

# **SERVICE STANDARDS**

Revised December 17, 2002



**Regional Transportation District  
1600 Blake Street  
Denver, CO 80202**

## I. INTRODUCTION

### A. Overview

RTD continually receives requests for changes to existing service and for new service in growing areas of the District. Additionally, RTD may be operating some services that are not attracting enough riders to justify their cost. In order to be consistent in the evaluation of service proposals, and to ensure that the service being provided represents the most cost-effective use of the District's resources, a set of service standards is maintained by RTD.

The specific standards, targets or minimum/maximum values for the standards, and a procedure for applying these standards, are presented in this document. Since service standards are intended to optimize usage of the District's resources, they are updated periodically to reflect changes in the District goals and resources. The procedure for updating the standards is described in Section I.C.

### B. Application of Service Standards

There are two primary applications for the ongoing use of the service standards. These are the use of standards to evaluate existing services, and use of standards to evaluate proposals for new service.

The application of standards to existing routes is a flexible process. The purpose of the standards is to help identify routes which are most in need of service changes, such as restructuring to eliminate lower-productivity segments or branches, adjusting service frequency to better reflect the demand for service, or providing additional promotion of less patronized routes where appropriate. Routes, which do not meet standards, are not automatically designated for elimination. Elimination of routes is only intended as a last resort, when it has been determined that no cost-effective actions are available to improve the productivity of the route.

The standards for evaluation of existing routes are not intended to preclude changes to routes that meet these minimum standards. In many cases, it may be possible to improve the productivity of routes that meet the minimum standards by making changes to headways or trip times. Since the overall mission of RTD is to "provide safe, clean, reliable, courteous, cost-effective public transit which affords desirable mobility options and to provide service to all areas of the District," these standards should not be used to prevent changes to improve the

efficiency of existing routes, as long as the changes meet the route design standards.

The availability of financial resources, represented by the annual budget, is the bottom line for these standards. Service expansion may occur when additional funds are available and contraction may occur otherwise. In any case, selection of which services to provide or curtail is based on these performance standards and no service is considered guaranteed or beyond review. The RTD Board of Directors, with input from RTD staff and the public, is responsible for making decisions on service recommendations.

The evaluation of new service proposals will take place as proposals are received or needs identified. The most recent values of the standards for existing routes will be used to evaluate the proposed new services. Decisions regarding implementation of new routes will be made through the service planning process. New routes will be expected to meet all applicable route design standards described in Chapter II, Section D, but will not be expected to meet the productivity standards described in Chapters II and III until they have been in operation for at least six months. Demonstration, experimental, and cost sharing services are also handled in this manner.

#### C. Updating of Service Standards

The service standards are intended to support the goals and objectives of the District. Since these objectives and the resources available to attain them can be expected to change over time, the standards will be revised periodically to reflect those changes.

The service standards will be reviewed on a bi-annual basis. At that time, experience with the service standards over the previous time period, as well as changes in the District's goals and objectives, will be used to determine whether any standards should be added or revised.

The numerical values of productivity standards will be updated each year, using ridership, revenue and cost figures for the most recent twelve-month period for which data are available. The rankings are based only on those routes that existed for the entire year. Routes which were eliminated during the year will not be included because they cannot be identified as candidates for revisions. Routes that were introduced during the year will not be included in determining the new standards since they are not required to meet the productivity standards until they have been in operation for at least six months. However, these routes will be evaluated separately, using the service standards contained in this document.

The updating procedure will compare the values of the productivity standards with those in effect for the previous year. Operating cost data for the previous year will be revised to account for system-wide increases or decreases in operating cost.

## **II. PRODUCTIVITY STANDARDS**

### **A. Derivation and Use of Standards**

The productivity standards are used to identify routes and services for appropriate marketing and possible revision or elimination. Separate standards are identified for each class of service. Routes are evaluated on ridership (either boardings per in-service mile or per trip, depending on the class of service) and on the economic measure of subsidy per passenger. These standards are based on the performance of the least productive 10 percent of the routes in each service class for either the ridership or economic measure, or on the least productive 25 percent of routes in both measures. The basis for the standards will be reviewed in conjunction with the cost recovery standards in Chapter VII, and may be revised if necessary.

New services should meet the applicable standards for their class of service after six months of operation. All new services will be reviewed after six months of operation and routes that have not shown adequate progress toward meeting the standards will be targeted for cost-effective actions to increase productivity or for elimination.

For the purpose of applying the standards, Local and Limited routes will be divided into three groups based on area-type land-use designations: CBD routes (routes which serve the Denver Central Business District), Urban routes, and Suburban routes (refer to Appendix B - RTD Service Classes for descriptions). These groupings of Local and Limited routes will enable the comparison of routes with similar service characteristics. Express, Regional and sky Ride routes will be evaluated as separate classes due to their different service characteristics. For the purposes of evaluating productivity, Light Rail will be measured against the standards established for CBD Local routes, except where otherwise noted.

The standards for evaluating portions of routes are intended for use in identifying needed service improvements, for making modifications to specific portions of existing routes, or for identifying low productivity segments of routes.

These standards could be used in situations such as isolating low productivity portions of otherwise productive routes or measuring options for bringing unproductive routes into compliance with the overall service standards. These

standards may also be used to evaluate proposals for new route extensions or deviations on existing routes.

## B. Ridership and Economic Measures

The RTD's approach is to develop a family of transit services suited to a variety of travel markets. All services are designed to match the level of service with demand, thus improving performance and sustainability. This results in multiple domains of acceptable performance for the various classes of service. Standards are best set by first determining measures of performance and objectives. The core objective is to maximize overall ridership, to the extent allowed by the available resources.

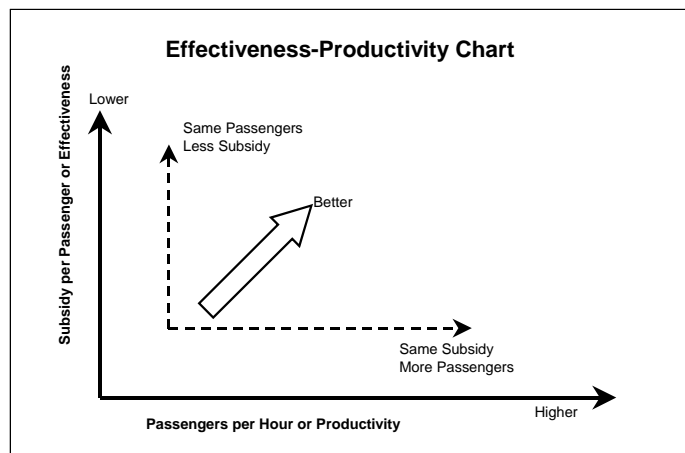
### Performance Objective

Service allocation is driven by the RTD adopted mission statement: "To meet our constituents' present and future public transit needs by offering safe, clean, reliable, courteous, accessible and **cost-effective service throughout the District.**"

### Performance Measures

- Passengers/hour (productivity)
- Passengers/trip (productivity)
- Subsidy/passenger (cost effectiveness)

The subsidy per passenger measure combines fare revenue and total cost impacts (refer to Appendix B for definitions) to produce a measure that comprehensively reflects the District's allocation of resources. The effectiveness-productivity chart presents economic effectiveness on the vertical axis, and productivity, or boardings per hour, on the horizontal axis. The chart offers a convenient comparative analysis of all classes of services, illustrating relative performance. When standards and guidelines are applied, judgments can be made.



The 10% and 25% standards for the economic and productivity measures are calculated annually and are presented in Appendix A. These measures and the effectiveness-productivity chart for all routes and services are calculated at least annually and are provided separately.

C. Fixed Route Service Design and Evaluation Standards

1. Minimum Service Frequency

New routes shall provide the minimum frequencies specified below. Existing services that cannot meet these minimum standards while adhering to the minimum passengers per hour or trip standards defined in Chapter II shall be identified as candidates for service changes or appropriate marketing promotion within available resources. These service changes may include providing service with longer headways if no other viable alternative exists. Elimination of the route may be considered if service changes and/or promotional efforts do not improve productivity.

These are “policy” service levels and represent a compromise between economic efficiency and the functionality of the system. To be sustained at these levels, a route must meet the minimum ridership performance standards discussed in Section II.C.2, and shown in Appendix A. Routes providing frequencies higher than the policy minimum must be justified by ridership demand as outlined in Section II.C.4.

The following table indicates the minimum frequency standard for types of service and time of day.

**Minimum Service Frequency Targets**

<b>Service Type</b>	<b>Time Frame</b>	<b>Minimum Frequency</b>
Local – Peak period	Mon–Fri 6:00am to 9:00am and 3:00pm to 6:00pm	30 minutes
Local – Off peak below 25% boardings per hour	Weekday midday	60 minutes
Local – Off peak above 25% boardings per hour	Weekday midday	30 minutes
Local	Evenings and weekends	60 minutes
Express & Regional to CBD	3 peak trips, Mon – Fri. Trips should target: 7:00/7:30/8:00 am work shift start times 4:00/4:30/5:00 pm work shift end times	

2. Minimum Ridership Performance

This standard applies to routes operating at the minimum service frequency target. For Local and Limited routes, the standard is passengers per hour based upon the bottom 10% and 25% of routes in the respective class. For Express, Regional, and skyRide routes, the standard is passengers per trip.

