
AC TRANSIT DISTRICT
Board of Directors
Executive Summary

GM Memo No. 07-185(c)

Meeting Date: January 23, 2008

Committees:

Planning Committee
External Affairs Committee
Rider Complaint Committee
Board of Directors

Finance and Audit Committee
Operations Committee
Paratransit Committee
Financing Corporation

SUBJECT: Consider Proposed Revisions to Board Policy 550: Service Standards and Design

RECOMMENDED ACTION:

Information Only Briefing Item Recommended Motion

Board Approval of revised Policy 550 and Service Characteristics Matrix

Fiscal Impact:

None

Background/Discussion:

Board Policy 550 (Service Standards and Design Policy) was adopted by the AC Transit Board in June 1994, and was most recently amended in July 2004. In December 2004, staff provided the first of a series of Briefing Memos to the Board on the Transit Capacity and Quality of Service Manual (TCQSM), a publication of the Transit Cooperative Research Program (TCRP).

The Board indicated an interest in applying some of the concepts contained in the TCQSM to selected Board Policies. The first policy chosen for that exercise was Board Policy 550.

Beginning in October 2006, staff presented the Board with proposed revisions to Policy 550 (GM Memo 06-228). Consideration of proposed changes has continued since that time, most recently at the December 12, 2007 Board meeting.

Attachment A to this memo provides the Board with a revised Policy 550 that incorporates Board direction and comments. Accompanying the revised policy is

BOARD ACTION: **Approved as Recommended** [] **Other** []
 Approved with Modification(s) []

The above order was passed on:

Linda A. Nemeroff, District Secretary

By _____

Attachment 1, a service characteristics matrix depicting standards and goals for the various types of service that AC Transit provides. Both documents are presented for Board consideration and approval.

Prior Relevant Board Actions/Policies:

GM Memo 00-215: Adoption of Guiding Principles for Service Deployment
GM Memo 02-033a: Fleet Composition Plan and Neighborhood Appropriate Vehicle Policy
GM Memo 03-262a: Approve Actions Related to Park and Ride Transit Centers GM Adoption of Amended Board Policy 550, July 2004
GM Memo 04-361: Overview of TCRP Manual
GM Memo 05-027: Designing with Transit
GM Memo 05-062: Part 1: TCRP Manual
GM Memo 05-083: Part 3: Transit Performance Measures
GM Memo 05-109: Part 3: Transit Decision-making
GM Memo 05-137: Part 3: Service Availability
GM Memo 05-173a: Part 3, Chapter 2: Quality of Service Factors
GM Memo 05-199: Review of the Transit Capacity and Quality of Service Manual
GM Memo 06-228: Proposed Outline of Revised Board Policy 550
GM Memo 07-033: 2006 Annual Assessment of Route Performance
GM Memo 07-185: Consider Revisions to Board Policy 550
GM Memo 07-187(a): Consider Approval of Revisions to Guiding Principles
GM Memo 07-185 (a): Consider Proposed Revisions to Board Policy 550
GM Memo 07-185(b): Consider Proposed Revisions to Board Policy 550: Service Standards and Design

Attachments:

Attachment A: Policy 550, Revised

Approved by:

Rick Fernandez, General Manager
Nancy Skowbo, Deputy GM, Service Development

Prepared by:

Nancy Skowbo, Deputy GM, Service Development

Date Prepared:

January 11, 2008

AC Transit

Policy No. 550

BOARD POLICY

Category: Service Development

SERVICE STANDARDS AND DESIGN POLICY

PURPOSE

As a public transportation provider and mobility manager for the East Bay, the Alameda-Contra Costa Transit District's goal is provide service in an efficient, effective and equitable manner. To accomplish this goal, the District establishes objectives relating to the design and allocation of services to develop a marketable and well-used transit system. Service design should be continually examined to ensure that service is allocated correctly, in accordance with stated objectives.

GUIDING PRINCIPLES

AC Transit is committed to the proposition that significantly greater utilization of AC Transit service must happen if people are just to continue enjoying the mobility they now have. As such, service quality must be measurable and monitored, and the accurate measurement of its patronage is highly critical because the over-arching measure of AC Transit's operational success is increased patronage. If future transit use is to increase, AC Transit must do a better job of providing that service. Therefore, the AC Transit Board of Directors recommends a set of Guiding Principles for the design and allocation of local, Transbay and All Nighter Services as follows:

The following are the Guiding Principles for the design and allocation of local transit service within the East Bay:

- 1. The AC Transit fixed-route service network shall be stable and cost-effective. To that effect, AC Transit will pursue opportunities to expand its fixed-route network, provided that the expected additional patronage is comparable to that which could be had by improving existing service. New service should be cost effective, vigorously marketed, and given ample time to prove its worth.**
- 2. AC Transit service should be easily understood by the public and user-friendly. Service should be designed in such a way as to provide intuitive wayfinding for the majority of the transit users. Subject to Title VI compliance, service will be prioritized to those areas with the**

Adopted : 6/94

greatest potential for transit use, with higher patronage resulting in more frequent service and expanded service spans where warranted by demand.

