

## **METRO TRANSIT LIGHT RAIL**

### **MINNEAPOLIS, MN**

#### **APPLICATION FOR 2013 RAIL SAFETY AWARD**

#### **“DEVELOPMENT AND IMPLEMENTATION OF AN EFFECTIVE COMPLIANCE TESTING PROGRAM”**

##### **Description / History of the Issue**

The operation of a safe and efficient rail system requires a well developed set of rules and procedures. Unlike other modes that operate on a public right of way where traffic laws set a standard, rail systems must develop their own “rules of the road.” And by the very nature of a fixed guideway system, the opportunities for evasive or “defensive” driving techniques to be applied are essentially non-existent. Enforced compliance with these rules is every bit as essential as traffic enforcement on a street or highway. But where local traffic enforcement generally falls to police agencies, rail transit systems must control their own operations. While essential to maintaining a safe and orderly operation, the means are often not well thought out and the process may lack definition.

Since its onset in 2004, the light rail operation at Metro Transit has included a compliance testing program of some form in its operation. Our State Safety Oversight Agency had included requirements for such testing in their program standards, leaving substance and form to Metro Transit. In the initial program, supervisors were tasked with completing a minimum number of tests each month. This requirement often varied with the coming and going of management personnel and was often diluted when staffing levels dropped or when other projects or demands took center stage. There was never standardization of the testing methods or clear definitions of what constituted failure or success. And most problematic, the very purpose of the testing was not only unstated, it was not apparent. Employees failed to recognize it as a constructive tool and saw it as no more than a means of harassment by supervision. Adding to this flavor was the lack of standardization, leading some supervisors to develop their tests into clever games of “cat and mouse” in an effort to “catch” someone in violation of the rules. Less motivated individuals picked only the easily administered tests to meet a quota. Clearly, there had to be a better way of managing such an important effort and minimizing the negative overtones.

##### **Description of the Project (Goals and Objectives)**

In 2009, Metro Transit began a commuter rail service (Northstar), contracting the operation of these trains to BNSF Railway. While commuter rail and light rail operations were separate departments, the rail safety staff had responsibilities with the operations

of both modes. As such, safety staff participated in joint testing with BNSF staff, testing both Northstar and BNSF freight trains for compliance with BNSF rules. It quickly became apparent that the BNSF program was far more organized and methodical in their testing procedures and protocols. Aside from the corporate experience, this sophistication may have come in large measure from the FRA oversight and regulation of their operation. While not necessarily openly embraced by all, the testing was recognized by their crews as a fact of life and the standardized procedures for not only the administration of the tests but the feedback resulting from these tests (both positive and negative) gave the entire process validity. We in Rail Safety became convinced that the same organization and rigor could be applied to the light rail compliance testing

With this objective in mind, the rail safety staff developed a testing manual in 2010 that could be provided to (and subsequently maintained and updated by) the light rail operations management team. With the BNSF Operations Testing Reference Guide serving as their template, they set out to look at key Metro Transit rules that would lend themselves to structured operations testing. Their goal was to design a plan that would provide a reference guide on all aspects of compliance testing from preparation to data entry. It sought to assist in the administering of testing on a consistent basis, allowing employees an opportunity to demonstrate their command of rules and instructions, while giving supervisors the chance to praise a job well done or to correct operating deficiencies and thereby avoiding potentially much more serious outcomes.

The key elements of this Guide include:

- Quality of Testing: Specific guidance regarding varying the times and locations of testing;
- Testing Frequency: Each supervisor is expected to complete 120 tests per month. To ensure balance (quality), there are restrictions on the number of tests that can be performed in a given day and week. At least 10 tests must be performed on maintenance employees, with the balance covering train operators. Planned tests must be a minimum number of the total to ensure that mere observations do not constitute the preponderance of the tests;
- Consistency: To ensure fair and consistent testing of employees, if a testing manager sees a need for a new planned compliance test, a test procedure formatted in the style of this document must be submitted to The Rail Transportation Manager or his designee for approval. No planned test shall be performed unless it is included in this manual;
- Testing Safety: By clarifying some key elements of how tests are to be conducted, there can be some assurance that hazards would not be created through non-standard procedures or a lack of communication;

- Testing Authorization: Consideration should be given by testing Managers regarding the type of tests to be performed. The testing Manager's knowledge and background are the limiting factors in each test selection. Likewise, supervisors will not conduct testing of peer supervisors;
- Testing Opportunities: In addition to planned field compliance testing activities, the use of event recorders and SCADA are acceptable methods of conducting tests;
- Testing Results: An important aspect of compliance testing is follow-up, which provides employees with feedback on their performance as it relates to management's expectations. In the event of a failure, the tested employee must be made aware of test results and given a performance review by a Supervisor. An important clarification was added that the only acceptable method of notification to an employee for a compliance testing failure is a face-to-face meeting with the employee involved in the testing failure. This timely feedback was viewed as critical to the success of any such program;
- Focused Testing: When a failure of a compliance test occurs, an increased number of that particular test should be conducted to ensure that other employees understand, and are complying with the applicable rules and policies. In addition, an increased number of tests should be performed on individual employees responsible for repeated failures. This was seen as a means of ensuring that bad practices were not becoming trends.

Each specific test is assigned a number and includes:

- The stated purpose of the test;
- The applicable rules that the test measures;
- Any preparations or conditions regarded for conducting the test;
- A clearly stated test procedure to ensure consistent administration;
- A definition of a failure. This element eliminates any subjective application of test procedures or their results.

While Metro Transit LRT has developed an MS Access based system for maintaining a database of testing results, any system that would allow data collection and sorting can be effective for maintaining test results. In our experience, the methodology of consistently and fairly conducting the tests and sharing the feedback was of far greater importance –and benefit – than sophisticated tracking programs.

Metro Transit rolled out its Light Rail Compliance Testing Reference Guide in February, 2011, the incorporating the benefits and virtues described above. Since that time, it has been maintained by Rail Operations management, it is now in its 5<sup>th</sup> Revision (attached as a reference – Appendix A).

## Specific Results

Metro Transit's light rail operations have enjoyed a very satisfactory safety record since opening. Rules compliance has been generally good, considering the transition of train operators from bus operators and the differing rules structure that governs rail operations. While lack of compliance has never been an egregious problem, there have been concerns in certain key areas.

Red signal compliance is one area that warrants continuous attention. The potential for disastrous results for non-compliance are readily apparent and there seems to be a culture shock of sorts when bus operators transfer into rail operations and experience the paradigm shift where ignoring these absolute signals carries far more severe consequences. The regimen of testing surrounding signal compliance is a key element of the testing program. By ensuring a minimum number of signal compliance tests, combined with testing of restricted speed and other related rules, management can seek to keep awareness in the forefront and our ongoing trend in red signal overruns is consistently decreasing (see Appendix B.)

