SamTrans (San Mateo County Transit District)

Service Policy Framework

Adopted March 2, 2022

Note

The Service Policy Framework provides SamTrans staff, leaders, stakeholders, and the public with a clear and transparent vision and methodology for how SamTrans designs and evaluates its mobility services. This document is the product and a memorialization of the work done as a part of the 2019-2022 Reimagine SamTrans Comprehensive Operational Analysis.

Building on cornerstone principles from the SamTrans Strategic Plan (2015 – 2019) and the SamTrans Business Plan (2018), as a part of Reimagine SamTrans staff identified four **guiding principles** specifically for the ways in which SamTrans designs, evaluates, and communicates about its bus service and supportive infrastructure investments. Those guiding principles have been included in the Service Policy Framework and will continue to guide staff in the formation and evaluation of service.

The Service Policy Framework will be a living document and likely be updated in the future given the change of pace and development as well as travel and transportation trends in San Mateo County and the San Francisco Bay Area as a whole. The COVID-19 pandemic has challenged the public transit industry and the "new normal" ridership pattern remain unknown. This unknown is reflective in the key performance indicators that have are to be determined (TBD) in this document. As ridership continues to normalize in a post-pandemic world, and as equity continues to take a large role in distribution of services, new best practices for measuring transit effectiveness may emerge and these metrics may change.

Specific performance targets for each route category will be determined once the Reimagine route network is implemented beginning in August 2022 and as ridership normalizes in a post-pandemic environment.

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1 Purpose and Introduction

The role of public transportation is to provide people with mobility to access places they want to go: employment, medical services, community resources, and places of recreation. Public transit benefits those without access to a personal vehicle who are dependent on transit as a mobility service and customers who may have personal vehicles that want to use alternative transportation. Providing effective, efficient, and high-quality mobility options comes from designing services that are attractive to people, are useful, and are sustainable to operate and reflect the values and priorities of the communities it serves. It is SamTrans' mission to supply the public with a high-quality, safe, and efficient transportation that should enhance quality of life by increasing access and mobility, reducing congestion, improving the environment, and promoting economic vitality.

PURPOSE OF THIS SERVICE POLICY FRAMEWORK

With this document:

- SamTrans staff will have a guidebook to implement and refine new and existing SamTrans bus service when responding to requests and making service design choices in the future.
- The SamTrans Board of Directors (BOD), advisory, and stakeholders' groups will have weighed in and approved the framework.
- Stakeholders and the public will have access to the framework to better understand how SamTrans makes service planning, and design decisions – balancing requests, resources, and needs.

SamTrans will also use this document in coordination with the BOD-approved Title VI Program to help monitor and ensure that programs and actions are not purposefully or accidentally discriminatory towards minority or low-income populations. Equity considerations will be interlaced with everything that SamTrans does.

COMPONENTS OF THIS FRAMEWORK

Chapter 2 provides an overview of the *guiding principles* staff developed as the baseline for the Reimagined Network and will be used for service planning and evaluation.

Chapter 3 establishes a new *family of services* based on route purpose and characteristics and discusses the role *equity* in service planning at SamTrans.

Chapter 4 details principles of effective *route design* employed by SamTrans.

Chapter 5 memorializes *customer communications guidelines* for service planning and changes.

Chapter 6 establishes *metrics to evaluate* SamTrans' fixed-route service.

Chapter 7 provides an overview of the *service planning process*.

2 Guiding Principles

1. Employ customer-focused decision-making. Prioritize improvements to the SamTrans rider experience. Enhance the experience of planning and making bus trips on SamTrans.

- Enhance customer safety, security, and comfort on the bus and when waiting for the bus.
- Design and operate routes that are simple and easy to understand.
- Conduct transparent and empowering community engagement.
- Adopt and promote available tools and new technologies that improve the customer experience.

2. Be an effective mobility provider. Service that is fast, frequent, reliable, and takes people where they want to go is important for growing new and more frequent riders.

- Build ridership through operating effective public transportation services.
- Provide fast or time-competitive bus transportation.
- Provide reliable bus transportation.
- Integrate SamTrans into the larger county and regional transportation network.
- Explore new and alternative transportation delivery models.
- Utilize public funds and resources responsibly and efficiently.

3. Provide transportation that supports the principles of social equity. Improve transportation for communities in San Mateo County with the most significant transportation and access disparities, designated as *SamTrans Equity Priority Areas*. SamTrans service design and evaluation will be in alignment with SamTrans' Title VI Program.

- Direct resources to provide high-quality service in communities with the greatest transportation disparities and mobility needs.
- Prioritize service, infrastructure, and pilot projects in SamTrans *Equity Priority Areas* (described in Chapter 3).
- Support access to jobs and workforce development opportunities from *Equity Priority Areas*.
- Seek to accommodate the transportation needs of workers with non-traditional work hours.
- Minimize missed trips (Do Not Operate/DNOs) on routes serving *Equity Priority Areas*.

4. Design service that can be reasonably delivered by our workforce. SamTrans' ability to provide reliable, high-quality bus transportation services is tied to the availability of its bus transportation workforce.

- Support the recruitment and retention of our workforce through route design and scheduling practices that consider the driving experience, realistic road conditions, and availability of restrooms and other facilities on route.
- Provide a feedback loop with the workforce, letting them know the ways in which their feedback is utilized.

3 Guidelines for Allocating Service

Service allocation guidelines help assess the appropriate level of service for a sustainable system that meets the needs of customers. The guidelines in this chapter provide a structure to help SamTrans make planning decisions and communicate with the public about investments. Chapter 6 Service Evaluation will turn these concepts into metrics that can be monitored and help target appropriate changes to the transit system.

