

Preliminary Draft

SEWRPC Community Assistance Planning Report No. 279

MILWAUKEE COUNTY TRANSIT SYSTEM DEVELOPMENT PLAN: 2005-2009

Chapter IV

PUBLIC TRANSIT SERVICE OBJECTIVES AND STANDARDS

INTRODUCTION

One of the critical steps in the preparation of a transit system development plan is the articulation of the objectives to be served by the transit system, together with the identification of supporting standards that can be used to measure the degree of attainment of the objectives. The objectives and standards provide the basis for assessing the performance of the existing transit system, identifying unmet transit service needs, designing and evaluating alternative transit system plans, and recommending service changes and improvements. The objectives and standards formulated under this study are intended to represent the level of transit performance desired by Milwaukee County.

This chapter presents the public transit service objectives, principles, and standards that were formulated and applied under the County's transit system development plan. The objectives and supporting standards set forth in this chapter may also be used by the County to guide in the design, operation, and review of its transit services after completion of this planning effort.

OBJECTIVES

The transit service objectives, principles, and standards set forth in this chapter are intended to reflect the underlying values of the elected officials and residents of Milwaukee County. One of the important functions of the Milwaukee County Public Transit Planning Advisory Committee was to articulate transit service objectives,

principles, and supporting standards for the planning effort. By drawing upon the collective knowledge, experience, views, and values of the members of the Committee, it is believed that a meaningful expression of the performance desired for the Milwaukee County Transit System was obtained, and a relevant set of transit service objectives and supporting principles and standards was defined.

The specific objectives adopted envision a transit system that will effectively serve transit travel by Milwaukee County residents both within the County and between the County and other adjacent communities in the Milwaukee urbanized area. More specifically, the following objectives were adopted by the Advisory Committee:

1. The public transit system should effectively serve the existing land use pattern and support the implementation of planned land uses, meeting the demand and need for transit services, and particularly the needs of the transit-dependent population;
2. The transit system should promote effective utilization of transit service and operate service that is reliable and provides for user convenience and comfort;
3. The transit system should promote the safety and security of its passengers, operating equipment and facilities, and personnel;
4. The public transit system should promote efficiency in the total transportation system; and
5. The public transit system should be economical and efficient, meeting all other objectives at the lowest possible cost.

PRINCIPLES AND STANDARDS

Complementing each of the foregoing transit service objectives is a planning principle and two sets of service standards, as set forth in Table 4-1. The planning principle supports each objective by asserting its validity. Each set of standards is directly related to the transit service objective and serves several purposes. The service design and operating standards are intended to primarily provide guidelines for the design of new and improved services, the operation of the transit system, and the acquisition of capital equipment and construction of facilities. The service performance standards primarily facilitate the evaluation of the performance of the existing transit system and of alternative service improvements. For each performance standard, one or more criteria are identified which can be used to quantify the performance of the transit service for measurement against the standard.

Table 4-1

**PUBLIC TRANSIT SERVICE OBJECTIVES, PRINCIPLES,
 STANDARDS, AND PERFORMANCE MEASURES FOR BUS SERVICE
 PROVIDED BY THE MILWAUKEE COUNTY TRANSIT SYSTEM**

| Objective | Principle | Standards | Performance Measure |
|---|--|--|---------------------|
| 1. The public transit system should effectively serve the existing land use pattern and support the implementation of planned land uses, meeting the demand and need for transit services, and particularly the needs of the transit-dependent population | Public transit is an essential element of the transportation system, connecting major land use activities and providing the accessibility essential to the support of these activities. Transit services are most cost-efficient when serving areas that are fully developed to medium and high densities. Transit also provides an important means of access to jobs and services for all segments of the population, but particularly for persons who must depend on transit as their primary means of travel. | <u>Service Design and Operating Standards</u> 1. The public transit system should serve travel demand generated within contiguous areas of urban development in the urbanized area and should be designed to provide for a higher degree of accessibility to areas of high density (7.0-17.9 dwelling units per net residential acre), and medium density (2.2-6.9 dwelling units per net residential acre) urban development than to areas of low-density development or which should be protected from development | 1. -- |
| | | 2. Public transit services should be designed and operated so as to permit the orderly and efficient expansion of service to developing areas | 2. -- |
| | | 3. Public transit services should be provided that address the varied travel and mobility needs of the County population and offer access to the major activity centers in the urbanized area. The transit services provided should include: a. Rapid and express service designed to reduce travel times for the longest trips made between component parts of the transit service area and to connect areas of high and medium density urban development to the Milwaukee central business district and the largest major activity centers b. Local service designed to provide transit within and between residential areas, to link residential areas with nearby major activity centers, and to provide for transfer connections with rapid, express, and other local services c. Local shuttle services designed to connect with rapid, express, and local services serving major activity centers d. Paratransit service designed to meet the needs of disabled individuals who are unable to use regular bus service | 3. -- |
| | | 4. The public transit system should serve and connect major activity centers in the urbanized area that currently generate, or have the potential to generate, significant ridership including: a. Housing facilities serving transit-dependent persons who are living independently including elderly, disabled, and low-income individuals b. Principal hospitals and medical centers c. Major retail shopping malls d. Principal colleges and universities e. Major Federal, State, and local governmental offices and institutions f. Major employers with more than 500 employees at one site g. Major industrial and office parks h. Major passenger terminals for intercity bus, passenger rail, and airline carriers i. Major public and private recreational centers hosting high attendance events | 4. -- |

