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metro.net**SYSTEM SAFETY AND OPERATIONS COMMITTEE
SEPTEMBER 19, 2013****SUBJECT: TITLE VI SYSTEM MONITORING REPORT****ACTION: ADOPT REVISED STOP SPACING STANDARDS AND RECEIVE AND
FILE TRIENNIAL SYSTEM MONITORING REPORT****RECOMMENDATION(S)**

- A. Approve the recommended revised Stop Spacing Standards presented in Attachment A.
- B. Receive and file the Triennial System Monitoring Report (Attachment B) required by Title VI

ISSUE

Federal Transit Administration (FTA) Circular 4702.1B, Title VI Requirements and Guidelines for Federal Transit Administration Recipients, effective October 1, 2012, requires the preparation of a System Monitoring Report at least once every three years. The report includes an assessment of how well bus and rail services meet the adopted Service Policies and Standards (last approved by the Board in March 2013). In instances where standards are not met the report also includes discussion of reasons, and incorporation of a plan of action for achieving targets. The Stop Spacing standard was found to unnecessarily limit accessibility to services. The follow-up action is a proposed revision that permits closer spacing.

DISCUSSION

The Board of Directors adopted revisions to five service standards (Passenger Loading, Headways, On-Time Performance, Stop Spacing and Accessibility) and two service policies (Passenger Amenities and Vehicle Assignment) in March 2013. Those standards and policies established thresholds for performance by mode for Metro Operations.

The principal focus of the System Monitoring Report is an evaluation of compliance with the adopted service policies and standards. This evaluation found compliance with five of the seven standards. Current service was found to be inconsistent with the On-Time Performance and Stop Spacing standards.

The On-Time Performance standard requires that 90% of lines achieve at least 90% of the current year's goal (presently 80%). Only 69% of lines met this standard, and minority lines were found to have significantly less compliance (67%) than non-minority lines (77%) resulting in a disparate impact (a 10% absolute difference between minority and non-minority compliance for system monitoring has been established as the threshold for a disparate impact). The report presents a limited history of past efforts to improve on-time performance, and notes that a Task Force has been established to more thoroughly identify reasons for not conforming with the standard and methods to improve performance.

The Stop Spacing standard requires that 90% of routes have average stop spacing (miles between stops) within one-tenth mile of specified distances which vary by service type (1.50 miles for Heavy & Light Rail, 1.25 miles for BRT & Express bus, 0.75 mile for Rapid bus, 0.50 mile for Limited Stop bus, and 0.25 mile for Local & Shuttle bus). The idea behind this standard was that there is a tradeoff between accessibility of services (necessitating more frequent stops) and travel time (necessitating fewer stops). The report found that this standard was met only 73% of the time primarily because many routes in the various service types had more stops than the standard would allow. There was a significant difference between minority (69%) and non-minority (85%) route compliance because many minority routes had more stops than the standard would accept. This is actually a beneficial circumstance because it means that minority routes are generally much more accessible (in terms of quantity and nearness of stops) than non-minority routes. While this finding may be viewed as positive it, nevertheless, does not meet the adopted Stop Spacing standard. In this instance, staff believes that the adopted standard is too narrow (that more stops are not necessarily negative, particularly in higher density congested areas) and should be revised. A proposed revised standard is presented in Attachment A which removes the minimum threshold on stop spacing, and requires only that 90% of routes not exceed the maximum distances specified by service type.

DETERMINATION OF SAFETY IMPACT

The requested actions in this report will have no direct impact on the safety of Metro's employees or customers.

FINANCIAL IMPACT

The actions requested in this report have no direct impact upon Metro's expenditures or revenues. Approval is consistent with the implementation of service included in the adopted FY2014 Budget. Continuing the existing Stop Spacing standards without revision could have adverse impacts on future year operating budgets.

Impact to Budget

Approval of this report is consistent with the FY2014 adopted budget.

