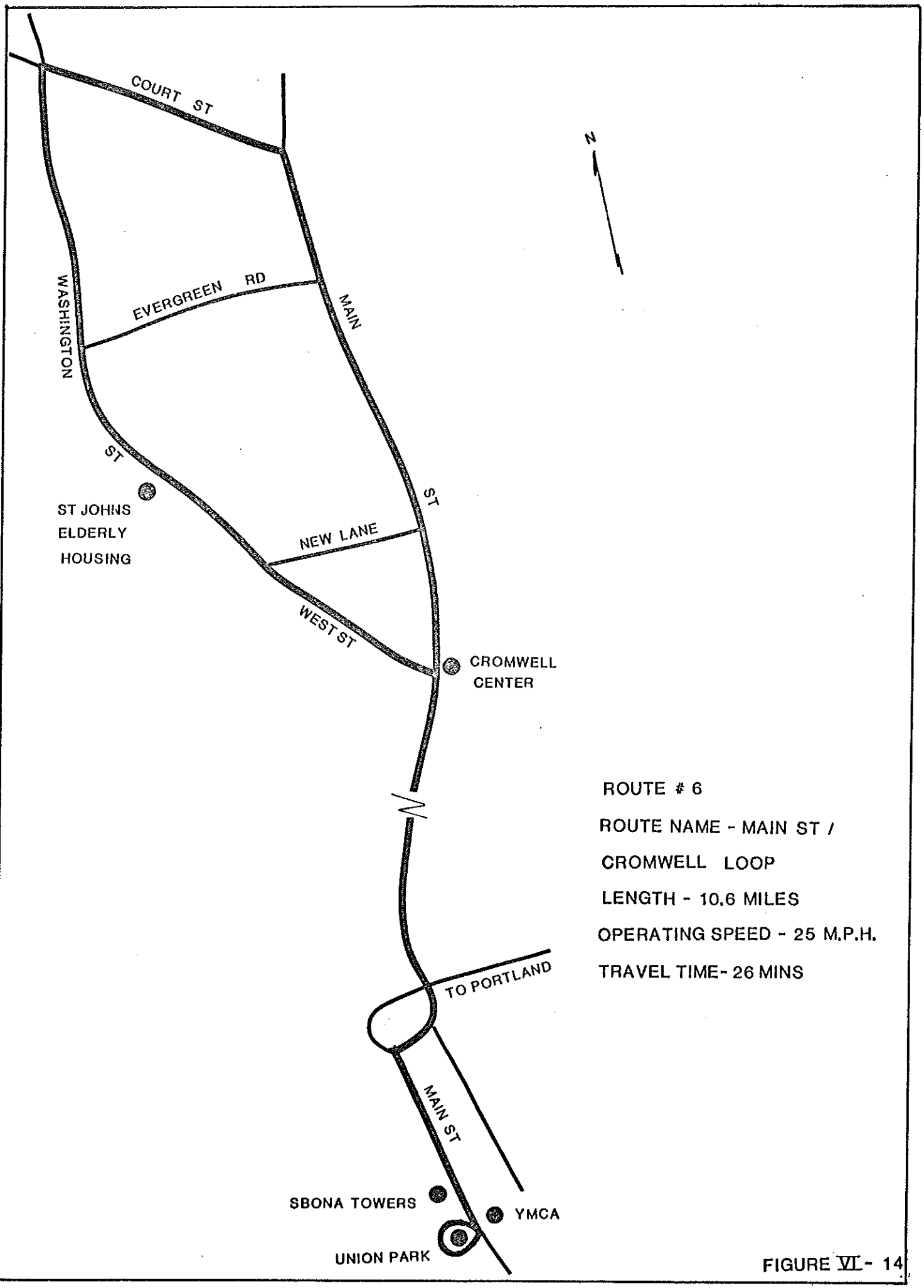
PROBLEMS:

1. Route length excessive. Operating speeds must be high to complete route in allotted time.

OPTIONS:

1. Main St. Cromwell, Evergreen Rd., West Street, Main St, Union Park.

2. Main St. Cromwell, New Lane, West St., Main Street, Union Park.



ROUTE # 6

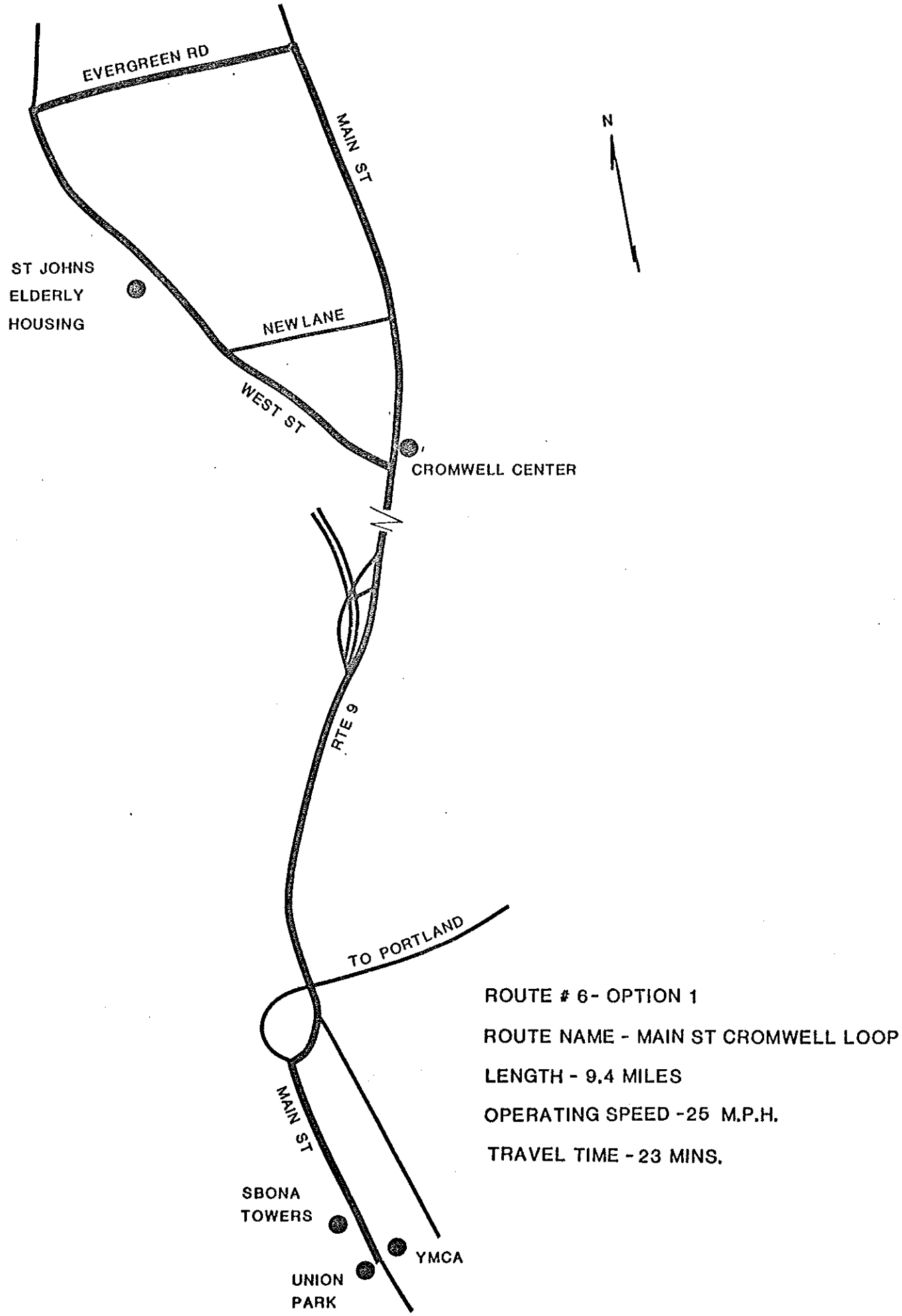
ROUTE NAME - MAIN ST / CROMWELL LOOP

LENGTH - 10.6 MILES

OPERATING SPEED - 25 M.P.H.

TRAVEL TIME- 26 MINS

FIGURE VI - 14



ROUTE # 6- OPTION 1

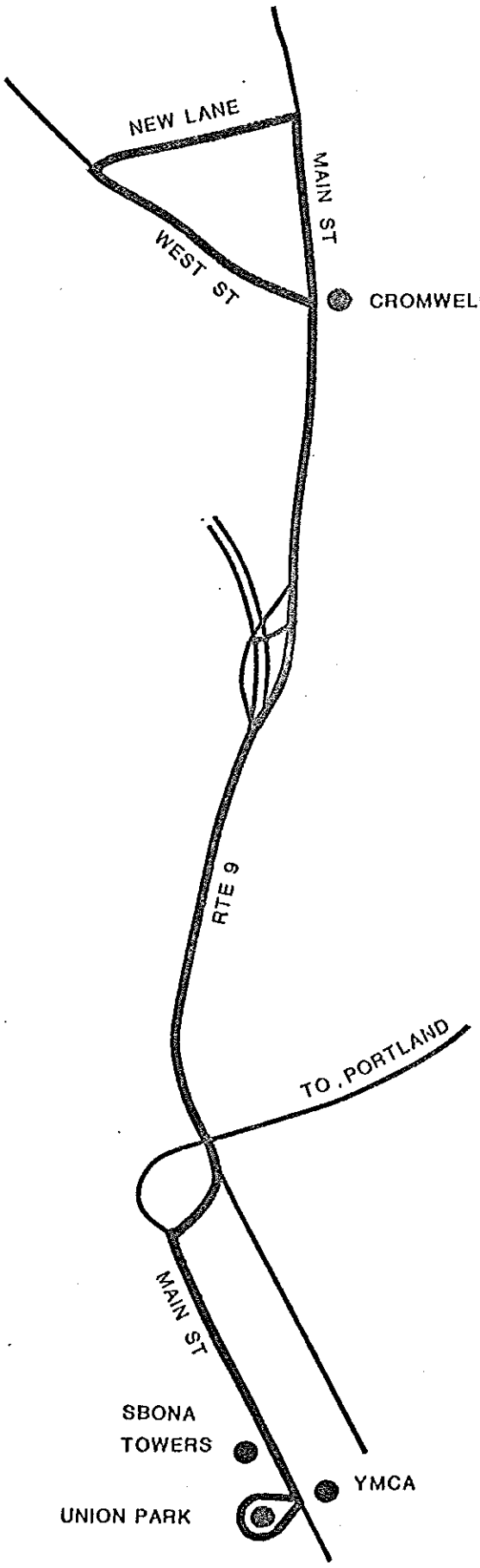
ROUTE NAME - MAIN ST CROMWELL LOOP

LENGTH - 9.4 MILES

OPERATING SPEED -25 M.P.H.

TRAVEL TIME - 23 MINS.

FIGURE VI - 15



ROUTE # 6 -OPTION 2

ROUTE NAME - MAIN ST CROMWELL LOOP

LENGTH - 7.2 MILES

OPERATING SPEED - 25 M.P.H.

TRAVEL TIME - 18 MINS.

FIGURE VI - 16

6.2.4 Service Option I - 30 Minute Service

This option assumes a radial pulse scheduled system operating at 30 minute headways. It is proposed that the system should operate from 6:00 AM to 6:30 PM in recognition of the early starting times of some area employment centers. This also recognizes the fact of low evening ridership after the peak hour. These hours should be considered flexible, however, realizing that later hours of service may be appropriate and justifiable on nights when stores remain open for shopping in the CBD.

Fares should be established at 35¢ for adults and 15¢ for elderly, handicapped, and children under 12. Free transfers between lines will provide an added attraction for transit usage and help minimize the inconvenience of the transfer process.

System Alternatives

Using the basic routes and options, many alternative systems can be identified. For analysis purposes, two specific systems have been selected. The first system is designed to produce maximum coverage of the service area. The six-route system shown in Figure VI-17 consists of the following services:

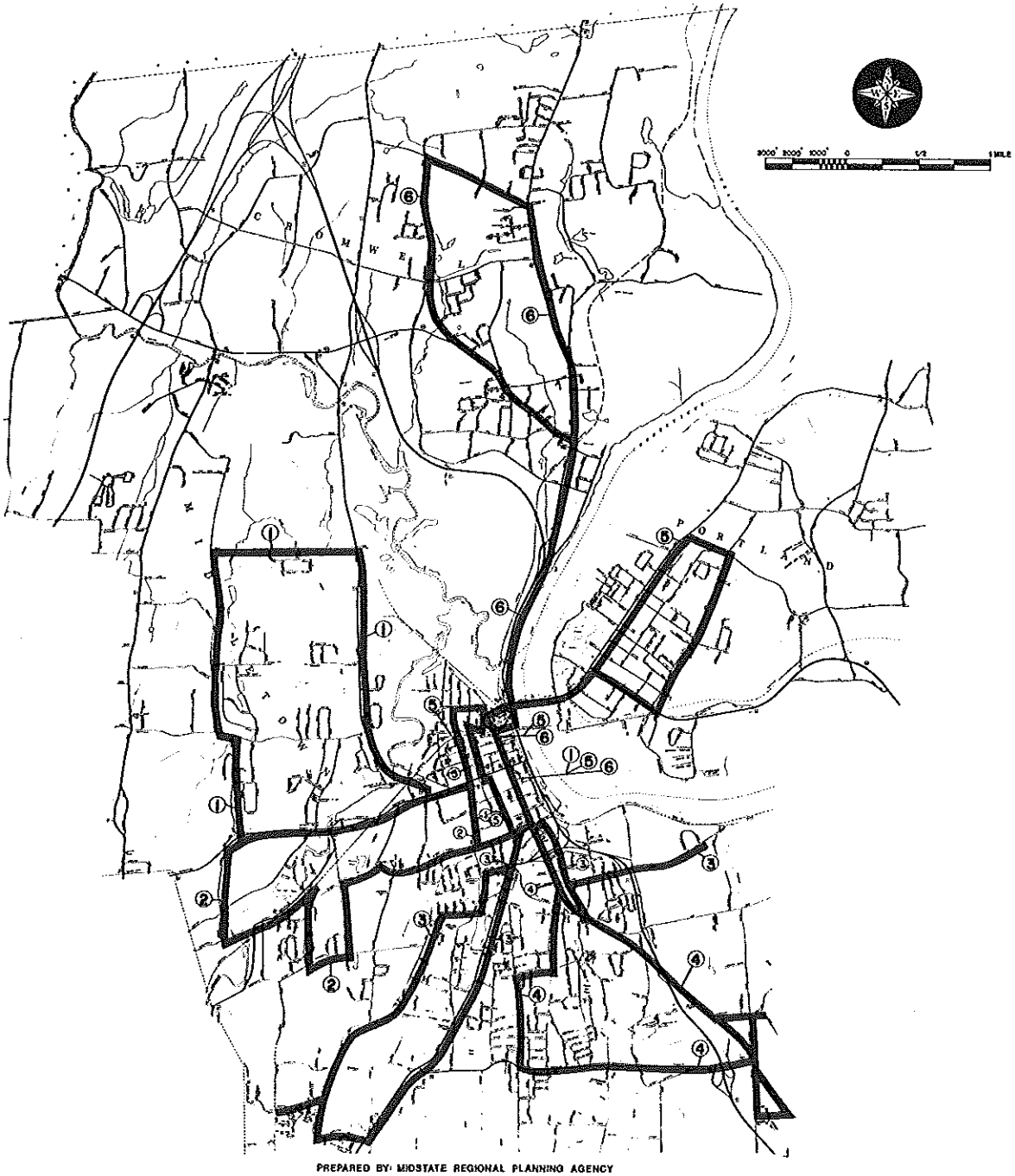
Route Code	Route Name
1	Washington Street North Loop
2 Option 1	Washington Street South Loop
3	Hospitals/South Main Street Loop
4	Saybrook Road/Hunting Hill Road Loop
5	Main Street, Portland Loop
6	Main Street, Cromwell Loop

Patronage, Revenue and Cost Analysis

The transit demand estimating procedure utilized in this study and documented in Appendix B to this report, produced the first year ridership estimates shown in Table VI-3.

Assuming a full adult fare of 35¢ and an elderly and children fare of 15¢, revenues are expected to average 30¢ per ride. Based on the forecast patronage, this will produce annual revenues totalling $116,766.

MIDSTATE PLANNING REGION URBAN AREA



PREPARED BY: MIDSTATE REGIONAL PLANNING AGENCY

FIGURE VI-17

MAXIMUM COVERAGE ROUTE SYSTEM

①,② ETC. DESIGNATE ROUTES

TABLE VI-3

SERVICE OPTION I

MAXIMUM COVERAGE ROUTE SYSTEM

FIRST YEAR PATRONAGE/COSTS/REVENUES

Route Code	Ridership	Miles	Revenue	Cost	Deficit	Percent Through Fare Box
#1	73,580	56,680	$ 22,074	$ 70,850	$ 48,776	31.0
#2 Option 1	52,260	46,800	15,678	58,500	42,822	26.8
#3	85,540	57,200	25,662	71,500	45,838	35.9
#4	59,020	48,880	17,706	61,100	43,394	29.0
#5	78,000	52,000	23,400	65,000	41,600	36.0
#6	40,820	68,900	12,246	86,125	73,879	14.2
TOTALS	389,220	330,460	$116,766	$413,075	$296,309	28.0

Based on the described level of service, annual route mileage totals 330,460 miles. At an estimated per-mile cost of $1.25, annual operating costs would total $413,075 leaving an annual deficit of $296,309. Complete route-by-route cost and revenue calculations are also shown in Table VI-3.

Using the State of Connecticut's subsidy formula, which provides for a 40 percent share of operating cost plus an additional 50 percent of any remaining deficit (a bill pending in the Connecticut Legislature would, if passed, increase the percentage split of operating cost from 40/60 to 50/50 Fiscal Year 1978), the net local share would be $65,340. divided equitably among the three service area towns. If percent of total bus miles is used to distribute the net local share, then the following annual costs would be incurred by each service area community:

Community	% of Bus Miles	Local Share
Middletown	82	$ 53,743.
Cromwell	10	6,554
Portland	8	5,243
	100 %	$ 65,540.

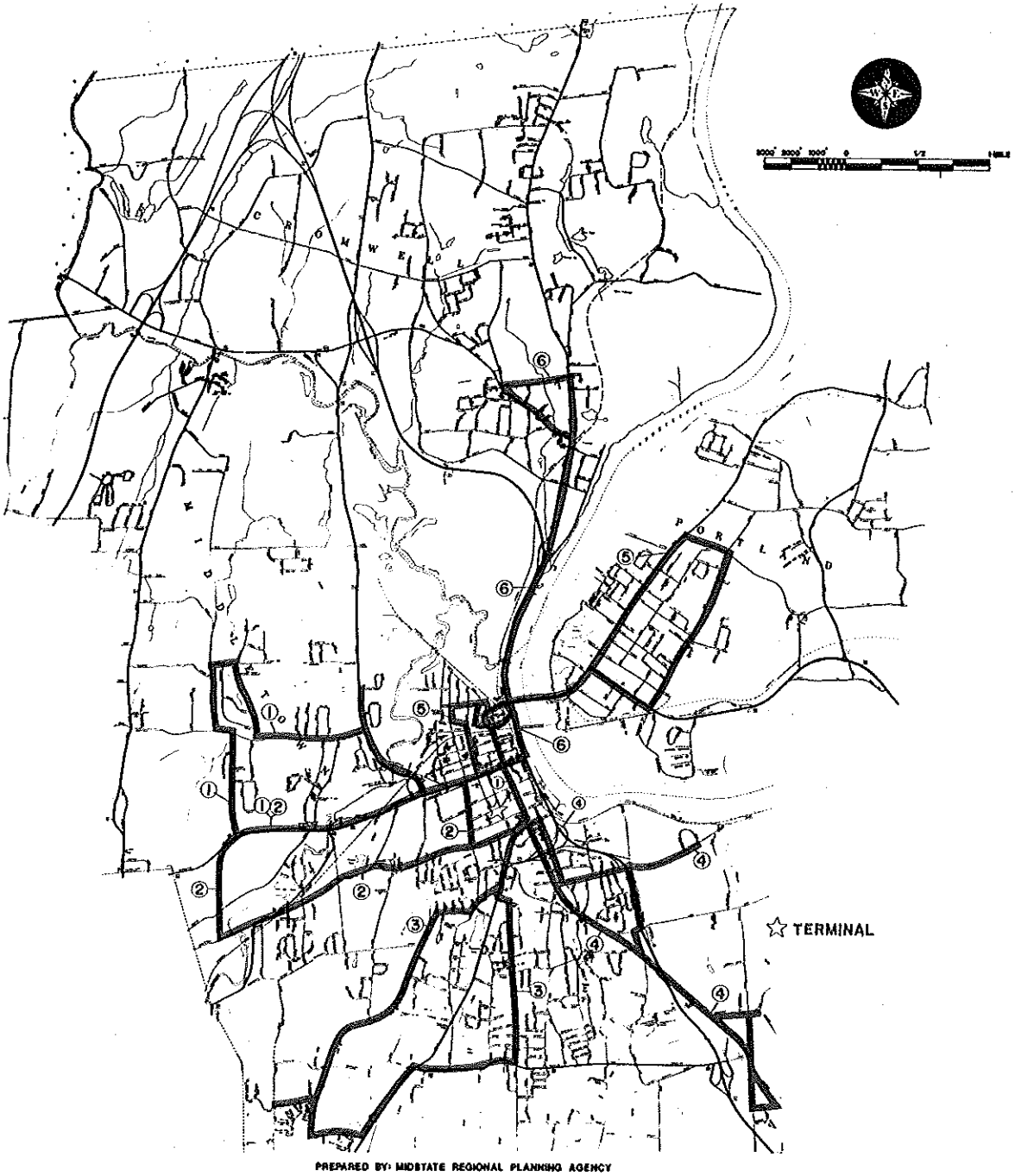
The impact of the system costs on community tax rates would be as follows:

Community	Local Share	Tax per $1,000 Assessed Value
Middletown	$ 53,743	$0.22
Cromwell	6,554	0.11
Portland	5,243	0.08

A second alternative system which optimizes the revenue/cost ratio while still providing comprehensive transit service to each service area community is shown in Figure VI-18. The specific routes are as follows:

Route Code	Route Name
1 Option 1	Washington Street North Loop
2	Washington Street South Loop
3 Option 2	South Main Street Loop
4 Option 1	Saybrook Road/Silver Street Loop
5	Main Street, Portland
6 Option 2	Main Street, Cromwell Loop

MIDSTATE PLANNING REGION URBAN AREA



PREPARED BY: MIDSTATE REGIONAL PLANNING AGENCY

FIGURE VI-18

OPTIMAL COST REVENUE SYSTEM

①② ETC. DESIGNATE ROUTES

In the first year of operation, total system cost would be approximately $352,950 and annual revenue is expected to be $107,172. The first year deficit is then $245,778. A route-by-route patronage/cost/revenue analysis is shown in Table VI-4. Using the subsidy formula previous described, the net local share of the deficit would be $65,540. The annual deficit distributed by community would be as follows:

Community	% of Bus Miles	Local Share	Tax Per $1,000 Assessed Value
Middletown	83	$ 43,410	$0.17
Cromwell	8	4,184	0.07
Portland	9	4,706	0.07
	100%	$ 52,300	

6.2.5 Service Option II - 60-Minute Service

This option also assumes a radial pulse scheduled system operating from 6:00 AM to 6:30 PM, but on 60 minute headways. All other basic service parameters, routes, and options, are the same as in Service Option I.

System Alternatives

A doubling of the line headways would be expected to decrease ridership by approximately 50 percent. In fact, the demand forecast for first year ridership on each route indicates exactly a 50 percent decrease.

For comparative purposes, the maximum coverage system and optimal cost/revenue system are analyzed once again. In the first year of operation, the maximum coverage system cost would be approximately $206,540 while annual revenues woud total $58,383, leaving a deficit of $148,157. The net local share of operating cost would be approximately 1/2 of the Service Option I level at $32,770. Similarly, the service area communities local shares would be halved. A complete route patronage/cost/revenue analysis is shown in Table VI-5.

If the optimal cost/revenue system is implemented, the first year cost of operation would be approximately $176,475 with revenues totaling $53,586. The estimated local share of operating costs would be approximately $26,150. The patronage cost and revenue analysis for this system is shown in Table VI-6. The service area shares would be approximately half of the comparable Service Option I system as shown below:

TABLE VI-4

SERVICE OPTION I

OPTIMAL COST/REVENUE SYSTEM

FIRST YEAR PATRONAGE/COSTS/REVENUES

	Ridership	Miles	Revenue	Cost	Deficit	Percent Through Fare Box
#1 Option 1	69,680	50,180	$ 20,904	$ 62,725	$ 41,821	33.4
#2	51,220	41,600	15,366	52,000	36,634	29.6
#3 Option 2	81,380	45,500	24,414	56,875	32,461	42.9
#4 Option 1	41,080	46,280	12,324	57,850	45,526	21.4
#5	78,000	52,000	23,400	65,000	41,600	36.0
#6 Option 2	35,880	46,800	10,764	58,500	47,736	18.4
TOTALS	357,240	282,360	$107,172	$352,950	$245,778	30.4

TABLE VI-5

SERVICE OPTION II

MAXIMUM COVERAGE SYSTEM

FIRST YEAR PATRONAGE/COSTS/REVENUES

Route Code	Ridership	Miles	Revenue	Cost	Deficit	Percent Through Fare Box
#1	36,790	28,340	$ 11,037	$ 35,425	$ 24,388	31.0
#2 Option 1	26,130	23,400	7,839	29,250	21,411	26.8
#3	42,770	28,600	12,831	35,750	22,919	35.9
#4	29,510	24,440	8,853	30,550	21,697	29.0
#5	39,000	26,000	11,700	32,500	20,800	36.0
#6	20,410	34,450	6,123	43,065	36,942	14.2
TOTALS	194,610	165,230	$ 58,383	$206,540	$148,157	28.0

Service Area Community	Maximum Coverage System		Optimal Cost/Revenue System	
	Local Share	Tax Impact	Local Share	Tax Impact
Middletown	$26,871	$0.11	$21,705	$0.08
Cromwell	3,277	.06	2,092	0.04
Portland	2,622	.04	2,353	0.04
	$32,770		$26,150	

6.2.6 Service Option III - 30 Minute Peak/ 60 Minute Off-Peak Service

This option is a combination of both service Options I and II. It is proposed that 30 minute service be provided during the peak travel hours of 6:00 to 9:30 AM and 3:00 to 6:30 PM. During the remainder of the day, 60-minute service would be implemented.

System Alternatives

If it is assumed that 60 percent of the daily ridership will occur during the peak period (6 to 9:30 AM and 3 to 6:30 PM) and 40 percent during the off-peak, the previous demand forecasts can be adjusted to reflect the varying service during the day. Using this assumption, if the maximum coverage system is selected, the first year of operation is estimated to cost $313,625, while annual revenues would total $93,210. Table VI-7 shows a route-by-route breakdown of first year ridership, cost and revenues.

