



MEMORANDUM

To: Colin Dentel-Post, SFCTA

From: Nelson\Nygaard

Date: March 4, 2016

Subject: Late-Night Performance Measures and Service Guidelines – Task 1

This memo details draft performance measures and service guidelines for use in late-night service evaluation and planning (Task 1).

LATE-NIGHT SERVICE PLANNING GOALS

This effort is intended to propose improvements to late-night transit. The following service goals will guide the study's approach to evaluation of the existing network and planning for improvements:

- **Availability** - Provide frequent, accessible, and affordable transportation to/from and within San Francisco, especially for low-income and disadvantaged communities
- **Productivity** – Optimize existing services and ensure that with added service coverage is commensurate with demand
- **Reliability** – Provide on-time service with conveniently timed transfers
- **Legibility** – Ensure user-friendly services and coordination between late-night operators

Ensuring customer safety is another important goal of late-night transit; however this element is best addressed through location specific and context sensitive assessment and planning processes, rather than through a network-wide service planning exercise. For this study, safety will be indirectly addressed through the reliability and transfer service attributes.

Market Prioritization

The primary passenger market this study will address is late-night workers traveling to, from, or within San Francisco, with secondary passenger markets including late-night visitors (e.g. to entertainment, bars, etc.) living in or outside San Francisco.

LATE-NIGHT SERVICE PLANNING APPROACH

The transit planning approach to this project begins with the identification of guidelines and standards pertaining to each goal area for late-night service. These guidelines and standards are based on existing operator service standards where available as well as general service planning best practices with modifications as needed given the unique characteristics of the late-night service environment and rider needs.

This planning effort will evaluate existing late-night transit service against the established guidelines and standards in order to identify areas where they are not being met or there is potential for improvement, then use the guidelines to lay out potential changes and additions to service. This work will include in its baseline the recently-expanded late night AC Transit service (implemented in partnership with BART), as well as planned Muni Owl service increases and improvements, and will incorporate available analysis completed during the planning and/or evaluation of those service enhancements.

There will be three components of this late night service evaluation:

1. An evaluation of each existing line's performance;
2. An evaluation of the overall network's performance against the guidelines; and
3. A market analysis to determine where there may be late-night transit demand that is being unmet by the existing network.

These analyses and the guidelines will be used to develop four to six initial service concepts, inclusive of cost-neutral and added-service alternatives serving both intra-San Francisco and regional trips. The effort will conclude with one preferred cost-neutral and one preferred added-service scenario for both intra-city and regional late night transit.

DRAFT SERVICE GUIDELINES

Service guidelines will be used to review, design and propose changes to late-night and early morning transit service. These guidelines are organized under the goals that they are designed to achieve, and the matrix that follows summarizes how the goals, guidelines, and metrics relate to one another.

Availability

Coverage

Providing accessibility to locations across San Francisco, as well as to important regional destinations, is one of the key design considerations for late night service to, from, and within San Francisco. Given the dense urban environment of the city, late-night transit service should be available within a reasonable walking distance from locations throughout San Francisco. While not an official SFMTA service standard, this planning effort will employ a guideline to provide late-night service within a half-mile of neighborhoods throughout the city.

Since most of the rest of the region is lower-density, the focus is on providing service between locations with the greatest demand and need based on a market analysis and identification of key destinations and transfer points. To ensure the right destinations are targeted by late night service design, temporal analysis through Census Transportation Planning Package (CTPP) origin/destination (O/D) data will help identify those areas of high demand in the late-night time period. This analysis also includes an equity component: while all transit needs to focus on service to disadvantaged populations, this planning principle is even more important in the late night timeframe and inclusion of low income and zero-car household variables will be part of the O/D analysis. Using this combination of demographic and O/D data, the plan will identify potential locations for new or expanded late-night service.

Frequency

Service headways are one of the most important determinants of ridership. Headway represents how many times per hour a bus starts a trip on a route. Because of the expense of frequent service, headways are normally scheduled based upon existing or potential demand, but should also be sufficient to meet lifeline service needs of late-night workers, who are more likely to be low-income and transit-dependent than daytime workers. The SFMTA service standard for late night transit is 20 min frequency for Rapid & Local and 30 min for Grid service. Regional service should provide, at a minimum, hourly headways. Additional service frequency will be considered based on the market analysis and where existing service productivity is relatively high.

Service Span

Transit service must be available near the time a trip needs to be made in order for transit to be a viable travel option. Routes should permit workers to make their early morning start times, and should end late enough to provide return trips home for workers whose shifts end in the overnight hours. Weekend routes must meet the same needs of workers, while also addressing the needs of those making entertainment-based trips. This effort will focus on the Owl/All-Nighter network that operates when regular daytime service does not, typically between midnight and 5 a.m. (later for regional service on weekend mornings before BART opens), and typically service should span the entire time when daytime service is not operating. However, for some regional routes, additional trips at the beginning or end of the daytime service span will be considered where all-night service is not reasonably feasible.

Stop Spacing

The distance between stops is a key element in balancing transit access and service efficiency. Though it is less efficient to have frequent stops, the ability to pick up and drop off riders closer to their origin or destination is potentially more important in the all-night period due to personal safety concerns of riders if they must walk longer distances. Given low demand, late-night buses in lower-density areas are unlikely to actually make every stop if they are close together; therefore, closely spaced stops may have little detrimental impact on travel times in these areas. Late-night transit service in lower-density areas may consider a policy whereby drivers are able to drop passengers on an on-demand basis, while on the route and in a safe location as determined by the driver (union contract and internal policy issues must be considered). Some regional service could have express segments between key destinations in order to shorten travel times over longer distances.

