



# SERVICE STANDARDS AND PERFORMANCE MONITORING GUIDELINES





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## 1 INTRODUCTION

Service standards are a set of metrics and targets for monitoring DART service delivery and ensuring effective use of public investments. DART strives to meet the expectations of riders, taxpayers, community members, and other stakeholders while allocating resources responsibly to provide the best possible transportation service to the Greater Des Moines area. The service standards described in this document provide a framework for consistently monitoring the performance of DART services and adjusting investments accordingly. For example, routes that repeatedly underperform may require corrective action to improve route performance or reallocation of those resources into more effective service options. These standards have been approved by the DART Commission and are applied on an on-going basis by DART staff.

## 2 PURPOSE

There are many reasons to establish service standards and performance monitoring guidelines, including:

### ▶ **Objective Evaluation Tool**

The performance indicators, standards, and guidelines for performance monitoring collectively function as a management tool for fairly and objectively evaluating service and developing minor and major service changes.

### ▶ **Institutional Consistency and Transparency**

Using service standards and consistent performance monitoring processes ensures that evaluation of service is not only objective, but consistent over time and across the planning department. It also ensures public transparency and accountability in the service planning process.

### ▶ **Compliance with Federal Requirements**

As part of the guidance for Title VI compliance (see Federal Transit Administration (FTA) circular *FTA C 4702.1B*), the FTA requires transit agencies with fixed-route service to set system-wide service standards and policies for all fixed-route modes, though the full list of metrics and thresholds are defined by each agency. In this document, DART addresses all service standards and policies required by the FTA (see *FTA C 4702.18*, Chapter IV-4 - IV-7):

- ▷ Vehicle load for each mode (must set quantitative standard)
- ▷ Vehicle headway for each mode (must set quantitative standard)
- ▷ On-time performance for each mode (must set quantitative standard)
- ▷ Service availability for each mode (must set quantitative standard)
- ▷ Distribution of transit amenities for each mode
- ▷ Vehicle assignment for each mode



### 3 SERVICE CLASSIFICATION

DART operates different transit service types to meet the diverse transportation needs within the region. Each service type differs in its purpose within the network and markets served. Thus, performance targets vary from one service type to another. DART utilizes the five service types listed in **Table 1**. In the appendix, **Table A1** summarizes the classification of existing routes.

Table 1: DART Service Types

Service Type	Description
<b>Core Local Route</b>	<ul style="list-style-type: none"> <li>▶ Serves transit-supportive markets (busy/dense corridors with key regional destinations) and yields strong ridership.</li> <li>▶ Strong ridership drives investment in frequent service.</li> <li>▶ All-day, all-week service, to greatest financial extent possible.</li> </ul>
<b>Support Local Route</b>	<ul style="list-style-type: none"> <li>▶ Serves a less transit-supportive market (lower-density development with few regional destinations) to improve connectivity of the transit network or provide access to riders in low-density areas of the region.</li> <li>▶ Modest investment of resources; less frequent service.</li> <li>▶ Limited span of service, peak-only where appropriate.</li> </ul>
<b>Express Route</b>	<ul style="list-style-type: none"> <li>▶ Serves commuters with limited-stop/closed-door service for most of trip. Travel time should be competitive with private car travel for similar trip.</li> <li>▶ Frequent departures during peak of the peak. Under-utilized trips may be eliminated.</li> <li>▶ Peak-hour, peak-direction service (bi-directional service may be appropriate for some routes).</li> </ul>
<b>Shuttle Service</b>	<ul style="list-style-type: none"> <li>▶ Circulator or short-distance routes for inter-community travel or first-/last-mile connections to/from Local or Express service.</li> <li>▶ Frequent service facilitates spontaneous travel and accommodates more network connections; however, frequency and span vary based on market/function of route.</li> </ul>
<b>On-Call Service</b>	<ul style="list-style-type: none"> <li>▶ Service by reservation that takes riders to requested destinations within a set service area.</li> <li>▶ Limited service days, mostly mid-day service.</li> </ul>



## 4 SUMMARY OF KEY PERFORMANCE INDICATORS

To achieve its mission of enriching lives, connecting communities, and expanding opportunities, DART must balance the customer experience with an efficient allocation of resources. Thus, DART has standards related to efficiency and effectiveness as well as standards related to service quality. Both are necessary to maintain and grow a strong regional transit network. This section provides a description of each key performance indicator DART uses to evaluate service. The associated standard, or threshold, for each performance indicator is listed in **Table 2** below.