As was mentioned, without a rigorous and structured program, supervisors often sought the low hanging fruit in the testing arena. Simple and sometimes meaningless "tests" that were actually functions of normal operation (such as horn or bell compliance or opening doors on the proper side of the train) were submitted in lieu of pre-planned and meaningful tests (such as withholding signals and monitoring compliance with related rules). By bringing structure to the testing protocols and requiring a minimum number of pre-planned tests, supervisors are now held accountable to deliver a more meaningful test program. Appendix C demonstrates the increase from no documented pre-planned tests in 2009 to almost 3,800 planned tests in 2012. Also, the inclusion of planned testing (as opposed to "observation tests", where the test is not premeditated but simply a reflection of randomly observed behavior) brought on a measurable improvement in performance. Appendix D demonstrates that the trend line of failure in observation testing remained relatively constant at 1% over a 4 year period, where after the inception of planned tests, the failure rate actually trended downward over time. We believe this is an indicator of the success of the improved testing procedures in improving rules compliance.

An intangible is the tacit acceptance of the process. Where in the past, the bargaining unit sought to bring forward grievances regarding the processes (sometimes unstructured and unorthodox) involved in the testing, the uniform processes have resulted in the absence of grievances of this nature. While the union may still challenge resulting disciplinary action, the fundamental process of the testing and the standardized methods have not been successfully challenged. Moreover, the fact that supervisors are now tasked with giving timely feedback of their observations (as

opposed to either not following up or passing paperwork off to one of their superiors) makes these tests more meaningful as a learning tool and less of a punitive measure.

Even with the best designed program, management interest and oversight is critical to obtaining the best possible outcome for the effort involved. We struggle from time to time with keeping the need for and quality of testing as priorities, given competing demands for time and resources. This organization faces continuing growth and while these are “good” problems to have, they provide the temptation to relax standards and expectations in favor of other more visible, public, or politically-charged issues. Maintaining reliable and safe service to the public depends on monitoring the compliance with rules governing the operation.

### **Applicability Elsewhere**

In order to ensure a safe operation, any fixed guideway transit system has the same core needs to monitor and enforce compliance with their operating rules. Approaching this function in a less structured manner does not really offer any optimum results and can, in fact, be counterproductive. Labor acceptance of management policies can be a challenge, but if testing is applied in an arbitrary and capricious manner the discord is magnified.

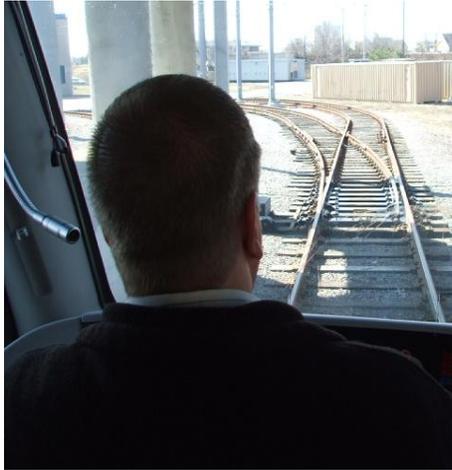
Similar properties would be able to follow what we have developed as a template, modifying content to match their individual needs or system distinctiveness. The inclusion of our document in its current form is meant to offer a starting point to other interested properties. The critical element is to define those rules that are worthy of testing and then develop a procedure to test each with a uniform process. The standardized testing procedures ensure fairness and keep the process focused on the goal of rules and procedural compliance without allowing for individual bias or tactics. Clear definition of what constitutes a failure makes the results standardized between testers and employees and offers legitimacy to the process. And keeping the focus of the program on improvement and feedback, as opposed to discipline and consequence, is perhaps the cornerstone of acceptance and success.

Safety is the cornerstone of what we do. And, in some ways, it is like housecleaning – it only rises to one’s attention if it’s not getting done. This is one important way of “getting it done,” consistently, fairly and competently.

**APPENDIX A**

**METRO TRANSIT LIGHT RAIL COMPLIANCE TESTING REFERENCE GUIDE**

**REVISION - 5**



# Light Rail Compliance Testing Reference Guide

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Revision - 5  
07/18/2012

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Metro Transit Rail Operations

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Revision Record		
Revision	Revision Date	Comments
1	02/10/2011	Original Document
2	09/03/2011	Update With Rule numbers from 6 <sup>th</sup> Edition Rail Operations Rule Book
3	12/14/2011	Updated Testing Failure Instructions, Updated Speed Defined Failures.
4	02/15/2012	Updated Number of Planned Compliance Tests – Table of Contents
5	07/18/2012	Added Test 209 LRV Pre-Trip Procedure

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## Compliance Testing Policy

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### INTRODUCTION

Compliance Testing is mandated by Metro Transit company policy and the State Safety Oversight Agency (SSOA). Minnesota Rail Safety Oversight Program standards (MNR SOP) require operational tests and inspections to determine the extent of compliance with Metro Transit’s rules, policies, instructions and general procedures specific to an employee skill set. Compliance Testing provides Metro Transit employees the opportunity to demonstrate their ability to apply the rules and special instructions in the work environment.

Quality Compliance Testing communicates clearly to employees what is expected of them. By reviewing particular rule requirements in a field application, both the employee and the Supervisor can gauge the level of rules proficiency.

The testing Manager or Supervisor should use this process to verify that employees are working safely and in compliance with all company rules, policies, instructions and procedures. When company expectations are not being met, this process will allow for correction of operating deficiencies before those same deficiencies become incidents. Throughout this document, any reference to a testing Manager is meant to include any rules qualified Supervisor, Manager, or Safety Staff member who may

be involved in Compliance Testing. Furthermore, any reference to an Operations Manager is meant to refer to the Transportation Manager or Assistant Transportation Manager (ATM).

## PURPOSE OF THIS DOCUMENT

This document is designed to provide a reference guide on all aspects of Compliance Testing from preparation to data entry. It will assist in the administering of Compliance Testing on a consistent basis assuring employees an opportunity to demonstrate their command of rules and instructions, while giving Supervisors the chance to praise a job well done or to correct operating deficiencies.

## METRO TRANSIT PHILOSOPHY

Compliance Testing is intended to be a positive experience for our employees. As a testing Manager, you should regard these tests as an opportunity to verify that employees are working safely and in compliance with all company rules, policies, instructions and procedures. Quality Compliance Testing is one of the most valuable services you can perform to ensure safe, efficient rail operations.

## TESTING QUALITY

Quality Compliance Testing is critical to the success of the program. Quality Testing requires strict adherence to Metro Transit's Compliance Testing Reference Guide and all rules, policies and procedures. Quality Testing also ensures Managers are conducting tests at random periods throughout the entire month. Testing activities must be included on weekends and holidays. Selecting certain days for testing or performing a large number of tests at one time or location should be avoided. Avoid repetition of tests and testing locations, concealing your vehicle when necessary to avoid being seen.

## TESTING FREQUENCY

All Rail Transit Supervisors are required to perform one hundred twenty (120) Compliance Tests each month. Of those one hundred twenty (120) tests:

- At least ten (10) Compliance Tests shall be conducted on Systems and Maintenance personnel (Traction Power, Signals, and Track). This testing stresses the daily supervisory role of observing other employees in their working environment, for rules compliance and the proper use of PPEs (Personal Protection Equipment).
- At least twenty (20) planned Compliance Tests will also be performed on Train Operator's.
  - At least ten (10) tests must be from the 100 series tests.
  - At least ten (10) tests must be from the 200 series tests.
- Planned Compliance tests should be entered into ROMS using the appropriate testing number (Not the rule number).
- Testing Supervisors will complete their required Compliance Tests so they are evenly dispersed over an entire month.
- The maximum number of Compliance Test entries that will be credited towards a Supervisors monthly required total will not be more than twenty five (25) Compliance Tests in a single day and no more than fifty (50) Compliance Tests in a single week.

