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TRANSPORTATION SYSTEM MANAGEMENT PLAN

JULY 1977

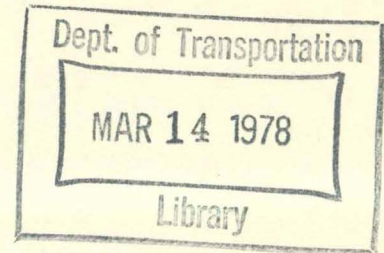


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PREPARED BY:

IOWA NORTHLAND REGIONAL COUNCIL OF GOVERNMENTS

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Iowa Northland Regional Council of Governments
Russell Lamson Building; Suite N
209 West Fifth Street
Waterloo, Iowa 50701

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INTRODUCTION

On September 17, 1975, the Department of Transportation issued final regulations governing urban transportation planning under the Federal Highway Administration and the Urban Mass Transportation Administration programs. The regulations specified that the urban transportation planning process shall include the development of a transportation plan consisting of a Transportation Systems Management (TSM) element and a long range element. This is the first time that a formal requirement for a TSM has been included in the urban transportation planning process.

The regulations identified the purpose of the TSM as follows:

1. "Provide for the short range transportation needs of the urbanized area by making efficient use of existing transportation resources and providing for the movement of people in an efficient manner.
2. Identify traffic engineering, public transportation, regulatory pricing, management, operational and other improvements to the existing urban transportation system not including new transportation facilities or major changes in existing facilities."

The responsibility for developing the TSM has been assigned to the Metropolitan Planning Organizations (MPO) for each urbanized area. It is clearly recognized that the preparation of the program must be carried out in conjunction with state and local authorities and that the MPO provides the forum for cooperative decision making by the appropriate elected officials and their appointed department heads. The cooperative aspects of the program are essential since implementation of most TSM activities are largely in the hands of state and local agencies.

To be eligible to receive Section 3 or Section 5 funds under the Urban Mass Transportation Act of 1964, as amended, the projects proposed from the TSM Plan must be programmed for implementation in the Transportation Improvements Program (TIP). The TSM is a continuing program which will be updated on an annual basis.

The concept of Transportation Systems Management is new only in the sense that this is the first time that a formal requirement for a TSM has been included in the urban transportation planning process. The TSM is meant to provide a blueprint for actions which can be implemented on a short term basis at low and moderate costs. Therefore, the burden of much of the success of the program lies with the implementing agency. With few exceptions, INRCOG (the MPO) will not implement the components of the program. Therefore, there is a vital need to work closely with the local implementing agencies including the Iowa Department of Transportation, Cedar Falls, Waterloo and Black Hawk County Engineering Departments, and the Metropolitan Transit Authority.

Goals and Objectives

As was stated earlier, the concept of TSM is not new it is only new in the sense that it is formally required in the urban transportation planning process. The local implementing agencies have been advocating TSM or TSM-related goals and objectives for at least a decade.

The Land Use Plan for Black Hawk County was prepared in 1967, and of its 15 specific goals and objectives, the following 4 were very similar to the objectives suggested in the Rules and Regulations of the Federal Register pertaining to TSM.

- Maximize the opportunity for a wide range of choice in residential living while maintaining the environmental conditions of fresh air, clean water, quiet streets, protection from incompatible land uses, and conveniently located community facilities.
- Redevelop downtown commercial areas to better accommodate both pedestrians and automobiles.
- Provide suitable land for industrial development conveniently located to utilities and transportation facilities and not incompatible with adjacent land uses.
- Provide a safe, pleasant, and efficient network of streets and roads through the maintenance of existing facilities and the optimum location of new transportation systems.

The Waterloo Metropolitan Area Transportation Study was completed in 1968, it included six basic criteria that were used to develop and evaluate the alternatives leading to the selection of the 1990 Plan. Of these six basic criteria, four would be considered TSM-related goals and objectives, they are the following:

- Minimize traffic congestion with best overall system performance.
- Maximize service to present land uses.
- Minimize total annual transportation cost.
- Maximize system flexibility.

In 1975, the Waterloo Metropolitan Area Transit Development Program was prepared, as was required by the Urban Mass Transportation Administration as an element of the continuing transportation planning process. Several TSM related goals and objectives were developed in the TDP. They were the following.

- Provide service to a maximum ridership at a reasonable cost.
- To strive toward a cost-efficient transit system which will maximize net revenues, and will provide for the equitable utilization of public funds when necessary to meet metropolitan needs.
- To reduce costs of transportation for metropolitan residents, both directly (personal costs of mobility) and indirectly (through reducing the environmental impacts of transportation and improving the efficiency of the transportation system).
- To encourage transit usage by the "non-dependent" and eliminate the necessity for multiple-auto ownership.

The above goals and objectives have guided policy decisions on the implementation of TSM and TSM related planning efforts during the last decade.

ELEMENTS OF THE TRANSPORTATION SYSTEMS MANAGEMENT PROGRAM

The Federal Register states that automobiles, public transit, taxis, pedestrians, and bicycles should be considered as elements of one single urban transportation system. The objective of urban transportation system management is to coordinate these individual elements through operating, regulatory, and service policies so as to achieve maximum efficiency and productivity for the system as a whole.

The Federal Register also lists four categories of action that must be addressed, realizing that the actions taken may differ with the size of an urbanized area or the extent of its congestion. The four main categories of action to be considered for inclusion in the TSM are the following:

1. Actions to ensure the efficient use of existing road space, including:
 - a. Traffic operations improvements to manage and control the flow of motor vehicles.
 - b. Preferential treatment for transit and other high-occupancy vehicles.
 - c. Appropriate provision for pedestrians and bicycles.
 - d. Management and control of parking.
 - e. Changes in work schedules, fare structure and automobile tolls to reduce peak hour travel and to encourage off peak use of transportation facilities and transit services.
2. Actions to reduce vehicle use in congested areas.
3. Actions to improve transit service.
4. Actions to increase internal transit management efficiency.