These standards are derived from system averages by class of service. All routes must meet their applicable minimum standards. Those that do not meet these standards will need to be modified or marketed in some way in order to bring them up to the minimum standards. Those that are not brought up to the minimum standards are subject to cancellation. Routes that meet their applicable minimum ridership standards justify a service level at the minimum service frequencies outlined in Section II.C.1. Higher frequencies must be justified by ridership as outlined in Section II.C.4.

a. Performance Standards

Current performance standards are outlined in Appendix A.

b. Specific Trips

i. The standard for evaluating specific trips on a route varies by time of day as shown in the following table. Trips must have boardings of at least the specified percentage of the minimum boardings standard for the time period of the trip, as defined in this table.

For Local or Limited routes, the minimum boardings per trip is derived by multiplying the boardings per mile standard by the length (number of miles) of the trip.

Time of Day for Service Class	Percentage of Ridership Standard
5:00 am - 6:00 am	75%
6:00 am - 7:30 pm	100%
7:30 pm - 11:00 pm	75%
11:00 pm - 5:00 am	50%

ii. On Express and Regional routes with more than three trips and which provide only peak period service, the first and last trips must have minimum boardings of one-half the service standard for the class of service if the overall route meets the minimum boarding standard. If boardings on the first or last trips are between 50 percent and 100 percent of the service standard, these trips may be candidates for elimination, if there is alternative local service available.

iii. On Light Rail, the first trip of the operating day in each direction, operated as the "Sweep Train", is exempted from the minimum ridership standards.

### 3. Maximum Load Standard

For Local and Limited routes in the peak, the maximum load standard is 125% of a seated load at the maximum load point. For Local and Limited routes outside of the peak, and for Express, Regional, and skyRide routes at all times, the maximum load is the seated capacity of the vehicle.

Service frequencies shall be adjusted so that the following maximum load standards are met ***at least 60 percent of the time***:

#### **Local and Limited Service:**

Peak periods – 125 percent of seated load on RTD's present bus fleet. The maximum time that an individual passenger should be expected to stand on a given trip is 15 minutes.

Off-peak periods - seated load

#### **Express, Regional, and skyRide Service:**

Seated load at all times.

#### **Light Rail vehicles:**

Peak periods - 125 passengers per vehicle

Off-peak periods - seated load

Special events – 165 passengers per vehicle

### 4. Demand Based Service Frequency

For routes meeting the above frequency, ridership, and load standards, frequency better than every 30 minutes may be provided when and where justified by ridership. This standard applies equally to all service categories. In order to be sustainable, higher frequency service must meet the following criteria:

- Incremental frequency necessary to maintain the appropriate load standard during any 30 minute time period.
- Appropriate vehicle assignment as outlined in Section 5.
- When a service exceeds the maximum load standard, higher frequency may be justified during that time period and/or route segment.
- If a service with better than the minimum frequency has passenger loads that can be accommodated with a lower frequency without violating the load standard, then frequency may be reduced.

Service frequency in the RTD network is based on 'clock pattern' schedules. This pattern provides consistent and easy to understand schedules for our customers, and makes possible the provision of timed transfer connection



hubs, whereby multiple routes are scheduled to meet at one location to facilitate connections. In general, routes are scheduled to operate in even increments of 30 minutes, or every 60, 30, 15, 10, 7.5, or 5 minutes. However, other frequencies may be provided depending upon passenger demand, or operational and scheduling needs.

Typical productivity by service frequency and route segment is provided in the following chart and documented in Appendix A, Table 3:

Frequency	Boardings Per Hour	
	Route	Segment-Period
60 - 30 minutes	Minimum for Class	-
15 minutes	25 - 39	35 +
10 minutes	40 +	45 +

5. Vehicle Assignment Targets

Equipment shall be assigned to specific routes and trips according to the following guidelines. These guidelines may be modified if operational and scheduling needs require:

- Small 27'-30' Bus: Appropriate for lower volume Local routes where ridership does not require a standard bus, or for routes where specific operating concerns preclude use of standard buses.
- Standard 40' Transit Bus: The standard equipment for Local and Express services. May also be used on Regional and skyRide trips in the Express fare category.
- Articulated 60' Bus: Appropriate for higher volume Limited and Express services. May also be used on Regional and skyRide trips in the Express fare category.
- Intercity Coach: Appropriate for Regional and skyRide services.

6. Design and Evaluation of Portions of Routes

The standards for evaluating portions of routes cover two areas in which minor modifications may be made to routes without changing the overall structure of the route:

- midline segments or midline deviations
- branches or end segments

The governing standards for overall route productivity were presented earlier. Since trips provided during marginally productive hours of the day or trips over marginal segments often increase the attractiveness of the overall service, an otherwise productive route may be able to support some less productive trips or portions of the route. However, if a route cannot meet

the overall service standards for its class of service, there may not be productive segments to enhance the unproductive segments. Therefore, specific segments, branches, or trips which meet the standards for portions of routes may still be modified in order to raise the productivity of the entire route, if the overall route does not meet the service standards for its class of service.

a. Midline Segments and Midline Deviations

i. A midline segment or deviation of a Local or Limited route should generate enough boardings per hour of service provided to meet the standard for its class of service (CBD, Urban and Suburban). Boardings in both directions will be counted.

ii. If a route is changed, the change shall not cause a reduction in the overall boardings per hour for the route.

iii. If a route is changed, the change shall not cause the route to violate any route design standards as defined in Chapter II, Section D, or the overall productivity standards as defined in Chapter II.

b. Branches and End Segments

i. A branch or end segment of a Local or Limited route should generate enough boardings to meet the ridership standard for its class of service (CBD, Urban and Suburban).

Boardings generated along the branch are defined as all passengers boarding the bus along the branch or end portion of the route, and all outbound passengers alighting along this section.

ii. Local collector portions of Express and Regional routes which meet the following maximum travel time standard, shall meet the ridership productivity standard for the entire route. This maximum travel time is equal to 15 minutes or 50 percent of line haul travel time, whichever is less.

For shorter segments, the minimum ridership standard is reduced by the ratio of actual travel time to the maximum allowable travel time. Thus, if the actual travel time along the collector is half of the maximum allowed, it must average half the number of boardings per trip specified in the minimum ridership productivity standard. Values of the ridership productivity standards for Express and Regional routes are found in Appendix A.

iii. A new extension to a route that does not meet the minimum ridership productivity standard must attract sufficient ridership for the entire route to meet the minimum ridership standard for its service class.

iv. A route extension will not be initiated which violates any of the route design standards found in Chapter II, Section D, or causes the route as a whole to fall below the minimum riders per unit of service or standards found earlier in Chapter II.

#### D. Non Fixed Route Service Design and Evaluation Standards

RTD continues to develop a family of transit services suited to a variety of travel markets. The goal of this approach is to match the type and level of service to the demand in a given service area, thus improving performance and sustainability. As such, a variety of non fixed route service alternatives are provided by the RTD. These alternative services include the following:

1. call-n-Ride Demand Responsive Service

Rather than operating on a fixed route according to a predetermined schedule, demand responsive call-n-Ride service can be defined as a shared ride public transportation service characterized by a defined geographic service area and the need for the passenger to telephone to arrange for passenger pick-up and service. A call-n-Ride service area for a single vehicle is generally between 4 and 10 square miles with 2 to 4 persons per acre and 1 to 3 employees per acre. call-n-Ride service often provides access to the broader RTD network of services through timed connections at transfer centers and RTD park-n-Rides. Call-n-Ride service is evaluated based on passenger boardings per revenue hour and subsidy per passenger boarding. Refer to Appendix A for current standards.

2. Vanpooling

Vanpooling is a public transportation option in which commuters/employees whose residences are geographically clustered, ride together to and from their work sites in a van that is driven by one of the vanpool participants. Typically vanpools make one roundtrip per day and carry from five (5) to 14 riders. Vanpooling offers greater opportunities for increased capacity compared to carpooling and offers a cost-effective alternative to conventional transit in areas of low employment density and longer commute distances. Vanpool service is evaluated based on subsidy per passenger boarding. Refer to appendix A for current standards.

3. SeniorRide and Senior Shopper

RTD provides services to enhance the welfare of certain groups of persons such as the current services offered for shopping and recreational trips for elderly

persons or persons with disabilities. Since SeniorRide and Senior Shopper service are point to point services, these services are evaluated based on passenger boardings per trip. Refer to Appendix A for current standards.

### III. GEOMETRIC DESIGN STANDARDS

#### A. Directness of Route

Routes shall be designed to be as direct as possible and to provide maximum accessibility to transit.

1. Deviations from a direct path from end-to-end of the route shall account for no more than one-quarter of the end-to-end travel time of the route.
2. For a specific deviation, the total additional travel time for all through passengers should not exceed three minutes for each rider boarding or alighting along the deviation.

In mathematical terms, this means that the quantity

$$\frac{P_T \times VTT}{P_D} < 3 \text{ minutes}$$

where:

$P_T$  = through passengers

VTT = additional vehicle one-way travel time

$P_D$  = passengers served by deviation

#### B. Stop Spacing Standards

Bus routes shall adhere to the following stop spacing standards.

