CAPMETRO

SERVICE STANDARDS & GUIDELINES

2023

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GLOSSARY

Public Transit or Public Transportation: A transportation system that is available for use by the general public that moves groups of people. As opposed to a private vehicle that generally carries fewer people and has limited access.

Transit Service: A system or network that supplies public transportation in the form of rides to and from different locations provided by a transit agency.

Service Area: The area served by CapMetro transit. This includes cities and communities that have authorized a 1-cent sales tax to fund transit or an in-lieu partnership agreement. The CapMetro service area includes Austin, Jonestown, Lago Vista, Leander, Manor, Point Venture, San Leanna and parts of Travis and Williamson Counties.

Fixed Route: A transit route with a fixed schedule and designated stops for picking up and dropping off riders.

Service Types: Groups or categories of similar types of transit services according to their form or function used to manage and monitor service effectively. For CapMetro this includes High Capacity, Frequent, Local, Community, Limited, and more.

Transit Demand: Refers to the level of desire and need for public transportation services within a given area or population. It represents the quantity and frequency of individuals who choose or require the use of buses or trains to travel from one location to another. Transit demand is influenced by various factors, including population density, travel patterns, urbanization, land use, accessibility, and the availability and quality of public and private transportation options. Understanding transit demand is crucial for transportation planners and authorities to effectively design, optimize, and meet the transportation needs of communities.

Standard: A point of reference or benchmark used to compare how a transit service performs. If something “meets the standard” it has an acceptable level of performance.

Schedule: The schedule is how the span and frequency operate throughout the day. Most often, this lays out each trip and the expected time of service from the start of the line, at timepoints, and at the end of the line. A schedule helps riders plan when they would need to reach a stop in order to use transit service.

Span: The number of hours in a day that revenue service is provided. Time starts when the first bus arrives at its first timepoint to when the last departs from its last timepoint.

Frequency: How often (in minutes) a bus passes by a bus stop during an hour.

Service Change: Adjustments to CapMetro services made at regular intervals throughout the year based on analysis of performance measures, community and operator feedback and available resources.

Performance: How well or poorly a transit route carries out its function.

Evaluation: An assessment of service at a specific point in time to determine its performance.

Monitoring: Keeping an eye on route performance over time to assess when changes might need to be made.

Reporting: The process for giving an account of the process and results of an evaluation or monitoring.

Key Performance Indicators (KPIs): Data points used to measure outcomes determined to be important to the success of transit.

ABOUT THIS DOCUMENT

CapMetro connects the people, jobs and communities of the Austin area by providing quality transportation choices. The CapMetro **Service Standards & Guidelines** provide a framework for how the agency designs and monitors transit service, as well as the process for making changes. The document is divided into three main sections.

The **Guidelines & Best Practices** section defines the different types of fixed-route transit service and a set of principles for how they should be designed.

The **Service Standards** section provides guidance on how CapMetro measures service performance and determines if changes are needed. Standards help ensure that CapMetro is meeting the expectations of the guidelines moving forward.

The **Service Changes & Evaluation** section describes the steps and timeline for making changes to service, especially when the service is not meeting the standards.

How to Use & Update This Document

Service standards are developed by each transit agency in the United States to guide the design, implementation and evaluation of their services. CapMetro staff conducts a review of the **Service Standards & Guidelines** regularly, typically every 5 years. The document is required by FTA Circular 4702.1B to comply with Title VI of the Civil Rights Act, which requires all transit agencies to develop service standards and guidelines. With each 5-year update, the **Service Standards & Guidelines** are updated to reflect the latest industry and agency best practices, recent service findings and experiences, feedback from the community, changes to service types and availability of resources. The document is then submitted to the CapMetro Board of Directors for approval.

In preparation for this update, CapMetro reviewed guidelines from 11 other transit agencies to develop an understanding of peer best practices, and completed internal and external engagement to determine what has worked well and what could be improved upon from previous guidelines.

ABOUT CAPMETRO

Each department within CapMetro works together to plan and operate transit service, ensure efficient use of funding, manage accessibility, safety, vehicles and capital investments, engage with the community, and more. Different departments have different roles and levels of involvement when it comes to the development of the **Service Standards & Guidelines** or in supporting adherence to these guidelines after their adoption.

CapMetro's Overarching Principles

Equity, Accessibility and Sustainability are key principles to designing an inclusive transit system. CapMetro strives to integrate these principles into each aspect of the planning and implementation processes. CapMetro conducted engagement with the public, detailed in the **Engagement Summary for the Service Standards and Guidelines Update,** as well as with internal staff to determine how accessibility, equity and sustainability can guide decision-making. The **Service Standards & Guidelines** were developed not only to ensure regulatory compliance or operational efficiency, but also to serve as a channel for advancing a more equitable, accessible and sustainable transportation system in the region.

Equity – As an agency, CapMetro is committed to delivering equitable and inclusive transit service. During the process of updating this document, the agency reviewed internal practices, standards and methodologies and codified considerations for people in the Central Texas region who rely on transit most. CapMetro also conducted internal interviews to discuss and document how service standards meet the needs of the community. Public engagement involving surveys, compensated focus group meetings, and a community advisory committee workshop also helped garner feedback on our processes. This document formalizes CapMetro planning processes and includes the following equity considerations in the guidelines:

- The service change process in the **Service Changes & Evaluation** section describes the steps for how CapMetro approaches service changes. The evaluation includes a demographic analysis that looks at the effects of a proposed change on the surrounding community. The evaluation includes an analysis of Black, Indigenous, people of color (BIPOC) populations, low-income, older adults, youth, individuals with disabilities, individuals with limited English proficiency, and zero car households. See page 38 for more details.

- CapMetro also outlines a data-driven methodology for evaluating how to distribute transit amenities across stops and stations. The process will guide CapMetro in placing these amenities based on community need. The analysis considers who a stop or station is serving and how it is being used. Please see the **Amenity Enhancement Process** for more detailed information.

Accessibility – CapMetro always strives to improve accessibility across services and is conducting a Self-Evaluation and ADA Transition Plan for accessibility across agency programs, services, facilities and technologies. CapMetro reviews all designs against Texas Accessibility Standards (TAS) and Public Rights-of-Way Accessibility Guidelines (PROWAG) to ensure compliance and that individuals with disabilities are able to safely access CapMetro services.

Sustainability – CapMetro works to integrate and track sustainability methods and treatments, including those outlined in the CapMetro Sustainability Vision Plan. CapMetro is also collaborating with the City of Austin and Austin Transit Partnership to develop sustainability-focused guiding principles and policies that provide resiliency in the face of a changing climate. These will assist planning, design and construction teams with integrating sustainability into agency processes and outcomes and summarize both mandatory requirements as well as additional voluntary measures that will help meet larger strategic goals.

REGIONAL COORDINATION

Central Texas is a growing region with transportation needs that go beyond the larger metropolitan areas. In 2013, CapMetro and Capital Area Rural Transportation System (CARTS), the regional rural transit provider for areas of Bastrop, Blanco, Burnet, Caldwell, Fayette, Hays, Lee, Travis and Williamson Counties, created the Office of Mobility Management (OMM). The OMM focuses on closing gaps in transit service by working with local jurisdictions, coordinating with service providers, and implementing new transportation tools in the region. The OMM strives to integrate the regional network of transit services in the Central Texas region. It is dedicated to meeting the transportation needs of senior adults, people with disabilities and veterans while addressing gap areas. The OMM also provides information to customers with travel requirements that cross jurisdictional boundaries or agency and service provider boundaries.

CapMetro adopted a Service Expansion Policy in June 2008 that was later revised in April 2014 and reaffirmed by the Board of Directors in November 2022 to provide guidance when there is a desire to add new service in the region in an area outside the existing service area. It defines approaches for service to jurisdictions within the region that are not currently served by CapMetro.

This policy defines the process for distributing federal transit funding in the region (Section 5307 Funds) and implementing transit service. Jurisdictions within the urbanized area, but outside the CapMetro service area, can participate. The program requires cities to first complete a Transit Development Plan (TDP) to identify transit service needs and assist in developing transit alternatives and financing. CapMetro currently coordinates with the cities of Buda, Hutto, Georgetown, Round Rock and Pflugerville as well as Travis County on updates to the required TDPs.

Future Services

This update to the **Service Standards & Guidelines** references future new modes of transit service, including Light Rail, which CapMetro will operate in the future with the implementation of **Project Connect** investments. However, this document does not set performance standards for these services yet. CapMetro will update its guidelines to include standards for new service types as they are implemented so that initial performance data can be used to set realistic thresholds.


Validator

CAPMETRO SERVICE TYPES

While all transit services are designed to connect riders to different destinations across the service area, different CapMetro transit services are a better fit for specific markets. All transit services function as part of the network, and different routes each have their own function within the network. This means that CapMetro's services have unique characteristics, including how early or late the service runs, how often the service comes, how far apart the stops are and factors such as the type of activity along the route and the nearby land uses. This document focuses on fixed route bus and rail transit, services that have a fixed schedule and designated stops for picking up and dropping off riders.

Similar services were grouped into categories called service types. Service types allow each route's performance to be evaluated relative to routes serving a similar purpose or with similar fundamental characteristics. Specific performance metrics for each route type are described in the **Service Standards** portion of the document. Routes can move between categories with changes over time. These service types are referenced throughout the document where detailed guidelines and standards for service quality and effectiveness are provided.

High Capacity

High Capacity routes are designed to carry more passengers per hour, faster. Stops are spaced further apart and are distinct from other routes in the system, with stations that can accommodate more people. This service can also use larger vehicles that accommodate more riders at a time. High Capacity routes are often implemented along highly traveled regional corridors where ridership is historically high and higher transit vehicle capacity is necessary to accommodate the travel demand.

Rail: MetroRail Red Line

Rapid: MetroRapid 801 and 803

Frequent

Bus routes that operate every 15 minutes or better during the day on weekdays and Saturdays, at least.

Local

Bus routes that typically operate every 30 minutes on weekdays, serving major destinations including downtown Austin, universities, shopping centers, and transit hubs.

Limited

Routes that have limited stops and/or limited times for service. These services often have a specific purpose such as providing express service for commuters at peak times or connecting to/from the high capacity network.

Express: Commuter bus service that brings outlying residents to and from Central Austin

Flyer: Limited-stop bus routes between downtown and various neighborhoods

Rail Connector: Circulators connecting neighborhoods to Red Line stations

Community

Routes tailored to specific populations, such as students and seniors, and their key destinations, or to meet a specific community need, such as providing essential connections to grocery stores or they are supported by community partnerships, e.g. University Routes. The frequency and span of community routes are tailored to the specific populations they serve.

Community Shuttles: Routes that connect neighborhoods to nearby destinations

University Routes: Frequent circulator routes that connect the University of Texas campus and residential areas

Night Owl: Late night local service

There are other local public transit services that are not covered in these guidelines.

Pickup – On-demand service available in designated zones located throughout the CapMetro service area. Service information and criteria for Pickup are available in the **Pickup Standards & Guidelines**.

Bikeshare – Public bikeshare program that provides first- and last-mile transportation to better connect the community to and from transit. MetroBike, Austin's public bikeshare service is now operated and maintained by CapMetro. It has an initial guiding plan called the MetroBike Expansion Plan. As the service develops, more guiding documents will become available.

Access – Demand-response paratransit service complementary to fixed-route service provided in accordance with the Americans with Disabilities Act

Rideshare – Carpool and vanpool service for registered customers

Guaranteed Ride Home – Emergency taxi service for registered customers

SERVICE GUIDELINES & BEST PRACTICES

This section contains the CapMetro **Service Guidelines & Best Practices**, which describe strategies for how to design, implement, and modify fixed-route transit services. This section provides an overview of industry-wide principles for designing a transit network, routes and schedules that meet the community's needs and are easy to navigate for its riders.

The guidelines in this document apply to both rail and bus fixed-route transit. Due to the greater flexibility of bus service, more of this section will apply to bus service than rail. While much of the section details strategic best practices for staff, the core purpose of the guidelines is the matching of service types to the specific communities served. Allocating the appropriate amount of service is key to ensuring transit is both convenient for riders and a sustainable use of community resources.

SYSTEM DESIGN GUIDELINES

When designing a transit system it is important to consider where people live and where they are trying to go. To be an efficient steward of public dollars, CapMetro considers the purpose each route serves in the system, how each route supports the entire transit system and who each route is serving to better understand the unique needs of how transit can serve the community well.

The most efficient transit routes are designed to serve areas with high ridership potential. Efficient routes and networks serve areas where people are and where they want to go by linking together key destinations and providing service along corridors that have high levels of demand. This means that some routes may be oriented towards serving areas of very high ridership potential, while others in the network provide wider coverage in areas where people need it the most. All routes are designed to work together to strengthen ridership of the system while serving the community. The sections that follow will provide information on the principles and guidelines that support the design of a robust transit system.

Transit and land use are fundamentally connected.

Transportation and the ways communities have developed have been intricately linked throughout history. In Central Texas, people historically traveled by streetcars and railroads until personal vehicles became the most prominent mode. Widespread car use has caused the key destinations within the region to move further away from the center of cities and beyond walkable distances. Across the country, the reliance on personal vehicles has demonstrated how transportation options impact development and, in turn, how that pattern of development leads people to choose one mode of transportation or another. For transit to provide the most benefit, it must be well suited to the development pattern of the area it serves.

These guidelines identify key characteristics of the built environment that relate to transit demand, including density, demographic characteristics of the residents of an area, the connectivity of the existing transportation networks and the location of major activity centers that are common destinations within a community.

Transit is best supported by mixed uses and density.

Routes are more efficient when they serve areas of high transit demand, or areas where people live (i.e., residential density), and work (i.e., employment density). While density of jobs or residents are good indicators of transit demand, a mix of land use in the same areas can produce even more demand than either alone. Mixed-use areas create a steady demand for transit throughout the day and evening. Other transit-supportive land uses include commercial and institutional areas, which attract large numbers of employees, patrons and guests.

Transit Oriented Development in Austin

CapMetro has also been involved in planning for Transit Oriented Development by advocating for mixed-use development near transit and supporting zoning that permits this type of development.

CapMetro has been leading Equitable Transit Oriented Development efforts, working in coordination with local jurisdictions to ensure that high-capacity transit investments are supported by development that not only increases transit ridership, but also provides access and space for people who need it the most in our community.

Transit should serve well-defined markets.

CapMetro's transit service strives to serve and connect multiple destinations using network design best practices. The most effective transit routes should be designed to serve areas with high ridership potential and provide access to key destinations. The strongest destinations for transit have intense activity throughout many times of the day; sometimes, activity centers and corridors with high ridership potential may be suitable as connection points for several transit services, such as downtown Austin or "The Drag" on Guadalupe Street near the University of Texas.

Well-defined markets may include:

- Large/high-density housing complexes
- Medical destinations (hospitals, doctor's offices, dialysis centers)
- Groceries and retail (Walmart, H-E-B, etc.)
- Social services providers (workforce solutions, Social Security offices, disability services, etc.)
- Sporting arenas and event centers (Q2 Stadium, Moody Center, Exposition Center)
- Shopping/entertainment districts (Downtown, the Domain)
- Colleges and universities (Austin Community College, the University of Texas, St. Edwards University, Huston-Tillotson University, etc.)
- Employment centers (office buildings, major retailers)

To better understand travel trends and how riders are using transit services in Central Texas, CapMetro conducts an Origin and Destination Rider Survey every 5 years. This survey is generally conducted during the spring and collects thousands of responses from riders about where their trip begins and ends, how frequently they ride and other questions. The most recent results of this data-driven market study were completed in Summer 2023.

The transit network should be supported by infrastructure.

Transit moves people, but it's important for it to be safe, comfortable and convenient to use as well. Transit service should be supported by well-connected streets and sidewalks, which make using transit easier and safer. Areas with poor street network connectivity, poor pedestrian access, physical barriers and frontage roads may be unsafe for transit riders and require more time and resources or a coordinated approach with agency partners to serve effectively.

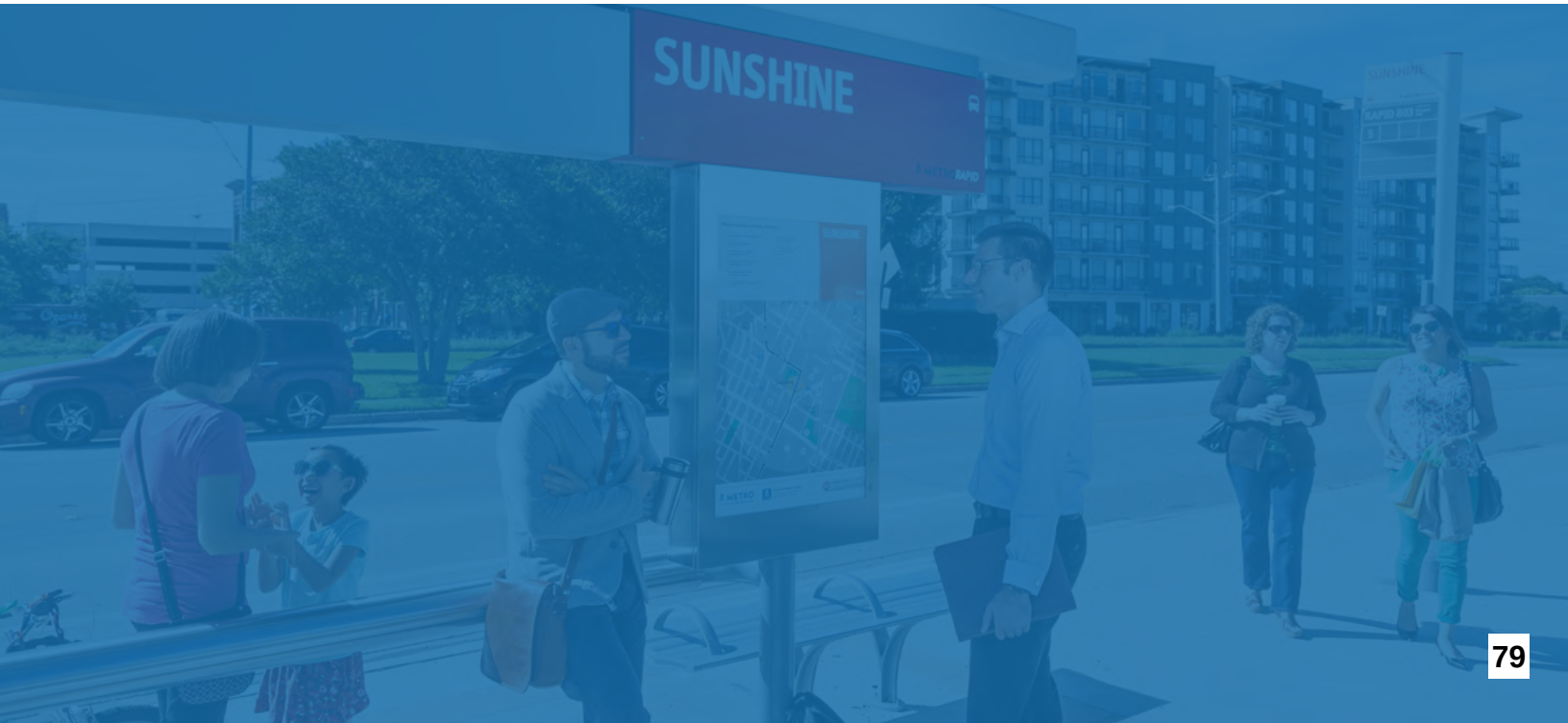
When streets and the surrounding environment are designed to support a variety of modes, more people choose to take transit. People may access transit in a variety of ways: walking, biking, using bike share like MetroBike, scootering, ridesharing, Pickup, or driving to a Park and Ride. These are often referred to as the first- and last-mile connections to transit.

Where possible, transit-supportive street design choices, such as transit priority lanes, traffic calming measures, safe bicycle facilities and wide sidewalks or shared-use paths, can help transit vehicles run more efficiently while also keeping drivers, cyclists, and pedestrians safer.

These efforts are just as important to the success of the CapMetro system as its routes and schedules are. When done right, they can enhance current users' experience and attract new riders. As Central Texas continues to experience growth, ensuring transit access across the area is a key to continued economic growth and prosperity. CapMetro will continue to work closely with member jurisdictions, partner agencies, and communities to promote regional connectivity.

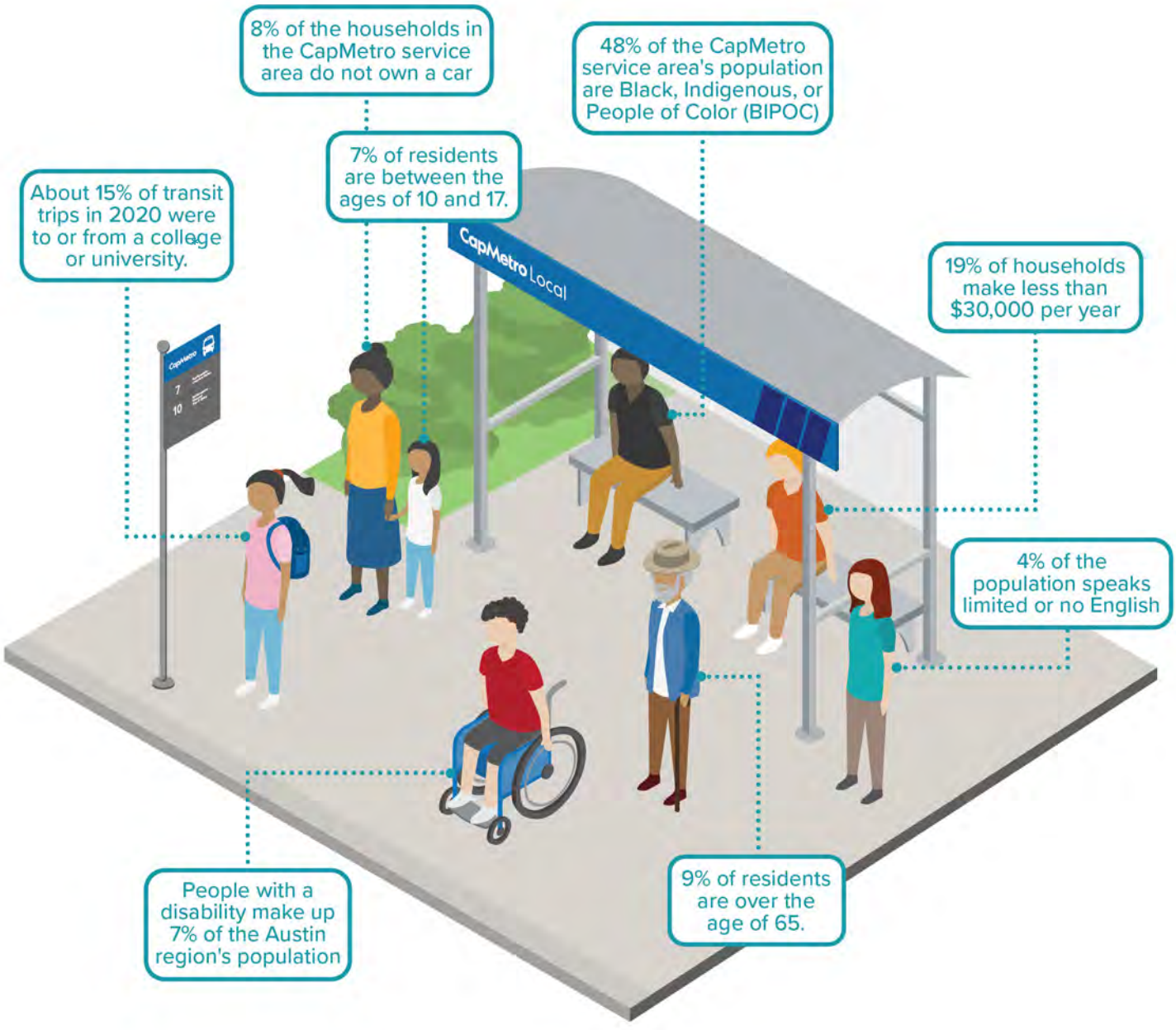
CapMetro partners with other jurisdictions to design and construct transit supportive infrastructure.