The emphasis of Transportation Management is in implementing low cost improvements to meet the immediate needs of the transportation system and aimed at making more efficient use of the existing facilities. The success of maximizing the use of the existing transportation system lies in the development of a balance between transit incentives and auto disincentives.

Traffic Operations Improvements to Manage and Control the Flow of Motor Vehicles

There were five types of traffic operations improvements stated in the Federal Register on September 17, 1975, which were: (1) Channelization of Traffic, (2) One-Way Streets, (3) Better Signalization and Progressive Timing of Traffic Signals, (4) Computerized Traffic Control and Metering Access to Freeways, and (5) Reversible Traffic Lanes. Improvements 4 and 5 are not applicable to the Waterloo metropolitan area. Improvements 1-3 are the type that will be made during the TSM program years (FY 1978-1982). The proposed traffic operations improvements are listed in Table 1 on page 6 .

The traffic operations improvements in the Waterloo metropolitan area proposed for FY 1978-1982 are necessary because of increasing traffic volumes and increased accidents. The result of these improvements should be increased control of the motor vehicle flow, a reduction in the number of accidents, and an increase in the overall safety at the various locations. The following documents would be considered the basis for the improvements listed in Table 1 .

1. Report on Traffic Safety Study for the City of Cedar Falls (1975)
2. Cedar Falls Capital Improvements Program FY 1978-1982 (1977)
3. Waterloo Capital Improvements Program FY 1978-1982 (1977)
4. City of Waterloo Signalized Intersecting and Traffic Channelization Medians (1976)
5. Traffic Signal and Channelized Intersection Inventory in Cedar Falls (1976)
6. A Proposal for the Progression of Traffic on University Avenue (1972)
7. Waterloo Metropolitan Area Transportation Study (1968)

Table 1

Traffic Operations Improvements to Manage and Control the Flow of Motor Vehicles

Program Jurisdiction - Cedar Falls

Project Title	Location	Type of Work	Funding Source	Accomplishments 1977	1978	1979	FY 1978-1982 Program Dollar Cost			Total
							1980	1981	1982	
First St. and Franklin St.		SM	State & Local		\$30,000					\$ 30,000
University Avenue		PS	Fed., State, Local		\$75,000					\$ 75,000
Sixth St. and Franklin St.		S	Fed., State, Local				\$20,000			\$ 20,000
18th St. and Waterloo Rd.		SM, CH	Fed., State, Local					\$100,000		\$ 100,000
Main St. and Seerley Blvd.		SM	Local					\$ 10,000		\$ 10,000
College St. and 23rd St.		SM	Local					\$ 5,000		\$ 5,000
Center St. and Lone Tree Rd.		S	Fed., State, Local						\$20,000	\$ 20,000

Program Jurisdiction - Waterloo

Hwy. 412	Kimball Ave.	CH	Local		\$10,000					\$ 10,000
Hwy. 412	Hammond Ave.	CH	Local		\$10,000					\$ 10,000
Hwy. 412	Hammond Ave.	S	Local/State			\$40,000				\$ 40,000
Hwy. 412	Sears Dr.	S	Local/State			\$40,000				\$ 40,000
Ridgeway	Deere Rd.	S	Local	\$ 25,000						\$ 25,000
E. & W. 4th Sts.	CBD	PD	Local	\$1,210,144						\$1,210,144
U.S. 20	Cedar Bend	S	Local/State				\$30,000			\$ 30,000
Kimball Ave.	Ridgeway Ave.	CH/S	Local				\$40,000			\$ 40,000
River Road	Illinois Cent. RR	R/R S	Local/Federal		\$50,000					\$ 50,000

Type of Work

CH = Channelization
 SM = Signal Modification
 S = Signalization
 PS = Progressive Signalization
 OW = One-way Systems
 B = Bikeways
 P = Pedestrian Improvements

Preferential Treatment for Transit and Other High Occupancy Vehicles

Preferential treatment for high occupancy vehicles in the Waterloo CBD was considered during FY 1977 as part of a Central Transfer Evaluation. This report reviewed transit circulation within the CBD in comparing alternative transfer sites for fixed route operations. Routing on East and West Fourth Street within the CBD would be ideal for minimizing bus route distances and in serving the highest intensity land uses within this area, however, recent traffic volumes are much higher than anticipated prior to reconstruction of the street and the opening of the connecting Fourth Street Bridge. As a result, levels of congestion on Fourth Street eliminate its feasibility for bus routes.

The exclusion of auto traffic on this street would provide an effective improvement in CBD transit routing, however, local groups which participated in the development of Waterloo's Downtown Development Plan have strongly maintained that auto circulation is needed in proximity to business located on Fourth Street and have rendered a political climate which makes the designation of an exclusive bus/taxi street in the downtown area very improbable at present.

No other areas for preferential treatment of bus and carpool travel have been identified for consideration within the five-year program.

Changes in Work Schedules, Fare Structures, and Automobile Tolls to Reduce Peak Period Travel and to Encourage Off-Peak Use of Transportation Facilities and Transit Service

Staggered Work Hours -

The Waterloo metropolitan area currently has staggered work hours, through varying arrival times in the manufacturing, retail, and professional sectors. The largest employer in the metropolitan area, the John Deere Tractor Works, has a shift that begins work at 7:00 a.m. and leaves at 3:30 p.m. The John Deere office employees begin work at 7:30 a.m. and leave at 4:30 p.m. for another variation. The CBD employees work from 9:00 a.m. to 5:30 p.m., while the professionals work from 8:00 a.m. to 5:00 p.m., and finally the shopping center employees work from 10:00 a.m. to 9:00 p.m. There is no further variation planned at this time.

Flexible Work Hours -

No examples of employment centers with flexible work hours were found to exist in the Waterloo metropolitan area, nor were there any with this type of program planned.

