

**DART
SERVICE
STANDARDS**

December 2021 Revisions

TABLE OF CONTENTS

PREFACE 6

SECTION 1: STRATEGIC PLANNING CONTEXT 8

MISSION STATEMENT 8

VISION STATEMENT 8

STRATEGIC PRIORITIES..... 8

SECTION 2: PURPOSE, CIVIL RIGHTS 8

PURPOSE 9

OBJECTIVES 10

TITLE VI COMPLIANCE..... 10

Major Service Change 10

Major Change 11

Disparate Impact Analysis..... 11

Disproportionate Burden Analysis..... 12

SECTION 3: BUS ROUTE AND SERVICE DESIGN GUIDELINES..... 12

OVERVIEW..... 13

SERVICE DESIGN PHILOSOPHY..... 14

SERVICE CLASSIFICATION 14

ADA Paratransit Service 17

AREA COVERAGE 17

 Table 3.1 - Recommended Bus Route Spacing Guidelines 18

BUS STOP SPACING..... 18

 Table 3.2 - Recommended Bus Stop Spacing Guidelines 19

GEOMETRIC DESIGN CONSIDERATIONS 19

DIRECTNESS OF SERVICE 20

Route Directness 20

 Table 3.3 – Target Route Travel Time Ratios, by Route Classification 20

Travel Directness on the Network 20

SERVICE DUPLICATION 21

SERVICE SPAN..... 21

 Table 3.4. Recommended Daily Service Periods, by Service Category 22

SERVICE FREQUENCY 23

 Table 3.5 - Maximum Service Headways (Minimum Service Level) 23

TRANSITION OF FIXED-ROUTE TO DEMAND-RESPONSIVE SERVICE.....	23
TRANSITION OF DEMAND-RESPONSIVE TO FIXED-ROUTE SERVICE.....	24
SECTION 4: BUS/RAIL INTERFACE GUIDELINES	26
FUNCTIONS AT BUS/RAIL INTERFACE STATIONS	26
Bus Operations Functions	26
Scheduling Bus Interface.....	26
ADA Paratransit Feeder Service	27
Service Guidelines	27
Terminating Routes	28
Through Routes	28
Parallel Routes	28
Intersecting Routes.....	29
New Routes.....	29
REVIEW OF ROUTE CHANGES	29
SECTION 5: RAIL SERVICE DESIGN GUIDELINES	29
RAIL SERVICE SPAN.....	30
Table 5.1. Recommended Rail Daily Service Periods	30
RAIL SERVICE FREQUENCY.....	31
Table 5.2 - Maximum Rail Service Headways (Minimum Service Level)	31
RAIL SYSTEM PHYSICAL DESIGN	31
Commuter Rail Station Spacing Considerations	32
SECTION 6: ADA PARATRANSIT SERVICES – STANDARDS AND DEFINITIONS	32
DETERMINING ELIGIBILITY	32
TRAVEL CHARACTERISTICS AND OPERATING PARAMETERS	33
Origin to Destination Service	33
Pick Up Windows and Timely Service	33
Capacity Constraints	34
Subscription Trips.....	34
Service Availability	34
Reservation Service.....	34
SECTION 7: SERVICE QUALITY	34
VEHICLE ASSIGNMENT.....	35
VEHICLE LOADING.....	36

Table 7.1 - Acceptable Vehicle Loads by Time Period 36

ON-TIME PERFORMANCE 37

Managing On-Time Performance..... 37

On-Time Performance Standard 38

Reporting of On-Time Performance..... 39

Special Considerations for Light Rail Operations 39

On-Time Performance Goal Setting 39

SECTION 8: RESOURCE MANAGEMENT 39

UTILIZATION OF RESOURCES – Passengers Per Revenue Hour 40

UTILIZATION OF CAPACITY – Passenger Miles per Revenue Mile 40

FISCAL RESPONSIBILITY – Subsidy per Passenger 40

SECTION 9: SERVICE PERFORMANCE EVALUATION POLICY..... 40

PERFORMANCE TARGETS 40

Methodology for Calculating Performance Targets and Evaluating Routes..... 41

CORRECTIVE ACTION 41

ROUTE DEVELOPMENT STANDARDS 42

SERVICE PERFORMANCE REPORT 42

BASELINE SERVICE 42

Baseline Definition and Categories 43

Subsidized Housing Locations 44

Social Service Locations 44

Medical Facilities 44

Low Income Areas 44

Baseline Designation 45

Table 9.2 - Minimum Service Levels for Baseline Routes 45

SECTION 10: ON-STREET PASSENGER SUPPORT FACILITIES..... 46

Signalized Intersections 46

Unsignalized Intersections 46

Left-Turning Buses 47

Right-Turning Buses 47

Passenger Boarding and Alighting 47

"Good Neighbor" Practice 47

Temporary Stops 48

PLACEMENT OF AMENITIES	48
Amenities Point System	48
Table 10.1: Point System for Bus Stop Amenities.....	49
ADDITIONAL CONSIDERATIONS FOR PLACEMENT OF AMENITIES	50
Public or Private Partnerships.....	50
Relocation and Removal of Stops, Benches, and Shelters.....	50
RAIL STATION PASSENGER SUPPORT FACILITIES	51

PREFACE

This document codifies the Service Standards adopted by the DART Board of Directors to provide guidance to the Authority's technical staff in evaluating the performance of the fixed route and demand-responsive services the agency provides to the general public. These standards apply to fixed-route bus services, site-specific shuttle services, DART ADA Paratransit services, and DART GoLink zones. The Service Standards documented herein are the result of a lengthy history of service evaluation and the evolution of performance metrics by DART.

The history of DART Service Standards actually precedes the formation of the authority. The predecessor to DART, the Dallas Transit System, developed a set of service standards in the late 1970's. DART initially used these standards in 1984 as it became responsible for public transit in the region. A specific set of DART service standards was developed and adopted in August 1985 (Resolution 850124). These standards were clarified and updated in March 1986 (Resolution 860009).

A significant effort to update DART Service Standards was completed in July 1991 (Resolution 910134). This effort focused on resource management and service quality and included guidelines for route and service design and bus-related passenger facilities. These standards were revisited in 1995 before the inauguration of the Light Rail system and the implementation of the feeder bus network.

In August 1995, the Board of Directors adopted a Policy on Service Standards and concurrently approved a revised system of service performance measurement. Resolution 950187 adopted Service Standards that, for the first time, included the concept of the Route Performance Index (RPI). Those 1995 Service Standards included the segmentation of bus service into route types based on function. Definitions of acceptable performance and of corrective actions to be employed for routes that were not performing acceptably were included. A program of regular reporting to the Board of Directors was established at that time.

In September 1995, the Feeder Bus Planning Guidelines were adopted and incorporated into the Service Standards (Resolution 950217). The Service Standards process was updated and clarified in November 1998 (Resolution 980261) with the adoption of the Policy on Performance Measures. This latter policy added the Rail Station Feeder routes to the other four route classifications, directed the annual adoption of performance metrics for each route classification, clarified the policy on quarterly reporting of service evaluation results and added the concept of "Baseline" service in areas of high reliance on public transit.

The Board of Directors adopted amendments to the Policy on Performance Measures in December 2003 (Resolution 030153). These amendments codified performance standards for DART-on-Call service and for Site-Specific Shuttle service.

In April 2013, the Board of Directors approved a series of Service Standards amendments to address new Federal Transit Administration requirements related to Title VI of the Civil Rights Act (Resolution 130037). These included new standards for vehicle assignments, definitions of what constitutes a major service change, and definitions for disparate impact and disproportionate burden of major service or fare changes.

In 2017, staff was asked to begin work on significant updates to current service standards. Central to the updates has been an interest in defining standards to assist in efforts to improve bus service quality and quantity, including network structure, service frequency, service span, and placement of appropriate passenger amenities. Many sections have been completely rewritten to reflect this interest. This version of Service Standards was approved by the Board of Directors in October 2018.

In 2021, DART completed development of and adopted a Final Bus Network Plan after a two year planning process. The new Plan – implemented in January 2022 – completely redesigned the DART bus network. The changes are so significant that they necessitated a series of changes to DART Service Standards that are incorporated into this newest, latest version of the policy document. In addition, this latest version of the Service Standards addresses other changes since 2018, including the evolution of GoLink service and the use of newer analytical tools in service planning work.

Subsequent sections set the Strategic Plan context for Service Standards, defines Route and Service Design Guidelines, incorporates the adopted Bus/Rail Interface Guidelines, establishes standards of Service Quality, explains Resource Management standards, codifies the process of Service Performance Evaluation and provides guidelines for Transit Amenities.

SECTION 1: STRATEGIC PLANNING CONTEXT

The Service Standards, formulated to guide the development and delivery of DART's family of services, have their basis in the Mission Statement articulated by the Board of Directors and in the Vision Statement that is corollary to it. These Service Standards have been designed to provide guidance to DART staff in achieving the goals and objectives set forth by the Strategic Plan.

MISSION STATEMENT

To benefit the region by providing a sustainable system of innovative, affordable, reliable, and safe mobility options for our riders that enhances the quality of life and stimulates economic development.

VISION STATEMENT

Transforming our region with mobility options that connect people, communities, and destinations.

STRATEGIC PRIORITIES

Building from the mission and vision, the DART Board of Directors adopts strategic priorities to guide Agency initiatives. Several of the current strategic priorities are directly related to many of the standards and guidelines described in this document.

Current strategic priorities include:

1. Enhance the safety and service experience through customer-focused initiatives.
2. Provide stewardship of the transit system, agency assets and financial obligations.
3. Innovate to enhance mobility options, business processes and funding.
4. Pursue excellence through employee engagement, diversity, development and wellbeing.
5. Enhance DART's role as a recognized local, regional and national transportation leader.

SECTION 2: PURPOSE, CIVIL RIGHTS

At the inception of Dallas Area Rapid Transit (DART) in 1983, transit service performance in Dallas was measured by a set of service standards approved by the Dallas Transit Board in 1979. Those standards were comprehensive in scope and typical of transit industry service standards of that

time. Since 1983, the DART staff has developed, and the Board of Directors has approved an initial set of DART Service Standards and several revisions of those standards to ensure that service design and performance measurement practices were in line with those common to the industry. The Board of Directors formally addressed Service Standards in 1985, 1986, 1991, 1995 and 1998. In November 1998, the Policy on Performance Measures was adopted.