Because CapMetro operates its services within the public right-of-way, the agency must coordinate with partner jurisdictions when implementing transit supportive infrastructure across the service area. Because most CapMetro services operate within the City of Austin, regular coordination with city departments is needed on projects that enhance bus travel times and improve first- and last-mile access to transit. This coordination frequently results in improved or new infrastructure that not only supports transit, but also supports the City's mobility and active transportation goals.



Transit should prioritize serving the people who need it most.

Some people rely on transit more than others, as seen in data that shows that a higher proportion of their demographic group uses the service. These groups include people who don't own a car, people with disabilities, students, youth, seniors, limited-English speaking populations, low-income populations and BIPOC populations. More priority needs to be given to these groups when making decisions about where transit service is placed and how often transit service comes. Serving those who need the service the most also makes the service more accessible for everyone.



Source: 2021 American Community Survey
**Source: 2020 Origin and Destination Survey, partially complete due to the COVID-19 pandemic and to be updated in 2023*

Fast service is better than slow.

Virtually all passengers prefer to get places faster rather than slower. Service can be made faster by making it more direct, spacing stops appropriately, and where possible, implementing transit priority measures.

Stop spacing should balance speed and access.

When stops are spaced too far apart, riders are forced to walk long distances to where they want to go, and fewer riders may be willing to take the service if they cannot get on or off near their desired destination. However, when stops are spaced too closely together, service is slow, meaning it takes a lot longer for someone to be able to reach their destination without providing a significant increase in access. Typically, consistently spacing stops between 1,300 and 2,650 feet (approximately 1/4 to 1/2 mile) can help to provide a high level of access while maintaining speed. Appropriate stop spacing also varies by route type. For example, an Express route (part of the CapMetro Limited services) has a specific purpose to provide a fast, reliable service into Downtown at traditional commute times (morning and evening), therefore, the stops will be much farther apart than other route types.

Service Type		Average Stop Distance (ft)
High Capacity	Commuter Rail	As Needed
	Rapid	2,650-4,000
Frequent		2,650-1,300
Local		~1,300
Limited		As Needed
Community		As Needed

Transit priority treatments can increase the speed of transit.

There are a variety of treatments that can be used to make transit more competitive with personal vehicles and help riders get to where they want to go quickly and reliably. Transit agencies across the country, including CapMetro, have implemented many of these treatments and tools, which vary in cost and offer a range of benefits to the speed and reliability of transit. Generally, these treatments help buses get around general traffic and congestion. Some of these treatments include:

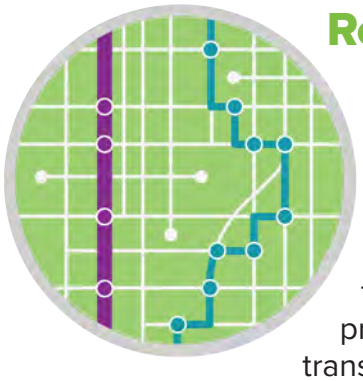
- **Dedicated transit lanes**, including fully dedicated lanes, bus and right-turn-only lanes, peak-only bus lanes, and curbside lanes.
- **Intersection treatments**, including queue jumps, transit signal priority, and other signal adjustments.

High-ridership segments of routes that experience the most delay and variability in travel time should be prioritized for improvements to speed up buses and make them more reliable for riders. MetroRapid service is a form of Bus Rapid Transit and should also be considered for treatments that support enhancing travel time reliability and making the service more visible to riders.

These are a few of the ways CapMetro coordinates with other jurisdictions to speed up transit vehicles. One example of this coordination is in the coordination with the City of Austin on their ATX Transit Enhancement Toolkit, which outlines transit priority treatments in more detail.

ROUTE DESIGN GUIDELINES

"Good" routes can look different depending on their function within the network, but they all serve their purpose efficiently and reliably for riders. They should be relatively simple for both existing and new riders to understand and should be coordinated with the larger system of routes to facilitate easy transfers.



Routes can serve different purposes, such as maximizing ridership or increasing coverage.

Making changes to individual routes or a portion of a route is rarely done in isolation, and involves thorough analysis, evaluation and community input to identify any changes. Individual routes can also serve different purposes within a transit network. As discussed previously, some routes are designed to serve areas of high ridership potential while others focus more on providing service to a specific area or neighborhood. Most of CapMetro's peer transit systems have a balance of these types of routes in their network.

Areas with a higher density of people and jobs and many destinations that are easily accessible within a short walking distance of each other are well-suited to providing simple and direct routes that can attract many riders. Routes in these areas usually run on more direct corridors, with fewer deviations or "branches", and they tend to have stops spaced farther apart. These characteristics mean that ridership-focused routes often have higher average speeds and experience less delay, making them more efficient. However, because they often run primarily on major arterial streets, riders may have to walk farther distances from their home or place of work to get to their bus stop.

Other areas are more spread out and have a lower concentration of people and jobs, but it is still important to find the most effective way to serve these areas with transit. Routes in these areas are often referred to as coverage-focused routes and are generally less direct, often traveling on more neighborhood roads to expand the geographic reach of the transit network. These routes have more stops, which typically means a shorter walk from homes and destinations. This type of route typically has a longer travel time and can require the customer to wait longer for the next bus due to its more stops along the route and less direct path. Generally, these routes can require a high amount of operator and vehicle resources, making them more costly to operate.

Even though the measures of success can be different for these distinct types of routes, the methods for making adjustments to help them meet their standards are often similar. The **Service Changes & Evaluation** section describes the process for evaluating routes based on different factors and common actions taken to make adjustments to help a route improve, such as seeing if the stops are closer together than expected or if there's a way to improve speed along the route. CapMetro uses this knowledge to match the appropriate transit service with the demand for transit in a given area.

Simple routes are better than complex ones.

A simple transit route design and simple schedules will attract more riders than a complex transit system. For people to use transit, they must be able to understand it, and simpler services are easier for riders to rely on. Transit agencies typically try to keep their systems simple where possible to help ensure that riders can get where they want to go when they want to without frustration or problems. Overall, transit systems with simpler route design can more quickly attract new riders and are better able to serve occasional riders. When a more complex route is warranted, it should fit within the context of the surrounding network.

Routes should operate along a direct path.

Routes should be designed to operate as directly as possible to keep travel time lower while maintaining access to key destinations.

The fewer turns a route makes, the easier it is for riders to understand. Conversely, circuitous paths are disorienting and difficult to remember, which can impact the reliability of the route. CapMetro designs routes so that they not deviate from the most direct path unless there is a compelling reason, such as to serve major activity centers or to provide coverage to areas with limited access.

Routes should be symmetrical and predictable.

Wherever possible, routes should operate along the same path in both directions to make it easy for riders to know how to get back to where they came from.

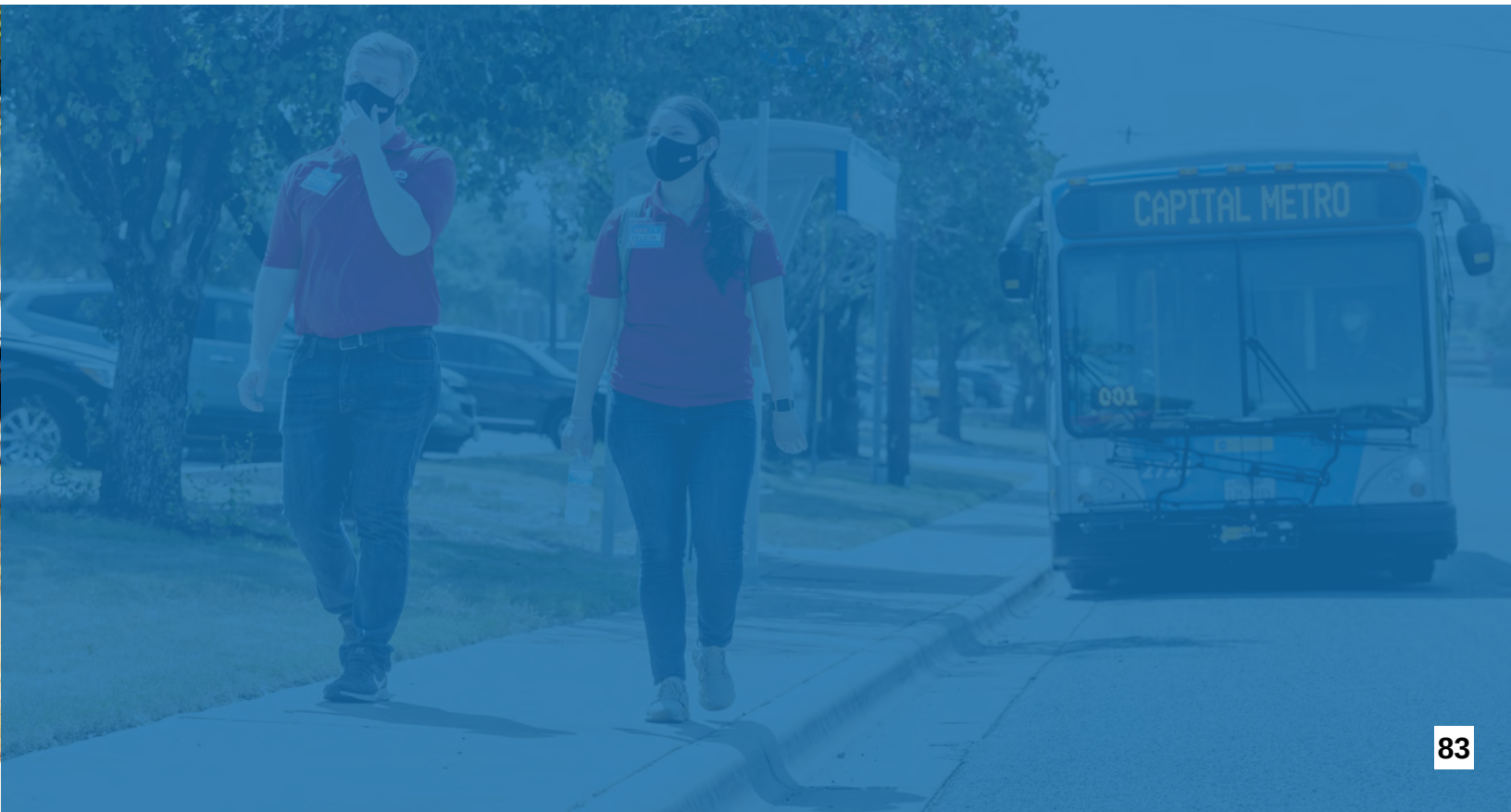
Due to one-way streets, such as in downtown Austin, it may be necessary to operate a route on two parallel streets. In such cases, efforts should be made to limit the distance between stop pairs.

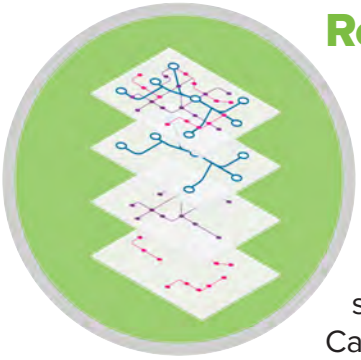
There are a limited number of cases where a route might vary from this.

A route might take a different path for a few trips when one portion of the route has a much stronger demand for service than another or in the case of a major attraction that has limited hours. For example, Route 4 extends past its typical endpoint a few trips each day to serve Austin High School. This type of route deviation is called a “school tripper.”

Routes should have appropriate start and end points.

The ideal start and end of a route should be at a transit center or activity center. When not feasible, CapMetro starts and ends routes at terminals including charging facilities for buses or a key destination that can provide strong ridership to “anchor” the route, such as grocery stores. When this kind of location does not exist, the end of line should be selected based on safety and security, restroom availability for operators and the potential impacts on adjacent land uses.





Routes should be planned within the context of the network.

Transit service planning doesn't happen in a vacuum. When changes are needed to a particular route or when a new service is being planned, the impact on other routes and the overall transit system should be assessed.

Routes should complement other routes to provide coverage across the service area while maximizing ridership and avoiding duplicative service. CapMetro coordinates where routes go, how often the bus comes and how the schedules line up as necessary to create a smooth rider experience.

Services should be well coordinated.

Where different routes connect or operate along the same street, schedules should be coordinated to the greatest extent possible to provide short wait times between transfers.

Routes should be appropriately spaced.

Parallel routes operating closely together have the potential to compete for and confuse riders. Appropriate route spacing attempts to balance the trade off between how far someone needs to travel to reach transit service and the efficiency of the service. Where the walking environment is difficult to navigate, such as near high traffic streets or areas without comfortable, safe and connected sidewalks, asking someone to go farther to reach the service may deter them from riding. However, routes that are too close together can be an inefficient way to use limited resources, making it more difficult to provide better frequency and coverage to the service area.

Special conditions may exist that require routes to operate closer to one another, such as terrain, barriers, or the street network's design. Routes of different service types may even overlap in some places to expand overall transit access in high-activity areas or corridors, such as the local underlying Route 1 that stops more frequently than the high-capacity MetroRapid 801 service that runs on many of the same streets with more limited stops.

Routes should be an appropriate length.

Routes should be an appropriate length to maximize ridership potential and minimize operational issues. Appropriate route lengths will vary based on context, but typically a route's length influences its performance. For example, if a route is too long, traffic can cause a delay that builds along the route. This can impact the route's reliability; it may show up at the stop too early or late and cause someone to miss their bus. A route that is too short may be difficult to schedule efficiently, making it difficult to give it an intuitive frequency (i.e. 15, 30, or 60 minutes). There are however additional factors that impact route lengths; currently, downtown Austin lacks space for vehicles to wait to start their next trip, which limits CapMetro from starting and ending routes downtown and may require lengthier alignments.

Service should be coordinated between modes.

Coordinating bus and rail services is important to maintaining a cohesive network that riders want to use. This typically involves coordinating schedules of bus routes that intersect with, or "feed," rail lines, and placing the stops for these routes close to rail stations. Facilitating convenient connections between bus and rail services makes the network stronger and benefits passengers by improving travel times and reliability.

CapMetro currently has two rail connector routes that circulate neighborhoods surrounding stations along the Red Line, in addition to other frequent and local routes that connect to the train.

SCHEDULE DESIGN GUIDELINES

Predictable and reliable transit services are easier for people to use and can help attract new riders and improve the experience of current riders. Customers need to know when a service will be there, that they can transfer reliably to a connecting service, and that they won't get stranded somewhere without a ride. When and how often a bus or train comes, and when the services start and stop throughout each day make up the service levels of a route. A good level of service is provided by a route that runs as early, late and as often as riders need it while still remaining productive and efficient. The following section defines the guidelines for schedules and the desirable service levels by type of transit.

Schedules should be predictable and easy to remember.

CapMetro designs schedules on repeating patterns, making them easier for people to remember. For this reason, routes that travel on consistent streets and at regular scheduled times are more successful than those that don't. CapMetro aims to schedule frequencies on round numbers, such as 15, 30, or 60 minutes, so that they are consistent and easier to remember.

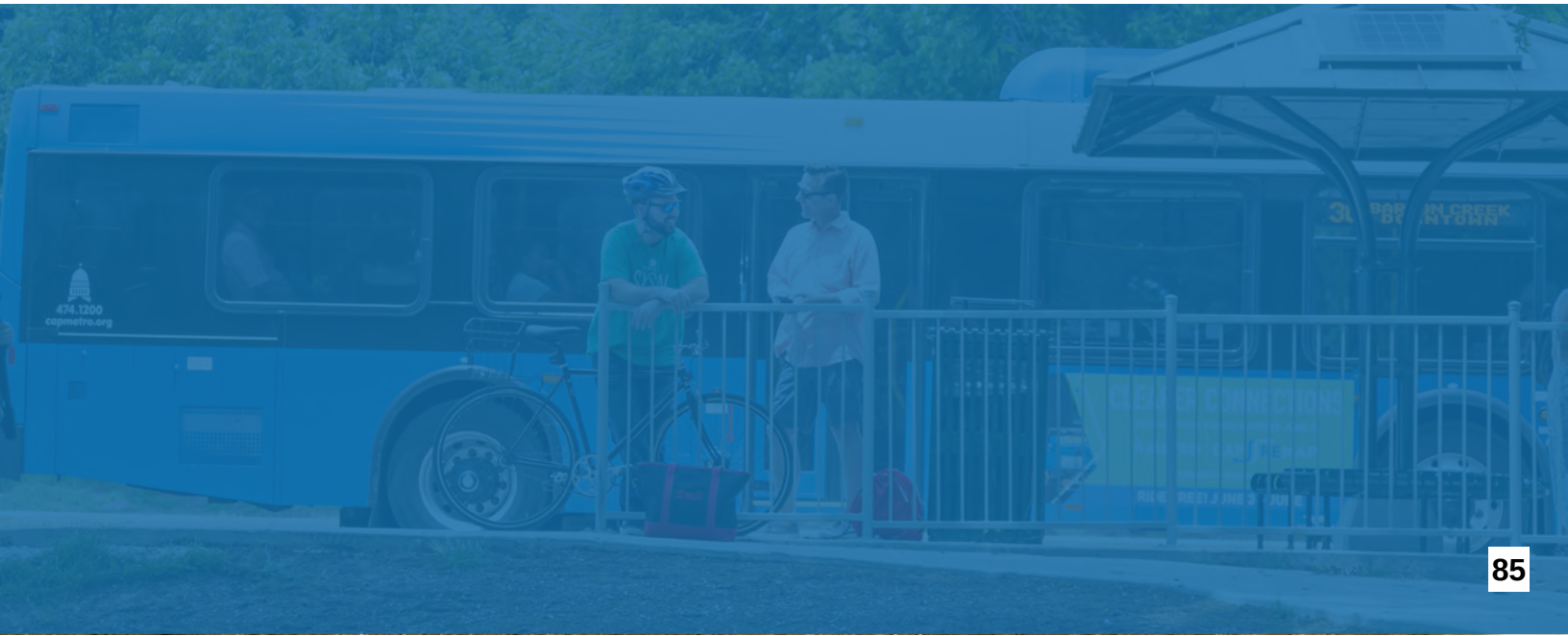
At CapMetro, a route's frequency is often associated with its service type; Local service typically runs at 30 minutes, and Frequent routes run every 15 minutes. When a route's frequency must differ from its assigned service type due to limited resources, schedulers will choose the closest possible clock-face headway. For example, CapMetro Local Route 30 runs at a 35-minute frequency, as opposed to a 32-minute or 36-minute frequency, to ensure riders can easily remember when their bus will arrive.

Helpful Definitions

Span: The number of hours in a day that revenue service is provided. Time starts when the first bus arrives at its first timepoint to when the last departs from its last timepoint.

Frequency: How often (in minutes) a bus passes by a bus stop during an hour.

Schedule: The schedule is how the span and frequency operate throughout the day. Most often, this lays out each trip and the expected time of service from the start of the line, at timepoints, and at the end of the line. A schedule helps riders plan when they would need to reach a stop in order to use transit service.



Timepoints should be used to keep routes running on time without sacrificing the rider experience.

Part of the route planning process involves determining which bus stops along a route are noted in the schedule as having a set departure time. Bus stops with these scheduled times are called timepoints. Timepoints are at existing stops along the route and help ensure buses remain evenly spaced and on schedule. Timepoints may also be used to communicate route schedules to the public. If a bus is running ahead of schedule, the driver will stop and wait at the designated timepoint before departing at the scheduled time.

Typically, timepoints are spaced every 8-12 minutes along the route. However, on local or community routes, timepoints can be spaced as close as every 4-6 minutes.

Timepoints are typically located at bus stops that:

- Serve a large number of riders
- Are near major intersections
- Are major transfer points
- Have a safe place and enough space for the bus to layover

On routes that share a path, timepoint locations are ideally the same for both routes along the shared stretch.

Communication about Timepoints is Important to the Community

Survey respondents generally felt that timepoints did not have a negative impact on their trip planning, either because they planned ahead to arrive on schedule or they were not in a rush. There were some respondents who expressed frustration with timepoints during rush hour and suggested better route optimization to minimize the need for buses to wait at stops.

Whether respondents had neutral or negative responses to timepoints, there was a general desire for better communication of these timepoints and their impact. CapMetro is now working to implement timepoint announcements on their vehicles to make customers aware of scheduled stops and their purpose.

"A timepoint has not impacted me in a significant way, I like that they are trying to match the schedule as it is not only an issue when buses are late, but also when buses leave earlier than the scheduled time."

"They're a little annoying when they're the stop immediately before my destination but I appreciate the commitment to the schedule because it would be chaos otherwise. And anyway, usually they aren't too long."

"I usually plan ahead for those, but it would be nice if they were announced more for routes I don't take as often."

STOP & STATION DESIGN GUIDELINES

The quality of transit facilities is important to the rider experience. See the CapMetro **Transit Stop & Station Design Guidelines** for more details on how CapMetro places stops and allocates different amenities across the city equitably and cost-effectively.

Stops and stations should be placed and designed to support safety, speed and access.

When designing bus stops or train stations, most transit agencies use strategies that support faster and more reliable transit service. Some of these include:

- Placing bus stops on the far-side of intersections to reduce conflict with turning drivers and minimize delays for bus operators to maneuver back into traffic
- Ensuring that stops or stations are not located too close together
- Implementing near-level, all door boarding and off board fare collection that speeds up the time it takes for passengers to get on or off vehicles when they are stopped
- Constructing longer bus stops at busier locations so more than one vehicle can stop at a time to load or unload passengers
- Considering the appropriate bus stop configuration for a specific location; in-lane bus stops are preferred and will be prioritized because they can reduce delay caused by vehicles needing to merge back into traffic, while bus pullouts will be considered in some cases based on built environment and traffic conditions

Amenities make transit more accessible, comfortable and convenient.