Table 4-1 (continued)

| Objective | Principle | Standards | Performance Measure | | | | | | | | | | | | |
|--|--|---|---------------------|----------------|----------------|----------|----------|----------|--|----------|----|-------|----------|----|--|
| <p>1. (continued)</p> | | <p><u>Service Performance Standards</u></p> <p>1. The population served should be maximized, particularly those who are transit-dependent. The population shall be considered as served when it resides within the following distances of transit service:</p> <p>Maximum Distance from a Bus Stop</p> <table border="1"> <thead> <tr> <th><u>Service Type</u></th> <th><u>Walking</u></th> <th><u>Driving</u></th> </tr> </thead> <tbody> <tr> <td>Rapid</td> <td>1/2 Mile</td> <td>3 Miles</td> </tr> <tr> <td>Express</td> <td>1/2 Mile</td> <td>--</td> </tr> <tr> <td>Local</td> <td>1/4 Mile</td> <td>--</td> </tr> </tbody> </table> | <u>Service Type</u> | <u>Walking</u> | <u>Driving</u> | Rapid | 1/2 Mile | 3 Miles | Express | 1/2 Mile | -- | Local | 1/4 Mile | -- | <p>1. The number of people residing within appropriate walking or driving distance of a bus stop and the percent of the total population represented</p> |
| | | <u>Service Type</u> | <u>Walking</u> | <u>Driving</u> | | | | | | | | | | | |
| | | Rapid | 1/2 Mile | 3 Miles | | | | | | | | | | | |
| | | Express | 1/2 Mile | -- | | | | | | | | | | | |
| Local | 1/4 Mile | -- | | | | | | | | | | | | | |
| <p>2. The major activity centers and jobs served should be maximized. Major activity centers and jobs shall be considered as served when located within the following distance of transit service:</p> <p>Maximum Walking Distance from a Bus Stop</p> <table border="1"> <thead> <tr> <th><u>Service Type</u></th> <th><u>Distance from a Bus Stop</u></th> </tr> </thead> <tbody> <tr> <td>Rapid</td> <td>1/2 Mile</td> </tr> <tr> <td>Express</td> <td>1/2 Mile</td> </tr> <tr> <td>Local</td> <td>1/4 Mile</td> </tr> </tbody> </table> | <u>Service Type</u> | <u>Distance from a Bus Stop</u> | Rapid | 1/2 Mile | Express | 1/2 Mile | Local | 1/4 Mile | <p>2. The number of major activity centers and jobs located within appropriate walking distance of a bus stop and the percent of the total activity centers and jobs represented</p> | | | | | | |
| <u>Service Type</u> | <u>Distance from a Bus Stop</u> | | | | | | | | | | | | | | |
| Rapid | 1/2 Mile | | | | | | | | | | | | | | |
| Express | 1/2 Mile | | | | | | | | | | | | | | |
| Local | 1/4 Mile | | | | | | | | | | | | | | |
| <p>3. The transit supportive land area served should be maximized. To be considered transit supportive, an area should have a density of at least 4 dwelling units per net residential acre, or at least 4 jobs per gross acre</p> | <p>3. The proportion of the transit supportive land area located within one-quarter mile of a local bus route</p> | | | | | | | | | | | | | | |
| <p>4. The public transit system should provide service within the urbanized area that maximizes the population that is:</p> <ul style="list-style-type: none"> a. Within 45 minutes overall transit travel time of 40 percent of the jobs in the urbanized area b. Within 35 minutes overall transit travel time of a major shopping mall c. Within 40 minutes overall transit travel time of a major college or university d. Within 30 minutes overall transit travel time of a major hospital or medical center e. Within 40 minutes overall transit travel time of a major Federal, State, or local governmental office or public institutional center f. Within 60 minutes overall transit travel time of a major passenger terminal for an intercity bus, passenger rail, or airline carrier g. Within 60 minutes overall transit travel time of a major public or private recreational center hosting high attendance events | <p>4. The number of people residing within each of the prescribed travel times and the percent of the total population represented</p> | | | | | | | | | | | | | | |

Table 4-1 (continued)