The net local share would be $47,483. If apportioned by percent of total bus miles as before, community shares and local tax impacts would be as follows:

Community	% Deficit	Local Share	Tax Per $1,000 Assessed Value
Middletown	82	$ 38,936	$0.16
Cromwell	10	4,748	0.08
Portland	8	3,799	0.06
	100%	$ 47,483	

Similarly, for the "minimum deficit system" the corresponding first year estimates are as follows:

Operating Cost	$268,775
First Year Revenue	85,878
First Year Deficit	182,897

TABLE VI-6

SERVICE OPTION II

OPTIMAL COST/REVENUE SYSTEM

FIRST YEAR PATRONAGE/COSTS/REVENUES

Route Code	Ridership	Miles	Revenue	Cost	Deficit	Percent Through Fare Box
#1 Option 1	34,840	25,090	$ 10,452	$ 31,360	$ 20,908	33.4
#2	25,610	20,800	7,683	26,000	18,317	29.6
#3 Option 2	40,690	22,750	12,207	28,440	16,233	42.9
#4 Option 1	20,540	23,140	6,162	28,925	22,763	21.4
#5	39,000	26,000	11,700	32,500	20,800	36.0
#6 Option 2	17,940	23,400	5,382	29,250	23,868	18.4
TOTALS	178,620	141,180	$ 53,586	$176,475	$122,889	30.4

TABLE VI-7

SERVICE OPTION III

MAXIMUM COVERAGE SYSTEM

FIRST YEAR PATRONAGE/COSTS/REVENUES

Route Code	Ridership	Miles	Revenue	Cost	Deficit	Percent Through Fare Box
#1	58,760	42,900	$ 17,628	$ 53,625	$ 35,997	30.0
#2 Option 1	41,600	35,620	12,480	44,525	32,045	28.1
#3	68,380	43,420	20,514	54,275	33,761	37.8
#4	47,060	37,180	14,118	46,475	32,357	30.0
#5	62,400	39,520	18,720	49,400	30,680	37.9
#6	32,500	52,260	9,750	65,325	55,575	14.9
TOTALS	310,700	250,900	$ 93,210	$313,625	$220,415	29.7

The distribution of the local share of the deficit would be as follows:

Community	% Bus Miles	Local Share	Tax Per $1,000 Assessed Value
Middletown	83	$ 31,285	$ 0.12
Cromwell	8	3,015	$ 0.05
Portland	9	3,393	0.05
	100	$ 37,693	

First year costs, revenues and patronage for this system are shown in Table VI-8.

6.2.7 Discussion of Regular Route Service Options

The three service options presented in the preceding section of this report have been designed to fulfill the need for regular route transit service in the Midstate Region to different degrees. It is readily apparent that the systems described under Service Option I provide the highest level of transit service and Service Option II, the lowest; while Service Option III is a compromise. It is also apparent that costs vary directly with service provided.

However, this information is not sufficient to allow a clear, rational choice of service. It is important at this point to step back and examine the advantages and disadvantages of each service and fully understand the implications of trade-offs between level of service and cost.

Table VI-9 is presented as a comparative analysis of the cost and service attributes of both the "Maximum Coverage" and "Optimal Revenue/Cost" systems for each service option.

6.3 SPECIAL SERVICES FOR THE WORK COMMUTER

6.3.1 Intra-regional Commuters

Midstate Region travel desire lines indicate that the majority of intra-regional work trips are destined for the central core of the urbanized area. These trips can be adequately served by the regular route service options previously discussed. However, there are several major employment centers which are on the outer fringes of the urbanized area and therefore, not served by the proposed route system. In particular, two major centers, Pratt & Whitney Aircraft Plant, approximately one mile southeast of the Middletown CBD, and the Sawmill Brook Industrial Park, approximately 5 miles northwest of the CBD, together employ over 4500

TABLE VI-8

SERVICE OPTION III

OPTIMAL COST/REVENUE SYSTEM

FIRST YEAR PATRONAGE/COSTS/REVENUES

Route Route Code	Ridership	Miles	Revenues	Cost	Deficit	Percent Through Fare Box
#1 Option 1	55,640	37,960	$ 16,692	$ 47,450	$ 30,758	35.0
#2	41,080	32,240	12,324	40,300	27,976	30.5
#3 Option 2	65,260	34,580	19,578	43,225	23,647	45.4
#4 Option 1	33,020	35,100	9,906	43,875	33,969	22.5
#5	62,400	39,520	18,720	49,400	30,680	37.9
#6 Option 2	28,860	35,620	8,658	44,525	35,867	19.5
TOTALS	286,260	215,020	$ 85,878	$268,775	$182,897	31.9

TABLE VI-9

COMPARATIVE ANALYSIS OF FIXED ROUTE ALTERNATIVES

Criteria	SERVICE OPTION I		SERVICE OPTION II		SERVICE OPTION III	
	System 1*	System 2**	System 1	System 2	System 1	System 2
First Year Cost	$413,075	$352,950	$206,540	$176,475	$313,625	$268,775
Fist Year Local Share	65,540	52,300	33,638	26,150	47,483	37,693
% of Population Served	73	64	73	64	73	64
Tax Impact						
Middletown	$.22	$.17	$.11	$.08	$.16	$.12
Cromwell	.11	.07	.06	.04	.08	.05
Portland	.08	.07	.04	.04	.06	.05
Sensitivity to Work Trip Desires	Very Good	Very Good	Poor	Poor	Very Good	Very Good
Sensitivity to General Trip Desires	Very Good	Very Good	Good	Good	Good	Good
Ease of Transfer	Very Good	Very Good	Fair	Fair	Good/Fair	Good/Fair
No. of Housing/ Activity Centers Served	30	26	30	26	30	26
No. of Major Employment Centers Served	7	7	7	7	7	7
Coordination with Existing Transit Services	Good	Good	Fair	Fair	Good/Fair	Good/Fair

* Maximum Coverage System
**Optimum Revenue/Cost System

persons. Of these, approximately 2,000 reside in the three communities of the proposed service area. Table VI-10 shows a specific breakdown by town and employment center. While these numbers are by no means insignificant, the widespread geographic distribution of employees and the distance of the employment sites from the central population area prohibits the use of a collector/distributor regular route bus service to satisfy trip desires. It is easy to see that such a system would require several routes to each employment site and, depending on the number of routes, an excessive amount of time to collect and distribute riders. Given the level of potential demand, this type of service would be neither cost-effective nor competitive with the private auto.

For example, to provide a high level of service which would be capable of attracting a significant percentage of the work trips to the fringe employment centers would require as a minimum four routes to each employment site. Optimistically, this high level of service would be able to attract 15 percent of the 1600 first shift employees or approximately 240 daily riders. At 35 cents per ride, annual revenues would total $21,840. The cost of the eight routes, assuming two runs per day to each site, at the cost of $1.25 per mile, would be $95,550 per year, leaving a deficit of $73,710. This service has a revenue/cost ratio of 0.23 as compared to the 0.30+ R/C ratios on the proposed regular route service. Using the Conn. DOT subsidy formula, the local share of the deficit would be $17,676. If the deficit is distributed by the same deficit formula used for the regular route service, the community shares are estimated to be as follows:

Community	% of Bus Miles	Local Share	Tax Per $1,000 Assessed Value
Middletown	50	$ 8,838	$0.04
Portland	25	4,419	0.08
Cromwell	25	4,419	0.07

A more cost effective approach to providing commuter transportation would be to provide shuttle service from a central point, such as Union Park, Middletown, to the work site. Access to the central point would be provided by the regular route service assuming it is implemented. Under the pulse schedule system, coordination between shuttle buses and regular route buses could be easily arranged and would considerably ease the inconvenience of a transfer.

The principal advantage of this system is that the collection/distribution function is performed by the regular route buses thereby reducing service costs. Furthermore, initial equipment requirements are reduced. If five percent of the work trips use the ser-

TABLE VI-10

EMPLOYEES PLACE OF RESIDENCE

EMPLOYER	NUMBER OF EMPLOYEES LIVING IN:		
	MIDDLETOWN	PORTLAND	CROMWELL
Pratt & Whitney	922	156	127
Sawmill Brook Industrial Park			
Olin Ski Co.	86	6	10
Raymond Precision	347	45	58
North & Judd	100	50	50
	533	101	118

SOURCE: AMV & Associates Surveys

vice, one bus would be required for each of the two sites. As demand fluctuates, equipment could be put on or pulled off the line.

The primary disadvantage is that employees living between Union Park and the employer would, in all probability, not be willing to use the service due to the typical resistance of patrons to move in a direction opposite to their final destination while commuting. In addition, the slight inconvenience of transfering could also tend to reduce demand.

The cost of a shuttle service to the Sawmill Brook and Pratt & Whitney sites would be $16,250 (based on $1.25/mile operating cost and 2 runs per site/day). Again, assuming that five percent of the total potential demand within the regular route service area will make use of the service (excluding those which would have to retrace steps), both buses combined would average approximately 70 one-way trips per day. If no additional fare is charged for the transfer, revenues would total approximately $6,360, leaving a deficit of $9,880. If, however, the subscription service were to be treated as a specialized extra service to which the free transfer privilege did not apply, the deficit could be substantially reduced by a $.35 or $.25 fare.

The revenue/cost ratio for this service of .39 is comparable to the regular route alternatives previously presented. Again, using the Conn. DOT subsidy formula, the estimated local share of the service would be $1,037. The deficit distribution calculations used in determining the local share are not applicable to this service since it only operates in Middletown. However, since the service is provided to benefit all communities in the transit district, each community should contribute to the local share. A distribution formula based on population is recommended. This would yield the following local shares:

Community	Percent Service Area Population	Local Share	Tax per $1,000 Assessed Value
Middletown	68	$ 705	$ 0.003
Portland	15	155	$ 0.003
Cromwell	17	176	$ 0.003

While the actual tax impact of the commuter services is low in comparison to the regular route service, it could be argued that since only a specific group of residents are being served, general local tax funds should not be used to subsidize the service. A possible alternative funding source would be the employers at the two industrial parks where service is proposed. Such employer support would reduce or eliminate the need for

using local tax revenue.

A final service option for these fringe commuter trips and the least costly to the transit operating body and the public at large, would be to encourage the employers to implement carpool and/or vanpool programs. The State of Connecticut has a well-developed carpool program in operation in which many of the region's employers already participate. Additionally, the Federal Energy Administration has embarked upon a series of workshops designed to assist employers in setting up vanpooling programs.

The primary advantage of paratransit services is that there is no cost to the transit operator. The primary disadvantage is that there would be no public transit link for existing or prospective employees who do not have an auto available for commuting and who do not live near an existing carpool.

6.3.2 Interregional Commuters

In addition to the major employment centers on the fringes of the urbanized area, a significant portion of the Region's work force (48%) commute to work outside the Region for a total of 19,893 trips per day. Of this number, 67 percent are destined for the greater Hartford area. The remaining 33 percent are spread over four other Metropolitan areas (Bristol, New Haven, Meriden, and New Britain).

Currently commuter transit service to Hartford from the Midstate Region is good, but only accessible by a relatively few residents as described in the "planning overview." However, the scope of the TDP is limited in this regard. UMTA requirements limit service options which can be considered to those which are intraregional. At the same time, working within these limitations, much can be done to improve Regional accessibility to existing line-haul services to Hartford.

Implementation of any of the proposed fixed route service options would greatly increase accessibility to Hartford by making the Connecticut Transit Company's "M" route accessible to more of the Region's residents.

In the same vein, the proposed CVH routes would also service the commuter express/carpool lot at the Route 9/Silver Street interchange, making express bus service to Hartford available to those without access to an automobile. Should the demand warrant it, the "pulse terminal" at Union Park could be an additional origin point for express service to Hartford.

Since these Middletown to Hartford services already exist and are operated by the State, no additional costs would have to be borne by the Transit District for any changes or additions to the

services that are justified. In fact, better coordination with existing service to Hartford could increase patronage on the regular route service through giving it a "feeder" function.

6.4 SPECIAL SERVICES FOR THE ELDERLY AND HANDICAPPED

6.4.1 Needs for Elderly and Handicapped Transportation

Elderly and handicapped transportation looms large as an area of present need that can be addressed by the Transit Development Program. Such persons represent a sizable share of the population of the Midstate Region: the elderly (persons 60 years of age and over) number 11,722 in the Midstate Region, or 13 percent of the 1976 total regional population of 90,202 (1). The handicapped number an estimated 3,500. Allowing for the likelihood that some persons appear in both categories and assuming the number of handicapped elderly bear the same relationship to the handicapped population as to the population at large, produces a total elderly and handicapped population of 14,370 in the Region, or 16 percent of the Region's population. Community totals are as follows:

Community	Number of Elderly and Handicapped	Percent of Community Population	Percent of Regional E&H Population
Middletown	6,910	17	48
Portland	1,500	16	10
Cromwell	1,390	14	10
East Hampton	1,310	16	9
East Haddam	1,070	20	8
Haddam	1,000	16	7
Middlefield	590	14	4
Durham	600	12	4
	14,370		100

SOURCE: 1976 Estimates based on 1970 Census data.

Mobility problems for these groups typically arise from their inability to own and/or operate an automobile due to age, income, or physical or mental incapacity or infirmity.

Where it is available, some are able to use conventional regular route public transportation. The study's on-board survey of the Middletown "M" Route found 17 percent of the current ridership to be elderly persons. Other elderly cannot use regular transit service due to schedules, destinations, distance from the nearest bus stop or vehicle design barriers. Within this latter group, some have their mobility needs served by themselves, family or friends; others by social service agencies or taxicabs, and finally, there is a large group that is, for the most part, immobile, confined to home all or much of the time through lack of transportation service.

(1) Totals were estimated by expanding 1970 Census data by Conn. DOT growth factors.

For this group, special transit services are needed. Such services usually provide door-to-door mobility, are demand-responsive (subscription, day-ahead or same-day call-in), and often utilize equipment that has been specially designed for the elderly and handicapped (e.g. vehicles designed to accommodate wheelchairs).

6.4.2 Present Solutions and Usage

The transportation needs of the elderly and handicapped in the Midstate Region are presently being served by 14 different social service and municipal organizations including seven school districts, three municipal governments and four social service organizations. The largest of these agencies is Middlesex County Transportation, Inc. (MCT) which provides approximately 220 elderly and handicapped trips per week. MCT operates a fleet of three radio equipped vans, one of which is specially equipped to handle wheelchair patients, on a 24 hour advance call-in dial-a-ride system. Service is provided to the entire county, but the vast majority of trips are made by Midstate Region residents.

Of the 13 remaining agencies providing transportation to their elderly and handicapped clientele, four operate their own equipment (the balance paying others for transport of their clients, i.e. local bus companies, taxicab companies, or use volunteer drivers with their own vehicles).

For transportation purposes, the four agencies have the following equipment: one mid-size bus, 7 vans, and 7 automobiles, none of which are wheelchair accessible.

The amount of services being provided to the elderly and handicapped by the 14 agencies mounted to 1,350 trips per week broken down as follows:

	Number of Weekly Trips	Percent
Agency Vehicles	1,000	74
Purchased Rides	340	25
Volunteer Vehicles	10	1

Based on the above estimate of special service transportation provision, and information reported by the agencies, it appears that there are approximately 300 handicapped users of agency-provided services or about 9 percent of the potential users. Approximately 550 elderly residents currently use the Region's special transportation services. When added to the 300 handicapped users, it is estimated that approximately 850 of the Region's elderly and handicapped population of 14,370 have the use of some form of public transportation, or about 6 percent. This leaves an extensive latent demand generated by 13,520 persons in possible need of special transportation service.

6.4.3 Regulatory Requirements

U.S. Department of Transportation Regulations (Title 49, Chapter VI, Part 613) published in the Federal Register (Vol. 41, No. 85) on April 30, 1976, set the criteria for urban transportation programming for elderly and handicapped persons.

The new regulations were aimed at planning public transportation facilities and services utilizable by elderly and handicapped persons, especially wheelchair users, through equipment (e.g. bus modifications and designs) and service innovations (e.g. taxi subsidies, trip coupons).

Four requirements are set as meeting the regulation standards:

1. Service and vehicles meet the needs of the wheelchair-bound and semi-ambulatory.

2. Service meets primary needs identified in the planning process.

3. Service is unrestricted to a specific organization.

4. Any fares charged are comparable to regular transit fares or one-half peak hour fares in the off-peak.

To demonstrate that "special efforts" have been made to meet requirements, the following are examples of the scale and types of actions that would meet that criterion:

- Expenditures for elderly and handicapped services should be equal to at least 5 percent of the UMTA Section 5 (operating subsidy) apportionment to the area.

- Making fifty percent of the regular route service bus fleet wheelchair-accessible.

- Assurance that each wheelchair user or semi-ambulatory person would have available public transportation that would enable ten round-trips per week at fares comparable to those paid by other system users for trips of similar length.

The final requirement is that a significant fraction of the need be met in a reasonable time. The elderly and handicapped services defined in the following sections have been shaped to comply with the four DOT requirements cited above, by employing where possible such "special efforts."

6.5 ELDERLY AND HANDICAPPED TRANSPORTATION PROGRAM FRAMEWORK

Provision for elderly and handicapped (E&H) transportation in the Midstate Region encompasses the following three-part program:

1. Coordinated Vehicle Control System

The agencies presently providing E&H services have noted their lack of coordination, producing evidence of duplication of equipment, overlapping of services, and inefficient and uneconomical use of resources. Often times there is a desire by each agency to serve its clientele by its vehicles. At the same time, most agencies complain of the high cost and significant share of their budget represented by transportation services.

Opportunities for cost cutting through coordination by a central agency, pooling of resources and identification of opportunities for mutually complementary use of vehicles by clients of several agencies appear feasible. A central coordinative agency such as the regional transit district or an advisory committee of all interested agenices with a full-time coordinator whose salary is shared by all participating agencies are possible approaches.

2. New Vehicles

New equipment which can be purchased with aid from Federal and State assistance programs, if the appropriate administrative framework exists, is desirable for both regular route service and special service systems. Such equipment should be equipped to facilitate its safe and convenient use by the elderly and handicapped. Federal guidelines suggest that special equipment appropriate to wheelchair users and semi-ambulatory persons be available and that five percent of the annual operating subsidies furnished by the Federal government be devoted to servicing E&H needs.

3. Management Improvement

Operation of E&H service requires a higher level of management than exists at present. A concerted effort to improve and broaden the availability of elderly and handicapped service will require not only the coordinative effort between agencies previously described, but coordination also with and among all local private carriers involved in E&H services. Also involved is a central procurement function, vehicle control (operation and maintenance, reliability and condition checks), financial control and performance evaluation.

6.5.1 Special Arrangements on Regular Route Service

Regular route service can meet the needs of a share of the E&H market if certain provisions are made to facilitate accessibility to the system. The proposals made in this regard complement and broaden those made elsewhere in the TDP report for development of the regular service system. They fall into these broad categories:

- Equipment
- Routes
- Schedules
- Fares
- Promotion

Equipment

Orders for new equipment purchased for regular route public transportaion service should have specifications for these features capable of facilitating use by the elderly and handicapped:

- Minimum height entry steps, 8-10 inch maximum.
- Minimum number of steps.
- Hand rails on seatbacks and along ceiling over aisles.
- Entry hand rails.
- Lighted entry
- Specially designated seating for elderly and handicapped to avoid standing.
- Adequate seating spacing.
- Radio equipped for emergencies.
- Interior public address for audibility of driver announcements.
- Visible and highly legible signs; exterior and interior.
- Good ventiliation and/or air conditioning.
- Package racks near passenger entrance.
- Padded seating and padded layer on any hard surfaces.

Waiting shelters with benches for weather protection and comfort while waiting have been proposed for high traffic locations.

Routes

Route adjustments to accommodate elderly and handicapped where they reside in clusters have been identified as feasible if desirable.

Short extensions of routes could provide service to Stoneycrest, Newfield, and Sbona Towers (extension of the Westfield/Newfield route); Quarry Heights and Portland Senior Center (extension of the Main Street, Portland Route) and to St. John's elderly housing in Cromwell (extension of the Main Street, Cromwell route).

Schedules

Frequent service will reduce the discomfort of long bus-stop waits for the elderly and handicapped. The "pulse system" of having all buses from all routes meet simultaneously will eliminate transfer waiting times for comfort and convenience of the elderly and handicapped.

Fares

Fares for the elderly and handicapped are recommended to be one-half (or less) of the full fare. Federal regulations mandate half fare for elderly and handicapped during non-peak hours as a condition for receiving Federal assistance. The State of Connecticut has extended this requirement to include all hours on state subsidized systems. To obtain these privileges, both groups should be furnished with identification cards to display to the bus driver to authorize payment of half-fare. The criteria for the issuance of such cards should be developed; e.g. documentary proof of age for the elderly; signed medical doctor's statement confirming disability for the handicapped.

Promotion

Many elderly and handicapped do not use available transit services due to ignorance of their avilability, timetables, route locations, fares, bus stops, and information sources.

An "outreach" effort as part of the marketing program appears indicated. The effort should have the following components:

- Brochure describing elderly and handicapped service.
- Passes for half-fare privilege.
- Map and timetable for system.
- Description of fares and transfers for both regular route and special services.
- Number to call for information, dial-a-ride reservation.
- Advertisements in local press and on buses.

- Liaison with social welfare agencies, nursing homes and elderly housing centers.

- Prominently marked bus stops.

6.6 ELDERLY AND HANDICAPPED SERVICE MANAGEMENT AND OPERATION

6.6.1 Background

The elderly and handicapped program has been developed in recognition of three major findings that emerged from the study of existing conditions and needs in the Midstate Region:

1. There is a large unmet or latent demand in the Midstate Region for elderly and handicapped service.

2. Only a minority -- less than 8 percent -- of the elderly and handicapped are being served by present social service agency transportation services.

3. There is a need for demand-responsive door-to-door service in light of the difficulty on the part of many to utilize regular route service due to physical disability.

6.6.2 Management

Alternatives

The management options examined are basically four in number:

1. A publicly owned transit operator to function as sole provider of E&H Services within the Region. Advantages: (a) services could be more readily coordinated using a centralized management system; (b) full utilization of all Federal, state and local subsidy arrangements could be made; (c) centralized volume purchases of vheicles, supplies and materials could command reduced costs; and (d) a mix of service types, vehicle types and operators could be achieved that matched services provided more precisely to E&H needs.

   Disadvantages: (a) may be occasional conflicts where service requests overlap; (b) may not be as demand-responsive, geographically widespread or closely

tailored to client needs as some present social service agency-operated services; and (c) may introduce costs to some users that were previously non-existent due to use of volunteer drivers and/or agency vehicles.

2. Social service agencies remain as separate operators or providers of E&H transportation services -- a continuation of existing arrangements. Advantages: (a) allows each agency to tailor services to specific needs of its clientele and none other; (b) avoids conflict in use of vehicles from overlapping schedules, and (c) may avoid some costs through use of volunteer or low-wage drivers.

   Disadvantages: (a) proves extremely costly due to service and vehicle duplication; non-coordination of services and inability to pool resources and purchase orders; (b) denies some persons service due to budget limitations on equipment purchases and operations; and (c) not able to tap state and Federal transit capital and operating subsidies for support of E&H services, use of which subsidies would allow reallocation of transportation costs to other vital functions in the agency budget.

3. Integration and coordination of a public transit operator and social service agencies as joint providers of E&H services -- a means of getting the best of both options. Advantage: (a) allows a transit authority to provide those services it is best able to offer while reserving to those social service agencies desiring to do so, the option of providing very specialized services that address specific client needs; (b) takes full advantage of all available subsidy arrangements, both transportation and social welfare programs through creating or retaining qualifying pass-through agencies; and (c) provides a central coordinative agency through which even those social services agencies not using transit authority E&H services can coordinate their resources, services and purchases with others for maximum economy and effectiveness.

   Disadvantages: (a) could retain some aspects of overlap and duplication of services; (b) in early phases, transit authority offerings may be limited to non-rural areas leaving some agencies with a portion of their present arrangements and costs; and (c) raises possibility of conflicts in schedules, varying needs of users with different characteristics.

4. Coordination of various social service agency programs through a committee and/or coordinator. This would involve closer integration and coordination of existing transportation programs to reduce overlap and duplication and promote various efficiencies and economies where feasible. Advantages: (a) allows each agency to tailor transportation services closely to client needs while securing some reduction in cost by ride and cost sharing with other agencies; (b) could secure economies from bulk purchasing arrangements; and (c) could support purchase of specialized equipment, e.g. a wheelchair accessible bus, through joint purchase and use that could not be afforded by any one agency acting alone.

   Disadvantages: (a) would not qualify for Federal and state transit subsidies to bear a portion of costs; (b) provides service only for the limited clientele of the agencies, while not addressing the problem of the larger E&H population that does not have a connection to any agency; and (c) generates uncertainty over permanence of arrangements since they are voluntary and agencies may drop out or cease coordination at will.

6.6.3 Recommended Management Concept

The recommended alternative is (3) -- the integration and coordination of a public transit operator and social service agencies as joint providers of E&H transportation services based on the evaluation criteria shown in Table VI-11.

Under this arrangement, a public transit operator would provide a basic E&H service to which those social service agencies could direct clients able to utilize it, while other social service agencies would continue to provide for clients not able to use the public services for various reasons; e.g. geographic coverage, schedules, destinations, equipment characteristics or specialized client needs. The services provided by the latter agencies could be coordinated for greater economy and efficiency, however, by the person in charge of E&H services for the transit authority. Federal and state subsidies would be avalble to reduce agency costs. Those persons not clients of agencies would have access to E&H services. Specialized equipment could be purchased by the transit authority that a single agency could not justify. Greater flexibility in matching equipment to demand would be possible from the larger vehicle fleet available to the transit operator; an elderly group outing by large bus, for example.