Time spent waiting for transit is part of a customer's trip, and CapMetro strives to make this as comfortable as possible. Important amenities provided at many CapMetro transit stops and stations include, but are not limited to benches, route maps and schedules, lighting, shelters, trash and recycling bins.

CapMetro's commitment to equity means uplifting and empowering riders who would benefit the most from improved transit accessibility and amenities. CapMetro recognizes the importance of allocating transit amenities equitably across the service area and prioritizing areas that have been historically underserved or lacking in quality infrastructure. Equity is a major metric that the agency considers when evaluating stops as part of its bus stop improvement program, along with ridership, proximity to key destinations, community input and other factors.

Accommodating accessibility of all transit users is also a key part of the design of CapMetro stops and stations. At a minimum, stops and stations are built to comply with ADA regulations. CapMetro also strives to ensure that transit facilities provide space for riders with mobility devices to maneuver and auditory and tactile information technology for riders who are visually impaired, so that all members of the community may use the transit system safely and independently. CapMetro also works with partner jurisdictions to improve adequate sidewalk and pedestrian crossing access to transit stops.

SERVICE STANDARDS

To ensure that CapMetro provides transit service that meets the needs of riders and follows the **Service Guidelines & Best Practices** identified above, the agency continuously compares its services to set performance standards. The **Service Standards** describe how to measure the success of CapMetro services, and when it might be warranted to take corrective actions to address any issues that arise.

The **Service Standards** are meant to be an input or consideration for decision-making that supports a data-driven process for tracking when a service is underperforming and action should be taken. When updating the standards, CapMetro reviewed recent historic data for how transit service has been performing, as well as several peer agency standards to ensure service performance measures are comparable against other transit systems of similar size and population.

The **Service Standards** are divided into two main sections:

- **Service Quality** includes metrics that keep transit service safe, comfortable, and convenient for riders.
- **Service Effectiveness** describes the metrics that track how well transit service is working, including its productivity, availability and cost to run.

The standards also describe actions that can be taken when a service is not meeting the expected level of performance. These actions fall under the following types of changes:

Reallocate

Resource adjustments that respond to overcrowding or reliability issues, such as increasing vehicles on a route or building transit priority infrastructure

Optimize

A change to the frequency, span, or route alignment of service to better match demand

Expand

Adding a new route to the network

Reduce

Removing a route

Adjust

Bus stop placement, configuration, or amenity change resulting from one of the changes above

The Service Change Process and how CapMetro decides to take action to address underperforming routes is discussed further in the following **Service Changes & Evaluation** section.

SERVICE QUALITY

CapMetro regularly evaluates its routes to ensure high quality service. Quantitative indicators such as those described in this section as well as qualitative information, like feedback from the community and operators, are used to evaluate how well service is meeting riders' needs. The following metrics were developed based on industry standards and adjusted for each of the corresponding CapMetro service types.

Transit should be convenient and reliable for riders.

On-Time Performance

Travel time is one of the most important factors when evaluating service quality from a rider's perspective. A rider's trip starts before they get on the bus. It also includes the time it takes them to travel to the bus stop or rail station, the time spent waiting for the bus or train, and sometimes the time waiting to make a connection to another route. When buses or trains depart later than scheduled, this adds additional time to a trip. When a vehicle departs before scheduled, a rider may be forced to wait for the next one even if they have arrived on time. An unreliable or unpredictable transit service can be extremely frustrating for riders, making it difficult to use.

There are a variety of reasons why buses or trains will get off schedule from time to time, but there must be a balance between riders' needs and the realities of operating in an environment with many factors that could delay operation. For a service to be considered "on time," it should not depart early, as that element is usually within the control of CapMetro. Some services, such as High Capacity rail lines, have higher expectations for being considered on time because they typically operate in their own right-of-way and are therefore not generally impacted by general traffic conditions. These services have a smaller window of time for being considered late, and a higher percentage of trips should be within the on-time window, as compared to bus routes that share space with automobile traffic. The below percentages describe the expected amount of trips that depart within the set on-time window for that service type.

Service Type		On-Time Window	On-Time Standard
High Capacity	Commuter Rail	0-3 minutes	90%
	MetroRapid	0-6 minutes	85%
Frequent		0-6 minutes	85%
Local		0-6 minutes	85%
Limited		0-6 minutes	85%
Community		0-6 minutes	85%

What can be done if the standard is not being met?

Routes with trips that are consistently leaving earlier or later than the on-time window should be examined to determine the reasons behind the issue. Some common issues include buses getting stuck in traffic, construction along the route and issues with the schedule, such as having too much or not enough slack in the schedule at timepoints. On-time issues should be prioritized for review during the service change evaluation based on the severity and longevity of the issue, or how far from the standard it is and how long the issue has been occurring.

Travel Time Reliability

Like on-time performance, the travel speed of a transit route has a direct impact on its usefulness and its operating cost; slower service requires more vehicles to deliver a given frequency. Maintaining similar average operating speeds to other modes of transportation ensures a competitive transit service that riders can rely on to meet daily needs.

Travel time standards determine scheduled speed, which is in turn used to build route schedules. When actual speeds do not meet the standard for scheduled speeds, routes will struggle to run on time. As discussed in the above Guidelines, transit speed can be slower when:

- Lots of riders are using the service: more people getting on and off the bus than normal can slow down transit and cause it to get behind schedule.
- High levels of traffic congestion: Sitting in traffic and at lights slows down service, which can cost more money in order to provide the same level of service over time as traffic conditions worsen.

A travel time reliability ratio compares the travel time variability, or how different the travel time across a section of a route can be at a given time of any day, relative to the minimum variability seen. Travel time variability is summarized at a segment level, and is useful for understanding how travel times change throughout the day in different areas of the transit system. This is a way to measure the reliability of travel time when taking transit.

A high travel time reliability ratio indicates that a segment has very different travel times throughout the day, making service less predictable for riders. CapMetro reviews route segments with a high travel time reliability ratio to identify areas where intervention may be warranted to improve transit service quality.

What can be done if issues are identified?

Because some routes partly overlap, varying amounts of service are provided along their different segments. Because of this, scheduled speed should be evaluated for each unique route segment and not at the route level. However, riders expect a certain service quality, especially for High Capacity routes, so it is especially important to make these services competitive in speed. Rapid routes should be prioritized for improvements to speed up buses to make the service visible, emphasizing transit on key city corridors and ensuring that the service remains reliable for riders.

There are many ways to speed up transit which vary in cost and effectiveness. The ATX Transit Enhancement Toolkit outlines many options that can be explored to help a route when it is slow, including intersection treatments such as a queue jump or transit signal priority, moving near-side stops to the far-side of the intersection or adding transit priority infrastructure like contraflow bus lanes or curbside lanes. CapMetro will also coordinate with other jurisdictions that advance similar transit-supportive infrastructure efforts.

Local jurisdictions are an important partner in transit priority infrastructure.

As the Austin region experiences population and employment growth, traffic congestion increases as well. This causes bus routes to become slower, requiring more trips and vehicles to meet the same level of service for riders. Over time, these issues can become detrimental to the health of the route, and make it more costly to run. CapMetro and the jurisdictions within its service area are partners and are working together to implement solutions. For example, the City of Austin and CapMetro are collaborating to determine the areas with transit speed and reliability issues to prioritize the path forward for larger capital projects to support transit priority. Please see the **ATX Transit Enhancements Report** for more information.

Frequency and Span

Frequency describes how often the bus comes, and span describes the hours each day that the service is running. Service spans and frequencies should be matched to the needs of the community. More service will be provided where there is a high number of transit customers (i.e., ridership) and less service where there is a lower number of transit customers to use resources efficiently. As the frequency of a route decreases it becomes more difficult for a customer to plan around, so all CapMetro fixed route service maintains at least a 60-minute frequency.

The service spans and frequencies listed here are typical levels for each service type. More or less service in terms of span or frequency may be warranted on a case-by-case basis. Because riders often use more than one route to complete a trip, it is beneficial to standardize spans and frequencies among routes of the same type.

High Capacity Routes

Rapid	Span	Frequency (minutes)				
		Early AM	AM Peak	Midday	PM Peak	Night
Weekday	5:00 AM to 12:30 AM	15	10	10	10	20
Saturday	6:00 AM to 12:00 AM	15	15	15	15	20
Sunday	6:00 AM to 11:30 PM	15	15	15	15	20

Commuter Rail	Span	Frequency (minutes)				
		Early AM	AM Peak	Midday	PM Peak	Night
Weekday	6:00 AM to 8:30 PM	30	25	60	30	-
Saturday	10:00 AM to 1:00 AM	35	35	35	35	35

Frequent Routes

Frequent	Span	Frequency (minutes)				
		Early AM	AM Peak	Midday	PM Peak	Night
Weekday	5:00 AM to 12:00 AM	30	15	15	15	30
Saturday	6:00 AM to 12:00 AM	30	15	15	15	30
Sunday	6:00 AM to 11:00 PM	30	30	30	30	30

Local Routes

Local	Span	Frequency* (minutes)				
		Early AM	AM Peak	Midday	PM Peak	Night
Weekday	5:00 AM to 11:00 AM	30	30	30	30	30
Saturday	6:00 AM to 11:00 AM	30	30	30	30	30
Sunday	6:00 AM to 11:00 PM	30	30	30	30	30

**Typical frequencies – some Local routes run at lower frequencies at different times of day based on demand*

Limited Routes

Limited	Span*	Frequency (minutes)				
		Early AM	AM Peak	Midday	PM Peak	Night
Weekday	6:00 AM to 9:00 AM 3:00 PM to 7:00 PM	-	20	-	20	-

**Minimum span – Some Limited routes operate throughout the day*

Community Routes

University Shuttles	Span	Frequency (minutes)				
		Early AM	AM Peak	Midday	PM Peak	Night
Weekday	7:00 AM to 11:30 PM	-	15	15	15	15
Sunday	3:00 PM to 10:00 PM	-	-	-	60	60

Night Owl	Span	Frequency (minutes)				
		Early AM	AM Peak	Midday	PM Peak	Night
Weekday	12:00 AM to 3:30 AM	-	-	-	-	30
Saturday	12:00 AM to 3:30 AM	-	-	-	-	30

Taking transit should be a comfortable experience.

Overcrowding and Load Maximums

Maintaining a reasonable passenger load on vehicles is another goal that helps CapMetro provide high-quality and comfortable service that meets the needs of riders. Typically, riders can expect to have a place to sit when they get on a bus or train, but that is not always possible. During peak periods in most large urban areas, there are bus and rail lines that require some riders to stand for at least some portion of the trip. If a rider is able and the travel distance is not too long, standing on transit vehicles is considered an acceptable part of using the service. Some routes and riders do travel longer distances; for commuter services where longer distances are expected, the standard is that loads should not normally require a rider to stand.

A route exceeds overcrowding standards when average capacity exceeds the number of people in the table below, or when standing loads last for 20 minutes or more on a trip.

Service Type			Peak Max Load
High Capacity	Commuter Rail		212 people
	MetroRapid	60’ bus	110 people
		40’ bus	80 people
Frequent	60’ bus		110 people
	40’ bus		80 people
Local	40’ bus		80 people
	35’ bus		60 people
Limited and Community	40’ bus		80 people
	35’ bus		60 people
	Over the Road Coach		57 people

What can be done if the standard is not being met?

Consistent overcrowding on a transit vehicle may indicate the need for improvements to the frequency of the service or an increase in the capacity of the vehicles used to run the service. When a trip routinely exceeds the maximum rider or load threshold, adjustments should be studied and implemented as part of the service change process. Shorter-term measures include assigning larger vehicles to the route where possible or the addition of “Run as Directed” (RAD) buses or extra trains for portions of the route to provide temporary additional capacity.

Longer-term adjustments include adding vehicles to the service and increasing service frequency for all or a portion of it. Short-turning trips for buses, or “trippers,” provide additional bus service on a specific segment of a route with capacity issues. Short-turn trains are used for peak service and are scheduled to serve only a segment of the line. Trippers and short-turn trains should include clear communication about start and end points to avoid any potential customer confusion.

Transit Amenities

The quality of transit facilities is important to the rider experience. Bus stops and stations should be kept clean, well-lit and easy to identify with clear signage and recognizable colors and features. This also enhances the visibility of the transit system and can reinforce the service as a high-quality resource within the community. Information on routes and their schedules and destinations will be clearly posted at any stop.

Based on factors like ridership, available space and the surrounding environment, stops will have additional amenities including seating and shelters that provide protection from rain, wind, and sun. Trash cans, landscaping, art installations and wayfinding features may also be added to enhance the space. Wherever possible, stops and stations will be located in places with more pedestrian traffic so they are easy to find and access. See the CapMetro **Transit Stop & Station Design Guidelines** for more details on how CapMetro places stops and allocates different amenities across the city equitably and cost-effectively.

Accessibility

The setting around stops is also vital to the safety and ease of use of transit riders. Facilities must be fully accessible by riders regardless of age or ability. The waiting area should be an appropriate size to accommodate passengers with enough room for those using mobility aids such as a wheelchair to board. Wayfinding at or around bus stops is also critical for riders who are blind or have limited sight. This includes using special bus stop poles and signage as well as truncated domes or other tactile warnings in the pavement. Bus stops will be located at or near a clear place to cross the street wherever possible so that riders can access or depart from them safely. Sidewalk availability is also important near transit facilities, as most riders start and end transit trips on foot. Nearby bicycle and scooter parking can also facilitate flexible, multimodal first- and last-mile connections.

People should feel safe using transit.

Transit moves people, but it's important for it to be safe, comfortable, and convenient to use as well. In terms of vehicle safety, taking the bus or train is statistically one of the safest modes of transportation. Prioritizing connectivity and accessibility in the design of transit facilities and their surrounding infrastructure can also enhance the physical safety of riders throughout the stages of their trip. Lighting and visibility are considered as part of the design of amenities and placement of stops. Determined minimum setbacks from the curb are also important to protecting pedestrians and waiting passengers from vehicle traffic and may be supplemented by bollards or other barriers.

Additionally, CapMetro's public safety program combines mental health-first community intervention and outreach techniques with customer support and traditional law enforcement presence, comprising a range of safety resources that can be accessed based on the needs of given situations.

Incidents of Service Interruption

While some service interruptions are outside of CapMetro's control, many mechanical failures can be prevented through ensuring vehicles are kept in a good state of repair. Vehicles and transit equipment are regularly rehabilitated or replaced based on their age in terms of years and/or mileage.

Sometimes buses experience unexpected mechanical failures or incidents while in service that require a road call, which can result in a bus being towed back to the yard for maintenance. There are a variety of other reasons a service might experience an interruption, including a crash or collision, a passenger becoming ill on the bus, electronic issues, mechanical issues, or security needs requiring action or a change in vehicle. Because service interruptions can impact the passenger experience, they are regularly monitored and evaluated by the Operations team so they can be addressed as needed.

SERVICE EFFECTIVENESS

Service effectiveness measures provide insight into how many people can benefit from using CapMetro service compared to how much that service costs to operate and maintain. The following metrics help determine how best to maximize high-quality service for many people using available resources in a responsible way.

CapMetro should be good stewards of their limited resources.

Productivity

The productivity of a route can be measured in several ways. CapMetro analyzes productivity based on ridership and hours of service, or revenue hours:

- **Riders per revenue hour** – the number of boardings divided by the total number of hours the vehicles on a route are in service

These measures describe how many people are using CapMetro routes compared to how much it costs to run them. Using ratios allows CapMetro to make comparisons between unique routes and understand which routes are using resources most effectively over time.

Helpful Definitions

Revenue Hour: One transit vehicle in revenue service for one hour. You will often see more than one operator on a route at a time to achieve a desired frequency.

Service Type		Productivity Standard
High Capacity	Commuter Rail	N/A
	MetroRapid	20 riders/hour
Frequent		15 riders/hour
Local		10 riders/hour
Limited	Express	6 riders/hour
	Flyer	6 riders/hour
	Rail Connector	6 riders/hour
Community		4 riders/hour

What can be done if the standard is not being met?

Routes are more productive when their level of service matches the level of demand for transit. If a route continually shows low productivity, that may be a sign that the route should be evaluated for improvements or reallocation of its resources. If a route is highly productive, it might warrant a higher frequency to continue to meet demand.

Running fewer vehicles on the route at a lower frequency can decrease the cost of a less productive route and allow those resources to be reallocated to another route that is experiencing overcrowding or has the demand to support more frequent trips. Low productivity routes may also serve lower demand areas or lack strong anchoring destinations. Routes that are less direct and more circuitous may have to travel farther while attracting fewer riders, making them less productive as well.

Cost Effectiveness

Several factors influence the cost to run transit service, including the number of vehicles, hours of operation, operator wages, vehicle maintenance and repairs, and fuel. Measuring a route's operating cost per rider shows how many people are using it compared to how much it costs to run. In general, the ratio of riders to operating costs improves when transit service is more efficient, because it can carry people farther and faster in the same amount of time. However, the variables that impact the cost to operate CapMetro service have been fluctuating in recent years, with the cost to run service going up and ridership down.

CapMetro is also in the process of purchasing electric vehicles and constructing charging stations needed for an electric fleet, which impacts the cost to operate service. Due to this changing environment, CapMetro reviews costs and sets a reasonable threshold of cost per rider prior to each service change in order to assess cost feasibility. This ensures that the latest data and operating environment factors are always taken into account.

What can be done if the standard is not being met?

Similar to productivity measures, cost effectiveness is maximized when transit service matches patterns of demand. Cost-saving measures often take the form of service reductions; decreasing the number of trips a route makes each day can reduce costs, but this also requires reducing its frequency, span or both. Alternatively, reducing deviations and making routes more direct can also help them run more efficiently.

Increasing speed and reliability of transit routes also makes them more cost effective. Efforts to reduce delays by implementing transit priority treatments can also improve efficiency, although many of these methods require an upfront investment and cooperation with other agencies like the City of Austin. Ensuring a route's stops are spaced appropriately rather than too close together also reduces delay caused when vehicles stop.

Transit resources should be allocated equitably and accurately.

Service Availability

CapMetro measures service availability to identify the parts of the service area that have enough population density to support transit service, and to determine how well the transit service provided in those areas is distributed.

CapMetro's service availability standard defines the transit-supportive service area as locations within the CapMetro service area with at least 16 people per acre (10,240 people/sq mile). The service availability standard measures the total number of residents in the transit-supportive service area that can access transit stops within a 5 minute walk or roll (1/4 mile). The target indicates that 95% of residents living within a transit-supportive area should have access to at least one transit stop within .25 miles of their residence.

Service Area Definition	Density Threshold	Walk/Roll Distance from Transit Stop or Station	Target Percent of Residents
Transit-Supportive Area	16 people/acre (10,240 people/sq mi)	.25 miles	95%

What can be done if the standard is not being met?

As discussed in the System Design Guidelines, land use and transit are fundamentally connected and transit routes are more efficient when they serve areas where more people live and work.

There are two main factors that can influence service availability findings:

1. An increase or decrease in transit coverage (e.g., removing a transit stop or route)
2. An increase or decrease in population density (e.g., more people moving into or out of an area)

Typically, CapMetro reviews the provision of transit service in the service area by conducting what is often referred to as a market analysis. This analysis is completed during a service plan to determine if the transit service being provided matches the transit demand. During this process, CapMetro reviews opportunities to fill gaps where additional service is needed or where transit stops and stations are too far apart or close together. Solutions that address these issues can impact service availability results.

Although calculating service availability is closely tied to population density, the factors that influence population density and housing supply in the service area occur over the longer term and should be looked at comprehensively. CapMetro has been involved in planning for Equitable Transit Oriented Development by advocating for mixed-use, affordable development near transit and supporting zoning that permits this type of land use, and will continue to collaborate with jurisdictions to encourage transit-supportive development in the service area.

Vehicle Assignment

Vehicle assignment refers to the process by which transit vehicles are allocated to routes throughout the CapMetro network. Several factors are considered when determining the type of vehicle most appropriate for a route, including:

Service Type – Generally, a fixed route bus service will require a 40’ or 60’ bus, while Commuter Rail routes require train cars known as diesel multiple units (DMUs). However, there are occasionally exceptions to this rule to meet community or operational needs. For example, express routes require a 45’ Over the Road Coach (ORC). These vehicle types offer seating more suited for long distance travel.

Ridership and Vehicle Capacity – Vehicle assignments are typically determined based on Automatic Passenger Counter (APC) data in CapMetro’s scheduling software. The software ensures that vehicles that are the right size are available based on ridership data and any customer or operator feedback about crowded buses. For example, low ridership routes may be assigned a 40’ bus whereas high ridership routes may be assigned a 60’ bus.

Compliance with Grant Awards – CapMetro is a proud recipient of discretionary federal grant funding, and as a result, must align with what was outlined in the original grant application. For example, current MetroRapid routes require specialized branding, and some future routes may require electric vehicles based on federal grant funding received.

Service Type		Vehicle Type	Appropriate Assignment Rate
High Capacity	Commuter Rail	DMU	100%
	MetroRapid	60’ or 40’ bus	80%
Frequent		60’ or 40’ bus	80%
Local		60’ or 40’ bus	80%
Limited	Express	45’ Over the Road Coach*	80%
	Flyer & Rail Connector	60’ or 40’ bus	80%
Community		60’ or 40’ bus	80%

**These vehicles offer seating more suited for long distance travel. ORCs cannot be used for interlining due to their size.*

What can be done if the standard is not being met?