ALTERNATIVES CONSIDERED

The alternative of not revising the Stop Spacing standards would be inconsistent with established practice, and could have significant adverse impacts on passenger access and convenience should the agency remove bus stops to comply with an inappropriate standard.

Board acceptance of a System Monitoring Report is a requirement of the Title VI Guidance. Failure to do so could lead to a finding of non-compliance with Title VI and loss of eligibility for federal funds.

NEXT STEPS

The System Monitoring Report will be submitted to FTA by October 1, 2013, in order to comply with the triennial reporting deadline established for LACMTA by the FTA.

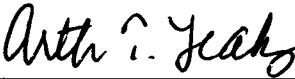
ATTACHMENTS

- A. Proposed Revisions to Stop Spacing Standards
- B. Title VI System Monitoring Report
- C. On-Time Performance Task Force Work Program

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**ATTACHMENT A
PROPOSED REVISIONS TO STOP SPACING STANDARDS**

Stop Spacing

Proposed stop spacing standards are shown in Table A-1. This revision is recommended because the current standards unnecessarily limit the accessibility to services by providing both a lower and an upper limit to stop spacing. The Rapid standard has been increased from .75 to .80, and the Limited increased from .50 to .60. The standards indicate the maximum stop spacing in miles by type of service, and are not to be exceeded by at least 90% of all routes operated.

Table A-1: Maximum Stop Spacing Standards (in miles)

| | |
|-------------------|-------------|
| Heavy Rail | 1.50 |
| Light Rail | 1.50 |
| BRT | 1.25 |
| Rapid | 0.80 |
| Express | 1.25 |
| Limited | 0.60 |
| Local | 0.25 |
| Shuttle | 0.25 |

ATTACHMENT B TITLE VI SYSTEM MONITORING REPORT

A System Monitoring Report is required by Title VI guidelines at least once every three years. Adopted service policies and standards are assessed for compliance as well as any inequities that may exist between minority and non-minority services. Metro has seven service policies and standards that are monitored for compliance comprising:

- Passenger Loading;
- Headways;
- On-Time Performance;
- Stop Spacing;
- Accessibility;
- Passenger Amenities; and
- Vehicle Assignment.

The last three of these standards are monitored at the system level. The first four are monitored at the route or line level, and require determination of whether a route or line is deemed minority or non-minority. Title VI guidelines stipulate that a route will be deemed minority if at least one-third of its length operates within census areas that are significantly minority (e.g. higher minority population share than the service area as a whole). While individual reclassifications are possible if additional data is available to support it, this report retains the classification for each route as determined by the FTA method.

The line classifications are as follows (Table 1) (routes are classified the same as their parent line) based upon December 2012 line definitions:

Table 1: Line Classification for System Monitoring

| Service Type | Minority Lines (Routes) | Non-Minority Lines (Routes) |
|--------------|---|--|
| Local | 10(48),14(37),16,18,28,30,33,35(38),40,45,51(52),53,55,60,62,66,70,71,76,78(79),81,83,84(68),94,102,105,108,110,111,115,117,120,125,126,127,128,130,152,163(162),166,176,177,190(194),200,202,204,205,206,207,209,210,211(215),212,224,230,232,233,234,246,251,252,254,256,258,260,265,266,267(264),268,270,290,292 | 2,4,20,90(91),92,96,150(240),154,155,156,158,161,164,165,167,169,175,180(181),183,201,217,218,220,222,236(237),239,243(242),245(244) |
| Shuttle | 603,605,607,611,612,620,625,665 | 645,685,687(686) |
| Limited | (311,312,316,330,352,353,355,358,364,378) | (302),344 |
| Express | 442,450,460,485,487(489),550,577,910 | 534 |
| Rapid | 705,710,720,728,733,734,740,745,751,754,757,760,761,762,770,794 | 704,741,750,780 |
| BRT | | 901 |
| Rail | 801,802(805),803,804,806 | |

Passenger Loading

Standard: The standard establishes the maximum ratio of passengers to seats during any one hour period, and should not be exceeded at least 95% of the time. The peak (6-9am and 3-7pm weekdays) and off-peak (all other times) standards are the same, as follows: Heavy Rail – 2.30; Light Rail – 1.75; and Bus – 1.30.