6.6.4 Modes of Operation

The provision of special services for the elderly and handicapped can be made via a variety of modes of operation each capable

TABLE VI-11

EVALUATION OF MANAGEMENT ALTERNATIVES FOR ELDERLY AND HANDICAPPED SERVICE

MANAGEMENT ALTERNATIVE / CRITERIA	COORDINATION OF ALL E&H SERVICES	UTILIZATION OF FEDERAL AND STATE TRANSIT SUBSIDIES	CENTRALIZED PURCHASING ECONOMIES	GOOD MATCH OF SERVICE TO DEMAND/NEED	REDUCED DUPLICATION AND OVERLAP OF SERVICE	USE OF VOLUNTEER DRIVERS	PROVIDES SERVICE TO GENERAL E&H PUBLIC	CAN PROVIDE SPECIALIZED SERVICES	CAN SERVE LOW DENSITY (RURAL) AREAS	CAN PROVIDE SPECIALIZED EQUIPMENT	CERTAINTY OF CONTINUING SERVICE	FLEXIBILITY IN SERVICE OFFERINGS	
1. Public Transit Authority Sole E&H Service Operator	G	G	G	M	G	P	G	M	P	G	G	G	
2. Social Service Agencies Provide Service to Own Clientele	P	P	P	M	P	G	P	M	G	P	M	M	
3. Integration and Coordination of Public Transit Authority and Social Service Agencies	G	G	G	G	G	G	G	G	G	G	G	G	
4. Coordination of Social Service Agency E&H Services	G	P	G	M	G	G	P	M	G	M	P	P	

KEY

G = Good
M = Moderate
P = Poor

of responding specifically to a given type or level of demand. They include:

- Medium size bus (30 passengers)
- Mini-bus (14-16 passengers)
- Van (12 passengers)
- Taxi (3-4 passengers)

The medium size bus, mini-bus and van may also be equipped with a lift or ramp to make them accessible to users of wheelchairs or other mobility aids. With all or a major part of this variety of equipment available, it would be possible to match vehicle capacity to demand for any given trip or set of trips.

Various optional operating modes for special E&H services are possible. They fall generally into these categories:

- Subscription Service. A service which handles recurring trips to and from the same origin and destination on a regular basis -- work and school trips are the usual trip types handled by this service.

- Feeder Service. Responds to the frequent elderly and handicapped problem of getting to regular route bus stops that are out-of-range for those with limited ambulatory mobility. The service picks up E&H patrons at their door and transports them to the nearest stop on a regular route transit line.

- Dial-a-ride. Provides door-to-door service when a request or reservation is phoned in in advance so that several passengers can be picked up and dropped off on the same trip or circuit, producing shared-ride economies. The amount of advance notice is variable, but 24- or 48-hour notice is usually required. This permits adequate planning of routes and schedules. While same-day or same-hour responsive dial-a-ride has been practiced in some cases, it has proven problematical from a dispatching, ride-sharing and economic viewpoint and is usually not recommended in the initial phase until experience with the system is achieved.

If the demand is expected to exceed the available supply of service that can be provided, it may be necessary to restrict the use of the system to only those trips deemed "essential", i.e. medical and nutrition trips followed by banking, shopping and social trips in order of priority, with possible omission of the "social."

The operators of the services described could be either one or both the fixed route operator and any participating local taxi operator under contract to provide service at a given price per vehicle mile when operating for the account of the transit agency. This arrangement permits the agency to only pay for those services actually rendered. It also permits the agency to observe any upset limits or budget limitations and as they are approached in a given accounting period to ration service on some priority basis if necessary.

At the same time, it promotes efficiency and economy by permitting the matching of vehicle capacity to effective demand. If, for example, there are only three applicants for dial-a-ride service in a given area at the same hour, a cab would be utilized rather than assigning a 16-passenger van. On the other hand, if a large group from a nursing home or elderly housing complex desire to travel at the same time to a shopping center or other common destination, a bus could be utilized rather than two or three vans. This would also permit the operator to more effectively utilize his drivers by providing them with runs in the off-peak when some equipment might normally be idled.

Finally, costs to social service agencies for purchase and maintenance of vehicles and performance of duplicative services would be reduced by allowing them to purchase services from the authority at standard rates to meet their clients' needs and, if preferred, at no cost to the client in that the social service agency would accept billing.

The areas proposed for service in the initial stage of the TDP are those communities containing 70 percent of the Region's elderly and handicapped population: Middletown, Portland and Cromwell. The more rural communities of Durham, Middlefield, the Haddams and East Hampton may be added to the service area as experience is gained in operating the system.

As previously mentioned, to produce maximum efficiency in operating an E&H service, coordination between all agencies involved is essentiall Middlesex County Transportation, Inc. (MCT) currently provides E&H service to the proposed service area. To avoid duplication of services, it is anticipated that MCT would cut back service to these areas. The benefits from such an arrangement would be twofold: First, MCT, which is currently experiencing funding difficulties, would be able to reduce operating costs substantially by providing service to the five town rural area instead of the entire region. In this respect, MCT, Inc. could provide a feeder service to the fixed route service in the urbanzed area if implemented. The second major benefit would be the increased level of service in the rural areas of the Region. Virtually all social service agencies involved indicated that there was a sizable unmet or "latent" demand in rural areas.

6.6.5 Service Specifications

Currently, MCT, Inc. provides the proposed service area with approximately 45 vehicle hours of service per week. However, each town does not receive service each day. Therefore, those wishing to use the service must schedule their trips to conform with service times. This is not always possible and, where possible, is often inconvenient. This fact alone is probably most responsible for the relatively low demand (approximately 40 trips/day) for the service. For this reason it is felt that each town in the service area should be served daily. The resulting increase in level of service can be expected to stimulate increased ridership from the latent demand sector.

To conform with the service already being provided by MCT, Inc. and basic trip making patterns and to insure coordination with any fixed route service to be implemented, the service should operate from 8:00 AM to 5:00 PM.

Fares can be set at various levels, but must meet the Urban Mass Transportation Administration and state law requirements that they be one-half of the standard fare for a trip of similar length. However, since there is no demand-responsive service in exstence in the Region which charges a fare to its patrons, there is no standard fare to compare against. The closest analogy that can be drawn is with taxi fares in the Region averaging $1.00 per each of 4 passengers for a five-mile trip.

An average E&H service load is estimated at four persons; an average trip length at five miles and an average cost per mile of 75 cents producing a total cost per trip of $3.75. Users of the regular route service are estimated to pay about 30 percent of operating costs. To retain this parity for E&H service and remain consistent with the half-fare requirements, it is proposed that E&H service fares be set at $3.75 x 30% / 4 passengers = 30¢ per one-way trip initially.

6.6.6 Ridership Estimates

As previously mentioned, a potential demand of 13,520 exists in the Region. Approximately 70 percent of that, or 9,770, reside in the proposed three community service area. It is estimated that 20 percent of these persons or 1,950 are without an automobile. This figure represents the maximum demand which could be expected given no competing service. However, due to the fact that each person is not likely to make a trip each day and the level of competing services (i.e. other private operators, social service agencies, ride sharing with friends or relatives, etc.) a reasonable estimate of demand would be 15 percent of the maximum or 300 trips per day. This estimate assumes no fixed route service. If one of the fixed route alternatives are implemented, this figure could be further decreased to an estimated 225 trips per day.

6.6.7 Equipment Requirements

Based on the preceding demand estimates and loading assumptions, it is estimated that between 16 and 25 vehicle hours of service per day will be required to meet demand in the Region. Assuming nine hours of operation per day, 2 to 3 vehicles in the 10-12 seating capacity range would be required, at least one of which should be wheelchair accessible. At a cost of approximately $20,000 each, this would require between $40,000 and $60,000 in capital investment.

6.6.8 Cost/Revenue Estimates

Annual operating expenses for E&H services have been estimated at $57,200 and fare revenues at $17,550 in the first year based on the calculations shown in Table VI-12.

Under the present funding arrangement, operating costs for modes other than regular fixed route are not eligible for state subsidies. This would include demand-responsive elderly and handicapped service. These E&H services, however, are eligible for Urban Mass Transportation Administration (UMTA) Section 5 funding. UMTA's policy is to fund 50 percent of the operating deficit incurred by the service. The remaining 50 percent must come from the local communities. The cost/revenue/subsidy projections shown in Table 15 reflect this subsidy arrangement. However, it should be noted the mass transit funding policy under consideration by the Connecticut legislature would provide operating subsidies to demand-responsive service on the same basis as regular fixed route service beginning in Fiscal Year 1979. Passage of this legislation is uncertain at the time of this writing and has, therefore, not been considered in making this study's calculations.

6.7 DEMAND RESPONSIVE SERVICE TO RURAL AREAS

Up to this point, service options have been limited to providing service in the urbanized areas of the Region where population densities are high enough to support public transportation. However, this study could not be considered comprehensive or regional in scope if it did not explore the need for and the feasibility of service linking the rural areas of the Region with the urban centers.

6.7.1 Rural Service Options

Where population densities are too low to support regular fixed route service, it is often feasible to provide transportation in a

TABLE VI-12

ELDERLY AND HANDICAPPED SERVICE
COST/REVENUES BY COMMUNITY

YEAR 1

	Middletown	Portland	Cromwell	Totals
Daily Vehicle Hours*	14	3	3	
Annual Vehicle Hours	3,640	780	780	
Fare	$0.30	$0.30	$0.30	
Assumed Origins/Hour	12	12	12	
Estimated Annual Ridership	40,950	8,775	8,775	58,500
Annual Revenue	$12,285	$ 2,633	$2,633	$17,550
Annual Operating Cost	$40,040	$ 8,580	$8,580	$57,200
Annual Deficit	$27,755	$ 5,947	$5,947	$39,650
Community Share (50% of deficit)#	$13,878	$ 2,973	$2,973	$19,825
Tax per $1,000 Assessed Value	$0.06	$0.05	$0.05	

*Assumes a mid-range demand of 225 trips/day

#If subsidy bill is passed by Legislature, Community share would decrease substantially.

demand responsive mode. Demand responsive service, alternately referred to as dial-a-ride service, provides on-call, door-to-door service, similar to conventional taxi, the primary difference being that the cost of the ride is shared with the other passengers.

Three basic modes of operation are generally considered when implementing demand-responsive service. Each offers a different level of convenience and cost. The least costly but also least flexible form of service is known as "Many to One" service. The service vehicles loop through their designated service areas picking up persons who have requested rides. When patron collection is complete, the vehicle runs express to a single destination. This type of service could be used to link outlying town centers to the Middletown CBD.

The second and slightly more costly service is known as "Many to Few" service. It is more flexible than "Many to One" in that several major destinations are served. For example, instead of dropping everyone off in Middletown, the vehicle could also make stops in other town centers.

The most flexible and also most costly service is known as "Many to Many" service. It will make pick ups anywhere within a specified service area and drop off anywhere within that area.

6.7.2 Demand for Service

Previous studies have shown that while population densities required to support a demand-respond system are lower than those needed for fixed route service, there is a minimum below which it is not cost effective to provide service. A study performed by Arrillage and Medville, presented in TRB Special Report 147, developed a series of demand, supply and cost equations for evaluating the potential of demand responsive transportation in rural areas. Input to the demand equation is in the form of population density, trip time in minutes, area served in square miles, type of service provided, and fare charged. By assuming an average trip time, type of service and fare, an estimate of the population density required to support demand responsive service can be made.

Given the spatial orientation of rural towns of the Midstate Region in relation to the Middletown CBD, a reasonable estimate of the average trip time would be 30 minutes (15 minutes of wait time and 15 minutes of travel at 30 MPH). The type of service selected has little effect on the demand estimate produced by the equation. However, ridership will tend to increase as the quality of service increases, so it will be assumed that a "Many to Many" service is being considered. Fares for this type of service normally range between $.50 and $1.00. To produce a high ridership level, we will assume a low fare of $.50.

The cost of "Many to Many" service is in the range of $12 to $16 per vehicle hour of operation. If operated for 8 hours per day, the cost/vehicle would be $96 to $128 per day. To maintain parity with the other services presented in this report, a revenue/cost ratio of .30 should be attained. At $.50 per passenger, this would require a daily ridership of approximately 75 passengers per vehicle.

Assuming only one vehicle is needed per town, then an estimate of the population densities required to support demand-responsive service can be reached by solving the following equation for D.(1)

$$R = \frac{(-59.388+0.0613D-0.368TT+1.12A+1.888S-145.4FA)(A)}{(1-0.0192A)}$$

where:

R = ridership
D = effective population density (persons/square mile)
TT = trip time in minutes (Wait + Ride Time)
A = effective area served
FA = fare in dollars
S = Services Type 1 = many to one
2 = many to few
3 = many to many

The average effective service area in each of the five rural towns (Middlefield, Durham, East Hampton, Haddam and East Haddam), is approximately 13 square miles. Using this fact, together with the assumptions made previously, as input to the demand equation, the density required to support demand responsive service is approximately 2,075 persons per square mile. The effective densities within the five town area range between 500 and 1000 persons per square mile -- far below the cost-effective level.

6.7.3 Assessment of Demand Responsive Service Potential

Based on this analysis, it appears at the present time that implementation of demand responsive service for the general public in the rural areas of the region will not be cost effective. However, service cannot be judged solely on the basis of cost. There are certain user groups (i.e. members of non-auto or single auto households who are not eligible for MCT or other agency programs) which should be provided with some form of transit service. The only realistic way of providing this service is through some sort of paratransit operation. However, a common problem of such operations is the cost to provide a ride is significantly greater than the revenue produced if fares are to be kept at a reasonable level.

(1) Adapted from TRB Special Report 147

It appears that any service that will both serve the public in terms of reasonable door-to-door trip time and fare will require a subsidy. The extent of the subsidy will depend on the service selected. Comparative studies have shown that taxi service tends to be less expensive than demand responsive service due primarily to labor, dispatcher and owner practices.

This leads us to conclude that during the initial phases of the TDP, serious consideration be given to using taxi operators as the paratransit mode before pursuing a demand responsive service.

However, demand responsive service needs comparatively short lead time for implementation. So as the Midstate Region continues to grow and the rural areas become more densely populated or if government subsidies increase, making transit service more cost effective, it can be implemented relatively quickly.

CHAPTER VII

RECOMMENDED TRANSIT DEVELOPMENT PROGRAM

Presented in this chapter is the recommended Transit Development Program for the Midstate Region. The recommended Transit Development Program consists of the following elements:

- Institutional and Management Structure
- Routes and Services
- Capital Requirements of the Program
- Implementation and Priorities Schedule
- Patronage, Revenue and Cost Analysis
- Potential Funding Sources

Based on an extensive public participation and review process, the towns of Portland and Cromwell have elected not to participate in the transit program initially. Hence the recommendations contained in this chapter reflect system elements for the City of Middletown only. Each of these elements is discussed in the remainder of the chapter.

7.1 INSTITUTIONAL AND MANAGEMENT STRUCTURE

7.1.1 System Ownership and Management

The recommended ownership and management mechanism for the transit system is a Transit District. The advantages of a Transit District are:

- Qualifies for federal and state subsidies up to 75% of the cost of operating and service, leaving the community to be assessed at maximum for only 25% of the net cost of the service it requests.
- Qualifies for 80% federal and 20% state matching grants for capital improvements (new buses, shelters, signs, and other equipment).
- Preserves ownership and operation by private operators, for whose services the District may contract.
- Provides for total local control of the amount of service received by a community through its representative on an advisory board comprised of local chief elected officials or their appointees and exercise of the franchise power.

- Provides the infrastructure for future expansion of the transit system to include other communities in the Region.

- Requires each Transit District member community to pay the net cost of service or deficit only for those services it receives. If it desires no transit service, it receives none and pays nothing. Each municipality will have complete freedom to determine its level of services and estimated cost before entering into a contract.

- Provides for continuing administration of the transit program by a professional administrator who acts under direction of the advisory board to: execute contracts, purchase equipment, apply for subsidies, carry out marketing and promotion, continuously update transit plans, monitor the performance quality of contracted services, and carry out other functions related to efficient transit operations.

The disadvantages of a Transit District are:

- The District is obviously going to cost money and local property taxes will rise or revenue sharing money will be utilized to account for the local share of the net cost of service. However, as the previous analysis has shown, the tax rate impacts are miniscule relative to the level of service provided. If future year tax levels for transit services should become unacceptable, the service levels can be adjusted accordingly, or service rejected altogether to reduce, or eliminate, the tax burden from that source.

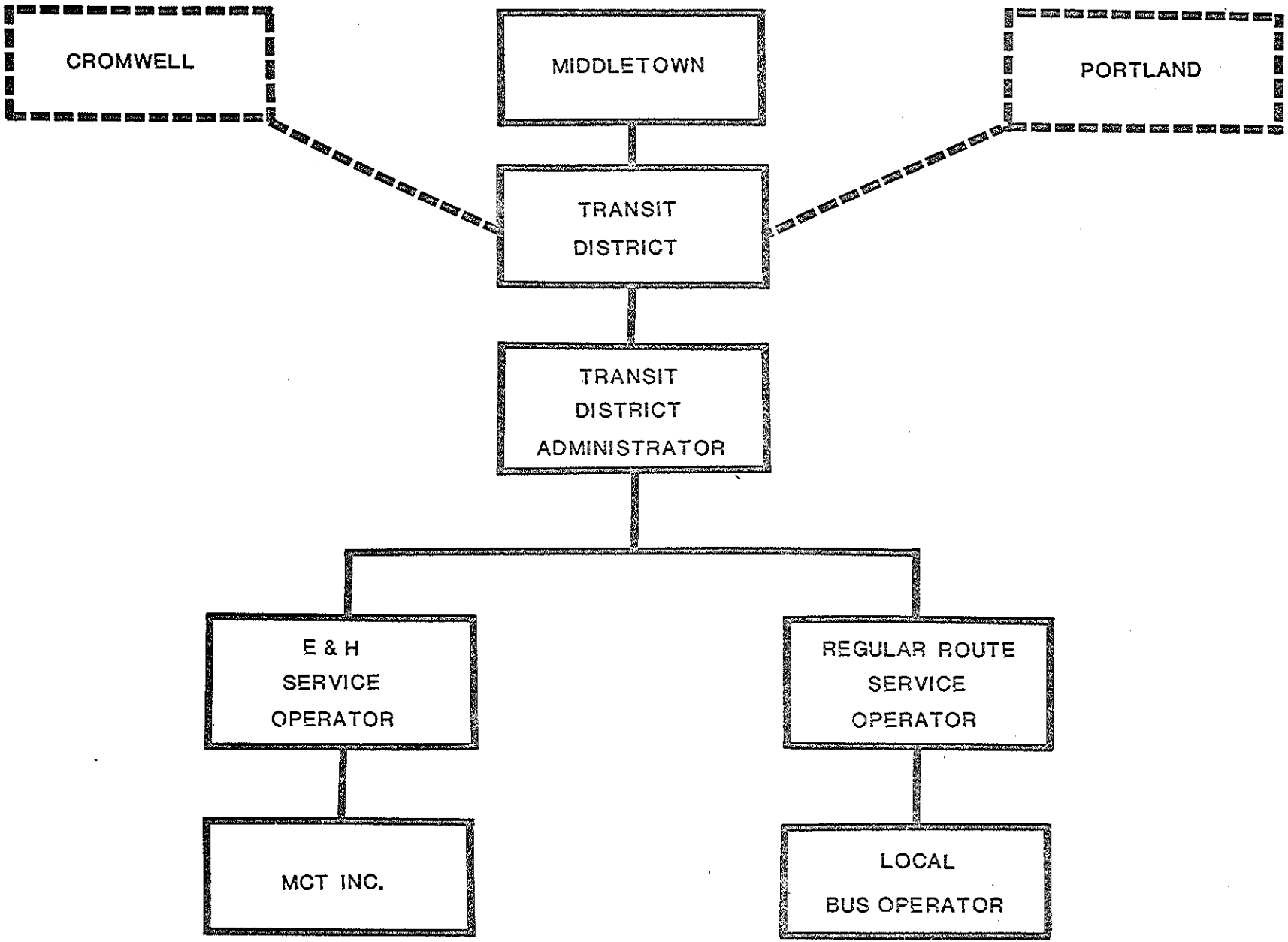
The successful implementation and maintenance of transit service in the Midstate Region will likely require the existence of a Regional Transit District (RTD) in the long run. The steady decline and eventual elimination of regular route local bus service in the Region is testimony to the fact that private operators alone cannot keep pace with the rising costs of providing service without some form of public financial assistance. The RTD will provide the mechanism for such assistance.

In the final analysis, a Regional Transit District that combines private operation with public ownership and financial assistance appears to be the best means of guaranteeing the preservation and future improvement of public transportation in the Midstate Region. Figure VII-1 shows the components of the recommended management body and their relation to each other.

It is recommended the Transit District contract a private transit operator(s) to manage the service components of the system initially. As the Transit District gains experience in system operation, it could consider a takeover of the service operating function.

FIGURE VII - 1

RECOMMENDED TRANSIT SYSTEM MANAGEMENT PLAN



7.2 ROUTE AND SERVICE RECOMMENDATIONS

7.2.1 Regular Route Service

The recommended system consists of four routes initially serving the City of Middletown. The proposed routes are shown in Figure VII-2, showing the overall system. Possible route expansions into the towns of Portland and Cromwell are also shown. Figures VII-3 through VII-6 present the detailed routing of each recommended route in the system. Figures VII-7 and VII-8 detail routes proposed for future consideration.

Routing procedures accounted for the location of major residential clusters, including apartments and medical facilities, activity, shopping and employment centers and topography where grades were too steep for transit operations.

The specific service improvements included in the recommended program are as follows:

- Washington Street North Loop -- A new route designed to link residential areas north of Washington Street in Middletown, particularly elderly housing units, to CBD, retail and social opportunities. Special loops into the shopping centers are also provided.

- Washington Street South Loop -- A new route designed to serve the high population density areas west of CBD, Wesleyan University and major shopping opportunities.

- South Main Street Loop -- A new route designed to provide service between southwest Middletown residential areas, educational facilities and the Middletown CBD.

- Saybrook Road/Silver Street Loop -- A new route to provide service between the low income housing complexes southeast of the Middletown CBD and retail, medical and educational facilities along Saybrook Road and in the CBD.

The two possible expansion services are:

- Main Street/Portland Loop -- A new route designed to provide an alternative transportation mode between the Town of Portland and City of Middletown. The route will provide service to the high density residential areas of Portland and provide increased access to employment, retail, social and educational opportunities to its residents.