It is strongly encouraged by the Managers of the Operations Department that the testing Manager completes more than the minimum monthly requirement of one hundred twenty (120) Compliance Tests. This additional information will help determine what rule or skill related area that focus is needed to help improve the employee's knowledge of operational safety, rules and/or special instructions.

To ensure fair and consistent testing of employees, if a testing Manager sees a need for a new planned Compliance Test, a test procedure formatted in the style of this document must be submitted to The Rail Transportation Manager or his designee for approval. No planned test shall be performed unless it is included in this manual.

### TESTING SAFELY

Before setting up tests that affect or stop train movements, the RCC Supervisor and/or ATM should be initially informed and then communicate with the RCC by cellular phone or Supervisor radio channel, if possible.

Circumstances surrounding a test must not create a hazardous condition for the employees being tested, the testing Supervisor, Metro Transit customers or the general public.

During any signal test, a Manager with a radio must be prepared to stop the train in case of a testing failure. Use of track shunts is permissible when a member of the test team has been trained in the proper procedures. Testing Managers must be aware of all affected grade crossings locations, and exercise caution against false activations of the grade crossing protection system.

### TESTING AUTHORIZATION

Consideration should be given by testing Managers regarding the type of tests to be performed. The testing Managers knowledge and background are the limiting factors in each test selection.

300 series tests may only be performed by an Operations Manager or Safety Staff. Supervisors will not conduct testing other Supervisors. (A Foreperson is not considered a Supervisor).

### TESTING OPPORTUNITIES

In addition to planned field Compliance Testing activities, the use of event recorders and SCADA are acceptable methods of conducting any Compliance Test. The recorded test date should be the date the event occurred.

If multiple infractions of the same rule are noted the infraction must only be entered once. If multiple rules violations exist, each rule will be entered as a failure.

### TESTING RESULTS

Compliance Testing can have one of two results, pass or fail. An important aspect of Compliance Testing is follow-up, which provides employees with feedback on their performance as it relates to Metro Transit's expectations.

In the event of a failure, the tested employee must be made aware of test results and given a performance review by a Supervisor.

**NOTE:** The only acceptable method of notification to an employee for an Compliance Testing failure is a face-to-face meeting with the employee involved in the testing failure.

**NOTE:** Before placing an entry in the operator comment field, the tested employee must be advised of the test by the method listed above.

A rule violation that is discovered by means other than a planned Compliance Test must be recorded as an Observation Test. In this particular situation, a Notice of Violation must be written and the incident must be reported to an ATM.

## TESTING FAILURES

When a failure of a Compliance Test occurs, an increased number of that particular test should be conducted to ensure that other employees understand, and are complying with the applicable rules and policies. In addition, an increased number of tests should be performed on individual employees responsible for repeated failures.

Individuals who fail a Compliance Test must be notified of the failure promptly and corrective measures taken to ensure safety. The Supervisor must determine whether the failure was due to lack of understanding of the rule requirement or as a result of a conscious decision to violate the rule.

The testing Supervisor **must** personally see or hear a rule violation, which may be for any requirement in the rule, whether specifically detailed in this reference or not.

Certain test failures (**Cardinal Rule Violations**) require supervisory assessment of the employee's fitness for duty. When these conditions occur, the testing Supervisor must contact an Operations Manager.

## FAILURE HANDLING

Metro Transit is committed to provide a safe work environment in which all employees can experience meaningful work, contribute to the success of the company, and find reward for safe and efficient job performance.

To ensure a safe environment for our employees and the communities we serve, the movement of trains and the maintenance of equipment, track and facilities must be conducted under the guidelines of carefully designed rules and procedures.

Violation of these rules and procedures may result in death, injury and/or substantial financial loss. Therefore, all violations will be treated in a serious manner.

All Compliance Tests failures must be recorded in the Rail Operations Management System (ROMS) with discipline handled in accordance with the applicable agreement and discipline policy.

Any violation of a rule covered by a specific test should be regarded as a failure of that Compliance Test.

Any failed rules Compliance Test that has escalated to a violation status will need to have a Special Situation Report (SSR) completed. If the failure can be confirmed by video, an LRV download, or Signal Department download, request the download from the appropriate department. The SSR is created to help keep track of downloads and information related to the Compliance Test failure. Send the email requests to the appropriate departments, specifying the exact information that needs to be downloaded. Send a copy of this email request to the Assistant Managers – Rail Transportation.

## **DATA ENTRY – TEAM TESTING**

The planned administration of some Compliance Tests requires the participation of two or more Managers. When the test results are being recorded, enter each participant's name and employee number in the comment field.

Foreign Managers (SSOA or FTA) should be entered for all tests in which they participate.

## **REPORTING DEADLINE**

All failed Compliance Testing reports must be entered into ROMS within 24 hrs and all passing reports must be entered within five calendar days after the test was performed and no later than the first day of the following month, whichever comes first. If the test entry deadline passes, but the company's interests would be best served having the tests entered, contact the Rail Transportation Manager.

## **COMPLIANCE TESTS ERRORS**

If an error has been made to a Compliance Test and it needs to be corrected or deleted, please email the Operations Manager with the following information:

Test number, test date, test time, employee number of the employee tested and detailed explanation of why test needs to be corrected. Tests will only be deleted if an explanation of the error is given with the request.

## TEST 101: FOULING TRACKS

This Compliance Test determines that employees do not foul a track, except for incidental fouling such as when crossing track, and then become preoccupied with some activity that prevents them from keeping a sharp look out for approaching trains and equipment.

### APPLICABLE RULES

R1005 Employees, contractors and visitors shall comply with any PPE requirements imposed by Metropolitan Council Policy, OSHA, Work Permits, Contractor Requirements or any other governing authority.

R3003 Employees must expect trains to move on any track in either direction. They must look in each direction before entering upon or standing close to tracks. When crossing tracks, employees must step over rails and switches, and avoid walking over switches at all times.

R3031 Any employee requesting Right-of-Way access must contact the RCC and provide the following information:

- Department name and employee number.
- Location (If necessary, explain direction of travel).
- Scope of work.
- Estimate of time required in the Right-of-Way.

Notify the RCC when all employees and equipment are clear of the Right-of-Way.

R3004 Employees in the Right-of-Way must face approaching trains and place themselves, their tools and equipment in safe positions. Employees must stay alert and in a safe location until the train has passed.

### PREPARATION/CONDITIONS

This Compliance Test can be conducted any time and any place employees are walking or working on or near tracks.

### PROCEDURE

Observe employees whose duties may require them to work around, on or near tracks. If they do not have authority to occupy or foul tracks in accordance with rules, observe that they do not become unnecessarily involved in tasks that reduce their attentiveness to potential equipment movements on tracks they are close to or fouling.