1. Minimum
  - Local and Express collection, residential areas - 600'  
(8 stops/mile) Commercial areas - 500' (10 stops/mile)
  - Limited service, limited-stop zone - 2500' (2 stops/mile)
2. Maximum
  - Local service, residential and commercial areas – 1,250'  
(4 stops/mile)
  - Limited service, residential and commercial areas – 1,250'  
(4 stops/mile)
  - Limited service, limited stop zone – 8,000' (1 stop/1.5 miles)

C. Roadway Design Goal

New bus routes should **not** be operated along streets that do not meet the following minimum standards:

- Turning radius - 35' minimum
- Bus stop composition
- deep-strength asphalt:           7" for existing street  
  11" for new street
- concrete:                           8.5" design thickness  
  8" existing thickness
- Street surface must be asphalt or concrete
- Lane width - 10' minimum
- No speed bumps
- Bridges - rated for H-20S loading (all legal weights)
- Shoulder width on rural roads - 6' minimum
- Overhead clearance - 12' minimum (16' 6" for structures on new roads)

**IV. AREA COVERAGE STANDARDS**

A. Purpose and Application

The purpose of these standards is to define a reasonable level of service to all areas of the District and to help RTD maintain this service level. Since the RTD service area includes many different types of development, and population densities and land use vary widely across the District, it would not be reasonable to expect all areas to support the same level of service. Moreover, different types of service may best meet the needs of different areas, and RTD's resources can be used in a more productive fashion if service can be tailored to the needs of particular areas. Area coverage standards provide guidelines for tailoring service to the needs of communities and help ensure that all areas receive a level of service that is commensurate with their needs.

Levels of service for specific areas also depend on the productivity of existing services. If existing or proposed services cannot meet the productivity standards outlined in Chapter II, RTD may choose not to provide the minimum level of service. Financial constraints may also limit RTD's ability to meet the area coverage (or any other) standards.

B. Coverage Levels Outside the Denver CBD

The area coverage standards for areas outside the Denver Central Business District (CBD) are based on a combined density measure. This measure adds

population and employment to determine potential demand for transportation to and from a particular area.

The area coverage standards presented below deal with minimum and maximum route spacing. Actual route spacing and service frequency will depend on demand and productivity of existing service in the area.

1. Minimum Service Levels

Areas with 3-12 residents and employees per acre:

- Peak period park-n-Ride service if either the travel time to the Denver CBD by Express bus, or a bus/rail timed connection, exceeds 20 minutes.

Areas with 12 or more residents and employees per acre:

- Local service on major arterials with pedestrian access within 1/4 mile.
- Peak period, Limited, Express, or Regional service from park-n-Rides if either the travel time to the Denver CBD by Express bus, or a bus/rail timed connection, exceeds 20 minutes.

2. Maximum Target Service Levels

Areas with 3-12 residents and employees per acre:

- Local service along major arterials with pedestrian access within 1/4 mile.
- Peak period, Limited, Express, or Regional service from park-n-Rides if travel time to the Denver CBD by Express bus exceeds 20 minutes.

Areas with 12 or more residents and employees per acre:

- Local service with 1/2 mile route spacing.
- Limited, Express, or Regional service if travel time to the Denver CBD by Express bus exceeds 20 minutes.

**V. SERVICE GUIDELINES FOR SPECIAL EVENTS AND SPECIAL SERVICES**

A. Derivation of Standards

The following guidelines for provision of bus and/or train service to special events is based on prior RTD Board actions and on the public convenience and necessity to:

1. Protect neighborhoods from the impact of events which are so large as to overwhelm the surrounding supply of parking, and
2. Serve customers by offering adequate service for events which are predictably large enough to overload the normally available transit service, and

3. Protect taxpayers by only serving those events that have a predictable level of transit demand great enough to justify the operation of special routes.

**B. Standards for Events**

RTD, within the limits of its budget, will operate special service:

1. For events at Invesco Field at Mile High with projected attendance of over 55,000, for which the crowd is expected to all be present at one time.
2. For events at Coors Field with projected attendance of over 40,000, for which the crowd is expected to all be present at one time.
3. At other venues where the ratio of projected attendance to available on-site parking is 6:1 and for which the crowd is expected to all be present at one time.

This service will not be provided when substantial numbers of the event patrons can be expected to arrive in privately operated or non-profit owned buses.

RTD will provide Express Shuttle service to Invesco Field and Coors Field from selected park-n-Rides for events described by Sections 1. and 2., above. The General Manager must specifically authorize park-n-Ride service for other events.

RTD may also provide service at events with lower attendance projections if the promoter is willing to subsidize such service. The RTD Board adopted a specific subsidy formula in September 1987.

**VI. SYSTEM-WIDE COST RECOVERY STANDARD**

In 1989, the RTD Board of Directors adopted a system-wide minimum farebox recovery ratio of 30 percent. This ratio is calculated by the following formula:

<div style="display: flex; justify-content: center; gap: 10px;"> <div style="text-align: center;"> <p>[ Farebox Revenues + Advertising Revenues + ----- Lease Revenues + FTA Operating Assistance + Other Non-Sales Tax Revenues ]</p> </div> <div style="text-align: center;"> <p>[ Category I Costs + Category II Costs + Local share of depreciation on RTD assets]</p> </div> </div>
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The annual budget and six-year Transit Development Program (TDP) are evaluated using this cost recovery standard.

If the standard is not met, several courses of action may be taken. The RTD Board has adopted a policy of evaluating the fare structure as part of the annual budget process; fares may be changed at that time to provide additional revenue. RTD may also choose to market its services more aggressively to attract more customers and their fares, or RTD may look for revenue from other sources. The productivity standards in Chapters II and III may be used to reduce the costs of providing service while disrupting service to as few passengers as possible.

## **VII. STANDARD FOR SERVICE FOR TRANSIT DEPENDENT PERSONS AND TO SOCIAL SERVICE DESTINATIONS**

For purposes of these service standards, transit dependent riders are defined as riders who either live in a household which does not own a car or who have a physical or mental disability that prevents the transit patron from driving a car. Social Service destinations are those destinations that are provided as a public service that may not have consistently sufficient ridership to otherwise warrant the establishment or continuation of a route or route segment. Examples of social service destinations would include county court facilities, hospitals, schools, or public institutions which have been situated or constructed in isolated locations prior to the establishment of RTD or following review and comment by RTD of the proposed development plans of such institution or agency, by the appropriate jurisdiction.

### **A. Purpose of the Standard**

This standard is intended to provide for consideration of transit dependency in service decisions. This standard does not guarantee a minimum level of service to all transit-dependent riders. However, it will ensure that transit-dependent riders and/or the need to have access to social service destinations are identified and considered when decisions are made to reduce service levels in an area.

### **B. Determination of Transit Dependency**

Whenever RTD plans changes to an existing route where there is no alternative service available to meet the area coverage standards in Chapter IV, such as a change in routing or span of service, transit-dependent riders will be identified through on-board surveys. This survey will ask questions about riders' travel habits and demographics, and it will attempt to identify transit-dependent riders and their destinations.



### C. Application of Transit Dependency Standard

The applicable minimum productivity standards for a route will be reduced by one-half the percentage of ridership that is defined as transit dependent. Thus, if 60 percent of the riders on a route are transit dependent, the route must achieve 70 percent [100 percent minus (60 percent divided by 2)] of the applicable productivity standards (ridership and economic) in order not to be considered a poor performer.

Applicable ridership standards for fixed route services may be found in Chapter II, and for non-fixed route services, in Chapter III.

If the on-board survey reveals that the route does not serve the destinations desired by transit-dependent riders, RTD may restructure the route to improve service and increase ridership. This could include changing the routing or schedule to serve passenger needs. RTD wishes to provide transit dependent riders with service that fits their needs and to provide service to social service destinations when there is even a modicum of recognized demand.

Another consideration to be given in whether or not to eliminate a route with some transit dependent passengers is the impact on required paratransit services. The Americans with Disabilities Act (ADA) requires that eligible persons with disabilities be provided with paratransit service if they have trip origins and destinations within a defined service area three-fourths of a mile from a non-commuter fixed route. If accessible fixed route service is considered for removal from a portion of the defined paratransit service area, an estimate of the demand for substitute paratransit service for persons with disabilities who require lift-equipped buses must be completed and a cost-benefit analysis performed for the alternatives (leaving fixed route versus providing paratransit service).

# APPENDIX A

## Productivity Standards

The calculation of the 10% and 25% standards are made from the annual, unweighted data, assuming the data have a normal distribution and using the appropriate formulas for standard deviation and confidence intervals; however, the standard deviation is applied to the weighted average. The following table gives the Year 2000 weighted averages and standards by type of service.