DEFINING SERVICE CHARACTERISTICS

Figure 1 Key Service Characteristics

Guideline	Description
Frequency	The number of trips operated in an hour by route and direction
Span of Service	The hours in the day that service operates
Days of Service	The days of the week a route operates
Stop Spacing	The distance between stops

Frequency

Frequency refers to how often a bus comes. A route that operates every 15-minutes provides a much higher level of service than a route that provides service once an hour. Routes with more demand should operate more frequently. Routes that exist to provide a basic level of coverage and connection to the network operate less frequently.

Minimum Frequency: For service that operates on regular headways, service should not be less frequent than every 60 minutes.

If a route cannot support 60-minute service, alternative service delivery methods, such as on-demand service or partnerships with local jurisdictions for shuttle service, should be considered.

Span of Service

Span of service is the duration of time (hours) that vehicles are available for passenger service on a route. The service span is measured from the beginning time of the first trip on the route to the end time of the last trip on that route. A span of service that extends earlier or later enables riders to have more access, and clearly defined service spans can help simplify the system for riders. The earliest and latest trips of routes that operate throughout the day often have fewer riders than trips during the peak or midday. If this is not true,

there is likely demand for earlier and/or later service. To simplify analyzing span of service, SamTrans has identified the following periods and what route categories should be operating in each period. Although the periods in Figure 2 extend from 4:00am to 3:59am the next day, service does not need to extend all the way to start of the first period it starts service or the last period it operates in (e.g. a route in a service category that should operate in the early morning does not need to start at 4:00am).

Figure 2 Periods of Service

Early Morning	Morning	Midday	Afternoon	Evening	Late Evening	Owl
4:00am	6:00am	9:00am	3:00pm	6:00pm	9:00pm	12:00am
↓	↓	↓	↓	↓	↓	↓
5:59am	8:59am	2:59am	5:59pm	8:59pm	8:59pm	3:59am

Weekday Span of Service: The service span for Frequent, Local, and Community service categories should operate in the Morning, Midday, and Afternoon. Weekend service can vary slightly since ridership is lower but providing service span as close to weekday as possible makes the service useful and understandable for riders. Alternatively, School-oriented, Express, Owl, and Special routes are targeted services that may have unique spans of service based on who and what destinations they serve.

Days of Service

Days of service tells customers which days of the week a service operates. Service that is not based around commuter or school-oriented service should operate seven days per week. This not only improves access across the county, but also makes the system more legible and improves the chances of people adopting transit as their mode of choice for a variety of trip purposes. Services that have specific purposes, serving school or commuter job access, may not be needed on weekends because schools and office buildings are most likely closed.

Days of Service Goals: Provide seven-day-a-week service on all or as many Local, Community, and Frequent routes as possible.

Stop Spacing

The distance between stops is a key element in balancing transit access and service efficiency. Closely spaced stops provide customers with more convenient access, as they are likely to experience a shorter walk to the nearest bus stop. However, transit stops are also the major reason that transit service is slower than automobile trips, since each additional stop with activity requires the bus to decelerate, come to a complete stop, load and unload riders, and then accelerate and merge into traffic. Since most riders want service that balances convenience and speed, the number and location of stops is a key component of determining that balance.

Stop Spacing Goals: Provide stop spacing between stops that are consistent with each service category.

SAMTRANS SERVICE CATEGORIES

SamTrans will use the following service categories to communicate, design, and evaluate routes and other mobility services it provides. The main components of each category are frequency, span of service, days of service, and stop spacing.

Figure 3 SamTrans Service Categories

Category	Frequency*	Span of Service**	Days of Service	Stop Spacing
Frequent	15 all-day	Early morning, morning, midday, afternoon, evening, late evening	All days	Up to ½ mile
Local	30 or better	Morning, midday, afternoon, evening	All days	¼ - ½ mile
Community	60	Morning, midday, afternoon	All days	¼ - ½ mile
Express & Limited	Limited trips	Morning, afternoon	Weekdays	½ mile or more on streets between high-speed corridors
School-Oriented	Limited trips	Morning, afternoon	Weekdays (when school in session)	¼ - ½ mile
Owl	Varied	Owl	Varied	¼ - ½ mile

* Frequency: maximum on weekdays (in minutes)
** Span of Service: minimum on weekdays

Frequent Routes

Frequent transit service connects people to places that can support higher levels of service – often areas of higher population or employment density with demand seven days a week from early morning to late in the evening. Routes in this category may warrant infrastructure improvements that prioritize transit, such as transit signal priority and bus lanes and may have specifically branded amenities and vehicles. Ideally, 15-minute service should be provided seven days a week on Frequent routes for much of the span of service, especially morning peak, midday and evening peak periods.

Local Routes

Local service connects neighborhoods, downtowns, and major destinations. They also are likely to provide important connections to transit routes within the service area. Local transit service should operate throughout the day, every day of the week when possible.

Community Routes

Community routes provide service to less densely populated areas and are considered a lifeline to the greater transit network and the community. Community routes may be more circuitous due to street network design and land uses. Community service should operate at least hourly on weekdays. The span of service can be less than Local or Frequent service based on demand, though later and/or earlier service hours may be a higher priority to a less densely populated community than high frequency.

Express/Limited-stop Routes

Express/Limited-stop routes provide limited-stop service to or from major destinations and are typically longer in length. Express routes often travel on higher-speed corridors making few or no intermediate stops, cover more distance, and may operate only during peak times on weekdays. These routes may also overlay existing service where demand is high enough between specific origin-destination pairs to provide an enhanced service and faster travel time.