| Objective | Principle | Standards | Performance Measure | | | | | | | | | | | | | | | | | | | | | | |
|--|---|--|--|-----------------------------------|------------|-----------------|-----------------------|--|------|-------|----------------------|--|----------------------|-------|---------|--|----------------------|----------------------|--------------|--------------|----------------------|----------------------|---------------------|--|--------------|
| <p>2. The transit system should promote effective utilization of transit service and operate service that is reliable and provides for user convenience and comfort.</p> | <p>The benefits of a public transit system are, to a large extent, greatly related to the degree to which it is used as measured by transit ridership. Ridership is a function of the degree to which people have access to transit services which are reliable and provide for quick, convenient, and comfortable travel. Riders view transit services with these attributes as an effective and attractive alternative to the private automobile.</p> | <p>Service Design and Operating Standards</p> <p>1. Public transit routes should have direct alignments with a limited number of turns, and should be arranged to minimize duplication of service and unnecessary transfers which would otherwise discourage transit use.</p> | <p>1. --</p> | | | | | | | | | | | | | | | | | | | | | | |
| | | <p>2. Rapid and express transit routes should be extended as needed to perform a collection-distribution function at the ends of the route</p> | <p>2. --</p> | | | | | | | | | | | | | | | | | | | | | | |
| | | <p>3. Public transit service that does not meet service performance standards may be warranted in special instances if it improves total system continuity and/or provides significant feeder service or transfer opportunities to other routes</p> | <p>3. --</p> | | | | | | | | | | | | | | | | | | | | | | |
| | | <p>4. Bus stops should be clearly marked by easily recognized bus stop signs and located so as to minimize the walking distance to and from residential areas and major activity centers, and to facilitate connections with other transit services where appropriate. The suggested locations and spacing for stops are as follows:</p> <table border="0" data-bbox="695 1003 1219 1213"> <thead> <tr> <th><u>Service Type</u></th> <th colspan="3"><u>Stop Locations and Spacing</u></th> </tr> </thead> <tbody> <tr> <td>Rapid</td> <td colspan="3">At terminal areas and one-mile or more on line-haul sections</td> </tr> <tr> <td>Express</td> <td colspan="3">At terminal areas, intersecting transit routes, signalized intersections with arterial streets, and major activity centers</td> </tr> <tr> <td>Local</td> <td colspan="3">600 to 1200 feet (two to three blocks) apart</td> </tr> </tbody> </table> | <u>Service Type</u> | <u>Stop Locations and Spacing</u> | | | Rapid | At terminal areas and one-mile or more on line-haul sections | | | Express | At terminal areas, intersecting transit routes, signalized intersections with arterial streets, and major activity centers | | | Local | 600 to 1200 feet (two to three blocks) apart | | | <p>4. --</p> | | | | | | |
| | | <u>Service Type</u> | <u>Stop Locations and Spacing</u> | | | | | | | | | | | | | | | | | | | | | | |
| | | Rapid | At terminal areas and one-mile or more on line-haul sections | | | | | | | | | | | | | | | | | | | | | | |
| Express | At terminal areas, intersecting transit routes, signalized intersections with arterial streets, and major activity centers | | | | | | | | | | | | | | | | | | | | | | | | |