Since 1998, the services provided by DART have evolved with new, non-traditional services being implemented to respond to changing needs within the communities the Authority serves. These changes resulted in services that did not fit the mold of performance measurement established by the 1998 policy. In the fall of 2003, the Planning Committee of the Board reviewed the history of DART Service Standards and the practical aspects of the application of those standards. After reviewing alternative approaches to performance measurement and considering the need to include new services in the process, the Policy on Performance Measures was modified in December 2003.

In 2003, DART also updated several aspects of current standards to address Federal Title VI civil rights requirements. These included establishment of formal standards for vehicle assignments to ensure equitable distribution throughout the DART network. The new standards also formally defined major service changes and the analysis required to ensure that such changes do not have unfair burdens in minority or low-income communities.

With the successful build-out of the DART light rail network, the DART Board and DART Cities have placed much greater attention in recent years on bus service, including network design, coverage, frequency, travel times, and amenities at bus stops and other DART facilities. 2018 and 2021 versions of the standards reflects a significant change in approach for DART, with a much greater focus on bus service improvements. Many sections have been completely rewritten to reflect changes in policy focus and the development of a new bus network design.

PURPOSE

The purpose of this document is to establish guidelines and measurements that will direct the development, implementation, monitoring, and modification of transit services. This document represents a codification of the application of the Policy on Performance Measures. It incorporates practices and definitions that have evolved from earlier service standards documents; it includes a definition of Baseline service; it includes a refined approach to developing indices by which route and service performance is measured, including Service Performance Indices for DART Innovative and ADA Paratransit services.

The guidelines that follow form the basis for the application of Service Standards established by the Policy on Performance Measures. Adopted DART Service Standards necessitate the development of administrative procedures and practices to support the standards.

OBJECTIVES

The objectives of the service standards process are:

- To provide a regular, consistent, fair and objective process for reviewing transit system performance and responding to changes in travel patterns and developing market conditions in order provide increasingly effective service.
- To establish a framework of empirical measurement of resource utilization by which scarce resources can be objectively and equitably distributed throughout the DART Service Area.
- To provide a systematic method of measuring, monitoring and reporting the performance of DART's fixed-route services, innovative services and ADA Paratransit services to management and the Board of Directors.

TITLE VI COMPLIANCE

It is the intent that DART will not discriminate in its services, guidelines, standards or policies. In the application of these standards, DART will be cognizant of the requirements of FTA C 4702.1B and DOT regulation, 49 CFR part 21. DART will respond to the needs of its Title VI and Environmental Justice population by being fair and equitable in its practices. DART will identify and address, as appropriate, disproportionately high, and adverse human health and environmental effects, including social and economic effects of programs and activities on minority populations and low-income populations.

Major Service Change

Changes to the transit network and to service levels are necessary to provide a system that responds to the changing travel needs of riders. Minor adjustments to schedules and minor realignment of routes occur in response to specific and, often, dynamic circumstances that require a timely response to maintain the system's utility. These changes are frequently undertaken in direct response to customer-expressed needs or changed operating conditions and affect a relatively small constituency with whom communication can be targeted.

DART's Service Planning process will be a participative one. The needs, concerns, opinions, and preferences of the communities being served by DART's routes and services are important to designing and delivering successful transit service. Planners will include specific rider and

community participation in each study effort that anticipates changing routes, service types or service levels. These opportunities may be relatively informal, occurring through small group meetings and one-on-one interaction.

Public participation will target low-income and minority riders and/or advocacy groups. Prehearing public participation will also include public meetings at transit centers, rail stations, or through the use of mobile information vehicles. These meeting opportunities will focus on the days and times of days that customers will be the most likely to be impacted.

Changes that affect the system and its users on a larger scale require a more deliberate and formal approach. The changes that impact routes and schedules more significantly require a defined process to allow for formal participation of the public in the change process. Major changes requiring the formal participation process are defined below.

Major Change

A major change is defined as:

- Any fare change;
- A service change that involves:
 - 25 percent or more of the number of transit route miles of a transit route;
 - 25 percent or more of the number of transit revenue vehicle miles of a transit route, computed daily, for the day of the week for which the change is made;
 - a headway adjustment of more than five minutes during peak-hour service and more than 15 minutes during non-peak-hour service;
 - the establishment of a new transit route; or
 - multiple changes in a fiscal year that cumulate to the levels described above.

The Texas Transportation Code requires that DART conduct formal public hearings in the event of major changes as defined above. DART's service planning process will anticipate the need for public hearings in the event of major changes and will include appropriate time for the public hearing process.

Disparate Impact Analysis

Federal Transit Administration regulations require that transit agencies conduct a disparate impact analysis when a major service change affects a minority transit route. DART will conduct a disparate impact analysis for each minority route for which a major service change is proposed. DART's Diversity Department will conduct a review of the disparity analysis to confirm

compliance with FTA Title VI requirements and to ensure there is no adverse impact on minority communities.

Minority Transit Route – A minority transit route is defined as a route with at least one-third of its revenue miles located in a Census block, Census block group, or traffic analysis zone where the percentage of minority population exceeds the percentage of minority population in the service area.

Disparate Impact Definition – A disparate impact is an adverse impact upon minority (or low-income, minority) population that is 5 percentage points greater than the proportion of minority (or low income, minority) population in the service area.

Disproportionate Burden Analysis

Federal Transit Administration regulations require that transit agencies conduct a disproportionate burden analysis when a major service change affects a low-income transit route. DART will conduct a disparate analysis for each low-income route for which a major service change is proposed. DART's Diversity Department will conduct a review of the disproportionate burden analysis to confirm compliance with FTA Title VI requirements and to ensure there is no burden on low-income communities.

Low-Income Transit Route – A low-income transit route is defined as a route with at least one-third of its revenue miles located in a Census block, Census block group, or traffic analysis zone where the percentage of low-income population exceeds the percentage of low-income population in the service area. For the purposes of this definition, low-income is defined as a household income less than 150% of the defined Federal Poverty Level.

Disproportionate Burden Definition – A Disproportionate burden is an adverse burden upon low income population that is 5 percentage points greater than the proportion of low-income population in the service area.

SECTION 3: BUS ROUTE AND SERVICE DESIGN GUIDELINES

Bus route and service design guidelines are used in the development of new service proposals, the evaluation of existing services, and the evaluation of proposed modifications to existing services. The following guidelines are used to optimize the overall usefulness of the system to riders, ensure the consistency of route structure, and provide objective and consistent criteria for the establishment of service levels. The guidelines can be divided into two categories: those

describing the physical characteristics of routes and service zones and those relating to the level of service operated over a route or within a service zone.

OVERVIEW

DART aims to provide bus services that are timely, frequent, reliable, accessible, clean, and comfortable. At the same time, DART serves a range of customers who have varying travel needs, and offers service with characteristics that are specifically targeted the varying customer markets. DART Service Standards define a number of key service categories to encapsulate the different services offered.

For traditional fixed-route, fixed-schedule, multiple-stop services, the different service classes vary significantly over key characteristics, including service frequency, stop and line spacing, directness, and service span. The following table summarizes a hierarchy of key bus service classes:

Type of Service	Minimum Peak, Midday Frequency	Minimum Line Spacing (miles)	Average Stop Spacing	Target Directness	On Time Performance Target	Service Span	Characteristics, Notes
Rapid Ride	15/20	1	0.75 mi.	<1.2	92%	4a-1a	Queue jump lanes; active TSP; dedicated ROW preferred; minimum 3,000 daily boardings; branded bus and stations
Frequent	15/20	1	0.25 mi.	<1.4	90%	4a-1a	TSP preferred
Local	15/30	0.5	900'	1.4	90%	5a-12mid	
Local Coverage	30/60	0.5	900'	1.4	90%	5a-12mid	
Baseline (See Section 9)	60/60 or GoLink	0.5	N.A.	N.A.	90%	5a-9p	Last stage for routes that do not meet performance standards

The following sections describe each service class in greater detail. Other, more specialized services are also included in the classification listings.

SERVICE DESIGN PHILOSOPHY

In 2019-2021 DART initiated a comprehensive bus network redesign effort that included a strong focus on the relative balance between two core service delivery approaches: ridership and coverage. Ridership-focused networks concentrate service where ridership demand is highest, offering fewer routes but greater frequency. Coverage-focused networks aim to serve everyone, typically with lower service frequency.

The New Bus Network introduced in 2022 blends both ridership- and coverage-based elements into a hybrid approach. In November 2020, the Board of Directors unanimously adopted a resolution that authorized DART staff to develop a bus network based upon the hybrid network concept with a ridership/coverage ratio between 75-25% and 70-30% and determined to maximize the most efficient approach, and based upon the FY20 budget for service level resources. The New Bus Network ultimately adopted by the Board reflected this balance, with a system-wide ridership/coverage ratio of 75-25%.

In considering service adjustment proposals, staff should evaluate whether the adjustment(s) would cause the systemwide ridership/coverage ratio to deviate significantly from the Board policy target, which was 75-25% for the 2022 New Bus Network. A significant deviation would normally be 5% or more, as the ridership/coverage ratio is calculated in 5% increments. For major service changes as defined in Section 2, staff shall report the impact of the changes on the ridership/coverage ratio as a part of the service change decision process.

Normally, changes in ridership/coverage ratios are the consequence of a broad service change involving many bus routes and/or GoLink zones. Changes at the individual route level are unlikely to impact the overall ratio for the system.

Major service planning efforts like the bus network redesign should explicitly consider ridership/coverage ratios as a part of the planning effort.

SERVICE CLASSIFICATION

DART bus services are classified into key service categories that reflect their functional and operational characteristics defined under the new bus network. The categories are the framework within which transit services are developed, modified and evaluated. A summary of the features characterizing each service category is provided in the following paragraphs.

Frequent Route Network *Various Bus and Rail Services, Bus Route Number Sequence 1-99*

Frequent routes serve high-ridership corridors that are integral to the DART service network, including a mix of bus and rail services. These routes are characterized by higher service

frequencies, a wider span of operating hours, and wider stop spacing. Frequent services should operate every 15 minutes during weekday peak periods, 20 minutes midday, and 20-30 minutes at other times, with more frequent service available as ridership demand requires. Traffic signal priority should be provided where technically feasible.

Service hours for Frequent routes will be designed to allow workers to reach jobs that start as early as 6:00am and travel home from jobs that end as late as 11:00pm. As a consequence, service will be available starting at 4:00am and continue until at least 1:00am (earlier or later where there is demonstrated demand for service). Early and late trips should be explicitly scheduled to serve early morning and late evening “line-ups” – scheduled times where bus and rail services converge to allow for wide-scale transfer activity.