## FAILURE DEFINED

The test is a failure when employees:

- Foul the track without proper authority or protection.
- Foul the track without knowledge through job briefing that proper protection has been acquired.
- Foul the track unnecessarily while engaged in an unrelated task, when the necessary protection has not been provided.
- Foul the track without the required reflective vest.

## TEST 102: COMPLIANCE WITH HAND SIGNALS

This test determines that hand signals are given in a proper manner and that Train Operators comply with all rules governing compliance with hand signals.

### APPLICABLE RULES

R2001 Hand signals may be given by hand, or a hand-held flag or flashlight. A flag or flashlight moved the same as the hand gives the same indication.

R2002 Hand signals must be given in the prescribed manner from a point where they may be plainly seen and sufficiently in advance to permit compliance. R2003 All hand signals must be given while facing the Train Operator.

R2009 Horn signals to be used by train and maintenance crews, when trains are pushed, pulled or to acknowledge a hand signal:

- Use one (1) short blast of the horn to acknowledge a STOP hand signal.
- Use two (2) short blasts of the horn before moving forward and to acknowledge all hand signals, except STOP, move backward and close doors.
- Use three (3) short blasts of the horn before moving backward and to acknowledge a hand signal to back-up.
- Use four (4) short blasts of the horn to request a hand signal.
- Use two (2) long blasts of the horn to warn people to clear the track.

The following three hand signals are the only hand signals that may be used for a planned Compliance Test. R2021 Stop, R2022 Reduce Speed\Slow Down Signal, R2023 Move Forward Signal.

## PROCEDURE

- Select the location where the test is to be performed well in advance of the arrival of the train.
- Communicate with the RCC to discuss your testing plans.
- The signal must be given properly in a clearly visible manner from a safe location that is visible to the Train Operator.
- Observe that the Train Operator complies with the hand signal given including proper horn acknowledgment. Once the hand signal is acknowledged, stop giving the signal and wait for the train to comply.
- Sound judgment should be used to select a safe location for the testing Managers and public. While not required, this test will usually be performed in an area where the train is operating at restricted speed. If there is a need to perform this test on the main line in an area where the train is not operating at restricted speed the testing Supervisor must submit a test plan to the Rail Transportation Manager or his designee for prior approval. This test should never be performed at a location where the train is already expected to be sounding their horn for another reason.

## FAILURE DEFINED

This test is a failure when:

- The hand signal is not properly given.
- Train Operator fails to acknowledge the hand signal with the appropriate horn signal.
- Train Operator fails to comply with the hand signal.

## TEST 103: REQUIRED EQUIPMENT

### TEST OBJECTIVE

The required equipment test monitors employee compliance with the rules related to wearing Personal Protective Equipment and clothing (PPE) and other equipment necessary to perform their job.

### APPLICABLE RULES

The tested employee is required to wear the proper PPE and have mandatory items in their possession as described in:

R1003 Employees must wear boots that are of sufficient height to support the ankle, have a defined heel, and a chemical resistant sole with a functioning tread. Sandals, cloth, canvas, wedge type, high heel, athletic or recreational shoes are prohibited.

R1004 All employees, contractors, or visitors who are in the Right-of-Way or in the ballasted area of the Yard shall wear the prescribed reflective safety vests. This includes the Lindbergh and Minnehaha Tunnels.

R1006 Employees whose duties require observing signal aspects or reading train directives and whose visual impairment or deficiency requires the wearing of corrective lenses must wear corrective lenses while on duty.

R4033 Mandatory items an employee must have while operating a train or OTE:

1. Track Warrant
2. Blank Track Warrants
3. Current Operating Rule Book
4. Current General Orders and Operational Notices
5. Operator Certificate (Applies to Train Operators only)
6. DOT Card (Applies to Train Operators only)
7. ANSI II or better Jacket or Vest
8. A Working – Approved Flashlight
9. Portable Radio
10. LRV and Switch keys

## LOST AND FOUND TAGS PROCEDURE

For Train Operators this test will be performed at the end points or relief points. Do not use test 103 to document a routine RCC “Grip check”.

Observe the employee and verify that job specific PPE requirements and mandatory items requirements have been met.

This test must not be performed in a manner or at a time and location that will unduly delay the train.

This test should be performed in the current operating cab of a train with the door closed.

For other employees in the field determine the type of specific PPE required for the observed activity. Additional PPE requirements may be specified in work permits.

## FAILURE DEFINED

- The Train Operator does not have all of the required items in the operating cab.
- Additional required PPE is not being used. (System employees & Supervisors).
- Train Operator Track Warrant is not current (this should be recorded as a failed 105 test).

## TEST 104: RADIO USAGE

The Radio Usage Test determines that employees practice proper radio procedures.

### APPLICABLE RULES

R3290 Radio Communications

### PREPARATION/CONDITIONS

This Compliance Test can be conducted anytime employees are using radio communications.

### PROCEDURE

Observe that all transmissions are consistent with existing rules including:

- Transmission begins with positive identification.
- Instructions are repeated as required.
- Employees make proper use of the terms “Over” and “Out”.
- Radio communications are not misused and prohibited communications do not occur.

### FAILURE DEFINED

This test is a failure any time a radio communication is not consistent with existing rules.

## TEST 105: TRACK WARRANT AUTHORITIES

This Compliance Test is designed to determine that RCC Supervisors and rules qualified employees have transmitted, copied and repeated verbally issued Track Warrant authorities correctly.

### APPLICABLE RULES

R4141 Each Train Operator must have a Track Warrant issued to them and must read and understand it. The Track Warrant must show the current date and name of the employee. The Track Warrant will govern main track occupancy under the direction of the RCC Supervisor. Track Warrant restrictions and authorities must be followed and the Track Warrant must be immediately available at all times.

R4144 Maintenance personnel and equipment may receive a Track Warrant in the same manner as trains to occupy or perform maintenance on the main track. A Track Warrant must not be issued to protect maintenance personnel unless all trains have been notified of their presence.

R5042 When the RCC authorizes a train to reverse run, the train must use only the track designated within the specific limits and proceed from one point to another in the direction authorized by the RCC. All trains within the limits are authorized to move in the same direction and must comply with the following:

- Proceed at Restricted Speed
- Trains must not change direction to move with the Current of Traffic or Assigned Direction of Traffic unless authorized to do so
- Trains must approach the end of the limits prepared to stop, unless authorized by signal indication
- Trains must report clear of the limits to the RCC

R4145 All Track Warrant updates are Mandatory Directives. The following must occur when an update to the Track Warrant is transmitted verbally:

1. Train Operators must stop their trains in a safe location before updating information on their Track Warrant.
2. The receiving employee will enter all of the information and instructions on the Track Warrant.
3. The receiving employee will read back the information to the RCC.
4. The RCC will confirm the read back and will respond, "That is Correct".

The restriction is in effect for an individual train immediately when marked in effect on the Track Warrant.

R4146 All or part of a Track Warrant is in effect until voided by the RCC or completion of a day's work. All Operators performing split work or overtime must reconfirm the Track Warrant with the RCC before resuming duty. This may be done in person, over the radio or on the phone.

R4052 Relief Operators must operate their trains at Restricted Speed until they have contacted the RCC for updates to their Track Warrant and the RCC confirms any updates.