Monitoring Result: The most recent quarterly data available for this report spans January-March of 2013 and documents the maximum observed load ratio (passengers divided by seats) for every hour operated for each line. Rail lines are not included in this report as the data presently collected for overall ridership estimation is not extensive enough to permit establishing maximum loads by hour by individual rail car.

Since weekday, Saturday and Sunday data is included in the monitoring program, the monitoring is summarized on a composite weekly basis (weekday data is multiplied by five and added to Saturday and Sunday data). The results are summarized in Table 2.

**Table 2: Compliance with Passenger Loading Standard
Average Week – January-March 2013**

| | # of Lines | # of Hourly Intervals | PEAK | | OFF-PEAK | | |
|--------------|------------|-----------------------|------------------------------|-------------|------------------------------|-------------|--------|
| | | | # of Non-Compliant Intervals | % Compliant | # of Non-Compliant Intervals | % Compliant | |
| Minority (1) | 104 | 7,105 | 10 | 99.86% | 18,493 | 54 | 99.71% |
| Non-Minority | 38 | 2,660 | 0 | 100.00% | 6,333 | 14 | 99.78% |

(1) Does not include 5 rail lines also classified as Minority

Compliance is robust for all classifications of the data as this standard is consistently met.

Headways

Standard: The Headway standard varies by type of service and time of day as shown in Table 3. The standard establishes the maximum gap (in minutes) between trips in the peak direction of travel at the maximum load point of a line. The standard should not be exceeded in at least 90% of all hourly periods.

Table 3: Headway Standards (in minutes)

| Service Type | Peak | Off-Peak |
|--------------|------|----------|
| Heavy Rail | 10 | 20 |
| Light Rail | 12 | 20 |
| BRT | 12 | 30 |
| Rapid | 20 | 30 |
| Express | 60 | 60 |
| Limited | 30 | 60 |
| Local | 60 | 60 |
| Shuttle | 60 | 60 |

Monitoring Result: Trips were compiled by time of day and day of the week for each line in the peak direction of travel at the maximum load point. Service between 6:00am and midnight was tested to determine whether the requisite number of trips required by the Headway standard were operated in each time period. For example, if a 20-minute maximum headway were permitted in the AM Peak period (6-9am), then at least nine trips had to be scheduled to comply with the standard. Every time period in which service was operated was categorized as complying, or not complying, with the standard and the number of hours in that time period was assigned to the appropriate category. To account for variation by day type a composite week consisting of five weekdays plus a Saturday and a Sunday was compiled for each line. The results are summarized in Table 4.

Table 4: Weekly Headway Compliance

| | # of Lines | PEAK | | | OFF-PEAK | | | COMBINED | | |
|--------------|------------|-----------------------|------------------------------|-------------|-----------------------|------------------------------|-------------|-----------------------|------------------------------|-------------|
| | | # of Hourly Intervals | # of Non-Compliant Intervals | % Compliant | # of Hourly Intervals | # of Non-Compliant Intervals | % Compliant | # of Hourly Intervals | # of Non-Compliant Intervals | % Compliant |
| Minority | 111 | 3,815 | 75 | 98.03% | 9,014 | 921 | 89.78% | 12,829 | 996 | 92.24% |
| Non-Minority | 36 | 1,330 | 35 | 97.37% | 2,924 | 407 | 86.08% | 4,254 | 442 | 89.61% |
| | | | | | | | | 17,083 | 1,438 | 91.58% |

Peak period compliance is better than 97% for both minority and non-minority lines. However, off-peak compliance is notably lower. This is not unexpected since the off-peak includes the start and end of service for many lines (those without owl service), and trips may not be operated throughout these time periods. Overall compliance meets the standard, and there is no significant disparity between minority and non-minority lines though minority lines have slightly better overall compliance.