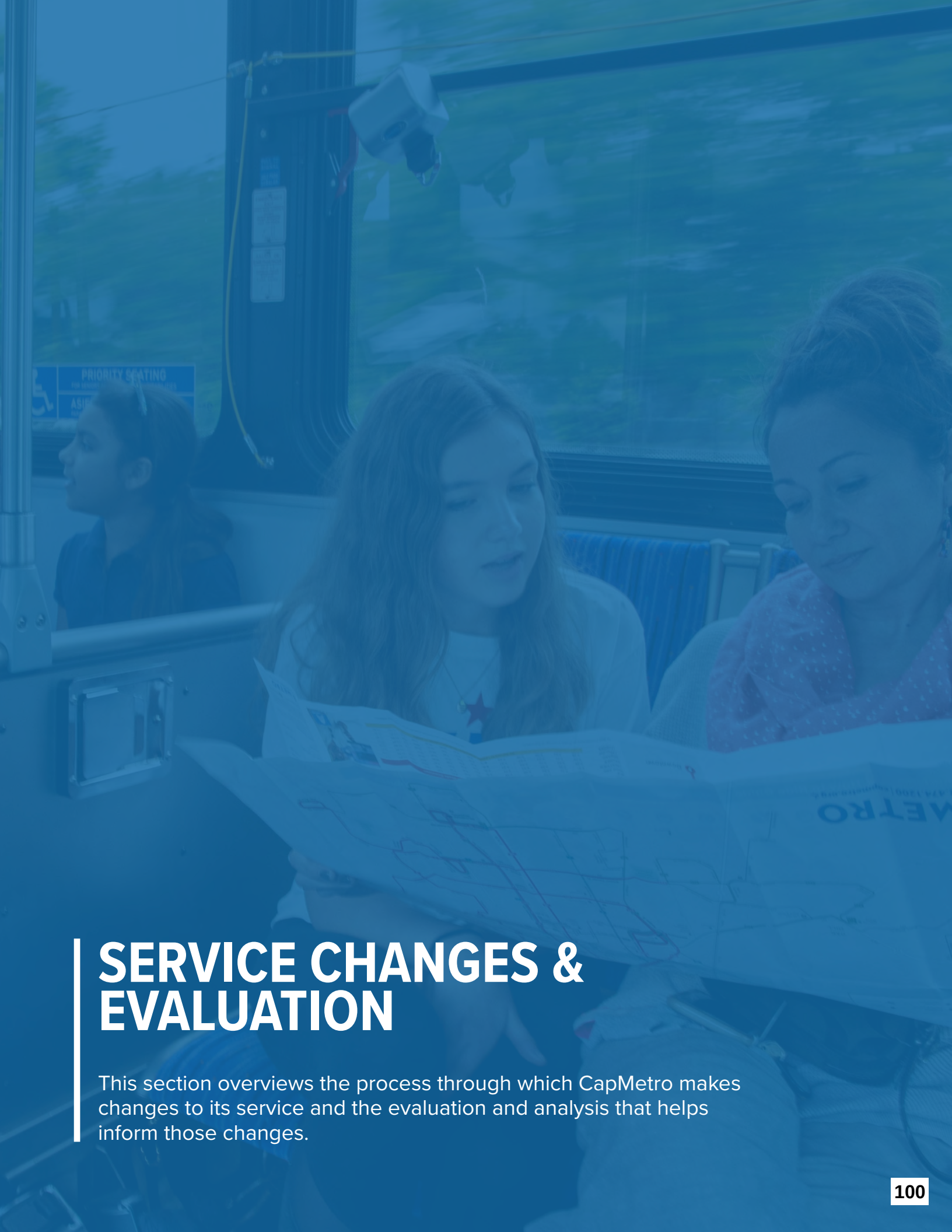
Vehicle assignment accuracy can be impacted by vehicle and operator availability. If vehicle allocation becomes a concern, CapMetro may hire additional operator staff or procure additional vehicles as budget constraints allow.

SERVICE MONITORING

CapMetro keeps track of several measures that are required by FTA Circular 4702.1B Title VI Requirements and Guidelines and are reported to FTA every three years. Reporting these standards involves analysis that ensures that CapMetro’s resources are distributed evenly and equitably throughout the region. The standards that are reported for FTA service monitoring include:

- On-Time Performance – Are transit vehicles departing from timepoints on time?
- Vehicle Frequency – How often does a vehicle pass by a stop or station during an hour?
- Vehicle Load – What is the ratio of passengers to total seated capacity?
- Service Availability – How much of the service area has bus stops within walking distance?
- Transit Amenities Policy – How are bus stop and station amenities distributed?
- Vehicle Assignment Policy – How are vehicles assigned to routes?

More details on the FTA Title VI Service Monitoring Process can be found in the **Title VI Monitoring Fact Sheet**.



SERVICE CHANGES & EVALUATION

This section overviews the process through which CapMetro makes changes to its service and the evaluation and analysis that helps inform those changes.

SERVICE CHANGES

CapMetro is continuously assessing service performance and feedback to make improvements for customers and the community. There are several recurring planning efforts undertaken by staff and approved by the CapMetro Board of Directors, each at different points in time and with varying levels of detail.

Every 5-10 years: Service Plan* – Entails analysis of demographic, land use, development, and transit ridership patterns across the CapMetro service area and evaluation of CapMetro services as a holistic network. Explores issues and opportunities for potentially larger changes to routes or groups of routes based on bigger changes happening over a longer time period. The last update was completed in 2017 with the next update effort beginning in 2023.

Every 5 years: Update Service Standards & Guidelines* – The previous update was completed in 2015.

Every 5 years: Origin & Destination Study – Involves surveying riders on vehicles to collect information on how and why people are using CapMetro services. Findings from this study help guide service planning and proposed changes. The most recent survey was completed in Summer 2023.

Every 3 years: Service Monitoring – federally required reporting on service performance. See the **Title VI Monitoring Fact Sheet** for more information.

As needed: Stop and Station Placement Evaluation – See CapMetro Transit Stop & Station Design Guidelines document for information on the process.

Multiple times per year: Service Changes* & Evaluation – Key Performance Indicator (KPI) evaluation that determines what service changes are proposed and implemented at designated Service Change periods three times a year.

Multiple times per year: Special Events – Austin City Limits, SXSW and Holidays require careful planning for changes in service. There are several specific staff committees dedicated to this work at CapMetro.

**Approved by CapMetro Board of Directors*

Because the Austin region is growing so rapidly, the landscape of where people live, work, and want to go is changing often. New developments, increased cost of living, shifting residential patterns, emerging employment hubs, changing traffic conditions, and infrastructure enhancements are all factors that can impact CapMetro service. Staff consider these changes when reviewing route performance and may make adjustments to routes so that they best serve the community.

CapMetro is continuously monitoring data and customer reports to ensure that service is running smoothly.

Outside of these specific processes outlined in this document, CapMetro also has specific teams that meet biweekly throughout the year to closely monitor the transit service. One team is called the Continuous Customer Experience Improvement Team, which reviews metrics such as On-Time Performance issues and Overcrowding on a regular and frequent basis.

Underperforming Service and When to Take Action

As discussed in the **Service Standards**, there are multiple actions that can be taken when a service is not meeting the standard. These actions fall under the following types of changes:

Reallocate: Resource adjustments that respond to overcrowding or reliability issues, such as increasing vehicles on a route or building transit priority infrastructure

Optimize: A change to the frequency, span, or route alignment of service to better match demand

Expand: Adding a new route

Reduce: Removing a route

Adjust: Bus stop placement, configuration, or amenity change resulting from one of the changes above

The following are examples of how CapMetro might respond to the issue of an underperforming route:

- Targeted marketing;
- Adjusting frequency or service span;
- Rerouting;
- Rescheduling;
- Eliminating or rerouting unproductive route segments;
- Consolidation of routes or portions of routes;
- Replacement with Pickup service; and
- Elimination of the route when none of the above actions are viable or prove successful.

If service elimination is under consideration, careful investigation will be done to maintain service for populations who rely on transit (people without a car, seniors and youth, BIPOC populations, riders with disabilities and low-income populations). For under-performing routes identified by CapMetro as a minority route, or a service where more than a third of the route's alignment travels through minority block groups, an additional 12 months should be allotted to meet targets after a service change has been made.

Helpful Definitions

Minority Route: Identified when more than 1/3 of a route's revenue miles are contiguous with minority block group(s) in the route's served area

Minority Block Group: A Census block group with BIPOC or low-income population percentages that are higher than the CapMetro service area average

Served Area of a Route: Area within a quarter mile buffer around a non-frequent route's stops or a half-mile buffer around a frequent route's stops

Evaluating New Services

Within the first year of implementation of a major change, services may be adjusted to help the service run more efficiently but should not be modified in significant ways. Riders often take some time to adjust to the new and changed services and it takes time for that market to develop. Typically, transit agencies will allow for some form of a "ramping up" period to allow for routes to be given time to

'mature' before their performance is evaluated against the same standards as mature routes. During this period, performance of new or changed service will be observed but not altered, because no service will be viewed by the public as dependable if it is too frequently changed.

After the first year, CapMetro expects that a service will meet 60% of the minimum thresholds described in the **Service Standards**. After 24 months of a service being introduced or since the last major change, a route should have a mature market and be expected to meet the standards. For a route that is underperforming but within 10% of its target and has shown growth over the previous 6 months, the service should be given six additional months to meet targets before a service change is studied.

Changing Service from Fixed Route to Pickup

When evaluating route performance in a certain area, one option is to consider creating a Pickup demand-responsive service. There are costs associated with creating a new Pickup zone or expanding an existing one. However, where a route(s) fails to meet performance standards, converting it to a Pickup zone could be a feasible solution.

Should conversion result in overall cost savings to CapMetro, savings may be re-invested in fixed-route service improvements, such as frequency or span increases, in other parts of the network.

Most Common Reasons for Service Changes

- Results from the evaluation of services that need improvements or corrective actions in order to meet the service standards
- Input from CapMetro employees, particularly operators who are most familiar with route issues and the public
- Service Planning staff recommendations to explore better operating alternatives

Other common reasons include:

- Providing improved service to riders that heavily rely on transit (low-income populations, people with disabilities, people of color)
- Seasonal school schedules (University of Texas, Austin Community College, etc.)
- Requests from the public, especially similar requests from multiple riders
- Requests from community institutions such as employers, educational and medical facilities, social service providers or developers
- Regular reviews of the effectiveness and quality of service that identify the need for a service change
- New common destinations, developments or streets that create transit demand

Responding to Requests for Service Changes

CapMetro frequently receives requests to create new services or bring back old services. Given the limited funding for putting transit service out on the street, it is very difficult for CapMetro to act upon and implement every request. CapMetro aims to provide a high quality, efficient and useful transit service, while balancing the needs of the residents in the service area and being good stewards of taxpayer dollars. These Service Standards & Guidelines provide a basis from which to review service requests received and to evaluate what can be done given the amount of funding available.

SERVICE CHANGE PROCESS

Service changes provide an opportunity to modify CapMetro service to better suit riders' needs. They can encompass changes to route alignments and schedules as well as physical amenities like bus stops and other facilities. Service changes occur three times per year: in January, June, and August. This schedule keeps changes predictable for both riders and operators and coincides with academic calendars, although extenuating circumstances may create the need for adjustments at other times.

The service change process allows CapMetro to adjust existing services, implement new services, and if necessary, realign, consolidate, or discontinue consistently unproductive route segments or scheduled trips. Service changes are important to ensure that CapMetro routes are doing what they need to do to meet the community's needs.

A service change is not an individual change in bus stop placement or configuration, which may occur as needed throughout the year. More information about this process can be found in the **Stop and Station Design Guidelines** document.

Service Change Process

★ *Step requires data analysis*

Service Change Timeline

Identify the Issues

Service evaluation is an opportunity to review issues and opportunities for CapMetro routes, which are informed by the following factors:

Review Community Feedback – CapMetro begins the service change process by reviewing information to understand what, if any, routes are not performing as expected, and who is being impacted by underperforming routes.

Staff across departments are collecting constant feedback from riders and operators, which is documented and used to identify issues and opportunities for individual and groups of routes throughout the year. Planning staff prioritize comments from vulnerable communities in the Austin area, such as low-income residents, seniors, individuals with disabilities, zero-car households, youth, and people of color.

Riders who give comments to customer service, attend board meetings, and participate in outreach activities bring valuable insight to the service planning process from the perspective of those who use services every day. Operators who have day-to-day experience with CapMetro routes also provide suggestions to help service run more efficiently. Feedback from these sources as well as CapMetro leadership is documented and considered when planning staff evaluates a route for potential improvements.

Evaluate New Streets & Key Destinations – The service evaluation process is also an opportunity for CapMetro to adjust service based on changes within the environment. Streets that are built or improved may provide a chance to straighten a route's alignment or to have it run closer to an important destination.

New developments or key destinations such as a new medical clinic, affordable housing development, grocery store, or retail center may also warrant adjustments to nearby service. Long-term construction efforts can also require realignments or schedule changes to minimize impact to the customer experience.

Analyze KPIs – Many of the KPIs described in the **Service Standards** are data inputs that can show when a route may need to be adjusted so it is more reliable or effective. As part of the service change process, CapMetro staff evaluate the performance of existing routes by examining KPIs and comparing route performance to the Service Standards described in the previous chapter. These serve as benchmarks for understanding how far off a route's performance may be from what is expected and define how expectations often vary across different route types, which may have different thresholds that are appropriate to the need that type of route serves.

The primary KPIs used for this part of a service evaluation include:

- **On-Time Performance** – How often does the bus or train depart on schedule?
- **Travel Time Reliability** – How fast is the bus service compared to what is expected?
- **Overcrowding** – How much room is there for passengers on a vehicle? Do vehicles have to skip stops because they're full?
- **Productivity** – How many people ride the bus or train per hour/mile it's running?

While all service KPIs are tracked throughout the year, these key measures are the first ones examined at the beginning of the service change process because their variation can clearly point to routes that might be performing unexpectedly or need additional resources or changes.

Deeper Dive

Once staff identifies routes that are not meeting minimum standards, they will conduct further study to understand the underlying cause and significance of the issue. Analysis at this stage aims to understand where the problem is, how far off it is from the standard, and how long it has been persisting. Data inputs such as On-Time Performance, Travel Time Reliability, Overcrowding, Productivity, Cost Effectiveness, Passenger Hours of Delay may be reviewed for specific segments, stops, and times of day.

Ridership, on-time performance, and vehicle capacity data for specific segments or stops along a route may be used to understand the geographic scope of an issue. Variance across different times of day may also show different needs at peak periods. Performance and cost data from recent evaluations may also be used to compare performance over time to understand when the problem began or whether it has a seasonal cause.

Develop Proposals

Findings from the service evaluation are used to develop a proposal describing prospective changes and their reasoning. Suggested changes may include adjustments to a route's schedule, alignment, or the schedule or alignment of an adjacent route. Changes are informed by the analysis done during the service evaluation, as well as answers to questions like the following:

- Does the change require allocating more vehicles to a route?
- Would the change duplicate other service?
- Is the change feasible? (e.g., is there enough room for the bus to make a required turn or park during a layover?)
- Does the change require operating outside the CapMetro service area?

These considerations help CapMetro staff weigh the prospective changes in the context of available resources. The resulting proposal(s) documents these changes, how they would be implemented, and their justification.

Evaluate Proposals

After drafting a service change proposal or multiple proposal options, staff completes three additional analyses to verify the intended changes will be beneficial to the community.

Trip Pattern Data – Does the proposed change improve a section of a route that has high ridership activity or connects key origins and destinations? Would it add service in an area with many potential riders?

Target Transit Rider Equity Analysis – Would the proposed change impact service on a section of the route used by a high proportion of BIPOC, limited-English speaking, older adults, people with disabilities or low-income riders?

Cost Feasibility – How much money is available to make the proposed change? What is the cost of the proposed change in terms of budget, available staff and vehicles?

Once the proposal or proposals have been examined through these lenses and finalized, they can move through the engagement process.

Compliance with Title VI Analysis for Major Service Changes

All service change proposals undergo the above analysis and review before they are finalized. However, some changes have a larger impact on the community than others and require an additional element of analysis to meet FTA guidelines. The Service Equity Analysis is an additional analysis defined in the CapMetro Major Change, Disparate Impact, and Disproportionate Burden Title VI policy and is meant to ensure that members of marginalized populations are not subject to disparate impacts or disproportionate burdens because of a potential CapMetro service change.

A major service change requiring a Service Equity Analysis is one that meets one of the following criteria:

- The establishment of new fixed-route bus route
- The elimination of any fixed-route bus or rail route in its entirety
- A geographic change on a given transit route of 25% or more of its annual revenue miles
- A change of 25% or greater in the number of annual revenue hours provided; or
- Six months prior to the opening of any new fixed-guideway project (e.g. BRT line or rail line), regardless of whether or not the amount of service being changed meets the requirements above

A major change is not:

- Temporary additions to service lasting less than 12 months
- Route renumbering with no underlying change
- Schedule or service adjustments required by a third party that operates or controls the same right-of-way (such as road closure)
- New fixed-route bus or rail “Break in period” prior to the commencement of revenue service, lasting less than 12 months
- Emergency service adjustments associated with weather or other emergency conditions
- Operations that result from circumstances beyond the control of Capital Metro (such as construction)

The service equity analysis is completed by comparing the existing service with the proposed new service and examining how much change would occur. The analysis then identifies how much of these changes would be experienced by BIPOC riders compared to non-minority riders:

- The adverse impacts experienced by minority riders is expected to be greater than 2% when compared to the adverse impacts experienced by non-minority populations
- The benefits associated with service changes accrue to non-minority populations greater than 2% when compared to minority populations

If the analysis results in either of the above instances of disparate impact, the service change proposal will be revised, or mitigation measures will be determined and included as part of the proposal that moves forward.

The results of any Title VI Service Equity Analyses will be presented to the Board along with the additional data analysis and customer feedback contained in all service change proposals.

Note: The Title VI analysis that is conducted during a service change process is different from FTA Title VI Service Monitoring. See Title VI Monitoring Fact Sheet for more details on that process.

Conduct Outreach

Before finalizing a service change, proposals are vetted through several outreach efforts. The Customer Service Advisory Committee (CSAC) and the Access Advisory Committee, both of which are comprised of community members appointed by the CapMetro Board of Directors, are presented with all service change proposals and their underlying analysis, justification and expected impacts.

Other potential outreach efforts include informing Neighborhood Associations, who may be invited to public meetings to discuss the proposed changes. Presentations to elected officials and governing bodies of partner jurisdictions are available when requested so they can answer questions that may arise from constituents. One-on-one presentations can be scheduled to various elected officials who represent the neighborhoods to explain the service changes.

If the outreach process brings forward any changes, proposals will be revised by planning staff, who will conduct the same evaluation analysis described above. This stage of the process can be iterative, with additional adjustments to the proposed changes made as new information or perspectives are considered. Once the proposed service change is finalized, it is presented to the CapMetro Board of Directors for approval.

Implement Changes

There are many steps to implementing service changes. First, CapMetro will ensure that the changes are understood by existing customers by conducting at-stop or on-board outreach at high-volume stops near the neighborhoods and transfer stations impacted. All marketing materials for the impacted services will also be updated. Online engagement, at-stop signage, and targeted messaging through the CapMetro App as well as on-bus announcements, mailers, and social media can be used to inform riders of the upcoming service changes.

CapMetro staff is also responsible for implementing the behind-the-scenes logistics that are required when a route changes. Updated schedule information is finalized so that the new or changed service integrates with the rest of the network seamlessly, and vehicle operators are trained so that they can answer any questions from customers.


METROPOL

APPENDIX A

TRANSIT STOP & STATION DESIGN GUIDELINES

2023

GLOSSARY

Public Transit or Public Transportation: A transportation system that is available for use by the general public that moves groups of people. As opposed to a private vehicle that generally carries fewer people and has limited access.

Transit Service: A system or network that supplies public transportation in the form of rides to and from different locations provided by a transit agency.

Service Area: The area served by CapMetro transit. This includes cities and communities that have authorized a 1-cent sales tax to fund transit or an in-lieu partnership agreement. The CapMetro service area includes Austin, Jonestown, Lago Vista, Leander, Manor, Point Venture, San Leanna and parts of Travis and Williamson Counties.

Fixed Route: A transit route with a fixed schedule and designated stops for picking up and dropping off riders.

Service Types: Groups or categories of similar types of transit services according to their form or function used to manage and monitor service effectively. For Capital Metro this includes High Capacity, Frequent, Local, Community, Limited and more.

Transit Stop or Station: A location marked with site specific signs, indicating where buses or trains will stop to pick up and drop off riders at designated times.

Stop and Station Types: Groups or categories of transit stops or stations according to their characteristics including number of average daily riders and the service types that use the stop, i.e. MetroRapid.

Stop and Station Amenities: Equipment to improve the experience of a rider when they reach a transit stop and wait for the bus or train. Items like shelter, seating, lighting, waste receptacles and more can improve the comfort, accessibility and ability for riders to use the transit system. Guidance and descriptions of the amenities can be found in the Stop and Station Amenities chapter.

Shared Mobility: Refers to short-term rental mobility options that can be shared like bikeshare or scooters or micromobility devices that use and share the public right-of-way, such as skateboards.

Americans with Disabilities Act (ADA) Compliance: The Americans with Disabilities Act (ADA) of 1990 and subsequent amendments mandates equal access to all public transportation services, regardless of mobility status. The ADA requires that fixed-route transit be accessible and compliance to these mandates often deals with the characteristics of transit equipment, service and boarding areas. For more detailed information and backing on ADA requirements, please visit the link at the top of the paragraph.

Public Rights-of-Way Accessibility Guidelines (PROWAG): Recommended guidelines for designing and constructing facilities within the public rights of way, most recently updated in 2013, as a best practice for accessibility issues in the public right of way not covered by the Department of Justice's currently adopted standards. For more information on PROWAG, visit the link at the top of the paragraph.

Texas Accessibility Standards 2012 (TAS): Technical requirements for accessibility to sites, facilities, buildings, and elements for people with disabilities. It applies during design, construction, additions to, and alterations of sites, facilities, buildings and elements to the extent required by the Texas Department of Licensing and Regulation under the authority of Texas Government Code, Chapter 469. The standards are intended to be consistent to the 2010 Standards for Accessible Design

and are generally the same except as noted. For more information on the TAS, visit the link at the beginning of this paragraph. The TAS is currently being updated and should always follow the most recently adopted version.

Transportation Criteria Manual (TCM): The City of Austin created this manual codified through Rule No. R161-21.14. This republication was enacted on December 6, 2021 and updated on July 12, 2022. The TCM serves as a foundation or starting point for the design requirements for transportation infrastructure. It includes standards and criteria for planning, design and coordination of applicable facilities within the city of Austin. The intent of the TCM is to apply a consistent approach to street design. CapMetro has worked with the City to develop sections of this manual as it relates to transit and building supportive infrastructure within the right-of-way. CapMetro follows TCM guidance where applicable and works with other jurisdictions directly to coordinate on design, permitting and implementation. For more information on the TCM, visit the link at the beginning of this paragraph. The TCM is updated relatively frequently and therefore should be referenced for the latest information as needed.

ABOUT THIS DOCUMENT

Transit stops and stations are the “front door” of transit systems. Their location, design and maintenance influence how riders experience transit. This document provides guidance for CapMetro and their partners to ensure transit is a safe, comfortable and convenient experience for customers. The **Transit Stop & Station Design Guidelines** is a tool to help CapMetro and other municipal and community partners deliver transportation choices that connect people, jobs and the community in a convenient, consistent and safe manner. The intent of these guidelines is to facilitate the proper siting, design and management of either existing or proposed stops and stations throughout the CapMetro service area.

Why It’s Important

Well-designed transit stops and stations enhance the transit experience, decrease perceived wait times for transit services and can increase ridership. CapMetro acknowledges that stop and station design and available amenities have an impact on people’s lives and their likelihood to use public transit. This document creates a path to improving how customers experience their transit system.