R4147 The RCC may “VOID” one or more lines of a Track Warrant. Operators must write “VOID” across their copy of the Track Warrant at the completion of their days work. The Track Warrant must be retained until the end of their shift.

### **PREPARATION/CONDITIONS**

This Compliance Test should be conducted when verbally issued Track Warrant updates are transmitted by radio are transmitted by radio. This test may be a part of test 313 required equipment inspections.

### **TESTING PROCESS**

Monitor audio communications or historical voice recordings. Verify that the RCC Supervisor, and Train Operator, or rules qualified systems employee have transmitted and repeated each item on the Track Warrant correctly.

For field employees, the Testing Officer should verify by visual inspection that the Track Warrant was copied correctly.

### **FAILURE DEFINED**

The Compliance Test is a failure when:

- RCC considers authority complete before all trains or affected employees have acknowledged Track Warrant update.
- RCC acknowledges an incorrect read back.
- Any written authority does not match the issued wording.
- Train Operator or affected employee does not have an accurate, complete, and current Track Warrant.

## TEST 106: CELL PHONE

### APPLICABLE RULE

Current Metropolitan Council Procedure 4-7 f Cell Phone Use While Operating a Bus or Light Rail Vehicle or the Rail Operations Cell Phone Policy, whichever is more restrictive.

### TESTING PROCESS

Visual observation to determine if prohibited possession or use is occurring

### PROCEDURE

Observe Train Operators or other employees operating company vehicles or on LRT ROW.

### FAILURE DEFINED

Any use of a prohibited electronic device while operating a Metro Transit vehicle while on the immediate ROW is a failure.

The visible or audible presence of a Blue Tooth ear piece, I-Pod, or other prohibited electronic device will result in a failure.

These Compliance Tests are to be based solely on visual or audible observation. It is not permissible to call an Operators phone to see if it rings or to ask an Operator to produce his or her phone.

A violation must be written and an Operations Manager notified of any failure of the cell phone policy.

## TEST 201: SIGNALS - STOP

The Block Signals-Stop Test determines that Train Operators comply with all rules governing stopping for signals displaying a Stop Indication.

### APPLICABLE RULES

R2021 STOP (Hand Signal)

R2135 The RCC must be notified promptly when a signal displays a STOP indication, unless the reason for a STOP indication is apparent.

R2139 To pass a Signal indicating STOP, verbal authority must be granted by the RCC to proceed as follows.

After stopping, “LRV # \_\_\_ has the authority to pass signal # \_\_\_. Proceed from Main Track # \_\_\_ to Main Track # \_\_\_ at Restricted Speed.”

The Operator must repeat back to the RCC the verbal authority. The RCC must verify the response.

R8034 When a controlled Interlocking Signal cannot be changed to display other than a **STOP** indication, the RCC must perform the following before permitting a train to pass such signal:

1. Verify that the track to be used is clear of conflicting movements.
2. Make sure that no conflicting movements have been authorized.
3. Obtain control of opposing trains through either a controlled signal, or by withholding authority to proceed.
4. When the signal governs movement to more than one track, designate the track on which the train is permitted to proceed.
5. When the **STOP** signal governs movement over power-operated switches, RCC must confirm alignment and correspondence in SCADA.
6. All other signal and switch controlling apparatus within the authorized limits must be positioned for the movement.
7. After all the above safeguards are implemented and instructions are issued concerning any power-operated switches, the RCC will issue verbal authority past the **STOP** signal per rule R2139.

## PREPARATION/CONDITIONS

- 1) Advise the RCC of your plans to conduct this test.
- 2) Request the Signal Supervisor to set up the Stop indication in ABS territory or request the RCC to hold the signal at Stop.
- 3) Caution must be taken ensure that adjacent vehicle traffic control devices will not be affected.

## PROCEDURE

After the necessary preparations have been made:

- 1) Observe that train stops before any part of the equipment passes the signal displaying a Stop Indication.
- 2) Verify rule compliance as follows:
  - Verify that the Train Operator stops for the signal and secures authority to pass the signal.
  - Verify that the RCC is properly notified.
  - Verify that the authority is properly transmitted and repeated **before** the train passes the signal. Restricted speed past the signal is a separate test (Test 204).

## FAILURE DEFINED

The test is a failure when:

- The Train Operator fails to stop their train short of a Stop Signal or proceeds without authority.
- Fails to promptly notify the RCC.
- The RCC fails to properly grant authority.
- The train fails to properly repeat authority.

## TEST 202: DARK SIGNAL

The Dark Signal Test monitors alertness of crews to recognize a signal improperly displayed.

### APPLICABLE RULES

R2132 An incorrectly displayed wayside signal, or a signal with a light or lens out, must be regarded as a **STOP** Signal. This condition must be promptly reported to the RCC. The Train Operator must follow instructions of the RCC.

R2133 Train Operators will immediately report a missing or defective signal to the RCC and be governed by the rules and instructions.

R8029 If a signal fails to operate properly, its operation must be discontinued and the signal must be blocked to display its most restrictive aspect. The RCC must report any unusual operation of signals and appliances promptly to the signal department.

### PREPARATION/CONDITIONS

- Testing Manager must verify that no trains, or personnel and equipment are within the block being protected by the dark signal to be tested.
- Contact the RCC advising your plans prior to setting up the test. Testing Managers must be assisted by a Signal Supervisor.
- Prepare for the test by requesting a Signal Supervisor to set-up the “dark” signal. This process should include verification that the signal displays a red aspect before it is darkened. (This is to ensure that the train approaches the dark signal on an approach indication prepared to stop)

### PROCEDURE

After the necessary preparations have been made:

- 1) Observe and confirm that the signal indications in advance of the dark signal display the appropriate signal sequence (approach) or that the signal requires a stop regardless (dwell lights).
- 2) Observe the train stops short of the dark signal. A Manager must remain at the dark signal able to stop any train not complying with the signal.
- 3) Speed compliance from point of stop throughout the remainder of the block may be checked by radar speed measuring device or event recorder data. Speed checked can be entered as a 204 test.
- 4) If the test is conducted at a dwell light all aspects must be darkened.

### FAILURE DEFINED

The test is a failure when:

- The test is a failure when the train does not stop before passing the dark signal.
- The Train Operator fails to report the dark signal to the RCC.
- The test is a failure when the RCC fails to notify the signal department.

## TEST 203: OBSTRUCTION TESTING

The Obstruction Test determines that the Train Operator is in compliance with all rules requiring ability to stop within half the range of vision. These requirements are found in Ops Notice 27-10 and apply wherever restricted speed is required. This test is conducted with a cone or authorized track flag.

### APPLICABLE RULES

R4091 When a train is required to move at Restricted Speed, the movement must be made at a speed that allows the train to come to a complete stop using good train handling, within one-half range of vision, short of:

- A Train
- An Obstruction
- A STOP Signal
- Personnel or Equipment Fouling the Track
- A Derail or an Improperly Lined Switch

The Operator must look out for broken rail and will not exceed 20 MPH.

When operating at Restricted Speed and approaching a grade crossing that has active warning devices, such devices must be confirmed to be working prior to entering the grade crossing.

