

**PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA**

Consumer Protection and Safety Division  
Rail Transit Safety Section

Resolution ST-111  
April 8, 2010

**RESOLUTION**

RESOLUTION ST-111 GRANTING SAN FRANCISCO MUNICIPAL  
TRANSPORTATION AGENCY A TEMPORARY VARIANCE FROM  
GENERAL ORDER 143-B, SECTION 9.06 c (1) CLEARANCES.

**SUMMARY**

This resolution grants San Francisco Municipal Transportation Agency's (SFMTA) request for a six-month variance to General Order (GO) 143-B, Section No. 9.06 c (1) Side Clearance requirements for the purpose of testing a Between-Car Barrier system at the following four above-ground stations: Folsom Street, Brannan Street, 2<sup>nd</sup> and King, and 4<sup>th</sup> and King.

The Americans with Disabilities Act (42 U.S.C. § 12131 et seq.) and the Federal Transit Administration (49 CFR Parts 38.63 & 38.85) require transit agencies to take steps to ensure that visually-impaired patrons do not fall from an elevated platform to the trackway below in the space between a train's light rail vehicles (LRVs). Between-Car Barriers (BCBs) are one method for protecting visually-impaired patrons from falling to the trackway, and this resolution allows SFMTA to install BCBs on the station platform edges as a six-month demonstration project designed to determine the safety and efficacy of a platform-based BCB system.

This resolution requires that SFMTA provides a report to Rail Transit Safety Section staff (staff) on the effectiveness and safety impacts of the BCB demonstration project. SFMTA may subsequently request a permanent variance for the BCBs if the demonstration project proves them to be safe and effective.

**BACKGROUND**

SFMTA requested a six-month variance from the minimum thirty-(30) inch side clearance requirements in GO 143-B, Section 9.06 c (1), by a letter dated November 21, 2008, in order to conduct a demonstration project designed to determine the safety and efficacy of BCBs. SFMTA intends to install the BCBs at the edges of the station platforms in order to prevent visually-impaired patrons from falling from the elevated platform to the trackway below in the space between a train's LRVs.

Staff reviewed the letter and drafted a response letter dated February 2, 2009 documenting staff's concerns and requesting that SFMTA supply additional information and criteria concerning its BCB demonstration project.

Staff met with SFMTA personnel responsible for the BCB demonstration project on February 18, 2009 to discuss the background of the project. In turn, SFMTA responded to staff's request for additional information in the letter dated March 24, 2009, which requested the variance again. The SFMTA's draft BCB Demonstration Project Plan, also dated March 24, 2009, was attached to this letter, and it addressed portions of staff's request for additional information and criteria.

Staff provided comments on the SFMTA's draft BCB Demonstration Project Plan to SFMTA during a meeting on July 31, 2009. SFMTA responded to staff's request for additional information in its letter dated October 22, 2009, and provided another draft of its Demonstration Project Plan.

49 CFR Part 38.85 provides in relevant part:

where vehicles operate in a high-platform, level-boarding mode, devices or systems shall be provided to prevent, deter, or warn individuals from inadvertently stepping off the platform between cars. Appropriate devices include, but are not limited to, pantograph gates, chains, motion detectors, or other suitable devices.

GO 143-B, Safety Rules and Regulations Governing Light Rail Transit, Section 9.06 states:

CLEARANCES. c. The minimum side clearance to obstructions higher than eight (8) inches above top-of-rail and the clearances between LRVs and streetcars located on parallel tracks used exclusively for light rail transit operations shall be governed by the following requirements:

(1) on station platforms, in yards and along shop aisles, and other locations, including emergency walkways, where passengers, employees, or other persons are permitted or required to be while trains are in motion, the minimum clearances shall be thirty (30) inches...

## **DISCUSSION**

SFMTA rail transit operations are carried out by the Green Metro Division and the Cable Car Division. The Cable Car Division operates the Powell-Hyde, Powell-Mason, and California Street lines. The Green Metro Division operates six light rail lines and one Historic Streetcar (HSC) line, including the F - Market and Wharves HSC line and the J - Church, K - Ingleside, L - Taraval, M - Ocean View, N - Judah, and T - Third Street light rail lines. The entire SFMTA rail system carries an average of more than 179,000 passengers per day.

SFMTA is proposing to install BCBs in four high-platform stations in order to test the safety and efficacy of platform-mounted BCBs in preventing patrons from falling from the elevated platform to the trackway below in the space between a train's LRVs. The proposed BCBs will obstruct the 30-inch side clearance required by Section 9.06 (c) (1) of GO 143-B.

SFMTA's October 22, 2009 draft BCB Demonstration Project Plan specified that the Green Metro Training Unit, under the direction of Safety personnel, will provide training for all light rail vehicle operators and that SFMTA will develop a separate and detailed Training Plan for the demonstration project. The draft BCB Demonstration Project Plan also

described: the BCB design, which is similar to the BCBs currently being tested by the Los Angeles County Metropolitan Transportation Agency (LACMTA); field installation procedures; opportunities for consumer input; the BCB maintenance plan; berthing procedures; efficiency testing procedures; a passenger incident reporting process; and acceptance testing standards.