Service Type	Efficiency & Effectiveness Standards		Service Quality Standards						
			Reliability		Comfort			Convenience	
	Passengers Per Hour	Cost Per Customer	On-Time Performance	Percent Trips Completed	Passenger Load	Vehicle Assignment	Average Fleet Age	Headways	Stop Spacing
Core Local	20	\$6.00	85%	98%	125%	40' (60' or 35' where appropriate)	8 years	15 - 30 min	0.25
Support Local	15	\$10.00			125%	40' (60' or 35' where appropriate)		30 - 60 min	0.25
Express	10	\$15.00			100%	40' (60' or 35' where appropriate)		20 - 30 min	Only as needed
Shuttle	5	\$25.00			125%	Vehicle smaller than 30' medium duty bus		Varies based on demand	0.25
Regional On-Call	5	\$25.00			125%	Vehicle smaller than 30' medium duty bus		On demand	N/A

Table 2: Summary of Service Standards by Service Type

### 4.1 Efficiency and Effectiveness Measures

As an agency that operates with taxpayer dollars, DART has an obligation to use its resources responsibly. Efficiency and effectiveness standards ensure that the community receives the



maximum benefit from each dollar invested in service. Measuring passengers per hour and cost per passenger helps DART to determine the return on investment: how many riders are returned for each unit of service investment.

#### 4.1.1 Passengers Per Service Hour

Passengers per service hour is a performance indicator that helps DART evaluate a route's productivity: ridership generated per hour of service operated. A service that carries 20 passengers per hour of service operated is more effective than a service that carries 10 passengers per hour of service operated. DART is expending the same cost while carrying twice as many riders.

**Application Example:** Consider a route that carries 500 passengers per day using 3 vehicles over a 12-hour period. There are 36 total hours of service operated, for a productivity of 13.8 passengers per hour. However, if this route could be operated more efficiently by speeding up service, reducing delay, and reducing recovery time at the end of the route, it might only require the use of 2 vehicles to provide the same level of service. In this case, there are 24 total hours of service operated, for a productivity of 20.8 passengers per hour. In this scenario, the productivity increased through using existing resources more efficiently.

#### 4.1.2 Cost per Customer

Cost per customer measures the cost to provide service on a per-passenger boarding basis. Like productivity, it is influenced both by how many riders a route carries and by how efficiently resources are deployed on the route. Since cost is primarily driven by the number of hours of service provided, routes with high productivity tend to have lower costs than routes with low productivity. However, cost metrics may vary depending on what type of vehicle is used (fuel efficiency, maintenance costs) and the presence of any cost-sharing partnerships. For services that do not meet minimum standards, DART can consider whether higher costs are acceptable relative to strategic priorities, such as access to job. Additionally, DART can explore funding partnerships that share the cost burden with the entities receiving the service.

## 4.2 Service Quality Measures

While efficiency and effectiveness measures evaluate how well resources are utilized, service quality measures evaluate how well DART is providing service to customers. It is not enough to simply operate a trip as scheduled. DART service must be reliable, comfortable, convenient, and accessible to be an attractive transportation option. Measuring on-time performance and trips completed evaluates reliability. Measuring passenger load, vehicle assignment, and fleet age evaluates passenger comfort. Finally, measuring frequency/headways and stop spacing evaluates accessibility and convenience. Distribution of transit amenities are often not controlled by DART alone, but they are addressed in these standards to ensure FTA compliance.

#### 4.2.1 On-Time Performance

On-time performance is a performance indicator of service reliability and measures how closely a route adheres to its published timetable. It is measured as the percentage of trips that were delivered "on-time," which DART defines as departing any amount of time before or up to five minutes after the scheduled departure time at each scheduled timepoint along a route.