Frequent routes will be identified as a part of periodic DART system and bus service planning efforts, including Transit System Plans and bus network redesign work. Candidate routes should have the following key characteristics:

- High residential densities, key activity centers, and preferably both should be located within walking distance of the route alignment
- Demonstrated high transit ridership performance and productivity relative to other, comparable routes
- Complementary to other parts of the DART Frequent network without duplicating key services

Local Routes *DART Route Number Sequence: 100- 199*

Local routes are fixed-route, fixed-schedule services, with frequent peak service and 30 minute service at other times. Most local routes make frequent stops and consequently operate at low average speeds. These routes operate seven days per week, and minimum service span is 5am-12midnight.

Local Coverage Routes *DART Route Number Sequence 200-299*

Local coverage routes are fixed-route, fixed-schedule services that cover areas with lower residential and/or commercial densities, but where ridership levels are sufficiently high to support fixed-route service rather than on-demand GoLink service. These routes have 30 minute peak service and 40-60 minute off-peak service frequency, operate seven days per week, and minimum service span is 5am-12midnight.

Express Routes *DART Route Number Sequence: 300 - 399*

Express routes have terminal points within the Dallas CBD or at other destination-oriented concentrations of employment or commercial activity where they may provide service over a route segment with local stops. They operate nonstop to and from park and ride, Transit Center and Rail station facilities. These routes primarily serve communities with lower population densities and depend upon the mode change at Transit Center, station or park and ride facilities to aggregate ridership. Express routes typically provide higher speed service than do other routes.

Shuttle Routes *DART Route Number Sequence: 400 - 499*

DART operates many special Shuttle routes. These routes tend to be relatively short, providing first/last mile access from the rest of the service network or circulation within key activity centers. Many operate as public/private partnerships under DART's Site-Specific Shuttle Program, with the private sector partner helping to fund service that may be operated by DART, a DART contractor, or by the partner. Shuttle services are available to the general public, but are generally tailored to specific needs of the employees, customers or clients of the areas served. The schedules of these routes are coordinated with other DART services.

Rapid Ride Routes *DART Route Number Sequence: 900-999*

Rapid Ride service involves limited-stop service in high ridership corridors. These routes aim to offer faster long-distance trips across the service area, especially during the time periods with the peak demand and heavy traffic. These routes may have crosstown or radial orientations, operating in major service corridors with heavy ridership and with a frequent underlying local service. DART is looking at a potential future network of Rapid Ride service in key corridors.

Traffic signal priority should be provided where technically feasible. Dedicated lanes, queue jumping facilities, and other traffic flow treatments designed to speed up vehicle operations should be investigated and implemented for Rapid Ride projects.

Rapid Ride routes will be identified as a part of periodic DART system and bus service planning efforts, including Transit System Plans and bus network redesign work. Candidate routes should have the following key characteristics:

- Demonstrated high transit ridership performance and productivity within the corridor served, sufficient to support both the rapid ride service and underlying frequent-stop service. Such corridors should have existing ridership of greater than 3,000 passengers per average weekday.

- Key activity centers, transfer points to other services with high ridership, or other ridership generators should be located along the route alignment

Mobility on Demand – GoLink Zones *DART Route Number Sequence: Community Name*

The Mobility on Demand program offers GoLink demand responsive service available to the general public within designated service zones. The service is usually anchored at a DART rail station or Transit Center, and customers can connect to and from the transit facility or circulate within the zone. Zones can be anchored to core frequent routes if more appropriate to the specific zone.

Trips are arranged through a smartphone application, or by a telephone call to a call center. GoLink service is often provided in areas of very low population density where traditional fixedroute bus service would not likely be successful, but can also be suitable for other use cases in higher-density areas. Services may include a mix of dedicated vehicles assigned to the zone plus other non-dedicated services (e.g., transportation network companies, taxis, etc.)

ADA Paratransit Service

ADA Paratransit service is a curbside-to-curbside public transportation service for people who are specifically qualified for such services under the provisions of the Americans with Disabilities Act (ADA). The ADA Paratransit service operates throughout the DART service area in a many-to-many mode. Areas of specific coverage and the span of availability of the service are compliant with requirements of the ADA. All vehicles used for the service are lift-equipped. Passengers who are unable to use steps are accommodated by the lift with a boarding chair available upon request. Specific policies and guidelines govern the scheduling of trips and the performance of the service.

AREA COVERAGE

Area coverage expresses the degree to which the transit network is within reasonable proximity of the population, employment, or other activity centers it is charged with serving. Area coverage is most easily expressed by a measure of acceptable walking distances on each side of a route and is, therefore, directly related to the geographic spacing of bus routes. A majority of transit users initiate their transit trip as pedestrians and walk some distance to reach a transit stop. These walking distances, typically between 0.25 mile and 0.50 mile, vary depending on the population or employment density. Areas of lower population density have more spatially dispersed population and activity centers, resulting in lower transit demand. The practicality of lower demand is a lower level of transit accessibility.

Route spacing guidelines are a function of the type of service and areas served. Generally, the core frequent route network should be spaced farther apart using major arterials to ensure faster operating speeds.

Table 3.1 - Recommended Bus Route Spacing Guidelines

Type of Service	Minimum Line Spacing (miles)
Rapid Ride	1
Frequent	1
Local	0.5
Local Coverage	0.5
Baseline (See Section 9)	0.5

These route spacing criteria are guidelines intended to assist in developing a route structure that provides a level of accessibility commensurate with ridership potential while avoiding a division of the potential ridership market among routes. In general bus routes should not be placed simply to meet an arbitrary standard of distance between routes but should be developed with the expectation that minimal levels of ridership relative to the level of service provided will be attracted to the route.

Duplication of route coverage along the same thoroughfares tends to divide ridership, reducing the productivity of routes and lowering the efficiency of resource utilization. It is expected that bus routes will converge at Transit Centers, rail stations and activity centers in order to accommodate ridership needs. The degree to which routes converge or duplicate one another should be governed by specifically identified service requirements and avoided without identified need.

BUS STOP SPACING

Bus stop spacing is the distance between successive, designated stop locations in the same direction of travel along a bus route. Bus stop spacing should be related to land use and the density of development along a route. Bus stop spacing is a significant measure of accessibility. When stop locations are being designated, it is necessary to consider passenger convenience, safety of passengers and transit operation and travel time impacts.

Stop spacing is defined in accordance with the type of service provided. Rapid Ride and Frequent routes will generally have wider average stop spacing to encourage faster operations. Other service tiers will have tighter bus stop spacing.

Table 3.2 - Recommended Bus Stop Spacing Guidelines

Type of Service	Average Stop Spacing
Rapid Ride	0.75 mi.
Frequent	0.25 mi.
Local	900'
Local Coverage	900'
Shuttle, Express	As Needed

GEOMETRIC DESIGN CONSIDERATIONS

Bus routes should generally use arterial and collector streets that are designed to accommodate higher traffic volumes and larger, heavier vehicles. The use of residential streets should be avoided, unless their use is part of a terminal routing or provides access to a specific location of high ridership demand. Routing on private property, such as driveways or parking facilities, is not permitted unless a specific legal agreement assuring safe operating conditions and providing for adequate pavement maintenance has been executed. New routes and route modifications should be planned to operate over streets that meet the following minimum standards:

Fixed Route Buses

- Intersections with minimum turning radius of 30 feet;
- Pavement composition sufficient to support the axle loads of a bus;
- Minimum lane width of 11 feet;
- Overhead clearance of 11 feet; and,
- No curb-to-curb speed bumps (There are alternative traffic calming devices that can better accommodate buses).

Innovative and ADA Paratransit Services Vehicles

- Intersections with minimum turning radius of 25 feet;
- Pavement composition sufficient to support the axle loads of paratransit vehicles;
- Minimum lane width of 11 feet;
- Overhead clearance of 12 feet;
- Speed bumps not to exceed 6 inches in height and spaced at least 30 feet apart.
- Gates controlling access to a facility must remain open a minimum of 30 seconds.

DIRECTNESS OF SERVICE

Directness of service can be defined in several ways. First, directness plays a key role in the design of individual routes, and DART should design each route to be as direct as possible. Second, many customers must use more than one bus or train to complete a trip, and for these customers the full trip from origin to destination should be as short as possible. Directness of service standards address both scenarios.

Route Directness

Directness for individual routes is defined as the ratio of the automobile travel time between two points versus the travel time between those two points via the transit network, following the most convenient routing. Because transit service competes with automobile travel, attention must be given to designing routes that operate as directly as possible between points of trip origins and destinations. The objective is to maximize average speed for the bus and minimize travel time for passengers.

Occasionally, it may be desirable to deviate the bus route away from the most direct routing to serve a specific trip generator. It is especially important that any deviation be consistent with accommodating identified travel demand that would otherwise not be within the route's coverage area. Any deviation from the most direct routing must be consistent with providing service that is competitive with automobile travel. The following table provides DART travel time ratio guidelines by service classification.

Table 3.3 – Target Route Travel Time Ratios, by Route Classification

Type of Service	Target Directness
Rapid Ride	<1.2
Frequent	<1.4
Local	1.4
Local Coverage	1.4

Travel Directness on the Network

Many DART customers use more than one bus, train, or other service to travel from their starting point to their destination. For these customers, DART's goal is to offer reasonably competitive

travel times versus comparable travel via personal automobile. Ideally, transit trips should require no more than two times the total travel time as a comparable automobile trip. This may not be feasible for very short or very long trips.

Because of the volume of multiple-link trips, convenience of transfers between different DART services becomes very important. Schedules and connecting facilities should be designed with transfer convenience in mind.

DART will work to design a service network that offers as many work commute customers as possible the opportunity to reach jobs by transit within sixty minutes overall travel time. For low-income neighborhoods (defined by census tract and household income levels below 150% of the Federal poverty level), DART will regularly measure the number of jobs accessible from such neighborhoods within 60 minutes travel time relative to total jobs accessible by DART transit service.

Service changes will be analyzed to the extent that they can improve the share of jobs accessed within 60 minutes. DART will also periodically analyze access from low-income neighborhoods to grocery stores, educational centers, and other common destinations. DART will aim to increase the share of destinations reachable within an hour over time to the extent that resources are available for more direct and/or more frequent service.

SERVICE DUPLICATION

Service duplication is the operation of two or more routes or services along the same street segment or on closely parallel streets. Service duplication should not occur except where routes converge to serve Transit Centers, rail stations or activity centers, or where the combined capacity of multiple routes is needed to serve area destinations. Where it is necessary for routes to duplicate each other for significant distances, schedules should be coordinated to provide generally even headways on the common street segments to the extent possible.