3. AC Transit lines with high patronage should run frequently enough that over most of the service period, passengers do not need a schedule to use the system. Limited stop service will be implemented on those routes with high patronage, when such service can significantly reduce overall travel times.
4. AC Transit believes that human-induced climate change is a great problem facing the world. AC Transit's greatest role in alleviating climate change is to get as many people out of their cars and onto its service as possible. As part of that effort, it will design routes that support smart growth and in-fill efforts. AC Transit will aggressively pursue transit priority and transit preferential methods and measures, to improve operation of the transit system and bus stop environments, and to encourage a modal shift of the populace from single-occupant vehicles to buses.
5. The AC Transit service network will provide for a multi-destination system that serves all traffic generators throughout the East Bay, regardless of location. AC Transit recognizes that it is part of a total transit system for the region, and shall support TransLink and other efforts toward making transit services seamless, regardless of the operator. It will serve other modal conversions as demand and total travel efficiency warrant, with a goal to improving connectivity and ease of transfer among the regional operators. AC Transit is also committed to a system that provides for internal transfers that are as seamless as possible.

The following are the Guiding Principles for the design and allocation of transit service within Transbay Corridors:

1. AC Transit will provide extensive commuter Transbay bus service where rail and road are approaching capacity. Non-peak service will be provided as justified by patronage.
2. AC Transit will provide a "many-to-one" service pattern from dense areas of the East Bay to downtown San Francisco, primarily developing a Transbay transit system that encourages walk access to transit, but may facilitate automobile park and ride access in low density areas and for Transbay transit access in the San Mateo and Dumbarton Bridge corridors.
3. Transbay Services should be funded from passenger fares and regional sources, most appropriately those revenue sources derived from users of the bridge corridors who benefit from decreased highway and bridge congestion. The District will support legislation to identify and implement these non-general fund sources.

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The following are the Guiding Principles for the design and allocation of transit service in All-Nighter (Owl) Corridors:

1. All-Nighter services are part of a regional network, and the All-Nighter route network should serve BART stations and the trunk bus network.
2. All-Nighter services should be funded from regional sources, most appropriately those revenue sources derived from users of the bridge corridors who benefit from decreased highway and bridge congestion and funding, ensuring access to employment. The District will support legislation to identify and implement these non-general fund sources.

DEFINITIONS, STANDARDS AND MEASURES

SERVICE DEFINITIONS –

A matrix depicting the service standards and goals for the various types of service is contained in Attachment 1 to this policy. The section below provides a definition for each service type operated by AC Transit:

Trunk Routes and Major Corridors – These are the services operating on corridors where residential densities are at least 20,000 residents per square mile (or comparable commercial densities). Routes in these corridors provide the backbone of the transit system; operate along the arterial streets and provide a high level of local and limited stop service. These routes have the highest priority for capital improvements.

Rapid - Provides limited stop service along a Trunk Route or Major Corridor featuring wide stop spacing, headway based schedules, transit signal priority and passenger amenities. Underlying local service contributes to aggregate service frequency.

Urban Secondary, Crosstowns and Feeder Routes – These are the routes operating in medium density corridors (10,000 – 20,000 residents per square mile or comparable commercial densities). These routes complement the trunk route network, providing a high level of local stop service. These corridors also are candidates for capital improvements to assist in bus operations.

Suburban Crosstowns and Feeder Routes – These are the routes operating in low density corridors (5,000 – 10,000 residents per square mile). These routes feed BART, park and ride lots, or other AC Transit routes, or serve neighborhood circulation functions with a high level of service.

Low Density Routes – These are primarily routes operating in areas of very low density (fewer than 5,000 residents per square mile). Most of this area is within Special Transit District 2.

Community Flex Services – These are primarily routes operating in areas of very low density, again, fewer than 5,000 residents per square mile, that provide a more flexible operation than traditional fixed route service. Most of this area is within

Special Transit District 2, although there are a number of areas in District 1 that would be candidates for this type of service.