If a bus departs from a schedule timepoint early, it may result in riders missing their bus. Similarly, a bus arriving late to DART Central Station may cause a customer to miss a connection to



another route. Consistently delivering on-time service makes trip planning easier for the customer and gives customers confidence in using DART service.

Setting the on-time performance standard requires effective use of recovery time in the schedule to accommodate travel delays and travel time variability without generating excessive recovery time that consumes resources without generating ridership.

#### 4.2.2 Trips Completed

By monitoring the number of scheduled trips that are completed, DART ensures effective resource management and customer reliability. Even if a given trip was consistently behind schedule and failed to meet the on-time performance definition at any of its timepoints or required a replacement vehicle, if the scheduled trip itself was completed, it is still considered service provided. Thus, DART measures trips completed as scheduled in addition to on-time performance. This indicator is useful in operations planning for establishing and monitoring operator and fleet availability requirements.

#### 4.2.3 Passenger Load

A passenger load standard is one component of ensuring buses are not overcrowded and customers have a comfortable ride experience. While strong ridership per trip indicates a successful service, overcrowding for large portions of a trip increases the number of standing passengers and the duration of standing time. A passenger load standard must balance efficient allocation of vehicles with customer comfort. The vehicle assignment standard should complement the passenger load standard to achieve this balance.

Passenger load is measured as a ratio of the number of people on a vehicle to the seating capacity of the vehicle. So, if every seat on a vehicle is occupied by a customer at the time of measurement, the passenger load of that vehicle is 100 percent.

**Application Example:** If a bus has a 32-seat capacity and there are 43 passengers on board, the passenger load would be 134 percent. If the standard for that route is 125 percent, this bus would not meet the passenger load standard.

Customers are more tolerant of standing for short trips and/or at slower speeds than on longer trips and/or at higher speeds. Thus, the passenger load standard for express routes (longer trips at faster speeds) is generally lower than for local or shuttle routes.

#### 4.2.4 Vehicle Assignment

A vehicle assignment standard provides guidance for matching the appropriate vehicle type to each service type. The primary consideration for vehicle assignment is the number of people on the vehicle at any one time (load). Most fixed-route services require a standard 40-foot bus; however, load variation may call for a different vehicle with more or less capacity. This standard is required of all fixed-route operators to ensure bus capacity is distributed in accordance with load or another objective measure.

#### 4.2.5 Average Fleet Age

Average fleet age is a simple average of the age (number of years since the vehicle was manufactured—not purchased) of every vehicle in DART's fleet. Monitoring average fleet age helps DART perform effective transit asset management and budgeting (Note: Additional factors, such as total vehicle mileage, number of preventable accidents, mean distance



between failures, trips missed due to major breakdowns, and duration of out-of-service maintenance time are also considered in these processes. More information is available in the *DART Transit Asset Management Plan*). Buses that have been in operation too long are prone to more maintenance issues and the “wear and tear” of usage may impact the customer experience. By consistently purchasing new rolling stock, DART increases the reliability of its fleet and improves the customer experience.

#### 4.2.6 Frequency/Headways

Service frequency is a strong indicator of how convenient transit service is for customers. Frequency is measured as the number of trips a bus route operates within an hour. Frequency is often referenced alongside the term “headway,” which is the time interval between bus trips, typically measured in minutes. For example, a bus with 15-minute headways has a frequency of 4 trips per hour. Most customers think of service accessibility and convenience in terms of minutes waiting for the next bus, so DART’s standard for frequency is defined as acceptable headway ranges for each service type.

Frequency of service is the number one factor that attracts riders to use transit service. Most riders want to be able to simply walk out to a stop and catch the next trip without consulting a schedule, but this can result in long wait times if a bus only operates every 30 to 60 minutes. While availability of real-time arrival information helps reduce some uncertainty with trip planning, it does not reduce the time riders have to wait for their bus to arrive. Wide headways reduce travel flexibility and convenience, making transit use less attractive.