Train speed must not exceed a lower governing speed limit

R4263 All trains must move within Yard limits at Restricted Speed, not exceeding 10 mph, 5 mph over switches, and be prepared to stop at all times. The rear trucks of the LRV must clear the switch before resuming the 10 mph speed limit.

### PREPARATION/CONDITIONS

This test may be conducted at any location where a train is required to move at restricted speed, these locations may include: Where passing a signal requires restricted speed.

- Within Yard Limits.
- Within a Temporary Restricted Zone (Line 5) Limits.
- Under any other condition requiring movement to stop within half the range of vision.

### PROCEDURE

- Select the location where the train is to be stopped well in advance of the arrival time.
- Communicate with the RCC to discuss your testing plans.
- Place the obstruction in a location that will test an employee's ability to stop within the requirements of restricted speed. For maximum effectiveness the obstruction should be placed in a location where visibility is limited. Placement of the obstruction on tangent track is discouraged for this test.
- An approved cone placed within the gauge of the track is the only acceptable obstruction to be used on mainline track. Within yard limits a cone or track out of service flags may be used.
- Verify that the train stops short of the obstruction.
- Sound judgment should be used to select a safe location for the testing Managers and crew.

## **FAILURE DEFINED**

This test is a failure when the train fails to stop short of contacting the obstruction.

Using emergency brake to stop short of the obstruction will be considered failure to comply with restricted speed.

## TEST 204: SPEED REQUIREMENTS

The Speed Requirements Test determines that a Train Operator is in compliance with the maximum allowable speed for any given location.

### APPLICABLE RULES

- R4091 (Restricted Speed).
- SSI currently in effect prescribing timetable speed for specific location.
- Track Warrant restrictions currently in effect at time and location of testing.
- Any check of speed during Test 201, 202, or 205.

### PREPARATION/CONDITIONS

- 1) Determine maximum speed for the train at the selected testing location.
- 2) Determine the method of measuring the speed at the testing location. If radar gun is to be used, follow the manufacturer's recommendation for testing the device.

### PROCEDURE

Measure train speed by using one of the following methods:

- Radar or Laser Speed Measuring Device—Verify the speed recorded is in compliance with the maximum allowable speed at the testing location.
- Event Recorder Measurement (Test may only be performed with consent of operations Manager)

### FAILURE DEFINED

Where “**Restricted Speed**” is required, the maximum allowable speed must “**Never**” be exceeded by any amount.

For all other testing, the following tolerances are allowed:

- Posted speeds may be exceeded by One (1) MPH and a Failed Compliance will “**Not**” be written.

<u>Posted Speed</u>	<u>Failed Compliance Test</u>	<u>Violation</u>
5 mph	7 mph	8+ mph
10 mph	12 mph	13+ mph
15 mph	17 mph	18+ mph
20 mph	22 mph	23+ mph
25 mph	28 mph	29+ mph
30 mph	33 mph	34+ mph
35 mph	38 mph	39+ mph
40 mph	43 mph	44+ mph
45 mph	48 mph	49+ mph

## TEST 205: ROADWAY WORKER PROTECTION COMPLIANCE FOR TRAIN OPERATORS AND ROADWAY WORKERS

This test is designed to determine that Train Operators comply with the requirements regarding approach and interaction with roadway workers who may be on or near the track. This test may also be used to determine that roadway workers are properly interacting with approaching trains.

### APPLICABLE RULES

R2009 (horn signals)

R2021 (hand signal to STOP)

R2022 (hand signal to Reduce Speed)

R2023 (hand signal to Proceed)

R3160 Work Zones/Display of Signs

R3020 Passing Work Crews/Maintenance Vehicles on Tracks

R3021 (Operators must pass workers on ROW at Restricted Speed)

### PREPARATION

This test may be performed anywhere it is observed that trains are approaching roadway workers on or near the track. It may be performed where crews are working within an established Temporary Work Zone or Temporary Restricted Zone (Line 5).

Supervisors may simulate roadway workers by wearing prescribed vests and hardhats to test for the audible warning required by train crews.

Supervisors may place work zone or speed restriction signage not specified on the Track Warrant to verify operator compliance with the instructions for a train encountering a Temporary Sign in an unexpected location (R2114, R2115, R2116, R2117, and R2118). When the Train Operator radios the RCC to report the signage the RCC will state “This was a compliance test, you have permission to pass the work zone sign (if displayed) and continue at restricted speed to (the next station, next signal or dark territory – whichever is applicable).

### PROCEDURE

Based upon the activity being observed, verify that the applicable rules are being applied by Train Operators to notify, protect and / or comply with valid instructions of roadway workers.

When prompted to enter a Rule Number, enter the appropriate rule number based on your testing situation.

## FAILURE DEFINED

Train Operators fail this test when:

- Failure to receive signals from employees on the ROW and acknowledge same via appropriate horn signal -OR-
- Failure to request hand signals via appropriate horn signal if not received from these employees.
- Failure to pass workers within the ROW at restricted speed.
- Failure to stop short of a Temporary Work Zone displaying signs.
- Failure to properly contact Movement Coordinator or follow the prescribed instructions.
- Failure to reduce speed and contact the RCC in accordance with R2110 – Temporary Signs Chart Instructions for encountering a Temporary Sign in an unexpected location.
- Failure to stop the train within 600' (distance must be confirmed by Field Supervisor) or otherwise comply with Temporary Work Zone / Display of Signs instructions for a train encountering a Temporary Sign in an unexpected location.

Document speed failures separately as a 204 test

Supervisors or systems employees fail this tests when:

- Failure to properly place (or remove) signs for a Temporary Work Zone or Temporary Restricted Zone.
- Failure to properly give authority for movement through a Temporary Work Zone.

## TEST 206: MALFUNCTIONING GRADE CROSSING PROTECTION (LINE 1)

### APPLICABLE RULE

#### R2243 Procedure for Malfunctioning Grade Crossings:

**IF ...**

**THEN ...**

No flagger present

The Train Operator must:

1. Stop the train before occupying the grade crossing and await the first safe opportunity to proceed.
2. Sound two short blasts of high horn prior to moving, regardless of any horn prohibition, and ring bell continuously through the entire crossing.
3. Operate at Restricted Speed until the head-end of the train completely occupies the crossing.
4. After the head-end has cleared the crossing, then the Train Operator may proceed at normal speed.

Flagger Present

Upon receiving a hand signal the Train Operator must:

1. Sound two short blasts of high horn prior to crossing, regardless of any horn prohibition, and ring bell continuously the entire crossing.
2. Operate at Restricted Speed until the head-end of the train completely occupies the crossing.
3. After the head-end has cleared the crossing, then the Train Operator may proceed at normal speed.

## TESTING PROCESS

Call the RCC and have them place a line 1 restriction on the Track Warrant.

## PROCEDURE

Observe trains approaching the out of service grade crossing for compliance with HSSI 1000.00.

Operations Manager may use this test to test responding supervisor and RCC.

## FAILURE DEFINED

- If there is no flagger and the train fails to comply with the restrictions listed.
- If there is a flagger and the train fails to comply with the restrictions listed.
- Any failure to use the horn.
- Failure to properly issue or repeat the line 1 restriction will be recorded as a test 105 failure.