School-oriented Routes

School-oriented routes operate very few trips a day (typically two) and are scheduled to align with school schedules and school bell times. The primary users of SamTrans' school-oriented service are students traveling to and from school, although these school-oriented routes are open to the public. School-oriented routes are meant to address a community mobility need, not to replace yellow school bus service where it does exist.

Owl Routes

Owl services operate overnight, after regular transit service has ended. Owl routes provide coverage to key employment locations with non-traditional business hours, areas with limited mobility options, and neighboring transit agencies.

Special Routes

Special routes serve a unique purpose that do not fit into other categories but should still be monitored for their performance to ensure that they are effectively serving the purpose of the service. Examples may include on-demand pilot programs, prolonged bus bridges for rail construction, and service to special events such as fairs or sporting events.

EQUITY PRIORITY AREAS

SamTrans follows a federally approved Title VI Program to explicitly track measures that are meant to help analyze the quality and performance of transportation available. SamTrans has also identified equity as one of the four guiding principles within this Service Policy Framework.

To further identify areas with significant transportation and access disparities in San Mateo County, SamTrans utilized a Neighborhood Equity Index[1] that geographically identifies neighborhoods with concentrations of households that meet the following three criteria:

- **Low-income households:** Households earning less than $75,000 annually[2]
- **Racial and ethnic minorities:** Populations that identify as a race or ethnicity other than white
- **Zero-car households:** Households with no access to a personal vehicle

The Equity Index produces a composite score of the above factors. The composite scores for each block group are mapped, allowing staff to spatially identify the areas of highest need, called *Equity Priority Areas*. These are neighborhoods where residents are less likely to have access to a car and are more likely to work low-wage jobs or identify as people of color. Mapping these areas helps staff understand and prioritize service in areas of highest transportation need.

The original analysis reflected in this framework was conducted using data from 2018. SamTrans Equity Priority Areas (shown in Figure 4) are located throughout San Mateo County and, as of 2021, include portions of the following communities:

- Belmont (south of Ralston Ave and west of Alameda de las Pulgas)
- Brisbane
- Daly City (Serramonte, Crocker, Westlake, and Hillside neighborhoods)
- East Palo Alto
- Millbrae
- Redwood City (Downtown, Fair Oaks, Palm Park neighborhoods and western border of Redwood Shores)
- San Bruno
- San Mateo (Downtown, Shoreview, and Central)
- South San Francisco

Figure 4 through Figure 7 provide a closer look at the Equity Priority Areas by sub-region of the county. These maps, and the identification of Equity Priority Areas, will support SamTrans planning staff in conducting route planning in the future in the spirit of our guiding principles. Data used in the Neighborhood Equity Index should be updated at least every three years, allowing SamTrans to understand how equity priority areas may have shifted. Criteria for defining Equity Priority Areas may be adjusted as best practices and our understanding of factors related to equity evolves in the future.

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[1] The metrics are weighted using countywide averages at the Census block group level. A municipality is classified as having lower-income, non-white, or zero-vehicle zones if the entire municipality falls into the fifth quintile of a category. There are some areas where only specific neighborhoods or block groups meet the criteria.

[2] Threshold selected in attempt to match "Very Low" income thresholds for family of three to qualify for affordable housing in San Mateo County, while using federally-available income thresholds used in the US Census and available in that data set.
https://housing.smcgov.org/sites/housing.smcgov.org/files/2020%20Income%20Limits%20revised%2004282020.pdf

How This Analysis is Used

The outputs of the equity analysis described above are used as one of many tools in planning and evaluating the performance of SamTrans service. These tools can be used to guide near-term and long-term decision-making to ensure SamTrans is meeting its goals around prioritizing service in equity priority areas.

Equity Priority Areas

Equity Priority Areas are spatially identified areas of highest need, determined using US Census block-group level data and mapping. Understanding these areas can be used in:

- Future visioning and investment exercises
- Route design and stop siting decisions
- Service enhancement or elimination decisions
- Identifying priority outreach locations
- Identifying priority infrastructure and demonstration project locations

Equity Priority: Route Rankings

The SamTrans routes have been sorted based on the percentage of route alignment and/or stops within equity priority areas to understand which routes predominantly serve areas of highest need. This sorting exercise does not supersede Title VI minority and low-income route designations, but can be used in:

- Service enhancement or elimination decisions
- Performance evaluation
- Transfer hub identification
- Identifying priority outreach routes

Figure 4 SamTrans Equity Priority Areas (Systemwide)