| Local | 600 to 1200 feet (two to three blocks) apart | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>5. The public transit system should be designed and operated so as to achieve the following minimum overall travel speeds by area based on average weekday conditions:</p> <table border="0" data-bbox="695 1318 1057 1476"> <thead> <tr> <th rowspan="2"><u>Service Type</u></th> <th colspan="3"><u>Travel Speed (miles per hour)</u></th> </tr> <tr> <th><u>CBD</u></th> <th><u>City</u></th> <th><u>Outlying Areas</u></th> </tr> </thead> <tbody> <tr> <td>Rapid</td> <td>5-10</td> <td>15-30</td> <td>40-55</td> </tr> <tr> <td>Express</td> <td>5-10</td> <td>15-20</td> <td>25-35</td> </tr> <tr> <td>Local</td> <td>5-10</td> <td>12-15</td> <td>18-25</td> </tr> </tbody> </table> | <u>Service Type</u> | <u>Travel Speed (miles per hour)</u> | | | <u>CBD</u> | <u>City</u> | <u>Outlying Areas</u> | Rapid | 5-10 | 15-30 | 40-55 | Express | 5-10 | 15-20 | 25-35 | Local | 5-10 | 12-15 | 18-25 | <p>5. --</p> | | | | | |
| <u>Service Type</u> | | <u>Travel Speed (miles per hour)</u> | | | | | | | | | | | | | | | | | | | | | | | |
| | <u>CBD</u> | <u>City</u> | <u>Outlying Areas</u> | | | | | | | | | | | | | | | | | | | | | | |
| Rapid | 5-10 | 15-30 | 40-55 | | | | | | | | | | | | | | | | | | | | | | |
| Express | 5-10 | 15-20 | 25-35 | | | | | | | | | | | | | | | | | | | | | | |
| Local | 5-10 | 12-15 | 18-25 | | | | | | | | | | | | | | | | | | | | | | |
| <p>6. The hours of service operation for the public transit system should serve the demand generated by the land use activities served by, and the function of, each route. Service periods should also accommodate the travel needs of those who depend on the transit system as their primary travel mode. The transit system should, therefore, strive to operate routes with service hours as follows:</p> <table border="0" data-bbox="695 1675 1219 1848"> <thead> <tr> <th rowspan="2"><u>Service Type</u></th> <th colspan="4"><u>Desirable Service Hours</u></th> </tr> <tr> <th><u>Weekdays</u></th> <th><u>Saturdays</u></th> <th><u>Sundays/ Holidays</u></th> <th></th> </tr> </thead> <tbody> <tr> <td>Rapid</td> <td>6:00 a.m.-10:00 p.m.</td> <td>6:00 a.m.-10:00 p.m.</td> <td>6:00 a.m.-10:00 p.m.</td> <td></td> </tr> <tr> <td>Express</td> <td>5:00 a.m.-11:00 p.m.</td> <td>5:00 a.m.-11:00 p.m.</td> <td>5:00 a.m.-11:00 p.m.</td> <td></td> </tr> <tr> <td>Local</td> <td>5:00 a.m.- 1:00 a.m.</td> <td>5:00 a.m.- 1:00 a.m.</td> <td>5:00a.m.- 1:00 a.m.</td> <td></td> </tr> </tbody> </table> | <u>Service Type</u> | <u>Desirable Service Hours</u> | | | | <u>Weekdays</u> | <u>Saturdays</u> | <u>Sundays/ Holidays</u> | | Rapid | 6:00 a.m.-10:00 p.m. | 6:00 a.m.-10:00 p.m. | 6:00 a.m.-10:00 p.m. | | Express | 5:00 a.m.-11:00 p.m. | 5:00 a.m.-11:00 p.m. | 5:00 a.m.-11:00 p.m. | | Local | 5:00 a.m.- 1:00 a.m. | 5:00 a.m.- 1:00 a.m. | 5:00a.m.- 1:00 a.m. | | <p>6. --</p> |
| <u>Service Type</u> | | <u>Desirable Service Hours</u> | | | | | | | | | | | | | | | | | | | | | | | |
| | <u>Weekdays</u> | <u>Saturdays</u> | <u>Sundays/ Holidays</u> | | | | | | | | | | | | | | | | | | | | | | |
| Rapid | 6:00 a.m.-10:00 p.m. | 6:00 a.m.-10:00 p.m. | 6:00 a.m.-10:00 p.m. | | | | | | | | | | | | | | | | | | | | | | |
| Express | 5:00 a.m.-11:00 p.m. | 5:00 a.m.-11:00 p.m. | 5:00 a.m.-11:00 p.m. | | | | | | | | | | | | | | | | | | | | | | |
| Local | 5:00 a.m.- 1:00 a.m. | 5:00 a.m.- 1:00 a.m. | 5:00a.m.- 1:00 a.m. | | | | | | | | | | | | | | | | | | | | | | |