MIDSTATE PLANNING REGION URBAN AREA

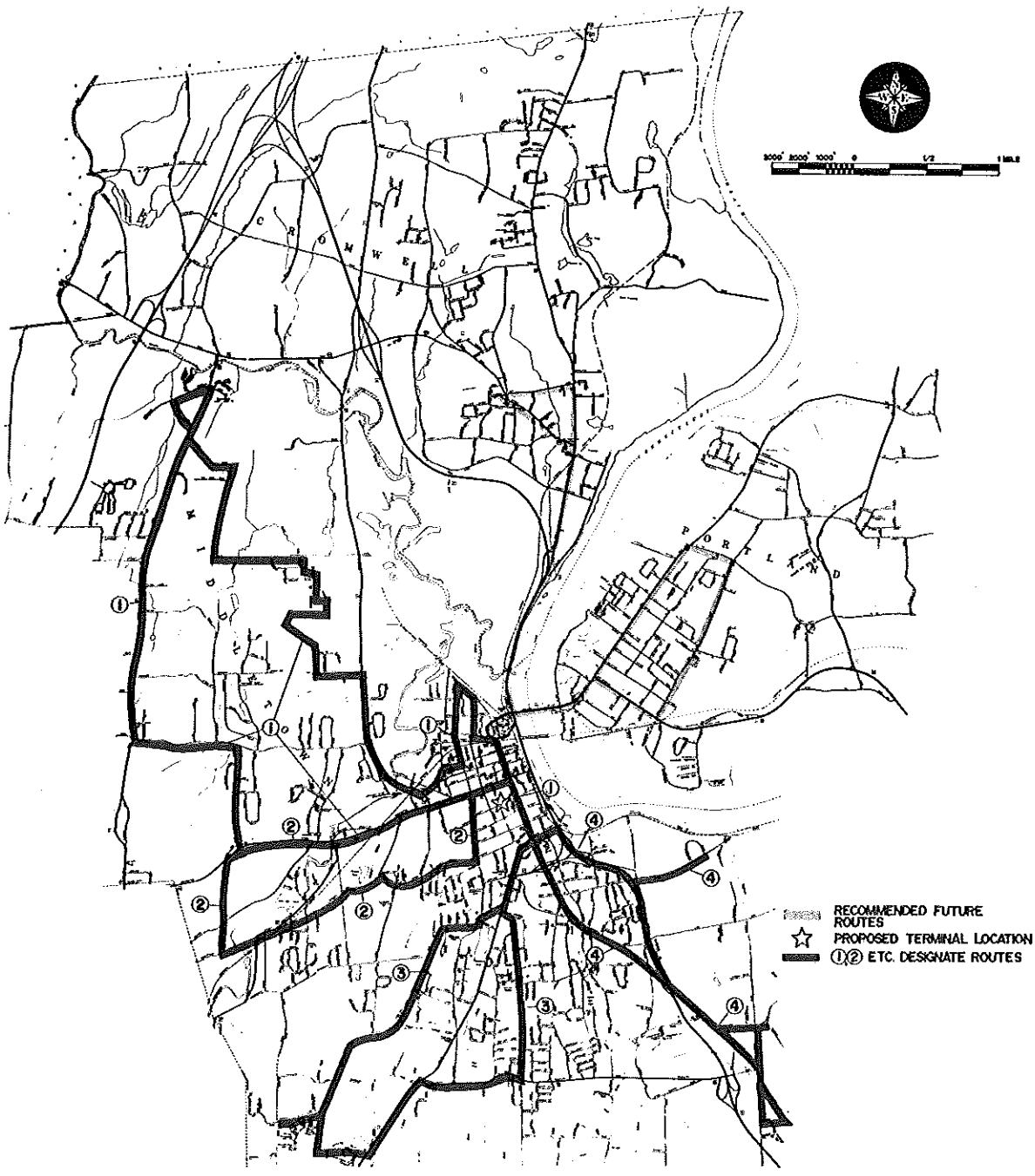


FIGURE VII-2
RECOMMENDED ROUTE SYSTEM

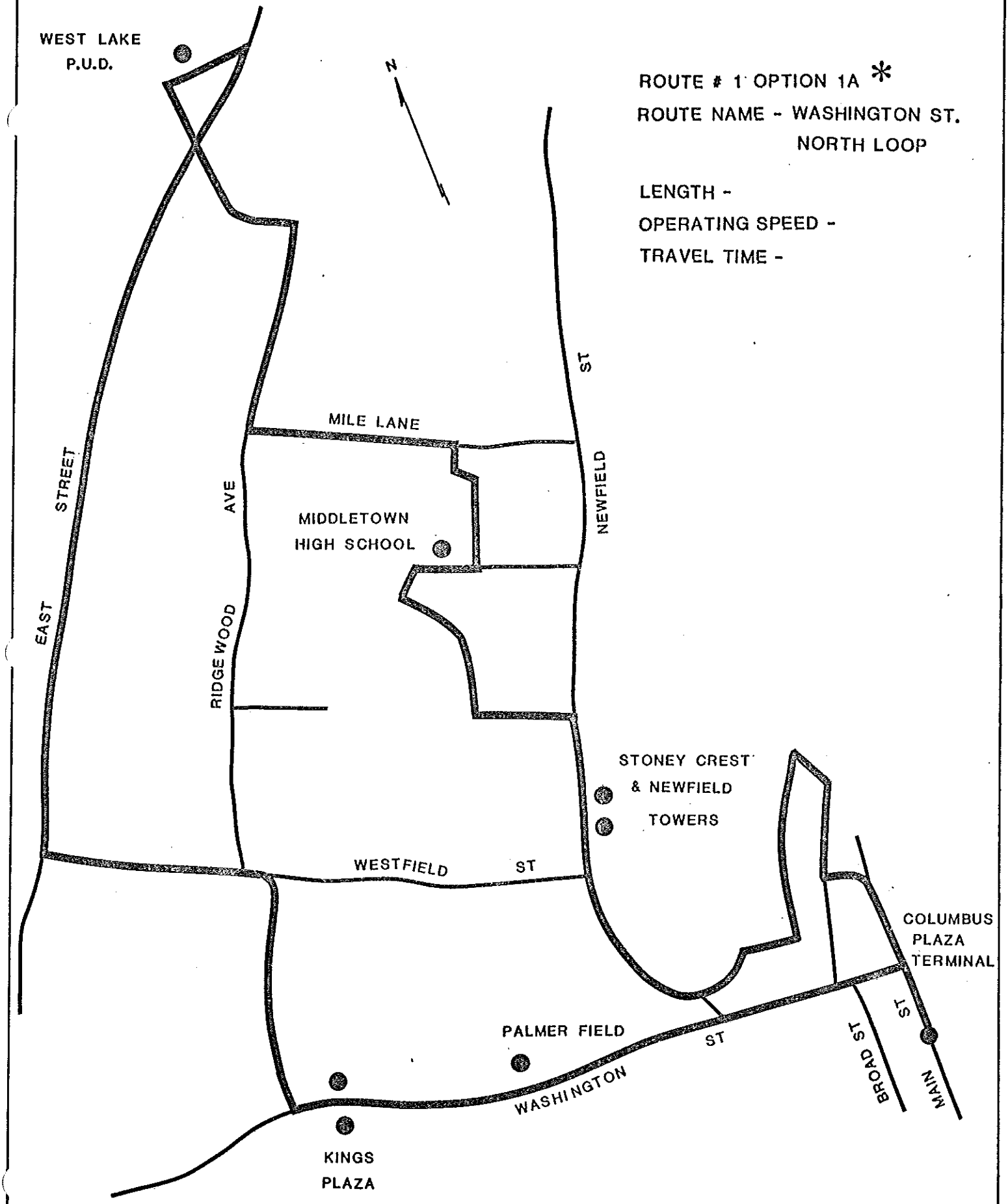
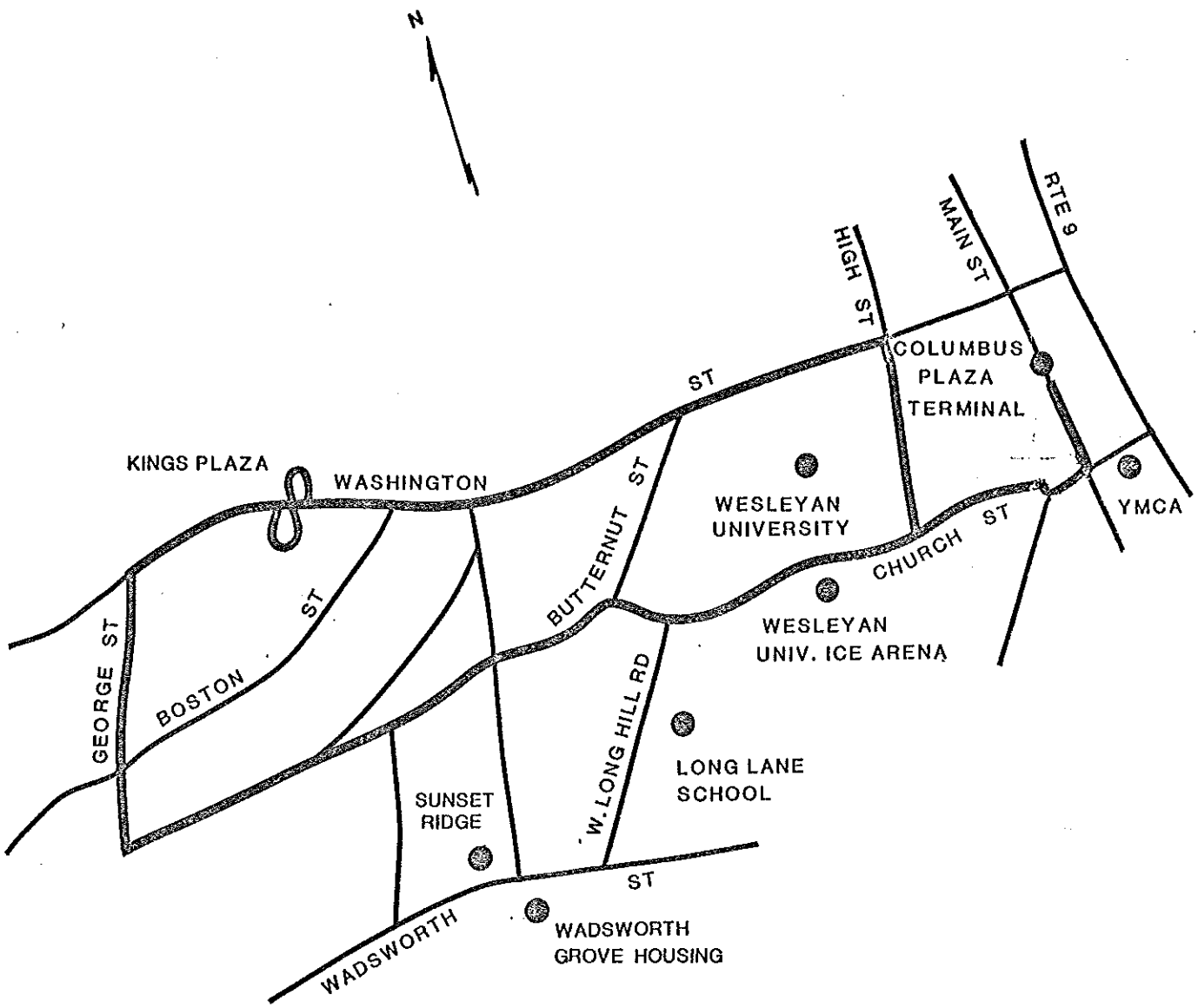

WEST LAKE
P.U.D.
N
ROUTE # 1 OPTION 1A *
ROUTE NAME - WASHINGTON ST.
NORTH LOOP
LENGTH -
OPERATING SPEED -
TRAVEL TIME -
ST
MILE LANE
NEWFIELD
STREET
AVE
MIDDLETOWN
HIGH SCHOOL
EAST
RIDGE WOOD
STONEY CREST
& NEWFIELD
TOWERS
WESTFIELD ST
COLUMBUS
PLAZA
TERMINAL
PALMER FIELD
ST
BROAD ST
ST
MAIN
WASHINGTON
KINGS
PLAZA

FIGURE VII - 3



ROUTE # 2

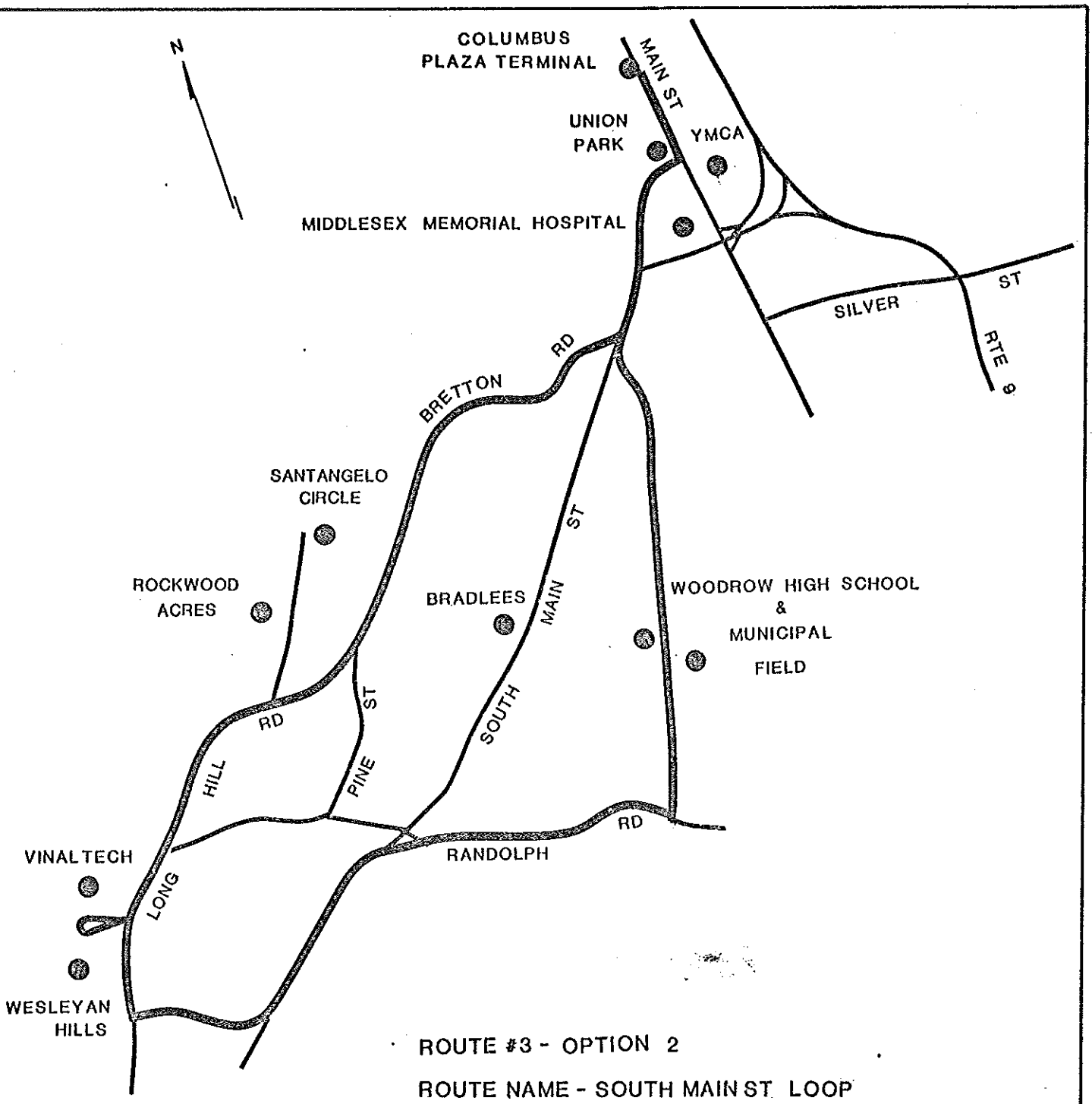
ROUTE NAME - WASHINGTON ST SOUTH LOOP

LENGTH - 6.5 MILES

OPERATING SPEED - 18 M.P.H.

TRAVEL TIME - 22 MINS.

FIGURE VII - 4



ROUTE #3 - OPTION 2

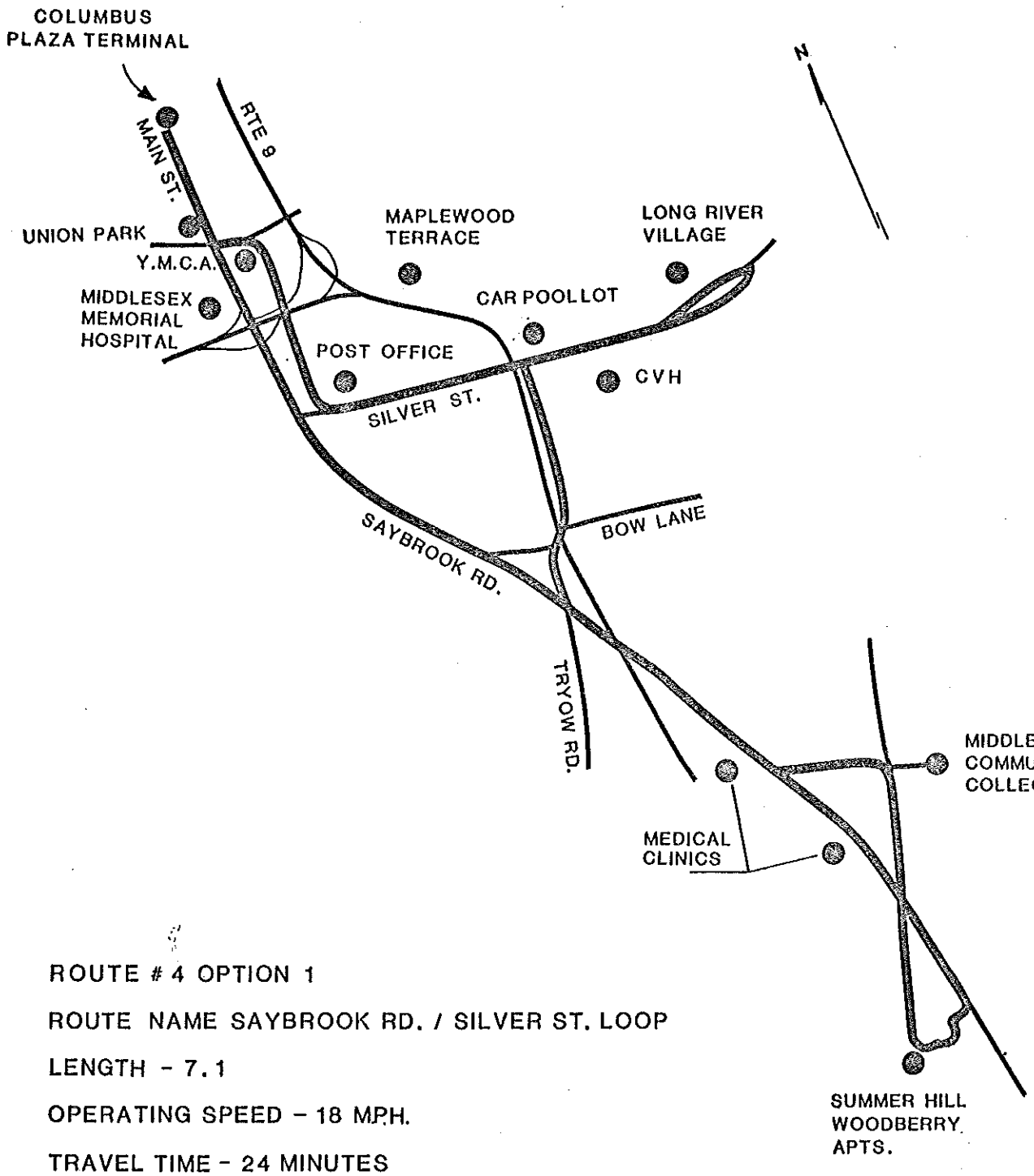
ROUTE NAME - SOUTH MAIN ST LOOP

LENGTH - 7.0 MILES

OPERATING SPEED - 20 M.P.H.

TRAVEL TIME - 21 MINS.

FIGURE VII - 5



ROUTE # 4 OPTION 1

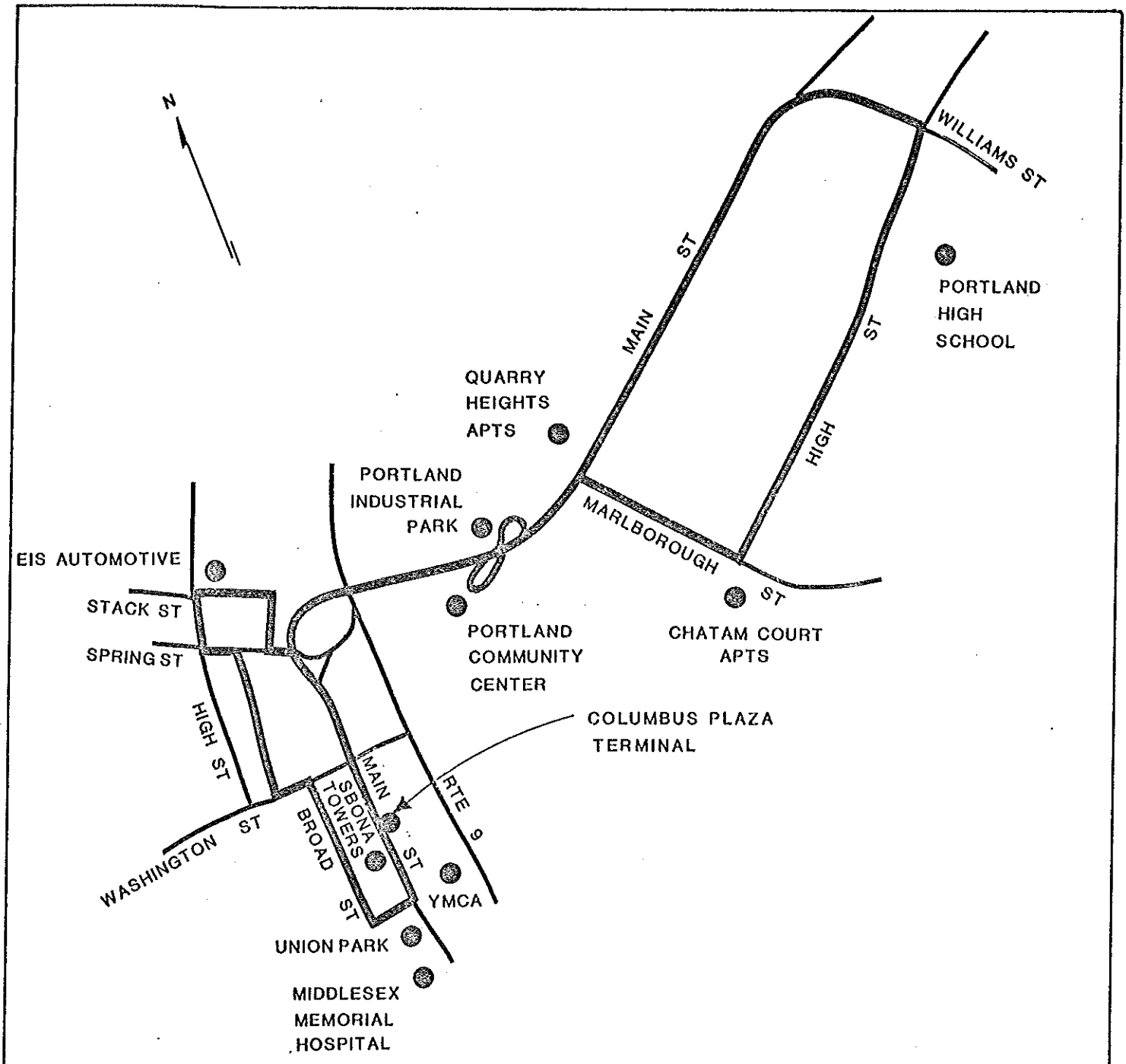
ROUTE NAME SAYBROOK RD. / SILVER ST. LOOP

LENGTH - 7.1

OPERATING SPEED - 18 M.P.H.

TRAVEL TIME - 24 MINUTES

FIGURE VII - 6



ROUTE #5 (FUTURE EXPANSION)

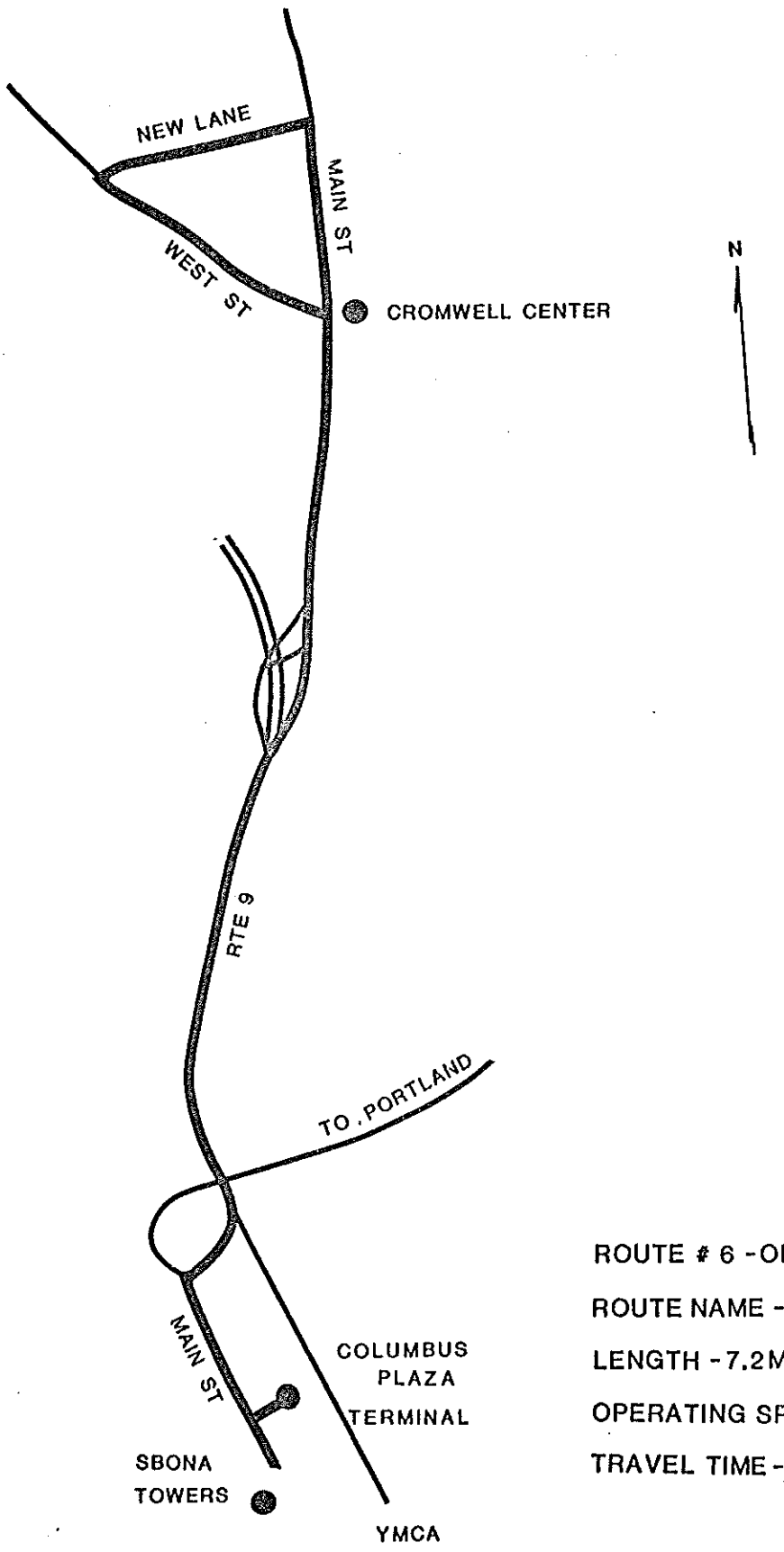
ROUTE NAME -MAIN ST/PORTLAND LOOP

LENGTH -8.0MILES

OPERATING SPEED -20 M.P.H.

TRAVEL TIME -24 MINS.

FIGURE VII - 7



ROUTE # 6 - OPTION 2 (FUTURE EXPANSION)

ROUTE NAME - MAIN ST CROMWELL LOOP

LENGTH - 7.2 MILES

OPERATING SPEED - 25 M.P.H.

TRAVEL TIME - 18 MINS.

FIGURE VII - 8

- Main Street/Cromwell Loop -- This route is basically a variation of the Middletown "M" route between Cromwell and Middletown. The route is designed to provide more frequent service to Cromwell residents desiring to take advantage of the educational, medical, social and retail opportunities available throughout the Region.

- All routes are recommended to meet simultaneously each half hour at the Columbus Plaza Terminal in Middletown, where a shelter and information booth will be located.

Major shopping centers have been made more accessible by providing loops directly into the centers from the various routes which service them. Such shopping centers as Caldors and Kings Plaza are directly accessed by the system for the convenience of shoppers carrying bags and bundles. The Central Business District of Middletown will benefit significantly from being the focal point of all system routes and the major transfer point in the "pulse" system where all buses arrive simultaneously and allow immediate transfer of any riders having continuing journies. It is recommended the terminal be located centrally in or near Columbus Plaza in downtown Middletown.

Industrial areas have likewise been made more accessible by the proposed route configuration. Coverage includes such major industrial centers as those along East Main Street and Spring Street in Middletown.

Activity centers accessible on the proposed route system include the U.S. Post Office, Middlesex Memorial and Connecticut Valley hospitals, Wesleyan University, Middlesex Community College, Palmer Field, the Middletown YMCA and numerous schools, community centers, and libraries.

Standard half hour headways are called for on all routes during operating hours. It is recommended the service be operated six days per week, Monday through Saturday, between the hours of 6:00 A.M. and 6:30 P.M. with service hours on Friday evening extended to 9:30 P.M. to accommodate evening shopping desires.

It is recommended that, to the extent feasible, schedules recognize starting and quitting times of major employment centers on all routes. Bus arrivals should occur an average of 10 minutes before starting times and a similar average length of time after quitting hour to facilitate commutation via the system.

7.2.2 Special Services for the Elderly and Handicapped

Special services to the elderly and handicapped are recommended to be provided via special considerations on regular route services and via services designed specifically for the elderly and handicapped. The latter services are most appropriate where large numbers

of elderly or handicapped lack access to regular service due to the nature of infirmity or disability, distance from bus stops or architectural barriers between origin or destination and bus stops.

Aspects of regular route service that have specific relevance to elderly and handicapped usage include the following. (A detailed description of the improvements is contained in Chapter VI.)

- New buses with design features incorporated which accommodate the comfort, safety and convenience of elderly and handicapped.

- Waiting shelters in high volume locations that provide weather protection and benches for waiting comfort.

- Routes adjusted to serve elderly housing concentrations and major destinations of elderly and handicapped (e.g., shopping and medical centers, work and school opportunities).

- Increased schedule frequency and reliability and the "pulse" system of transfers to reduce waiting times.

- Half fares for elderly and handicapped.

- Promotion efforts to make available transit services known to elderly and handicapped through such means as maps and timetables, brochures, advertisements, liaison with social welfare agencies, nursing homes and elderly housing centers and prominently marked bus stops.

Special services for the elderly and handicapped are designed to supplement regular route service for those citizens with these characteristics that do not have access to the regular service. Three types of service offerings are recommended:

- Subscription service - for the regularly made trips between the same origins and destinations. As examples, the service could include daily work and school trips and weekly or semi-weekly shopping trips for residents of a given nursing home or elderly housing project.

- Demand responsive service - also sometimes called dial-a-ride, the service involves shared-ride service door-to-door for those phoning reservations 24 hours in advance to permit schedules and routes to be made up that will maximize service efficiency.

- Coordinated control system - coordination of transportation services among social service agencies offering same to reduce duplication and overlap, increase efficiency and economy and provide opportunities for cost reduction through joint purchasing agreements.