#### 4.2.7 Stop Spacing

Stop spacing refers to the distance between bus stops and is measured in miles. The average distance between stops on a route is one indicator of service accessibility—how many people can access a given route or the DART network. Important considerations in stop spacing include environment, speed, and service type/customer expectation.

Surrounding land use and density should be taken into consideration when siting bus stops. For example, areas with unsafe pedestrian conditions may require more frequent stops in order to be accessible for riders or may increase the average distance between stops if there are not enough places for a bus to safely pull over for passengers to board or exit the vehicle. Speed impact is another important consideration. Stops spaced too closely together slow down bus operations by causing the bus to decelerate, stop, board passengers, and merge back into traffic more frequently. Finally, service type and customer expectation play an important role in determining appropriate stop spacing. For example, a circulator service in a dense area (ex: Downtown D-Line) should have less distance between stops (every few blocks) compared to express service that should collect riders at/near the beginning of the route, spend most of the route with limited-stop/closed-door service (only stopping at major destinations), and then distribute riders at the end of the route.

#### 4.2.8 Distribution of Transit Amenities

DART selects all bus shelter locations, and bus shelter investments are prioritized where there is strong ridership, key transportation corridors, partnership opportunities, and/or a walkable environment. When citing a location, DART may have to work with private property owners to acquire additional permits or reach agreements about a shelter location.





## 5 PERFORMANCE MONITORING GUIDELINES

In order for service standards to be an effective tool, they must be accompanied by guidelines for application. This section lays out timelines for monitoring service performance, actions to take if a route falls below expectations, and the process for evaluating requests for new service.

### 5.1 Performance Monitoring Schedule and Process

DART should evaluate each route based on the key performance indicators outlined in Section 4 on a quarterly basis. In most cases, an average of all trips on a route within the quarterly reporting period will be generated to compare to the DART standard. If a route does not meet one of the standards during one quarterly reporting period, no immediate action is required. However, if a route fails to meet either of the efficiency and effectiveness standards (passengers per service hour or cost per customer) for three consecutive quarterly evaluations, DART will conduct a more thorough review of that route's performance and determine the best corrective action.

### 5.2 Corrective Actions and Exceptions

Routes that fall below an efficiency and effectiveness standard (either passengers per service hour or cost per customer) for three consecutive quarters will be considered "under review for corrective action." DART should develop a Corrective Action Plan to address the route's underperformance. Strategies for the Corrective Action Plan might include:

- ▶ **Segment Level Analysis:** A segment-level analysis of a low-performing service may highlight a specific portion of the route that significantly reduces the overall performance, causing it to fall below standards. If a low-performing segment is identified, it can be modified to attempt to raise productivity for the route as a whole.
- ▶ **Operational Analysis:** Often the difference between meeting and failing minimum performance standards is inefficient use of vehicle resources. Realigning service to cover only critical segments, removing deviations, reducing recovery time, and eliminating excess dwell time are ways to reduce travel time and save resources, thereby raising performance levels without significantly affecting ridership.
- ▶ **Changes in Service Levels:** Adjusting the service levels of a low-performing route – by any combination of frequency, span, or day of week changes – may help tailor the transit product to its market and increase productivity. Some low-performing routes may not warrant the existing scheduled frequencies, and right-sizing investment in the route may be required.
- ▶ **Cost Sharing:** Exploring cost sharing or public-private partnerships can reduce the amount of public funding required on low-performing services. If a route does not meet passenger per hour thresholds but provides access to priority service destinations, continued service may be justified if funding partnerships offset enough cost so that DART's cost per passenger meets the standard.
- ▶ **Targeted Marketing:** Marketing tactics can help raise public awareness of a route in need of remedial action. Poor ridership may be a result of a miscalculation of a route's potential market. Investing in targeted marketing may be effective, particularly if a route is designed to serve concentrated market groups like employment centers, shopping districts, schools, hospitals, social service offices, or other major destinations.



- ▶ **Rider Outreach:** On-board surveys and rider interviews can provide valuable insight into how a route can be improved. Riders may share information on why the route schedule, alignment, or operation may be preventing people from using it more often.