Who Should Use These Guidelines

The information in these guidelines will be useful to anyone involved in the planning, design, construction, maintenance and/or use of stops and stations: community members, transit staff, planners at the municipal, county, and state levels, as well as developers and private landowners.

These guidelines may be used by different audiences to assist them with their associated responsibilities and needs regarding bus stop placement and design. While CapMetro and other municipal partners are public professionals accustomed to guidelines and policy, community members and developers or property owners may be less familiar with how and when to use this document. Refer to the table below for direction on what each section of this document contains and what questions they might answer about the stop and station design process.

Community

Transit riders, residents, elected officials, employers

CapMetro Staff

Municipal Staff

Developers

Developers and property owners

Section	What Questions It Answers
Introduction	What are design guidelines? Who are they for?
Stop and Station Types	What are the different types of stops and stations in the system? How do they differ in terms of their minimum, preferred and optional amenities?
Stop and Station Amenities	What considerations are important for the amenities included at stops and stations?
Stop and Station Configurations	What do stops and stations look like in the street context?
Stop and Station Spacing and Placement	Where do stops and stations go? What factors are important to determine where they go?

Guidance and Standards

The content in this document is not intended to be strict standards, but instead to provide guidance and inform design decisions within the real-world context or needs of a specific location. Providing this guidance is meant to support the work of CapMetro, and flexibility is key as the street and right-of-way, or land in which a road is built, is unique in each context. Potential impacts must be considered when designing a stop or station and implementing the processes outlined in this document.

However, all stops and stations and any pertinent features should comply with Public Rights-of-Way Accessibility Guidelines (PROWAG) provisions and Texas Accessibility Standards (TAS). PROWAG adheres to standards set by the Americans with Disabilities Act (ADA), and while PROWAG are not governing standards, they do provide guidance for creating accessible right-of-way, where ADA does not provide standards. In that sense PROWAG goes beyond meeting ADA regulations. TAS closely mirrors ADA standards but should also be reviewed to ensure compliance in areas where it diverges from ADA.

This document incorporates the latest regulatory standards from ADA, PROWAG and TAS and best practices as of May 2023. When regulatory standards or guidelines are updated, the latest guidance and this document should be reviewed regularly and updated as needed to reflect these changes.

PROJECT CONNECT AND LIGHT RAIL

In 2020, Austin voters approved a property tax rate increase which provides dedicated funding to CapMetro, Austin Transit Partnership and the City of Austin's plan to advance transit mobility, Project Connect. Project Connect includes constructing a light rail service in Austin, which will provide high capacity transit service that acts as a spine for the transit system, as well as several new MetroRapid services. As of May 2023, light rail station standards are being defined by Austin Transit Partnership as they work towards construction of this vision. Once light rail service is closer to a final design, CapMetro will incorporate additional guidelines that integrate the needs of light rail transit stations.

DESIGN PRINCIPLES

A high-quality transit stop is one that is well connected to the neighborhood or community it serves, accommodates the needs of all transit riders freely and comfortably, increases the safety of those waiting for the bus or train and enables efficient operations. Stop and station design should be guided by the following principles:

Locate Stops and Stations in Convenient and Comfortable Locations

Stops and stations should be located in places that are convenient to where people are traveling to and from, including near where housing or jobs are concentrated and key destinations such as social services or shopping.

Locate Stops and Stations in Safe Locations

Stops and stations should be located where customers feel comfortable, which is a location with enough people, activity and/or lights to not feel isolated. In addition, the location of the stop itself should be well lit and should provide adequate space for waiting riders to sit or stand, with considerations for other people using the street or sidewalk.

Make Stops and Stations Visible and Easily Identifiable

Stops and stations should consistently be located in easily identifiable places, so they can be found without difficulty by riders and bus drivers alike. Stops and stations should follow CapMetro branding guidelines for the specific service type operating, so that they are a recognizable component of the transit infrastructure.

Make the Wait Comfortable

Providing amenities, such as benches, lighting, bike parking, waste receptacles, etc. at stops and stations makes it more comfortable for riders to wait for the bus. While it is not practical nor cost-effective to provide all amenities at all stops, more extensive amenities should be provided in areas where there is greater need. See the **Amenity Enhancement Process** for more details on the process for distribution of amenities.

Provide Information on Available Services

Stops and stations should make it intuitive for riders to know when and where they're traveling. Signs should provide basic service information such as route numbers and destinations. Stops and stations with higher amounts of riders should have arrival time estimates and route information at the stop.

Integrate Stops into Street Design Processes

When new developments are constructed, the stops and stations should be designed as part of the overall project, rather than placed as an afterthought. Similarly, when roads and/or sidewalks are reconstructed, stops should be developed as part of the overall design and brought to current stop or station amenity level standards.

Provide Good Pedestrian and Bicycle Access to Stops and Stations

Stops and stations should be located at sites that provide safe, PROWAG and TAS-compliant pedestrian access to the surrounding area, especially to the other side of the street. This should include well-defined and contiguous sidewalks to and from the stop or station, protected crossings or stops strategically placed at signalized intersections, and adequate bicycle facilities to and from the stop or station.

STOP & STATION TYPES

This section describes the types of stops and stations in the CapMetro system, including stops designated as transit hubs and transit centers. It also summarizes the level of amenities found at each. Definitions for each amenity and more detailed guidance can be found in the **Stop and Station Amenities** section.

DEFINING STOP & STATION TYPES

Transit stops and station types are defined according to their operational, service, land use and utilization characteristics. All stops and stations are assigned a type and subsequent amenity level (Levels 1 – 4). These types provide CapMetro with a clear starting point and practical guidelines for the provision of amenities at stops and stations and a structured process to improve the customer experience across the transit system. No matter how many customers use a stop or station on a given day, each requires certain key design elements to be safe, accessible, reliable and comfortable for riders. By formalizing the process for enhancing amenities at stops and stations, CapMetro sets clear goals for stop and station quality and ensures equitable distribution of amenities across the system.

Stops and stations are classified based on the average number of people who use the stop or station each day, the number of trips at a stop where people might experience wait times longer than 30 minutes or more and the type of transit service. Stops and stations are classified according to the following three types:

Transit Stop – Level 1: These stops serve the lowest daily ridership and provides the most basic level of amenities.

Average Ridership: 0 – 14 riders per day

Transit Stop – Level 2: These stops serve a mid-level of daily riders or riders who might have to wait a long time for the next bus or train, and therefore have additional amenities such as seating and a shelter.

Potential for Long Wait Times: More than half the transit trips arrive 30 or more minutes apart, and/or;

Average Ridership: 15 – 50 riders per day

Transit Station – Level 3: This level of station serves a high level of daily riders and high frequency routes. The highest level of amenities are provided at transit stations.

Service Type: Includes a MetroRapid or MetroRail service, and/or;

Average Ridership: More than 50 riders per day

Many transit agencies across the nation use riders per day to determine the level of amenities to provide at a stop. This is a core defining feature of the stop and station type, however, CapMetro has also identified that the community prefers that stops where a rider might have to wait a long time should be prioritized for shelters and seating. **Therefore, a stop that has a potential for long wait times has been moved to Level 2, even if the ridership is lower than 15 riders per day.** Also, CapMetro provides the highest expectations for amenities for their premium high capacity services, which includes MetroRapid and MetroRail, therefore, those service types qualify for the Transit Station type or Level 3 amenities.

Reviewing Additional Site Context

After the initial classification of stops and stations, additional site context information is reviewed to inform what amenities should be present at a particular location. There are two additional definitions of transit facilities to consider depending on the location's context. Both of these types would increase the expectations of amenities provided to **Level 4**.

Transit Center – This is for stops or stations that support multiple transit routes and are typically owned or leased by CapMetro for an off-street location to support operational service needs.

Transit Hub – This is for stops that are located near dense, mixed-use areas or major community destinations that benefit from additional mobility options to support transit use.

For example, a transit station might be located near a lot of mixed-use development and be recategorized in this step as a transit hub so that the appropriate level of amenities are provided. This additional step helps CapMetro to assess the needs of their different types of facilities based on their surroundings.

AMENITIES

Stop and station amenities are desirable elements or features that improve the experience of waiting for a bus or train by providing comfort, safety and convenience. Amenities help retain and attract transit riders by improving the overall experience at stops and stations. Additional detail and guidance on specific amenities is included in the **Stop and Station Amenities** section. Amenities are divided into four categories based upon the experience they enhance:

Access amenities allow people to comfortably get to and from stops and stations. Amenities in this category facilitate safety and access for all users.

Comfort/Safety amenities address the state of the immediate environment around a stop or station. It encompasses amenities that make the space more comfortable and add elements of security for riders accessing the location.

Information amenities help riders understand how to navigate the services available to them.

Building More Accessible Stops and Stations are principles not listed under the table of amenities, but are a collection of elements that make experiencing getting to and from stops or stations a dignifying experience for customers.

The expected level of amenities for each stop or station are determined by the type. Under each level (1-4), each amenity is assigned one of the following classifications:

Required – The typology must have the amenity present, based on legal requirements at the federal or local level.

Vital – Use of the amenity is vital to the customer experience and should be provided unless CapMetro staff finds installation unfeasible or unnecessary based on the context.

Optional – If monetary resources for the amenity are available, it should be provided unless built environment or other installation constraints are present.

Not Applicable – Amenity is not applicable to the stop type.

For all new stops and stations, CapMetro will seek to provide the level of amenities associated with the stop or station type and the process for distributing funds for amenity upgrades is detailed in the **Amenities Enhancement Process**. Prioritizing locations to upgrade stop amenities, as well as determining and adhering to maintenance responsibilities, will ensure that amenities effectively benefit customers in the long term.

Summary of Amenities by Stop Type

The table below shows the required, vital and optional amenities for each stop and station type. CapMetro will consider the area constraints and fiscal constraints when placing amenities. Every reasonable effort should be made to meet the required amenities below, and thorough documentation should be recorded for any stop that does not meet required amenity levels. For vital amenities, good faith efforts should be made to include them at every stop, however physical or fiscal constraints may intervene, and should be recorded. Optional amenities should be included if the context of the stop allows. Refer to the **Stop and Station Amenities** section of this document for descriptions of each of these amenities.

Amenity		Level 1	Level 2	Level 3	Level 4
		Transit Stop	Transit Stop	Transit Station	Transit Center or Hub
Access	Landing Pad/Platform	Required	Required	Required	Required
	Shared Mobility	Optional	Optional	Vital	Vital
	Bike Racks	Optional	Vital	Vital	Required
	Wheelchair Charging	Optional	Optional	Vital	Vital
Comfort & Safety	Seating	Vital	Required	Required	Required
	Shelter	Vital	Vital	Required	Required
	Lighting	Vital	Vital	Required	Required
	Waste Receptacles	Vital	Required	Required	Required
	Landscaping	Optional	Optional	Vital	Required
	Security Camera	Optional	Optional	Required	Required
	Security Booth/Attendant	N/A	N/A	Optional	Optional
Information	Sign and Pole	Required	Required	Required	Required
	Real Time Info	Optional	Optional	Required	Required
	Wayfinding	Optional	Optional	Vital	Vital
	Personal Charging	Optional	Optional	Vital	Vital
	Public Wifi	Optional	Optional	Vital	Vital
	Fare Machine	Optional	Optional	Vital	Vital

Transit Stops

Transit stops are the backbone of CapMetro's transit network as they are the most common place where riders access the transit system. Stops provide critical points of access to daily needs. Even if some stops may have lower daily ridership, they should be accessible by all riders and include basic amenities to ensure safety and comfort.

With over 2,500 bus stops, CapMetro's stops vary a lot throughout the system. There are two transit stop categories – Level 1 and Level 2. Because bus stops are used across many fixed route service types (High Capacity, Frequent, Local, Limited and Community), surrounding land uses may range dramatically including serving low density neighborhoods, commercial areas such as grocery stores and strip malls and higher density, mixed-used areas.

Given CapMetro's commitment to providing amenities for customers in communities that could benefit the most from additional investment at transit stops, all stops that meet the Level 1 ridership criteria will also be evaluated for service frequency, to understand if customers at the stop may experience longer periods between buses. Longer potential wait times for a customer equals a greater need for stop amenities. If more than half of bus trips have frequencies greater than 30 minutes, the stop will be upgraded to Level 2, regardless of ridership.

TRANSIT STOP – LEVEL 1

Level 1 bus stops serve as the most basic stop type, generally supporting lower daily ridership, less frequent local bus service and typically served by only one route.

Average Ridership: 0 – 14 riders per day

Required

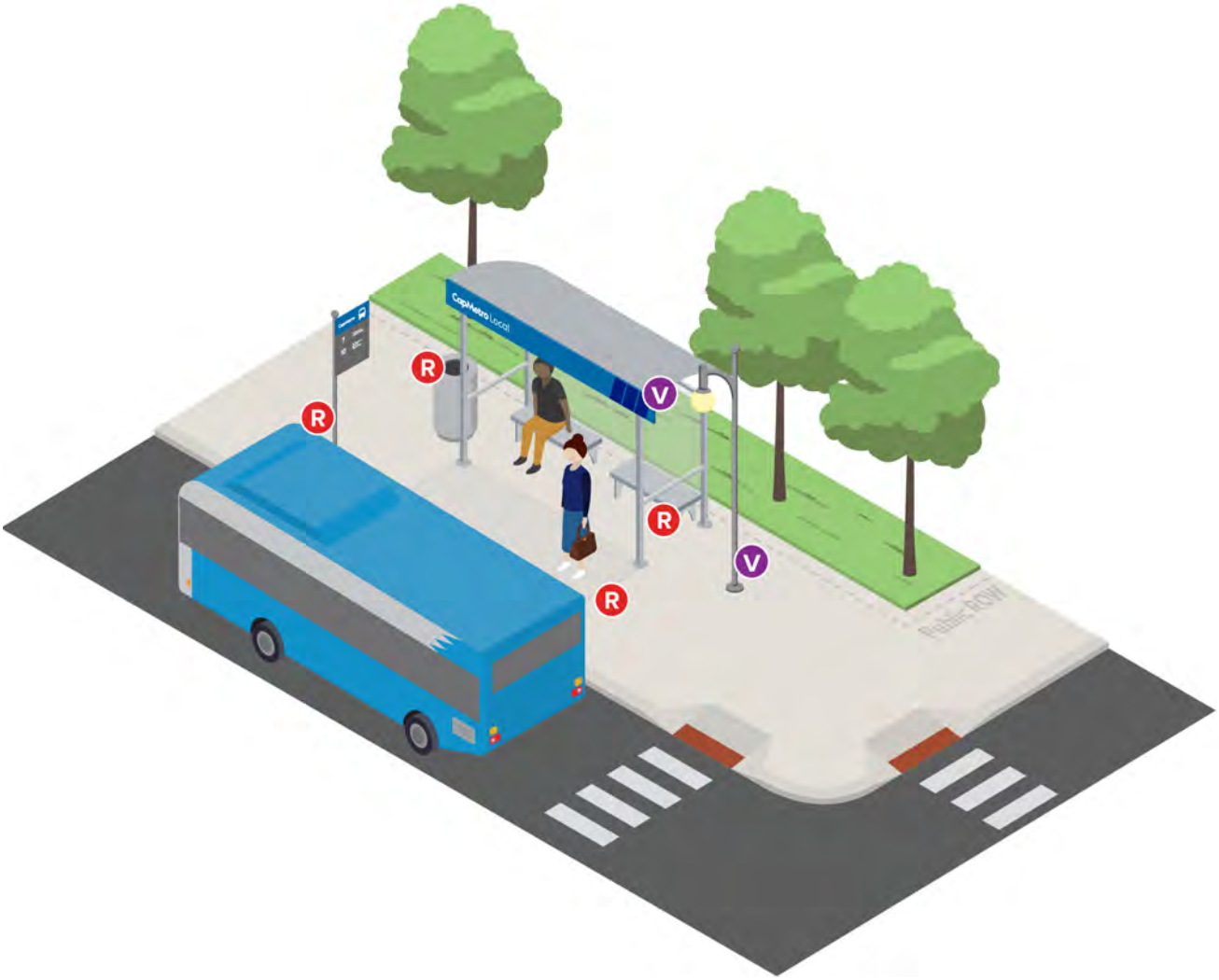
- Landing Pad
- Sign and Pole

Vital

- Seating
- Lighting
- Waste Receptacles
- Shelter

Optional

- Shared Mobility
- Bike Racks
- Wayfinding
- Landscaping
- Wheelchair Charging
- Real Time Info
- Security Camera
- Personal Charging
- Public Wifi
- Fare Machine



TRANSIT STOP – LEVEL 2

Level 2 bus stops support low to medium ridership, less frequent MetroBus service and typically serve one or more routes. A stop that has a potential for long wait times is considered Level 2, even if the ridership is lower than 15 riders per day.

Potential for Long Wait Times: More than half the transit trips arrive 30 or more minutes apart, and/or;

Average Ridership: 15 – 50 riders per day

Required

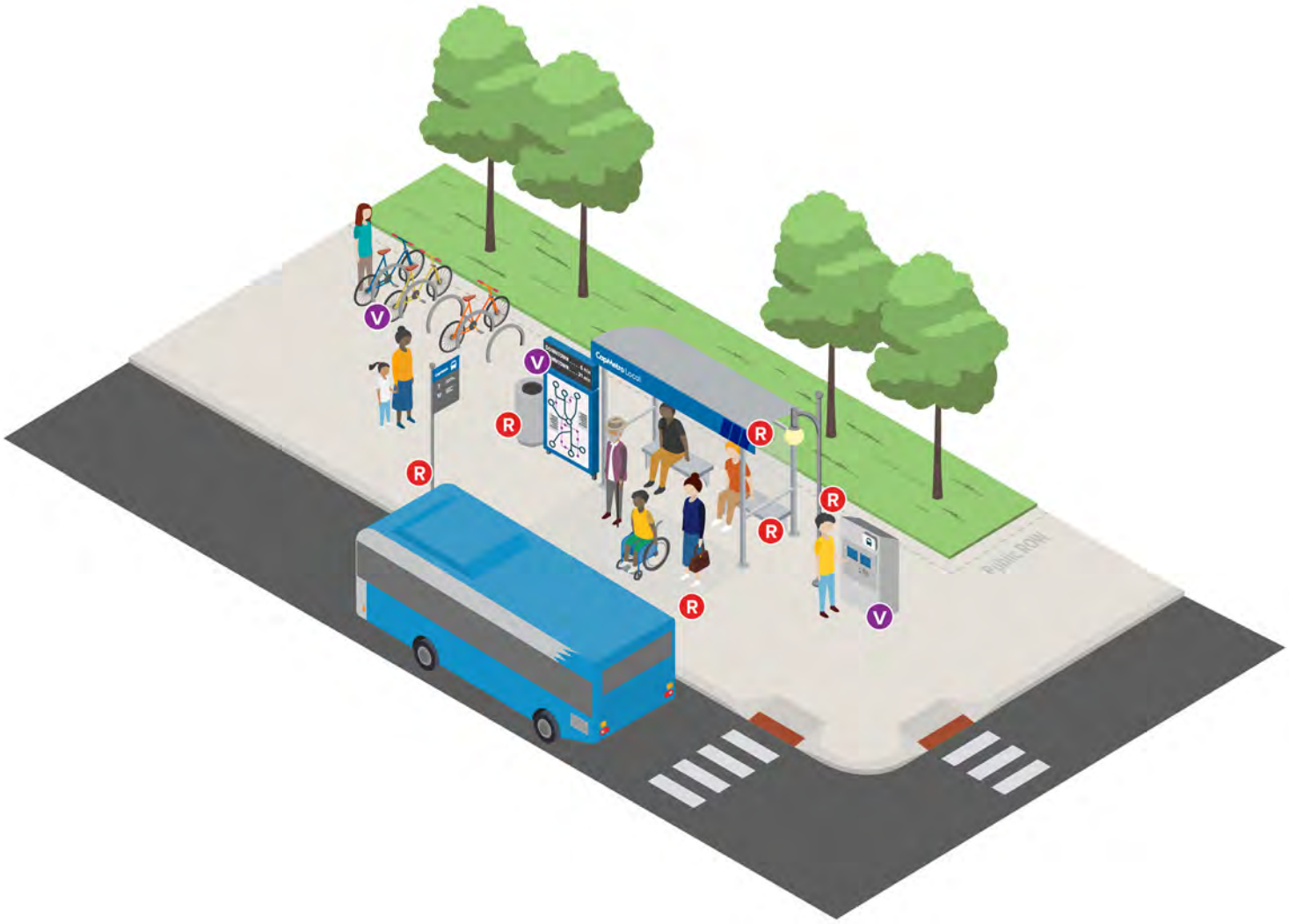
- Landing Pad
- Sign and Pole
- Seating
- Waste Receptacles

Vital

- Shelter
- Lighting
- Bike Racks

Optional

- Shared Mobility
- Wayfinding
- Landscaping
- Wheelchair Charging
- Real Time Info
- Security Camera
- Personal Charging
- Public Wifi
- Fare Machine



TRANSIT STATION – LEVEL 3

Transit stations support CapMetro's higher frequency transit service including MetroRapid and MetroRail. Transit stations support high daily ridership and support riders with the provision of additional amenities. Stations should be comfortable areas for riders to wait and provide information support services.

While surrounding land uses may vary, transit stations generally serve denser residential and commercial areas and important community destinations like educational institutions, grocery stores and sports stadiums.

Service Type: Includes a MetroRapid or MetroRail service, and/or;

Average Ridership: More than 50 riders per day

Required

- Landing Pad/Platform
- Sign and Pole
- Seating
- Shelter
- Lighting
- Waste Receptacles
- Security Camera
- Real Time Info

Vital

- Shared Mobility
- Bike Racks
- Wheelchair Charging
- Landscaping
- Wayfinding
- Personal Charging
- Public Wifi
- Fare Machine

Optional

- Security Booth/Attendant

TRANSIT CENTER – LEVEL 4

A transit center should be applied at stops that serve riders with multiple mobility options in one convenient area. A key function of a transit center is supporting multiple routes or services, making it easy and convenient for riders to make transfers. Land use can vary greatly near transit centers. They may be located either on CapMetro-owned property, such as the Tech Ridge transit center and park and ride, or leased property, such as at the Norwood HEB or Westgate Transit Center.

A transit center should feel safe and comfortable for riders to access and wait for their ride and have amenities to support higher ridership. More than one shelter and additional seating may be considered at transit center stops where higher ridership is present. Amenities should include first/last mile facilities to connect riders from transit centers to their destination including but not limited to bike parking and vehicular parking where applicable. Transit centers should also have a higher level of information amenities to make it easy for riders to know when and where they need to go, even during service disruptions. Placemaking amenities, while optional, bolster a sense of place and community and should be considered where possible. A few examples of a transit center include North Lamar Transit Center, South Congress Transit Center, Tech Ridge Park and Ride and Eastside Bus Plaza. In order to power many of the necessary amenities at transit centers, a dedicated electric meter should be included at the site wherever feasible.