**Table 1**  
**Year 2000 Weighted Averages and Standards By Class of Service**

Class	Subsidy/Boarding			Boardings/Hour		
	Average	10% Max	25% Max	Average	10% Min	25% Min
CBD Local	\$2.19	\$4.14	\$3.21	37.4	20.6	28.6
Urban Local	2.86	7.85	5.47	28.7	14.6	21.3
Suburban Local	6.08	13.39	9.91	15.2	6.4	10.6
call-n-Ride	14.41	17.59	16.07	3.6	3.0	3.3
Express	4.50	11.21	8.01	32.4	18.3	25.1
Regional	5.83	9.80	7.91	20.3	13.8	16.9
SkyRide	4.08	4.90	4.51	17.5	16.0	16.7

**Table 2**  
**Year 2001 Weighted Averages and Standards By Class of Service**

Class	Boardings/Trip		
	Average	10% Min	25% Min
Express	19.5	10.2	15.2
Regional	18.8	12.5	16.0
SkyRide	21.3	15.6	17.8

**Table 3**  
**Demand-Based Frequency Productivity Analysis**  
Year 2001 Weekday Boardings & Hours By Runboard

Route	Average Weekday		Boardings Per Hour			Frequency (minutes)				Trunk Segment Sampled Peak: 7a - 9a & 4p - 6p; Peak Direction Off-peak: 12p - 2p. ~Year 2001/02
	Boardings	In-Service Hours	SORT↓ Route	Trunk		Trunk		Tail		
				Peak	Off Peak	Peak	Off Peak	Peak	Off Peak	
			<b>40+</b>	<b>45+</b>		<b>&lt;=10</b>	<b>10 or 15</b>			
15L E Colfax	8,836	134	66	95	97	7.5/10	15	15	30	Colfax & Billings to Market & 16th St.
15 East Colfax	11,295	180	63	77	65	7.5/15	10	30	30	Colfax & Monaco to 10 & Larimer
120X Wagon Rd/Thornton	3,135	50	62	174	73	10+	30	--	--	Entire Route
16 W Colfax	5,247	98	54	N/A	N/A	10/15	15	--	60	Colefax & Broadway to Wadsworth
30 South Federal	4,735	99	48	89	78	15	10	30	60	Federal & Evans to 20th & Champa
43 MLK Blvd	1,717	36	48	45	39	15	15	--	--	Entire Route
SKIP Broadway	5,304	115	46	48	54	7	10	--	--	Entire Route
83Ltd.-Parker/Leetsdale	2,855	70	41	64	42	15	30	30	60	Civic Center Station to 9 Mile PnR
38 38th Ave	3,921	98	40	60	52	15	30	30	30	15th & Stout to 38th & Wadsworth
40 Colorado Blvd	5,084	128	40	N/A	N/A	10	15	30	30	Yale to 40th
			<b>25 - 39</b>	<b>35+</b>		<b>15</b>	<b>15 or 30</b>			
3 Alameda	4,424	120	37	N/A	N/A	15	30	30	30	Lakewood Commons to Alameda Station
121 Peoria	2,916	79	37	41	55	15	30	--	--	Stapleton Transfer Center to 9 Mile PnR
21 Evans	4,686	127	37	81	64	15	15	30	30	Monaco & Evans to Evans LRT
0 South Broadway	8,997	245	37	47	44	10+	10	30	30	Englewood Station to 17th Ave & Market
105 Havana	3,452	96	36	66	61	15	30	30	60	Stapleton Transfer Center to Southmoor PnR
31 N Federal	4,098	115	36	51	57	15	15	30	30	Federal & 72nd Ave to Champa & 20th
65 Monaco	1,409	43	33	46	39	15	30	--	--	Tufts & Ulster to Stapleton Transfer Center
11 Mississippi Ave	3,497	108	33	35	51	30	30	--	--	Alameda & Blackhawk to Allison & Virginia
44 44th Ave	4,290	137	31	62	46	15	30	30	30	44th & Kipling to 18th & Stout
227 Lafayette/Boulder	1,656	59	28	N/A	N/A	15	30	--	--	Entire Route
7 N Washington	2,472	89	28	31	31	15	30	30	30	Mariposa & Colfax to Wagon Rd PnR
1 W 1st Ave	2,273	82	28	N/A	N/A	15	30	30	30	Entire Route
2 E 1st Ave	1,137	42	27	45	22	30	30	--	--	Birch & Virginia To Larimer & 14th
32 32nd Ave	2,082	77	27	41	45	15	30	30	30	17th & Stout to 32nd & Wadsworth
28 28th Ave	2,537	96	27	41	32	15	30	30	30	17th & Stout to Stapleton Transfer Center
6 E 6th Ave	3,183	121	26	51	52	30	30	--	--	8th & Colorado to 15th & Champa
6 N Pecos	3,183	121	26	31	28	30	30	--	--	Colfax & Broadway to 106th & Melody
BOUND 30th St	1,528	58	26	30	23	10	10	--	--	Entire Route
10 East 12th Ave	3,161	125	25	72	38	10/15	15	30	30	9th & Clermont to 15th & Blake
204 Table Mesa/N 19th	1,291	52	25	33	28	15	30	--	--	Entire Route
12-South Downing	1,538	63	25	40	29	15	30	--	--	Englewood Sta to 10th & Larimer
			<b>&lt;25</b>	<b>&lt;35</b>		<b>15 or 30</b>	<b>30 or 60</b>			
52 W 52nd Ave./S Pearl	2,374	116	20	N/A	N/A	15	30	30	30	Olde Town to Colefax & Broadway
76 Wadsworth	3,291	162	20	34	38	15	30	30	30	Lakewood Commons to Wadsworth & 88th
JUMP Arapahoe	1,715	86	20	29	25	10	10	20	30	Tech Ed Center To 14th &
205 Crossroads/Gunbarrel	1,235	63	20	35	37	15	30	--	--	Entire Route
51 Sheridan	1,946	101	19	20	30	30	30	--	--	Entire Route
92 92nd Ave	736	55	14	20	21	30	30	--	--	Entire Route
LEAP Pearl	436	51	9	13	11	10	10	--	--	Entire Route

# APPENDIX B

## GLOSSARY

accessibility - the extent to which facilities are barrier free and usable by persons with disabilities, including those who use wheelchairs.

alight - to get off a transit vehicle.

all day route - routes that run during both peak and off-peak hours.

alternate local service - service on which the passenger can make the same trip with no more than one transfer.

area coverage standard - guidelines for tailoring service to the needs of communities and help ensure that all areas receive a level of service that is commensurate with their needs.

arterial - high volume city street.

board of directors - the elected Board of Directors of RTD.

boarding - getting on a transit vehicle.

branch - see extension.

central business district (CBD) - the downtown retail trade and commercial area of a city or an area of very high land valuation, traffic flow, and concentration of retail business offices, theaters, hotels and services.

contracted/privatized bus service - service that is contracted to private industry.

cost-effectiveness - an analytical technique used to choose the most effective method for achieving a program or policy goal.

cost recovery standards - established standards of minimally acceptable total revenues to total cost ratios.

deadhead - the movement of a transit vehicle without passengers aboard -- often to and from a garage, or to and from one route to another.

demand - the quantity of transportation desired.

destination - the point at which a trip terminates.

displaced passenger - those passengers directly affected by a change to, or elimination of, a route.

District - refers to the Regional Transportation District.

end-to-end travel time - the time required to get from one end point of a route to the other.

end segments - those segments on the terminal ends of a given route; can either be the collection or drop-off segments.

Express - service that has fewer stops and a higher operating speed via limited access freeways than Local or Limited regular service.

extension - a transit route addition to an existing route.

fare revenue - a classification of revenue sources that includes all fare media: cash, token, ticket and all passes, including monthly & annual passes, Eco Pass, CU Pass, and Auraria Pass.

fixed route - a system in which buses follow a fixed time schedule over a prescribed route. It is different from such modes of transportation as taxicabs or demand-responsive transportation, where each trip may differ in its origin, destination, or schedule.

frequency - the number of transit vehicles on a given route or line, moving in the same direction, that pass a given point within a specified interval of time, usually one hour.

grid system - a service pattern in which a system of parallel routes intersect each other at right angles.

headway - the time interval between the passing of successive transit vehicles moving along the same route in the same direction, usually expressed in minutes.

in-service mile - unit of measure used to describe only that portion of a trip that is revenue generating.

land use - the purpose for which land or the structure on the land is being used, for example, residential, commercial, light industry.

Limited - a transit service provided on major arterial roadways, with longer stop spacing than Local routes. Limited routes generally do not operate on limited access freeways.

line haul - transportation service along a single corridor, without branches, with stops along the way. Usually service is intensive (high capacity) and may use exclusive right-of-way.

local - transit service that involves frequent stops and consequent low average speeds, the purpose of which is to deliver and pickup transit passengers close to their destinations or origins.

local collector portion of an express or regional route - that portion of the specific express or regional route which picks-up passengers at several points.

marginal operating cost - that added cost of operation covered by a change in ridership.

marginal segments - those segments that cover the percentage change in cost associated with the percentage change in ridership.

marginally productive hours - that point in productivity where the percentage change in per unit cost is equal to the percentage change in per unit benefit. An example being the point where the percentage change in passenger miles is equal to the percentage change in per unit cost of operation.

maximum load standard - the greatest allowable ratio of passengers actually carried versus the total passenger capacity of a vehicle.

non-fixed route - a system in which vehicles do not follow one or more specified routes on a fixed time schedule.

on-board survey - a survey taken of actual transit users on board a transit vehicle. Such a survey may include questions concerning travel habits, economic status, and employment information.

on-demand service - also known as demand responsive or dial-a-ride service, this door-to-door service responds to passenger requests made by telephone. It is typically operated in lieu of fixed route service with small vehicles in a geographical area that generates low levels of demand.

operating cost - the sum of all costs that can be associated with the operation of the system during the period under consideration.

paratransit - demand responsive transportation that requires a request for service and which does not necessarily operate on a fixed route or fixed schedule.

park-n-ride - a location where passengers arrive by automobile, feeder bus, or other modes of transportation and board transit vehicles. Usually includes a parking area.

peak period - the period when demand for transportation service is heaviest.

pedestrian access - the permission, liberty, or ability to enter, approach, or make use of a system by a person traveling on foot.

point-to-point service - service in which the transit vehicle will not stop along the way to pick up additional passengers.

population density - the number of people per defined unit of area.

productivity - the ratio of units of transportation output to units of input; for example, vehicle miles per operator hour, or passenger miles per unit cost of operation.