Typical local stop spacing policy for Muni routes is assumed for this effort, while regional service could have a mix of local stop spacing and potential express service connecting key destinations/regional hubs.

Productivity

These metrics are used to identify high- and low- performing routes in terms of how many passengers are served with a given level of investment. These performance metrics are best used to compare routes with similar types of service, so the analysis will determine performance of individual late-night routes relative to the rest of the late-night network. The productivity metrics to be used are:

- Route level/segment level/stop level ridership

- Passengers per vehicle revenue hour/per trip
- Cost per passenger boarding

Proposed thresholds for determining underperforming and high-performing routes will be based on the bottom quartile and top quartile, respectively, when compared to the Owl average. If regional service productivity is consistently different from local (Muni) productivity, regional routes will be evaluated separately.

Reliability

Reliability is a critical measure of the quality of transit service. Late-night, with substantially lower service frequencies than during the day, transit that operates on time, with few to no missed trips, and consistency in meeting transfers, is vital to customer satisfaction.

On-Time Performance

On-time performance is the extent to which buses arrive on time with posted schedules. Reliability is particularly important for routes which operate at headways of more than 15 minutes. In addition, unreliable late-night service has implications for safety and security of passengers, among other issues. As such, all efforts should be made to build schedules that facilitate reliable service during late-night hours, for example by including appropriate recovery time, so that operators are able to meet or exceed their reliability standards.

Reliability for existing routes should meet operator standards. For both local and regional service, buses should be on-time at least 85% of the time (current definition is assumed as: no more than 1 minute early or 4 minutes late. It will be modified for each operator, as needed).

Service Delivery

Missed trips, especially late at night when service frequencies are much lower than during the daytime, can have a profound effect on customer satisfaction and willingness to ride. Late night service should deliver all scheduled trips.

Transfers

With local (Muni) late-night service far more robust in terms of scheduled service when compared to regional offerings, it is especially important to ensure that the complete network has clear and logical timed transfers to facilitate movement throughout the transit system with minimized transfer wait times.

Legibility

The late-night transit network should consist of routes that provide efficient travel to key destinations and are easy for riders to understand. For new or modified routes, simple, direct, and legible routing and stopping patterns consistent with overlapping daytime services will be used to the maximum extent possible. Route alignments should follow major streets or dense residential and commercial corridors. Where feasible, routes should operate along the same alignment in both directions to make it easy for riders to know how to return to their trip origin location. Timed transfer points should be logically located at key destinations or intersections.

LATE-NIGHT TRANSIT PHASE II
SFCTA

PROPOSED SERVICE EVALUATION AND PLANNING FRAMEWORK

The following matrix illustrates the measures, guidelines, and data sources to be considered for each goal and service attribute.

Goal	Service Attribute	Type	Measure	Guideline/Standard	Source
Available - Provide frequent, accessible, and affordable transportation to/from and within San Francisco, especially for low-income and disadvantaged communities	Coverage	System Level	Serve key destinations and origin areas of high demand, with focus on disadvantaged communities	Local - All neighborhoods within 1/2 mile of transit stop	Service Plans, GIS
				Regional - Serve areas with highest travel demand density to/from San Francisco (O/D analysis)	CTPP, Census demographic data
	Frequency	System Level	Meet minimum standards; increase based on demand	Local - All routes meet Muni minimum frequency standards based on typology (20 min Rapid & Local lines, 30 min for Grid service)	Service Plans
				Regional - 60 min or better	Service Plans
	Span	System Level	Ensure 24-hour transit service on Owl network (span varies by type of day - Su-Th, Fr-Sa)	Local - All night operation for all Owl routes (existing/planned)	Service Plans
				Regional - All night operation for all Owl routes (existing/planned). Add early/late trips on routes where all-night not feasible.	Service Plans
	Stop Spacing	System Level	Meets existing standards	Local - Follows Muni local stop spacing standards	Service Plans

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Goal	Service Attribute	Type	Measure	Guideline/Standard	Source
				Regional - Follows local stop spacing standards of daytime overlay when operating locally, with exceptions on express segments	Service Plans
Productive – Optimize existing services and ensure that with added service coverage is commensurate with demand	Productivity	Route Level	Route level/segment level/stop level ridership Passenger per revenue vehicle hour/trip Cost per passenger	Identify bottom 25% and top 25%. Consider lowest-performing for route changes, highest for service increases.	Performance data from operators
Reliable – Provide on-time service with conveniently timed transfers	On Time Performance	Route Level	On time performance	85% (-1,4 standard or based on operator-specific standard if different)	Performance data from operators
	Trip Delivery	Route Level	Missed trips	Local - 98.5% of scheduled trips delivered	Performance data from operators
				Regional - 100% of scheduled trips delivered	Performance data from operators
	Transfers	System Level	Maximize opportunities for timed transfers and	Maximize opportunities for timed transfers, and consider connection opportunities with other routes and	Service Plans

LATE-NIGHT TRANSIT PHASE II
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Goal	Service Attribute	Type	Measure	Guideline/Standard	Source
			minimize transfer wait times	minimizing transfer wait times when recommending headways.	Service Plans
Legible – Ensure user-friendly services and coordination between late-night operators	Route Directness Route Alignment	Route Level	Service design	Direct routing that follows major daytime transit corridors where possible	Service Plans
	Transfers	System Level	Network has clear and logical timed transfers	Clear and logical timed transfer points	Service Plans