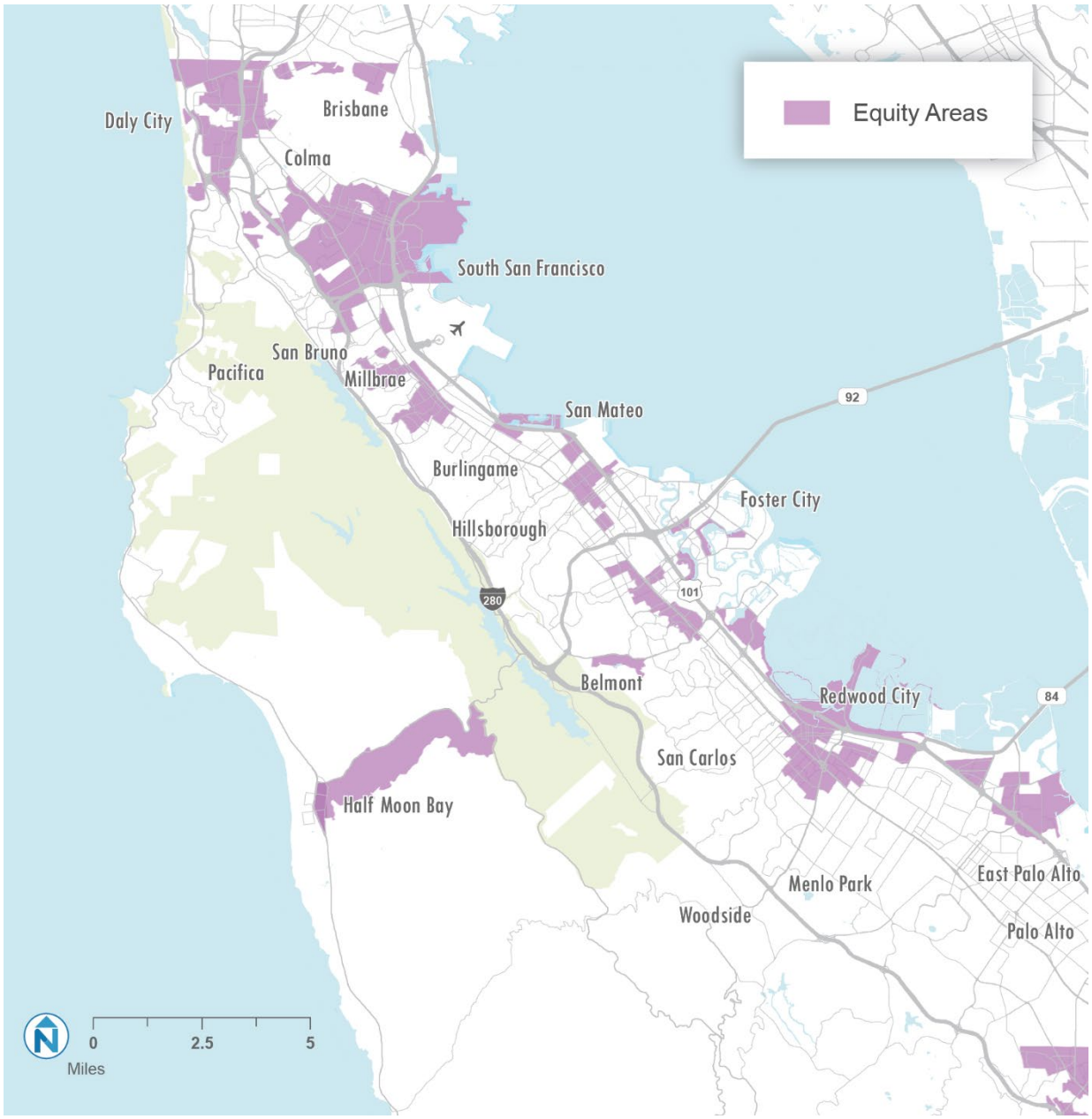

Figure 5 SamTrans Equity Priority Areas (North County)

Figure 6 SamTrans Equity Priority Areas (Mid-County)

Figure 7 SamTrans Equity Priority Areas (South County)

4 Route Development Guidelines

Understanding where people want to travel and what levels of service can be supported is key to mobility and successful transit operations. At the route level, there are tradeoffs that must be made that balance service availability to as many people as possible with creating an attractive mode choice.

This chapter presents multiple key guidelines for SamTrans to strive for when considering new routes or changes to existing routes and is also reflective of the public and rider input on service trade-offs and preferences.

ROUTE DESIGN

Route design focuses on the alignment of the route including the directness, deviations from the main arterials, and how it relates to the overall system of services. Direct routes typically operate at higher speeds than routes that make deviations, but usually have a longer distance between stops.

Route Directness

Routes should be designed to operate as directly as possible to increase average speed for the route and minimize travel time for passengers while maintaining access to service. Fast and direct routes tend to be useful to more people than circuitous routes.

The different services that SamTrans operates will have different ideal levels of directness. Frequent, Local, and Express routes should be as direct as possible to efficiently serve the customers using those services. Community, School-Oriented, and Owl Routes may require slower and less direct paths to adequately serve their respective market because they are coverage-based services.

Although not a perfect indicator of route directness, the one-way trip length (in miles) can be divided by the direct driving distance (in miles) between the route terminals. Frequent and Express Routes should be as close to one as possible. Community and School Routes should be designed to be as close to one as possible, but due to the purpose and areas served it may be difficult to achieve that.

Route Deviations

Routes should not deviate from the most direct alignment unless there is a compelling reason, such as the presence of a major shopping center, employment site, school, etc. In these cases, the benefits of operating the route off the main roadway must be weighed against the inconvenience caused to passengers already on board. Additional considerations include the impact on overall route productivity, the increased time added as a result of the deviation, and the schedule coordination with connecting services. If a deviation is made, service should be provided to that location as consistently as possible.

When ridership and load on the vehicle is available through actual data or modeled, SamTrans staff should compare the time lost to the customers not using the deviation to the ridership that use the deviation. This will help ensure that service to the location is justified compared the impacts it may have on existing customers.

Route Duplication

Routes are best designed so that they do not compete for the same customers. In most environments, people are willing to walk ¼ mile to access local transit service. Ideally, routes would therefore be at least ½ mile apart from each other. An exception is routes that converge near an activity center or transfer point. When

possible, schedules for routes that operate on the same corridor should be offset to maximize frequency of service.