RTD - the Regional Transportation District - (1) a legally defined special district consisting of most of metropolitan Denver in which standard transit service is provided. (2) Also the semi-governmental agency established to administer the transit service within the boundary of the district.

regional - transit lines with few stations and high operating speeds. They primarily serve long trips of long duration or distance within metropolitan regions, as distinguished from local transit service and short-haul transit service.

rider - a passenger on any revenue service vehicle.

ridership - the number of people making one-way trips on a public transportation system in a given time period.

route - the geographical path followed by a vehicle or traveler from start to finish of a given trip.

route deviation - a situation in which a transit vehicle deviates on a regular schedule from the main route to serve a specific facility.

route spacing - the distance between routes; calculated with such variable as potential riders per acre, walking distance to stops, and type of service being supplied.

segments - portions of routes delineated from others on the basis of such aspects as collection or delivery points, or the portion between these points.

service class - the delineation made between such types of service as local, limited, and regional.

service standards - those established standards used to evaluate existing transit service, and proposals for new service.

specific trips - trips designed for a specific purpose (see Appendix B).

stop spacing - the distance between consecutive transit stops.

subscription service - commonly uses medium to small buses to provide service to customers who have made reservations in advance. Passenger origins can be doorstop or checkpoint, which features a convenient stop for 2 or more patrons.

total additional travel time - the additional time duration of a linked trip, that is, from the point of origin to the final destination, including waiting and walking time at transfer points and trip ends.

total cost - the sum of all costs, fully allocated, including overhead and depreciation (reflecting also whether particular routes are operated by RTD or a contractor).

Traffic Analysis Zones (TAZ's) - small geographic areas with common access to major streets used in transportation modeling.

transfer - a passenger's change from one transit unit or mode to another unit or mode.

transit dependent riders - riders who either: (1) live in a household which does not own a car; (2) who have a physical or mental disability that prevents the operation of a motor vehicle.

transit system - the facilities, equipment, personnel, and procedures needed to provide and maintain public transit service.

travel time - the time duration of a linked trip on transit, that is, from the point of origin to the final destination, including walking time at transfer points and trip ends.

trip - a one-way movement of a person or vehicle between two points for a specific purpose; sometimes called a one-way trip to distinguish it from a round trip.

trip time - see travel time.

unproductive routes - those routes that fall below the established production standards; usually below the marginal productive level.

# APPENDIX C

## RTD SERVICE CLASSES

### Fixed Route Service

- CBD Local - Local or Limited routes operating to/from the Denver Central Business District.
- Light Rail Transit – Rail transit service operating on fixed track using designated light rail vehicles. Light rail is characterized by the ability to operate at high speeds (50+ miles per hour) on private right of way, AND the ability to operate in mixed traffic on city streets.
- Limited - routes serving high-density corridors with stops at one-half to 1.5 mile intervals, providing faster overall service than Local routes. Limited routes generally do not operate on limited access freeways.
- Mall Shuttle - a free shuttle service operating along the Sixteenth Street Mall in downtown Denver.
- Express - routes providing high-speed service on limited access freeways from suburban sections of the Denver metropolitan area to downtown Denver and other employment centers. Express service is provided up to a maximum distance of 16-18 miles.
- Regional - long-haul routes providing service between outlying communities and employment centers in Denver and Boulder. Regional service is provided at distances of approximately 18 miles or more.
- Paratransit – nonscheduled service for seniors and the disabled.
- skyRide – Service provided to Denver International Airport. Operates all day seven days per week.
- Suburban Local - local or limited routes that predominantly serve suburban areas, which have low to medium residential densities, medium to large lots and homogeneous land uses (mean population densities of approximately 5 per acre and mean employment densities of 2 per acre).
- Urban Local - local or limited routes that predominantly serve urban areas, which have high residential and/or employment densities, characterized by small residential lots and major suburban activity centers or business parks (mean population densities of approximately 9 per acre and mean employment densities ranging from 4 to 20 per acre).

### Non-Fixed Route Service

- access-a-Ride - a curb-to-curb paratransit service provided to persons with disabilities who are eligible for service under the requirements of the Americans with Disabilities Act of 1990.
- BroncoRide - shuttle service from selected park-n-Rides to Denver Bronco home games.
- call-n-Ride Demand Responsive Service - Demand responsive service defined by a geographic territory and the need to telephone for pick-up. Small vehicles are used. Customers call directly to the driver who has a cellular phone (thus eliminating the need for additional dispatching, except for back-up). The driver takes trip requests to go anywhere within the territory. Calling for reservations about an



hour in advance is generally required, but pre-scheduled and subscription services are also available. The territory for a single vehicle is typically between 6 and 10 square miles with 2 to 4 persons/acre and 1 to 3 employees/acre.

- Carsharing & Station Cars - Mobility systems with several to many cars and subscribers. Subscribers must reserve the use of a car, since it used multiple times by different subscribers.
- Miscellaneous Service - service to special events as needed.
- on demand - door-to-door service that responds to passenger requests made by telephone. It is typically operated in lieu of fixed route service with small vehicles in geographical areas or during times of day that generate low levels of demand.
- RockiesRide - shuttle service from selected park-n-Rides to Colorado Rockies home games.
- Route and Point Deviation Service - Route deviation is typically defined as a fixed route where the bus is allowed to go off-route upon demand. The frequency and distance of deviations are limited to a prescribed geography and slack time. Point deviation is typically defined as a series of scheduled timepoints a bus must adhere to, but without a prescribed routing. RTD Night Stop is a variant of route deviation.
- SeniorRide - pre-scheduled trips in off-peak hours to recreational events for elderly persons.
- Senior Shoppers - regularly scheduled trips for seniors from common pickup points to common destinations Monday through Friday.
- Saturday Shoppers - curb-to-curb advanced reservation for elderly and persons with disabilities on Saturday.
- Subscription - commonly uses medium to small buses to provide service to customers who have made reservations in advance. Passenger origins can be doorstep or checkpoint, which features a convenient stop for 2 or more patrons.
- Vanpool - Vanpooling is an element of ridesharing. A vanpool may be private or a lease of a van to individuals or employers who may subsidize them. Vanpools can meet the needs of a significant portion of peak-period commuter trips, especially those between 15 and 30 miles one-way to large employment centers. They are a complement to or substitute for RTD Express and Regional services.

# APPENDIX D

## Route Performance Data

Table 4 provides subsidy per boarding and boardings per hour data and Table 5 gives boardings per trip. These tables are updated annually and follow this page.