Forty-eight percent of the Region's elderly and handicapped residents reside in the City of Middletown, making it a prime candidate for expanded E & H service. In addition, the Town of Portland, containing ten percent of the Region's elderly and handicapped, has expressed a desire to contract E & H service from the Transit District. In these areas it is recommended that service be provided daily from 8:00 A.M. to 5:00 P.M. A minimum of 14 daily vehicle hours of service should be provided in the City of Middletown to meet projected demand. Should the Town of Portland decide to contract service from the Transit District, a minimum of three daily vehicle hours would be required to meet projected demand.

The Transit District should provide the service and contract a local private transit operator to operate and manage the service. The E & H service operator may, or may not, also operate the regular route system. In any case, the service operator should be prepared to operate equipment whose capacity matches demand for a specific trip: bus, mini-bus, or van. Specially equipped wheelchair accessible vehicles should be maintained for trips requiring same.

Existing providers of E & H services, such as MCT, Inc., should be encouraged to continue providing service in those low population density areas and to those clients whose transportation needs are not, or cannot be, met by transit agency service offerings. Social service agencies should be encouraged to arrange for trips in the transit system when their clients can be served by that means.

7.3 CAPITAL REQUIREMENTS OF THE PROGRAM

The major elements of the recommended five-year Capital Improvement Program are described below. Table VII-1 summarizes the program and its associated costs.

New Vehicle Requirements

A fleet of new vehicles adequate to fully operate the regular route service is desirable to provide users with recent advances in vehicle technology and design that will enhance their comfort, convenience, safety and speed and reliability of ride. Such features as large tinted-glass windows, "kneeling" capability to reduce first step height, air conditioning, public announcement system, padded seating, and elderly and handicapped safety and access lighting, handholds, and parcel storage are options found in most modern buses and should be considered for any new equipment. The attractiveness of the system will be enhanced and ridership increased by new equipment -- a vital part of the marketing effort.

TABLE VII-1

PRELIMINARY FIVE-YEAR CAPITAL IMPROVEMENT PROGRAM[1]

MIDSTATE TRANSIT DEVELOPMENT PROGRAM

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	Total
New Transit Buses[2]	(7) $245,000					$245,000
New Elderly and Handicapped Service Vehicles[3]	(3) 60,000					60,000
Fare Boxes	(7) 9,800	(3) $ 4,200				14,000
Two-Way Radios[4]	(3) 3,600	(7) 8,400				12,000
Bus Stop Signs	(100) 5,000	(25) 1,250	(25) $1,250	(25) $1,250	(25) $1,250	10,000
Waiting Shelters	(1) 2,400	(1) 2,400	(2) 4,800	(2) 4,800	(2) 4,800	19,200
Contingency @10.0%	32,580	1,625	605	605	605	36,020
Total	$358,380	$17,875	$6,655	$6,655	$6,655	$396,220

1/ Does not include maintenance, administrative facilities, or terminal.

2/ Assumes 18-passenger, air conditioned buses.

3/ Assumes 12-passenger vans (one equipped with wheelchair lift).

4/ Does not include base station radio.

The average day bus requirement is five buses with a likely need for two additional buses to act as spares and as back-up for maintenance, emergencies, added service, or to serve peak-hour demand. A total of seven buses has, therefore, been specified for purchase in the first year of the program so that the entire system can be upgraded simultaneously and as soon as possible.

It is recommended that the transit vehicles purchased be eighteen-passenger, diesel-powered buses. These vehicles will provide adequate capacity to handle peak period loads on both regular routes and E & H subscription service. To increase patron comfort in the hot summer months, it is recommended that transit vehicles be purchased with air conditioning. Additionally, the vehicles should be equipped with Environmental Improvement Packages to minimize noise and air pollution.

In addition to transit buses, the Capital Improvement Program provides for the purchase of three 12-passenger vans for use in elderly and handicapped demand-responsive service. One of the vans should be equipped with wheelchair lifts or ramps.

Fare Boxes

The Capital Improvement Program calls for the purchase of ten fare boxes for installation in the new transit vehicles. These fare boxes should be of the drop, lock-box type with two vaults per unit and with recording registers. Such boxes should provide improved security and record-keeping capability.

Two-Way Radios

Radio equipment is included in the Capital Improvement Program for equipping all new vehicles. Such equipment will help the transit operator improve efficiency, safety and service. Ten radios are called for.

Bus Stop Signs

While the capital costs associated with bus stop signs constitute only a small share of the Capital Improvements Program, their importance cannot be underestimated. If the Midstate Region is to have a transit system with a positive image and growing ridership, facilities which make potential riders aware of the system and how to use it are essential. Over the five-year period covered by the Transit Development Program, it is recommended that 200 new signs be purchased and installed. A large number of signs is necessary since there are no suitable signs in place currently. Each sign should indicate which routes stop at that sign and in key locations, such as downtown stops and shopping centers, the signs should be complemented with an eye-level, plastic-enclosed map and schedule.

Waiting Shelters

Over the five-year period, a total of eight bus shelters are recommended. Shelters should be weatherproof, attractive, and constructed so as to minimize the potential for vandalism. Table VII-2 lists the recommended locations of bus stop shelters by year. In addition, the maps of recommended routes should have shelter locations designated on them.

7.4 IMPLEMENTATION AND PRIORITIES SCHEDULE

Shown in Table VII-3 is the recommended implementation schedule for the Midstate Transit Development Program. Implicitly, this schedule reflects the priorities and values which have been placed on transit by the Citizens Transit Advisory Group and the other public bodies, agencies, and committees that have monitored and advised the TDP Study Team.

Considerable activity, expecially in the capital improvements and marketing area, has been shown for the first and second years. Experience in other systems indicates the value of early and dramatic evidence of transit improvements on transit ridership after a long period of service and patronage decline. High visibility of improvement to the system provides a powerful marketing tool to reattract patrons who have become disenchanted with public transportation. Solid evidence is needed that the picture has been turned around. For this reason, an emphatic thrust of activity for the first two years is recommended to emphasize the high levels and quality of service.

Additional capital needs may appear as experience with the expanded system develops. Such needs will be identified through the monitoring process and may be made part of a capital improvement program in the second 5-year period or introduced sooner if the needs are more immediate. Possible areas of emerging needs are: additional waiting shelters, major terminal shelters at Union Park, a new or expanded garage facility, shop and maintenance equipment, an enlarged spare parts supply, paint and body shop equipment, and service vehicles.

7.5 PATRONAGE, REVENUE AND COST ANALYSIS

7.5.1 Patronage Forecasts

The prediction of future ridership has been accomplished, in this TDP study, through a modeling process that involved surveying the characteristics of transit users and identifying, through the use of socio-economic data, the presence of similar persons and households throughout the geographic area of interest. Transit travel demand on the part of such persons was then estimated by the use of "adjustment factor" curves which related propensity to use transit (trip generation) to transit system level of service and locational characteristics (e.g., service frequency, walking distance to bus line, and distance to nearest central business district). From this process,

TABLE VII-2

WAITING SHELTER LOCATIONS

Year	Location
1	Columbus Plaza Terminal
2	Middlesex Memorial Hospital
3	Stony Crest/Newfield Towers Sbona Towers
4	Long River Village Wesleyan University
5	Woodrow Wilson High School Middlesex Community College

TABLE VII-3

IMPLEMENTATION SCHEDULE

MIDSTATE TRANSIT DEVELOPMENT PROGRAM

YEAR 1

- Establish a Transit District which will bond for and own any capital equipment purchased in the future, contract for the operation of transit services, and obtain federal, state and local subsidies for capital and operating costs remaining after revenues have been applied to costs.

- Hire a Transit District Administrator to initiate and administer various contracts, grant applications, and purchases as approved by the RTD Advisory Board.

- Purchase the following new equipment:

  7 eighteen-passenger transit buses

  3 special elderly and handicapped service vehicles

  7 fare boxes

  3 two-way radios

  100 bus stop signs

  1 waiting shelter

- Design logo and adopt new livery colors for the transit system.

- Institute all routes and schedules recommended by TDP study found acceptable to the Advisory Board acting for the Transit District.

- Establish transit marketing program and information media as described in the following chapter.

- Establish a transit monitoring plan as described in the following chapter.

- Perform additional specialized transit studies as outlined in the on-going transportation Unified Work Program.

TABLE VII-3 (Continued)

YEAR 2

- Purchase the following new equipment:

  3 fare boxes
  7 two-way radios
  1 waiting shelter
  25 bus stop signs

- Expand E&H service in accordance with demand and Advisory Board estimate of justified levels of supply.

- Continue to implement transit marketing and information plan.

- Continue to implement transit monitoring plan.

- Revise and update Transit Development Program as necessary.

- Perform additional specialized transit studies as called for in the on-going transportation Unified Work Program.

YEAR 3

- Purchase the following new equipment:

  2 waiting shelters
  25 bus stop signs

- Continue to implement transit marketing and information plan.

- Continue to implement transit monitoring plan.

- Revise and update Transit Development Program as necessary.

- Perform additional specialized transit studies called for by the transportation Unified Work Program.

TABLE VII-3 (Continued)

YEAR 4

- Purchase the following new equipment:

  2 waiting shelters

  25 bus stop signs

- Continue to implement transit marketing and information plan.

- Continue to implement transit monitoring plan.

- Revise and update Transit Development Program as necessary.

- Perform additional specialized transit studies called for by the transportation Unified Work Program.

YEAR 5

- Purchase the following new equipment:

  2 waiting shelters

  25 bus stop signs

- Continue to implement transit marketing and information plan.

- Continue to implement transit monitoring plan.

- Revise and update Transit Development Program as necessary.

- Perform additional specialized transit studies called for by the transportation Unified Work Program.

it was possible to model the patronage expected on a route-by-route basis. Verification was obtained by comparing present ridership on systems similar to the proposed system to those predicted by the modeling procedure.

The projections of ridership growth were modeled on an "S-curve" which models typical experience in actual similar situations: a rapid rise in ridership in the first years that begins to slow down in later years with more modest increases thereafter. System improvements will initially attract large numbers of transit-dependent riders who will establish a transit riding habit when attractive service levels are implemented. "Non-captive" transit riders are attracted from their alternative modes (e.g., automobiles) in similar numbers over time as they become aware of the system and find it meets some of their travel needs.

Introduction of new equipment and a vigorous marketing and information program will enhance and reinforce the attractiveness of the system. Patronage increases can be expected as users become familiar with the new system and make additional trips to both old and new destinations.

Experience has shown, however, that it takes generally two complete years before a new route reaches its full patronage potential.

Although it is conceivable that a substantial resurgence in transit ridership could occur in the next five years due to an external factor, such as a gasoline shortage, no allowance for such an occurrence was made. Table VII-4 reveals that system patronage would increase about 10 percent in the second year based on a vigorous marketing and information program. Further increases are anticipated in the remaining years of the initial five-year program at a declining rate. Patronage in the fifth year of the Transit Development Program is expected to be approximately 32 percent higher than patronage at the end of the first year. These figures appear not unreasonable and may be conservative based on the experience of Transit Districts in other areas. These patronage forecasts are reflected in the expected annual passenger revenues shown in Table VII-6

7.5.2 Impact of Alternative Fare Structures

The regular route service patronage projections for the recommended program have been developed assuming a fare of $.35 with free transfer privilege and half-fares for elderly, handicapped, and children under 12. This has been done to encourage a return to transit riding by significant numbers of the population. In effect, the implicit goal for the initial period is to maximize ridership, not revenues. It is recommended that this fare level be retained for the initial five-year period to firmly establish ridership habits. If found desirable to reduce public subsidies, or necessary due to inflation, moderate fare increases in the following five-year period could then be instituted without severely reducing transit usage or depressing growth trends.

TABLE VII-4

PATRONAGE FORECAST

MIDSTATE TRANSIT - FIRST FIVE YEARS

YEAR	TOTAL ANNUAL RIDERSHIP	INCREASE FROM PREVIOUS YEAR	PERCENT INCREASE
1	325,620		
2	358,180	32,560	10
3	386,840	28,360	8
4	410,050	23,210	6
5	430,550	20,500	5

An increase in fares would have the effect of increasing revenues, at least in the short run, but of decreasing system ridership. The danger of a fare increase is that it may effect a resumption of the vicious "transit spiral" in which fares are increased and ridership declines repetitively over a period of years.

Table VII-5 presents estimates of the quantitative impacts of alternative fare structures in the Midstate Region. It should be noted that because of half fares for elderly, handicapped and young children, the average fare is not equal to the regular base fare. The figures in Table VII-5 assume an average fare which is 85 percent of the base fare.

- An increase in the base fare to $.40 would reduce the deficit by $7700, but would lose 50 daily riders.

In view of these results, it is recommended that the initial fare structure with a base fare of $.35 be maintained, at least until a positive transit program is well underway in the Region, ideally for the initial five-year period of the TDP. At that time, it would be appropriate to consider a fare increase.

7.5.3 Expense-Revenue Forecasts

Figure VII-9 shows the total costs for the recommended system. Briefly, the total costs are estimated to be approximately $380,744 during the first year of operation. More than half of this cost is directly attributable to labor costs. Figure VII-10 shows the costs for the system broken down by funding source. As shown in Figure VII-9 the City of Middletown is responsible for $67,246 in local subsidy or 17 percent of the total operating cost.

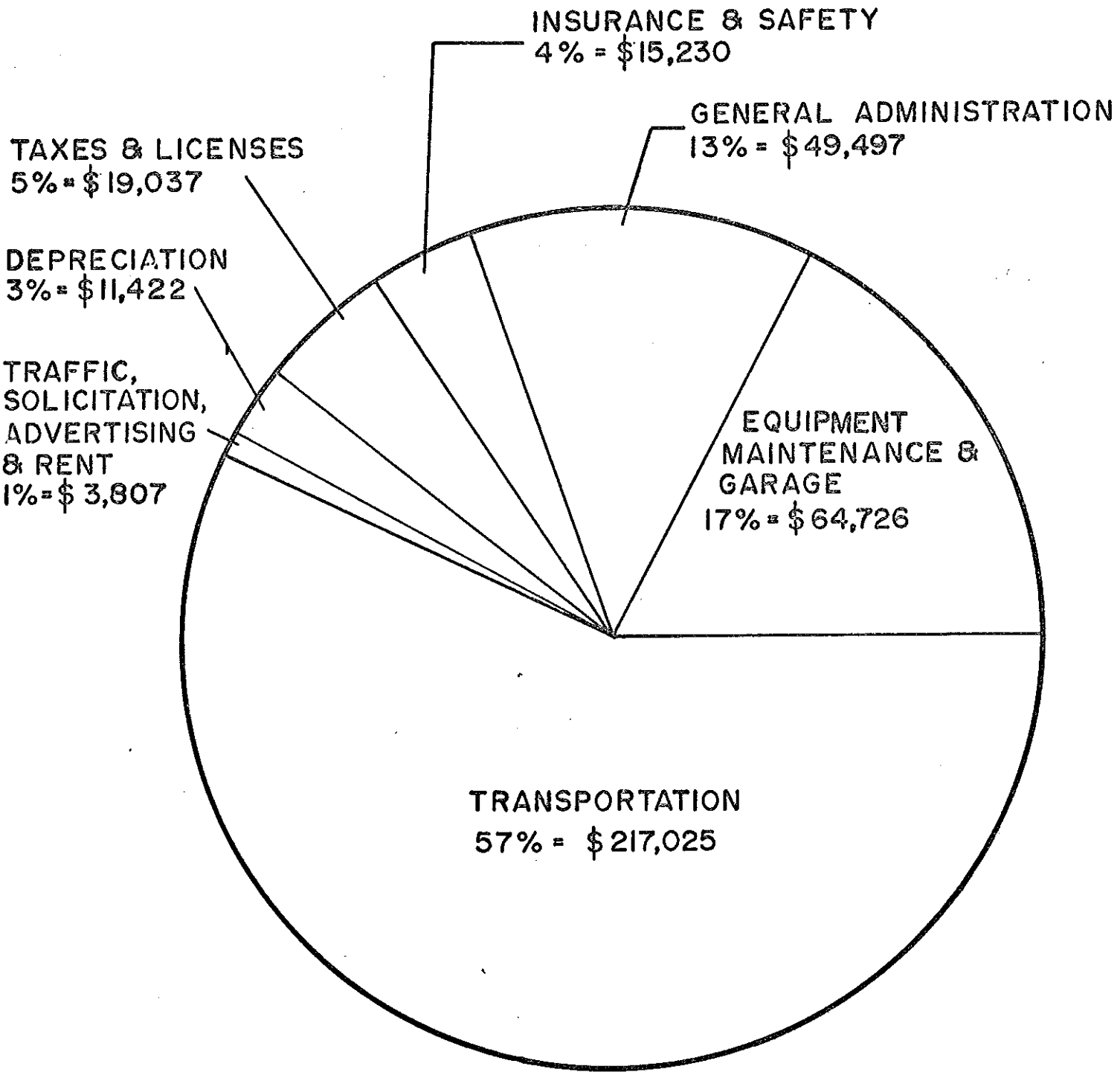
The five-year expense-revenue forecasts of the recommended Transit Development Program are presented by Table VII-6. Similar to revenues and ridership, larger increases in costs are expected in the initial period as the system and level of service are expanded to former levels capable of more adequately servicing regional transit needs and demands. Once established, these levels are not expected to change appreciably over the short term. The rate of increases for expenses is expected to taper off as experience is gained with the revised system permitting service and operating modifications that promote productivity increases which help offset inflationary gains.

In summary, the expense-revenue forecasts indicate that the total annual operating deficit will increase from $270,775 in Year 1 of the TDP to $363,370 in Year 5, an increase of 34 percent.

7.6 POTENTIAL FUNDING SOURCES

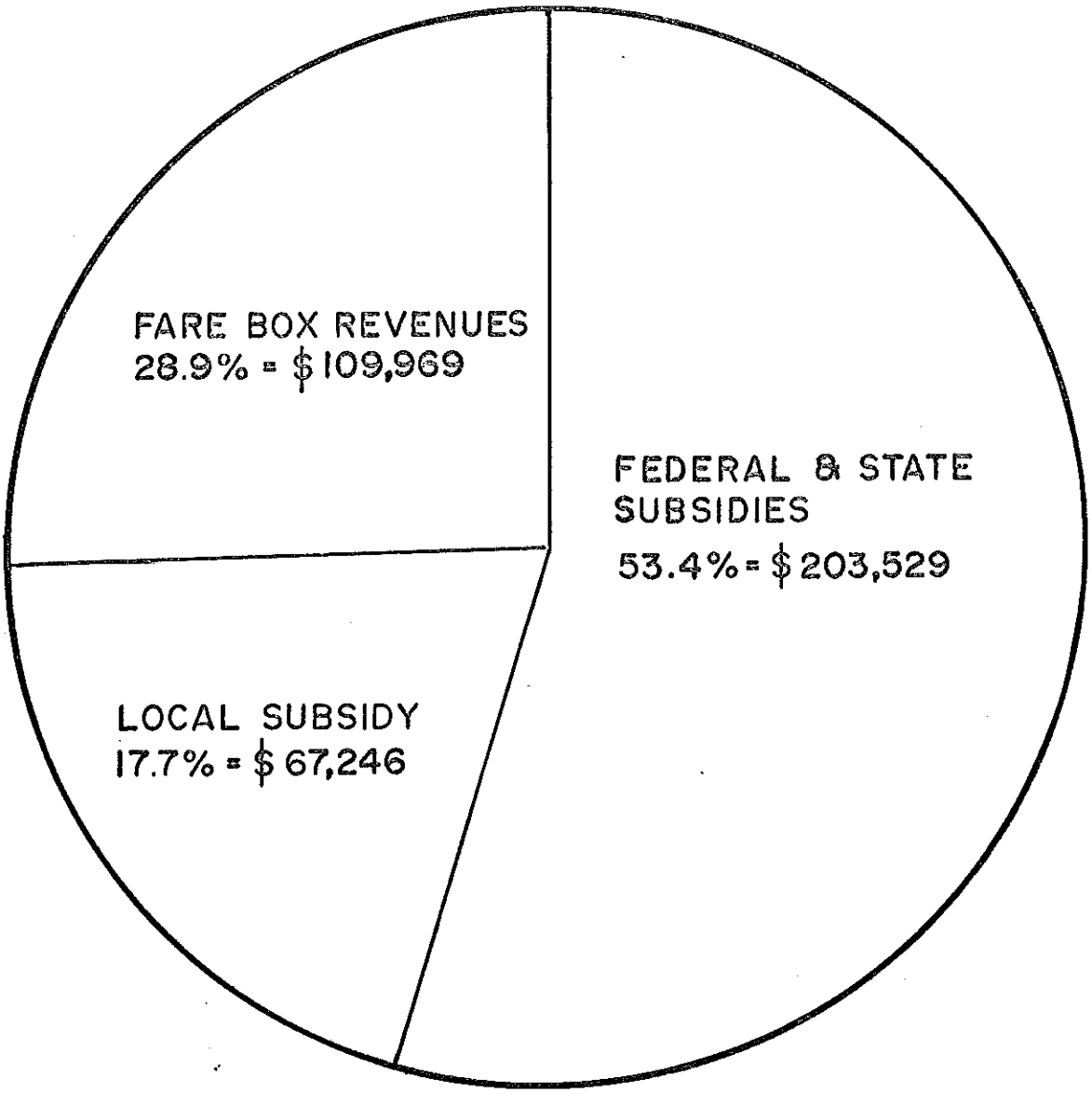
The discussion of potential funding sources is divided into two parts -- capital improvements and operating deficits.

RECOMMENDED SYSTEM
ANNUAL OPERATING COST BREAKDOWN



TOTAL COST = $ 380,744

REGULAR ROUTE AND ELDERLY/HANDICAPPED SYSTEMS COSTS BY FUNDING SOURCE



TOTAL COST = $380,744

TABLE VII-5

SHORT-RANGE IMPACT OF ALTERNATIVE FARES ON REGULAR ROUTE SERVICE PATRONAGE AND REVENUES[1/]

	BASE FARE	
	$.35*	$.40
First Year Average Weekday Ridership	1,050	1,000
First Year Annual Ridership	325,620	310,000
First Year Annual Revenue	97,684	105,400

*Proposed Base Fare

1/ Table based on a fare elasticity of .33. (cf. John F. Curtin, "EFFECT OF FARES ON TRANSIT RIDING", Highway Research Record 213 - Passenger Transportation. (Washington, D.C., Highway Research Board, 1968), pp. 8-20.

TABLE VII-6

FIVE-YEAR EXPENSE REVENUE FORECAST

YEAR	1	2	3	4	5
REVENUES					
Regular Route Service	$ 97,684	$107,454	$116,052	$123,015	$129,165
E&H Special Service	12,285	12,899	13,802	14,906	15,651
TOTAL REVENUE	109,969	120,353	129,854	137,921	144,816
EXPENSES					
Regular Route Costs	340,704	374,774	404,756	433,089	454,743
E&H Service Costs	40,040	44,044	47,568	50,898	53,443
TOTAL COSTS	380,744	418,818	452,324	483,987	508,186
DEFICIT	270,775	298,465	322,470	346,066	363,370
STATE AND FEDERAL SUBSIDY	203,529	224,188	242,186	259,650	272,634
LOCAL SHARES	67,246	74,277	80,283	86,415	90,736

7.6.1 Capital Improvements

Under the Urban Mass Transportation Act of 1964, Section 3, the federal government, via the Urban Mass Transportation Administration, will provide financial assistance to public agencies in providing capital facilities and equipment for use in public transportation service in urban areas. Eligible facilities and equipment include land, buses, other rolling stock, and other real or personal property required for an efficient and coordinated mass transportation system. Equipment which is used exclusively for the provision of contract school bus service or charter service is not eligible for federal assistance. As amended by the Federal Aid Highway Act of 1963, federal participation in the capital costs of eligible transit facilities and equipment may be up to 80 percent of the total costs provided ". . . the regular program planning requirements are met." (1) The anticipated federal share of the recommended Capital Improvement Program for the Midstate Region is based on full 80 percent participation.

The remaining 20 percent share for capital improvements and purchases is an obligation of the state's local communities who are members of a regional Transit District receiving service. Under Connecticut's current funding policy, the State provides all of the additional capital funding requirements if funds are available, if capital expenditures are recommended in an acceptable transportation plan, and if operating funds are assured for a five-year period.

7.6.2 Operating Deficits

Urban Mass Transportation Administration (UMTA) Operating Assistance grants are available under Section 5 of the 1974 Mass Transportation Act. The Federal Register of January 13, 1975 contains regulations for their apportionment and disbursement. Connecticut has had set aside $62.3 million to be apportioned to its urban areas over a six-year period, 1975-80. There are separate amounts for cities over 200,000 population and for cities under 200,000 population.

In the Meriden/Middletown urbanized area, there is presently $548,067 of Section 5 funding available for use. Additional matching funds are available from the State's transportation fund. In the Meriden/Middletown urbanized area, there are $463,252 of state matching funds available for use during FY 1979. Through 1980, there is approximately 1.9 million dollars of available Section 5 funding and an equivalent amount of state funding available for transit operating assistance.

7.7 SOCIO-ECONOMIC/ENVIRONMENTAL ASSESSMENT

Purpose

The purpose of this section is to assess and evaluate the socio-economic and environmental impacts of the various transit alternatives. The areas in which impacts are expected, on the basis of the effects of similar actions under similar conditions elsewhere, are the following:

- Social
- Economic
- Environmental

Social

Community Cohesion and Stability. -- Transit systems have frequently promoted a greater degree of community cohesion and stability through a number of characteristics. Among them:

- Transit's propensity to reduce automobile traffic volumes on urban residential streets generates more neighboring activities across the street. Research has revealed that cross-street neighboring is more intensive at the lower traffic volumes (about 5,000 vehicles per day) and decreases to negligibility as volumes approach 20,000 average daily traffic.(1)

- Transit lines are reasonably permanent transportation corridors which represent long-term positive features of accessibility for residents locating along or near such lines. These features contribute positively to residential satisfaction, quality of life, and property values. The same cannot be said concerning automobile travel corridors which are subject to extensive change as new facilities cause diversion of traffic onto little used streets and off others which become less heavily used due to bypassing.

- Transit enhances community cohesion and stability by bettering access to community facilities (e.g. schools, parks, recreation, health, medical, and social centers) for their predominant users: the very young, the elderly and lower income persons who typically do not enjoy full access to automobile transportation to reach such locations. The current TDP proposals represent an effort to provide greater access between residential areas and community facilities for these transit-dependent groups.

- Linkages between neighborhoods themselves are improved by the proposed transit routings which will bring areas of Middletown, Portland and Cromwell within a few minutes' bus ride of each other. Friends and relatives will find social inter-communcation facilitated by the proposed arrangements, if implemented.

Mobility improvement - Non-car owners represent 12 percent of the households in Middletown, Portland and Cromwell. In actual numbers, this means 2,282 out of 19,541 households in the three communities are reliant on other means than the automobile for mobility. In essence, 12 percent of the households in Middletown, Portland and Cromwell, are in need of transit services to get to jobs, school, shopping, medical appointments, and other essential destinations in addition to social and recreational trips.