Once a Corrective Action Plan has been developed and implemented, the route is expected to meet standards for three consecutive reporting periods to no longer be considered “under review.” If the route does not meet both efficiency and effectiveness standards for at least three of the four reporting periods after implementation of corrective action, revision of the corrective action plan or potential route discontinuation may be considered to ensure responsible distribution of resources. Route discontinuation is the final option for a low-performing route that does not meet performance standards and may be applied geographically (to a particular segment or route pattern) or temporally (during a particular service day or time of day).

Some routes that fail to meet service standards may be exempt from corrective action planning. This includes new service that has not yet matured (see Section 5.3), routes that provide necessary coverage or service to minority or low-income populations, routes that achieve strategic objectives (such as access to jobs), and other justifications deemed appropriate by the DART Commission. Routes that provide critical service to minority and low-income populations are determined through the service equity process outlined in Section 5.2.

## 5.2 Major and Minor Service Changes and Equity Analysis

Quarterly performance monitoring will play a role in DART's service planning decisions. Any change in service must be evaluated to determine if it is a minor or a major service change. (See *DART Service and Fare Equity Policy* for definitions and thresholds.) Major service changes are subject to a service equity analysis in accordance with Title VI of the Civil Rights Act of 1964, as applied in the Code of Federal Regulations and interpreted by FTA Title VI Requirements.

A service equity analysis must be conducted for any major service change and performed in compliance with FTA guidelines, as outlined in *FTA C 4702.1B*, and DART's *Service and Fare Equity Policy*. If a disparate impact or disproportionate burden is identified, DART will mitigate the impacts, where possible, but may proceed with the change if staff have demonstrated that there are no practicable alternatives that would accomplish DART's program goals and have less of an impact on minority and/or low-income communities.

Major service changes also require certain public outreach efforts, as outlined in the *DART Public Participation Plan*. These efforts may include a public meeting, opportunities for public input, and notice and communication of final changes. When possible, DART uses data from past public outreach efforts to identify the communication methods preferred or most utilized by DART customers. Monitoring customer communication preferences helps DART design a public outreach strategy that will reach the most customers (or specific markets, when appropriate) and generate robust public input.

Minor service changes or adjustments are not subject to the *DART Public Participation Plan* requirements or a service equity analysis.

## 5.3 Responding to Requests for New Service

DART frequently receives new requests for service from businesses, residents or regional destinations. DART must evaluate each request to see if the service proposed would meet established service standards. Understanding how many hours of service would be required,



DART can estimate the number of passengers the new service must generate to meet established cost per passenger and passengers per hour standards. DART should consider potential ridership and cost-per passenger standards when responding to requests for new service.. Additionally, DART should also consider cost-sharing partnership with the entity requesting service in order to allow the service to meet the cost per passenger standard without jeopardizing overall system performance.

When a new service is implemented, it should operate for a two to three year trial period. If after trial period the service does not meet passenger per hour and cost per passenger service standards, the route may need to be modified or undergo some other corrective action.



**APPENDIX**

*Table A1: Routes by Service Classification*

Service Classification	Route Name
<b>Core Local</b>	1-Fairgrounds 3-University 4-E 14 <sup>th</sup> St 6-Indianola Ave 7-SW 9 <sup>th</sup> Ave 14-Beaver Ave 15-6 <sup>th</sup> Ave 16-Douglas Ave 17-Hubbell Ave/Altoona 52-Valley West/Jordan Creek 60-University/Ingersoll
<b>Support Local</b>	5-Franklin Ave 8-Fleur Dr 10-East University Ave 11-Ingersoll/Valley Junction 50-Euclid/Douglas
<b>Express</b>	92-Hickman 93-NW 86 <sup>th</sup> 94-Westown 95-Vista 96-EP True 98-Ankeny 99-Altoona
<b>Shuttle</b>	13-SE Park Ave 40-LINK 42-D-Line 72-West Des Moines Flex/Clive 73-Urbandale/Windsor Heights Flex 74-NW Urbandale
<b>On-Call</b>	Alleman Ankeny Easter Lake Granger/Grimes Grimes/NW Johnston