## TEST 207: GRADE CROSSING INDICATOR TESTING

The Grade Crossing Indicator Test determines if a Train Operator is in compliance with the procedure established for a solid Grade Crossing Indicator at a grade crossing.

## APPLICABLE RULES

- R2260 Grade Crossing Indicators Aspect Chart
- R2261 Grade Crossing Indicator Dark
- R2262 Grade Crossing Indicator Solid Lunar
- R2263 Grade Crossing Indicator Flashing Lunar

When approaching a grade crossing with a Grade Crossing Indicator it will function as follows:

A solid Grade Crossing Indicator will turn on indicating that the crossing arms are in motion. Once the system verifies all gate arms are in the down position, the Grade Crossing Indicator will begin to flash. If the system is not able to determine that all the gate arms are down it will stay solid.

**A flashing Grade Crossing Indicator:** proceed at normal track speed.

**Grade Crossing Indicator Solid Lunar:** If the Grade Crossing Indicator is solid when passing the decision point marker, make a braking application; observe the crossing for a broken gate arm, a gate arm stuck in the OCS or vehicle underneath the grade crossing arm. If something is observed in the crossing, apply emergency brake. Contact the RCC stating the condition of the crossing. If nothing is observed proceed through the crossing at Restricted Speed and resume track speed once the front of the train is through the crossing.

**Grade Crossing Indicator Dark:** If the Grade Crossing Indicator is dark when passing the decision point marker, make a braking application; observe the crossing for a broken gate arm, a gate arm stuck in the OCS or vehicle underneath the grade crossing arm. If something is observed in the crossing, apply emergency brake. Contact the RCC stating the condition of the crossing. If nothing is observed proceed through the crossing at Restricted Speed and resume track speed once the front of the train is through the crossing.

## PREPARATION/CONDITIONS

- Permission to perform this test must be granted by the Operations Manager or Assistant Manager(s) prior to testing.
- Contact the RCC advising them of your plans prior to setting up the test.
- Testing Managers must be assisted by a Signal Supervisor/Manager.

## PROCEDURE

Signal Supervisor/Manager will disable the “flashing lunar indication” at the test location, allowing “only” a solid lunar indication to be visible to the Train Operator(s) being tested.

## FAILURE DEFINED

This test is a failure if the Train Operator fails to follow R2260.

- Fails to make braking application.
- Fails to contact the RCC stating the condition of the crossing.
- Fails to proceed through the grade crossing at “restricted speed” and resume track speed once the front of the train is through the crossing.

## TEST 208: SIGNAL - UPGRADE

The Signal Upgrade Test determines if a Train Operator is in compliance with the procedure established to upgrade a Rail Signal to the most permissive aspect.

## APPLICABLE RULES

- R2131 – Wayside signal aspects apply –
- R2138 – A train must **STOP** before –
- R2139 – To pass a signal indicating **STOP**, verbal authority –
- R2201 – **STOP**
- R2202 – Approach
- R2203 – Approach Diverging
- R2204 – Clear
- R2205 – Diverging Clear
- R2206 – Diverging Approach
- R2207 – Diverging Restricting

## PREPARATION/CONDITIONS

- RCC places applicable Interlocking into RCC control, before the Operator/train being tested occupies the preceding stations TWC loop.
- Wait for the Operator/train to depart said station, and return applicable Interlocking to AUTO control.

## PROCEDURE

As Operator/train being tested occupies applicable TWC loop of station involved in Signal – Upgrade testing, Testing Manager allows Train Operator adequate time while stopped to press enter to self upgrade involved signal.

## FAILURE DEFINED

The test is a failure when:

- The Train Operator fails to stop their train short of a Stop Signal or proceeds without authority.
- Fails to promptly notify the RCC.

## TEST 209: LRV PRE-TRIP PROCEDURE

The LRV Pre-Trip Procedure Test determines if a Train Operator is in complete compliance with R4001.

## APPLICABLE RULES

R4001 – Prior to entering revenue service, Operators must perform a pre-trip inspection in accordance with established procedures.

## PREPARATION/CONDITIONS

The supervisor conducting the Pre-Trip Procedure Compliance Test will position themselves in the LRV storage facility prior to the Train Operators arrival and will observe the Train Operator performing the following procedure.

- Establish which end of train is going North and South
- Set up trailing cab first (see train cab set-up)
- If 3 LRV, set up middle northern LRV cab to go North
- Place defect slips in each operating cab
- Make sure all operator cab doors are locked

Train cab set-up:

- Key up
- Set Enunciator
- Enter block and route number
- Radio check
- Scan seals on safety bypass switches
- Press dash light test button (also check lights under Ins. seat)

- Horn and bell test
- Scan Train Operator Display (TOD) for faults
- Test “dead man”
- Set mirrors and seat
- Perform a running brake test
- Pull up and occupy door, call RCC for directions

## PROCEDURE

Field Supervisor will monitor the Train Operator conducting the Pre-Trip Procedure. This should be done in such a way that the Train Operator is unaware they are being tested.

## FAILURE DEFINED

The test is a failure when:

- The Train Operator fails to perform all checks as indicated above.

## TEST 301: EMERGENCY EVENTS

Verify that RCC Supervisor gathers pertinent information, secures the affected area of railroad and makes notifications.

## APPLICABLE RULES

Operations Emergency Management Plan (OEMP) current version.  
Rail Accident /Incident Investigation Plan current version.  
LRT Emergency Action and Spill Plan current version.

## TESTING PROCESS

Test 301 will only be performed by an Operations Manager or Safety Staff and will use one of the three procedures below.

## PROCEDURE

Chose one of the following:

- Approach the RCC Supervisor in person and inform the RCC Supervisor that for test purposes you are reporting a train that is involved in an emergency event (derailment, fatality at a grade crossing, passenger or employee fatality - or serious injury to one or more passengers or employees requiring hospitalization, an evacuation of a passenger train, or a security situation e.g., a bomb threat).
- Call in to the grade crossing hotline and state that for test purposes you are reporting a malfunction or accident as above.
- Contact the RCC via Etel and inform the dispatcher that you are portraying an injured or ill passenger in need of assistance.

Observe that the RCC Supervisor responds by:

1. Ascertaining pertinent information:
  - What emergency response equipment is needed?
  - Are any other tracks blocked?
  - Is the LRV derailed?
  - Is the OCS compromised?
  - What other threats exist, if any?
2. Secures the area of the emergency from other train movements that could cause unnecessary interference and danger.
3. Explaining or demonstrating the process by which they will notify the correct emergency response agency and required Managerial personnel.

### **FAILURE DEFINED**

This test is a failure if the RCC Supervisor does not ascertain pertinent information, secure the affected area and define the notification process.

Calls made to the Grade Crossing Hotline shall not be answered by the RCC, but allowed to go to “voicemail” and retrieved immediately afterwards. This procedure will avoid any unnecessary customer interactions, and will retain for future reference the incoming calls phone number. Next, the RCC will place the appropriate Track Warrant restrictions, and dispatch the Signal Department to investigate the reported issue.