SERVICE SPAN

Service span is the interval from the first time a vehicle enters revenue service to the time it leaves revenue service at the end of the day. Each of the three main service schedules (Weekday, Saturday, Sunday) are divided into periods that include the peak home-to-work commute periods in the morning and afternoon, the midday period, and the evening period of lower travel demand. Ridership characteristics, demand, and trip purpose differ greatly, depending on the time of day and day of the week (*e.g.*, Weekday, Saturday, Sunday).

Service hours for Frequent routes will be designed to allow workers to reach jobs that start as early as 6:00am and travel home from jobs that end as late as 11:00pm. As a consequence, core

service will be available starting at 4:00am and continue until at least 1:00am (earlier or later where there is demonstrated demand for service). Early and late trips should be explicitly scheduled to serve early morning and late evening “line-ups” – scheduled times where bus and rail services converge to allow for wide-scale transfer activity.

Other local fixed-route services (including Local, and Local Coverage) will generally operate between 5:00am and Midnight, though some may start earlier in the morning and/or finish service after Midnight with demonstrated passenger demand, including connections to key early morning and late evening transfers or line-ups that may occur outside of the regular service window.

Express services are normally scheduled to arrive at their key destination (usually Downtown) no later than 6:00am, and most offer trips scheduled in the evening for late workers or customers transferring from other routes. Midday service is provided where passenger demand warrants.

The following table defines the recommended daily service span for each of the service categories operated by DART.

Table 3.4. Recommended Daily Service Periods, by Service Category

SERVICE CLASS	WEEKDAY				SATURDAY				SUNDAY			
	AM/ PM Peak	Midday 9a - 3p	Evening 6p - 9p	Night 9p	Morning < 9a	Midday 9a - 6p	Evening 6p - 9p	Night 9p	Morning < 9a	Midday 9a - 6p	Evening 6p - 9p	Night 9p
Frequent	+	+	+	+	+	+	+	+	+	+	+	+
Express	+	*	*	-	-	-	-	-	-	-	-	-
Rapid Ride	+	*	*	*	*	*	*	*	*	*	*	*
Local, Local Coverage	+	+	+	+	+	+	+	+	+	+	+	+
Shuttle	+	+	+	*	*	*	*	*	*	*	*	*
GoLink	+	+	*	*	*	*	*	*	*	*	*	*
Paratransit*	+	+	+	*	+	+	+	*	+	+	+	*

+ Indicates service usually operated during this period.

* Indicates service may be operated during this period, but on a demand basis.

- Indicates service is traditionally not operated during this period.

Note: The AM/PM peak services periods for DART are 6:00 a.m. to 9:00 a.m. and 3:00 p.m. to 6:00 p.m., respectively.

*Note: ADA Paratransit Services operates on a schedule comparable to all DART fixed-route bus/rail services

SERVICE FREQUENCY

Service frequency, or headway, refers to the scheduled amount of time between consecutive trips on a transit line. The fewer or greater the number of minutes, the “shorter” or “longer” is the headway, respectively. The frequency on a route is determined on the basis of policy and passenger demand. It is generally recognized that certain minimum service frequencies should be maintained on a route to ensure that individual routes operate at frequencies which are appropriate to the type of service they provide, and adequately address both existing and potential ridership demand.

In order to assure that a reasonable, attractive level of transit service is available throughout the DART system, minimal acceptable levels of service are defined. The following table identifies the maximum (longest) headways for each of the five fixed-route bus categories operated by DART. The values in this table represent the minimum service level to be offered if the decision is made to offer service during a particular service period. Service spans are identified in Table 3.4, above.

Table 3.5 - Maximum Service Headways (Minimum Service Level)

SERVICE CLASS	WEEKDAY HEADWAYS				SATURDAY HEADWAYS				SUNDAY HEADWAYS			
	AM/ PM Peak	Midday 9a - 3p	Evening 6p - 9p	Night 9p	Morning < 9a	Base 9a - 6p	Evening 6p - 9p	Night 9p	Morning < 9a	Base 9a - 6p	Evening 6p - 9p	Night 9p
Frequent	15	20	15	30	30	20	30	30	30	20	30	30
Express	30	60	60	-	-	-	-	-	-	-	-	-
Local	15	30	30	30	30	30	30	30	30	30	30	30
Local Coverage	30	60	60	60	60	60	60	60	60	60	60	60
Shuttles	30	60	60	60	60	60	60	60	60	60	60	60
Rapid Ride*	15	-	15	-	-	-	-	-	-	-	-	-

* Rapid Ride services that are available beyond weekday peak periods should generally follow Core service frequency levels

TRANSITION OF FIXED-ROUTE TO DEMAND-RESPONSIVE SERVICE

When DART fixed-route services fail to meet service performance standards, one potential option is to convert service to GoLink demand-responsive operation. Where two or more adjacent routes both fail to meet performance standards, conversion to GoLink operation becomes more feasible and potentially cost-effective.

Should conversion result in overall cost savings to DART, savings should be re-invested in bus service improvements (especially frequency) in other parts of the network.

TRANSITION OF DEMAND-RESPONSIVE TO FIXED-ROUTE SERVICE

When a DART GoLink performance reaches an average passengers per hour statistic of 10.0 or better for three consecutive quarterly periods (as reported by the Service Standards Monitoring Report), an analysis of the potential for converting the zone to fixed-route operation will be undertaken.

That analysis will include the review and analysis of the zone's trip manifests for the month of highest activity in the most recent quarterly reporting period. The beginning and end points of each trip made during that month will be identified and geocoded as origin/destination pairs. A cluster analysis of those points will be completed to identify concentrations of trips whose origins and destinations are sufficiently proximate to each other as to begin to define a potential route pattern.

If the existing travel patterns are not sufficiently clustered as to produce a viable route pattern. Conversion to a fixed route will be determined to be infeasible. If there is an identifiable, viable potential route pattern identified, the route will be defined, and a service schedule developed. The trip time data from the analyzed trip manifests will be analyzed relative to the proposed schedule and the schedule will be modified, if necessary, to optimize the number of trips that the proposed route can accommodate.

The ridership for the proposed route will be estimated based upon the existing GoLink zone ridership and the demographic characteristics of the community to be served. The ridership estimates will be compared to the operating parameters of the proposed route's schedule and the passengers per revenue hour and subsidy per passenger parameters calculated.

If the performance parameters of the proposed replacement route will meet DART standards for service productivity, the route will be programmed for implementation, replacing the GoLink zone at the next practical programmed service change date.

DEMAND-RESPONSIVE SERVICE DESIGN

GoLink service has evolved from the older DART On Call program, offering demand-responsive service with advanced technology and much greater deployment flexibility. GoLink zones are usually deployed in low-density commercial and/or residential settings, offering coverage in areas where fixed-route service may not be practical.

Deployment of GoLink service targets areas of at least six square miles (smaller areas in some special instances) where ridership levels are insufficient to support various fixed-route service types. Larger zones up to over 20 square miles have proven feasible; however, waiting and travel times tend to be longer for the larger zones, and the functional operation of larger zones should be carefully monitored. To the extent possible, zones should not overlap fixed-route service. All

zones will have at least one anchor point located at a bus or rail facility with connections to the rest of the DART service network.

In normal GoLink operations, customers can travel between any two points within a zone or to and from the anchor point(s) for that zone. However, there are situations where a significant destination lies a short distance beyond a zone (normally less than a mile from the zone boundary). If DART receives significant customer interest in access to such destinations and a staff assessment concludes that the destination will not compromise normal operating parameters, these destinations may be designated as “blue dot” locations and included in service for the zone. All blue dot locations should be shown on printed and electronic maps for a given zone.

DART uses a “mixed-supply” model for GoLink operations. This means that in all zones, customers will have the choice of service provided through DART contractors and service offered by transportation network companies. For DART-contracted service, operations will include a combination of dedicated/assigned vehicles and non-dedicated trips (e.g., taxis), with the mix determined by ridership demand and user needs (e.g., accessibility). GoLink is a sharedride service by design, and customers on any type of operated service may share rides with other customers.

Customers can schedule GoLink trips via a mobile application or by telephone. Trips scheduled by mobile app are more efficient and strongly preferred, and DART should work with customers to maximize the usage of mobile app bookings.

As an on-demand service, GoLink has operating parameters that are very different from fixed route operations. One of the most important GoLink operating parameters is waiting time, which is defined as the span of minutes from the rider’s requested pickup time to the actual pickup time. The target for the average waiting time for the GoLink trips booked via mobile application is 15 minutes or less. For trips scheduled by telephone, the target waiting time is 30 minutes or less. When the average waiting time for trips exceeds these levels in a zone, DART staff will immediately evaluate the service arrangement for each zone and adjust resources as needed.

Travel times are also a key parameter for GoLink design. Shared ride operations will sometimes mean that customers will travel longer than a direct point-to-point trip would require otherwise. The actual travel time for each customer should not generally exceed two times the direct driving time. GoLink is a relatively new service, and as DART gains more experience with its operation, additional refinements to the service model should be evaluated and subsequently implemented if proven cost-effective and without adverse customer impact. As of 2021, two refinements under consideration and testing include zone-to-zone passenger travel (not allowed previously) and the use of “cluster” stops to consolidate boardings and alightings at designated locations within the zone.

SECTION 4: BUS/RAIL INTERFACE GUIDELINES

All transit systems expand and contract in response to changing travel demands. In June 1996, DART opened the first phase of the DART light rail system. In response to the need for bus service to collect and distribute passengers for the rail service, a significant redesign of the bus network in areas served by rail was undertaken. The following section explains the set of guidelines specifically developed as a tool in aiding Service Planning and Scheduling staff in planning bus/rail interface activities. These guidelines are the result of in-depth research and years of staff experience in planning and implementing transit routes and service.

FUNCTIONS AT BUS/RAIL INTERFACE STATIONS

Functions relating to rail stations can be assigned to three categories: train operation, bus operation and other uses such as joint development. This section will focus solely on the development of guidelines relating to bus operations planning for rail stations.

Bus Operations Functions

Functions relating to bus operation at rail stations fall into three categories: boardings and alightings, waiting times, and bus layover.

Definitions:

<i>Boarding</i>	The act of entering a transit vehicle.
<i>Alighting</i>	The act of leaving a transit vehicle.
<i>Waiting Time</i>	The time interval that a bus or train waits to allow for transfers between routes or modes.
<i>Layover Time</i>	The time interval that a bus or train is scheduled to wait at the end of a trip to recover from unexpected delays in service. Layover time is provided to assure that the next scheduled trip departs on time.