Reduced Transit Fares for Off-Peak Transit Users -

Reduced fares were maintained during off-peak hours for FY 1977 for elderly and handicapped riders. On October 1, 1976, a fare increase raised full fares to 35¢ with one-half off-peak fares raised to 17.5¢ (8-ride \$1.40 ticket) additionally, half-fares were expanded to all operating hours for elderly and handicapped starting November 1, 1976.

Increased Peak-Hour Commuter Tolls on Bridges and Access Routes to the City -

Currently there are no peak-hour commuter tolls in the Waterloo metropolitan area, nor are there any proposed. Such action would be taken only if traffic levels increased greatly on access routes into the metropolitan area, which would be detected in the Surveillance element of the continuing transportation planning process.

TRANSIT

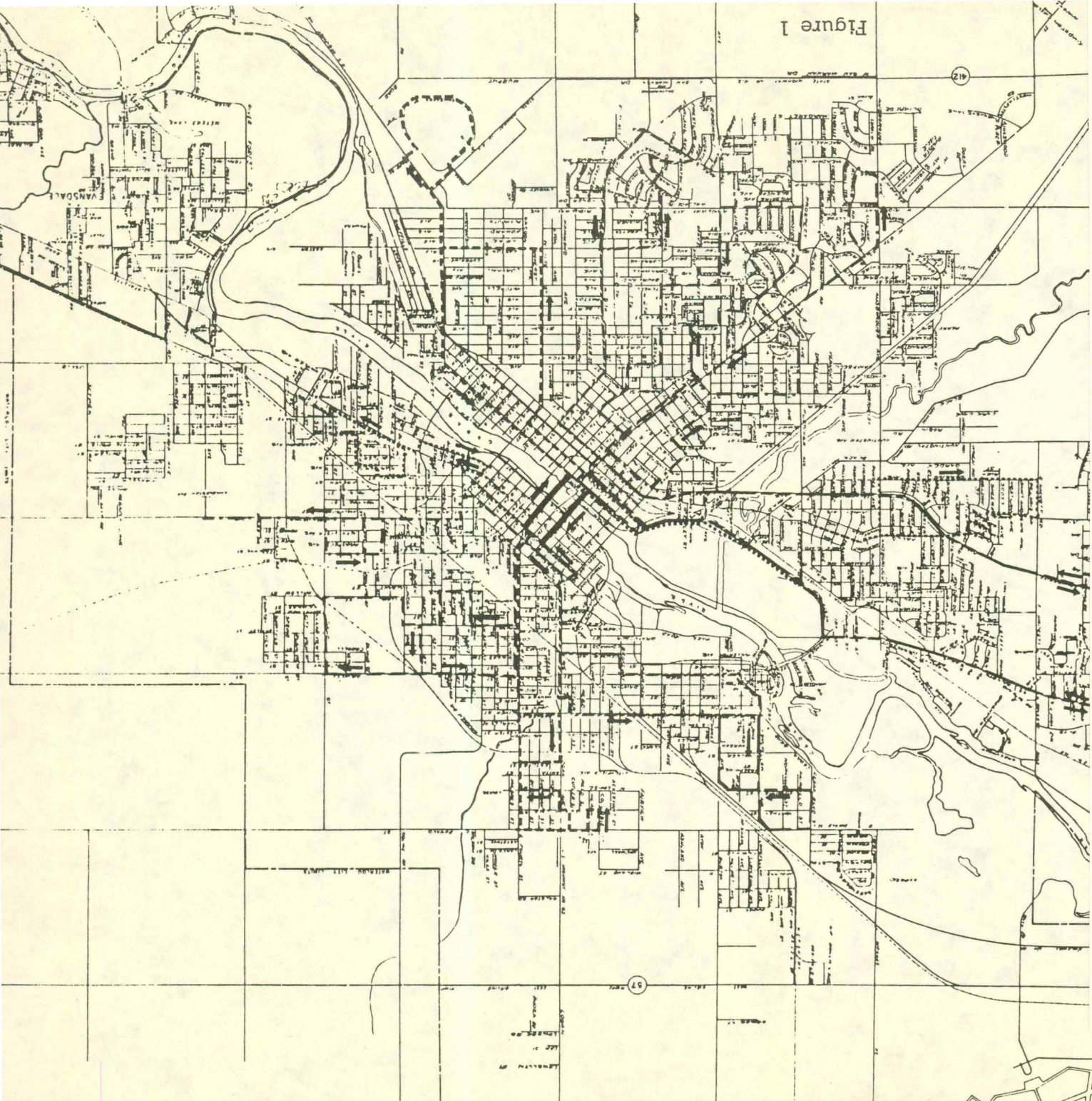
Transit improvements considered as part of the FY 1978 TSM Plan have been based upon the conceptual framework of the original Metropolitan TDP as revised through the previous TSM/TIP, and have further been based upon revisions resulting from ongoing surveillance and system performance evaluations. Additionally, metropolitan implications resulting from an update of the Regional TDP have been incorporated.

Review of Fiscal 1977 Operations

Projected operating expansion during the past year was limited, similar to the previous year, as a result of cash flow limitations, excessive cost increases (especially insurance costs), and service limitations on the existing bus fleet due to the increasing maintenance required and commensurate vehicle "down time." In spite of financial constraints, the following improvements were made during the year:

- September 1, 1976 - A new Cedar Falls route was initiated as developed in the TDP, for increased coverage and improved service to major trip generators. An updated map showing fixed routes at the end of the year (including the new Cedar Falls route) is shown in Figure 1.
- October 1, 1976 - The fare structure was revised upward to compensate for rising costs and high subsidy/rider levels. Old and new fares are listed respectively: full - 25¢ to 35¢; 10-ride coupon \$2.00 to \$3.00; half-fare elderly and handicapped 12.5¢ to 17.5¢; and children 11-16 15¢ to 25¢. Free transfers were maintained. The increase brings fares closely in line with comparable sized mid western urban areas. While 76.6 percent of the annual ridership occurred after the fare increase, 81.1 percent of fare revenue was generated in the same period.
- November 1, 1976 - Based upon community requests and minimal capacity problems, the MET Board established one-half fares for the elderly and handicapped during all operating hours (instead of off-peak only). Elderly and handicapped ridership has increased through the period and reflected 17.2 percent of ridership toward the end of the year.
- Two subscription routes recommended for initiation during the year were not undertaken, however, a new special run was provided to a new manufacturing plant at the fringe of the urban area. Although the service was well publicized, with the company's cooperation, only seven riders were served over an eight

Figure 1



day period so service was discontinued. The poor response was attributed to large parking availability at the plant and irregularity of employee work schedules.