Required

- Landing Pad/Platform
- Sign and Pole
- Seating
- Shelter
- Lighting
- Waste Receptacles
- Landscaping
- Real Time Info
- Security Camera
- Bike Racks

Vital

- Shared Mobility
- Wheelchair Charging
- Wayfinding
- Public Wifi
- Personal Charging
- Fare Machine

Optional

- Security Booth/Attendant

TRANSIT HUB – LEVEL 4

Transit hubs integrate multiple transportation modes such as bikeshare, shared mobility options such as scooters and access to safe, high-quality walking and biking infrastructure. The focus of transit hubs are to expand and integrate multimodal travel options, increase travel safety and enhance customer experience.

Transit hubs are anchored by high frequency transit and supported by dense, mixed-use development. Importantly, they link riders to commercial areas, community destinations and activity centers. Transit hubs should also consider local placemaking features such as public art and landscaping to bolster a sense of place and enhance customer experience.

Walking and biking along the streets and at intersections near the transit hub stop should be supported with high-comfort sidewalks and biking facilities to ensure adequate connectivity to the hub. Shared mobility zones should be present to designate where to drop off/pick up the shared vehicles. Bikeshare stations are highly encouraged at transit hubs to support first/last mile connections. A few examples of a transit hub include Martin Luther King Station, Pleasant Valley & E 7th Street and Plaza Saltillo Station.

In order to power many of the necessary amenities at transit hubs, a dedicated electric meter should be included at the site wherever feasible.

Required

- Landing Pad/Platform
- Sign and Pole
- Seating
- Shelter
- Lighting
- Waste Receptacles
- Landscaping
- Real Time Info
- Security Camera
- Bike Racks

Vital

- Shared Mobility
- Wheelchair Charging
- Wayfinding
- Public Wifi
- Personal Charging
- Fare Machine

Optional

- Security Booth/Attendant

STOP & STATION AMENITIES

This section goes into detail on guidance for siting each transit amenity along with the roles and responsibilities for partners in implementing each. CapMetro follows the guidance of the City of Austin's Transportation Criteria Manual (TCM), which contains standards and guidelines related to transportation within the public right-of-way, including transit supportive infrastructure. At the time of publishing these guidelines, the latest TCM update was completed in July 2022. CapMetro may set additional guidance including guidelines to support efficient transit operations or set the level of amenities that should be provided. For those stops within the City of Austin, the TCM provisions are applicable. The key provisions from the TCM are included under each amenity in the Guidance sections as well as any other applicable documentation. Other municipalities in the CapMetro service area may contain their own specific provisions to transit amenities and CapMetro works directly on design, permitting and implementation with each jurisdiction.

LANDING PAD OR PLATFORM ACCESS

Landing pads are areas where customers get off and on the bus. They offer space for bus drivers to deploy ramps, and where riders may queue in line to get on the bus. All stops must have landing pads provided and landing pads should cover all doors of the transit vehicle. Landing Pads must comply with the latest PROWAG provisions.

Platforms are the rail equivalent of a landing pad, where customers get off and on the train. The configuration and dimensions of a platform depends on the track location, right-of-way and passenger capacity. Station platform lengths shall be in accordance with ADA, Federal Railroad Association guidance, state, county and local requirements, as well as the appropriate environmental decision document.

Where They're Required

Level 1 Transit Stop	Level 2 Transit Stop	Level 3 Transit Station	Level 4 Transit Center or Hub
Required	Required	Required	Required

Guidance

According to PROWAG, all new or upgraded bus stops are required to have a front landing pad that:

- Provides near level boarding with a 9" curb
- Provides a clear length of 96 inches (8') minimum, measured perpendicular to the curb, and a clear width of 60 inches (5') minimum, measured parallel to the roadway
- Parallel to the roadway, the slope shall be the same as the roadway, to the maximum extent practicable
- Has a cross slope perpendicular to the roadway that does not exceed 1:48 (approx. 2%)

CapMetro exceeds PROWAG guidance, and implements a 10'x30' (8"X25" min.) pad to allow space for the rear door, where context allows. Additionally, the 8'x5' clear area of the landing pad should be kept clear of any obstructions or other amenities to allow uninterrupted movement for all customers.

Tactile warning strips, also referred to as truncated domes in the engineering field, should be included along the entire edge of the boarding platform for Level 3 and Level 4 stops. Placement and use of tactile warning strips should follow PROWAG guidance.

Roles and Responsibilities

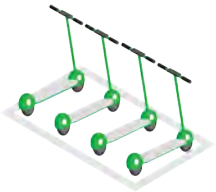
Role	Responsibilities
CapMetro Staff	• Approving all landing pad or platform design and location from other agencies or developers • Design and construction of all landing pads or platforms at stops or stations associated with CapMetro capital projects
Municipal Staff	• Design and construction of all landing pads or platforms at stops along municipally-funded corridor development programs
Developer	• Design and construction of all developer-initiated alterations of current or planned CapMetro stops and stations

SHARED MOBILITY ACCESS

Bikeshare

Public bikeshare stations are bicycle racks where riders can access public bikes. Placing bikeshare stations near stops provides a first/last mile option for riders by connecting bikeshare to transit services. In 2022, the City of Austin and CapMetro agreed to a 10-year expansion project of public bikeshare, an emerging transportation mode, which includes goals of transitioning to a 100% electric fleet, equipment enhancements and expanding service area to outside of Austin's urban core. The latest expansion plan for the public bikeshare system will dictate where future stations will be located.

Scooters and Other Shared Mobility



Micromobility services offer transportation options for short-term rental from the public right-of-way and provide a first/last mile option for transit riders to access bus stops. Micromobility options may include electric scooters, or other small mobility devices that do not have a license plate. Micromobility providers are regulated by the City of Austin, but are owned and operated by private entities. Designating space for micromobility vehicles makes it easy for transit riders to end their trip near the bus stop while ensuring the vehicles do not interfere with surrounding walkways.

Where They're Required

Level 1 Transit Stop	Level 2 Transit Stop	Level 3 Transit Station	Level 4 Transit Center or Hub
Optional	Optional	Vital	Vital

Guidance

Section 9.9.0 of the TCM sets general guidelines for dockless mobility parking areas to match bike rack guidelines in Section 9.8.0, which are further discussed in the next section.

Roles and Responsibilities

Role	Responsibilities
CapMetro Staff	• Install new Bikeshare facilities • Partner with the City of Austin to operate and maintain the public bikeshare system • Partner with the City of Austin to plan for operations and expansion of the public bikeshare system
Municipal Staff	• Fund bikeshare expansion in concert with partner agencies • Coordinate with CapMetro for public bikeshare planning, expansion, installation, maintenance and operation • Administer the Shared Micromobility Program which manages and provides permits to private shared micromobility providers
Developer	• Coordinate with CapMetro on integration of public bikeshare at stops and stations

BIKE RACKS ACCESS

Bicycle racks at bus stops provide additional support for customers accessing bus service. While there are a variety of bike rack styles, bike racks should permit the use of a high security lock (such as a U-lock), allow the frame and both wheels to be locked, and not damage the bike when locked. Within constrained areas, CapMetro will assess the stop area to determine the appropriate multi modal infrastructure.

Where They're Required

Level 1 Transit Stop	Level 2 Transit Stop	Level 3 Transit Station	Level 4 Transit Center or Hub
Optional	Vital	Vital	Required

Guidance

When siting bike racks, CapMetro should adhere to the following considerations:

- Bike racks must not interfere with walkways, accessible routes and bus door zones
- Bike racks should be placed in a highly visible, well-lit area
- Bike racks should be placed on a paved or concrete surface, not on grass or dirt

According to Section 9.8.0 of the City of Austin TCM, all bike racks must meet the following criteria:

- Bike racks should provide enough space to accommodate two bicycles per "U" in a rack. The standard space is 2' wide, 6' long and 3' 4" tall. If larger bicycles are anticipated at a particular bike rack, the standard spacing should use the specific bicycle in mind as the standard design
- Minimum spacing of racks placed next to each other is 3' as shown in TCM figure 9-17
- Racks should be placed in the pedestrian or bicycle and street edge zone, or the tree and furniture zone. They should be outside of travel lanes, loading zones and bike lanes. Bike racks must also not obstruct a pedestrian path when bikes are locked to them
- Bike racks may be installed parallel, perpendicular or at a 45–60-degree angle to the curb

Roles and Responsibilities

Role	Responsibilities
CapMetro Staff	• Install and maintain new bike racks at transit stops and stations
Municipal Staff	• Coordinate with CapMetro for their installation
Developer	• Fund and install bike racks on development property and align with TCM standards • Coordinate with CapMetro for their installation

WHEELCHAIR CHARGING ACCESS

Wheelchair charging is a critical need for those using mobility devices to access transit. At the stop or station, a charging outlet provides reliability and convenience for riders, who may need to top off their device or charge it in order to make the final portion of their trip.

Where They're Required

Level 1 Transit Stop	Level 2 Transit Stop	Level 3 Transit Station	Level 4 Transit Center or Hub
Optional	Optional	Vital	Vital

Guidance

Charging outlets require an electric connection to the stop or station and should be a standard 120 volt outlet. They should be located in an accessible space, with clear access and maneuverability around the outlet. Outlets should be clearly labeled for wheelchair charging use, with informational signage to help other riders understand the priority of the use is for those using mobility devices. Outlets should also be located under a covered area.

Roles and Responsibilities

Role	Responsibilities
CapMetro Staff	• Install and maintain outlets • Install and maintain labeling of wheelchair charging and informational signage for other riders
Municipal Staff	• Coordinate with CapMetro for their installation as needed
Developer	• Coordinate with CapMetro for their installation as needed

SEATING COMFORT & SAFETY

A bench provides an opportunity for riders to pass time comfortably while they wait for the bus or train to arrive. Benches are required at all stop types except for Level 1 bus stops. For Level 1 bus stops, bench placement will be considered for stops that serve riders who benefit most from the amenity including the elderly and people with varying abilities (as detailed in the amenity enhancement process). Lean rails may also be included at stops but are not a substitute for benches. Lean rails are a vertical structure about waist height which allow customers to lean on and rest while waiting for the bus to arrive. Lean rails take up less footprint than benches and can provide additional comfort for stops where right-of-way space is limited.

Where It's Required

Level 1 Transit Stop	Level 2 Transit Stop	Level 3 Transit Station	Level 4 Transit Center or Hub
Vital	Required	Required	Required

Guidance

Seating can include benches, leaning rails and low stone walls. Seating should be shielded from vehicular traffic.

- Benches should be constructed with durable material and be resistant to vandalism and wear from weather exposure through design. Seating must also be ADA and TAS compliant in dimension
- The recommended minimum length for benches of 6.5' or the equivalent of three seats. CapMetro may install benches that are shorter based on the use of the stop, or the space available in constrained locations. CapMetro will accommodate the most seating feasible based on the previous factors along with financial availability
- Benches should include arms at either end to assist seniors and people with disabilities in standing
- The recommended height of leaning rails of 2.5' above the stop location surface or slightly higher than seat height

Section 6.3.5.3 of the TCM makes recommendations for seating considerations and characteristics:

- Seating should be installed at stops with high use by elderly people and children, as well as stops with longer wait times or a high volume of travelers
- Benches should prioritize visibility of people sitting
- Benches should be in the Tree and Furniture zone and maintain 2' spacing from other street furniture and waste receptacles and 3' from utility appurtenances or other amenities for appropriate access. Benches may alternatively be placed adjacent to building faces that abut the right-of-way line provided that clear width is maintained for the sidewalk
- Benches shall include space for wheelchair access adjacent to the bench. Reference the City of Austin Standard details for design of benches

Roles and Responsibilities

Role	Responsibilities
CapMetro Staff	• Fund and install only CapMetro Standard Benches attached to bus shelters • Maintain all bus stop seating
Municipal Staff	• May fund and install municipal or custom seating at bus stops where demand is high • Coordinate with CapMetro for placement and installation of bus stop seating
Developer	• Fund and install seating at stops and stations adjacent to property • Coordinate with CapMetro for their installation

SHELTER COMFORT & SAFETY

A shelter protects riders from the elements, both heat and rain, and helps identify the location of a stop. Shelters are also one of the most visible elements of CapMetro's transit network to the public, therefore adhering to shelter design guidance is important for network continuity. Shelters are required for transit stations, transit hubs and transit centers. While shelters are considered a valuable amenity for the transit stop types mentioned, site constraints may limit the possibility of shelter placement.

Where They're Required

Level 1 Transit Stop	Level 2 Transit Stop	Level 3 Transit Station	Level 4 Transit Center or Hub
Vital	Vital	Required	Required

Guidance

According to Section 6.3.5.2 of the TCM, shelters should not obstruct pedestrian through-paths and should be oriented towards the path to the landing pad.

Passengers must be able to easily see transit vehicles that arrive, and operators must be able to easily see passengers. Shelters should have internal lighting or be in well-lit areas. The shelter should have perforated panels, glass or an open back wall to enhance visibility.

Roles and Responsibilities

Role	Responsibilities
CapMetro Staff	• Fund and install CapMetro standard shelters based on the amenity enhancement process • If shelter is being installed by the City of Austin or a developer or in private right-of-way, coordinate with the relevant parties for installation • Maintain all shelters within the bus stop network
Municipal Staff	• Coordinate with CapMetro for their installation
Developer	• Fund standard shelters based on the amenity enhancement process at stops adjacent to property • Coordinate with CapMetro for their installation

LIGHTING COMFORT & SAFETY

Well-lit bus stops make riders and the surrounding community feel safer, more secure and more comfortable than transit stops or stations in poorly lit areas. Lighting also provides greater visibility for operators and riders at a stop. Transit stop placement should consider areas where pedestrian scale streetlights are present. Solar lighting should be placed at all stops where there are no environmental constraints and secondary lighting is not present. If a shelter is being placed at a stop, solar lighting can be integrated into the shelter, except in cases where there may be significant solar obstruction.

Where It's Required

Level 1 Transit Stop	Level 2 Transit Stop	Level 3 Transit Station	Level 4 Transit Center or Hub
Vital	Vital	Required	Required

Guidance

In Section 6.3.5.5 of the TCM, it states that pedestrian-scale lighting includes lamps less than 25' high. Referencing other similar size agencies and academic literature, other recommended characteristics of pedestrian scale lighting include:

- Spacing of 30m (approximately 98') intervals
- Lighting styles that complement the architectural style of adjacent developments
- Providing an average level of 1.3 to 2.6 f.c. (horizontal foot candles) or 13 to 26 lux, which is the typical light level around a building entrance
- Energy saving devices like efficient lamps, solar power and daylight sensing equipment
- Additional lighting from nearby streetlights and illuminated signage and fixtures

Roles and Responsibilities

Role	Responsibilities
CapMetro Staff	• Fund, install and maintain integrated bus shelter lighting and sign-mounted power lights at stops and stations
Municipal Staff	• Install and maintain overhead streetlamps at stops and stations • Coordinate with CapMetro for placement and installation
Developer	• Install and maintain adjacent lighting at stops and stations • Coordinate with CapMetro for placement and installation

WASTE RECEPTACLES COMFORT & SAFETY

Waste receptacles offer convenience for waiting riders and help to reduce the amount of waste left on vehicles and the surrounding transit stop area. CapMetro provides two types of waste receptacles: regular waste and solar compacting.

Where They're Required

Level 1 Transit Stop	Level 2 Transit Stop	Level 3 Transit Station	Level 4 Transit Center or Hub
Vital	Required	Required	Required

Guidance

Within the City of Austin, waste receptacles and recycling containers are located next to each other at all locations in compliance with the Universal Recycling Ordinance. CapMetro works with other municipalities to locate waste receptacles or recycling as needed and in compliance with other local ordinances.

According to Section 6.3.5.4 of the TCM, waste receptacles shall be within 50' of the entrance to food service establishments. Preferred placement of waste receptacles is within the Tree & Furniture Zone.

In the Downtown area, waste receptacles shall be located at intersections, adjacent to sidewalk curb ramps and follow Great Streets Standards. The waste receptacle shall be outside of the curb ramp limits, and directly next to the curb ramp no more than 1 foot away from the curb ramp and either within a sidewalk or directly adjacent to the edge of a sidewalk.

Waste receptacles should be placed at the far side of benches, and, like other street furniture, they must be at least 2' away from other street furniture.

Roles and Responsibilities

Role	Responsibilities
CapMetro Staff	• Fund and install CapMetro standard waste receptacles at stops and stations • Maintain CapMetro-installed waste receptacles at appropriate intervals to ensure stops and stations remain comfortable for those waiting for transit
Municipal Staff	• May fund and install municipal or custom waste receptacles at stops and stations • Maintain municipal or custom waste receptacles at appropriate intervals to ensure stops and stations remain comfortable for those waiting for transit • Coordinate with CapMetro for placement and installation
Developer	• May fund and install waste receptacles at stops or stations adjacent to property • Coordinate with CapMetro for their installation

LANDSCAPING COMFORT & SAFETY

Landscaping improves the visual experience and beauty of a space by incorporating green space in and around transit stops and stations. Landscaping can provide functional advantages like shading and shelter, as well as psychological benefits like making the environment more inviting and appealing.

Where It's Required

Level 1 Transit Stop	Level 2 Transit Stop	Level 3 Transit Station	Level 4 Transit Center or Hub
Optional	Optional	Vital	Required

Guidance

Landscaping should not impede an unobstructed pedestrian route, and should be maintained to allow a shy zone buffer between the pedestrian realm. Landscaping species should be drought resistant and appropriate for central Texas climates and adhere to municipal standards for specific species and watering regulations.

Green infrastructure is also a valuable stormwater management tool and can improve water quality, detain stormwater flows and reduce stormwater volumes. Landscaping specific to stormwater mitigation should follow municipal codes and should be carefully designed to not overflow near transit infrastructure, where such an instance may affect the customer experience and travel time of transit vehicles.

Roles and Responsibilities

Role	Responsibilities
CapMetro Staff	• Fund, install and maintain landscaping within CapMetro stop or station areas • Coordinate with municipal staff on appropriate species and planting procedures • Coordinate with municipal staff for maintenance of landscaping in the ROW but outside of CapMetro stop or station areas
Municipal Staff	• Coordinate with CapMetro staff on appropriate species and planting procedures • Coordinate with CapMetro staff for maintenance of landscaping in the ROW but outside of CapMetro stop or station areas
Developer	• Coordinate with CapMetro and municipal staff on landscaping location, species and planting at development site

SECURITY FEATURES COMFORT & SAFETY

Amenities such as security cameras and attendants provide greater sense of security for riders and provide tools for CapMetro to respond to incidents at transit facilities. This also enhances the perception of safety and may encourage new riders.

Where They're Required

	Level 1 Transit Stop	Level 2 Transit Stop	Level 3 Transit Station	Level 4 Transit Center or Hub
Security Camera	Optional	Optional	Required	Required
Security Booth/Attendant	N/A	N/A	Optional	Optional

Guidance

In accordance with the American Public Transit Association (APTA) Recommended Practice: **Bus Stop Design and Placement Security Considerations**, CapMetro completes a Crime Prevention Through Environmental Design (CPTED) survey to "identify and recommend the appropriate enhancements to implement crime prevention or homeland security measures." The Recommended Practice "**Application of CPTED for Public Transit Facilities**" contains information about performing a CPTED survey and should be reviewed. Some considerations mentioned in the best practice paper include the following design interventions: natural surveillance, clear lines of sight, lighting, landscaping and access control.

In addition to CPTED, guidance for additional security features CapMetro enlists are described below. Each of these features require a power connection to the stop or station.

Security Cameras – Security cameras act as a deterring factor for criminal behavior and provide an avenue to enforce laws and regulations. Security cameras must accompany locations where high-value assets are located, like fare machines. Security cameras are also an important asset at high ridership locations.

Security Booth & Attendant – Security booths allow CapMetro staff a designated location to provide customers with support for safety and security needs. They also allow passengers a central location for assistance should it be needed on site.

Roles and Responsibilities

Role	Responsibilities
CapMetro Staff	• Fund and install security features at stops and stations • Maintain CapMetro-installed security features
Municipal Staff	• Maintain municipal or custom security features • Coordinate with CapMetro for placement and installation

SIGN AND POLE INFORMATION

Transit stop and station signs are the most basic element of a transit stop and are vital to the rider experience. They indicate where operators will stop and where riders will board and alight the vehicle. Signs are required at all stops and stations.

Where They're Required

Level 1 Transit Stop	Level 2 Transit Stop	Level 3 Transit Station	Level 4 Transit Center or Hub
Required	Required	Required	Required

Guidance

Signage should contain route name, number, direction and destination, CapMetro customer service phone number, system logo and website address.

Signage at major boarding locations should include information about schedules and routes. Every transit stop and station has a unique ID number that must be displayed, and include instructions on finding real time information through texting, the online trip planner or the CapMetro mobile app.

Signs must be ADA compliant. This includes signage in braille and with raised lettering for the stop ID number and the routes that serve the stop or station. Preferred sign location is 2' set back from the curb edge and with 2' clearance from the landing pad.

Transit sign posts should also be distinguishable from other street signs at their base by a detectable indicator. This will help those using a cane to identify vertical elements with transit specific information for riders.

Roles and Responsibilities

Role	Responsibilities
CapMetro Staff	• Provide, install and maintain a sign at every transit stop and station
Municipal Staff	• Coordinate with CapMetro for pole placement and installation in the public right-of-way
Developer	• Coordinate with CapMetro for pole placement and installation in the private right-of-way

REAL TIME INFORMATION INFORMATION

Real time information provides up-to-date information on bus arrival time, which is based on the actual location of the bus or train on the route. Real time information greatly enhances the rider experience and ease of use as it enables riders to spend less time waiting for transit and anticipate arrival times more accurately – even when the bus or train is delayed. Real time information is displayed at the stop with a digital display and is built into the trip planner app on CapMetro's mobile app and website.

Where It's Required

Level 1 Transit Stop	Level 2 Transit Stop	Level 3 Transit Station	Level 4 Transit Center or Hub
Optional	Optional	Required	Required

Guidance

According to the TCM in Section 6.3.5.6, information technology devices should be placed in the Pedestrian Zone without impeding an unobstructed, accessible pedestrian route and should be placed in an accessible location that complies with the applicable provisions of PROWAG.

For all stops or stations with real time information, a power connection must be provided.