Improved transit service will increase the mobility offered the non-auto-owning households and more specifically these segments of the population typically in need of such services due to lack of good access to automobile transportation:

- Elderly: Those over age 60 total 7,736 persons in Middletown, Portland and Cromwell, 13 percent of the total population of 61,166.

- Handicapped: Those having mental or physical disabilities total about 2,450 persons in Middletown Portland and Cromwell or four percent of the population.

- School-age children: Children 10-16 years of age total 5,950 of Middletown, Portland, and Cromwell's residents, or 10 percent of the three communities' total population. (When summed, elderly and children comprise 23 percent of the three communities' population: nearly one-quarter of the population is thus potentially transit dependent on the basis of age alone.)

- Low income: Poverty level households totaled 7,285 out of 19,541 households in Middletown, Portland and Cromwell. This represents 37 percent of all households and about 22,803 persons.

The transit system route improvements proposed in this report were specifically designed to link residential areas in Middletown, Portland, and Cromwell with the major employment, shopping and activity centers in each community for greater accessibility by those lacking in mobility by automobile.

Safety -- Greater travel safety is promoted by an attractive transit system that diverts significant numbers of persons

from automobile for trip-making. Nationally, the accident rate on transit vehicles is about 0.13 passenger fatalities per 100 million passenger miles. On the other hand, the passenger death rate for automobile users is approximately 2.1 per 100 million passenger miles. Hence, bus users are 16 times safer from fatal injury in a transit vehicle than he or she would be as passengers in a private automobile.

Economic

Employment and income -- Transit provides two major benefits in the area of employment and income: jobs in the transit industry and access to employment opportunities.

A new transit operation supported by state and Federal financial assistance would raise the amount of income going to local residents employed in the transit industry by approximately $250,000 in the first year of improved service. This would represent an infusion of money into the regional economy and provide a boost to employment, retail sales and other sectors of the economy. Other expenditures generated by the transit operation would go to local suppliers of goods and services used in system operation and maintenance. The effect of these disbursements would be increased by "multiplier effect" representing second and third round outlays in the cash flow cycle.

The second likely income and employment impact arises from the accessibility afforded to work places by an improved transit system. The proposals for routes and schedules made in this report have been responsive to this need in attempting to provide access to major employment centers on schedules that will facilitate commuting and job seeking. Not only is an improved employment picture a possible result but that portion of income labeled "discretionary" may increase for transit users as the cost of using transit will probably be less than the cost of automobile operation for the commuter trip. (Compare, for example, a round trip by transit at the proposed fare: 70¢ per day, versus a 5-mile commute by automobile at the average operating cost of $.15/mile round trip, 10 miles x $.15 equals $1.50 -- about 2 times the transit cost). Some families may be able to dispense with a second car for a considerable savings at the average annual cost of operation of about $1,600 per year.(2)

Economic growth -- Transportation often has a positive impact on land development due to the improvement in accessibility it provides. Transit-related residential development typically concentrates along streets containing bus lines. Due to the high capacity of the transit system, higher population densities can be accommodated without producing extreme street congestion. In fact, high density is complementary to transit in promoting the higher ridership levels transit needs for greater economic viability from fare-box revenues.

Improved transit may provide a spur to in-town housing development in the form of high-rise and garden apartments and town-house clusters. Because such housing types often produce more tax revenues than they require as expenditures for services, they produce a net tax surplus, to the jurisdiction's advantage.

Shopping accessibility will be improved by the proposed route configurations and scheduling. Additional shopping centers are served and, often, served more directly, via a bus loop into the center itself. The Downtown business district of Middletown, forming the focus of all bus routes will enjoy a particular advantage in terms of access to shoppers. Being the transfer point between lines adds to the advantage in that transferring riders often pause to shop between buses; a process facilitated by more frequent schedules. All shopping centers should enjoy patronage and sales increases from the access improvement and the increased discretionary income of transit users previously discussed.

Employment centers sometimes develop in response to transit access, especially where the desire is to attract hourly wage workers, a group that typically utilizes transit to a greater degree than other employees. There may be added impetus to employers to locate in transit-accessible sites for the above reason as well as to hedge against future energy shortages which could cause remote sites capable of being reached only by automobile to become relatively less accessible to some employees.

Regional and community plans -- Such plans as exist were taken into account in the formulation of the Transit Development Program with the intent that transportation reinforce proposed land use goals and patterns and support their implementation. To the extent possible, this has been achieved through proposing a "blanket" transit system that provides a high level of service to a majority of residential, commercial, and industrial areas, community facilities, and institutions and other activity centers.

Revenues and expenditures -- While public transportation improvement costs under the various improvement proposals will cause a rise in public expenditures, the returns from the relatively modest expenditures appear to justify the outlays.

For example, under the recommended system, the local expenditures amount to $67,246 in the first year. For this amount, it is possible to leverage the following benefits which can cycle back to taxing jurisdictions in the form of increased revenues:

- Federal and state revenue sharing funds in the form of transit operating subsidies (an estimated $203,529,).

- Potential tax-productive growth in residential, commercial and industrial development with positive impacts also in the construction industry, and in overall employment and income levels.

- Employment and income increases in the transit industry and for its suppliers. Higher sales and income will eventually be reflected in land values.

- Reduction in parking demand permitting present and potential parking to be put to more tax-productive uses.

Complementary transportation links -- Under an improved transit system, potential will exist for more timely and convenient linkages to long distance transportation services; namely, the inter-city bus carriers. Local bus stops within walking distance of the inter-city bus depots are proposed which will make transfers from one system to another easy and increase ridership on both systems with correlated revenue gains.

Consumer benefits. Consumers of transit service will accrue financial gains in the form of cost savings under what they would pay to utilize an automobile for the same trip. As shown by the previous example, the transit user, assuming an average trip length of 5 miles, will pay $.35 per trip, or $.07 per mile (actually less considering some fares are half-fares, the average fare comes to about $.28 or $.05/mile). These savings, averaging $.08 to $.10 per mile (or $.40 to $.50 per trip) under the cost of owning and operating an automobile, provide cost savings to all first year users of the pro-proposed full system between $130,248 and $162,810 per year.

True, a subsidy is involved that causes the actual cost of public transportation to be more nearly equivalent to the cost of auto usage on a passenger mile basis: $.72 per passenger mile, transit vs. $.77 per passenger mile, auto, counting driver time (@ $2.00/hour) and operating costs (@$.15/mile). For the amount of the subsidy, a social goal is fulfilled: many persons are provided with mobility who cannot use and/or afford to use an automobile providing them with fuller participation in community economic and social life that would otherwise be lacking.

The consumer benefit of lower transportation costs become a commuter economic benefit as the savings are spent in other sectors of the economy, often providing more buying power to those on fixed or low incomes.

A second consumer benefit arises from the fact that many transit users, without that option, would be transported by private automobile or taxi in numbers that would increase roadway volumes and congestion with concomitant costs in added operating time, and accident costs. An estimated 215,867 vehicle miles traveled (VMT) will be avoided in this manner in the first year of operation of the new system.

Energy and resource conservation -- As ridership grows over the years, the fuel consumption of the improved transit system will become increasingly efficient as load factors increase. As shown by Figure VII-11, passenger miles per gallon of gasoline have been estimated for a standard automobile as 15 MPG with the nationwide average of 1.5 passengers. Passenger miles per gallon by a transit bus with these occupancies (passengers per vehicle mile) have been estimated: (3)

Bus Occupancy	Passenger Miles per Gallon
3.0	11
5.0	19
7.0	25
9.0*	29
11.0	40

*Average occupancy of U.S. transit bus.

As average bus occupancy approaches the U.S. average, the energy savings benefit over the automobile is almost doubled.

As predicted shortages grow, and energy prices escalate, there will be a larger role for transit to play in promoting energy-efficient travel and providing alternative transportation for those who find gasoline too expensive or difficult to obtain. Communities with a well-developed transit operation in place will have an advantage over those which have let their service decline or expire.

Other resource savings are possible from transit:

- In that transit tends to encourage concentration of urban development, pressures for building on agricultural, open space and conservation lands are reduced.

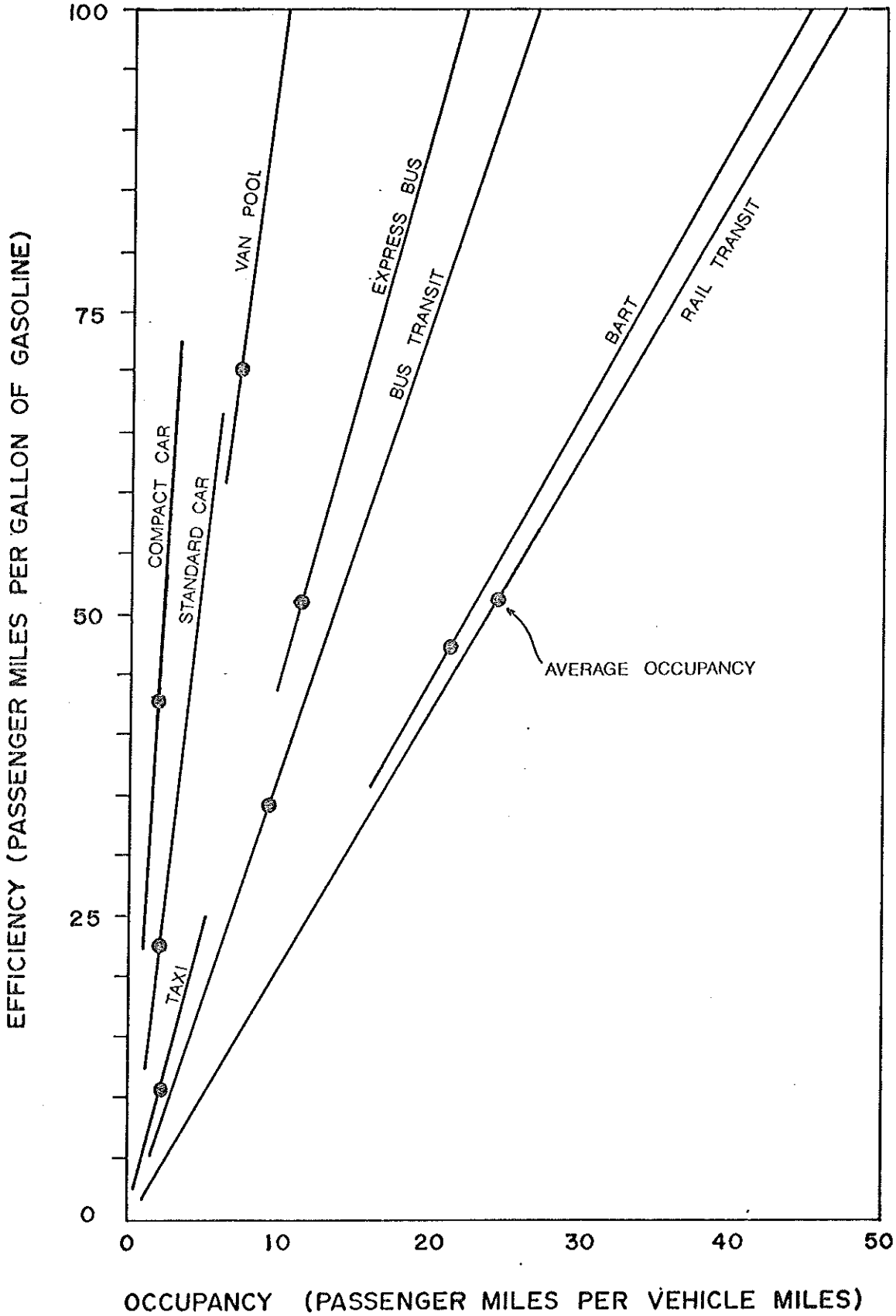
- Reducing the necessity to own a second car (or even a first in some cases) transit promotes the conservation of resources that would go into the fabrication and operation of such vehicles.

Environmental

Air Pollution -- Use of transit tends to reduce air pollution levels. Table VII-7 shows the amounts of exhaust emissions produced by automobiles and buses per vehicle mile.

FIGURE VII-11

ENERGY EFFICIENCIES OF URBAN PASSENGER MODES BY OCCUPANCY



SOURCE: McChesney, Don and Alan M. Voorhees, "Energy Efficiencies of Urban Passenger Transportation," AMV Tech Notes, Vol. 1, No. 15, June 1, 1974.

TABLE VII-7

EXHAUST EMISSION FACTORS FOR VARIOUS TRAVEL MODES

GRAMS PER VEHICLE MILE

1972

(Preliminary)

POLLUTANT	AUTO[1]	DIESEL BUS[2]
Carbon Monoxide (CO)	85.00	20.41
Hydrocarbons (DC)	9.50	3.36
Nitrogen Oxides (NO_x)	6.17	33.57
Sulfur Oxides (SO_x)	.18	2.45
Particulates	.30	1.18

1/ 1972 emission factors, based on 25 MPH and cold start operation.

2/ Based on fuel consumption estimate of 5 miles/gallon.

SOURCE: U.S. Environmental Protection Agency, Compilation of Air Pollutant Emission Factors, Revised, February, 1972, and Institute for Defense Analysis, Economic Characteristics of the Urban Public Transportation Industry, February, 1972, as prepared for Urban Mass Transportation Administration by PRC Systems Sciences Company and Alan M. Voorhees and Associates, Inc., "Development of an Air Pollution Generating Model (APGM) for Transit Systems," Draft, July, 1972, as synthesized in Bellomo, Salvatore J., "Providing for Air Quality and Urban Mobility," a paper presented to Highway Research Board Meeting, July-August, 1972.

If we assume a peak hour bus with 20 commuters aboard who formerly drove their automobiles, Table VII-8 shows the amounts of air pollution that would be avoided by those persons shifting to the bus as their travel mode. As can be seen from the table, the air quality gains achievable by shifting travelers from auto to bus are considerable, especially for carbon monoxide, oxides of nitrogen and hydrocarbons.

Conclusions

Based on the preceding assessments, the following conclusions can be drawn:

- Implementation of a Transit System in the Midstate Region will significantly improve the quality of life by improving access to the Region's community facilities, retail and employment opportunities. Greatest impact will be felt by those residents with mobility deficiencies.

- A transit system in the Region would provide a "shot in the arm" to its economy through increases in income (directly through salaries and indirectly through lower transportation costs), improved accessibility to retail and employment opportunities and increases in jobs associated with the new industry.

- Increased use of public mass transportation would have a significant impact on the amounts of air pollution present, particularly within the urban areas.

TABLE VII-8

AIR POLLUTION COMPARISON

TWENTY COMMUTERS BY AUTOMOBILE AND BUS

GRAMS PER VEHICLE MILE

POLLUTANT	Twenty Autos	One Diesel Bus	Difference
CO	1700.00	20.41	1679.59
HC	190.00	3.36	186.64
NO_x	123.40	33.57	89.83
SO_x	3.60	2.45	1.15
Particulates	6.00	1.18	4.82

SOURCE: Calculation based on Bellomo, Salvatore,J., "Providing For Air Quality and Urban Mobility," a paper presented to Highway Research Board Meeting, July-August, 1972.

VIII. TRANSIT MONITORING AND MARKETING PLAN

8.1 SYSTEMS MONITORING

Objectives of a Monitoring Plan

There are two primary objectives of the transit monitoring plan for the Midstate Region. First, it should provide the data and information necessary to assess system performance; i.e., determine how well the system is satisfying the goals set for public transportation in the Region. Because these goals are likely to change over time and shift in emphasis, it should be recognized that a monitoring plan will require periodic revision. Second, a plan should provide the data necessary to conduct public transportation planning at various levels of detail and for various time frames. These levels may be defined as follows:

- Operations Planning. It is at this level of planning that the day-to-day modifications and improvements in public transportation service must be planned. Scheduling, exact routing of service, and fare level charges fall within operations planning. For the most part, planning at this level tends to be reactive rather than prescriptive. The transit operating agency should be responsible for Operations Planning.

- Short-Range Planning. The scope of short-range planning is generally limited to those projects or new services which can be implemented within a five-year period. The planning of new route services or of new special transit services would be appropriate at this level. Also, the detailed planning of programs or services which are part of a long-range plan would be conducted as part of short-range planning. The Midstate Regional Planning Agency (MRPA) working closely with community planning departments and the transit operating agency should be responsible for short-range transit planning.

- Long-Range Planning. Long-range public transportation planning must be conducted in concert with long-range land use and long-range multimodal transportation planning. At this level, the plans for major modifications or improvements in public transportation service are studied and developed. The Midstate Regional Planning Agency, with assistance from community planning departments, should be responsible for conducting long-range transit planning.

Recommended Monitoring Techniques

Described below are the public transportation monitoring techniques which are recommended for the Midstate Region. Taken together, these techniques form the recommended monitoring plan.

- Compilation of Transit Operating Data. To evaluate the performance of public transportation systems and to plan for new systems, complete, accessible, and understandable operating records are essential. Although the operating records which have been kept by transit companies are usually quite extensive, they often omit data which would be especially useful in planning and evaluation. Specifically, the continuous compilation of operating data by the transit operating agency should include, at a minimum:

  - System revenues by type (e.g., regular route service, charter, special services, etc.

  - System costs by category (e.g. maintenance fuel, labor, etc.) and type of operation.

  - Estimated system ridership by category showing daily, monthly, and annual fluctuations.

  - Revenues, ridership levels, and marginal operating costs by route and for special transit services.

  - Inventory and location of all bus stops, benches, and shelters.

  - Complete description of all routes and services provided, including exact routing, frequency and time of service, equipment used, and any special features which may be significant.

  It is important that this information not only be routinely compiled, but also that it be maintained in a usable and easily understood format. This is especially necessary because the agencies responsible for short- and long-range transit planning are often not the agencies operating public transportation services.

- On-Board Passenger Surveys. A systemwide, comprehensive, on-board passenger survey is recommended and should be performed every four years. Such a survey, which gathers both socio-economic information and origin-destination data, is needed for short- and long-range planning as well as for system performance evaluations. In addition to systemwide, comprehensive surveys, specialized on-board surveys which are limited in scope, may be appropriate on either a more frequent basis or on a one-time basis for operations planning. Examples of such specialized surveys are as follows:

  - Attitudinal Surveys -- Attitudinal surveys are effective for gauging the response or potential response of system users to fare changes, passenger amenities, schedule changes, or new services. Depending on the objective of the survey, it may be possible to conduct attitudinal surveys on selected services or on a system-wide basis with a well constructed sample to reduce costs. Although it may be desirable to repeat a specific attitudinal survey on a regular basis to measure broadly defined transit attitudes, these surveys are generally related to specific system modifications and, therefore, tend to be one-time surveys.

- Interviews with Citizen Groups, Social Agencies, and Business Organizations -- At the outset of a short-range transit planning program, a series of interviews should be conducted with pertinent citizen groups, social agencies, and business organizations. Such interviews are especially useful in identifying appropriate special services for the transit-dependent and estimating the probable usage of such services. After an initial round of interviews, an advisory group comprised of MRPA, community planning department and transit operating agency representatives should continue to meet with these groups formally at least once a year. These meetings will provide information of use in the continuing short-range transit planning process as well as operations planning and, moreover, will provide information needed in evaluating system performance. In addition to the formal meetings, the advisory group members should strive to maintain a good working relationship with these various organizations. Although usually qualitative in nature, interviews and informal contact with local organizations provide a fast and economical way to obtain valuable planning and evaluation data.

- Passenger Load Counts by Route -- At least once a year the transit operating agency should obtain passenger load counts for every route in the system. These load counts involve recording bus loads on a particular route every time a bus passes or leaves specified points on the route. As a minimum, load counts should be made for one complete work day; however, it is preferable to obtain load counts over a one-week period to show fluctuations in passenger loads by day of the week. In addition, it may be desired to perform load counts on a seasonal basis (i.e. school versus summer vacation) for comparative and planning purposes. Load counts are required to conduct economic evaluations of existing routes and to plan route modifications.

- Socio-Economic Surveys -- Since the possible goals of public transportation are related to the socio-economic characteristics of system ridership, a system-wide on-board survey obtaining only socio-economic data can be a useful tool in measuring system performance. By omitting questions relating to exact origin and destination, considerable savings can be achieved in the cost of survey coding.

- Route or Subarea Surveys -- As a prelude to modifying or introducing a new service or as a means of evaluating a specific service, an on-board survey with limited geographic coverage may be appropriate. Such surveys can be performed quickly and economically. These surveys might obtain a combination of origin-destination, socio-economic and attitudinal data.

  In general, the specialized surveys would be responding to operations or short-range planning needs. Therefore, the transit operating agency and MRPA should be responsible jointly for conducting these surveys. The comprehensive on-board survey is an essential element in the data collection for long-range transportation planning. Therefore, the MRPA should assume responsibility for the designing and probable funding of this type of survey. Close liaison should be maintained with community planning departments for technical and manpower assistance.

- Telephone, Mail-Out, or Home Interview Surveys -- The primary deficiency of on-board surveys is that they obtain information about current system users only. Techniques to obtain data relating to system users and

non-users include telephone surveys, mail-out surveys, and home interview surveys. Surveys of this type have potential applications in transit operations planning or in short-range transit planning when limited in scope. A well-designed telephone survey to a specific geographic sub-area, for example, can be used to identify transportation needs and latent demand. Additionally, this survey can provide information relevant to system evaluation. Generally, these surveys with limited scope should be performed by the transit operating agency on an "as needed" basis.

- Inventory of Land Use and Land Activity Data -- The need for inventories of existing and forecasted land use and activity for long-range transportation planning is well recognized. The MRPA, which conducts the long-range transportation planning for the Region, and community planning, should be responsible for maintaining these inventories which typically include such things as:

  - Existing and forecasted population distributions
  - Existing and forecasted employment distribution
  - Existing and forecasted residential densities
  - Zoning regulations
  - Regional economic forecasts
  - Existing and forecasted land use

  For operations and short-range planning, the transit operating agency should monitor new developments and land use changes which will occur within five years. New apartment complexes, industrial parks, and shopping centers can create shifts in transit needs and demands which will require new public transportation services or modifications of existing services. Periodic reviews of building permit applications, zoning hearing transcripts, or often just local newspapers can keep the transit operating agency attuned to pending changes in land use.

- Inventory of Multimodal Transportation Data -- For short- and long-range transit planning, it is obviously necessary to obtain data relative to other transportation modes. In the Midstate Region, other transportation modes reduce down to highways and the private automobile, with limited interregional bus service. Necessary data pertaining to highway systems include:

  - Existing highway facilities (capacity, traffic volumes, travel times, etc.)

- Planned or committed future highway facilities (planned routing and capacity, forecasted traffic volume, implementation schedule).

- Existing and anticipated automobile ownership rates.

- Existing and future parking availability.

Like land use data, the responsibility to maintain transportation data for modes other than transit should reside with an agency other than the transit operating agency. However, the data should be maintained in a form which is readily accessible to the staff of the transit operating agency.

Of a more immediate nature, the transit operating agency should continuously monitor the status of highway improvements, TOPICS work, and other on-going projects modifying the existing highway and traffic system. This monitoring is necessary because such modifications can affect existing transit routes and schedules. Informal working relationships between the transit operating agency, Connecticut DOT, and community engineers should provide the means to conduct appropriate monitoring.

- Surveillance of Transit Technology -- For both short- and long-range transit planning, there should be a continuous surveillance of transit technology. The MRPA should focus its surveillance activities on such things as new line-haul transit systems, people mover systems, and other new concepts in public transportation. More mundane, but equally important, are the surveillance activities which should be conducted by the transit operating agency. It should focus on monitoring available transit vehicles and support equipment so that it can make informed decisions when determining new equipment needs and making purchases.

To summarize the transit monitoring plan, Tables VIII-1 and VIII-2 were prepared. Table VIII-1 indicates the responsible agency and recommended frequency for each monitoring technique in the plan. Table VIII-2 summarizes the primary objectives of each recommended monitoring technique.

8.2 PROGRAM UPDATE PROCEDURE

The interface between transit operations planning and short-range transit planning is the annual update of the Transit Development Program. As indicated in the previous section on monitoring

TABLE III-1

RECOMMENDED MONITORING TECHNIQUES --
RESPONSIBLE AGENCY AND RECOMMENDED FREQUENCY

Monitoring Technique	Responsible Agency*	Recommended Frequency
1. Compilation of Transit Operating Data	TOA	Continuously
2. On-Board Passenger Surveys		
Comprehensive Surveys	MRPA and CPD	4 Years
Attitudinal Surveys	TOA and MRPA	As Needed
Socio-Economic Surveys	TOA, MRPA and CPD	As Needed
3. Telephone, Mail-out or Home Interview Surveys		
Regional Surveys	MRPA	5-10 Years
Subarea Surveys	RTA, MRPA and CPD	As Needed
4. Interviews with Citizen Groups, Social Agencies and Business Organizations	MRPA, CPD, TOA	Annually
5. Passenger Load Counts by Route	TOA	Annually
6. Inventory of Land Use and Activity	MRPA, CPD	Continuously
7. Inventory of Multi-Modal Transportation Data	MRPA and CONN. DOT	Continuously
8. Surveillance of Transit Technology	MRPA, TOA	Continuously

* TOA - Transit Operating Agency
CPD - Community Planning Departments
MRPA - Midstate Regional Planning Agency
CONN. DOT - Connecticut Department of Transportation

TABLE VIII-2

PRIMARY OBJECTIVES OF RECOMMENDED MONITORING TECHNIQUES

	System Evaluation	Public Transportation Planning		
		Operations	Short-Range	Long-Range
1. Compilation of Transit Operating Data	x	x	x	
2. On-Board Passenger Surveys				
Comprehensive Surveys			x	x
Attitudinal Surveys	x	x		
Socio-economic Surveys	x	x		
Subarea Surveys		x	x	
3. Telephone, Mail-Out, or Home Interview Surveys				
Regional Surveys	x			x
Subarea Surveys	x	x	x	
4. Interviews with Citizen Groups, Social Agencies, and Business Organizations	x		x	
5. Passenger Load Counts by Route		x	x	
6. Inventory of Land Use and Activity			x	x
7. Inventory of Multi-Modal Transportation Data			x	x
8. Surveillance of Transit Technology			x	x

techniques, the transit operating agency should assume responsibility for operations planning while the MRPA should assume general responsibility for short- and long-range transit planning. Thus, the update procedure for the Transit Development Program must involve both the transit operating agency and MRPA. Overall responsibility for conducting the update, however, should reside with the transit operating agency since it will be the agency's responsibility to implement the Program.

To update the Program each year in sufficient time to be included in local fiscal year budgets, the following steps are recommended:

- A thorough evaluation of each existing route or service should be conducted by transit operating agency staff by December 1 of each year. This evaluation should examine each service from economic and social standpoints and identify the relationship of each service to the Region's overall transportation system.