Scheduling Bus Interface

To the extent possible, scheduled headways on bus routes serving rail stations will be identical to or evenly divisible by the scheduled train headway for each period of the day. Bus arrival and departure times at rail stations will be coordinated with train arrival and departure times.

During peak periods, bus schedules will be coordinated with the predominant passenger movement. When the predominant passenger movement is from bus to rail, buses will be scheduled to arrive at the station five minutes before the scheduled train departure in the

predominant direction of travel. When the predominant passenger movement is from rail to bus, buses will be scheduled to depart the station five minutes after the scheduled train arrival in the predominant direction of travel. During off-peak times, buses will be scheduled to arrive at the station five minutes before the departure of the next scheduled train.

When a bus route serves more than one rail station, a single station will be designated as the key station and schedule coordination will occur at the key station. The volume of passenger activity and the direction of travel of the majority of the passengers will determine the key station designation.

ADA Paratransit Feeder Service

Feeder service connects certified Paratransit passengers to a DART passenger facility for a reduced fare. A passenger facility is a Park and Ride, rail station, transfer location, or transit center. From there, passengers can transfer to bus and rail, and travel through the entire DART network.

Paratransit Feeder Service is booked like a regular Paratransit trip. When a passenger calls Scheduling, he or she will request a trip that begins or ends at a transit facility. The Scheduling Representative will confirm that the trip meets the feeder fare guideline and will schedule the trip. Due to the nature of Paratransit services, pick up and drop off windows will conform to Paratransit standards but would not necessarily meet a particular scheduled train arrival time. See Section 5 for Paratransit pick up and drop off standards.

BUS SYSTEM MODIFICATION GUIDELINES

Service Guidelines

Access between rail and bus systems should be maximized, and access time should be minimized. Additionally, impacts on non-rail bus riders (*i.e.*, through bus riders) should be minimized. Bus-to-rail access time should be minimized by diverting appropriate bus routes from their previous routes to stops near rail station entrances. Bus lines should not be diverted when:

- Bus route diversion (circuitous routing) time is greater than walking time from the closest stop on the existing route to the rail station entrance;
- Travel time on bus to access rail exceeds 30 minutes for the majority of the passengers;
- Overall travel time (bus/rail) exceeds the existing bus travel for the majority of the passengers;
- The street system, traffic patterns, and limited curb space for stops limits physical access; or,

- The negative impacts for through bus riders are greater than the benefits gained by connecting riders (measured in time).

Parallel express or limited stop bus routes within a corridor served by rail should be discontinued or modified when the route will compete with the rail line for ridership. Rail service will replace the non-stop portion of these bus routes. The local service portion of a limited stop route that duplicates rail service should be modified to become a rail station feeder route.

APPLICATION OF GUIDELINES

The following sections outline the practical application of these guidelines,

Terminating Routes

Bus routes that end within one mile of a rail station should be extended to terminate at that station. Routes that terminate at distances greater than one mile from a rail station should be extended to the station if the rerouting establishes a valuable link in the overall transportation network by providing a connection to a major traffic generator, or by realizing a reduction in travel time for a significant number of riders.

Through Routes

Through routes, with respect to rail lines, are routes that intersect the rail line, and continue beyond it to serve another market area. The extent to which a through bus route will be diverted to serve a rail station is dependent upon the type of bus interchange facilities that are provided and upon the density of ridership in proximity to the station. When significant transferring to and from the rail line is anticipated, the route should be diverted.

Parallel Routes

A bus route that runs parallel to the rail line can be diverted to serve the rail stations if the following criteria are met:

- The route can be used as a line-haul route in case of an interruption of service on the rail line;
- Walking distance from the closest stop on the route to the rail station entrance is greater than one-quarter mile;
- Total bus diversion time in one direction is five minutes or less;
- Average peak period load at the point of diversion is less than 50% of seated capacity;
- There is sufficient curb space available for arriving and departing buses; and,

- Access to the station stops can be obtained without circuitous routing.

Intersecting Routes

A bus route that intersects a rail line can be diverted to serve the closest rail station, provided the following criteria are met:

- Total bus diversion time in one direction is five minutes or less;
- Average peak period load at the point of diversion is less than 75% of the seated capacity;
- There is sufficient curb space available for arriving and departing buses; and, • Access to the station stops can be obtained without circuitous routing.

New Routes

A new feeder service can be implemented to serve one or more rail stations if a particular need can be demonstrated, and if an area is not within one half mile of an already existing bus route.

REVIEW OF ROUTE CHANGES

After the implementation of the new rail service and the rerouting of the bus lines to serve the stations, service usage of the rerouted services should be monitored at six-month intervals. If a diverted route is not meeting the minimum standards for its category as identified in this document after 24 months, with attempts for improvements, it should be considered for rerouting back to its original and direct route.

SECTION 5: RAIL SERVICE DESIGN GUIDELINES

DART operates (directly or for funding partners) several distinct types of rail service to meet the diverse demands of travel within the Service Area, including light rail, commuter rail, and streetcar.

- **Light rail** is designed to provide regular, frequent service throughout its service day seven days per week, with stop spacing designed to ensure faster travel speeds. LRT services are part of the core frequent route network.
- **Commuter rail** is designed to provide a more limited service level focused primarily on longer distance home-to-work commutes trips although off-peak and weekend service may be offered in response to demand.

- **Streetcar** service usually operates on-street, usually in higher-density areas with high ridership potential. Stops are more tightly spaced than light or commuter rail operations. Operation in exclusive or transit-only lanes is preferred to achieve more optimal running speeds.

RAIL SERVICE SPAN

Service span refers to the interval from the first time a train enters revenue service to the time the last train leaves revenue service at the end of the day. The following table defines the recommended daily service periods for the DART Light Rail system.

Light rail services are part of the core frequent route network should operate all hours between 4:00am and 1:00am, seven days per week. Commuter rail and streetcar services will often have more limited service hours, depending upon market conditions.

The following table defines the recommended daily service span for each of the rail service categories operated by DART.

Table 5.1. Recommended Rail Daily Service Periods

SERVICE CLASS	WEEKDAY				SATURDAY				SUNDAY			
	AM/ PM Peak	Midday 9a - 3p	Evening 6p - 9p	Night 9p - 1a	Morning < 9a	Midday 9a - 6p	Evening 6p - 9p	Night 9p - 1a	Morning < 9a	Midday 9a - 6p	Evening 6p - 9p	Night 9p - 1a
Light Rail	+	+	+	+	+	+	+	+	+	+	+	+
Commuter	+	+	+	*	+	+	+	*	*	*	*	*
Streetcar	+	+	*	*	+	+	*	*	*	*	*	*

+ Indicates service usually operated during this period.

* Indicates service may be operated during this period, but on a demand basis.

- Indicates service is traditionally not operated during this period.

Note: The AM/PM peak services periods for DART are 6:00 a.m. to 9:00 a.m. and 3:00 p.m. to 6:00 p.m., respectively.

It is recognized that demand characteristics vary in differing portions of the DART Service Area. Because of these demand characteristics, it is appropriate to reduce the Light Rail service period along certain outlying segments of individual lines to be commensurate with the level of demand. These modifications to the service period are appropriate in both the early morning and night periods and may be established based on specific evaluation of ridership demand.

RAIL SERVICE FREQUENCY

Headway is the scheduled time between consecutive trains on a rail line. Service frequency on a line should be determined based upon passenger demand. It is, however, generally recognized that certain minimum service frequencies should be maintained on a line to ensure that service is attractive to the public and that the needs of transferring passengers are accommodated.

Commuter Rail service is somewhat different from both Bus and Light Rail service in ridership demand characteristics and physical operating constraints of the railroad over which the service operates. The physical operating constraints, particularly the extent of single-track line segments, limit the frequency of service that can be operated.

The standards for service frequency for the Commuter Rail service have been developed to be consistent with both the physical constraints and the highly peaked demand characteristics of typical commuter ridership. The following table summarizes the minimum acceptable service frequencies for the DART portion of the Commuter Rail line.

The following table summarizes the minimum acceptable service frequencies for DART Light Rail service.

Table 5.2 - Maximum Rail Service Headways (Minimum Service Level)

SERVICE CLASS	WEEKDAY HEADWAYS				SATURDAY HEADWAYS				SUNDAY HEADWAYS			
	AM/ PM Peak	Midday 9a - 3p	Evening 6p - 9p	Night 9p - 1a	Morning < 9a	Base 9a - 6p	Evening 6p - 9p	Night 9p - 1a	Morning < 9a	Base 9a - 6p	Evening 6p - 9p	Night 9p - 1a
Light Rail	15	20	20	30	30	20	30	30	30	20	30	30
Commuter	30	60	60	-	-	-	-	-	-	-	-	-
Streetcar	20	20	20	30	30	20	30	30	30	20	30	30

RAIL SYSTEM PHYSICAL DESIGN

Because of the capital-intensive nature and relative permanence of rail system development, a comprehensive planning process is involved in developing alignments, selecting station locations, projecting ridership and ridership characteristics, defining the nature of station design requirements and building the physical facilities used in delivering both Light Rail and Commuter Rail Service.

DART complies with the planning guidelines of the Federal Transit Administration in selecting rail alignments and developing station locations. The process is thoroughly documented in the

various reports required in completing the Major Investment Study that precedes the construction of a rail line.

DART has developed and continually reviews and updates a Design Criteria Manual that specifies the standards for the design of physical facilities.

These studies and manuals codify DART's standards for such issues as alignment, station spacing and design elements.

Commuter Rail Station Spacing Considerations

The spacing of stations along the Commuter Rail line was developed consistent with projected patterns of ridership demand. The RAILTRAN Corridor Planning and Implementation Study (Final Report, June 11, 1992) identifies that placement of the stations was based upon base ridership projections, a potential station site's development suitability (high density, mixed use, industrial and low density), transit access and linkage potential, timing for joint development, availability and strength of joint venture partners and ridership increase from joint development. Each proposed station location was evaluated according to a rating and weighting system based on these factors.

SECTION 6: ADA PARATRANSIT SERVICES – STANDARDS AND DEFINITIONS

This section incorporates standards and definitions for eligibility for DART's ADA Paratransit services and codifies policies governing the use of the service.

DETERMINING ELIGIBILITY

DART follows the Americans with Disabilities Act (ADA) of 1990 eligibility standards for paratransit services. People with disabilities in the following categories are eligible to receive paratransit services.