Table 4-1 (continued)

| Objective | Principle | Standards | Performance Measure | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---------------------|--|--------------------------------|----------------------------|-----------------|----------------|----------------|-----------------|-----------------|---------------------|----------------|---------------|-----------------|---------|-----------------|-------|----|---------|----------------|-------|----|---------|--------|----|----|--|----------------|--|----------------|-------------|-----------------|-----------------|---------------------|----------------|----------------|-----------------|-------|----|----|----|---------|----|----|----|-------|----|----|----|-------|
| 2. (continued) | | <p>7 The availability of weekend and holiday service enhances the attractiveness of weekday service and positively affects system ridership by providing that regular weekday riders need not seek alternative travel modes. Therefore, a reasonable level of service should also be maintained on weekends and holidays.</p> | 7. -- | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | <p>8. Operating headways for public transit fixed-route service should be capable of accommodating passenger demand at the recommended load standards, and should also provide for a convenient service so as to encourage transit use. The desirable headways presented below represent a frequency of transit service that would be desirable to provide a service of high quality and to promote transit ridership. Lower headways may be provided in high density corridors of heavy travel demand, and higher headways may only be feasible in areas of low and medium density.</p> <p style="text-align: center;"><u>Desirable Headway (minutes)</u></p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th rowspan="2"></th> <th colspan="2"><u>Weekday</u></th> <th><u>Weekend</u></th> </tr> <tr> <th><u>Peak</u></th> <th><u>Off-Peak</u></th> <th><u>Periods/</u></th> </tr> <tr> <th><u>Service Type</u></th> <th><u>Period</u></th> <th><u>Period</u></th> <th><u>Holidays</u></th> </tr> </thead> <tbody> <tr> <td>Rapid</td> <td>10</td> <td>20</td> <td>30</td> </tr> <tr> <td>Express</td> <td>10</td> <td>20</td> <td>30</td> </tr> <tr> <td>Local</td> <td>10</td> <td>20</td> <td>30</td> </tr> </tbody> </table> <p>Operating headways should not exceed the following maximum headways throughout the service area when service is offered:</p> <p style="text-align: center;"><u>Maximum Headway (minutes)</u></p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th rowspan="2"></th> <th colspan="2"><u>Weekday</u></th> <th><u>Weekend</u></th> </tr> <tr> <th><u>Peak</u></th> <th><u>Off-Peak</u></th> <th><u>Periods/</u></th> </tr> <tr> <th><u>Service Type</u></th> <th><u>Periods</u></th> <th><u>Periods</u></th> <th><u>Holidays</u></th> </tr> </thead> <tbody> <tr> <td>Rapid</td> <td>30</td> <td>60</td> <td>60</td> </tr> <tr> <td>Express</td> <td>30</td> <td>60</td> <td>60</td> </tr> <tr> <td>Local</td> <td>30</td> <td>60</td> <td>60</td> </tr> </tbody> </table> | | <u>Weekday</u> | | <u>Weekend</u> | <u>Peak</u> | <u>Off-Peak</u> | <u>Periods/</u> | <u>Service Type</u> | <u>Period</u> | <u>Period</u> | <u>Holidays</u> | Rapid | 10 | 20 | 30 | Express | 10 | 20 | 30 | Local | 10 | 20 | 30 | | <u>Weekday</u> | | <u>Weekend</u> | <u>Peak</u> | <u>Off-Peak</u> | <u>Periods/</u> | <u>Service Type</u> | <u>Periods</u> | <u>Periods</u> | <u>Holidays</u> | Rapid | 30 | 60 | 60 | Express | 30 | 60 | 60 | Local | 30 | 60 | 60 | 8. -- |
| | | | | <u>Weekday</u> | | <u>Weekend</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <u>Peak</u> | <u>Off-Peak</u> | <u>Periods/</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | <u>Service Type</u> | <u>Period</u> | <u>Period</u> | <u>Holidays</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | Rapid | 10 | 20 | 30 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Express | 10 | 20 | 30 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Local | 10 | 20 | 30 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <u>Weekday</u> | | <u>Weekend</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <u>Peak</u> | <u>Off-Peak</u> | <u>Periods/</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <u>Service Type</u> | <u>Periods</u> | <u>Periods</u> | <u>Holidays</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rapid | 30 | 60 | 60 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Express | 30 | 60 | 60 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Local | 30 | 60 | 60 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>9. All transit vehicles should have heating/air conditioning units and wheelchair lifts/ramps that are in good working condition and should be cleaned and inspected daily with needed repairs made on a timely basis</p> | 9. -- | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>10. Consideration should be given to rehabilitating or replacing each public transit vehicle at the end of its normal service life, which shall be defined as follows:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th rowspan="2"><u>Vehicle Type</u></th> <th rowspan="2"><u>Length</u> <u>(feet)</u></th> <th colspan="2"><u>Normal Service Life</u></th> </tr> <tr> <th><u>Years</u></th> <th><u>Mileage</u></th> </tr> </thead> <tbody> <tr> <td>Heavy-duty bus</td> <td>35 or more</td> <td>12</td> <td>500,000</td> </tr> <tr> <td>Heavy-duty bus</td> <td>25-30</td> <td>10</td> <td>350,000</td> </tr> <tr> <td>Medium-duty bus</td> <td>25-30</td> <td>7</td> <td>200,000</td> </tr> <tr> <td>Light-duty bus</td> <td>25-30</td> <td>5</td> <td>150,000</td> </tr> </tbody> </table> | <u>Vehicle Type</u> | <u>Length</u> <u>(feet)</u> | <u>Normal Service Life</u> | | <u>Years</u> | <u>Mileage</u> | Heavy-duty bus | 35 or more | 12 | 500,000 | Heavy-duty bus | 25-30 | 10 | 350,000 | Medium-duty bus | 25-30 | 7 | 200,000 | Light-duty bus | 25-30 | 5 | 150,000 | 10. -- | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <u>Vehicle Type</u> | | | <u>Length</u> <u>(feet)</u> | <u>Normal Service Life</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <u>Years</u> | <u>Mileage</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Heavy-duty bus | 35 or more | 12 | 500,000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Heavy-duty bus | 25-30 | 10 | 350,000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Medium-duty bus | 25-30 | 7 | 200,000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Light-duty bus | 25-30 | 5 | 150,000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>11. Consideration should be given to providing passenger shelters of an attractive design at all bus stops where warranted by existing conditions including: boarding passenger counts, passenger waiting time, bus stop situation, exposure to weather conditions, and the facility or land use being served.^b</p> | 11. -- | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>12. Park-ride facilities should be provided at appropriate stops on rapid and express services to serve transit users from medium and low density residential areas. Sufficient off-street automobile parking should be provided at park-ride facilities to accommodate the total parking demand generated by transit users and carpoolers</p> | 12. -- | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 4-1 (continued)