Capital Improvements

Capital improvements made during the year reflect the utilization of unused funds from a previously approved UMTA Section 3 grant of approximately \$33,000. Other items reflected in the FY 1977 annual element are either pending grant approval or have not yet been applied for, as follows:

FY 1976 Carryover to 1977 Annual Element

- Garage addition/bus washer. A Section 5 application is pending with total cost revised from \$125,000 to \$199,274.
- Twenty-one digital counters not yet applied for.
- Fifty bus stop signs, received through balance of Section 3 grant.

FY 1977 Projects

- Twenty-one buses not yet applied for.
- Eight shelters - four received with Section 3 funds, two of which have been placed on the Cedar Falls route at University of Northern Iowa stops.
- Radio communications, Section 5 application is pending and has been revised from \$54,650 to \$58,383 which reflects two additional mobile units over the FY 1977 program--one portable unit for the route supervisor and one spare unit.
- Twenty bus schedule boards, not yet applied for.
- Office equipment has been purchased with Section 3 funding balance.
- Central transfer facility not yet applied for, awaiting availability of and justification for alternate site location.

System Performance

Table 2 provides a comparison of FY 1977 operations to projections on which the FY 1977 TSM was based.

MET PERFORMANCE

FY '77

REVENUES

ROUTE	RIDERSHIP		REVENUE	
	PROJECTED	ACTUAL ^e	PROJECTED	ACTUAL
Highland/Byrnes Park		82,852		
Cedar Falls/Waterloo		110,914		
Parker/West Ninth		96,215		
East Fourth/La Porte Rd.		144,322		
Lafayette/Downing-Ansbr.		89,533		
Williston/Cottage		126,282		
Cedar Falls	850,000	17,372		
Subscription A } (Not Subscription B } Initiated)	23,000	(specials) 38,888	\$236,800	\$196,536
			10,575	0
Charter			10,000	13,279
Other Revenue			1,000	72
(Interest & Cash Discount earned)				1,868
TOTALS	850,000	706,378	\$258,375	\$211,755

e = estimated
SYSTEM DATA

COSTS

OPERATING EXPENSES	PROJECTED	ACTUAL
Wages		\$376,582
Insurance		82,167
Maintenance		78,572
Operating Rents		23,155
Utilities		9,088
Tax & Licenses		29,158
Account. & Legal		2,431
Promotions		4,708
Other		10,167
TOTAL COSTS	\$641,662	\$616,028

OPERATING COSTS

- \$616,028

	PROJECTED	ACTUAL
COST		
/Hr.	\$12.830	\$13.000
/Mi.		.978
/Pass.	.755	.871
/Capita*	6.041	5.800
SUBSIDY		
/Pass.	.451	.572
/Capita	3.608	3.806
PASSENGERS		
/Rt. Mi.		1.122
/Seat Mi.		.032

SUBSIDIES

	TOTAL DEFICIT	
(\$383,287)		\$404,273
N.P.	I-DOT	45,000
\$191,643	FEDERAL	\$202,136*
142,505	WATERLOO	150,308
49,138	C. F.	51,828
PROJECTED		ACTUAL

CAPITAL COSTS (Includes FY '76 carryover)

	TOTAL	
\$257,657		\$1,764,220
206,125	FEDERAL	1,411,376
38,319	WATERLOO	262,375
13,213	CEDAR FALLS	90,469
ACTUAL		PROJECTED

*(Pending Approval)

\$661,930

TOTAL COSTS FOR YEAR

*Total Population Waterloo and Cedar Falls 106,218 (1975 Special Census)

Table 2

Ridership decreased 3.5 percent from 731,305 in FY 1976 to 707,047 in FY 1977, however, total revenue increased 17.8 percent from the previous year to \$196,536 in FY 1977. Other FY 1977 comparisons to the previous year were: deficit up 22 percent, total operating costs up 21 percent, or 7.5 percent per hour of operation. The projected hourly cost increase had been based on a six percent inflation rate. The added increase in operating costs can primarily be attributed to insurance coverage rates which have risen drastically.

In addition to the evaluation of the past fiscal year operating data, transit surveillance efforts were undertaken to update and expand transit system documentation originally compiled for the TDP and initial TSM. Summaries of these efforts are presented below:

Route Ridership

Ridership monitoring is still somewhat hampered since only four digital counters are currently available (additional counters will be included in a FY 1978 capital application), and registering units on fare boxes are inoperative. However, weekday ridership was counted on successive days and has been broken down by route end as shown in Table 3.

Route	<u>Route End</u>		Total	Average		
	East	West		# Days Counted	Daily Riders	% of System
#1 Byrnes Park/Highland	129	269	494	2	247	12.5
#2 Cedar Falls/Waterloo	827	1,362	2,189	6	365	18.4
#3 W. Ninth/Parker	268	321	589	2	295	14.9
#5 E. Fourth/La Porte	418	491	909	2	455	23.0
#6 Falls/Lafayette	174	395	569	2	285	14.4
#7 Williston/Cottage	364	446	810	3	270	13.6
#8 Cedar Falls	207	174	381	6	64	3.2
TOTAL					1,981	100.0

Table 3

Table 4 provides a further breakdown of fare categories by route and route end and provides an indication of elderly-handicapped usage (half fares) by service area.