Community Service Routes - These routes are intended to serve specialized needs for groups of individuals for which fixed route service may not be warranted. Service usually operates sporadically to trip attractors such as shopping centers and senior centers.

All-Nighter (Owl) Routes – These are the routes providing service between 12 midnight and 6 am. All-Nighter routes operate as a lifeline service during the “owl gap” period.

Transbay Routes – These are the routes providing service to downtown San Francisco via the Bay Bridge Corridor, and to peninsula destinations via the San Mateo and Dumbarton Bridge Corridors.

Supplementary Services – These are special services operated to meet common carrier requirements of Federal and State laws and accommodate school bell times.

Standards and Measures

Level of Service (LOS) metrics will be used to describe standards and goals for the specific categories of Service Provision, Load Factor, and Service Span. The tables below provide the characteristics for each of those metrics:

Figure 1: Service Provision

LOS	Average Headway	Comments
A	<10 min	Passengers do not need schedules
B	10-14 min	Frequent service, passengers consult schedules
C	15-20 min	Maximum desirable time to wait if bus/train missed
D	21-30 min	Service exceeds maximum desirable wait time
E	31-60	Service available during the hour
F	>60	Service unattractive to all riders

Figure 2: Load Factor

LOS	Load Factor (pax/seat)	Comments
A	0.00-0.50	No passenger need sit next to another
B	0.51-0.75	Passengers can choose where to sit
C	0.76-1.00	All passengers can sit
D	1.01-1.25	Comfortable standee load for design
E	1.26-1.50	Maximum schedule load
F	>1.50	Crush load

Figure 3: Service Span

LOS	Span of Service	Comments
A	19-24 hours	Night or Owl service provided
B	17-18	Late evening service provided
C	14-16	Early evening service provided
D	12-13	Daytime service provided
E	4-11	Peak hour only service or limited weekday service
F	0-3	Very limited or no service

Density Standards and Service Objectives

One of AC Transit’s main criteria for service allocation is the density of land uses along a route. In denser areas, service will be more frequent, routes will be spaced closer together, and the evening service will run later. Within each service category, service will be allocated primarily on the basis of demand or use, provided that minimum service levels are provided. For example, within the Trunk/Major Corridor category, all services will be provided at a minimum of LOS C (15 – 20 minutes). More frequent service allocation will be provided on the basis of a combination of demand and density. The following table reflects **the weekday peak service frequency standards for different densities.**

Persons per Square Mile	Route Spacing	Route Structure	Weekday Peak Frequency Standard
20,000 and over (High Density) [such as International Blvd., Telegraph Ave.]	¼ mile	Grid	Trunk/Major Corridor: LOS C (15-20 minutes)
20,000 - 10,000 (Medium Density) [such as grid sections in Oakland and Berkeley]	¼ - ½ mile	Grid	Urban Crosstown/Feeder: LOS C (15 – 20 minutes)
10,000 - 5,000 (Low Density) [such as Hayward, Castro Valley, some areas of Richmond, Fremont]	½ mile	Focal Point Timed- Transfer	Suburban Crosstown/Feeder: LOS D (21 - 30 minutes)
5,000 - 0 (Very Low Density) [such as areas of Fremont and hills]	1 mile	Focal Point Timed- Transfer	Low Density Routes: LOS E (31 – 60 minutes)

Distance to Bus Routes

Standards for how far passengers should travel to reach a bus route shall be based on density, with some allowance made for Express or Transbay services, which generally operate from catchment areas that may not meet the density standards. This standard shall also take into consideration topography or street patterns, which may increase or decrease the distance to bus routes.

Persons per Square Mile	Distance to Bus Routes
20,000 and over (High Density) [such as International Blvd., Telegraph Ave.]	¼ mile
20,000 - 10,000 (Medium Density) [such as grid sections in Oakland and Berkeley]	¼ - ½ mile
10,000 - 5,000 (Low Density) [such as Hayward, Castro Valley, some areas of Richmond, Fremont]	½ mile to ¾ mile
5,000 - 0 (Very Low Density) [such as areas of Fremont and hills]	1 mile or greater

Route Type	Span of Service Standard	Weekday Peak Frequency Standard
Trunk and Major Corridors	LOS A (19 – 24 hours daily)	LOS C (15-20 minutes)
Rapid Service	LOS C (14 – 16 hours daily)	LOS B (10 – 14 minutes) (headway based)
Urban Crosstown / Feeder	LOS C (14 – 16 hours daily)	LOS C (15 – 20 minutes)
Suburban Crosstown / Feeder	LOS C (14 – 16 hours daily)	LOS D (21 – 30 minutes)
Very Low Density	LOS C (14 – 16 hours daily)	LOS E (31 – 60 minutes)
All Nighter (Owl) Service	Owl Gap period	LOS E (31 – 60 minutes)
Transbay	LOS B: Bay Bridge Corridor (17-18 hours daily); LOS C: DB/San Mateo Corridor (14-16 hours daily)	LOS D (21 – 30 minutes)