- A re-evaluation of each scheduled component of the existing Transit Development Program in light of recent information and experience should be conducted by MRPA staff by December 1 of each year.

- By January 1 of each year, transit operating agency staff assisted by MRPA staff, should prepare an initial draft of the Program Update.

- Approval of the updated Program by the transit operating agency should occur by February 1 of each year.

- By March 1 of each year, the updated Program should be submitted to, and receive the approval of MRPA, the local A-95 review agency.

8.3 MARKETING AND INFORMATION PLAN

As revenues and patronage dropped dramatically in the years following World War II, private transit operators throughout the country eliminated many non-operating activities and expenses in an effort to remain profitable. Unfortunately, these cutbacks all too frequently included the elimination or severe reduction of basic marketing and promotional activities. Such has been the case in Fitchburg and Leominster, where printed schedules and route maps do not exist on a wide-scale basis. The overall reduction in marketing activities has tended to reinforce the downward

spiral of transit usage in the United States. It is now generally recognized, however, that a marketing and information plan is an essential element of a Transit Development Program. Without such a plan and its vigorous implementation, the success of the entire program is severely endangered. Accordingly, the five-year program is severely endangered. Accordingly, the five-year expense revenue forecasts for the Transit Development Program were developed with the provision for a substantial financial commitment to marketing activities. This section will describe the objectives which a marketing and information plan should achieve in the Midstate Region and the recommended elements of the plan.

Objectives of the Marketing and Information Plan

There are three primary interrelated objectives of a transit marketing and information plan. These are as follows:

- The plan must achieve and maintain a continuous public awareness of public transportation services in the Region (see Figure VIII-1). If the residents of the Region are to utilize transit services in increasing numbers, they must be aware that alternatives to the private automobile or to the taxi do exist. Further, they must be encouraged to view public transit as an alternative transport mode for their use, not solely for the use of others. The plan must demonstrate that many preconceptions about transit service are unfounded.

- The plan must disseminate information so that the residents of the Region and visitors can easily learn how to use the public transportation system. They must be able to determine quickly and accurately what the general system characteristics are; what services are particularly relevant to their travel patterns; what the fares are; how to transfer from one route to another; and importantly, how to find additional information about the system. It must be recognized that this information should be directed to long-time residents, new residents, and visitors, which may require that different approaches be used for each group.

- The plan must develop and maintain public support for the transit system. This support should manifest itself in actions and activities which go beyond the political arena, although this is a most

FIGURE VIII - 1

Public Awareness Visual Aid

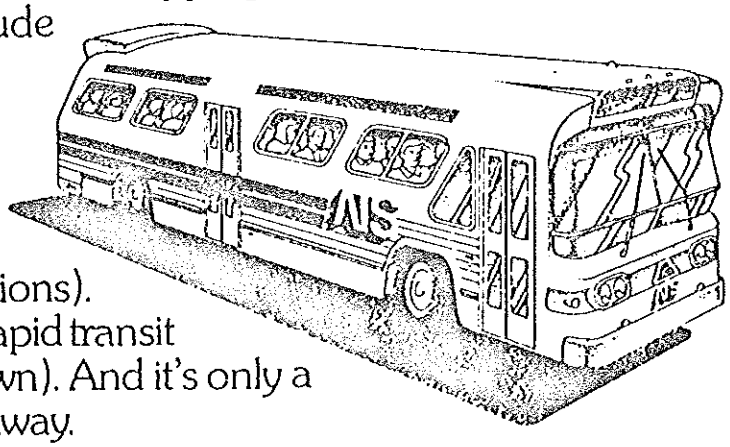
Rapid Transit, only a bus stop away.

There's nothing slow about (Anytown Transit System) when it comes to keeping up with the growing transportation needs of (Anytown). We're right on schedule—supplying the latest equipment and the best service.

Recently we've added (nine) new streamlined, air-conditioned buses. Each bus has comfortable, modern seats.

More comfort and better service, too. (ATS) has added a new route to (Anytown Mall.) And we are continually providing better service to areas that need and use buses the most.

But we're not stopping while we're ahead. Future plans include (new bus stop shelters and benches in strategic locations). (ATS) is rapid transit in (Anytown). And it's only a bus stop away.



Call (000-000) for route and schedule information.

Anytown Transit System

ATS

SOURCE: PREPARED FOR URBAN MASS TRANSPORTATION ADMINISTRATION & GEORGIA DEPARTMENT OF TRANSPORTATION BY ALAN M. VOORHEES & ASSOCIATES

significant aspect of such support. It should encourage the involvement of community groups by developing a continuing dialogue which ultimately leads to ongoing transit planning which is genuinely responsive to the Region's needs.

Public Information Element

The public information element of the plan is directed at the first two objectives -- creating a transit awareness and providing sufficient information so that potential users can easily learn how to use the system. The following techniques are recommended for the Midstate Region:

- System Logo and Color Scheme -- At the earliest possible date, the public transit agency should develop an easily distinguishable logo (Figure VIII-1) and color scheme. This can serve to give the system a new identity and is an important step in providing the image of a service that is modern and desirable. Attractive and well-maintained transit vehicles offer an effective means of marketing if properly used.

- Bus Stops, Benches, and Shelters -- Included in the recommended Capital Improvement Program are significant numbers of bus stop signs, benches, and shelters to be installed over the five-year period. Bus stop signs should, utilizing simple graphics, display a bold system logo or bus symbol which is distinguishable from at least one-half block. Each sign should also indicate the routes or services which stop at that point, and ideally should be complemented with an eye-level plastic-enclosed system map. Shelters and benches not only provide valuable service improvements to system users, but also will do much toward demonstrating that the transit system is striving to improve service.

- Printed Schedules and Route Maps -- Easily understandable and preferably color-coded route maps and schedules should be devised and well distributed (Figure VIII-2). They should be readily available at news stands, drug stores, service stations, stores, banks, and at shelters. Periodic distribution by mail should be considered. (The community water bill may be an excellent mechanism.) Route maps should be posted in every bus, at shelters, and at major bus stops.

ansit Route Map and Schedul Layout

Fold

10 Tift Park

To Anytown

AM				
4 56	5 00	5 04	5 17	5 35
5 30	5 34	5 38	5 51	6 09
5 50	5 54	5 58	6 11	6 29
6 10	6 14	6 18	6 31	6 49
6 21	6 25	6 29	6 42	7 00 A
6 25	6 29	6 33	6 46	7 04
6 45	6 49	6 53	7 06	7 27
7 05	7 09	7 13	7 26	7 48
7 23	7 27	7 31	7 44	8 06
7 35	7 39	7 43	7 56	8 18
7 55	7 59	8 03	8 16	8 38
8 15	8 19	8 23	8 36	8 52
8 38	8 42	8 46	8 59	9 15
9 06	9 10	9 14	9 27	9 43
9 36	9 40	9 44	9 57	10 13
10 06	10 10	10 14	10 27	10 44
10 36	10 40	10 44	10 57	11 14
11 06	11 10	11 14	11 27	11 44
11 36	11 40	11 44	11 57	12 15
PM				
12 06	12 10	12 14	12 27	12 45
12 36	12 40	12 44	12 57	1 15
12 57	1 01	1 05	1 18	1 36
1 06	1 10	1 14	1 27	1 45
1 30	1 34	1 38	1 51	2 08
1 53	1 57	2 01	2 14	2 31
2 15	2 19	2 23	2 36	2 54
2 37	2 41	2 45	2 58	3 18
2 59	3 03	3 07	3 20	3 42
3 22	3 26	3 30	3 43	4 02

Sunday

AM				
8 15	8 19	8 23	8 36	8 52
8 38	8 42	8 46	8 59	9 15
9 06	9 10	9 14	9 27	9 43
9 36	9 40	9 44	9 57	10 13
10 06	10 10	10 14	10 27	10 44
10 36	10 40	10 44	10 57	11 14
11 06	11 10	11 14	11 27	11 44
11 36	11 40	11 44	11 57	12 15
PM				
12 06	12 10	12 14	12 27	12 45
12 36	12 40	12 44	12 57	1 15
12 57	1 01	1 05	1 18	1 36
1 06	1 10	1 14	1 27	1 45
1 30	1 34	1 38	1 51	2 08
1 53	1 57	2 01	2 14	2 31
2 15	2 19	2 23	2 36	2 54
2 37	2 41	2 45	2 58	3 18
2 59	3 03	3 07	3 20	3 42
3 22	3 26	3 30	3 43	4 02

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10 Tift Park

From Anytown

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5 30	5 34	5 38	5 51	6 09
5 50	5 54	5 58	6 11	6 29
6 10	6 14	6 18	6 31	6 49
6 21	6 25	6 29	6 42	7 00 A
6 25	6 29	6 33	6 46	7 04
6 45	6 49	6 53	7 06	7 27
7 05	7 09	7 13	7 26	7 48
7 23	7 27	7 31	7 44	8 06
7 35	7 39	7 43	7 56	8 18
7 55	7 59	8 03	8 16	8 38
8 15	8 19	8 23	8 36	8 52
8 38	8 42	8 46	8 59	9 15
9 06	9 10	9 14	9 27	9 43
9 36	9 40	9 44	9 57	10 13
10 06	10 10	10 14	10 27	10 44
10 36	10 40	10 44	10 57	11 14
11 06	11 10	11 14	11 27	11 44
11 36	11 40	11 44	11 57	12 15
PM				
12 06	12 10	12 14	12 27	12 45
12 36	12 40	12 44	12 57	1 15
12 57	1 01	1 05	1 18	1 36
1 06	1 10	1 14	1 27	1 45
1 30	1 34	1 38	1 51	2 08
1 53	1 57	2 01	2 14	2 31
2 15	2 19	2 23	2 36	2 54
2 37	2 41	2 45	2 58	3 18
2 59	3 03	3 07	3 20	3 42
3 22	3 26	3 30	3 43	4 02

Sunday

AM				
8 15	8 19	8 23	8 36	8 52
8 38	8 42	8 46	8 59	9 15
9 06	9 10	9 14	9 27	9 43
9 36	9 40	9 44	9 57	10 13
10 06	10 10	10 14	10 27	10 44
10 36	10 40	10 44	10 57	11 14
11 06	11 10	11 14	11 27	11 44
11 36	11 40	11 44	11 57	12 15
PM				
12 06	12 10	12 14	12 27	12 45
12 36	12 40	12 44	12 57	1 15
12 57	1 01	1 05	1 18	1 36
1 06	1 10	1 14	1 27	1 45
1 30	1 34	1 38	1 51	2 08
1 53	1 57	2 01	2 14	2 31
2 15	2 19	2 23	2 36	2 54
2 37	2 41	2 45	2 58	3 18
2 59	3 03	3 07	3 20	3 42
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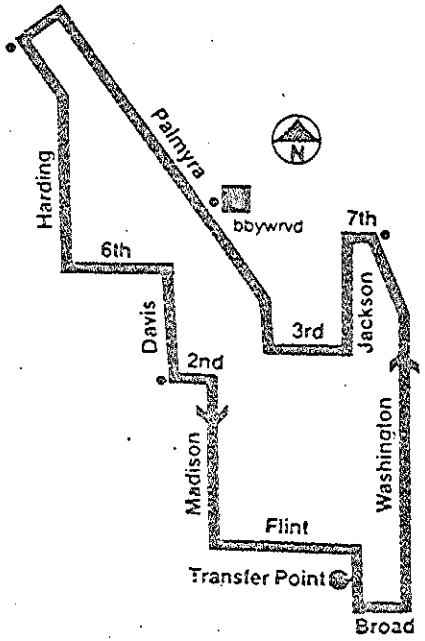
10 Tift Park



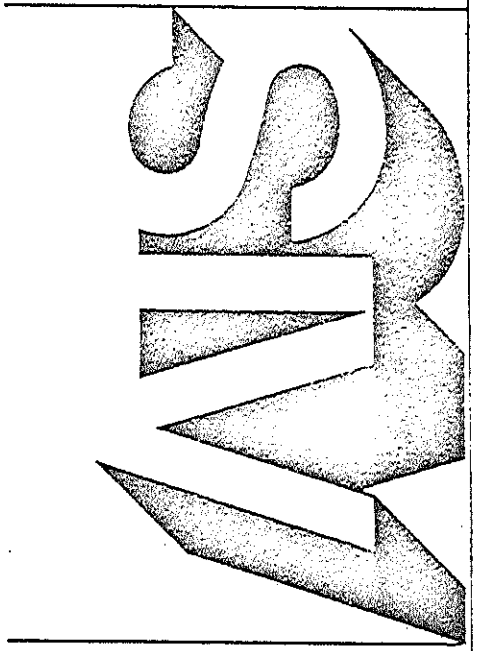
• Time Point

8 Anytown State

10 Tift Park

Via Main, Palmyra Park Hospital, University District, James Park

Effective January 1, 1977



Anytown Transit System

Information 435-5061

SOURCE : PREPARED FOR URBAN MASS TRANSPORTATION ADMINISTRATION
& GEORGIA DEPARTMENT OF TRANSPORTATION
BY ALAN M. VOORHEES & ASSOCIATES

- Telephone Information Service -- A telephone information service is an important means by which to provide transit information to users (Figure VIII-3). The availability of such a facility, however, must be known and, therefore, it should be widely publicized with its use encouraged. A simple and easily remembered telephone number may be available from the telephone company and should be exhibited on all route maps, signs, advertisements, and schedules. For a system the size of that proposed, it is difficult to financially justify a full-time telephone receptionist to answer user questions. It is probable, however, that existing office staff and supervisors, if properly trained, could provide this service until the point is reached where an additional employee is essential due to call frequency.

8.4 ADVERTISING AND PUBLIC RELATIONS ELEMENT

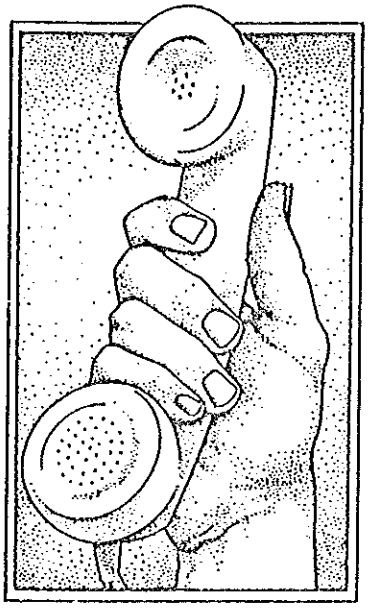
Given the new character, image, and services which will be provided, a reasonable quantity of regular paid advertising (especially in the local newspapers) may be quite advisable, in the early phases of the program, and whenever new services are implemented. For reference, such advertisements should contain detailed schedule data in a form which suggests clipping and saving such schedules in households (Figure VIII-4).

Also, advantage should be taken of a new opportunity for expanding the paid-space dollar. Radio and TV stations are now expected by law to devote a certain amount of their commercial space to public service announcements. It is also important to note that good relations with the local news media are paramount in the successful execution of marketing programs for transit, particularly when the marketing budget is severely restricted.

If the press, radio, and TV management are convinced that the transit service is adequately serving the public need, they will do all possible to support the effort. However, this cannot be accomplished by simply making "press releases" to the various media. It is important that personal contact be made on a continuing basis with the newspaper publisher, his editors and reporters, and radio and TV commentators and general managers. If they are kept well informed, the result will be that the transit system is repeatedly in the public's eye as a truly customer-oriented public service. The purpose is not only to generate new customers for the service, but also to create a favorable image in the eyes of the general public and their elected officials for obtaining future sympathetic public reactions to bond issues, fare increases, routing changes, and the like.

Public Information Phone Service

The biggest know-it-all in (Anytown) is a phone number.



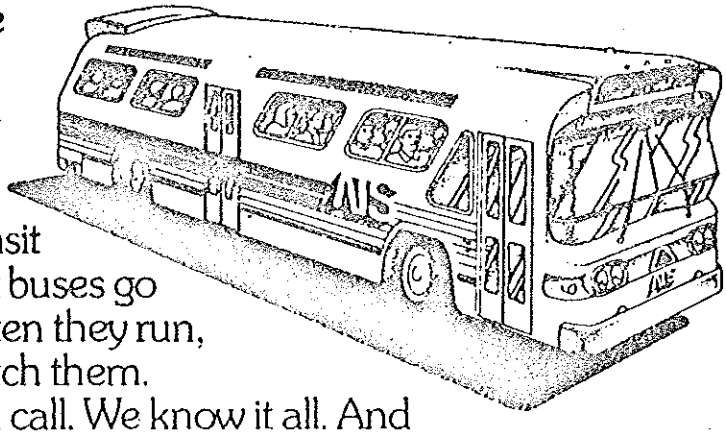
It's BusPhone, (000-0000). A new telephone information service of the (Anytown Transit System.) Our operators know all about the buses in town. And, all you need to know is our number.

Just call (000-0000). Tell us where you are and where you want to go. We'll tell you the easiest, quickest way to get there.

You can call us (any day of the week, from 4 a.m. until 10 p.m.)

And we'll even mail you any schedules you need.

If you're new in town, or you're not a regular passenger, BusPhone can tell you everything you want to know about the (Anytown Transit System). What buses go where, how often they run, and how to catch them.



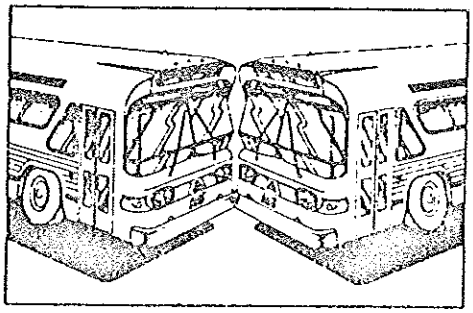
So, give us a call. We know it all. And we're glad to share it with you!

Anytown Transit System ATS

SOURCE: PREPARED FOR URBAN MASS TRANSPORTATION ADMINISTRATION
& GEORGIA DEPARTMENT OF TRANSPORTATION
BY ALAN M. VOORHEES & ASSOCIATES

Supplemental Advertisements for Service Additions

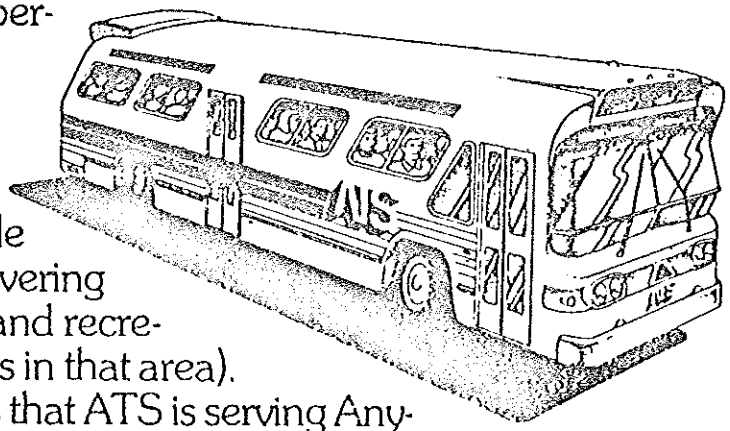
What's the point of adding to our busy schedule?



The point is the more routes we have, the more ways we have to serve you. We want to be where you want us, when you want us.

So, (Anytown Transit System) has just added (three) routes. One provides (new service to the (Anytown Mall) with arrival and departure times geared to store hours and to your shopping convenience).

Another route expands existing bus service to the (Main Street business district). (ATS) is making more stops along (Green and Plum Streets, between 7 and 9 a.m. and 4 and 6 p.m.) We're right on schedule, when it comes to helping you get to work on time.



(Bus #7, operating down Waterville Street, now continues on to Waterville Road/I-75, covering the industrial and recreational facilities in that area).

The point is that ATS is serving Anytown with more routes and schedules than ever before.

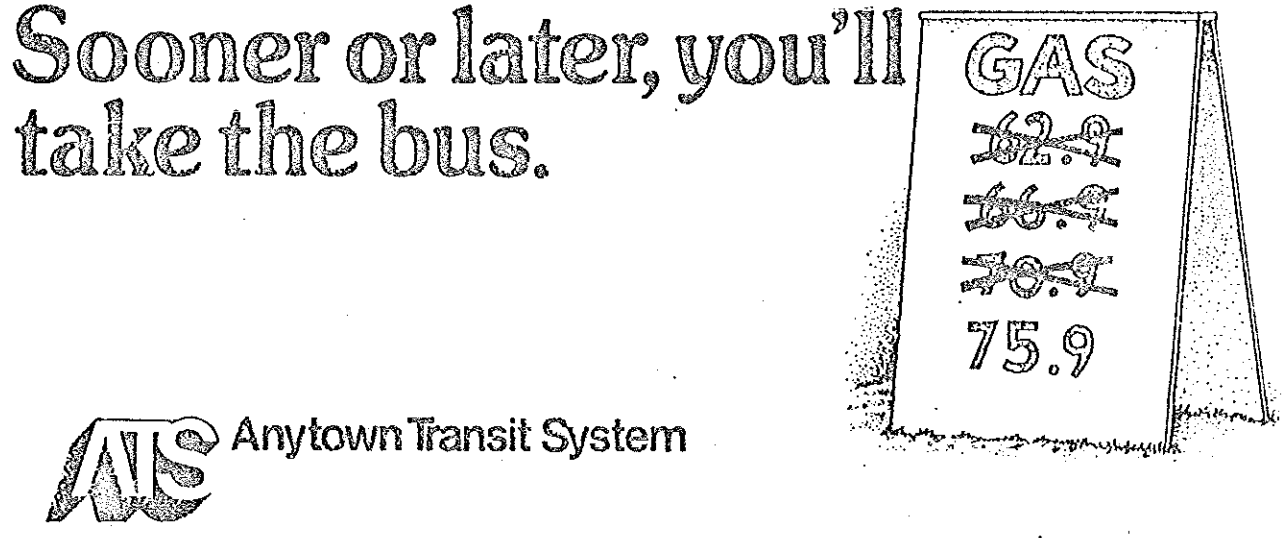
For complete information call BusPhone, (000-0000).

Anytown Transit System ATS

SOURCE: PREPARED FOR URBAN MASS TRANSPORTATION ADMINISTRATION & GEORGIA DEPARTMENT OF TRANSPORTATION BY ALAN M. VOORHEES & ASSOCIATES

FIGURE VIII - 5

Transit Promotional Advertisement



SOURCE : PREPARED FOR URBAN MASS TRANSPORTATION ADMINISTRATION
& GEORGIA DEPARTMENT OF TRANSPORTATION
BY ALAN M. VOORHEES & ASSOCIATES

8.5 SALES PROMOTION ELEMENT

Customer-oriented promotions are a valuable and low-cost method of increasing ridership and of keeping the transit system in the news (Figure VIII-5). They should be based on targets of opportunity that are consistent with a specific purpose; i.e. off-peak travel, the elderly rider, holiday season shopping, the early shift worker, and the suburbanite. The expenses can frequently be shared with local businessmen who will support the program with the expectation of a reasonable return on their investment, but who also may be convinced to assist based on an interest in public service.

Possible examples of sales promotion are:

- A daily "lucky seat" lottery in which a rider wins a merchandise or cash prize. If tie-ins are made with a leading merchandiser, the cost to the system might be nil.

- Shopping day discounts to build off-peak ridership. This might possibly be combined with "lucky" shopping buses on which riders are given merchandise certificates.

- Promotion of a route-assistance service through which people requesting information on how the system can serve them would receive marked maps (similar to those provided AAA members). This might be handled in writing and/or through personal service at one or more local offices or terminals.

  To spotlight inauguration of the service, specially marked route maps might be personally tendered to the Mayor and members of the City Council showing each how to use the transit system to travel from his home to his office.

- Use of buses to transport deserving groups (residents of homes for the aged, needy children, veterans' hospital patients, etc.) to special events on major holidays.

8.6 COMMUNITY RELATIONS ELEMENT

As public transit has unique public service elements associated with its existence, a transit marketing program should address the community aspects of that service, and itself become a vehicle by which citizen involvement on an informal basis is an extension of that marketing program. The community relations aspect is the suggested mechansim by which the overall transit marketing program

may be made more effective. Contacts inviting discussions between the transit operating agency, planning bodies, and community groups, is an effective and inexpensive method of relating the transit system's interest in serving the public and of obtaining feed-back from the public on their reaction to the service. Simple slide presentations indicating the system's method of serving the public should be available to fraternal, church, business and school groups. This should also be supplemented with the formation of specific advisory committees of citizens representing marketing target groups, such as neighborhood areas, the elderly, school children, apartment dwellers, and industry. These groups will outline opportunities for improving existing service, for new service, and for charters. Representatives of each of the sub-groups could then be formed into an overall citizens group to advise the operator of the needs and to act as a sounding board for the operations plans.

APPENDIX "A"

INVENTORY OF ROLLING STOCK

CONNECTICUT TRANSIT COMPANY
HARTFORD DIVISION

ROLLING STOCK INVENTORY

	# of Buses	Make	Model	Year	Seating Capacity	UTILIZATION (Check Appropriate Columns) Regular Route	Charter	School	Other
1.	1		TDH	1947	36	x			
2.	10		TDH 5303	1964	45	x			
3.	50		TDH 5303	1964	51	x			
4.	3		TDH 3501	1964	35	x			
5.	1		TDH 3501	1967	35	x			
6.	9		TDH 4517	1961	44	x			
7.	18		TDH 4517	1962	44	x			
8.	34		TDH 4519	1964	45	x			
9.	20		TDH 4519	1965	45	x			
0.	2		TDH 4519	1968	45	x			
1.	69		T6H 5308	1974	51	x			
2.	1		TDH 5304	1967	51	x			

NEW BRITIAN TRANSPORTATION COMPANY

ROLLING STOCK INVENTORY

# of Buses	Make	Model	Year	Seating Capacity	UTILIZATION (Check Appropriate Columns) Regular Route	Charter	School	Other
34	International	S.B.	1972	66			x	
5	International	S.B.	1972	36			x	
1	G.M.C.	3714	1953	36	x			
4	G.M.C.	4512	1953	45	x			
2	G.M.C.	5106	1953	53	x			
1	G.M.C.	5106	1953	51	x			
2	G.M.C.	5304	1966	51	x			
2	G.M.C.	5308A	1974	51	x			
1	G.M.C.	5306A	1970	51	x			
1	G.M.C.	4905A	1970	49		x		
1	G.M.C.	4905AM	1971	49		x		
2	G.M.C.	4905	1974	49		x		
2	G.M.C.	4905	1975	49		x		
1	G.M.C.	4905	1976	49		x		

NEW BRITIAN TRANSPORTATION COMPANY

STORAGE AND MAINTENANCE FACILITIES

Type of Facility (Check Appropriate Column)		Location	Size (Sq. Ft.)	Bus Capacity	Facility Condition
Storage	Maintenance				
x	x	257 Woodlawn Rd.	15,000	18	New Building in 1971

Route and Schedule from Middletown Area:

1. Middletown to New Departure Bristol:

Main St.-Middletown West on 66 to Meriden & Southington to Bristol

5:45 AM going to Bristol

3:30 PM return from Bristol -- Monday thru Friday only

2. Plainfield Track:

Middletown to Plainfield via Route 72-66-2-164

6:20 PM leaving from Middletown -- Monday thru Saturday nights

APPENDIX B

DEMAND FORECASTING PROCEDURE

DEMAND FORECASTING PROCEDURE

Before the viability of a transit service can be established, an estimate of the potential ridership must be made. Many factors affect transit patronage such as:

- frequency of service
- trip length
- walk distance to the bus
- fare level

Of the four items listed above, fare level is the least significant determinant of ridership, based on empirical data from on-going systems. Once the decision is made to charge a fare for a new service, the range of reasonable fares for the type of service provided is so narrow that changes in ridership due to change in fare become insignificant. This is particularly true when dealing with a captive ridership.