1977 Ridership Count By Fare

<u>Route/Route End</u>		<u>% of Riders Paying</u>				<u>Transfers</u>
		<u>Full (35¢)</u>	<u>Ticket (30¢)</u>	<u>Half (17.5¢)</u>	<u>Children (25¢)</u>	
Byrnes/Highland	East	39	16	11	4	30
	West	30	21	20	3	26
	Total	34	19	16	3	28
Waterloo/C.F.	218	32	27	13	2	26
	Rainbow	27	39	13	4	17
	Total	29	35	13	3	20
W. 9th/Parker	East	29	26	16	1	28
	West	27	33	15	1	24
	Total	28	29	16	1	26
E. 4th/LaPorte	East	47	21	6	3	23
	West	41	16	15	4	24
	Total	43	18	11	4	24
Falls/Lafayette	East	36	21	16	3	24
	West	24	37	13	3	23
	Total	28	32	14	3	23
Williston/Cottage	East	45	19	7	5	24
	West	32	26	18	2	22
	Total	38	23	13	3	23
Cedar Falls	East	50	19	10	8	13
	West	35	23	16	13	13
	Total	43	20	13	11	13
<u>System Total</u>		33.4	27.4	13.4	3.5	22.3
<u>Excluding Transfers</u>		43.0	35.3	17.2	4.5	-

Table 4

Transit Travel Time and Routing Evaluation

Referring to Table 5, the bus figures for length and average speed were taken from actual transit data and used to obtain the travel time for the east and west loops and the CBD sections of each route. Such breakdowns were not available for the Cedar Falls local route and the Waterloo-Cedar Falls intercity route, making them less accurate but still generally viable for comparison purposes. The figures for average speed of the auto were taken from the link speed data supplied by the Waterloo Area Transportation Study Network and were applied to the same sections of each respective bus route for obtaining comparable auto times.

The comparison table shows that the private auto clearly has an advantage over bus travel, in both average speed and travel time. Beyond average speed and travel time, the basic problem with the transit system--when compared with the private auto--is the route configuration, its corresponding direction of travel, and the availability of direct line travel to major trip generators. A further analysis of the transit system reveals that some transit trips are quite competitive with the private auto, especially when taking into account all that is involved, such as wait time, parking availability, parking time, walking time, etc.

In general the major work trip generators are well served, especially the main John Deere Tractor Works plant, which is served by special routes as well as peak hour direct routes. Trips centering on the downtown Waterloo area are also served better than the averages that are reflected in the table. The transit system currently has a total coverage ratio of 64 percent in the metro area (those living within one-eighth mile of a bus route). Of the Waterloo routes, a certain percentage of each (as measured by percent of the routes total mileage), is linked directly to the downtown Waterloo area. Table 6 shows these percentages for the various Waterloo routes and the percentages of each route end, which are directly linked to the downtown, making that percent of each route very competitive with the private auto for those travel lines.

Some trips are especially ill served by the current route system. The most noticeable of these are trips originating from the west side with a destination of the Crossroads Shopping mall. These travel desires require greater than normal travel time and involve reverse direction travel to the CBD where a transfer can be made to reach Crossroads.

With the growth and development occurring rapidly on the west side, many of these new areas are left unserved by the current system. For this reason, a new route will be developed emphasizing these uncovered areas on the west side. Currently, the coverage of the transit system is quite adequate for the non-choice rider. The indirectness of travel and the additional time required for some travel desires preclude extensive use of the system by choice riders. These factors will be taken into account in redeveloping the existing route structures for more direct and efficient service.

Waterloo Routes

#	Route End	Length (Miles)	Average Speed (mph)		Travel Time (Minutes)		% Difference (Bus Over Auto)
			Bus	Auto	Bus	Auto	
1	CBD	1.15	13.6	19.0	5.5	3.6	34.5
	North	5.52	15.0	26.0	22.1	12.7	42.5
	South	6.42	14.0	21.0	27.7	18.3	33.9
	Total	13.09	14.2	22.0	55.3	34.6	37.0
3	CBD	1.15	13.6	19.0	5.5	3.6	34.5
	North	4.91	13.3	24.5	22.1	12.0	45.7
	South	6.36	13.7	21.4	27.6	17.8	35.5
	Total	12.42	13.5	21.6	55.2	33.4	39.5
5	CBD	1.15	13.6	19.0	5.5	3.6	34.5
	North	6.42	17.0	21.5	22.7	17.9	21.1
	South	6.45	13.7	22.3	28.4	17.4	38.7
	Total	14.02	14.8	20.9	56.6	38.9	31.3
6	CBD	1.15	13.6	19.0	5.5	3.6	34.5
	North	3.82	11.1	23.0	22.1	10.0	54.8
	South	7.94	17.2	21.0	27.7	22.7	18.1
	Total	12.91	14.0	21.0	55.3	36.3	34.4
7	CBD	1.15	13.6	19.0	5.5	3.6	34.5
	North	5.64	14.9	23.2	22.1	14.6	33.9
	South	5.55	11.8	21.3	27.7	15.6	43.7
	Total	12.34	13.4	21.2	55.3	33.8	38.8

Cedar Falls Local Route

8	Westbound	15.52	16.9	24.0	55.0	38.8	29.5
	Eastbound	15.39	16.8	24.0	55.0	38.5	30.0

Waterloo-Cedar Falls Intercity Route

2		15.45	17.0	26.0	54.5	35.7	34.9
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Table 5

Percent of Route Directly Linked to CBD

<u>Route #</u>	<u>% Direct (total)</u>	<u>% Direct East Loop</u>	<u>% Direct West Loop</u>
1	36	33	38
3	44	49	40
5	44	45	43
6	46	43	48
7	37	30	44

Table 6

Schedule Adherence

In evaluating the schedule adherence of the MET Transit system, the actual arrival times were plotted against the scheduled arrival times for peak (3:45 and 4:15) and mid-day (1:45) hours, two days during the week. The east, west, and Waterloo-Cedar Falls routes were evaluated separately, omitting the CBD section in order to provide a more direct comparison of actual loop ends. Arrival times are shown in Table 7.