When designing new routes, a ¼ mile buffer should be used to see how much overlap there is between the new service and the existing system, with consideration given to the local conditions, pedestrian environment, and topography. With any duplication, it is ideal to reduce the overlap while still serving the intended purpose of the route.

ROUTE SCHEDULING

Efficient route scheduling is essential for a usable service. Route scheduling includes the duration, timepoints along the route, trip start times, and transfers between services.

Route Duration

Routes should be the appropriate duration to maximize ridership potential and minimize operational issues. Excessively long routes with one-way trip times greater than 60 minutes in the off-peak hours should be avoided to minimize potential schedule adherence issues. In some cases, this is unavoidable to continue to serve existing SamTrans customers and their travel needs, but SamTrans staff should strive to identify solutions that reduce the duration of the one-way trips while still serving the needs of the community.

Route Timepoints

Route timepoints (points along the route that have established times when transit vehicles should arrive and depart) are essential for communicating to customers approximations for when service will arrive and for schedulers to ensure that the service is running efficiently and on-time. Timepoints should be located at major transfer hubs, destinations, and cross streets and should be approximately 10-minutes apart.

Trip Start Times

Trips for routes by direction should have consistent start times within the hour throughout the day, especially with routes that have lower frequency (30- and 60-minutes). If a trip operates every hour and the first trip starts at 6:10am the subsequent trips should start at :10 for the entirety of the span of service. If a trip operates every half hour and the first trip starts at 6:10am the subsequent trips should start :40 and :10 for the entirety of the span of service.

Timed Transfers and Connections

SamTrans routes should be designed to work together to create a system that allows customers to easily travel throughout the County and not just to destinations along the route. Ideally, customers would be able to easily transfer from one route to another throughout the day, but due to multiple transfer points along routes and efficiency in utilizing resources it may not be possible. SamTrans should use the following framework when developing connections between routes, but it may not always be possible.

SamTrans Connections

The time spent waiting for a connecting bus is important to customers and should be minimized wherever possible.

Connections between Frequent and Local/Community routes should have timed transfers, preferably at major transfer hubs such as transit centers, train stations, and park and rides and should be based on customer travel patterns throughout the day.

Timed connections between low frequency services (Local/Community) should be established when appropriate at major transfer hubs and other key locations to allow safe and convenient transfers. Untimed transfers are expected for trips on, or between, more frequent services (Frequent).

All SamTrans route should (connections along the route and operational capacity allowing) do the following at major transfer hubs:

- Run every 15 minutes or better, for relatively easy connections (Frequent)
- Arrive and depart at a hub at similar times twice an hour, if it runs every 30 minutes or better (Local)
- Arrive and depart at a hub at similar times once an hour, if it runs every 60 minutes (Community)
- Arrival and departure times would ideally be coordinated to allow reasonable transfers between routes. Additional timed transfers would also be available at other smaller transfer locations.

Major **transfer hubs** include regionally identified centers and areas where high transfer activity has been identified which include the following:

- Serramonte Mall
- Hillsdale Shopping Center
- Linda Mar Park & Ride
- Daly City, Colma, Millbrae, South San Francisco, and San Bruno BART Stations
- San Carlos, Redwood City (Sequoia), and the Palo Alto Caltrain Stations

Regional Rail Connections

SamTrans will strive to connect lower frequency service as much as possible with regional rail connections. The connections will be based on travel patterns and factor in the feasibility of connecting with rail connections along with other established connections along the route.

Coordination with Other Transit Partners

SamTrans will continue to coordinate with other transit partners such as MUNI and VTA to ensure reasonable transit connections, when possible, at the Daly City BART station and at the Palo Alto Caltrain station.

BUS STOP SITING AND BALANCING

Many factors contribute to the speed at which a bus makes a trip along its route, including both internal and external factors. External factors include typical and acute traffic congestion events, street geometry and turning movements, and traffic signal timing. Internal factors include stop spacing and stop placement decisions.

Stop Spacing

The distance between stops is a key element in balancing transit access and service efficiency. Closely spaced stops provide customers with more convenient access, as they are likely to experience a shorter walk to the nearest bus stop. However, transit stops are also the major reason that transit service is slower than automobile trips, since each additional stop with activity requires the bus to decelerate, come to a complete stop, load and unload riders, and then accelerate and merge into traffic. Since most riders want service that balances convenience and speed, the number and location of stops is a key component of determining that balance.

The average stop spacing on a Local or Community Route should be approximately ¼ mile to achieve an appropriate balance between speed and access. However, stop spacing on Express routes or overlay service can be longer to increase speeds. Stop spacing will vary along the length of a route, with shorter spacing in denser areas and longer spacing with less dense development. When selecting locations, stops should be located close to locations with significant numbers of potential riders such as housing and employment locations, as well as major destinations for transit riders such as shopping centers, and consider topography which impacts access to the stops.

Figure 8 Stop Spacing by Route Category

Category	Bus Stop Spacing (typical distance in miles)	Bus Stop Spacing (typical walk in minutes)
Frequent	Up to ½ mile	Up to 10 minutes
Local	¼ - ½ mile	5-10 minutes
Community	¼ - ½ mile	5-10 minutes
Express/Limited	½ mile or more on streets between high-speed corridors	10 minutes or more
School-Oriented	¼ - ½ mile	5-10 minutes
Owl / Lifeline	¼ - ½ mile	5-10 minutes
Special	Varies	Varies

Stop Placement

Bus stop placement involves a balance of customer safety, accessibility, and operations. All stops should be fully accessible per the American with Disabilities Act of 1990 (ADA). Bus stops should be compatible with adjacent land use and the natural environment. Specific ridership generators may determine the placement of a bus stop. Infrastructure consideration for bus stop placement includes lighting, topography, and roadside constraints such as driveways, trees, poles, fire hydrants, etc.