| Objective | Principle | Standards | Performance Measure | | | | | | | | | | | | | |
|--|---|---|--|---------------------|-----------------------|-----------------------------|----------|-----------------|-----------|-----------------|------------------|-----------------|--|------|------|---|
| 2. (continued) | | <p><u>Service Performance Standards</u></p> <p>1. Ridership on the transit system and the overall effectiveness of the services provided should be maximized.</p> | <p>1a. Total passengers</p> <p>1b. Total passengers per capita</p> <p>1c. Revenue vehicle hours per capita</p> <p>1d. Total passengers per revenue vehicle hour</p> <p>1e. Total passengers per revenue vehicle mile</p> | | | | | | | | | | | | | |
| | | <p>2. Ridership and service levels on each transit route should be monitored and service levels adjusted to be appropriate for demand levels unless special circumstances warrant otherwise^c.</p> | <p>2a. Total boarding passengers per revenue vehicle mile</p> <p>2b. Total boarding passengers per revenue vehicle hour</p> <p>2c. Productivity frequency index^d</p> | | | | | | | | | | | | | |
| | | <p>3. The minimum service effectiveness levels to warrant continued service operation shall be as specified below, unless special circumstances warrant otherwise^c:</p> <table border="0" data-bbox="716 821 1166 982"> <tr> <td colspan="2" style="text-align: center;"><u>Total Boarding Passengers Per</u></td> </tr> <tr> <td style="text-align: center;"><u>Service Period</u></td> <td style="text-align: center;"><u>Revenue Vehicle Hour</u></td> </tr> <tr> <td>Weekdays</td> <td style="text-align: center;">22^e</td> </tr> <tr> <td>Saturdays</td> <td style="text-align: center;">15^e</td> </tr> <tr> <td>Sundays/Holidays</td> <td style="text-align: center;">10^e</td> </tr> </table> | <u>Total Boarding Passengers Per</u> | | <u>Service Period</u> | <u>Revenue Vehicle Hour</u> | Weekdays | 22 ^e | Saturdays | 15 ^e | Sundays/Holidays | 10 ^e | <p>3. Total boarding passengers per revenue vehicle hour</p> | | | |
| | | <u>Total Boarding Passengers Per</u> | | | | | | | | | | | | | | |
| | | <u>Service Period</u> | <u>Revenue Vehicle Hour</u> | | | | | | | | | | | | | |
| | | Weekdays | 22 ^e | | | | | | | | | | | | | |
| | | Saturdays | 15 ^e | | | | | | | | | | | | | |
| Sundays/Holidays | 10 ^e | | | | | | | | | | | | | | | |
| <p>4. The average maximum load factor, measured as the ratio of passengers to bus seats at that point on a route where passenger loads are highest, should not exceed the following during any one-hour period:</p> <table border="0" data-bbox="691 1115 1182 1255"> <tr> <td colspan="3" style="text-align: center;"><u>Average Maximum Load Factor</u></td> </tr> <tr> <td style="text-align: center;"><u>Service Type</u></td> <td style="text-align: center;"><u>Peak Periods</u></td> <td style="text-align: center;"><u>All Other Times</u></td> </tr> <tr> <td>Rapid</td> <td style="text-align: center;">1.00</td> <td style="text-align: center;">1.00</td> </tr> <tr> <td>Express</td> <td style="text-align: center;">1.33</td> <td style="text-align: center;">1.00</td> </tr> <tr> <td>Local</td> <td style="text-align: center;">1.33</td> <td style="text-align: center;">1.00</td> </tr> </table> | <u>Average Maximum Load Factor</u> | | | <u>Service Type</u> | <u>Peak Periods</u> | <u>All Other Times</u> | Rapid | 1.00 | 1.00 | Express | 1.33 | 1.00 | Local | 1.33 | 1.00 | <p>4. Average maximum load factor by route for the weekday peak hour of service</p> |
| <u>Average Maximum Load Factor</u> | | | | | | | | | | | | | | | | |
| <u>Service Type</u> | <u>Peak Periods</u> | <u>All Other Times</u> | | | | | | | | | | | | | | |
| Rapid | 1.00 | 1.00 | | | | | | | | | | | | | | |
| Express | 1.33 | 1.00 | | | | | | | | | | | | | | |
| Local | 1.33 | 1.00 | | | | | | | | | | | | | | |
| <p>5. The transit system should be designed and operated to maximize schedule adherence and be "on-time" at least 90 percent of the time. On-time is defined as schedule adherence within the ranges of one minute early and three minutes late.</p> | <p>5. Percent of scheduled bus trips on time</p> | | | | | | | | | | | | | | | |
| <p>6. Travel for public transit passengers should be reasonable in comparison to travel by private automobile for trips made between component parts of the service area. Transit travel distances and times should not be more than 1.5 times longer than with the automobile travel for comparable trips</p> | <p>6a. Ratio of transit to highway distance</p> <p>6b. Ratio of transit to highway travel time</p> | | | | | | | | | | | | | | | |
| <p>7. Preventative maintenance policies and practices should be established to maximize the reliability of revenue vehicles so that:</p> <p>a. All of the vehicles required to operate peak service are available daily</p> <p>b. The number of breakdowns requiring a maintenance road call do not exceed one per 6,000 vehicle miles of service</p> | <p>7a. Number of buses available for weekday peak service versus peak bus requirement</p> <p>7b. Percent of bused that miss scheduled pull-outs</p> <p>7b. Vehicle miles between road calls</p> | | | | | | | | | | | | | | | |

Table 4-1 (continued)