Schedule Adherence

	<u>Minutes</u>	<u>Mid-Day Arrivals</u>				<u>P. M. Peak Arrivals</u>			
		<u>West</u>	<u>East</u>	<u>W'loo- C.F.</u>	<u>%</u>	<u>West</u>	<u>East</u>	<u>W'loo C.F.</u>	<u>%</u>
Early	5+ minutes					6			12
	1-5 minutes	6	2		33	8			17
On Time	+ or - 1 minute	4	6		42	4	10		29
Late	1-5 minutes			2	8	2	2	6	21
	5+ minutes		2	2	17		8	2	21

Table 7

The table may be summed as follows: The Waterloo-Cedar Falls route is characteristically behind schedule in both peak and mid-day operations. The east side loops, while generally adhering to schedule in mid-day operation, fall 5-6 minutes behind in the latter day peak hour operations (all but one of the 4:15 routes were 5-6 minutes late). The west side loop is characteristically ahead of schedule, even more so during peak hour periods.

More involved work needs to be undertaken in this area. The addition of radio units for each bus would make this possible. Radio units would also improve the general adherence to schedule through improved communications throughout the entire route system, as well as aiding the system in emergencies (i.e., breakdowns, accidents, etc.).

Regional TDP

An update of the Regional TDP was completed during FY 1977 and considered transit needs of the region with emphasis upon the elderly and handicapped. Implications of the Regional Study have been incorporated into the metropolitan transit program. It has been estimated based on Iowa Department of Transportation guidelines, that 33,000 potential monthly trips exist for elderly and handicapped in the metro area. This reflects a demand for essential trips completed at 8 and 12 trips/person/month for the elderly and handicapped, respectively. Approximately one-third of this amount is currently served by MET transit based on rider counts. An additional 1,800 trips/month are served through the County Council on Aging, however, approximately 20,000 trips per month are estimated to be unserved because of coverage and level of service limitations. As a result, three small diesel vehicles have been added to the program to provide a special level of service for elderly and handicapped and to complement existing average fixed route systems.

A companion study to the Regional TDP Update was completed as a technical memorandum for the identification of work and residence locations of the handicapped. The metropolitan data in this report, although very generalized, is being incorporated into metro transit evaluations. Further evaluations will be undertaken in FY 1978 to determine the replacement of existing special social agency transportation services with expanded MET transit service through a demand-responsive component. This service improvement is contingent on the initiation of radio communications which will result from a pending capital application.

Special Efforts for the Elderly and Handicapped

As a result of previously mentioned planning considerations, the following special efforts will be reflected in the FY 1978-1982 TIP:

- Establish radio communications (FY 1978)

- Establish demand-responsive service to serve uncovered areas and semi-ambulatory persons in covered areas unable to use fixed route service. Two vehicles are programmed for FY 1979 and one additional for FY 1981, all equipped with wheelchair lifts.

- Continue fare structure of one-half full fare during all hours.
- Consider absorption of social agency transit operations and coordination with agencies programs for elderly and handicapped.

Source of Funds

Capital

- UMTA Section 5 funds
- Local matching funds

Operating

- UMTA Section 5 funds
- Local matching funds

Additionally, the absorption of social service transit services may implicate current Black Hawk County funding support towards special elderly and handicapped service operated by MET.

HEW Older American Act funds may be utilized separately by the Council on Aging County program to subsidize the one-half elderly fares based on their client's ability to pay for necessary trips.

Special Planning Efforts

Further planning efforts will complement past work and will include:

- Developing operating/dispatching procedures for demand-responsive service.
- Developing an evaluation method for determining optimal cost effectiveness for special elderly and handicapped transit service and consider contracting off-hour and isolated trip services to a third party para transit operator (to be undertaken in FY 1978).

FISCAL 1978 ANNUAL ELEMENT AND PROGRAM UPDATE

A summary of revised operating projections resulting from transit improvements is shown in Table 8. These projections have incorporated anticipated increases in costs and fares and are based on previously mentioned start up dates for expanded or new service. Ridership projections have also been revised based on recent trends, coverage, and service improvements. Anticipated ridership for the program has been projected as follows:

<u>Fiscal Year</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>
Fixed Route	707,000	797,000	880,000	906,000	933,000
Demand-Responsive	-	37,800	92,000	115,000	138,000
Total	707,000	834,800	972,000	1,021,000	1,071,000

A summary of the five year capital improvement program is shown in Table 9. Pending applications from FY 1977 have been shown as a carryover portion of the FY 1978 Annual Element. A further breakdown of FY 1978 Annual Element Projects is shown in Table 10.

The following sections have been developed based on a FY 1977 operations review, surveillance and planning refinements since the FY 1977 TIP.

ACTIONS TO IMPROVE TRANSIT SERVICE

Routing Improvements

- The 218 shoppers express is proposed to start Saturday service in January 1978.
- A new Ansborough-Downing route is proposed to start service on July 1, 1978.
- A new west side route is proposed for service starting July 1, 1978.
- Two demand-responsive vehicles will start service on January 1, 1979.
- An additional demand-responsive vehicle will be added on January 1981.

Rolling Stock Improvements

- Fleet replacement has been re-programmed for fiscal 1978, inasmuch as existing vehicles were not considered old enough for replacement during the past year according to UMTA's administrative guidelines. Revisions in the current TIP reflect:
 - Vehicle cost estimates at \$75,000 each
 - A reassessment of fleet size from 21 to 25 based on aforementioned programmed route expansions and MET management requirements for 4 spare vehicles during peak hour vehicle utilization.

**FIVE-YEAR
TRANSIT
OPERATING
IMPROVEMENT
PROGRAM**

REVISED FOR
FY 1978 T.I.P.