Roles and Responsibilities

Role	Responsibilities
CapMetro Staff	• Fund, install and maintain real-time information displays at transit stops and stations

WAYFINDING MATERIALS INFORMATION

Wayfinding materials at a stop or station can include schedules, system and route maps and local area maps. These are important because:

- Schedule information at stops and stations helps reduce some of the uncertainty associated with taking the bus and provides information for people without access to CapMetro apps
- Transit system maps can assist customers in determining the best routing for their trip, including identifying transfer locations. System maps can also act as low-cost advertising and help potential customers understand how they can use transit services
- Local area maps provide neighborhood context for transit riders unfamiliar with a given location and can alert regular users to previously overlooked destinations and transfer opportunities

Where They're Required

Level 1 Transit Stop	Level 2 Transit Stop	Level 3 Transit Station	Level 4 Transit Center or Hub
Optional	Optional	Vital	Vital

Guidance

The following guidelines are recommended for wayfinding materials:

- Placement of information in predictable location like overhead or eye-level, place at regular intervals and include context-specific information at decision points
- Include information that facilitates multi-modal options of travel, like locations of bikeshare stations or regional transportation information
- Use easily understood units like walking time from the stop or station to the destination

CapMetro should collaborate with relevant stakeholders in the surrounding area of stops and stations to identify key, place-specific information to incorporate. Enhanced information should also be delivered in a way that is accessible and ADA compliant, leveraging technology in consideration of disabilities like visual impairment. Examples of this information technology includes tactile maps, detectable warnings and directional texture, infrared talking signs, GPS, mobile apps and smart pens. For more information on these accessible resources, **projectaction.org** provides more detailed information and other disability-specific wayfinding strategies.

Roles and Responsibilities

Role	Responsibilities
CapMetro Staff	• Fund, install and maintain printed bus schedules and system and route maps at stops or stations
Municipal Staff	• Coordinate with CapMetro for placement and installation of community centric wayfinding to be included at stops and stations

PERSONAL TECHNOLOGY CHARGING STATION INFORMATION

Personal technology charging stations are areas around transit stops and stations where people can plug in and charge their phones or other devices. This feature at transit stops provides support for personal devices, allowing people to take transit without worry of losing connectivity or use of their mobile app, which many customers use for their tickets and route information.

Where They're Required

Level 1 Transit Stop	Level 2 Transit Stop	Level 3 Transit Station	Level 4 Transit Center or Hub
Optional	Optional	Vital	Vital

Guidance

Based on recommendations at other agencies, personal technology charging stations are recommended in areas with higher ridership, major transfer points, and stops with longer wait times for riders. Other recommendations include installing personal technology charging stations in coordination with payment/real-time app development and can be incorporated with fare machines.

Charging should be provided via 120 volt outlets. The area should have clear labeling identifying the amenity for riders. The charging station should be located under a covered area, and be separate from designated wheelchair charging outlets.

All stops and stations that contain a personal technology charging station must have a power connection.

Roles and Responsibilities

Role	Responsibilities
CapMetro Staff	• Fund and install personal technology charging stations at stops and stations
Municipal Staff	• Coordinate with CapMetro for utilities around installation of personal technology charging stations
Developer	• Coordinate with CapMetro for utilities around installation of personal technology charging stations

PUBLIC WIFI INFORMATION

Public wifi is an amenity commonly found in public places which allows people to access the internet on personal devices. Many transit riders use their personal devices to access the CapMetro app to find trip information, access tickets and receive alerts from CapMetro.

Cities across the country have begun to implement public wifi as a public utility. It provides access to opportunities for underserved communities and provides everyday convenience for riders in a digital world.

Where It's Required

Level 1 Transit Stop	Level 2 Transit Stop	Level 3 Transit Station	Level 4 Transit Center or Hub
Optional	Optional	Vital	Vital

Guidance

Wifi equipment should be installed in a secure location, to prevent vandalism or unintentional damage during daily use, and should be built to standards that will protect it from the elements. The network should work seamlessly with on-vehicle network to allow riders to transition smoothly from the station to the vehicle without losing signal.

Roles and Responsibilities

Role	Responsibilities
CapMetro Staff	• Fund install and maintain public wifi system at stop and station locations • Coordinate with municipalities on local public wifi programs to sync networks as needed as changes to public wifi best practice evolves
Municipal Staff	• Coordinate with CapMetro on future public wifi initiatives to explore opportunities for partnership and integration networks

FARE MACHINE INFORMATION

Fare machines, also known as ticket vending machines (TVMs), are secure electronic kiosks that allow customers to purchase single fares and passes. The installation of fare payment/purchase equipment at transit stops can improve customer convenience and service reliability by reducing on-board cash transactions and bus stop dwell times.

Where They're Required

Level 1 Transit Stop	Level 2 Transit Stop	Level 3 Transit Station	Level 4 Transit Center or Hub
Optional	Optional	Vital	Vital

Guidance

According to the TCM in Section 6.3.5.6, like Real Time Info technology, fare kiosks should be placed in the Pedestrian Zone without impeding an unobstructed, accessible pedestrian route and should be placed in an accessible location that complies with the applicable provisions of PROWAG.

Roles and Responsibilities

Role	Responsibilities
CapMetro Staff	• Fund, install and maintain fare machines at transit stops and stations
Municipal Staff	• Coordinate with CapMetro for utilities around installation of fare machines
Developer	• Coordinate with CapMetro for utilities around installation of fare machines

BUILDING BETTER STOPS

Sidewalk

Sidewalks provide critical access for people walking and rolling to and from their transit stop and are a key part of the infrastructure that facilitates multimodal connectivity. At minimum, a sidewalk should be present on the same side of the street as the stop and continue through to the nearest intersections on either side of the transit stop.

Sidewalk connectivity and design is critical to stop access. Sidewalks must provide clear and unobstructed paths to transit and comply with PROWAG and TAS guidelines. Width of sidewalks should be in alignment with the latest edition of the TCM in Section 2.

Protected Crossings

Protected crossings provide a designated space for vulnerable road users to cross motor vehicle traffic. They are crucial for transit access because they keep people safe when crossing busy roads. They also make it easier and more comfortable for pedestrians and cyclists to use public transportation, encouraging more people to choose it as a convenient way to travel.

CapMetro requires all new transit stops to be placed within 100 feet of a protected pedestrian crossing. This practice aligns with Section 4.2 of the TCM, which recommends crossings within 100 feet of all transit stops. For older stops that may be further away from a protected crossing, CapMetro may move the transit stop closer to an existing crossing or coordinate with the City of Austin and other jurisdictions to add a new crossing.

Protected crossings include stop or signal-controlled intersections or mid-block crossings, with signalized pedestrian crossing islands, where needed. For stops at a midblock location, protected crossings should be considered based on context of the roadway. In addition, all pedestrian crossings must be compliant with the provisions of Section 4.2 of the TCM, including a maximum desirable distance between marked crossings based on street level. The City of Austin's Crossing Guidelines provides further recommendations of appropriate treatments for pedestrian crossings based on a street's number of lanes and median presence, annual average daily traffic and vehicle speeds or posted speed limits.

Multimodal Access

All users should be able to get to transit using a variety of mode choices. Access to and from transit stops and stations should be well maintained and accommodate people who walk, bike, use wheelchairs or other mobility devices.

Section 6.2.3 of the TCM clearly states that a clear path of travel shall be provided for each mode, serve all users and provide a sense of comfort to and from the stop or station, and that priority shall be given to people walking and biking over motorized traffic.

The preferred configuration for rights-of-way where transit and bike networks overlap is a floating stop with raised or protected bike lanes. Section 6.2.3.1 of the TCM contains guidance and design details and must be followed for integrating bike facilities at the stop or station.

Park & Ride

Park & Rides are an important component of the transit system, concentrating transit demand and enabling transit services that would otherwise not be cost-effective, and are designed to transfer commuters from low-occupancy modes (personal cars) to high occupancy modes (rail, bus, vanpool and carpools).

Public Art

Public art improves the experience at transit stops and stations by offering interesting and engaging visuals while waiting for services. Public art fosters a sense of belonging and identity, which makes a space more comfortable. Integrating public art around transit stops benefits the transit network and surrounding community by offering opportunity for local artists, creating a sense of place and improving the rider experience.

The **MetroArt program** works to collaboratively educate inform and engage central Texas residents about the value public transit brings to the community. The art and music program aims to strengthen community and culture by:

- Creating inviting public spaces that people want to revisit
- Supporting local artists through paid work
- Increasing the sense of home and belonging in central Texas neighborhoods
- Partnering with local agencies, non-profits and community organizations.

Heat Mitigation

Shade and relief from the heat is an important factor for riders during most months of the year in Central Texas. Transit stop placement should accommodate the most shade coverage feasible. Transit centers should consider additional heat mitigation measures. Heat mitigation measures can include:

- Sun screens integrated on stop or station shelters
- Street trees
- Structural shade from built environment
- Fabric shade shelters

Trees can provide cooling, shading and shelter, and have been shown to mitigate the negative impact of high temperatures on ridership more than typical bus stop shelters in the CapMetro service area. Staff should consider taking advantage of existing street trees for shade when placing stops; however, staff must also consider solar power availability when placing shelters with solar-powered lighting. Research on heat mitigation has produced evidence that street trees are slightly more effective at mitigating ridership decrease from high temperatures[1] and that street trees and shading are the amenities most perceived by riders to have cooling effects.

A combination of measures should be considered to provide the most protection for riders possible. Mitigation strategies may be unique to each site and careful review should be taken when siting stop or station locations or when retrofitting a site with heat mitigation.

Collaboration with partner organizations such as nonprofits has been one way to facilitate heat mitigation measures around transit stops and stations.

1 Lanza K, Durand CP. Heat-Moderating Effects of Bus Stop Shelters and Tree Shade on Public Transport Ridership. International Journal of Environmental Research and Public Health. 2021; 18(2):463.

Bathrooms

Public bathrooms provide a basic service for riders waiting for a connection or alighting after a long trip as well as for the surrounding community. While bathrooms serve an important purpose for customers and the general public, they require a unified approach to their management and maintenance. CapMetro is undergoing a holistic review of qualifications and locations where bathrooms may be appropriate, and will coordinate with the City of Austin and other member cities to determine the feasibility of establishing these for public use.

STOP SPACING AND PLACEMENT

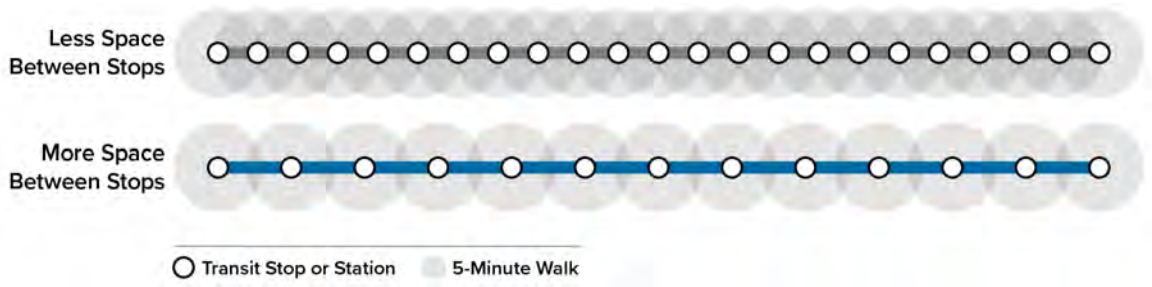
This chapter helps answer the following questions: How far apart should stops or stations be from one other? What factors are important when deciding where a stop should be placed on the curb?

STOP & STATION SPACING

The distance between stops or stations significantly impacts bus and rail travel times. It can also both positively and negatively impact the willingness for customers to use transit and their experience while doing so. Transit service runs more efficiently when stops and stations are optimally spaced but must balance the need for rider access and service experience.

Stops or stations placed closer together provide customers with shorter walk times, but they also increase travel times and are a major reason that transit is slower than automobile travel. Each additional stop or station requires the bus to slow down, come to a complete stop and load and unload riders before speeding up and re-merging into traffic. Most riders want transit service that balances convenience and speed, and the number and location of stops is a key component of determining that balance. Providing fewer, safer and more accessible stops and stations enhances rider experience over more stops that are less accessible.

Stop or station spacing is aligned with the type of service that is provided and the travel experience it aims to achieve. For example, MetroRapid is a high capacity bus service, and therefore has stations that are further apart between 2,650 to 4,000 feet or ½ to ¾ mile to provide a faster and more reliable service. Commuter rail is also a high capacity service, but has a more nuanced spacing standard which depends highly on surrounding land use and site availability and access. Commuter rail stop spacing should be placed as needed and prioritize fast and efficient service, while balancing access needs for commuters. Local service will have tighter stop spacing on average around 1,300 feet or ¼ mile. The table below shows the average stop and station spacing based on service type.



Service Type		Average Distance (ft)
High Capacity	Rail	As needed
	Rapid	2,650 – 4,000
Frequent		1,300 – 2,650
Local		~1,300
Limited		As needed
Community		As needed

STOP & STATION PLACEMENT

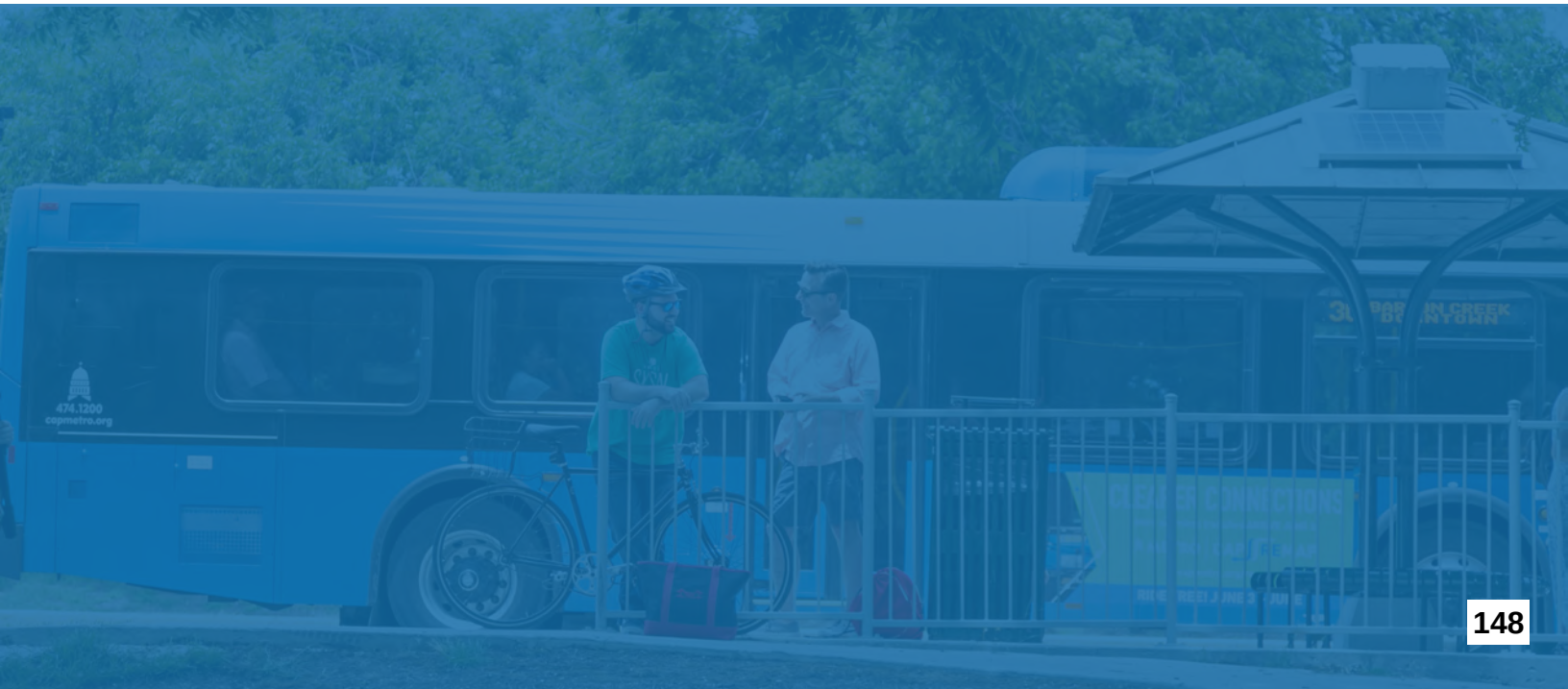
Stop and station placement involves balancing customer safety, accessibility and operational efficiency. All stops and stations should be fully accessible with a concrete landing and access to a sidewalk or pathway that connects to an intersection. When siting a stop, considerations should be given to the location it is serving. For example, if the stop is near a grocery store, riders may be carrying heavy bags, so the stop should be placed as close to the entrance of the store as possible with clear and convenient access from the stop to the store entrance. Stops and stations should be placed at intersections to maximize pedestrian safety; however, infrastructure considerations can affect stop placement, including right-of-way availability, cost of installation and maintenance, potential future changes to a stop location, city, county, state or federal laws and regulations or other operational reasons.

Stop & Station Pairing

Riders need to be able to make a round trip using transit. A stop or station needs to have a stop pair which allows for taking a transit route in both directions. Stop and station locations should be located within close vicinity to the stop for taking the same route back the other direction. This makes it simpler for riders to navigate the transit system and provides a similar level of access to a location when making a round trip. This makes transit service easier to use and more convenient. CapMetro staff may need to use professional judgment as certain land use or street context may prevent closely paired stops or stations.

Locations at the Intersection

Transit stop and station positions at the intersection impact the reliability of transit service and convenience for the customer getting to the stop. When placing a stop, it can be located near-side, far-side or mid-block in relation to the intersection. Far-side stops are the preferred placement in most situations to keep the bus moving, for the safety of pedestrians exiting the bus and for the drivers to be able to effectively merge back into traffic. However, each location needs careful consideration for stop placement based on the amount of right-of-way and set up of that particular intersection. For more detailed information on the location of stops at the intersection, see the **Stop and Station Con igurations** section.



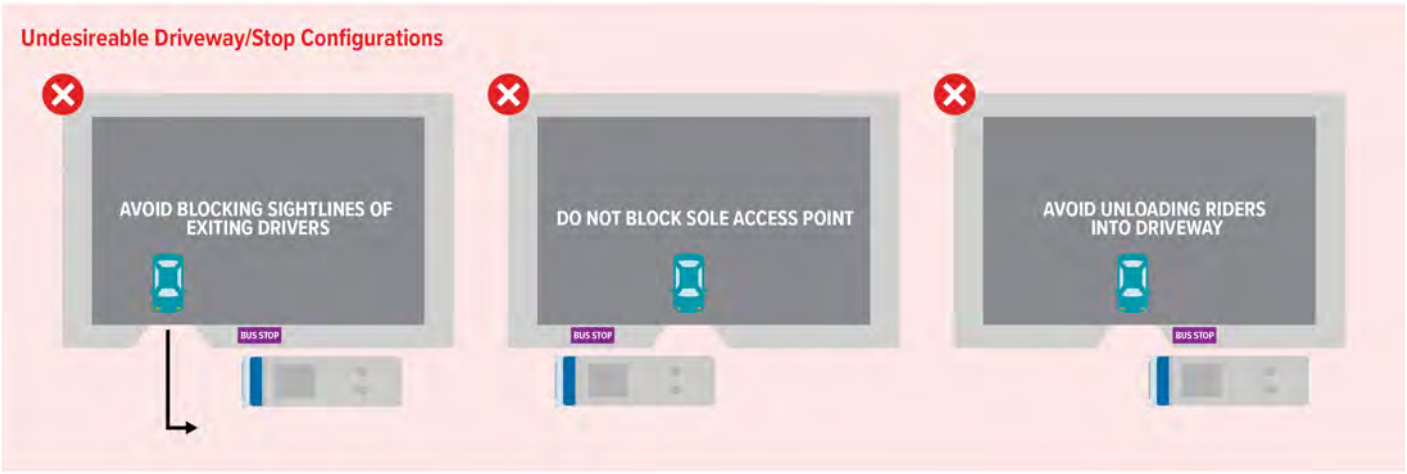
High Transfer Stops & Stations

A high transfer stop or station refers to a location where riders are often making a connection to another transit service. For example, a rider may get off the Rail Connector Route 465 at a bus stop at MLK Station to connect to the Red Line station. Where transfer activity between routes is significant, stops or stations should be located as close together as possible to provide a short walk and convenient transfer for customers. This may result in a near-side and far-side stop at the same corner of an intersection to mitigate the need to cross the street. CapMetro staff will use professional judgment to site stops and stations at high transfer locations based on the land use and operational context.

Driveways

Driveways and other curb cuts near transit stops or stations can pose safety hazards for customers getting on and off transit and for drivers of transit vehicles. There are six principles that guide the siting of stops in relation to driveways, illustrated below.

There may be locations where it is not possible to meet all six principles for driveway arrangements to create or preserve equal access to the transit stop. Safety and accessibility are the most important considerations when siting stops around driveways and curb cuts. In cases where stops are competing with driveways consistently along a corridor, driveway consolidation and access management, in coordination with municipal partner staff may be a beneficial solution.



STOP & STATION CONFIGURATIONS

This section reviews the location of stops at the intersection, and the configuration of stops within the right-of-way. It also gives guidance on setbacks from the crosswalk, and advantages and considerations for each stop locations and configuration.

LOCATIONS AT THE INTERSECTION

Determining where to locate stops and stations is one of the most important factors that makes transit run well. Transit stop placement involves balancing customer safety, accessibility, comfort and operational efficiency. A stop can be described in terms of its location along the block relative to the nearest intersection, and its configuration relative to the curb and the adjacent area. The dimensions included in this section are based on best practices but are subject to change based on site-specific constraints or opportunities. When placing at stop near an intersection, sometimes the placement may require that driveways need to be consolidated or closed to create room for transit vehicles to stop safely.

FAR-SIDE

Far-side stops are located past the intersection so vehicles move past the traffic signal and crosswalk before reaching the stop. This reduces delay by allowing the bus to resume its trip as soon as passengers have finished boarding, rather than having to then wait for a green light. Far-side bus stops are generally preferred as this placement increases visibility and reduces the chance of collisions between buses and right turning vehicles before the intersection.

NEAR-SIDE

Near-side stops are located before the intersection. These are not preferred, as vehicles may have to wait at a red light, which can impact speed and reliability. Other drivers may also try to merge in front of a stopped bus to make a right turn, which can create a safety concern or further delay the bus. To avoid this, near-side stops should be built to allow transit vehicles to stop as close to the intersection as possible, up to 10' from the crosswalk. A near-side stop may be preferred if it is closest to the destination most riders are going to at the location.

MIDBLOCK

Mid-block stops are not located at an intersection. They are typically only placed near important destinations or where longer block lengths do not allow for optimal stop spacings. These stops should be accompanied by mid-block crossings protected by signalized pedestrian crossings, or pedestrian crossing islands, in coordination with the City of Austin or other service member jurisdictions.