On-Time Performance

Standard: Service is considered on-time if the departure from a designated time point is no more than one minute early and no more than five minutes late. Performance is measured at all established time points excluding line terminals. The standard requires that at least 90% of lines achieve at least 90% of the current year's objective. For FY2013, the objective is 80% on-time for bus operations. The established rail standard is 95% on-time, but monitoring data is not yet available as an interface to the SCADA computer system that governs rail operations needs to be developed.

Monitoring Result: On-time performance was measured for a composite week consisting of five weekdays plus a Saturday and a Sunday. The results are provided in Table 5.

Table 5: Weekly On-Time Performance

| | Weighted # of Lines | # of Non- Compliant Lines | % Compliant |
|--------------|------------------------|------------------------------------|-------------|
| Minority (1) | 677 | 226 | 66.62% |
| Non-Minority | 247 | 57 | 76.92% |
| | 924 | 283 | 69.37% |

(1) excludes five Minority rail lines

Overall compliance is significantly below the 90% required, and is significantly poorer for minority lines than non-minority lines creating a disparate impact as the difference is greater than 10%.

While the overall objective is 80% on-time the bus system falls short of that level of performance at all times: 74.8% average on-time on weekdays; 70.8% on Saturdays; and 75.8% on Sundays. Performance tends to decline as the day goes on (Table 6).

Table 6: Weekday On-Time Performance

| Time of Day | System On-Time Performance |
|-----------------------|-----------------------------------|
| Early AM (4-6am) | 88.9% |
| AM Peak (6-9am) | 80.5% |
| Midday (9am-3pm) | 75.6% |
| PM Peak (3-7pm) | 68.6% |
| Early Evening (7-9pm) | 71.0% |
| Late Evening (9-Mid) | 73.9% |
| Owl (Mid-4am) | 74.2% |

Also notable, the rate of early departures has begun to increase after efforts had been made to address this. Early departures are presently 6.6% of trips for the January-March quarter which is unacceptable.

Since 2009 the agency has undertaken extraordinary efforts to improve on-time performance with some success (Table 7).

Table 7: Historical On-Time Performance

| | |
|--------|-----|
| Apr-09 | 69% |
| Apr-10 | 74% |
| Apr-11 | 76% |
| Apr-12 | 78% |
| Apr-13 | 76% |

An on-time performance task force was established in 2009 to identify issues affecting service reliability and to implement solutions. Some of the early solutions included ensuring buses left divisions and terminals on time, as well as disciplining operators for running “hot” or ahead of schedule. A new on-time performance task force was created in July 2013 and recommendations for implementation are presented in Attachment C.

In addition, a Task force has been established to look specifically at Line 720. Schedule adjustments will be implemented in September, which include four standby buses to be managed by supervisors as well as a monitoring program to manage bus bunching.

Stop Spacing

Standard: The Stop Spacing standard establishes a range of distances within which the average distance between stops must fall for at least 90% of all routes. The range for each service type is within one-tenth mile of the values shown in Table 8.

Table 8: Stop Spacing Standards (in miles)

| Service Type | Stop Spacing |
|--------------|--------------|
| Heavy Rail | 1.50 |
| Light Rail | 1.50 |
| BRT | 1.25 |
| Rapid | 0.75 |
| Express | 1.25 |
| Limited | 0.50 |
| Local | 0.25 |
| Shuttle | 0.25 |

Monitoring Result: Average stop spacing was determined for every route by dividing the bidirectional total number of stops (or stations) by the bidirectional route length. The results are summarized in Table 9.