FISCAL YEAR	1978 (Annual Element)	1979	1980	1981	1982
<u>Estimated Operating Costs¹</u>					
Fixed Routes	\$ 672,000	\$ 889,658	\$ 943,014	\$ 999,366	\$ 1,059,316
Demand-Response	-	54,166	114,829	152,114	193,487
Charter	14,000	14,840	15,730	16,670	17,670
Total	\$ 686,000	\$ 958,664	\$ 1,073,573	\$ 1,168,150	\$ 1,270,473
<u>Estimated Revenue</u>					
Fixed Routes @\$.294 avg. fare	\$ 208,140	\$ 234,318	\$ 295,680 ⁴	\$ 304,416	\$ 313,488
Demand-Response @\$.375 avg. fare	-	14,175	41,400 ⁵	51,750	62,100
Charter @\$15.00/hour	15,000	20,000 ³	20,000	20,000	25,000 ⁶
Miscellaneous ²	1,000	1,000	1,000	1,000	1,000
Total	\$ 224,140	\$ 269,493	\$ 358,080	\$ 377,166	\$ 401,588
<u>Operating Deficit</u>	(\$ 461,860)	(\$ 689,171)	(\$ 715,493)	(\$ 790,984)	(\$ 868,885)
<u>Source of Subsidy</u>					
Federal Subsidy (Section 5)	\$ 230,930	\$ 344,585	\$ 357,746	\$ 395,492	\$ 434,442
Local Subsidy	175,930	289,586	302,747	340,492	379,443
State Subsidy	55,000	55,000	55,000	55,000	55,000

¹ Costs assume 7½% annual rate of inflation for FY 78, and 6% for balance of program.

² Miscellaneous revenue includes items such as junk sale, storage, token sale, accident collections over costs, etc.

³ Anticipates charter rate of \$20.00/hour.

⁴ Anticipates fare increase for average fare of \$.336/rider.

⁵ Anticipates fare increase for average fare of \$.450/rider.

⁶ Anticipates charter rate of \$25.00/hour.

Table 8

**FIVE-YEAR
TRANSIT
CAPITAL
IMPROVEMENT
PROGRAM**

REVISED FOR
FY 1978 T.I.P.

FY 1977 Carry-
over to FY 1978
Annual Element
\$204,500
412,282
616,782

\$ 58,383

199,274

\$257,657

\$206,125

\$ 51,532

FISCAL YEAR	(ANNUAL ELEMENT)					TOTAL	
	1978	1979	1980	1981	1982		
Section 5 Federal Funds - After Operating Subsidy	\$ 274,570	\$209,915	\$229,254	\$ -*	\$ -*		
Section 5 Federal Funds - Unused Carry-over	410,657	0	145,915	0	0		
Section 5 Federal Funds - Total Available	685,227	209,915	375,169	-*	-*		
CAPITAL COSTS (Number Units)							
16 Passenger Bus w/lift		(2) 63,600		(1) 35,750		99,350	
35 Passenger Bus	(25) 1,875,000					1,875,000	
Shelters		(4) 8,400				8,400	
Base Radio Facility						-	
Mobile Radios		(2) 2,000		(1) 1,125		3,125	
Garage Addition						-	
Automatic Bus Washer & Sweeper						-	
Service Truck		9,500				9,500	
Digital Counters	(21) 1,105					1,105	
Registering Fare Box		(2) 2,000		(1) 1,125		3,125	
Bus Stop Signs						-	
Bus Schedule Board	(8) 1,600					1,600	
Office Equipment						-	
Shop Equipment & Inventory		30,000	4,000			34,000	
Central Transfer Facility		105,600				105,600	
TOTAL		\$2,022,805	\$ 80,000	\$ 0	\$ 38,000	\$ 0	\$2,140,805
80% Federal "Section 5" Funds	\$ 685,227	\$ 64,000	\$ --	30,400	--	\$ 779,627	
80% Federal "Section 3" Funds	933,017	--	--	--	--	933,017	
20% Local Matching Funds	404,561	16,000	--	7,600	--	428,161	

*UMTA Section 5 funds have not been appropriated for 1981 and 1982; 1980 balance will be utilized toward 1981 operations.

Table 9

TRANSIT PROJECTS FOR THE FY 78 ANNUAL ELEMENT*

OPERATIONS

<u>Project Description</u>	<u>Estimated Total Cost</u>	<u>Federal Funds/ Source</u>	<u>Non-Federal Funds/ Source</u>
Maintenance of operations on existing 7 regular fixed routes and 5 special school/work trip routes.	\$ 661,542	\$ 226,076 UMTA Section 5	\$ 207,390 - Revenue \$ 55,000 - I-DOT ¹ \$ 171,076 - Local Subsidy ² \$ 2,000 - Misc. Income and Charter Revenues
Initiation of "218 Shopper's Express" Saturday service (Re: '75 TDP) on January 1, 1978 between College Square and Crossroads shopping centers. (8.2 miles in length)	\$ 3,458	\$ 1,354 UMTA Section.5	\$ 750 - Revenue \$ 1,354 - Local Subsidy ²
Charter Service estimated @1,000 hours	\$ 14,000	--	\$ 15,000 - Income (\$1,000 profit toward operating deficit)
Section 15 project establish FARE reporting system.	\$ 7,000	\$ 3,500 UMTA Section 5	\$ 3,500 - Local Subsidy ²
TOTAL	\$ 686,000	\$ 230,930 UMTA Section 5	\$ 208,140 - Fare Revenue \$ 55,000 - I-DOT ¹ \$ 175,930 - Local Subsidy ² \$ 16,000 - Misc. Income and Charter Revenue \$ 455,070 - Total Non-Federal Funds

*The MET Transit Authority of Black Hawk County is the funding recipient and agency responsible for implementing all projects in the FY 78 annual element.

¹Iowa D.O.T. State Transit Assistance funds (allocation pending).

²Local subsidy is derived from cities general fund supported primarily through property tax revenue and is received from Waterloo and Cedar Falls at 74.36% and 25.64%, respectively, based on hours of service delivered within each city.