Staff shall review and provide comments on SFMTA's test procedure and results during the demonstration project. Upon the successful completion of the project, SFMTA may subsequently, as appropriate, request the variance be made permanent system-wide for all of its high-platform train stations.

SFMTA installed two samples of its BCB design at Folsom Street station on November 17, 2009 for testing purposes, and so that staff could examine them. On November 20, 2009, staff visited that station along with SFMTA's System Safety Supervisor to observe the two sample BCBs that were installed in that station.

Staff has reviewed SFMTA's request dated October 22, 2009 and believes that granting the temporary variance will not have an adverse effect on system safety. Staff suggests that the resolution should be granted with the following conditions:

1. The variance shall be temporary for a limited period of six (6) months;
2. During this six-month demonstration project, SFMTA shall install two (2) sets of BCB units parallel to the track at the edge of each platform at the Folsom Street, Brannan Street, 2<sup>nd</sup> and King, and 4<sup>th</sup> and King stations. The BCBs shall be placed at a two-car train's standard berthing location such that the BCB unit will be positioned in the open area between the anti-climbers on the first and second cars.
3. During the six-month demonstration project, SFMTA shall continue to research BCB alternative designs that do not encroach or infringe on GO 143-B clearance requirements. Alternative designs should include car-borne BCB designs and other designs that allow for 30-inch dynamic envelope clearance. SFMTA shall submit a report to staff

detailing the alternatives studied and justifying its preferred solution;  
and

4. Prior to installing any BCBs and beginning the BCB demonstration project, SFMTA shall submit and receive staff approval of a revised BCB Demonstration Project Plan that, at a minimum, shall include:
  - a) Project start date and installation timeline;
  - b) The minimum number of trains that will be monitored weekly, with a minimum of 500 trains observed during the demonstration project;
  - c) The time periods during which the trains will be monitored, including both peak and off-peak travel times;
  - d) The number of trains evaluated at each station;
  - e) The criteria and methodology for determining whether an LRV is properly berthed;
  - f) A preventive maintenance plan for bollards;
  - g) Bollard repair priority/time frame (work-order priority);
  - h) Operational procedures for the incorrect LRV berthing, including action taken when LRV does not berth within tolerance;
  - i) Operational procedures during single-track or reverse-running LRV operation;
  - j) Operational procedures for LRV berthing when bollards are damaged;
  - k) General specifications of the bollards, including force associated with moving, final height, distance apart, and force to compress the entire row;
  - l) A process which provides staff the opportunity to timely comment and participate in the BCB testing and monitoring;
  - m) An acknowledgement that staff shall have input into the testing of the BCBs during the entire period of testing and shall continually evaluate the overall performance of the BCB project;
  - n) A separate and detailed training plan, including training in berthing procedures and compliance; and

- o) Efficiency testing procedures to ensure correct LRV berthing at stations equipped with BCB units.
5. The following observations shall be included as part of the test:
  - a) Data showing the distance between BCB units and the corresponding LRV during train stops;
  - b) Data showing any obstruction to the movements of patrons on station platforms created by the BCB units;
  - c) Data concerning the number of train operators who comply, and the number who fail to comply, with the established train berthing procedures; and
  - d) Data establishing the number of incidents, with detailed descriptions of their locations, where BCB units presented a potential hazard such as a tripping hazard or a hazard created by the loss of one or more bollards through damage or acts of vandalism, etc.
6. Within 30 days after the test, SFMTA shall provide a report to staff on the effectiveness and safety impacts of the BCB demonstration project.

### **NOTICE**

On February 19, 2010, SFMTA's exemption request was published on the Commission's Daily Calendar.

### **COMMENTS**

The draft resolution of the CPSD in this matter was mailed in accordance with Section 311 of the Public Utilities Code and Rule 14.2(c) of the Commission's Rules of Practice and Procedure. Comments were filed on \_\_\_\_, and reply comments were filed on \_\_\_\_.

### **FINDINGS**

1. SFMTA proposes to temporarily install BCBs along the light rail station platforms in order to comply with the Americans with Disabilities Act

(42 U.S.C. § 12131 et seq.) and requirements imposed on transit systems under 49 CFR 38.85.

2. SFMTA contends that its BCBs will significantly reduce the risk that visually-impaired patrons will fall from the station platform to the trackway below in the space between two cars of a light rail train.
3. By a letter dated October 22, 2009, SFMTA requests a six-month variance to the 30-inch side clearance requirement of GO 143-B, Section 9.06 c (1), to conduct a demonstration project to determine the safety and efficacy of a platform-based BCB system.
4. Staff will have input into the process and will evaluate the BCBs' safety and efficacy during the demonstration project.
5. SFMTA will submit additional information to staff as staff requests, such as BCB maintenance plans, Light Rail Operations Standard Operating Procedure updates, BCB Training for the LRV operators, LRV Berthing Performance Report, Closed-Circuit Television Observation, BCB designs, and alternative BCB design reports.
6. SFMTA provided a draft BCB Demonstration Project Plan to staff on October 22, 2009. The plan described: the BCB design, which is similar to the BCBs currently being tested by the LACMTA; field installation procedures; opportunities for consumer input; the BCB maintenance plan; berthing procedures; efficiency testing procedures; a passenger incident reporting process; and acceptance testing standards.
7. SFMTA installed two assembled samples of their BCB design at Folsom Street station on November 17, 2009 for testing purposes, so that staff could examine them. On November 20, 2009, staff visited that station along with SFMTA's System Safety Supervisor to evaluate the two test BCBs that were installed in that station.
8. Granting the temporary variance for a six-month period will not have a significant adverse effect on system safety.