- Category I - Applicants who cannot independently use DART bus or rail service, even with training.
- Category II - Applicants who can use or learn to use an accessible public transit system, but the system is not fully accessible.
- Category III - Applicants who have a specific impairment that prevents them from getting to or from a bus stop or rail station.

Applicants must follow these steps to be considered for Paratransit Services:

- Step 1 - Complete a Paratransit Certification form.
- Step 2 - Obtain a written verification of your disability from a physician.
- Step 3 - Return form and verification documents to Paratransit mail services.
- Step 4 - Complete in-person paratransit eligibility assessment by an Eligibility and Training Specialist.

TRAVEL CHARACTERISTICS AND OPERATING PARAMETERS

This section describes the standards by which individual passenger trips are accommodated. These standards define both performance characteristics of the ADA Paratransit service and its availability to clients.

Origin to Destination Service

Origin-to-destination service, providing service from a rider's origin to the rider's destination, must be provided. Curb-to-curb or door-to-door may be provided.

Pick Up Windows and Timely Service

- On time – Vehicle arrives at the pickup location within the established pickup window.
- Early – Vehicle arrives and departs with the rider before the established pickup window begins.
- Late – Vehicle arrives after the end of the established pickup window and the rider boards the vehicle.
- Missed trips – Occur when the vehicle arrives 1 minute or more after the pickup window and the trip is not conducted either because the customer is no longer there, or the customer decides not to take the trip because it is now late.
- Trip Length – Trips should be comparable to the length of comparable fixed route trips to include walking time to the stop/station from the origin address, waiting time, invehicle time (for all trip segments), transfer times and walking time from the final stop/station to the destination address. The average trip length is considered to be about 90 minutes and a trip may exceed or fall below the average depending on the specific circumstances of the individual trip.

Capacity Constraints

The agency shall not limit the availability of complementary paratransit service to ADA paratransit eligible individuals by any of the following:

- Restrictions on the number of trips an individual will be provided;
- Waiting lists for access to the service; or
- Any operational pattern or practice that significantly limits the availability of service to ADA paratransit eligible persons. Such patterns or practices include, but are not limited to substantial numbers of significantly untimely pickups for initial or return trips, substantial numbers of trip denials or missed trips, or substantial numbers of trips with excessive trip lengths.
- Operational problems attributable to causes beyond the control of the agency.

Subscription Trips

Subscription service may not absorb more than fifty percent of the numbers of trips available at a given time of day, unless there is non-subscription capacity.

Service Availability

FTA guidelines mandate that ADA service be available within a ¼-mile buffer around bus routes and a ¾-mile radius around rail stations during all times that the routes and train lines are in operation.

Current DART practice is to provide service anywhere within the DART Service Area, and if we receive a trip request outside of our normal operating hours, we provide service if there is fixed route service available in the requested area(s) at that time.

Reservation Service

ADA Paratransit service normally requires advance reservations one day in advance of desired travel. Online reservations are currently offered 8am-5pm Weekdays, with an automated system available at other times.

SECTION 7: SERVICE QUALITY

An important element of the success of the service DART provides to its customers is the quality of that service. Service quality is directly related to customer satisfaction, which translates into

the retention of existing riders and the attraction of new riders. This section specifically addresses the quality issues of vehicle loading and on-time performance.

VEHICLE ASSIGNMENT

It is DART's standard to assign its revenue service vehicles in a manner that is consistent with ridership demand while assuring that all vehicles are used fairly and equitably throughout the system regardless of vehicle type, equipment or age. Revenue service vehicles will be assigned in the following manner.

Assignment by Type - Specialized routes services will receive vehicles specifically designed to meet the unique features of those routes and services. GoLink zones will be assigned smaller vehicles chosen for size and maneuverability commensurate with demand responsive operation. Express routes will receive the single-door buses designed for their particular loading characteristics.

Assignment by Capacity - Other routes and services will be assigned buses based upon their observed ridership demand with bus seating capacity and load factor standards governing the assignment. SmartBuses will be assigned to routes with per-trip on-board passenger loads consistent with their seating capacity. Mid-sized 31-foot transit coaches will be assigned to routes with per-trip on-board passenger loads consistent with their 26-seat capacity. Full-sized 40-foot transit coaches will be assigned to routes with per-trip on-board passenger loads consistent with their 39-seat capacity.

Assignment to Operating Facilities – Revenue service vehicles will be assigned to operating facilities first on the basis of the requirement for specialized vehicles then in consideration of the demand characteristics of the routes assigned to operate from the facility and finally, as nearly as possible, proportionately to the age and amenities of the sub-fleet of the vehicle types available throughout the system. The assignment of vehicles among operating facilities will be reviewed prior to each service change and more often if necessary, to assure that vehicle use characteristics are balanced across the fleet.

Daily Assignment of Vehicles – The daily assignment of vehicles to blocks (a “block” is the tour of duty for a bus for a day) will be by rotation. Among the vehicles assigned to the facility of the type required for a particular block the rotation will assure that each vehicle of the appropriate type has an equal chance of being assigned to each block.

VEHICLE LOADING

Vehicle loading refers to the average number of passengers on board a vehicle during a specified period of time divided by the total seating capacity of those vehicles. The following table shows the vehicle loading guidelines that are used for developing service levels that best meet the need of DART's current and potential future riders and ensure that patronage is not discouraged by overcrowding vehicles. The guidelines are based on vehicle capacities and are designed to balance safety, passenger comfort and operating efficiency.

Table 7.1 - Acceptable Vehicle Loads by Time Period

Time Period	Express	Frequent / Local/ Rapid	Light Rail/ Streetcar	Commuter Rail
Peak Period	100 %	125 %	150 %	100 %
Peak Hour	100 %	150 %	175 %	100 %
Midday	100 %	100 %	125 %	100 %
Evening	100 %	100 %	125 %	100 %

Vehicle loading standards are applied on an average basis over the time period in question. It is recognized that, on occasion, individual trips may experience loading that exceeds the stated standards for short periods of time and for relatively short distances because of peaking demand for service. These instances are considered acceptable performance. Service levels will be reviewed when individual trips exceed the standard loading factor for a period of greater than six consecutive months.

An additional element of service quality related to vehicle loading occurs when the load factor exceeds 100 percent. While DART standards define circumstances under which it is acceptable for passengers to stand, it is acknowledged that standing for extended periods of time may be a deterrent to ridership growth. In examining load factors that approach DART's standards for maximum loads, the proportion of the vehicle trip's total revenue time during which passengers stand should be examined.

If load factors at the maximum load point of a bus route or rail line on which the standard permits standing exceed 95 percent of the standard load factor for an hour, the proportion of trip time that includes any standing passengers will be analyzed. If the proportion of the total trip time that includes standing passengers exceeds 65 percent, corrective action in the form of headway adjustments or capacity augmentation should be considered.

ON-TIME PERFORMANCE

DART's schedules are our contract with our passengers for timely, reliable service that accommodates their travel within reasonable time frames, allowing them to accurately plan trips with confidence. The DART bus and light rail system is a fully integrated network of interconnected routes and strategically located facilities that facilitate and often require the individual traveler to transfer among routes and between modes. The degree to which service adheres to published schedules is a significant contributor to the ability of customers to use the network with confidence.

Managing On-Time Performance

DART's buses and trains will regularly operate according to their schedules when those who develop the schedules and those who manage the delivery of service work cooperatively to identify issues that compromise on-time performance and behave proactively to identify and correct issues that prevent on-time performance.

Automatic Vehicle Location (AVL) technology provides data that will identify and quantify the issues that compromise on-time performance. As reports become available from the AVL system, Schedule Analysts should review reports for those routes where on-time performance is identified as being more than ten percent below the currently adopted system on-time performance standard. Potential corrective actions should be identified and investigated. Solutions that are viable and affordable should be reviewed with Field Operations staff and a plan for implementing change developed.

Similarly, Field Operations staff should review the AVL reports for those routes where on-time performance is identified as being more than ten percent below the currently adopted system on-time performance standard. Specific investigations of potential causative factors should be undertaken and documented. In the instance of Operator performance issues, appropriate intervention should occur. When other issues, including passenger loading factors, traffic or street conditions or run time allocation are identified, those specific issues should be documented and communicated to the Service Planner and Schedule Analyst responsible for the route.

Factors that should be specifically addressed when investigating on-time performance issues include:

- Scheduled cycle time relative to headway and coordination requirements
- Allocation of cycle time among route segments and recovery time
- Consistency of scheduled time among routes sharing common segments

- Location of time points relative to route length and transfer connection needs
- Time of trip departures from ends of lines, rail stations and Transit Centers
- Consistency of bus operation with traffic flow along route segments
- Consistency in definition of physical time point location (*e.g.*, at the bus stop nearest the time point, entering the intersection, departing the intersection)
- Timely arrivals at transfer points including rail stations and Transfer Centers

On-Time Performance Standard

Transit operations encounter many situations that prevent precise schedule adherence at each and every time point. It is necessary to establish measurement standards that acknowledge this reality. Those standards should not, however, become license to complacency in scheduling or delivering service to DART's customers. A measurement standard is established for reporting on-time performance.

Analysis of schedules and supervision of day-to-day service delivery should not rely exclusively on the measurement standard but should review route and trip performance to identify chronic variance from schedules, investigate causative factors and intervene appropriately. Any route or trip whose raw on time performance statistics (the actual time that vehicles encounter time points compared to scheduled time, excepting early arrivals at terminal points) when taken over a period of six weeks or more is more than ten percent below the system on-time performance target should be investigated and appropriate intervention initiated.

Separate standards have been identified for services that operate in mixed traffic (bus, streetcar) versus services that operate in dedicated rights-of-way (light rail, commuter rail). The time window that defines on time performance is tighter for services that operate in a dedicated corridor.

Specific reporting standards have been established for DART services:

- **Bus, Streetcar** - A vehicle is considered to be on time if it departs its scheduled time point no more than 59 seconds before and no more than four minutes and 59 seconds after the scheduled time.
- **Light Rail, Commuter Rail** - A train is considered to be on time if it departs its scheduled time point no more than 59 seconds before and no more than two minutes and 59 seconds after the scheduled time.

Measurements will normally occur at defined timepoints for each scheduled service.

Reporting of On-Time Performance

Reports developed from data collected by the AVL system will be used to report on time performance.

Special Considerations for Light Rail Operations

The complexity of the light rail system operation through the junctions of lines, particularly those entering/departing the Dallas CBD, requires that a very high level of attention be given to on-time performance. The precision required to achieve acceptable operation includes adherence to departure times with an accuracy of 30 seconds at times when the most frequent service is scheduled.