Near-side and far-side stops allow passengers to board and alight closer to intersection crosswalks and are generally preferred over mid-block stops. The following situations are common determinants of bus stop placement:

- The preferred location for bus stop placement is far-side of the intersection in most cases, especially in cases including:
  - The route turns left or right at an intersection
  - There is a high volume of vehicles turning right at an intersection
  - An intersection is complex, with multi-phased traffic signals or dual right- or left-turn lanes
  - A route utilizes transit signal priority (TSP) to receive priority crossings through a traffic signal
- When the route alignment requires the bus to make a left turn and it is not feasible or desirable to locate the bus stop on the far-side of the intersection after the bus turns, a mid-block stop may be warranted.
- Mid-block bus stops prior to left turns should be located a safe distance from the intersection and allows the bus to easily maneuver into the proper lane to turn left.

- When connections between two bus routes show a strong directional pairing (e.g., passengers connecting from eastbound to southbound route), placing one bus stop on the nearside and the other on the far-side can reduce pedestrian crossings at the intersection.

SamTrans Planning staff will coordinate and collaborate with Transit Operations on all bus stop locations.

ROUTE CROWDING

Passenger max load is a measure of crowding on the bus. It is used to determine when additional trips may be warranted on a bus route to meet demand and identify if there are any routes that may need trippers at specific times to alleviate overcrowding. Max load is determined by the number of passengers in a bus between stops divided by the seated capacity. Max load is expressed as a percentage where 100 percent represents all seats being used (100 percent seated capacity) and 150 percent represents a bus that can comfortably hold 150 percent of its seated capacity with standees. For example, with a max load of 150 percent, a bus with 40 seats could comfortably hold 60 passengers (40 passengers seated and 20 standees). The desired max load by route category are shown in Figure 9.

Figure 9 Load Factor by Route Category

Category	Maximum Load
Frequent	150%
Local	150%
Community	150%
Express/ Limited	100%
School-Oriented	150%
Owl	100%
Special	N/A

Regardless of route category, route segments that operate on highways and freeways for a long length of time aim to have no standees for safety reasons. Routes that have a high turnover of passengers or carry passengers for short distances can tolerate more standees.

ROUTE TERMINALS

When possible, routes should end at major anchor points or destinations to foster ridership. Route terminals should have restrooms available for operators during all hours of bus service.

Layover space should be available at route terminals. From an operating perspective, minimizing the time spent getting to or from layover areas will reduce operating costs, and potentially give operators more layover and/or recovery time. Layover space in residential neighborhoods should be avoided and at least one end of route terminals should have dedicated facilities.

FREEWAY ROUTE PLANNING

Routes designated as Express routes should maximize travel time and distance traveled via a freeway by minimizing intermediate stops. It can take on average about 1,800 feet (or approximately one-third of a mile) to make one lane change in a bus. The necessity to transition to and from the far-left lane on a freeway should be considered when determining the appropriate proximity of intermediate stops.

SCHOOL-ORIENTED ROUTE DESIGN AND SCHEDULING

School-oriented service is an important element of the SamTrans bus system. School-related service is open to all passengers but is timed to meet school start and end times (bell times) at the school(s) the route serves.

This service is very important to the community but is also resource-intensive during the most constrained times of day, the peak commute times, and requires a large proportion of travel time to and from the route start and end (deadhead) for only one revenue trip. As a result, school-oriented routes should have a higher passenger productivity than other categories of routes. SamTrans strives to provide a package of school-oriented service that is efficient while maintaining service for youth and parents who depend on or prefer to use public transit to get to school. School-oriented routes that serve *Equity Priority Areas* are the priority school services to be provided.

SamTrans works in partnership with school officials to design school-oriented routes on an annual basis. To maintain efficient operations of school-oriented service, the following processes and guidelines are utilized:

- School-oriented route schedules are based on bell times provided by the schools and SamTrans relies on that information in order to schedule the service. Schools must notify SamTrans of anticipated bell time changes in the spring; if a school does not notify SamTrans of a change to the bell times the school runs the risk of their service not being accurately timed with their bell schedule.
- Changes to schedules of school-oriented routes are typically made only three times a year. Changes are made during regular scheduled service changes for the SamTrans service. If changes to bell times occur and SamTrans is not notified in a timely manner, there are limited opportunities to make adjustments to the schedule until the next service change.
- School-oriented service is designed to connect with the school schedules during the week. School-oriented routes may have trips with variable start and end time on different days of the week, but service accommodations are not made for inconsistent or irregular school schedules. For example, if a school has a minimum day that is not scheduled consistently every week, the route start time will not be altered to accommodate the one-off schedule, but if the school has a late start every Thursday, then a route would be able to have a trip with a later start time on Thursdays.
- School-oriented routes are typically established to serve schools with 6th grade passengers and up; however, there are rare cases where school-oriented routes will service lower elementary grades.
- School enrollment and school-oriented route usage is more dynamic than local routes. Because of that dynamic nature, school-oriented routes should be reviewed a minimum of once a year to ensure resources are utilized efficiently.
- School-oriented routes should be prioritized where local routes are not able to meet the mobility needs for the school. New or expanded school-oriented service should be prioritized in *equity priority areas* if resources allow.

5 Route Communication Guidelines

The following guidelines support SamTrans in providing clear and effective communications to customers and the public about the family of services we provide and how to make use of our mobility services.