Table 4

**RTD Service Standards Analysis – 2001**  
**Subsidy per Boarding and Boardings per Hour by Route**

Route	Standards Class	Farebox Revenue	Operating Costs	Total Boardings	In-Service Hours	Net Subsidy	Subsidy per Boarding	Boardings per Hour
00	CBD Local	\$1,458,613	\$7,985,020	2,792,190	78,447	\$6,526,407	\$2.34	35.59
0L	CBD Local	\$133,793	\$1,538,423	210,959	5,562	\$1,404,629	\$6.66	37.93
01	CBD Local	\$401,090	\$2,731,463	671,124	25,898	\$2,330,373	\$3.47	25.91
02	CBD Local	\$197,366	\$1,264,967	328,685	12,148	\$1,067,600	\$3.25	27.06
3L	CBD Local	\$112,639	\$869,339	156,804	3,500	\$756,701	\$4.83	44.81
06	CBD Local	\$551,016	\$3,515,126	939,683	38,728	\$2,964,110	\$3.15	24.26
07	CBD Local	\$402,462	\$2,136,683	734,638	27,919	\$1,734,221	\$2.36	26.31
08	CBD Local	\$156,444	\$1,241,860	261,688	14,383	\$1,085,417	\$4.15	18.19
09	CBD Local	\$193,681	\$1,444,164	325,585	13,429	\$1,250,483	\$3.84	24.25
10	CBD Local	\$557,657	\$3,844,155	932,510	38,267	\$3,286,499	\$3.52	24.37
12	CBD Local	\$269,939	\$2,221,855	475,534	20,327	\$1,951,916	\$4.10	23.39
15	CBD Local	\$2,208,722	\$6,446,518	4,177,142	64,991	\$4,237,796	\$1.01	64.27
15L	CBD Local	\$1,217,383	\$4,251,915	2,252,874	34,179	\$3,034,533	\$1.35	65.91
16	CBD Local	\$953,829	\$3,067,801	1,750,882	33,325	\$2,113,972	\$1.21	52.54
16L	CBD Local	\$125,951	\$1,211,928	215,318	8,925	\$1,085,977	\$5.04	24.13
20	CBD Local	\$606,936	\$3,948,556	1,052,226	32,900	\$3,341,621	\$3.18	31.98
28	CBD Local	\$410,002	\$3,220,670	736,017	29,190	\$2,810,668	\$3.82	25.21
29	CBD Local	\$113,832	\$736,558	200,907	7,968	\$622,726	\$3.10	25.21
30	CBD Local	\$849,795	\$2,624,189	1,595,065	30,868	\$1,774,394	\$1.11	51.67
30L	CBD Local	\$31,562	\$226,148	57,819	1,567	\$194,586	\$3.37	36.90
31	CBD Local	\$700,426	\$3,075,574	1,259,508	36,200	\$2,375,148	\$1.89	34.79
32	CBD Local	\$342,695	\$2,684,203	575,967	22,903	\$2,341,508	\$4.07	25.15
36	CBD Local	\$167,328	\$916,768	294,540	10,343	\$749,440	\$2.54	28.48
38	CBD Local	\$664,311	\$3,362,805	1,222,729	32,541	\$2,698,494	\$2.21	37.57
38L	CBD Local	\$15,231	\$255,222	21,738	952	\$239,992	\$11.04	22.83
44	CBD Local	\$724,056	\$4,499,828	1,275,533	43,643	\$3,775,772	\$2.96	29.23
44L	CBD Local	\$26,062	\$348,451	41,418	1,738	\$322,389	\$7.78	23.83
46L	CBD Local	\$78,700	\$630,955	118,634	2,043	\$552,254	\$4.66	58.08
48	CBD Local	\$258,580	\$2,168,136	442,692	20,323	\$1,909,556	\$4.31	21.78
50	CBD Local	\$11,608	\$105,395	18,908	751	\$93,787	\$4.96	25.19
52	CBD Local	\$410,915	\$3,306,843	720,149	36,313	\$2,895,928	\$4.02	19.83
79L	CBD Local	\$51,370	\$504,823	81,335	1,865	\$453,453	\$5.58	43.60
83L	CBD Local	\$475,441	\$3,203,688	826,329	21,744	\$2,728,247	\$3.30	38.00
GW	CBD Local	\$2,301	\$5,727	2,896	94	\$3,426	\$1.18	30.97
<b>Subtotal - CBD Local</b>		<b>\$14,881,735</b>	<b>\$79,595,756</b>	<b>26,770,026</b>	<b>753,973</b>	<b>\$64,714,021</b>	<b>\$2.42</b>	<b>35.51</b>
03	Urban Local	\$671,236	\$4,443,513	1,311,995	39,758	\$3,772,278	\$2.88	33.00
11	Urban Local	\$548,624	\$3,604,485	1,032,764	33,579	\$3,055,861	\$2.96	30.76
14	Urban Local	\$123,921	\$1,001,256	230,258	9,413	\$877,335	\$3.81	24.46
21	Urban Local	\$698,313	\$4,465,435	1,351,298	37,650	\$3,767,122	\$2.79	35.89
24	Urban Local	\$201,057	\$1,831,547	364,076	19,467	\$1,630,490	\$4.48	18.70
27	Urban Local	\$209,440	\$1,961,795	370,085	19,704	\$1,752,354	\$4.74	18.78
34	Urban Local	\$11,595	\$294,944	17,118	553	\$283,349	\$16.55	30.98
35	Urban Local	\$72,943	\$1,465,934	132,564	10,237	\$1,392,991	\$10.51	12.95
40	Urban Local	\$725,845	\$3,723,689	1,548,769	40,677	\$2,997,844	\$1.94	38.07
43	Urban Local	\$269,496	\$1,525,091	534,518	12,767	\$1,255,594	\$2.35	41.87
45	Urban Local	\$62,523	\$518,832	114,434	4,136	\$456,309	\$3.99	27.67
47	Urban Local	\$31,062	\$628,743	50,689	6,362	\$597,681	\$11.79	7.97
49	Urban Local	\$12,895	\$222,671	20,314	2,295	\$209,775	\$10.33	8.85
51	Urban Local	\$360,134	\$2,528,451	627,997	31,905	\$2,168,317	\$3.45	19.68
51L	Urban Local	\$8,030	\$171,092	15,239	548	\$163,062	\$10.70	27.80
53	Urban Local	\$385,330	\$2,198,224	695,303	21,217	\$1,812,893	\$2.61	32.77
54	Urban Local	\$12,381	\$135,440	24,415	884	\$123,059	\$5.04	27.63
56	Urban Local	\$6,394	\$116,667	9,323	570	\$110,273	\$11.83	16.37
65	Urban Local	\$205,464	\$1,152,449	407,494	13,888	\$946,985	\$2.32	29.34
73	Urban Local	\$63,935	\$1,196,337	118,916	10,898	\$1,132,402	\$9.52	10.91
76	Urban Local	\$534,875	\$4,184,425	992,886	47,649	\$3,649,550	\$3.68	20.84
105	Urban Local	\$587,766	\$3,461,974	1,064,803	29,420	\$2,874,208	\$2.70	36.19
125	Urban Local	\$21,152	\$475,250	39,965	5,577	\$454,098	\$11.36	7.17

**RTD Service Standards Analysis – 2001  
Subsidy per Boarding and Boardings per Hour by Route**

Route	Standards Class	Farebox Revenue	Operating Costs	Total Boardings	In-Service Hours	Net Subsidy	Subsidy per Boarding	Boardings per Hour
AVA	Urban Local	\$9,911	\$79,795	16,378	485	\$69,884	\$4.27	33.80
BEE	Urban Local	\$33,266	\$1,112,565	138,288	11,621	\$1,079,299	\$7.80	11.90
200	Urban Local	\$102	\$5,082	182	26	\$4,980	\$27.36	6.95
201	Urban Local	\$11,608	\$235,688	19,990	2,737	\$224,080	\$11.21	7.30
203	Urban Local	\$61,756	\$636,205	118,308	5,277	\$574,449	\$4.86	22.42
204	Urban Local	\$187,876	\$1,775,921	368,890	16,100	\$1,588,046	\$4.30	22.91
205	Urban Local	\$203,900	\$1,631,712	379,661	19,127	\$1,427,812	\$3.76	19.85
206	Urban Local	\$92,420	\$902,640	171,093	8,350	\$810,220	\$4.74	20.49
207	Urban Local	\$2,886	\$24,334	4,919	236	\$21,448	\$4.36	20.84
208	Urban Local	\$115,409	\$767,782	207,596	6,893	\$652,373	\$3.14	30.12
209	Urban Local	\$72,194	\$710,261	142,195	7,239	\$638,067	\$4.49	19.64
210	Urban Local	\$13,620	\$325,680	22,241	3,481	\$312,060	\$14.03	6.39
225	Urban Local	\$50,986	\$579,557	92,901	5,616	\$528,572	\$5.69	16.54
227	Urban Local	\$260,218	\$2,094,452	462,777	17,107	\$1,834,233	\$3.96	27.05
BOUND	Urban Local	\$242,221	\$1,747,817	448,406	17,565	\$1,505,596	\$3.36	25.53
JUMP	Urban Local	\$259,863	\$2,516,290	491,215	25,196	\$2,256,427	\$4.59	19.50
LEAP	Urban Local	\$61,817	\$1,379,271	109,376	12,336	\$1,317,454	\$12.05	8.87
SKIP	Urban Local	\$855,254	\$3,113,040	1,591,528	34,827	\$2,257,786	\$1.42	45.70
<b>Subtotal - Urban Local</b>		<b>\$8,359,717</b>	<b>\$60,946,336</b>	<b>15,861,167</b>	<b>593,371</b>	<b>\$52,586,619</b>	<b>\$3.32</b>	<b>26.73</b>
17	Suburban Local	\$97,556	\$1,458,721	185,153	15,170	\$1,361,165	\$7.35	12.21
57	Suburban Local	\$98,385	\$1,164,649	203,858	7,944	\$1,066,264	\$5.23	25.66
58	Suburban Local	\$7,354	\$21,754	12,436	174	\$14,400	\$1.16	71.37
59	Suburban Local	\$34,573	\$772,562	60,556	5,619	\$737,989	\$12.19	10.78
60	Suburban Local	\$14,174	\$415,957	26,047	2,009	\$401,782	\$15.43	12.97
66	Suburban Local	\$50,162	\$950,942	98,601	5,827	\$900,779	\$9.14	16.92
67	Suburban Local	\$49,081	\$1,364,558	89,559	9,623	\$1,315,477	\$14.69	9.31
72	Suburban Local	\$92,186	\$1,075,477	181,569	13,985	\$983,291	\$5.42	12.98
75	Suburban Local	\$31,577	\$1,312,483	53,958	4,281	\$1,280,906	\$23.74	12.60
77	Suburban Local	\$17,276	\$615,342	29,804	2,017	\$598,066	\$20.07	14.78
80	Suburban Local	\$28,323	\$232,489	45,358	3,018	\$204,166	\$4.50	15.03
88	Suburban Local	\$150,577	\$1,220,387	237,972	15,049	\$1,069,809	\$4.50	15.81
92	Suburban Local	\$129,959	\$1,446,401	226,208	17,018	\$1,316,442	\$5.82	13.29
100	Suburban Local	\$131,825	\$1,347,656	239,100	15,834	\$1,215,832	\$5.09	15.10
104	Suburban Local	\$38,609	\$701,196	60,555	6,965	\$662,587	\$10.94	8.69
120	Suburban Local	\$76,967	\$999,643	126,663	13,100	\$922,676	\$7.28	9.67
121	Suburban Local	\$429,874	\$2,781,504	826,910	23,382	\$2,351,630	\$2.84	35.36
128	Suburban Local	\$37,080	\$405,586	58,144	5,332	\$368,506	\$6.34	10.90
169	Suburban Local	\$100,734	\$935,278	173,823	8,112	\$834,545	\$4.80	21.43
401	Suburban Local	\$54,826	\$1,662,932	91,765	11,170	\$1,608,107	\$17.52	8.22
402L	Suburban Local	\$24,707	\$1,202,887	42,684	6,564	\$1,178,179	\$27.60	6.50
403	Suburban Local	\$19,273	\$515,543	32,489	1,490	\$496,270	\$15.28	21.80
470L	Suburban Local	\$4,129	\$139,166	6,330	454	\$135,038	\$21.33	13.95
426	Suburban Local	\$14,977	\$1,111,659	67,455	7,824	\$1,096,682	\$16.26	8.62
228	Suburban Local	\$68,552	\$1,366,604	114,547	12,358	\$1,298,052	\$11.33	9.27
301	Suburban Local	\$4,008	\$37,783	9,840	136	\$33,775	\$3.43	72.51
302	Suburban Local	\$13,600	\$29,323	31,150	174	\$15,724	\$0.50	178.97
303	Suburban Local	\$3,346	\$6,836	7,671	22	\$3,490	\$0.45	346.58
310	Suburban Local	\$24,608	\$538,530	59,299	5,159	\$513,923	\$8.67	11.49
311	Suburban Local	\$22,947	\$536,683	56,732	5,669	\$513,736	\$9.06	10.01
312	Suburban Local	\$37,491	\$813,191	88,245	6,781	\$775,700	\$8.79	13.01
313	Suburban Local	\$9,642	\$261,170	20,954	2,686	\$251,529	\$12.00	7.80
314	Suburban Local	\$11,491	\$346,766	26,304	3,607	\$335,275	\$12.75	7.29
<b>Subtotal - Suburban Local</b>		<b>\$1,929,869</b>	<b>\$27,791,662</b>	<b>3,591,739</b>	<b>238,552</b>	<b>\$25,861,793</b>	<b>\$7.20</b>	<b>15.06</b>