Table 9: Stop Spacing Standard Compliance

| | MINORITY | | | NON-MINORITY | | |
|----------|-------------|--------------|--------------|--------------|--------------|--------------|
| | # of Routes | # Conforming | % Conforming | # of Routes | # Conforming | % Conforming |
| Local | 83 | 71 | 85.54% | 34 | 34 | 100.00% |
| Shuttle | 9 | 8 | 88.89% | 4 | 2 | 50.00% |
| Limited | 10 | 3 | 30.00% | 2 | 1 | 50.00% |
| Express | 9 | 1 | 11.11% | 1 | 0 | 0.00% |
| Rapid | 16 | 8 | 50.00% | 4 | 2 | 50.00% |
| BRT | 0 | 0 | | 1 | 0 | 0.00% |
| Rail | 6 | 1 | 16.67% | | | |
| Combined | 133 | 92 | 69.17% | 46 | 39 | 84.78% |
| | | | OVERALL | 179 | 131 | 73.18% |

Overall compliance is significantly below the required 90% with a significant difference between minority and non-minority routes. Poor compliance is primarily attributable to non-local service types. Further analysis disclosed that the predominant reason for non-compliance was too many stops (average stop spacing falling below the minimum standard). While this is beneficial from a customer perspective because it provides greater access, it is noncompliant with the standard as adopted. Under the circumstances this finding suggests that the adopted standard is too restrictive, and a less restrictive standard has been proposed in Attachment A. It is noted that if the proposed revised standard were to be in effect then minority compliance would be at 94.74%, non-minority compliance would be at 95.65%, and overall compliance would be at 94.97%.

Accessibility

Standard: This standard states that service is to be provided within one-quarter mile of 99% of census tracts having at least three households per acre and/or at least four jobs per acre within Metro's service area. Fixed route service provided by other operators may be used to meet this standard.

Monitoring Results: Only one census tract (#4087.23) meeting the stated criteria is not within one-quarter mile of a fixed route transit stop. This tract is in the southeastern portion of Los Angeles county in an unincorporated area known as Rowland Heights. It is the only non-compliant tract of 1,891 that meet the stated criteria for a compliance of 99.95%.

Passenger Amenities Policy

Policy Statement: This policy provides a minimum standard for the provision of passenger amenities at all Metro owned off-street facilities that serve passengers as shown in Table 10.

Table 10: Passenger Amenities Policy

| | |
|--------------------|---|
| Shelters: | HR – not applicable LR – at least 80 linear ft. Bus – at least 6 linear ft. per bay |
| Seating: | HR – at least 12 seats LR – at least 10 seats Bus – at least 3 seats per bay |
| Info Displays: | HR – at least 12 LR – at least 10 Bus – at least 3 |
| LED Displays: | HR – at least 8 arrival/departure screens LR – not applicable Bus – not applicable |
| TVMs: | HR/LR = at least 2 Bus – not applicable |
| Elevators: | HR – at least 2 LR – at least 1 for elevated/underground Bus – at least 1 for multi-level terminals |
| Escalators: | HR – at least 4 (2 Up / 2 Down) LR – not applicable Bus – not applicable |
| Waste Receptacles: | HR – at least 6 LR – at least 2 Bus – at least 1 per 3 bays / 2 minimum |

Monitoring Result: Based upon surveys conducted in 2011 and 2013 all facilities covered by this policy meet the minimum standards provided.

Vehicle Assignment Policy

Policy Statement: This policy provides the basis for how vehicles will be assigned to operating facilities as stated in Table 11.

Table 11: Vehicle Assignment Policy

| | |
|-------------|---|
| Heavy Rail: | Not applicable – only one line and one vehicle type |
| Light Rail: | Vehicles will be assigned to individual lines on the basis of compatibility of vehicle controllers with each line’s signal system. The number of vehicle types/manufacturers will be kept to no more than two at any facility to minimize parts storage and maximize maintenance expertise. |
| Bus: | Vehicles will be assigned to individual facilities on the basis of vehicle size requirements for lines supported by each facility. |

Monitoring Result: There is only one Heavy Rail facility and associated operating yard, the policy is not applicable to this mode.

Light Rail vehicle assignments are shown in Table 12.