CLEAR AND SIMPLE INFORMATION

SamTrans should adopt simple and clear route naming conventions, timetables, and other customer communications. On maps and timetables, SamTrans should embrace the use of universally understood symbols and icons to maximize legibility by all language speakers. Timepoints in published materials should be labeled consistently and align with on-board text/announcements. When possible, timepoints should reflect the place name if more common and well-known than the cross streets (i.e., BART station or school).

TRANSPARENT AND EMPOWERING COMMUNITY ENGAGEMENT

All service change proposals or decisions should be communicated in language that is easy for riders and community members to understand. SamTrans should conduct empowering community engagement by holding events in our communities in locations our riders and stakeholders already visit or attend events. Major service changes should be communicated proactively across all platforms and consistent with the SamTrans Title VI Program.

TECHNOLOGY AND TOOLS

SamTrans should maintain and expand the availability of real-time bus arrival information, available across a variety of platforms, including 511, the SamTrans mobile app, other third-party transit apps, and real-time arrival screens at key bus stops and transit hubs in the County.

SamTrans should prioritize the expansion of bus stop-based arrival information screens at high ridership or high transfer stop locations and in SamTrans equity priority areas.

REGIONAL INTEGRATION

SamTrans should continue to participate in regional efforts to standardize customer facing information. This includes the regional mapping and wayfinding project, as well as efforts to improve and standardize data/GTFS feeds. Duplication of route numbers with adjacent transit agencies should be avoided when possible to minimize passenger confusion.

6 Service Evaluation

Tracking the performance of routes helps agencies target where transit services are meeting customer needs and where there are opportunities for improvement. Exceeding or failing to meet targets does not necessarily require an agency to act. It is meant as a tool to help guide assessment and adjustment of bus operating resources investment when needed. Over time, being able to understand trends can help SamTrans be more proactive with service changes and more efficiently use resources.

There are many metrics used in the transit industry. The key is to find metrics that tie the goals established by the agency into actionable measure for service improvement. The metrics identified below tie to the four established guiding principles of: delivering a customer-focused experience, being an effective mobility provider, providing transportation supporting social equity, and designing service that can be reasonably delivered by our workforce.

- **Boardings per revenue hour** is a standard productivity measure that normalizes the ridership to the amount of service being provided by calculating the number of customers that board the service per the revenue hours operated by the service.
- **Boardings per revenue mile** is a standard productivity measure that normalizes the ridership to the amount of service being provided by calculating the number of customers that board the service per the revenue miles operated by the service.
- **Boardings per trip** is a standard productivity measure that normalizes the ridership to the amount of service being provided by calculating the number of customers that board the service per the trips operated by the service.
- **Load-Percentage** is standard that measures the seated capacity utilization of a vehicle between stops.
- **On-time performance** measures how often the service departs timepoints on-time (within a certain threshold of the publicly posted time).
- **Missed Trips** is a measure that identifies the number of missed trips and includes service that was not operated or not completed.
- **Complaints per boarding** is a standard that identifies the customer perception of the service and is ratio of the complaints per number of boardings.
- **Cost per passenger** is a standard that measures the financial effectiveness of the service and is the total operating cost to provide the service per the number of boardings on the service.
- **Subsidy per passenger** is a standard that measures the financial effectiveness of the service and is the total operating cost to provide the service minus the fare revenue per the number of boardings on the service.

A detailed look at how the metrics listed above relate to the four guiding principles can be seen in Figure 10.

Figure 10 Summary of Key Performance Indicators (KPIs) Aligned with Guiding Principles

Performance Indicators	Customer	Effectiveness	Equity	Workforce
Boardings per revenue hour		x		
Boardings per revenue mile		x		
Boardings per trip		x		
Max Load	x	x	x	x
On-time performance	x	x	x	x
Missed trips	x	x	x	x
Complaints per boarding	x		x	x
Cost per passenger		x		
Subsidy per passenger		x		

PERFORMANCE TARGETS

Performance of the SamTrans bus network is measured in the following two ways:

1. **Minimum targets.** For key performance indicators, targets establish a base level of productivity that should be expected for service to be successful and sustainable.
2. **Comparisons.** Comparing similar routes against each other allows staff to identify routes that may need further analysis for improvement or modification. It allows staff to normalize performance by determining average performance within route categories, and then targeting the lowest performers for service improvements/adjustments.

Targets do not have to be static, but they should be based on industry standards for operating service that fits the demand and the identified guiding principles.

Minimum Targets

Minimum targets set a baseline for which all routes should operate. Routes that regularly fall below minimum targets should be candidates for targeted changes that could include reduction in frequency, changes to service span, increased marketing, changes to the route alignment, improvement plans for operations staff, or even an alternative service delivery model.

It is important to note that a route with performance under the minimum does not immediately trigger agency action. The metrics are not meant to be prescriptive but offer a frame with which to better understand where improvements can be made. If a route has a history of falling below multiple metrics (at least two straight service changes), SamTrans staff should identify an action plan to improve the services productivity.