The remaining three determinants do significantly affect transit ridership. The basic relationships can be simply stated as follows:

- As frequency of service increases, ridership tends to increase.
- As walking distance to the route increases, ridership tends to fall off.
- As trip length increases, ridership begins to increase, but reaches an optimum and begins to drop off when the trip length is excessive.

Traditionally, transit demand forecasts have been made by applying a mode share percentage, based in part on the previously-mentioned determinants, to existing demand. However, this approach has not proved appropriate for small urban areas, principally because it does not account for what is termed "latent demand." Latent demand is those trips which are generated by the introduction of new or improved service.

The nature of transit trip-making in smaller urban areas then argues strongly for a demand estimating technique which emphasizes generation of trips rather than "mode splitting" existing demand.

For this reason, a direct trip generation model, employing a working knowledge of the relationships previously described, and the experiences of numerous small area transit systems was developed.

Previous studies have shown that a bus system providing service at one hour intervals would carry an average 32 annual riders per dwelling unit located within 1/4 mile walk of a bus line.[1/]

TABLE 1

SURVEY RESULTS

TRANSIT TRIPS PER DWELLING UNIT

Location	No. Transit Trips/Dwelling Unit
Portland, Oregon	32.33
Boise, Idaho	33.55
Salem, Oregon	32.98
Fitchburg, Mass.	33.12

SOURCE: Estimating Ridership on Small Systems, C.H. Buttke Passenger Transport, Vol. 34, No. 1, November, 1976.

Table 1 indicates a consistency, independent of location.

Further analysis of data obtained for urban areas of similar size and characteristics to the Midstate Region, indicate that a trip generation rate can be specified for households of a similar socio-economic category. Specifically, trip rates were identified for non-auto and auto owning households. These are:

- 10.6 transit trips/year for auto owning households
- 55.7 transit trips/year for non-auto owning households

Dividing these rates by the annual days of operation yields trip rates of 0.04 and 0.21 trips per dwelling unit per day respectively. It was assumed that these trip generation rates are transferable and on that basis an estimate of line patronage for a transit route in the Midstate Region of Connecticut was achieved by simply multiplying the basic trip generation rate by the number of households in their

1/ C.H. Buttke,"Estimating Ridership On Small Systems," Passenger Transport, Vol. 34, No. 1, November, 1976.

respective categories within the service area of the line. If household information is known on regional traffic zone basis, the mathematical equation for a transit line's patronage can be written as:

(1)

$$T = \sum_{i=1}^{n} \sum_{j=1}^{2} T_{ij} = \sum_{i=1}^{n} \sum_{j=1}^{2} R_j H_{ij}$$

where:

T = Total trips generated by the service

T_{ij} = Trips from traffic zone i by auto ownership category j

R_j = Basic trip generation rate for auto ownership category j

H_{ij} = Number of households in traffic zone i of auto ownership category j

It must be stated at this point that the trip generation rates reported correspond to a specific system-wide level of service. If this procedure is to be applied to the Midstate Region, then clearly the basic trip rates must be adjusted to reflect the differing levels of service as well as the different spatial orientation of the Region.

The most direct way to sensitize the model to level of service changes is to apply factors to the basic trip rates. Using "service specific" data collected during several TDP's in New England, a series of factor adjustment curves were developed to account for changes in frequency of service, walk distance to the line and trip length. These curves are shown in Figures 1 through 3. The mathematical model for predicting line patronage can now be written as:

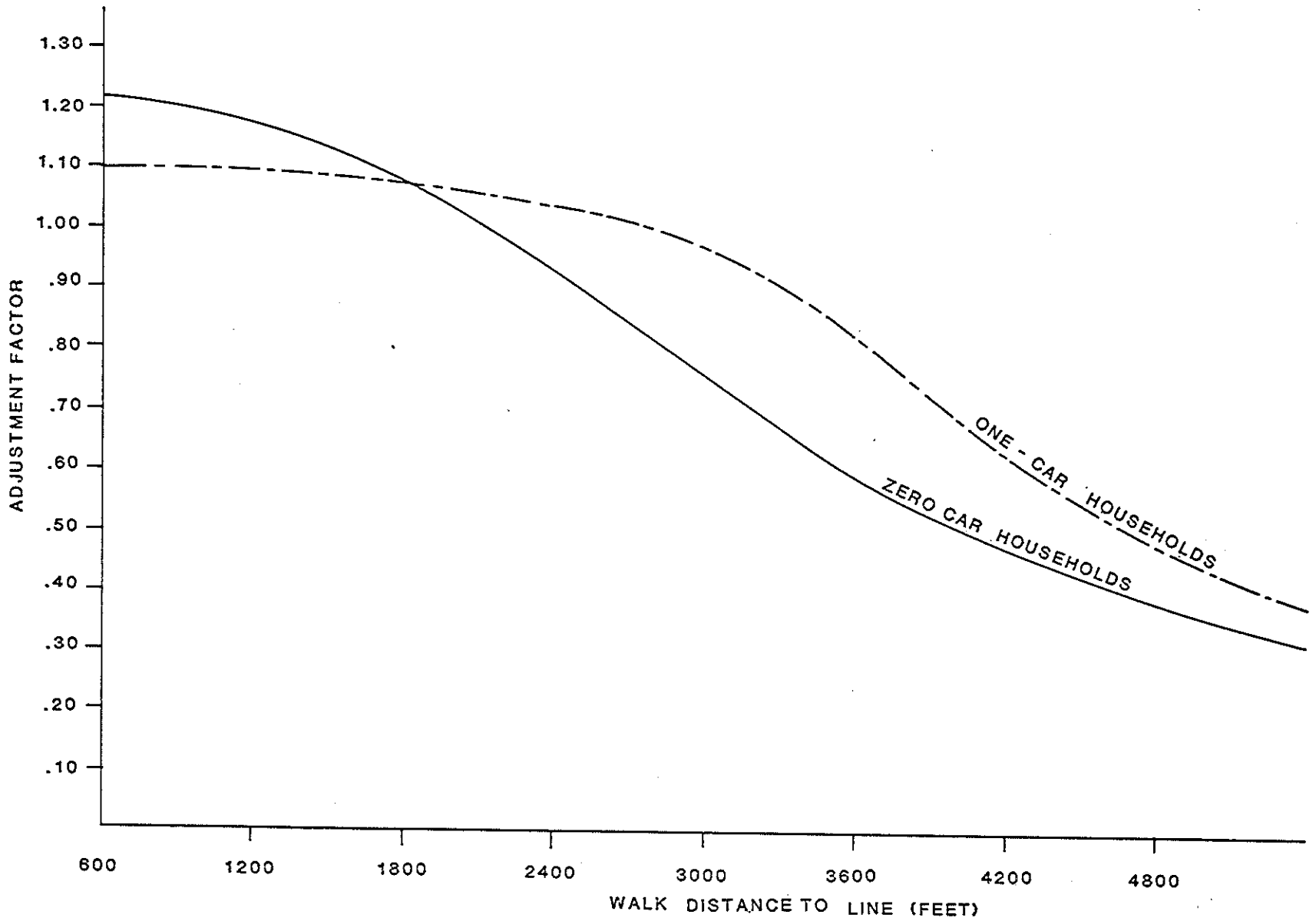
$$T = \sum_{i=1}^{n} \sum_{j=1}^{2} T_{ij} = \sum_{i=1}^{n} \sum_{j=1}^{2} (R_j)\ (H_{ij})\,(Q_{ij})\,(W_{ij})\,(D_{ij})$$

where:

Q_{ij} = Frequency adjustment factor for category j in traffic zone i

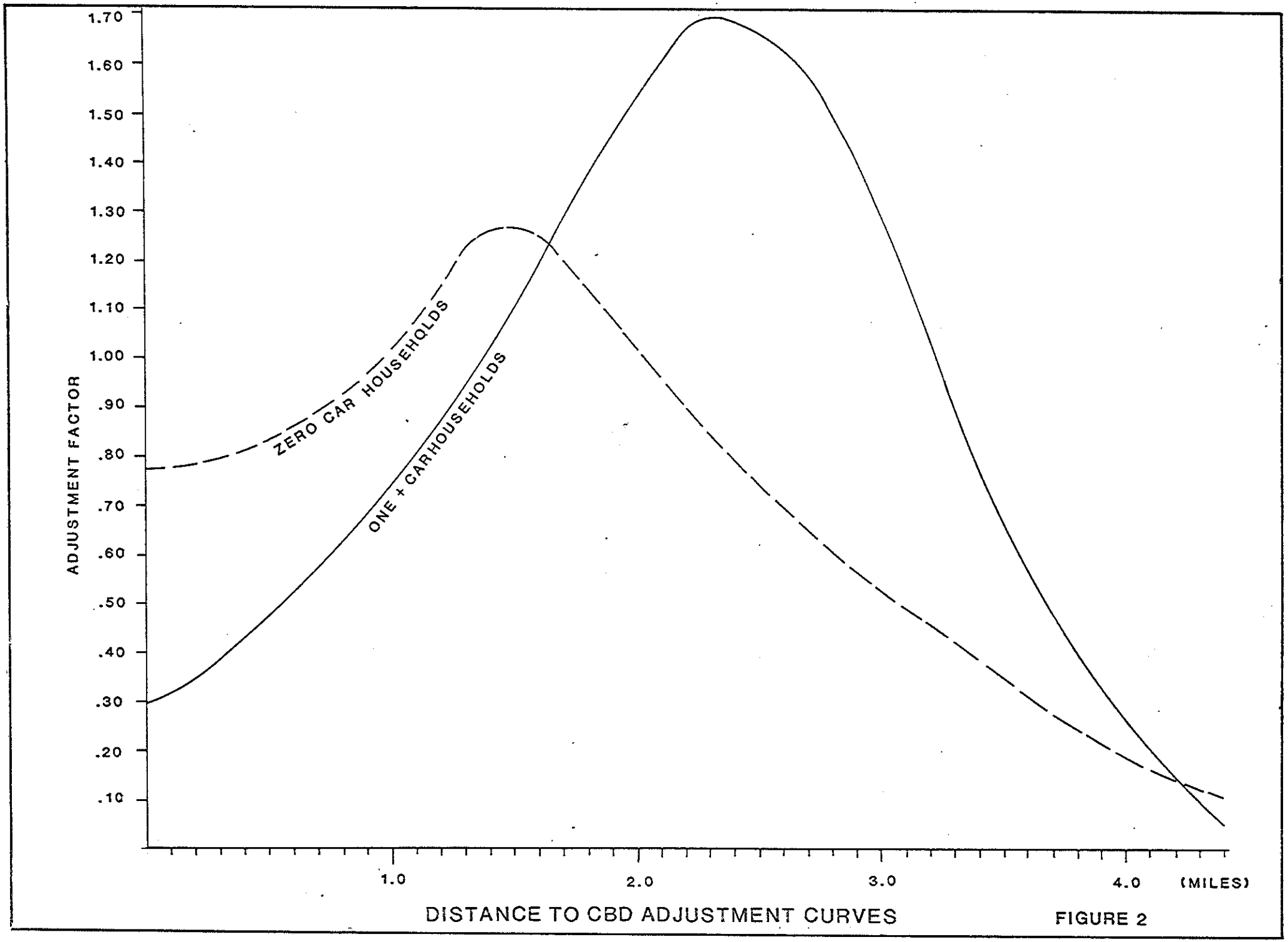
W_{ij} = Walk distance adjustment factor for category j in traffic zone i

D_{ij} = Trip length adjustment factor for category j in traffic zone i



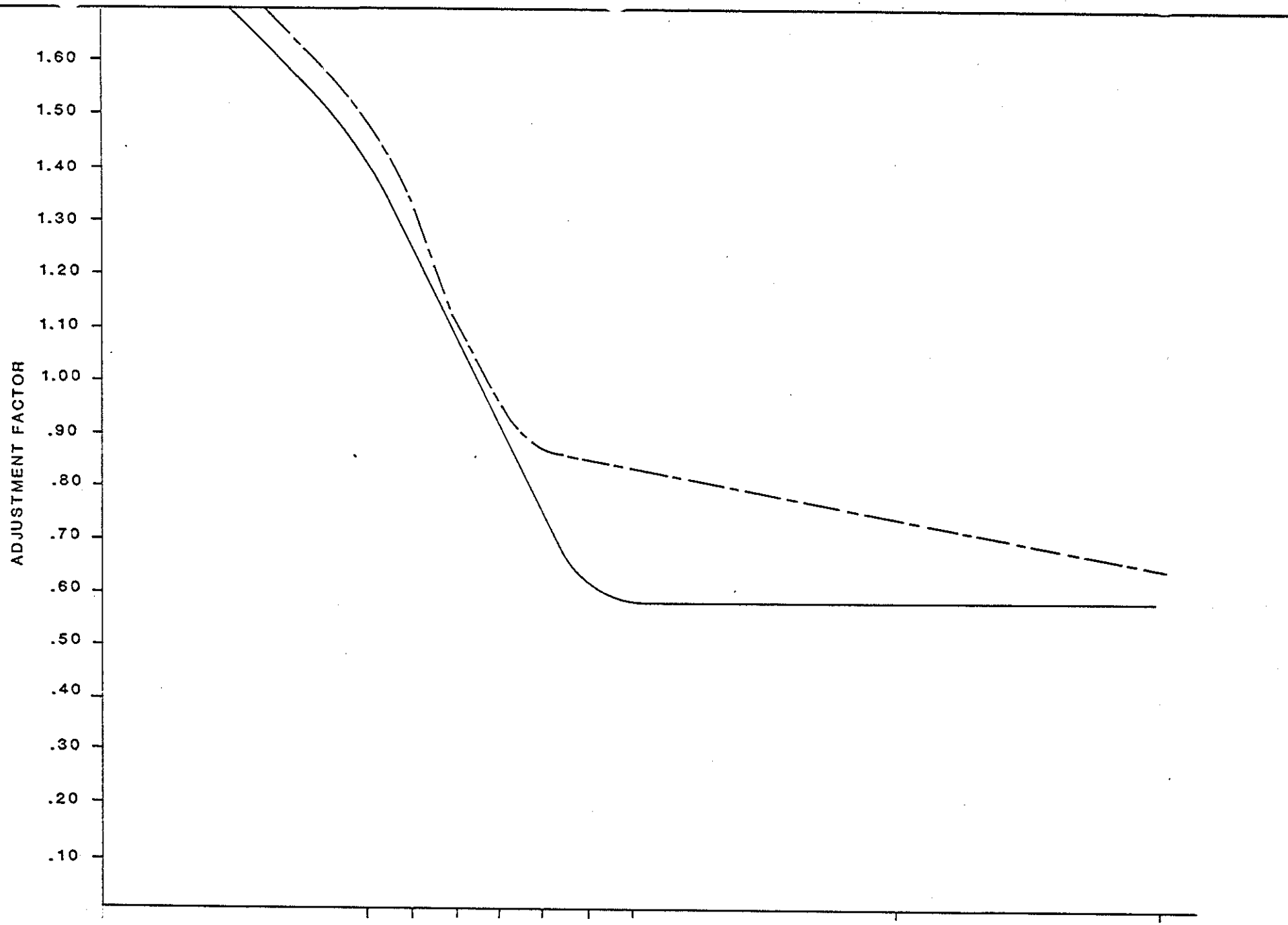
WALK DISTANCE ADJUSTMENT CURVES

FIGURE .1



DISTANCE TO CBD ADJUSTMENT CURVES

FIGURE 2



FREQUENCY ADJUSTMENT CURVE

FIGURE 3

The model specification, while trying to address the conditions of small areas, does have specific limitations. These are:

- The model is for conventional transit service and should not be extended to paratransit services.
- The model is for the traditional CBD-radial system structure.

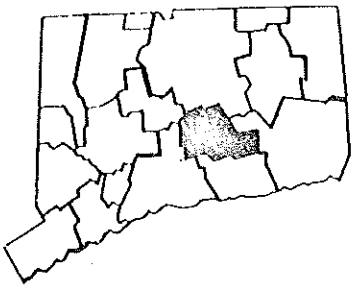
The first condition does not restrict transit development alternatives to conventional bus operations. Paratransit alternatives should be investigated using estimation techniques more appropriate to those modal characteristics. The second condition also does not pose a problem as non-radial (crosstown) service in small areas is generally not economically practical and, therefore, seldom given serious considerations; crosstown service is better approached with paratransit concepts, such as taxi, jitney, etc.

APPENDIX C

COMMUNITY ENDORSEMENTS

MIDSTATE REGIONAL PLANNING AGENCY

CROMWELL DURHAM EAST HADDAM EAST HAMPTON HADDAM MIDDLEFIELD MIDDLETOWN PORTLAND



P.O. BOX 139 MIDDLETOWN, CONNECTICUT 06457 203 347-7214

MIDSTATE TRANSIT DEVELOPMENT PROGRAM

RESOLUTION OF ENDORSEMENT

I certify that the following is a true copy of the vote of the Midstate Regional Planning Agency, the Metropolitan Planning Organization for the Midstate Region, at its meeting of May 2, 1978, in Middletown, Connecticut.

DATE: 5-18-78

John E. Moore, Sr.,
Secretary/Treasurer

WHEREAS, the Midstate Regional Planning Agency has identified a need for public transportation in the Midstate Region and has prepared a five-year Transit Development Program in response to that need, and

WHEREAS, the Transit Development Program has received the endorsement of the Middletown Common Council, the Middletown Transit District, the Middletown business community, and the Middletown community-at-large;

NOW THEREFORE BE IT RESOLVED by the Midstate Regional Planning Agency to endorse the Transit Development Program and to authorize the Chairman to submit it to the Urban Mass Transportation Administration for approval.

GEOFFREY L. COLEGROVE, DIRECTOR

RESOLUTION OF ENDORSEMENT

WHEREAS, the Common Council of the City of Middletown finds that a legitimate need for public transportation exists in Middletown based upon a needs assessment undertaken by the Midstate Regional Planning Agency; and

WHEREAS, a five-year Transit Development Program has been prepared by the Midstate Regional Planning Agency which properly addresses said need; and

WHEREAS, the Transit Development Program has received the endorsement of the Middletown Transit District, recognized civic organizations, and general public support;

NOW, THEREFORE, BE IT RESOLVED by the Common Council to endorse said Transit Development Program and declare its intent to provide the financial support necessary to implement the Transit Development Program.

CERTIFICATE

I, Rose A. Scotti, Assistant City and Town Clerk of the City of Middletown, Connecticut, and custodian of the records and seal thereof, hereby certify that the above is a true and correct copy of a Resolution passed and adopted by the Common Council of the City of Middletown at a Regular Meeting held on Monday, May 1, 1978.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the seal of my office this 4th day of May, 1978.

ATTEST:
Rose A. Scotti
ROSE A. SCOTTI
Assistant City and Town Clerk

ANTHONY S. MARINO
Mayor

GERALD E. DALEY
Administrative Assistant

OFFICE OF THE MAYOR

City of Middletown

CONNECTICUT 06457

Transit District

May 17, 1978

Geoffrey Colegrove
Midstate Regional
Planning Agency
P.O. Box 139
Middletown CT 06457

Re - Transit Development Program

Dear Geoff:

On May 1, 1978 The Transit Development Program received the endorsement of The Common Council of the City of Middletown.

The Middletown Transit District has unanimously supported and endorsed this proposal during the entire development of the TDP.

We are pleased to pledge our continued support towards making this proposal a reality for the residents of the Middletown area.

Kenneth L. Bondurant
Chairman
Middletown Transit District

KLB/apw
Atts.

cc: Mayor Marino
J.G. Sennik-Secretary MTD

Municipal Building, deKoven Drive, Telephone: (203) 347-4671, Extensions 214-215

Retail Trade Bureau

100 Riverview Center Middletown, Conn. 06457

Tel. 346-8010

May 3, 1978

Mr. William Van Beynum
Chairman
Midstate Regional Planning Agency
209 Court Street
Middletown, CT 06457

Dear Mr. Van Beynum:

The Retail Trade Bureau of the Northern Middlesex Chamber of Commerce has endorsed the Transit District Proposal of Midstate Regional Planning Agency for the City of Middletown. The Transit District Proposal includes four loops that will service various sections of the City and will connect these sections at a central point in the downtown area. The central dropoff point is proposed for Columbus Plaza. The four loops proposed consist of the Washington Street North Loop, the Washington Street South Loop, the South Main Street Loop and the Saybrook River/Silver Street Loop.

The above routes were proposed based on a population survey and can be altered at any time in the future. In addition to the four transit loops, the Retail Trade Bureau also endorses the second part of the proposal which pertains to elderly or handicapped transportation services. This proposal plans to purchase additional vehicles which would allow expanded services in the urban area. Other services may be eliminated when the fixed route service is operational. The Transit District would then operate or contact out to another operator a Dial-a-Ride Service to make it easier for the elderly and handicapped to go from one place to another.

Proposed fare for the fixed route service would be $.35 for adults and $.15 for the elderly, handicapped or children.

The Retail Trade Bureau feels that this Transit Proposal would be a strong asset to the City of Middletown and wold benefit both the public and the business community.

Sincerely,

Robert G. Comstock
President

jf

THE
Northern Middlesex Chamber of Commerce
PORTLAND • CROMWELL • DURHAM
HADDAM • EAST HAMPTON
MIDDLEFIELD • MIDDLETOWN

RECEIVED
MAY 5 1978

May 3, 1978

Mr. William Van Beynum
Chairman
Midstate Regional Planning Agency
209 Court Street
Middletown, CT 06457

Dear Mr. Van Beynum:

The Executive Committee of the Board of Directors of the Northern Middlesex Chamber of Commerce met on April 5, 1978 and strongly endorsed the current proposal for the provision of subsidized local bus transportation which is the outgrowth of work done by the Midstate Regional Planning Agency.

In arriving at this decision, the Committee recognized the following near and long term benefits.

The present proposal will provide scheduled curb service for the vast majority of elderly residing in multi-unit housing within the City, giving them access to medical, shopping, social and business centers within the City.

The basic route system will also provide transport opportunity for many residents for travel to and from work centers and for young people not having access to private automobiles.

The existence of the system will permit consolidation of existing senior citizen transport which has been artificially restricted to age rather than need.

The system will provide an ongoing administrative mechanism capable of organizing and managing specialized transportation needs beyond the scheduled route service.

The existence of a system will permit the subsequent exploration and implementation if warranted of limited commuter service to areas of concentrated employment.

The existence of service should relieve some existing parking problems and tend to reduce the land area required for future parking.

100 Riverview Center, Middletown, Connecticut 06457 Tel. (203) 347-6924

Well managed mass transit is recognized to be substantially more energy efficient and less air polluting than the use of multiple low occupancy auto travel.

The committee considers the benefits warrant the devotion of the subsidy inherent in the proposal.

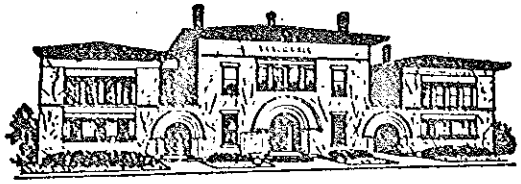
Sincerely,

Robert G. Comstock
President

jf

APPENDIX D

COMMUNITY CORRESPONDENCE



TOWN OF PORTLAND
265 MAIN STREET
PORTLAND, CONN. 06480

May 19, 1978

William Van Beynum
Midstate Regional Planning Agency
Middle Haddam Road
Portland, Ct. 06480

Dear Mr. Van Beynum:

This is to confirm that the Board of Selectmen adopted a resolution at its February 23, 1978 meeting to the effect that Portland not join the proposed regional transportation district but continue participating in the specialized transportation services for elderly and handicapped residents.

Sincerely,

Marie T. Larson
First Selectman

MTL:jg

ANTHONY S. MARINO
Mayor

OFFICE OF THE MAYOR
City of Middletown
CONNECTICUT 06457

GERALD E. DALEY
Administrative Assistant

May 17, 1978

Mr. Peter N. Stowell, Director, Region I
Urban Mass Transportation Administration
Transportation System Center
Kendall Square
Cambridge, Massachusetts 02142

Re: Request For Letter Of No Prejudice

Dear Mr. Stowell:

The City of Middletown, as a part of a regional UMTA study, has accepted the findings of Alan M. Voorhees and Associates and is pursuing implementation of the Transit Development Program. Within the next several months, application will be made to UMTA for funding capital equipment with the intent of having a system "on line" by mid-1979.

During the consultant's presentations to local officials in January of this year, it became apparent that an off-street site was required in our Central Business District in order to provide safe, clean and convenient terminal and dispatching facilities.

An ideal opportunity presented itself when during the late winter, the roof of an abandoned theatre building collapsed in one of the City's prime commercial blocks. The theatre site is extremely convenient to public parking, County courts, City offices and all major downtown stores. The site also enjoys a small portion of Main Street frontage while in the rear, opens to an internal roadway system.

The City wishes to capitalize on the theatre owner's dilemma by purchasing this building at its now reduced value in anticipation of the local transit system being funded. Because we view this site as an ideal solution to locating the system's principal facilities, the City, using its own funds, has already engaged appraisers and have the benefit of their findings. In order to safeguard the loss of this important site, we, therefore, request a letter of "no prejudice" whereby City funds which are expended for the acquisition of the property and possible demolition

ANTHONY S. MARINO
Mayor

OFFICE OF THE MAYOR
City of Middletown
CONNECTICUT 06457

GERALD E. DALEY
Administrative Assistant

of the structure, may qualify under Federal guidelines for reimbursement upon approval of capital equipment funding.

Should you require any further information concerning this request, we would be most happy to meet with you at your convenience to discuss this proposal. We are most appreciative of the support given, thus far, by UMTA and look forward to continuing cooperation.

Very truly yours,

Anthony S. Marino
Mayor

Kenneth Bondurant
Chairman, Middletown Transit District

c.c. Donald G. Sullivan, Chief Planner
James F. Shugrue, Commissioner, Connecticut DOT
Fred Thumm, Connecticut DOT
Midstate Regional Planning Agency
Alan M. Voorhees Associates
Rich Clair
Richard Bradley
Members of Middletown Transit District