**RTD Service Standards Analysis – 2001  
Subsidy per Boarding and Boardings per Hour by Route**

Route	Standards Class	Farebox Revenue	Operating Costs	Total Boardings	In-Service Hours	Net Subsidy	Subsidy per Boarding	Boardings per Hour
Brighton	call-n-Ride	\$10,306	\$224,394	19,015	3,725	\$214,088	\$11.26	5.10
Broomfield	call-n-Ride	\$4,109	\$161,607	7,582	2,625	\$157,498	\$20.77	2.89
Interlocken	call-n-Ride	\$5,744	\$161,845	10,598	2,625	\$156,101	\$14.73	4.04
Longmont	call-n-Ride	\$4,471	\$222,522	8,249	2,603	\$218,051	\$26.43	3.17
Louisville	call-n-Ride	\$7,493	\$209,584	13,825	3,700	\$202,091	\$14.62	3.74
Majestic	call-n-Ride	\$317	\$17,907	584	413	\$17,590	\$30.12	1.41
Superior	call-n-Ride	\$6,763	\$223,156	12,477	3,702	\$216,393	\$17.34	3.37
<b>Subtotal - call-n-Ride</b>		<b>\$39,203</b>	<b>\$1,221,016</b>	<b>72,330</b>	<b>19,392</b>	<b>\$1,181,813</b>	<b>\$16.34</b>	<b>3.73</b>
02X	Express	\$94,601	\$515,232	59,620	1,639	\$420,631	\$7.06	36.37
05X	Express	\$95,223	\$331,383	60,692	1,554	\$236,160	\$3.89	39.05
06X	Express	\$46,730	\$412,332	28,773	2,622	\$365,603	\$12.71	10.98
08X	Express	\$32,028	\$169,707	20,708	978	\$137,679	\$6.65	21.18
11X	Express	\$25,729	\$161,970	31,846	1,534	\$136,241	\$4.28	20.76
12X	Express	\$26,459	\$180,487	17,198	795	\$154,028	\$8.96	21.64
17X	Express	\$20,404	\$416,051	24,862	1,262	\$395,647	\$15.91	19.70
18X	Express	\$25,181	\$166,651	15,486	1,007	\$141,470	\$9.14	15.37
23X	Express	\$32,041	\$328,884	37,625	1,250	\$296,843	\$7.89	30.11
24X	Express	\$69,287	\$842,886	81,260	3,540	\$773,599	\$9.52	22.95
25X	Express	\$82,346	\$752,018	95,619	5,099	\$669,672	\$7.00	18.75
31X	Express	\$42,058	\$175,153	24,813	1,165	\$133,095	\$5.36	21.31
35X	Express	\$24,528	\$288,226	30,128	1,632	\$263,698	\$8.75	18.46
39X	Express	\$34,719	\$399,035	47,156	1,700	\$364,316	\$7.73	27.74
40X	Express	\$89,434	\$403,414	57,189	1,721	\$313,980	\$5.49	33.23
47X	Express	\$69,799	\$716,620	81,259	3,089	\$646,821	\$7.96	26.30
58X	Express	\$49,050	\$342,343	28,185	1,322	\$293,293	\$10.41	21.32
59X	Express	\$31,657	\$545,881	21,664	2,755	\$514,224	\$23.74	7.86
63X	Express	\$23,130	\$471,536	25,532	3,084	\$448,406	\$17.56	8.28
66X	Express	\$22,831	\$454,495	27,456	1,264	\$431,664	\$15.72	21.73
68X	Express	\$44,291	\$171,498	28,682	1,029	\$127,207	\$4.44	27.89
72X	Express	\$118,002	\$657,093	79,978	3,388	\$539,091	\$6.74	23.61
75X	Express	\$33	\$605	18	7	\$572	\$31.77	2.52
76X	Express	\$69,047	\$217,387	42,277	1,547	\$148,340	\$3.51	27.33
78X	Express	\$56,305	\$544,967	71,590	2,321	\$488,662	\$6.83	30.85
80X	Express	\$34,615	\$242,675	22,324	1,207	\$208,061	\$9.32	18.50
82X	Express	\$97,770	\$371,306	61,329	1,648	\$273,536	\$4.46	37.22
85X	Express	\$80,628	\$618,460	90,138	3,635	\$537,832	\$5.97	24.80
86X	Express	\$190,921	\$526,640	121,661	1,528	\$335,720	\$2.76	79.60
87X	Express	\$32,168	\$137,068	20,627	731	\$104,900	\$5.09	28.22
89X	Express	\$45,761	\$680,559	55,502	2,406	\$634,798	\$11.44	23.07
90X	Express	\$222,124	\$1,672,249	270,389	6,722	\$1,450,125	\$5.36	40.23
91X	Express	\$58,518	\$445,756	70,529	2,185	\$387,238	\$5.49	32.29
93X	Express	\$40,072	\$291,039	26,393	1,292	\$250,966	\$9.51	20.43
100X	Express	\$60,503	\$476,296	71,215	2,013	\$415,793	\$5.84	35.38
108X	Express	\$78,719	\$279,567	48,206	2,017	\$200,849	\$4.17	23.89
116X	Express	\$115,843	\$973,666	75,381	3,665	\$857,823	\$11.38	20.57
119X	Express	\$53,703	\$307,956	34,528	870	\$254,253	\$7.36	39.69
120X	Express	\$1,261,441	\$2,608,465	807,450	13,611	\$1,347,024	\$1.67	59.32
122X	Express	\$51,841	\$141,880	33,027	506	\$90,039	\$2.73	65.23
145X	Express	\$26,739	\$245,257	14,724	2,184	\$218,518	\$14.84	6.74
169X	Express	\$182,427	\$528,397	106,417	3,377	\$345,970	\$3.25	31.51
185X	Express	\$48,374	\$377,553	28,914	4,019	\$329,179	\$11.38	7.19
470X	Express	\$8,335	\$266,269	11,071	926	\$257,934	\$23.30	11.96
475X	Express	\$15,399	\$403,237	11,543	1,104	\$387,838	\$33.60	10.45
<b>Subtotal - Express</b>		<b>\$3,930,812</b>	<b>\$21,260,150</b>	<b>3,020,984</b>	<b>102,949</b>	<b>\$17,329,339</b>	<b>\$5.74</b>	<b>29.34</b>