Figure 11 Key Route-Level Performance Indicator Targets

Metric	Frequent Transit	Local	Community	Express & Limited	School-Oriented	Owl
Minimum boardings per revenue hour	TBD	TBD	TBD	N/A	N/A	TBD
Minimum boardings per revenue mile	TBD	TBD	TBD	N/A	N/A	TBD
Minimum boardings per trip	TBD	TBD	TBD	TBD	TBD	TBD
On-time performance	85%	85%	85%	90%	90%	85%
Max Load	150%	150%	150%	100%	150%	100%
Missed trips	99.98%	99.98%	99.98%	99.98%	99.98%	99.98%
Complaints per 10,000 boarding	1	1	1	1	1	1
Cost per passenger	TBD	TBD	TBD	TBD	TBD	TBD
Subsidy per passenger	TBD	TBD	TBD	TBD	TBD	TBD

Route Comparisons

Although planning staff will identify solutions for all routes that do not meet minimum productivity measures, staff will also consistently analyze the bottom ten percent based on rankings derived from a composite score of the routes to identify any potential improvements. This ensures that the system will always be moving towards more effectively and efficiently serving the current and future customers. Because School and Express/Limited routes have such a specific purpose they will be evaluated separately from Frequent, Local, Community, and Owl service. The calculation of the composite scores is shown in Figure 12.

Figure 12 Route Composite Score Development

Category	Metrics				Composite Score
Frequent, Local, Community, Owl	Route Boardings / Median Boardings *Per Hour*	Route Boardings / Median Boardings *Per Mile*	Median Cost / Route Cost *Per Passenger*	Median Subsidy / Route Subsidy *Per Passenger*	Sum of all metrics added together
Express, Limited, School	Route Boardings / Median Boardings *Per Trip*		Median Cost / Route Cost *Per Passenger*	Median Subsidy / Route Subsidy *Per Passenger*	Sum of all metrics added together

New Service

New service implemented past any recommended services for Reimagine should be allowed to mature for at least 12 months before it is held to the same service standards as other routes in its category. SamTrans should do appropriate marketing and outreach to help any new service succeed.

Network Level Metrics

In addition to metrics by route, it is important to provide network level metrics that can quickly provide a snapshot of the overall systems performance. SamTrans has identified several metrics that are important to understanding and assessing systemwide performance which are shown in Figure 13, along with targets for them.

The following definitions are for the new metrics introduced that are specific to the network level metrics and have not been defined in the route metrics:

Farebox Recovery is the percent of fare revenue divided by the total operating cost.

Mean distance between failures is the total miles divided by the number of mechanical failures.

Mean distance between accidents is the total miles divided by the number of accidents.

Operator absences is the total number of operators that were scheduled to work that were not available.

Equity Neighborhoods served by all day service is the percent of equity neighborhoods in the SamTrans service area that are within ¼ mile of all day service.

Figure 13 Key Network Level Performance Indicators

Metric	Target
Passengers per hour	TBD
Passengers per mile	TBD
Cost per passenger	TBD
Subsidy per passenger	TBD
Farebox recovery	TBD
On-time Performance	85%
Complaints per boarding	<1 per 10,000
Missed trips (service availability)	<1%
Mean distance between failure	>25,000 miles
Mean distance between accidents	>100,000 miles
Operator absences	
Equity Neighborhoods served by all day service (lifeline, local, and or frequent)	85% within ¼ mile

7 Service Planning Process

BALANCING SERVICE PRIORITIES

Transit agencies weigh tradeoffs about where service is located and how frequently service should be available. The distribution of transit service considers many factors, including:

- Community goals and needs
- Service and design best practices
- Budget and resource constraints
- Equity needs across the service area
- Land uses and the built and natural environments

SamTrans' priorities for the distribution of service will not be static because what exists today may be different tomorrow. The size, demographics, and travel patterns of communities in San Mateo County change over time, along with the funds and resources available to provide transit service. The ability to dynamically adjust service based off the potential changes listed above will allow SamTrans to provide mobility services as effectively as possible to customers traveling within and through San Mateo County.

Service distribution must balance operating constraints (number of operators and vehicles available), maximizing ridership, and providing coverage to residents. The desire to serve all must be balanced with the fiscal responsibility of having passengers use the service and the objectives of providing high-quality service in equity priority areas. Applying service standards that consider social equity, effectiveness, and productivity helps an agency achieve the right balance.

The service and design guidelines are tools to help support SamTrans make service decisions. The service planning process ensures SamTrans has the tools to monitor and evaluate service and community needs that lead to service change recommendations. It also allows SamTrans to be transparent with service planning priorities and standards, and when faced with competing demands for limited resources, helps and supports staff decision making. It allows provides a mechanism to constantly refine the system by targeting low-performers and reallocating service to more productive services or new service.

PERFORMANCE EVALUATION

The process starts with an approved set of targets (the service standards) that should be reviewed annually. Using the performance targets, staff will measure each route's performance and the systemwide performance for productivity and equity considerations, targeting the lowest performers for improvement.

Operations Planning staff will create adjustments and alternatives to improve service and meet service level targets. Service change recommendations will be based on:

- **Performance**
- **Financial obligations, resources, and funding availability**
- **Awareness of regional transportation infrastructure planning efforts and land use trends**
- **Promotion and development of high-quality service in identified equity priority areas.**

SERVICE REQUESTS

On an ongoing basis, staff will evaluate requests from external sources and customers for new or modified service based on the same criteria. The service guidelines presented earlier in this document will help staff communicate the circumstances in which SamTrans will consider changes and the priorities and best practices for service design. Using the criteria followed for the Title VI Program for community engagement and outreach, SamTrans will share ideas and gather input from the community on proposed major service changes.

SamTrans will conduct three to four service changes annually (consistent with the current labor agreement) with two of those changes having more significant updates (changes to runtimes, trip times, frequency, span, etc.) and the other changes allowing for minor tweaks in service. Attempts will be made to align service change dates with regional operators.

Major Service Changes

All major service changes should be consistent with and follow the guidelines identified in this document and consistent with the SamTrans Title VI Program.