Table 10

TRANSIT PROJECTS FOR THE FY 78 ANNUAL ELEMENT*

CAPITAL

<u>Project Description</u>	<u>Estimated Total Cost</u>	<u>Federal Funds/ Source</u>	<u>Non-Federal Funds/ Source</u>
Fleet replacement of 17 existing 1966 transit coaches and 4 existing 1967 transit coaches with (21) 30', 35 passenger buses with air conditioning and registering fare boxes. These vehicles will be used to maintain the existing level of fixed-route operations for 7 regular routes and 5 special routes.	\$1,575,000	\$641,983 UMTA Section 5	\$315,000 Local Funds
Four additional 30' 35 passenger buses with air conditioning and registering fare boxes. Two buses will be used on a route extension of approximately 12 miles to extend service to developing areas on Ansborough Avenue South, and to the Central High area. Two buses will be utilized on a new west side route under development to provide direct routing between residential areas, the CBD, and Crossroads Shopping Center, and to connect current route ends on Waterloo's west side.	\$ 300,000	\$240,000 UMTA Section 5	\$ 60,000 Local Funds
Service truck to replace existing 1964 vehicle.	\$ 9,500	\$ 7,600 UMTA Section 5	\$ 1,900 Local Funds
Twenty-one (21) digital counters for vehicles to assist in ridership data gathering.	\$ 1,105	\$ 884 UMTA Section 5	\$ 221 Local Funds
Eight (8) schedule/map boards to be placed in shelters.	\$ 1,600	\$ 1,280 UMTA Section 5	\$ 320 Local Funds
Shop equipment and parts inventory for new bus fleet including 1 spare engine, 1 spare transmission, 1 engine/transmission dolly and an estimated \$10,000 parts inventory.	\$ 30,000	\$ 2,400 UMTA Section 5	\$ 6,000 Local Funds
Development of a central transfer facility on Sycamore Street between Park and East Third on a 13,800 sq. ft. site to include site development (estimated @ \$50,000) and an enclosed shelter area and protective canopy (estimated @ \$46,000) and including a 10% contingency.	\$ 105,600	\$ 84,480 UMTA Section 5	\$ 21,120 Local Funds
	\$2,022,805	\$685,227 UMTA Section 5	\$404,561 Local Funds
TOTAL		\$933,017 UMTA Section 3	

*MET Transit Authority of Black Hawk County is the funding recipient and agency responsible for implementing all projects in the FY 78 annual element.

¹Local subsidy is derived from cities general fund supported primarily through property tax revenue and is received from Waterloo and Cedar Falls at 74.36% and 24.64%, respectively, based on hours of service delivered within each city.

Table 10
(continued)

- Additionally, it is the MET Board's firm objective to replace the current fleet as soon as practicable with "conventional technology" equipment to avoid excessive capital costs and the severe operational limitations which they feel would result from proposed "trans-bus" type of equipment with "total accessibility" features. Also, an early application for currently available vehicles will minimize the operations period of existing depreciated rolling stock.
- Three demand-responsive vehicles (two in FY 1979 and one in FY 1981) have been added to the program to provide a special level of service for elderly and handicapped while maintaining the operational efficiency of the scheduled, fixed-route system. Further, these vehicles will provide system flexibility for extending coverage to the general public (i.e., outlying subdivisions can be served on an abbreviated schedule basis with transfers to the fixed-route system and will provide an alternative to non-cost effective fixed-route extensions into areas of minimal ridership generation.)

Shelters

- Programmed shelters have been reduced from eight to four based on receipt of four shelters with Section 3 funds. The four additional shelters have been programmed for FY 1979 and will be located on expanded routes at heavy boarding points and/or transfer locations.

Other Improvements

Additional revisions and additions to the TIP include:

- Twenty-one digital counters for monitoring ridership
- Eight schedule boards (reduced from 20) for the proposed central transfer and revised shelter locations
- Shop equipment and parts inventory reflects an anticipated \$30,000 capital expenditure for one spare engine, one spare transmission, a new engine transmission dolly, and an approximate \$10,000 parts inventory to coincide with the acquisition of new rolling stock.
- Central transfer site development has been revised downward to \$105,600 based on an evaluation study completed during FY 1977 which recommends the development of an off-street transfer on an alternative site from the one suggested in the original TDP. Since property has been locally acquired at the alternate site, the project cost has been reduced and reflects a preliminary estimate of costs for site development and shelter construction.

- Service truck replacement has been advanced from FY 1979 to 1978 based on the poor condition of the existing truck (purchased in 1964).
- The addition of three small vehicles for demand-responsive service has necessitated the programming of commensurate radio, fare box, and parts inventory.

ACTIONS TO INCREASE INTERNAL MANAGEMENT EFFICIENCY

During fiscal 1978 the following areas will be emphasized for the improvement of metropolitan transit management:

- Establish a FARE accounting and reporting system based on preliminary work completed during FY 1977, to provide an ongoing uniform system for measuring operational performance and evaluating the program budget.
- Implement marketing strategies recommended in the FY 1977 marketing analysis and strengthening promotional efforts in identified areas toward increasing ridership.
- Continue to implement a "preventive maintenance program."
- Compile thorough accident and claims records to facilitate more acceptable insurance coverage rates.
- Initiate an effective communications system and increased monitoring of route operations upon the receipt and installation of radio equipment.

Continuing TSM Planning Efforts

During FY 1978, TSM efforts will be maintained within the approved Unified Work Program for transit planning in the metropolitan area.

Areas receiving concentrated attention during the year include:

- The development of improved promotions and transit informational materials (maps and schedules) to implement selected marketing strategies.
- Perform further evaluation of the fixed-route structure especially for its complementary development with programmed demand-responsive service.

- Evaluate methods of expanding service to the transit disadvantaged through initiation of demand-responsive service and service contracts to para-transit operators.

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