**RTD Service Standards Analysis – 2001  
Subsidy per Boarding and Boardings per Hour by Route**

Route	Standards Class	Farebox Revenue	Operating Costs	Total Boardings	In-Service Hours	Net Subsidy	Subsidy per Boarding	Boardings per Hour
B	Regional	\$2,334,238	\$7,184,606	1,156,559	45,477	\$4,850,368	\$4.19	25.43
C	Regional	\$232,881	\$1,247,535	117,692	5,598	\$1,014,654	\$8.62	21.02
CC	Regional	\$25,548	\$668,581	18,716	3,016	\$643,033	\$34.36	6.21
D	Regional	\$296,295	\$1,824,682	133,896	11,369	\$1,528,387	\$11.41	11.78
E	Regional	\$127,748	\$768,048	63,629	2,622	\$640,300	\$10.06	24.27
F	Regional	\$88,012	\$344,890	46,399	1,924	\$256,879	\$5.54	24.11
G	Regional	\$182,661	\$866,208	90,429	5,967	\$683,547	\$7.56	15.15
H	Regional	\$148,468	\$920,553	83,460	3,435	\$772,085	\$9.25	24.29
J	Regional	\$49,663	\$394,438	25,934	1,849	\$344,775	\$13.29	14.03
L	Regional	\$455,084	\$2,114,994	240,761	14,746	\$1,659,910	\$6.89	16.33
M	Regional	\$423,862	\$1,707,067	208,004	13,128	\$1,283,205	\$6.17	15.84
N	Regional	\$244,061	\$682,687	105,987	5,888	\$438,626	\$4.14	18.00
P	Regional	\$242,288	\$1,915,762	148,959	7,753	\$1,673,474	\$11.23	19.21
R	Regional	\$115,646	\$674,143	55,394	3,589	\$558,497	\$10.08	15.43
S	Regional	\$70,457	\$537,393	33,730	2,631	\$466,936	\$13.84	12.82
T	Regional	\$179,432	\$910,533	80,724	5,480	\$731,101	\$9.06	14.73
U	Regional	\$78,066	\$864,773	47,841	3,187	\$786,706	\$16.44	15.01
W	Regional	\$128,719	\$797,786	68,305	3,552	\$669,067	\$9.80	19.23
Y	Regional	\$34,327	\$180,996	15,765	995	\$146,669	\$9.30	15.85
Z	Regional	\$124,071	\$846,637	62,388	3,983	\$722,566	\$11.58	15.66
<b>Subtotal - Regional</b>		<b>\$5,581,528</b>	<b>\$25,452,311</b>	<b>2,804,572</b>	<b>146,190</b>	<b>\$19,870,783</b>	<b>\$7.09</b>	<b>19.18</b>
AA	skyRide	\$308,930	\$1,379,024	193,690	10,503	\$1,070,094	\$5.52	18.44
AB	skyRide	\$1,125,692	\$2,553,666	370,753	22,106	\$1,427,974	\$3.85	16.77
AF	skyRide	\$1,003,520	\$2,878,676	458,765	22,622	\$1,875,156	\$4.09	20.28
AS	skyRide	\$692,545	\$2,873,684	451,121	24,534	\$2,181,139	\$4.83	18.39
AT	skyRide	\$781,088	\$2,991,290	425,146	24,205	\$2,210,201	\$5.20	17.56
<b>Subtotal - skyRide</b>		<b>\$3,911,775</b>	<b>\$12,676,340</b>	<b>1,899,475</b>	<b>103,971</b>	<b>\$8,764,565</b>	<b>\$4.61</b>	<b>18.27</b>
BroncoRide	Other	\$546,760	\$1,386,139	387,986	21,491	\$839,380	\$2.16	18.05
BuffaloRide	Other	\$11,794	\$30,956	5,897	553	\$19,162	\$3.25	10.66
CUJCSU	Other	\$40,509	\$89,089	27,169	1,552	\$48,580	\$1.79	17.51
RockiesRide	Other	\$407,531	\$1,161,556	221,952	19,046	\$754,025	\$3.40	11.65
SeniorRide	Other	\$46,402	\$686,688	92,804	11,719	\$640,286	\$6.90	7.92
<b>Subtotal - Other</b>		<b>\$1,052,996</b>	<b>\$3,354,428</b>	<b>735,808</b>	<b>54,361</b>	<b>\$2,301,433</b>	<b>\$3.13</b>	<b>13.54</b>
LRT	Other	\$6,479,460	\$24,703,002	9,080,578	44,640	\$18,223,542	\$2.01	203.42
Mall Shuttle	Other	\$0	\$6,675,527	16,495,486	51,735	\$6,675,527	\$0.40	318.85
<b>System Totals</b>		<b>\$46,167,094</b>	<b>\$263,676,527</b>	<b>80,332,165</b>	<b>2,109,134</b>	<b>\$217,509,433</b>	<b>\$2.71</b>	<b>38.09</b>

NOTE: call-n-Ride farebox revenue is estimated at the Denver Local average fare.

Table 5

**Year 2001 Boardings Per Trip**

Weekday Farebox Boardings &amp; Trips by Runboard

Route	Avg Brdngs		Avg Brdngs
	Per Day	Per Day	Per Trip
<b>Express</b>			
100X South Kipling Express	279	9	31.0
108X Countryside Express	189	9	21.0
116X South Simms Express	296	13	22.8
119X Union Express	135	5	27.1
11X E. Mississippi Express	125	8	15.6
120X Wagon Road Express	3,135	140	22.4
122X Wagon Road/Civic Center Express	397	12	33.1
12X North Washington Express	67	6	11.3
145X Brighton/DIA Express	45	11	4.1
169X Buckley/DIA Express	293	12	24.5
17X East Mexico Express	97	6	16.2
185X Tower Road Express	91	18	5.0
18X North Pecos Express	61	6	10.1
23X East Iliff/Seven Hills Express	148	6	24.6
24X S. University Express	319	15	21.2
25X DTC/Inverness Express	375	18	20.8
2X Alkire/Cold Spring Express	234	8	29.2
31X North Federal/Lowell Express	101	6	16.8
35X E. Hampden/E. Yale Express	118	8	14.8
39X East Mansfield Express	185	8	23.1
40X North Colorado Express	224	9	24.9
475X Kipling-C470 Express	46	6	7.7
47X Green Valley Ranch-Montbello Exp	319	13	24.7
58X W. 58th Express	110	6	18.4
5X Cold Spring Express	238	14	17.0
63X Martin-Tech Center Express	100	16	6.4
66X East Arapahoe Express	108	6	17.9
68X North Pierce Express	112	6	18.7
6X Ward Rd/Cold Spring/DTC Express	113	8	14.1
72X Ward Road Express	314	24	13.2
75X Martin/Waterton Express	5	2	2.3
76X North Wadsworth Express	166	9	18.4
78X Cherry Knolls Express	281	9	31.2
80X West 80th Express	88	6	14.6
82X Pomona Express	240	9	26.7
85X S. Quebec/Eastridge Express	353	16	22.1
86X Westminster Center Express	477	15	31.8
87X South Wadsworth Express	81	4	20.3
89X Southmoor-Yosemite Express	217	17	12.8
8X North Huron Express	81	7	11.6
90X Meadowood Express	1,061	30	35.4
91X Pheasant Run Express	277	8	34.6
93X Green Mtn Express	103	6	17.2
<b>Average</b>			<b>19.5</b>
<b>Stotal/Weighted Average</b>	<b>11,804</b>	<b>570</b>	<b>20.7</b>
<b>Standard Deviation</b>			<b>8.2</b>
<b>Minimum at 10% or better: Average +/- 1.28 * Std Dev</b>			<b>10.2</b>
<b>Minimum at 25% or better: Average +/- .67 * Std Dev</b>			<b>15.2</b>

**Avg Brdngs Avg Trips Avg Brdngs**

**Route Per Day Per Day Per Trip**

<b>Regional</b>				
B	Boulder/Denver	4,011	179	22.4
CC	Coal Creek/Wondervu	73	15	4.9
CV	CV/CS/CX - Conifer/Denver	462	20	23.6
DD	Boulder/Colorado Blvd	523	24	21.8
E	Evergreen/Denver	250	10	25.0
F	Foothills/Superior-MSS	183	10	18.3
G	Golden/Boulder	354	22	16.1
H	Foothills/Superior-Ccs	326	15	21.8
J	Longmont-East Boulder	102	6	16.9
L	Longmont/Denver	928	42	22.1
M	Boulder/Longmont	732	50	14.6
N	Nederland/Boulder	352	27	13.2
P	Parker/Denver	583	25	23.7
R	Brighton/Denver	217	14	15.9
S	Denver-East Boulder	132	9	14.7
T	Boulder/Greenwood Plaza	316	11	28.8
U	Pine Junction/Conifer/DTC	188	9	20.9
W	Wagon Rd/DTC/Meridan	268	11	24.3
Y	Lyons/Boulder	62	8	7.7
Z	Evergreen/Aspen Via Cold Springs	244	13	18.8
<b>Average</b>				<b>18.8</b>
<b>Stotal/Weighted Average</b>		<b>10,306</b>	<b>519</b>	<b>19.9</b>
<b>Standard Deviation</b>				<b>5.7</b>
<b>Minimum at 10% or better: Average +/- 1.28 * Std Dev</b>				<b>12.5</b>
<b>Minimum at 25% or better: Average +/- .67 * Std Dev</b>				<b>16.0</b>

<b>skyRide</b>				
AA	Wagon Rd - D.I.A.	562	38	14.8
AB	Boulder - D.I.A.	1,084	39	27.8
AF	Cold Spring-Stapleton-D.I.A.	1,379	59	23.5
AS	Ward Rd - Stapleton - D.I.A.	1,283	68	19.0
AT	Arapahoe County - D.I.A.	1,228	58	21.3
<b>Average</b>				<b>21.3</b>
<b>Stotal/Weighted Average</b>		<b>5,536</b>	<b>261</b>	<b>21.2</b>
<b>Standard Deviation</b>				<b>4.4</b>
<b>Minimum at 10% or better: Average +/- 1.28 * Std Dev</b>				<b>15.6</b>
<b>Minimum at 25% or better: Average +/- .67 * Std Dev</b>				<b>17.8</b>