| Objective | Principle | Standards | Performance Measure |
|---|---|--|---|
| <p>3. The transit system should promote the safety and security of its passengers, operating equipment and facilities, ad</p> | <p>Accidents take a heavy toll in property damage and human suffering, and can contribute substantially to the overall costs of operation for the public transit system and, in particular, the public funds required. Incidences that jeopardize the security of passengers or transit system property may promote the perception that transit travel is not safe, thereby hampering the mobility of persons who must travel within areas the public deems unsafe. Therefore, every attempt should be made in the operation of the transit system to reduce the incidence and severity of accidents and to increase security for transit passengers, equipment and facilities, and personnel</p> | <p><u>Service Design and Operating Standards</u></p> <p>1. Public transit service should not be operated over streets that exhibit conditions that may be hazardous for transit operations including steep grades, narrow traffic lanes, uncontrolled intersections, poor pavement conditions, or habitual problems with illegal parking</p> | <p>1. --</p> |
| | | <p>2. Nearside bus stops facilitate passenger use of crosswalks and convenience in transferring between routes, provide for adequate sight considerations for vehicle operators, and allow transit vehicles to utilize the intersection to merge into traffic. The use of nearside locations for bus stops on a consistent basis is also favored by the disabled community. Therefore, bus stops should generally be located at the nearside of intersections to promote passenger safety and the safe operation of transit vehicles. Stops may be located elsewhere if warranted by special circumstances</p> | <p>2. --</p> |
| | | <p>3. Bus stops should not be located in areas without adequate pedestrian facilities such as sidewalks or adequately maintained roadway shoulders</p> | <p>3. --</p> |
| | | <p>4. The public transit system should promote the use of appropriate security equipment and practices--including the use of mobile radios, automatic vehicle location (AVL) hardware, cameras, and security personnel--to enhance the security of passengers and transit system equipment, facilities, and personnel</p> | <p>4. --</p> |
| | | <p><u>Service Performance Standards</u></p> <p>1. The number of accidents on the public transit system should be minimized</p> | <p>1. The number of accidents on the transit system per 100,000 vehicle miles of service</p> |
| | | <p>2. The number of security incidences on transit property should be minimized</p> | <p>2. The number of security incidences on the transit system per 100,000 vehicle miles of service</p> |
| <p>4. The public transit system should promote efficiency in the total transportation system</p> | <p>Public transit facilities and services can promote economy and efficiency in the total transportation system. The transit system has the potential to supply additional passenger transportation capacity, which can alleviate peak loadings on arterial street facilities and assist in reducing the demand for land necessary for parking facilities at major activity centers. Efficient transit service also has the potential to reduce energy consumption and air pollutant emissions</p> | <p><u>Service Performance Standards</u></p> <p>1. The total amount of energy and the total amount of energy per passenger mile consumed in operating the total transportation system of which the public transit system is an integral part, particularly petroleum-based fuels, should be minimized</p> <p>2. The amount of highway system capacity which must be provided to serve travel demand should be minimized</p> | <p>1. Passenger miles per gallon of motor fuel</p> <p>2. Potential increase in vehicle traffic on surface streets if transit trips use automobile</p> |

Table 4-1 (continued)

| Objective | Principle | Standards | Performance Measure |
|--|--|---|--|
| <p>5. The public transit system should be economical and efficient, meeting all other objectives at the lowest possible cost</p> | <p>The total financial resources of the County are limited and any investment of funds in public transit facilities and services must be weighed against other public investments. Therefore, total transit system costs should be minimized for the desired level of transit service and transit revenues should be maximized to maintain the financial stability of the system. The attainment of this objective may at times conflict with, and require the modification or elimination of, other standards</p> | <p><u>Service Design and Operating Standards</u></p> | <p>1. --</p> |
| | | <p>1. The total operating and capital investment for the public transit system should be minimized and reflect efficient utilization of resources</p> | <p>2. --</p> |
| | | <p>2. The fare policy for the public transit system should provide for premium fares for premium transit services, as well as special or discounted fares for priority population groups and frequent transit riders</p> | <p>3. --</p> |
| | | <p>3. Periodic increases in passenger fares should be considered to maintain the financial stability of the public transit system when:</p> <p>a. The farebox recovery rate for the transit system goes below levels determined to be acceptable by local officials</p> <p>b. Operating expenses for the transit system have increased by 10 to 15 percent since fares were last raised</p> <p>c. Projected levels of Federal and State operating assistance funds would require an increase in projected local operating assistance levels above that determined to be acceptable by local officials</p> | <p>4. --</p> |
| | | <p>4. Public transit service should not be extended to communities or major activity centers located outside the County at the direct expense of County taxpayers. The net local costs--total costs minus passenger revenues and federal and/or state assistance funds--of such transit service shall be provided through sources other than County tax dollars unless special circumstances warrant otherwise</p> | <p><u>Service Performance Standards</u></p> |
| | | <p>1. The operating expense per unit of transit service, the operating expense per passenger, and the total operating assistance per passenger should be minimized for the public transit system as a whole. Annual increases in such costs should not exceed the average percentage increase experienced by comparable transit systems</p> | <p>1a. Operating expense per revenue and total vehicle mile</p> <p>1b. Operating expense per revenue and total vehicle hour</p> <p>1c. Operating expense per boarding passenger</p> <p>1d. Total operating assistance per boarding passenger</p> |
| | | <p>2. Public transit system operating revenues generated from passenger fares and private sources should be maximized.</p> | <p>2. Percent of operating expenses recovered through passenger and other operating revenues, excluding public operating assistance</p> |
| | | <p>3. The total operating expense per passenger and total operating assistance per passenger should be minimized for the public transit system as a whole. Annual increases in such costs should not exceed the average percentage increase experienced by comparable transit systems</p> | <p>3a. Total operating expense per boarding passenger</p> <p>3b. Total operating assistance per boarding passenger</p> |
| | | <p>4. Cost effectiveness levels on each transit route should be monitored and service levels adjusted to be appropriate for demand levels or the route eliminated unless special circumstances warrant otherwise.^c Cost effectiveness levels shall be measured using the total boarding passengers per revenue vehicle hour for each route.</p> | <p>4a. Total boarding passengers per revenue vehicle hour</p> |

^aThe "core service area" for the transit system is the area bounded by Capitol Drive on the north, Oklahoma Avenue on the south, 76th Street on the west, and Lake Michigan on the east.