It is necessary for the Rail Operations Supervisors and Train Controllers to carefully monitor on-time performance to meet these very precise operating parameters. Departures for end of line points and departures from stations immediately preceding critical junction locations cannot be allowed to vary from scheduled time without negatively impacting the performance of the entire light rail system. Monitoring of schedule adherence must be performed at locations that permit corrective action to maintain service quality and reliability.

On-Time Performance Goal Setting

On-time performance will be reviewed annually as a part of the development of the Business Plan. The purpose of this review is to establish target percentages for on-time service for the upcoming fiscal year and to ensure that an acceptable level of on-time reliability is maintained. Setting different targets for different service types may be appropriate.

SECTION 8: RESOURCE MANAGEMENT

Public transit systems in North America have become public enterprises increasingly dependent on public funding at both the local and national level. This dependence, along with a growing demand for public transit service, has placed severe strains on available resources.

To avoid excessive fares and a loss of transit patronage, the practice of subsidizing fares is typical throughout the transit industry. DART is no exception to this norm. In fact, as it became responsible for public transit in the Dallas area, one of DART's first actions was to reduce the fares charged for bus service, further subsidizing the passenger's ride. To assure effective, rational resource management DART utilizes three indicators when measuring the performance of transit service.

UTILIZATION OF RESOURCES – Passengers Per Revenue Hour

Passengers per revenue hour is defined as the number of passengers boarding one bus during one hour in revenue service. This measure is DART's measure of the utilization of service delivery resources. Routes having higher passengers per revenue hour ratios are generally better utilizing resources such as equipment, fuel and personnel than those with lower ratios.

UTILIZATION OF CAPACITY – Passenger Miles per Revenue Mile

This is the ratio of the passenger-miles traveled on the route to the revenue vehicle-miles traveled on that route. It can be visualized as the average passenger load carried along the length of the route and can be easily related to the seating capacity of the bus serving that route (ranging from 17 for the ARBOC “Smart” bus fleet to 37 for most of the 40-foot fleet).

FISCAL RESPONSIBILITY – Subsidy per Passenger

Subsidy per passenger is DART's measure of fiscal responsibility. Subsidy per passenger is the public funding requirement to make up the difference between cost per passenger and revenue per passenger. This cost and revenue relationship for a route permits evaluation of the effects of differing ridership and fare levels on route performance. This measure effectively ties the impact of public support of transit directly to the use of the service. Unlike other performance measures, higher subsidy/passenger numbers indicate diminished performance, and lower numbers indicate improved performance.

SECTION 9: SERVICE PERFORMANCE EVALUATION POLICY

DART utilizes passengers per revenue hour, passenger miles per revenue mile, and subsidy per passenger statistics as key performance indicators. These measures, as defined in Section 8, provide the agency with very detailed information relating to utilization of service capacity, utilization of resources, and fiscal responsibility, and offer an effective, objective set of measures of resource management.

PERFORMANCE TARGETS

Following each quarter of the fiscal year, DART will evaluate whether each route has met the performance targets for its assigned route category. The routes will be compared within a category, rather than with the system's performance as a whole, in order to account for the unique characteristics of each route category. For example, Express routes are characterized by

a large number of trips oriented to a single employment center, for example, with performance measures that vary significantly from other route types.

Methodology for Calculating Performance Targets and Evaluating Routes

For a given quarter, DART will compile, as appropriate for service type, every route's total ridership, total revenue hours, total revenue miles, total passenger miles, total operating cost, and total operating revenue. These quantities will then be summed within each route category. Then, the performance measures listed in Section 8 will be calculated for each route and for each route category as a whole.

The three route category performance targets will then be calculated as follows:

- A. Utilization of Resources Target = $0.75 * (\text{Total passengers divided by total revenue hours in that category})$
- B. Utilization of Capacity Target = $0.75 * (\text{Total passenger miles divided by total revenue miles in that category})$
- C. Fiscal Responsibility Target = $1.33 * (\text{The difference between total operating cost and total operating revenue in that category divided by total passengers})$

For demand-response services with dedicated vehicles (e.g., GoLink), only target C will be used, since mixed-supply model used for these services means that riders per hour statistics are no longer relevant.

CORRECTIVE ACTION

Routes that fail to meet any of the performance targets in their route category will be targeted for action directed toward improving performance.

Specific actions to improve performance include:

- Targeted marketing;
- Service frequency changes;
- Service period and service day adjustments;
- Rerouting;
- Rescheduling;
- Eliminating nonproductive route segments;
- Consolidation of segments into other routes;
- Replacement with GoLink service; and
- Elimination of the route when none of the above actions are viable or prove successful.

Routes that meet one or more targets but fail to meet others will also be evaluated for improvement. In some instances, positive ridership growth trends will be sufficient to improve performance.

Resources from reduced or replaced services should be reinvested to improve service in other parts of the DART network. Staff shall develop a plan to reallocate resources from reduced or replaced services in accordance with ridership/coverage ratio policies as adopted by the Board of Directors.

ROUTE DEVELOPMENT STANDARDS

DART Performance Measures are applied to mature routes that have been functioning for a number of years. New or significantly modified routes require a development period during which to mature and achieve full ridership potential. This development period is typically 24 months.

If standards are not met after 18 months, service should be reviewed, and the corrective action should be taken on the route. A route should reach maturity after 24 months. At this time, if no improvement in performance is noted, the route should be considered for discontinuation. If at any stage, a route fails to reflect the expected level of development, corrective action should be considered. However, it is important that such factors as transit need and general trends in ridership be considered in conjunction with performance measures when route discontinuance appears necessary.

SERVICE PERFORMANCE REPORT

To ensure that individual routes are reviewed appropriately against targets, a Service Standards Monitoring Report is included in the Quarterly Operations and Financial Report to the DART Board of Directors. This report includes the relevant performance measures for each route or service and the performance targets for each route category. Service Planning staff review this report and develop plans to respond to those routes whose performance requires corrective action. Routes that fail to meet standards appropriate for their category for two or more consecutive quarters are targeted for action on a semiannual basis.

BASELINE SERVICE

DART's goals of sound resource management are not met in a social or political vacuum. Considerations of fiscal responsibility and resource optimization, primarily efficiency-related criteria, must not conflict with DART's responsibility as a regional taxing authority with an

obligation to provide an adequate level of service to all contributing entities. DART has an obligation to consider the needs of the poor, the transit dependent, the elderly, and the disabled. Service changes should not affect these groups disproportionately and should not decrease their mobility.

DART's commitment to service equity is the concept of Baseline service. Routes are considered for Baseline classification only when the performance of the route is poor relative to the routes of its service classification, and provided the route serves one or more locations of “critical need” to the transit dependent population. As part of the process, routes designated as Baseline are allowed an additional 12 months maturity time as protection from corrective actions up to and including discontinuation.

A route is classified as Baseline only under the following conditions:

- The route has had an initial maturity time of at least 24 months;
- The route has failed to meet any of its performance targets for two or more consecutive quarters; and,
- The route is the only route providing service within ¼ mile of a location with a critical need for the transit dependent population.

Because the purpose of Baseline classification is to provide the route, and its passengers, with a “grace period” of 12 months to improve to satisfactory performance, after the 12-month period is completed, the route will be subject to same corrective action as other routes. During the 12-month period, Service Planning and Scheduling staff will work to develop alternative service options for the passengers, in the event that the route does not improve. Routes are not eligible for Baseline classification in consecutive years.

Baseline Definition and Categories

A Baseline route is one providing the only service within one-quarter mile of a location with a critical need for the transit dependent population. If more than one route serves a location, then neither route would be considered Baseline since one route could be eliminated and the location would still retain service. If two routes serve a location of critical need and one of the routes is eliminated, the remaining route would be designated Baseline because it would be the sole route providing service to that location. Baseline locations fall into the following four broad categories:

- Subsidized Housing
- Social Services
- Medical Facilities
- Low Income Areas

These categories focus on the nature of the human services provided and the economic situation of the citizens likely to require these services. The basic services available to these residents would not be accessible without the existence of bus service. Listed below is a description of each category.

Subsidized Housing Locations

This category consists of multi-family public housing complexes either operated by the Dallas Housing Authority (DHA) or subsidized by the federal Housing and Urban Development (HUD) department under Section 8 and/or Section 236 programs. Single-family residences are not included since the focus of Baseline services are on concentrations of demand. A requirement of 50 or more boardings per day is established for HUD locations at the bus stop nearest the location; however, all DHA operated low-income multi-family housing units are eligible regardless of unit quantity.

Social Service Locations

This category consists of social service locations that are publicly funded and operated, including but not limited to schools, colleges and universities, multi-service centers, public welfare offices. Some privately operated social service locations serve a transit dependent population and are of importance to many low-income residents; no clear approach is, however, available to differentiate among those agencies that serve transit dependents and those that do not.

Medical Facilities

This category consists simply of public hospitals or satellite health clinics (i.e., Parkland Memorial Hospital (PMH), Veterans Administration Medical Center (VA), etc.), and does not include private hospitals or clinics regardless of their "for-profit" or "not-for-profit" classification. For consideration in this category, a hospital must have at least 50 beds in addition to being publicly operated.

Low Income Areas

This category identifies concentrations of primarily low-income riders. "Low-income," for this purpose, is defined where the population within a census block group has an average income that fall below 150% of the federal poverty level average for the DART Service Area. This percentage (150%) was established to expand the economic reach of this category to encompass significant groups of low-income riders.

Baseline Designation

Baseline designation is a function of the regular monitoring process of all routes. As routes are evaluated, all routes failing to meet any of their performance targets for two consecutive quarters are subject to a Baseline screening process. Once a route fails to meet any of its performance targets for two consecutive quarters, screening is done to determine whether or not the definition of Baseline applies. If the definition does not apply, the route is subject to the same corrective actions as all other routes. If the Baseline definition does apply, the route is designated Baseline.