Table 12: Light Rail Vehicle Assignments

| Vehicle Type | Div 11 | Div 21 | Div 22 |
|----------------------|--------|--------|--------|
| AnsaldoBreda2550Base | | 50 | |
| Nippon Sharyo 2020 | 15 | | |
| Nippon Sharyo 865 | 54 | | |
| Siemens 2000 Base | | | 29 |
| Siemens 2000 GE/ATP | 23 | | |

The two Nippon Sharyo vehicle types shown assigned to Division 11 are essentially the same vehicle, but acquired through two separate procurements. Therefore, the light rail policy is being followed.

Bus assignments are documented in the Equipment Assignment Report (Report 4-12) most recently issued for the June 2013 service change. The report is too voluminous to include here, but it follows the bus vehicle assignment policy in assigning buses to operating facilities.

ATTACHMENT C

ON-TIME PERFORMANCE TASK FORCE

The goal for this effort is to meet or exceed the 80% target systemwide by the end of the fiscal year. In the latest Service Performance Analysis report, ISOTP through the end of June pegged the 2014 systemwide YTD achievement at 77% and 2013 YTD AT 75.8%. This table displays YTD 2014 and 2013 achievements:

| DIVISION | 2014 YTD | 2013 YTD |
|----------|----------|----------|
| 1 | 78.6% | 79.6% |
| 2 | 78.4% | 74.1% |
| 3 | 75.4% | 76.1% |
| 5 | 72.6% | 75.9% |
| 6 | 74.9% | 75.3% |
| 7 | 74.4% | 71.9% |
| 8 | 86.4% | 79.8% |
| 9 | 76.5% | 76.1% |
| 10 | 71.9% | 71.8% |
| 15 | 80.3% | 77.5% |
| 18 | 74.2% | 75.8% |
| SYSTEM | 77.0% | 75.8% |

The on time performance standard for every bus division is 80%; Metro is 3-4 points away from making the target. A meeting was held on July 22, 2013 to discuss the various options and to explore ways to obtain and maintain the improvement.

The on time performance task force consists of all disciplines responsible for some aspect of reliable service, including Operations management, Scheduling / Operations Planning, Information Technology Services (ITS), Bus Operations Control (BOC), Vehicle Operations (VO), Bus Maintenance, Division Transportation, and others.

Several efforts are underway to address various aspects of on time performance:

1. To identify focus areas to address, additional reports will be developed to be able to identify poor on time performance by street segment, line, and operator. These reports will “drill down” to details including time of day, day of week, and direction.
2. Scheduling will continue to work to improve running times to match on street experience, and to develop service plans that are easily operated. Some of the efforts over the last few years are to reduce the number of timepoints to allow operators to better manage line segments, reducing complexity in line variants and branches, and reducing the length of lines. These strategies were a result of observed issues impacting on time performance.
3. Vehicle Operations supervisors and Bus Operations Controllers will begin to enforce running early as a major rule violation. This strategy was employed a few years ago which resulted in significant improvements to earlies. Contract service divisions have already begun disciplining operators regarding this issue and are currently posting less than 1% early in their on time performance.

4. Bus Operations Control will monitor services remotely and work with Vehicle Operations supervisors to move and adjust bus locations to ensure late operators are put back on time and spacing between bus headway is normalized. Line 720 will be an initial line saturation effort with dedicated supervisors managing the line during the PM peak period when on time performance is significantly impacted.
5. Division Management will contact Operators with a high early or late percentage and begin corrective actions.
6. Bus Operations Control and Vehicle Operations will review weekly statistics showing Operators with the highest lates, earlies and road calls.
7. Division management will develop campaigns to educate and enforce with the operators the importance of on time performance. They will target worst performing operators for more training and coaching to improve their performance. Campaigns will also ensure that on time performance trends and information are shared with operators.
8. Operations staff is working with TAP card staff to develop ticket validators to be used for rear door boarding on Rapid and Silver Line service. This effort is expected to speed boardings at major stop locations.
9. Maintenance will support this effort by ensuring that buses are available for on time pull outs, and road calls are minimized.