Service Frequencies –

In the District’s most urban locations, the **service frequency standard shall be LOS B for Rapid Corridors, and LOS C for Trunks/Major Corridors.** In other, less dense areas, **the frequency standard shall be LOS D,** and timed transfers should be accommodated. In all cases of service operating at frequencies exceeding 15 minutes, schedules shall be written on clock, memory-based headways **to the extent practicable,** so that the service is scheduled at the same time(s) each hour.

VEHICLE LOAD STANDARDS

A Vehicle Load Factor is the ratio of the number of seats on a vehicle to the number of passengers on-board. Load factor is an indicator of the extent or probability of overcrowding, and may indicate the need for additional vehicles to maintain useful service.

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The Load factor is determined by taking the number of seats on a specific route which pass the peak load point during the peak hour, and dividing that number into the number of passengers that are actually carried past that point during that hour.

Load factors can vary by service type. For purposes of the AC Transit District, different Vehicle Load thresholds shall be used to measure service effectiveness or to determine remediation. The following thresholds shall be monitored:

Route Type	Vehicle Load Factor
Trunk and Major Corridors	1.25 (25% standees)
Rapid Corridors	1.25 (25% standees)
Urban Crosstown / Feeder	1.25 (25% standees)
Suburban Crosstown / Feeder	1.25 (25% standees)
Very Low Density	1.25 (25% standees)
Transbay/Express	1.0 (no standees)
All Nighter (Owl) Routes	1.25 (25% standees)

For purposes of measuring the Vehicle Load Factor for Transbay or Express Service, the Vehicle Load Factor shall be measured as the route enters the “express area” and is operating closed-door, which is generally on the freeway.

APPLICATION OF STANDARDS

To determine service effectiveness, staff will conduct ridership surveys on a regular basis. This information will be used to determine evaluative components such as passengers per vehicle hour, vehicle load factor or the overall ranking of the services.

On an annual basis, AC Transit staff will provide the Board of Directors with an assessment of route performance within the service categories. Transit lines will be ranked by a variety of metrics such as passengers per hour or annual subsidy. Minority Transit routes (those routes that have at least 1/3 of the total route mileage in a census tract with a percentage of minority population greater than the percentage of minority population in the service district) will also be identified.

Service that falls below the 25th percentile of all routes within its category will be analyzed for the following:

- Schedule adjustments, if service frequencies exceed the standards provided in this Policy.
- Running time adjustments or minor route changes, to provide substantially the same level of service while reducing operating costs and retaining most passengers.
- Route improvements, including route consolidation or through-routing to improve efficiency and effectiveness.

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- Route discontinuance, should there be no other means to improve efficiency or provide a well-used transit product.
- Other actions, such as grant funded opportunities, to improve route performance.

BOARD ACTION

- Prior to the Board initiating action on changes to routes or the route network, staff will provide an analysis of the issues, including an analysis of potential effects on minority communities as required by Title VI of the Civil Rights Act of 1964, as well as a recommendation based on this analysis.

Public Hearings will be held in accordance with Board Policy 163 before Board action on service changes or recommendations.