Upon designation as Baseline, the route will be carefully analyzed to determine whether very infrequent fixed-route service or GoLink services would be most appropriate. If GoLink service is the most appropriate service as a replacement, the route would be replaced by GoLink service. If GoLink is not a suitable replacement, service levels of the route will be modified to meet Baseline specifications. If this modification will result in an increase in service for the route, no change will be made to the service levels of the route. The minimum service levels for routes designated as Baseline are as follows:

Table 9.2 - Minimum Service Levels for Baseline Routes

BASELINE SERVICE	WEEKDAY HEADWAYS				SATURDAY HEADWAYS				SUNDAY HEADWAYS			
	AM/ PM Peak	Midday 9a - 3p	Evening 6p - 9p	Night 9p - 1a	Morning < 9a	Midday 9a - 6p	Evening 6p - 9p	Night 9p - 1a	Morning < 9a	Midday 9a - 6p	Evening 6p - 9p	Night 9p - 1a
All Service Types	60	60	60	60	60	60	60	60	60	60	60	60

Baseline service is scheduled on an “as-needed” basis, but with a maximum headway of 60 minutes, assuming service was available before the Baseline designation. Weekend service levels are applicable only for those routes that had weekend service before Baseline designation. Under no circumstance should a route’s Baseline designation add service.

GoLink service may be a more suitable replacement where the route alignment covers a sufficiently large area to meet the minimum requirements for GoLink service (e.g., area of approximately six square miles. Other situations will be more suitable to continue as a limited fixed-route operation.

Once designated Baseline, a route will have an additional 12 months for achieving one or more of its performance targets. During this 12-month period, Service Planning and Scheduling staff will continue to monitor the performance of the route; however, staff will also use this time to pursue alternative services for passengers in the event that it has not improved according to adopted standards.

At the end of the twelve-month period the designation of Baseline will be removed regardless of the route's performance, thus making the concept of Baseline a one-year process.

SECTION 10: ON-STREET PASSENGER SUPPORT FACILITIES

The following general guidelines are intended to facilitate the proper placement of DART bus stops and set the standards for bench and shelter placement. Because the topic of bus stops involves a detailed discussion of sign design, placement, and safety, it is DART practice to pattern its bus stop practice after the well-established and proven Transit Cooperative Research Program, Report 19, Guidelines for the Location and Design of Bus Stops prepared by the Texas Transportation Institute. This document may be accessed on-line at (http://onlinepubs.trb.org/Onlinepubs/tcrp/tcrp_rpt_19-a.pdf) It is recommended that all DART staff with bus stop responsibilities become familiar with TCRP Report 19.

The following summary may be especially useful when a bus stop location decision must be made by staff in the field and there is insufficient time to review TCRP Report 19. In general, stops should be located in the vicinity of demonstrated or potential ridership generators where the stop can be sited safely. Safety issues take precedence over issues of convenience.

BUS STOP PLACEMENT

Signalized Intersections

Current practice at intersections with traffic signals is to locate bus stops nearside. This allows the bus to use the red light stop time for passenger boarding and alighting and to avoid making a second stop after the intersection. One exception to this practice is where exclusive right turn lanes prevent the location of a nearside stop close to the intersection. In such a case the preference is for either a far-side stop after the intersection, a mid-block stop, or a near side stop prior to the right turn lane. Generally, the far-side stop is more convenient for transfer passengers where applicable.

Unsignalized Intersections

At unsignalized intersections, far-side stops are preferred for safety reasons. Far-side stops should be located no closer than approximately 80 feet to the intersection to allow for adequate space to prevent automobiles from backing into the intersection.

If far-side stops are not possible, bus stops should be located mid-block or nearside. In placing these signs, special care should be taken to locate the stops far enough back from the cross street

to preserve cross and parallel traffic sight distances and allow traffic traveling parallel to the bus route an unobstructed view of the intersection and traffic control signs, if present.

Left-Turning Buses

Left turns – especially at unprotected intersections -- should be minimized in the route design process to the extent possible.

At locations where buses turn left at an intersection, bus stops are generally located either (1) mid-block or sufficiently near-side (*a distance of 100 feet per lane that must be crossed to make the left turn is recommended*) to allow the bus to access the left turn lane, or (2) sufficiently farside after the turn to allow the bus to pull straight along the curb after the turn. The choice is usually dependent on opportunity to consolidate stops for multiple routes, thereby assisting transfer passengers and minimizing costs.

Right-Turning Buses

At locations where buses turn right at an intersection, a stop can be located either nearside or far side depending on the opportunities for other routes to share the stop, enhancing transfer convenience. As noted above, nearside stops are preferred at signalized intersections. Where possible, nearside stops should be located at distances no closer than 20 feet from the intersection to allow for "squared off" bus burns. Far-side stop locations should provide enough distance for the bus to pull straight to the curb following the turn.

Passenger Boarding and Alighting

It is DART's recommended practice to place bus stops along raised curb areas with sidewalks when possible and provided other criteria are met. This provides passengers with safe and convenient boarding and alighting. Stop placement should avoid vehicle doors opening in close proximity to catchment basins, newspaper stands, and other such pedestrian hazards.

"Good Neighbor" Practice

It is DART's recommended practice to place bus stops in locations that minimize conflict with adjacent residences and businesses. Whenever possible, and within the above criteria, stops should be located in unused areas along property lines, as opposed to near building doors and windows. These stops should also avoid blocking private signs. A location which places a barrier such as a fence between the stop and adjacent buildings, especially residences, is preferred, assuming passenger access is reasonable. In addition, stop locations should avoid interference with driveways.

Temporary Stops

In locations where bus stops are likely to remain for less than six months, consideration may be given to the placement of temporary stops. When considering a location for a temporary stop, all criteria for permanent stops should be considered. The decision to place a temporary stop should consider the likelihood that a temporary sign may be vandalized, removed, or relocated improperly during the temporary period.

PLACEMENT OF AMENITIES

Amenities as described in this section are bus shelters, benches, smart shelters and free standing solar lights. The placement of amenities at bus stops helps to provide passenger convenience and increases system ridership.

All bus stops within the DART service can be considered for an amenity. DART staff will evaluate amenity candidate locations. Staff will use the below general criteria and point system to determine if an amenity can be installed at a DART bus stop.

Amenities Point System

An Amenities Point System will be used to determine an existing bus stop is a candidate for an amenity. A bus stop must have 50 points to be considered for a bus shelter, 25 points to be considered for a bench, 12 points to be considered for a free-standing light and 90 points to be considered for a smart shelter.

In addition to the point system, there are minimum guidelines for placement of amenities for certain types of services. Shelters should be placed at least one per mile for frequent service routes. Benches should be placed at least one per mile for local coverage routes. Finally, Smart Shelters should be placed at all Rapid Ride stops.

The following table describes the details.

Table 10.1: Point System for Bus Stop Amenities

Category	Points
Bus Shelter	50 Points Required
Average Daily Boardings	1 point per average daily boarding
*Sensitive Use Area	10 points
Low income population (150% of poverty level)	10 points
Frequent Services	Placed 1 per mile minimum
Transfer Locations	40 points
Bench	25 Points Required
Average Daily Boardings	1 point per average daily boarding
*Sensitive Use Area	5 points
Low Income Population (150% of poverty level)	5 points
Low Midday Frequencies (Local coverage routes)	Placed 1 per mile minimum
Free Standing Lights	12 Points Required
Average Daily Boardings	1 point per average daily boarding
High Crime Area (Assault and Individual Robbery)	2.5 points
Stop serves routes with 30 or more minute headway at night	2.5 points
Smart Shelter	90 Points Required
Average Daily Boardings	1 point per average daily boarding
Rapid Ride Routes	Automatically placed at all Rapid Ride stops

*Sensitive use areas defined in this document are as follows:

- Hospitals
- Schools
- Senior Citizen Activity Centers
- Rehabilitation Centers
- Social Service Agencies
- Medical Facilities

ADDITIONAL CONSIDERATIONS FOR PLACEMENT OF AMENITIES

Where a bus stop location meets minimum point standards, staff will conduct a detailed evaluation and review for potential placement of amenities at the location. Some of the key considerations that are reviewed include:

- The amenity must be able to be safely located without obstructing American Disability Act (ADA) access;
- There must be sufficient public right-of-way to install the amenity. If a portion of the amenity is in private right-of-way, a right of entry from the property owner will be required;
- The bus bench must not be located where an existing shelter or bench is located, unless additional seating capacity is required;
- Shelter locations and drawings must receive the approval of the participating municipality and the other governing authorities as required;
- Existing locations with vandalized, defective, or destroyed amenity will receive priority for a new amenity, unless the site is determined to be a "location of habitual vandalism or damage;
- Potential placement of bike or scooter facilities as needed; and
- Free standing solar lights will be installed at shelters that do not have solar lights.

Public or Private Partnerships

DART has devised a private shelter policy for private or public entities that desires a shelter or bench at a location that does meet point amenity point requirements. This policy allows the public or private entity to participate financially in the placement of the desired shelter or bench. It requires the public or private entity to build the amenity pad (per DART specifications) and DART provide the amenity.

DART will also provide standards and guidance for businesses, government entities, and neighborhoods who wish to install their own shelters or bus stop amenities in some situations.

Relocation and Removal of Stops, Benches, and Shelters

As a part of DART's good neighbor policy, DART staff endeavors to be responsive to requests for bus stop adjustments where passenger safety, comfort and convenience are not compromised. When a request is made to remove or relocate a bus stop, cooperation with requesting residents or owners of residences or businesses that are adjacent to bus stops is appropriate when ridership levels and the availability of a reasonable alternative location affords reasonable accommodation of DART riders.

Where stops are located at intervals of 750 feet or less, requests to remove or relocate stops may be accomplished through consolidation of adjacent stops at an appropriate location. Consolidation of stops may have the positive result of improving travel time and resolving adjacency issues.

It is DART policy to not remove or relocate bus stops, bus benches or bus shelters when such action would negatively impact passenger convenience, safety or comfort. DART policy prohibits bus stop removal or relocation where such requests have the appearance of being motivated by bias on the basis of the ethnicity, income level or social status of passengers using the bus stop location.

RAIL STATION PASSENGER SUPPORT FACILITIES

DART standards for most rail station amenities are identified in the DART Light Rail Project Design Criteria Manual, Volume I. In general, rail stations are provided, as a minimum, with the following amenities:

- Canopies
- Windscreens
- Seating
- Lighting
- Trash Cans
- Telephones
- Ticket Vending Machines
- Schedule Information Displays
- Bus Shelters
- Bus Benches
- Kiosks
- Digital Guide-A-Rides

At stations projected to have significant levels of passengers who access the station by automobile, parking is provided.

Standard DART bus shelter shall be installed at every rail station bus bay. If there is sufficient right-of-way, a shelter shall be installed at rail station bus pull out bays.

Standard DART benches are to be installed if seating demand exceeds bus shelter capacity. Benches should not be located in areas that disrupt passenger flow or ADA access. The total amount of seating area may be adjusted based upon demand.