Table 4-1 (continued)

^bPotential bus shelter locations shall be reviewed and scored against criteria which are deemed to warrant the construction of a shelter, with a range of point values assigned to conditions for the criteria that rate the relative need for a shelter. The total point value for each location shall determine its rank in a prioritized listing of potential sites with a maximum possible total score of 100 points for each location. The criteria and conditions used to rank bus shelter locations are as follows:

| Conditions Warranting Bus Shelter | Point Value | Conditions Warranting Bus Shelter | Point Value |
|---------------------------------------|-------------|--|-------------|
| Boarding Passenger Counts | | Facility or Land Use Being Served | |
| Less than 25 passengers..... | 0 | (values are additive up to a maximum of 10 points) | |
| 5-74 passengers..... | 10 | Not a transit trip generator..... | 0 |
| 5-149 passengers..... | 20 | Commercial or shopping center..... | 5 |
| 50-299 passengers..... | 30 | Industrial plant or office building..... | 5 |
| 100 or more passengers..... | 40 | Park or recreation center..... | 5 |
| Passenger Waiting Time | | Other significant transit trip | |
| (one-half of the midday headway) | | generator..... | 5 |
| Less than 3.0 minutes..... | 0 | High density residential area..... | 10 |
| 1-6.0 minutes..... | 4 | Facility or activity for elderly | |
| 1-9.0 minutes..... | 8 | individuals..... | 10 |
| 1-12.0 minutes..... | 12 | Facility or activity for disabled | |
| 1-15.0 minutes..... | 16 | individuals..... | 10 |
| More than 15.0 minutes..... | 20 | Hospital, medical center, or clinic..... | 10 |
| Bus Stop Situation | | University, college, or public | |
| Not a transfer point..... | 0 | secondary school..... | 10 |
| Transfer point..... | 10 | | |
| Exposure to Weather Conditions | | | |
| None..... | 0 | | |
| Minimum..... | 5 | | |
| Average..... | 10 | | |
| Full..... | 20 | | |

^cA reasonable period of time should be allowed for ridership to develop and stabilize before evaluating the performance of new transit services to determine if the service should be continued, modified, or eliminated. Generally, new transit services should achieve 40 percent of average performance levels for existing routes after six months of operation; 60 percent of average performance levels for existing routes after nine months of operation; and 80 percent of average performance levels for existing routes after one year of operation. The period for services that are funded through federal or state transit demonstration grants may be extended to coincide with the period for the demonstration grant.

^dThe productivity frequency index (PFI) is an analytical tool developed by the Milwaukee County Transit System which measures the relationship between passengers per revenue vehicle hour of service and the service frequency, or headway on each bus route. The index is calculated for each route in the transit system by service period as follows:

$$PFI = \text{Boarding Passengers per Revenue Vehicle Hour} \times \frac{\text{Average Headway on Route}}{60 \text{ Minutes}}$$

The PFI values calculated for each route are compared against target values for the transit system to assist in determining if changes in the headways on the route should be considered.

^eDuring 2004, the transit system carried about 41 total passengers per revenue vehicle hour systemwide on all services and the regular routes operated on an average weekday carried about 35 total passengers per revenue vehicle hour.

Source: SEWRPC.

The performance evaluation of the existing transit system undertaken for the current study included assessments of transit performance on a both a systemwide basis and on an individual route basis. The performance standards set forth in Table 4-1 represent the specific standards and performance measures that were applied in conducting these evaluations. The performance standards in the table include the transit system performance measures which the Wisconsin Department of Transportation utilizes to assess the performance of Wisconsin transit systems, and which the State requires be included in multi-year service and performance goals for each such transit system. Such measures include operating ratio, or farebox recovery rate; operating expense per passenger; passengers per capita; passengers per revenue vehicle hour of service; operating expenses per revenue vehicle hour of service; and revenue vehicle hours of service per capita. The performance standards and evaluation findings of this study can, therefore, provide guidance to the County in establishing the required multi-year service and performance goals.

OVERRIDING CONSIDERATIONS

The objectives, principles, and standards set forth in Table 4-1 were intended to be used to guide the evaluation of the performance of existing transit system and the design and evaluation of alternative service improvements. In the application of the objectives, principles, and standards, several overriding considerations must be recognized.

First, it must be recognized that an overall evaluation of the existing public transit services and the alternative service plans must be made on the basis of cost and revenue. Such an analysis may show the attainment of one or more standards to be beyond the economic capability of the community and, therefore, the standards cannot be met practically and must be either modified or eliminated.

Second, it must be recognized that a transit system is unlikely to fully meet all the standards and that the extent to which each standard is met, exceeded, or violated must serve as the final measure of the ability of the system to achieve the objective that a given standard supports.

Third, it must be recognized that certain intangible factors, including the perceived value of the transit service to the County and its potential acceptance by the concerned elected officials, may influence the preparation and selection of a recommended plan. Inasmuch as transit service may be perceived as a valuable service, the County may decide to initiate or retain such services regardless of performance or cost. Only if a considerable degree of such acceptance exists will service recommendations be implemented and their anticipated benefits realized.

* * *