**THEREFORE, IT IS ORDERED THAT:**

1. San Francisco Municipal Transportation Agency's request, dated October 22, 2009, for a six-month variance to General Order 143-B, Section No. 9.06 c (1) Side Clearance requirements for the installation of Between-Car Barriers is granted as part of a demonstration project to test the safety and efficacy of Between-Car Barriers designed to meet the requirements of the Americans with Disabilities Act (42 U.S.C. § 12131 et seq.) and 49 CFR Pt. 38.85.
2. The purpose of the Between-Car Barriers demonstration project shall be to test their safety and efficacy in preventing visually-impaired patrons from falling from the elevated platform to the trackway below in the space between a train's light rail vehicles.
3. This variance shall be effective for six (6) months from today.
4. San Francisco Municipal Transportation Agency shall install two (2) sets of Between-Car Barrier units parallel to the track at the edge of each platform at the Folsom Street, Brannan Street, 2<sup>nd</sup> and King, and 4<sup>th</sup> and King stations. The Between-Car Barriers shall be placed at a two-car train's standard berthing location such that each unit will be positioned in the open area between the anti-climbers on the first and second cars.
5. San Francisco Municipal Transportation Agency shall continue to research Between-Car Barrier alternative designs that do not encroach or infringe on General Order 143-B clearance requirements. Designs should include car-borne Between-Car Barrier designs and other designs that allow for a 30-inch dynamic envelope clearance.
6. Prior to installing any Between-Car Barriers or beginning the Between-Car Barriers Demonstration Project, San Francisco Municipal Transportation Agency shall submit and receive staff approval of a revised Between-Car Barriers Demonstration Project Plan that, at a minimum, shall include:
  - a) Project start date and installation timeline;

- b) The minimum number of trains that will be monitored weekly, with a minimum of 500 trains observed during the demonstration project;
  - c) The time periods during which the trains will be monitored, including both peak and off-peak travel times;
  - d) The number of trains evaluated at each station;
  - e) The criteria and methodology for determining whether a light rail vehicle is properly berthed;
  - f) A preventive maintenance plan for bollards;
  - g) Bollard repair priority/time frame (work-order priority);
  - h) Operational procedures for the incorrect light rail vehicle berthing, including action taken when a light rail vehicle does not berth within tolerance;
  - i) Operational procedures during single-track or reverse-running light rail vehicle operation;
  - j) Operational procedures for light rail vehicle berthing when bollards are damaged;
  - k) General specifications of the bollards, including force associated with moving, final height, distance apart, and force to compress the entire row;
  - l) A process which provides staff the opportunity to timely comment and participate in the Between-Car Barrier testing and monitoring;
  - m) An acknowledgement that staff shall have input into the testing of the Between-Car Barriers during the entire period of testing and shall continually evaluate the overall performance of the Between-Car Barriers project;
  - n) A separate and detailed training plan, including training in berthing procedures and compliance; and
  - o) Efficiency testing procedures to ensure correct light rail vehicle berthing at stations equipped with Between-Car Barrier units.
7. The following observations shall be included as part of the test:
- a) Data showing the distance between Between-Car Barrier units and the corresponding light rail vehicle during train stops;

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- b) Data showing any obstruction to the movements of patrons on station platforms created by the Between-Car Barrier units;
  - c) Data concerning the number of train operators who comply, and the number who fail to comply, with the established train berthing procedures; and
  - d) Data establishing the number of incidents, with detailed descriptions of their locations, where Between-Car Barrier units presented a potential hazard such as a tripping hazard or a hazard created by the loss of one or more bollards through damage or acts of vandalism, etc.
8. Within 30 days after the demonstration project ends, San Francisco Municipal Transportation Agency shall provide a report to staff on the effectiveness and safety impacts of the Between-Car Barrier test. The report shall include an analysis of alternatives to the platform-mounted Between-Car Barrier within the General Order 143-B clearance envelope, as noted in No. 5, above.
9. If at any time during the Between-Car Barriers demonstration project, staff determines that Between-Car Barriers pose a significant safety hazard, San Francisco Municipal Transportation Agency shall immediately comply with staff's directions concerning individual Between-Car Barriers or the entire Between-Car Barrier project.
10. This resolution is effective today.

I certify that this resolution was adopted by the Public Utilities Commission at its regular meeting held on April 8, 2010. The following Commissioners voting favorably thereon:

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PAUL CLANON  
Executive Director

[Cover Letter/Cert. of Service to Res. ST-111](#)