Board Policy 550: Weekday Peak/Base Period Service Characteristics

Service Type	Peak Frequency Standard Characteristics	Peak Frequency Standard/LOS Ranking	Peak Frequency Goal Characteristics	Peak Frequency Goal LOS Ranking	Base Frequency Standard	Base Frequency Goal	Scheduling	Service Routing	Route Spacing	Street Operations	Vehicles	Span of Service Goal	Span of Service LOS	Stop Spacing	Stop Amenities	Passengers per hour	Load Factor
Trunk/ Major Corridor	15-20 minute frequencies	LOS C: 15 - 20 minutes	Not less frequent than 10 min; usually more frequently	LOS A: < 10 minutes	LOS C: 15 - 20 minutes	LOS B: 10 - 14 minutes	Clock Headways preferred	Major Arterial streets	On major streets with ADT of more than 25,000	Mixed flow operation	High-Capacity, fast boarding, low floor	19-24 hours daily	LOS A	1/4 to 1/2 mile depending on density	Only when provided by advertising or city	40 weekdays (min) 35 weekends (min)	1.25
Rapid Service	Not less frequent than 12 min; usually more frequently	LOS B: 10 - 14 minutes	Not less frequent than 12 min; usually more frequently	LOS B: 10 - 14 minutes	LOS B: 10 -14 minutes	LOS B: 10 - 14 minutes	Headway based	Major Arterial streets	On major streets with ADT of more than 25,000	Mixed flow with signal priority	High-Capacity, fast boarding, low floor	14-16 hours daily	LOS C	1/2 to 2/3 mile depending on density	well designed stops, shelters, real time information	40 weekdays (min) 35 weekends (min)	1.25
BRT (note: this service type not yet implemented)	Not less frequent than 10 min; 7.5 min preferred	LOS A: < 10 minutes	Not less frequent than 10 min; 7.5 min preferred	LOS A: < 10 minutes	LOS A: < 10 minutes	LOS A: < 10 minutes	Headway based	Major Arterial streets	On major streets with ADT of more than 25,00	Significant portion of exclusive lane operation	High-Capacity, fast boarding, low floor	17-18 hours daily	LOS B	1/2 to 2/3 mile depending on density	well designed stops/stations, real-time passenger information with significant	40 weekdays (min) 35 weekends (min)	1.25
Urban Crosstown/Feeder	Not less frequent than 15 min; can be more frequent	LOS C: 15 - 20 minutes	Not less frequent than 15 min; can be more frequent	LOS C: 15 - 20 minutes	LOS D: 21 - 30 minutes	LOS C: 15 - 20 minutes	Clock Headways	Secondary Streets	1/2 mile maximum	Mixed flow operation	Standard 40' vehicle	14-16 hours daily	LOS C	1/8 to 1/2 mile depending on density	Only when provided by advertising or city	30 weekdays (min) 25 weekends (min)	1.25
Suburban Crosstown Feeder	Not less frequent than 30 min; can be more frequent	LOS D: 21 - 30 minutes	Not less frequent than 15 min; can be more frequent	LOS C: 15 - 20 minutes	LOS D: 21 - 30 minutes	LOS C: 15 - 20 minutes	Timed transfer with other crosstown lines	Secondary Streets	1/2 to one mile	Mixed flow operation	Standard 30' or 40' vehicle	14-16 hours daily	LOS C	1/4 to 1/2 mile depending on density	Only when provided by advertising or city	20 weekdays (min) 15 weekends (min)	1.25
Low Density	Not less frequent than 60 min; can be more frequent	LOS E: 31 - 60 minutes	Not less frequent than 30 min; can be more frequent	LOS D: 21 - 30 minutes	LOS E: 31 - 60 minutes	LOS D: 21 - 30 minutes	Timed transfer with other crosstown lines	Timed Transfer with other crosstown or feeders	One mile or flexible service/circulator	Mixed flow operation	Standard 30' or 40' vehicle	14-16 hours daily	LOS C	No current standard	Only when provided by advertising or city	No standard	1.25

All Nighter and Weekday Transbay Peak Period Service Characteristics

Service Type	Peak Freq. Standard	Freq. Goal Ranking	Peak Freq. Goal	Freq. Goal Ranking	Scheduling	Service Routing	Route Spacing	Street Operations	Vehicles	Span of Svc. Goal	Span of Svc. LOS	Stop Spacing	Stop Amenities	Psgrs/Hour	Load Factor
All Nighter (Owl) Service	Not less frequent than 60 min; can be more frequent	LOS E: 31 - 60 minutes	Not less frequent than 30 minutes; can be more frequent	LOS D: 21-30 minutes	Timed transfer with other crosstown lines/regional providers	Major Arterial streets; freeways	N.A.	Mixed flow operation	Standard 40' or 60' vehicle	Owl Gap Period	LOS A	1/4 to 1/2 mile depending on density	Only when provided by advertising or city	50 passengers/night minimum	1.25
Transbay	Weekday Peak Periods: not less frequent than 30 min; can be more frequent	LOS D: 21-30 minutes	Weekday Peak Periods: Not less frequent than 15 min; can be more frequent	LOS C: 15 - 20 minutes	Clock Headways	Major Arterial streets; freeways	1/2 to one mile	Mixed flow operation	Standard 40' bus; 45' Over-the-Road bus; 60' vehicle	14-16 (DB/San Mateo Corridor); 17-18 hours (Bay Bridge Corridor)	LOS C / LOS B	1/2 to 2/3 mile depending on density or local operation	Only when provided by advertising or city	25 pax/trip minimum--peak direction	1.00