Summary of Configuration Details

Stop Placement	Rear Buffer from Crosswalk (ft)	Stopping Area (ft)		Front Buffer from Crosswalk (ft)	Total Length (ft)	
		40' Bus	60' Bus		40' Bus	60' Bus
Far-side	20	40	65	N/A	60	85
Far-side after Bus Left Turn	20	40	65	N/A	60	85
Far-side after Bus Right Turn	20	40	65	N/A	60	85
Near-side	N/A	40	55	10	50	65
Mid-block	N/A	40	55	N/A	40	55

Values in table are approximate for planning purposes.

The table below describes the trade offs of these stop placements as well as important considerations for CapMetro when they are implemented.

Stop Placement	Benefits	Considerations	Ideal Locations
Far-side	• Riders exiting the bus will cross behind the bus, which is safer. • A bus can merge more easily back into a travel lane due to gaps created by the signal.	• Consider traffic signal priority to increase likelihood bus makes it through an intersection. • If the stop is part of a high transfer stop pair, near-side may be preferable.	• Consider at all stop locations, but especially those with high right turn volumes or where bus travel time delay occurs.
Near-side	• Not preferred, but may be best fit for places where transfer pairs would be improved, where space constraints limit far-side options or where it is closest to a destination many riders are going to.	• Near-side stops may obscure the sightlines between pedestrians and drivers turning right. • Near-side stops may impact vehicle operations and schedule reliability. • Minimize space that would be left in front of stopped vehicles, so drivers do not attempt to turn in front of them.	• High transfer locations. • Locations with high bus left turns or high turn volumes. • Locations where preferred far-side placement is not feasible.
Mid-block	• Allows a stop to be located directly in front of a high-demand destination even if not at an intersection. • Midblock stops allow buses to avoid complexity at intersections (turning vehicles, pedestrians, etc.). • Can be used to achieve desired spacing.	• Mid-block placements require crossing treatments. • Drivers may not expect a bus to stop midblock. • Walking distance for transfers may increase.	• Where spacing guidelines and destinations dictate.

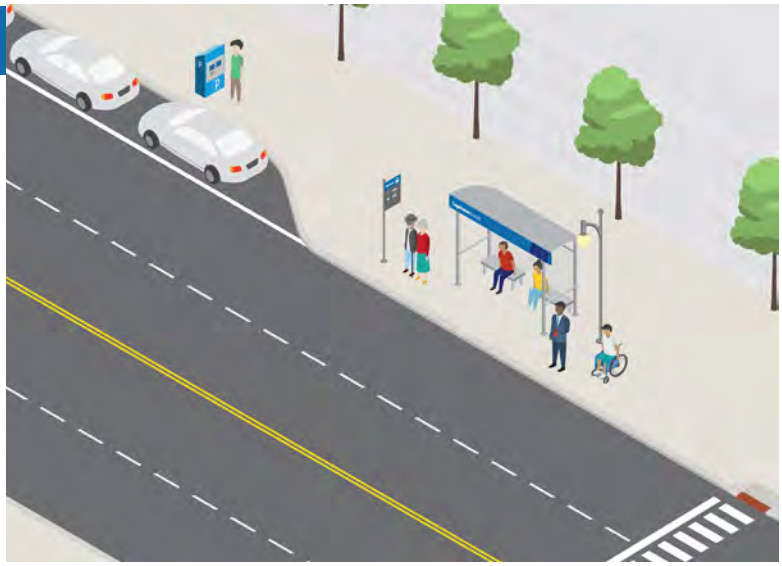
BUS STOP & STATION CONFIGURATIONS

In-Lane Bus Stops & Stations

In-lane stops allow vehicles to stop in the travel lane. These stops do not require them to move into parking or bike lanes, reducing conflicts between pedestrians, cyclists and transit users. They help increase reliability and speed because buses do not have to wait to merge back into traffic and also provide more space to furnish amenities at the curb.

BUS BULB

A bus bulb is an extension of the curb into the parking lane which allows buses to stop against a curb without exiting the travel lane. Bus bulbs are typically used on lower speed roadways with speed limits less than 35 mph.



FLOATING

Floating bus stops are those on streets with dedicated bike facilities, which continue behind the waiting area of a bus stop. The preferred configuration includes separate spaces for the waiting area, bike lanes and the sidewalk, but if there is limited right-of-way available, sometimes these areas may share space. Floating stops should generally comply with the dimensions for bus bulbs.

Accessibility and universal design principles are important at these stops as they can be more difficult to understand for people with vision impairments due to the required crossing of bike facilities.

Out-of-Lane Bus Stops & Stations

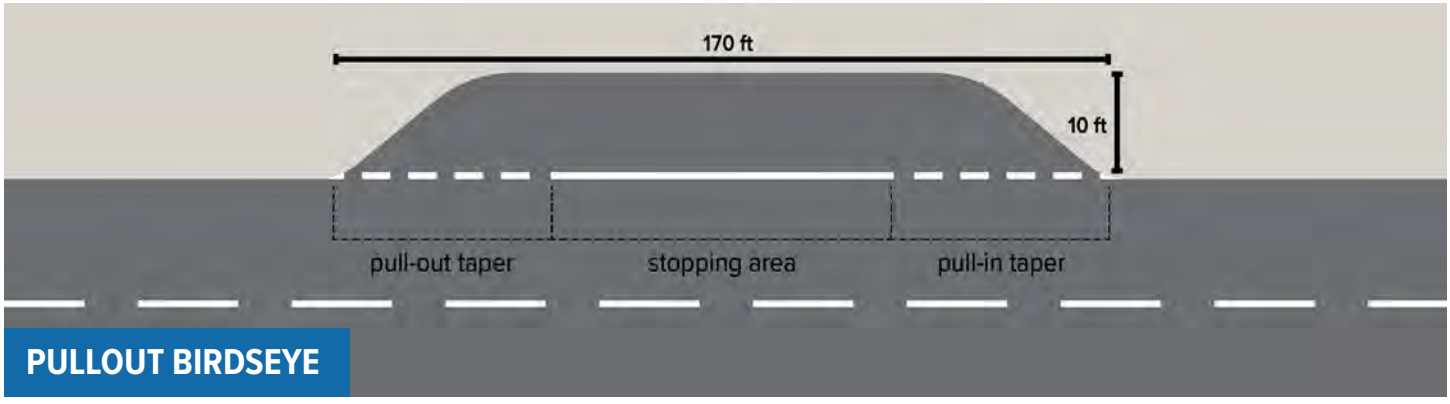
Out-of-lane stops require transit vehicles to pull out of travel lanes to stop at the curb. These allow for continued traffic flow for other drivers but are generally less desirable as they may increase delays because buses need to merge back into traffic when departing the stop.

CURBSIDE

Curbside stops are the most common stop configuration. At these stops, the bus pulls out of the travel lane, fully or partially, to the curb to serve riders. While these stops are common, they are not recommended on streets with a bike lane, or high vehicle speeds with higher potential for people driving to sideswipe or rear-end buses.

PULLOUT

Pullout stops for on street configurations, or bus bays for off street, refer to stops where vehicles pull entirely out of the travel lane into a bus-only pull-out space. Typically, this stop configuration is not used by CapMetro due to the difficulty in merging back into traffic and the resulting delay riders experience. However, these stops are typically found at select locations where having the bus exit the travel lane is desirable for safety or operational reasons. These can also be an appropriate option at locations where longer dwell time can be expected for operator breaks or at timepoints. Typical dimensions for pullouts are shown below.



PULLOUT BIRDSEYE

Values are approximate for planning purposes.

The table below summarizes the key considerations for CapMetro when these stop configurations are chosen.

Stop Config.	Type	Benefits	Considerations	Ideal Locations
In-Lane Stops	Bus Bulb	• Bus bulb stops can reallocate right-of-way to provide more amenities such as shelters and seating, as well as reduce delay by allowing the bus to stop in-lane.	• Coordination may be needed if parking spaces will be lost when implemented (Austin Transportation Department, property owners, etc.).	• At any locations where the bus experiences delay due to having to merge back into traffic. • Where there is not enough right-of-way behind the existing curb to install amenities that the stop warrants.
	Floating	• Floating stops eliminate or mitigate the conflicts between pedestrians, transit riders and cyclists by providing separate space.	• Some locations may lack the right of way needed for separate space for each mode; constrained floating bus stops with shared boarding/bike space is an option.	• Any stop where a bike lane exists or is proposed.
Out of Lane Stops	Curbside	• Allowing the bus to pull out of traffic may be desirable at some locations for operational or safety reasons.	• May not be suitable for arterials that experience high amounts of traffic congestion or delay.	• Where there is not enough right-of-way to implement a full pullout stop.
	Pullout	• At timepoints or other places where the bus will need to wait longer than normal, pullouts help maintain general traffic flow.	• There is often delay associated with the bus merging back into traffic. • More right-of-way is required for pullout stops than curbside or floating stops.	• On high-speed roadways or at timepoints where it is desirable for safety reasons to allow the bus to pull out of traffic. • At locations where expected riders may benefit from this configuration (visually impaired or disabled people, senior centers, schools).

COMMUTER RAIL STATIONS AND CROSSINGS

CapMetro currently operates nine commuter rail stations that provide riders a place to safely get on or off the Red Line and connect to the area's walking network, trails, bus stops or a park-and-ride lot. There are usually one or two platforms at each station depending on the track configuration and operational requirements. Platform design including the width, length and layout will vary depending on the site needs. The configuration chosen depends on the right-of-way available, number of tracks, level of service provided, passenger capacity, vehicle size and capacity requirements, ADA and other contextual conditions.

CapMetro follows detailed guidance based on the technical requirements of commuter rail, and works closely with the public, officials and staff during planning and engineering phases to identify and analyze specific station locations. The types of commuter rail station configurations are outlined at a high level below.

CENTER PLATFORM

A center platform allows riders to access both the inbound and outbound trains from one platform when there are two tracks. This usually requires that riders cross the railroad in order to reach the platform unless there is an overpass or underpass. A benefit of this configuration is that riders do not need to decide between multiple platforms depending on which direction they are trying to ride. A disadvantage of this configuration is that it is difficult to handle a surge in riders due to limited space. A current example of this type of configuration is MLK Station on the Red Line.

SIDE PLATFORM

A side platform configuration typically has a platform for each track. If there are 2 tracks, a station will have 2 platforms, one on each side, where riders access the inbound and outbound trains from separate platforms. Riders will need to know which platform to use based on their direction of travel. This usually requires that riders cross the railroad in order to reach the opposite platform absent an overpass or underpass. Where a single track is present there is only one platform. A current example of this type of configuration is Lakeline Station on the Red Line, where there is a single track and a side platform.

CENTER/SIDE PLATFORM

A center/side platform is a combination of the previous two configurations where there is both a center platform and a side platform, typically with one track in between platforms instead of two. A current example of this configuration is Downtown Station, which has a center platform that can be used for boarding and alighting for inbound and outbound trains, and a side platform for additional capacity for alighting in the future.

At-Grade Rail Crossings

CapMetro's commuter rail shares tracks with freight and the rail corridor runs outside of general traffic except where it crosses streets and highways. All grade crossings should have full road crossing gates with flashers and warning bells. Pedestrian or bicyclist crossings of the railroad tracks occur only at approved locations, almost always where roadways intersect the railroad tracks, or at pedestrian crossings adjacent to station platforms. Medians or a four quadrant gate can be installed at crossings to prevent traffic from driving around the active gates. The type of treatments are determined on an individual basis after reviewing train speed, visibility, vehicle and pedestrian activity and more. All rail crossings follow federal, state and local standards to ensure compliance and the safety of those crossing the railroad.

Guidance

According to Section 6.2.3.4 of the TCM, Rail Crossings should:

- At-grade rail crossings shall conform to the latest edition of the Texas Manual on Uniform Traffic Control Devices (TMUTCD) standards and are subject to the required US DOT approval process.
- Slopes to at-grade crossings shall comply with grades to curb ramps and crossings shall be 12 ft. or 16 ft. wide depending on ridership and constructed of precast concrete panels.
- The crossing shall extend from the face of one platform to the face of the opposite platform at the same elevation as the top of rail.
- The platform shall be depressed to the crossing at a rate that does not exceed 8 in. rise for 16 ft. of run.
- Signalized crossings shall be provided at locations where two or more tracks are crossed; gates at crosswalks shall not be allowed at these locations.
- Cross track boarding is to be avoided and warning signals should be provided at all existing at-grade crossings.
- The number of at-grade crossings is based on the platform length and the maximum distance between at-grade crossings is 405 ft.

APPENDIX B

AMENITY ENHANCEMENT PROCESS

2023

TRANSIT AMENITY ENHANCEMENT

The prioritization process for transit stop and station amenity updates and upgrades gives each stop a score based on a multi-criteria analysis of existing stop conditions and its surrounding characteristics. The approach includes both quantitative and qualitative data to incorporate statistics based on Census and City data, as well as community input to provide valuable context to transit stop needs and the degree of urgency. As a next step, CapMetro will develop a strategy for implementing transit stop improvements, including innovative financing options.

Amenity Enhancement Components

The amenity enhancement process prioritizes transit stops based on several indicators that address the following criteria:

- **People With High Amenity Need: 60% of total score**
- **Transit Stop Use: 13% of total score**
- **Multimodal Access: 20% of total score**
- **Customer Requests: 7% of total score**

Weighting of indicators is based on a prioritization of equity considerations when distributing bus stop amenity upgrades and funding. The most weight went to people who would benefit most from amenity enhancements, followed by a stop's access to infrastructure and services, how often a stop is used and whether the stop has received specific customer requests for amenity updates. Please refer to the **Amenity Distribution Scoring Rubric** below for a summary of all indicators, their groups and those groups' weighting towards the final score.

People With High Amenity Need

People With High Amenity Need represents historically disadvantaged communities. This group also represents those who are more likely to rely on transit as their primary mode of transportation, making proper amenities at their transit stops a priority.

The table below presents criteria for bus stop scoring based on data that identifies transit reliant and historically disadvantaged communities:

Data Source	Indicator	Data Type	Points Criteria	Possible Points
Latest American Community Survey (ACS) 5-Year Census Data	BIPOC populations	Table B03002	2 points = 85th percentile or above 1 point = Above average 0 points = Average or lower	2
	Low-income households	Table B19001		2
	Zero vehicle households	Table B25044		2
	Older adults (65+)	Table B01001		2
	Youth (14 and younger)	Table B01001		2
	Individuals with disabilities	Table B23024		2
	Individuals with low English proficiency	Table B16004		2
USDOT Data	Justice40 disadvantaged communities	Justice40 Dataset	4 points = Disadvantaged tract 0 points = Non-Disadvantaged tract	4

ACS

Each bus stop is assigned the Census Tract that it is within using a spatial join in GIS. All stop values are then compared to determine the average of the set of bus stops, as well as the 85th percentile value for each ACS indicator. Each bus stop is then assigned the corresponding points based on how it compares to those values.

Justice40

The Justice40 Initiative is an environmental justice-based Biden administration goal that 40% of the overall benefits of certain Federal investments flow to disadvantaged communities that are marginalized, underserved, and overburdened by pollution.

Justice40 data is collected at the federal level and highlights disadvantaged Census Tracts that meet the thresholds for at least one of the tool's categories of burden, or if they are on land within the boundaries of Federally Recognized Tribes. The categories of burden are Climate Change, Energy, Health, Housing, Legacy Pollution, Transportation, Water & Wastewater, or Workforce Development. The Justice40 indicator uses GIS to determine whether a bus stop is within a Census Tract that is designated as "disadvantaged" in the Justice40 dataset.

Transit Stop Use

This indicator measures the proportion of total transit trips to a stop that ended up serving at least one customer. The intention of the indicator is to balance bus stops with low boardings that occur frequently with bus stops that have high boardings that occur infrequently.

This indicator determines transit stop use reliability through a two-step process:

1. Assess whether each trip at a stop resulted in at least one boarding or one alighting. If there was either one boarding or one alighting, a value of 1 is assigned to the stop for the trip; if either is false, a value of 0 is assigned to the stop for the trip.
2. Sum the total of the trip values from Step #1 and divide it by the total number of trips serving the bus stop for the period of time evaluated.

The resulting value is a percentage, which is then compared to the use at all stops, and given a score from 1 to 4 depending on what quartile a stop falls in.

Below are two hypothetical examples of calculating stop use.

HOURLY WEEKDAY SERVICE

7am	8am	9am	10am	11am	12pm	1pm	2pm	3pm	4pm	5pm	6pm
0	1	0	0	1	0	0	0	0	1	1	0
Value Total = 4 boardings or alightings											
Transit Stop Use = 33% (4 boardings or alightings/12 daily trips)											

PEAK PERIOD WEEKDAY SERVICE

7am	8am	9am	10am	11am	12pm	1pm	2pm	3pm	4pm	5pm	6pm
1	1	0	N/A	N/A	N/A	N/A	N/A	N/A	0	1	1
Value Total = 4 boardings or alightings											
Transit Stop Use = 66% (4 boardings or alightings/6 daily trips)											

To calculate this indicator, CapMetro uses Automatic Passenger Count (APC) data that assigns an ID for each transit trip at each stop and the boarding/alighting for each trip at each stop for all CapMetro services. The table below summarizes the Transit Stop Use Reliability indicator.

Data Source	Indicator	Data Type	Points Criteria	Possible Points
CapMetro	Transit Stop Use	APC Data	4 points = Very High 3 points = High 2 points = Medium 1 point = Low	4

Multimodal Access

Multimodal Access indicators focus on surrounding infrastructure, services, and facilities to prioritize bus stops based on sidewalk connectivity and the stop's proximity to destinations people would use transit to reach. The table below provides a summary of the indicators and how they are scored.

Data Source	Indicator	Data Type	Points Criteria	Possible Points
City of Austin	Sidewalk Reliability	City of Austin's Strategic Measure Sidewalk Segment Data	2 points = 85th percentile or above 1 point = Above average 0 points = Average or below	2
City of Austin	Proximity to Key Destinations	Key Destination GIS layer	4 points = 2+ types of destinations within 1/2 mile 2 points = 1 type of destination within 1/2 mile 0 points = No key destinations within 1/2 mile	4

Sidewalk Reliability

The value of comparison for each bus stop's sidewalk reliability score is the ratio of "Absent" sidewalk segments to total sidewalk segments within ¼ mile of the stop.

Proximity to Key Destinations

Using GIS, key destination data from City of Austin is geospatially analyzed to identify every transit stop's proximity to these key services and facilities. In GIS, each stop is given a ½-mile radius buffer and is assigned a score based on how many and what type of destinations fall within that radius.

The following services are considered key destinations for this indicator:

- Libraries
- Recreation Centers
- Schools
- Hospitals
- Childcare centers
- Employment centers
- Parks

Each bus stop is given a score of 1 if one type of destination is within a ½ mile radius and 2 points if two or more types of destinations are within a ½ mile radius.

Customer Requests

The customer feedback indicator offers community input in the prioritization process for stop amenity distribution. The indicator will score stops by reviewing customer call reports that request amenities at bus stops. Bus stops with one amenity-related call receive 1 point, while bus stops with more than one amenity-related call receive 2 points.

About Bicycle Access

Bicycle access to transit is an important component of a well-functioning transportation system, as both modes together provide reliable coverage to areas that transit could not serve alone. People who bike to transit and people who walk or take rideshare to transit deserve the same amenities regardless of the mode used to access transit except for bike parking.
Bike access is not part of the evaluation process for amenity enhancement because the proximity of a transit stop to protected bicycle infrastructure does not influence the relative need for upgrading the amenities at that stop. Bike parking is an important amenity for people using a bike to access transit, however, it should be placed on a case by case basis according to measured or predicted cycling use for the system at large and by the amount of space available at the stop or station. Any increased use of a given stop or station caused by greater density of protected bicycle infrastructure nearby is captured in the ridership metric used to assign stop type, and directly influences amenity levels provided at that stop or station.

PROCESS IMPLEMENTATION

The Amenity Enhancement components work together to identify the amenity needs of all CapMetro transit stops and score the stops to determine which needs should be met with the resources available. This makes it easier for CapMetro to make cohesive decisions and be more transparent with the public.

Each stop is classified into types based on ridership and service type, as stated in the **Transit Stop and Station Design Guide**. These are the following steps for amenity distribution process.

Step 1 – Identify Amenity Needs

Using stop inventory data developed and maintained by the agency, a list of amenity needs can be created for each stop. If unit costs are documented for each amenity type, total costs to meet stop type amenities levels can be developed to understand the level of investment required at each stop.

Step 2 – Prioritize Stops

All stops in the system are scored and prioritized based on the Amenity Enhancement Process also described in detail in the Methodology section.

Step 3 – Allocate Resources

Based on the time when financial resources become available, funds can be distributed starting with the top priority stops to purchase amenities to bring the stops up to the newly established stop type amenity standards. CapMetro may determine to allocate funds in buckets based on classification type, or solely based on priority scoring. With over 2,500 transit stops, this process will take time and be repeated as more funds are available to bring stops up to the standards incrementally over time.

Stop Type Classification should be completed on at least an annual basis to ensure that stop types are upgraded as needed, which will increase the expected amenities. In some instances, it will also trigger needed updates including new stops and service type upgrades.

Exceptions

New Stops

New stops in previously unserved areas will not have ridership numbers or measured frequency to go on. Therefore, staff will need to assign an initial stop type based on like service from another corridor. Once the service has matured, after 12 – 24 months, the stop type should be reassessed with actual stop data.

Service Type Upgrades

If a specific route receives service changes or improvements like increasing the route frequency, the stops in that route should go through the amenities enhancement process again to ensure they account for the new appropriate amenity level needed. For example, if a stop had previously been served by only local service, and a new MetroRapid service is implemented, it will become a Transit Station stop type with different amenity requirements.

Customer Requests

Customer requests should be added and scoring updated at regular intervals, before new batches of funding are allocated to amenity enhancements.

AMENITY DISTRIBUTION SCORING RUBRIC

Category	Indicator	Possible Points	Overall Weight in Category
Equity Indicators	BIPOC populations	2	Equity Indicators = 60% of how we prioritize a bus stop for amenity distribution
	Low-income households	2	
	Zero vehicle households	2	
	Older adults (65+)	2	
	Youth (14 and younger)	2	
	Individuals with disabilities	2	
	Individuals with low English proficiency	2	
	Justice40 disadvantaged communities	4	
	Total	**18**	**60%**
Stop Use & Accessibility Indicators	Transit Stop Use	4	Stop Use and Accessibility Indicators = 33% of how we prioritize a transit stop for amenity distribution
	Sidewalk Reliability	2	
	Proximity to Key Destinations	4	
	Total	**10**	**33%**
Customer Feedback	Customer Feedback	2	Feedback Indicator = 7% of how we prioritize a bus stop for amenity distribution
	Total	**2**	**7%**
	Grand Total	***30***	***100%***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