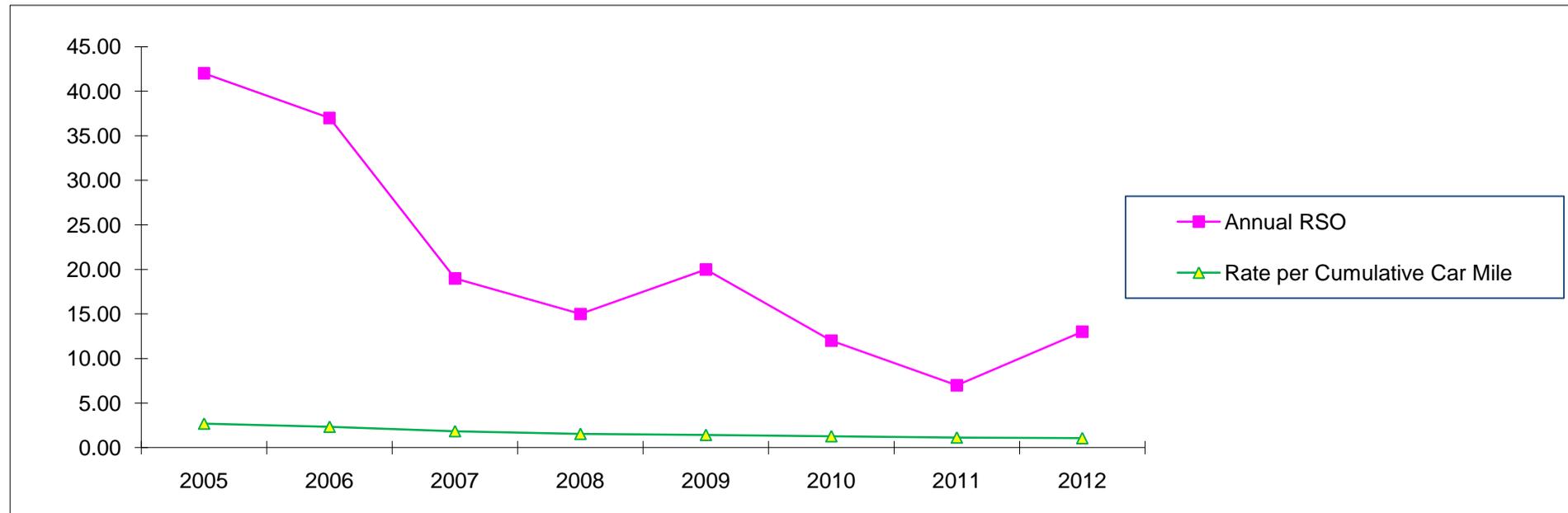
APPENDIX B

Metro Transit LRT

Safety Stats: Red Signal Overruns (RSO) per 100,000 Car Miles

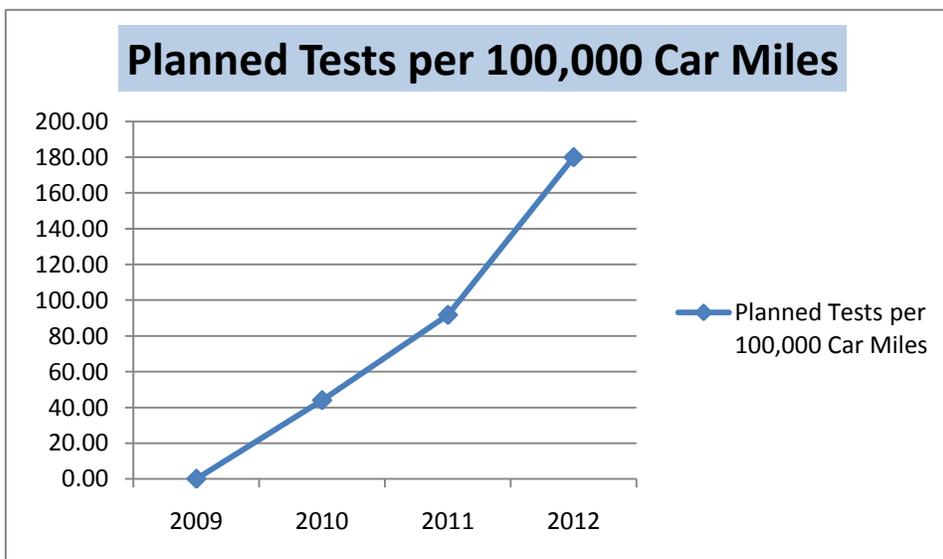
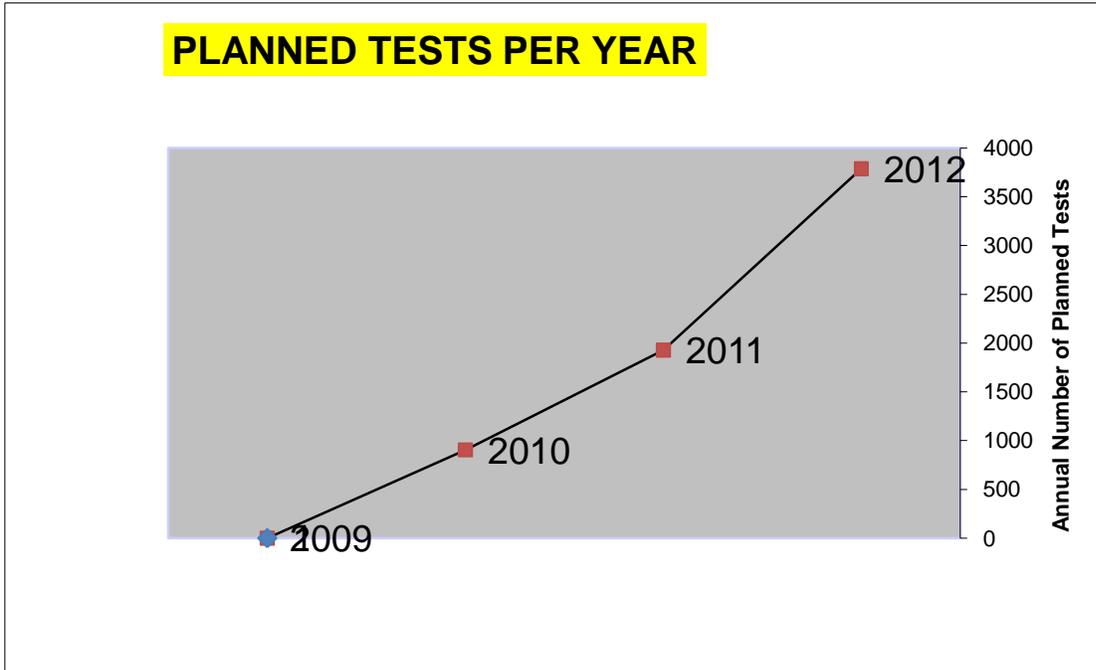
YEAR	ANNUAL		CUMULATIVE		CUMULATIVE
	CAR MILES	ANNUAL RSO	CAR MILES	RSO	RSO / 100,000 VEH. MILES
2005	1,565,393	42	1,565,393	42	2.6830
2006	1,817,934	37	3,383,327	79	2.3350
2007	1,935,024	19	5,318,351	98	1.8427
2008	2,025,269	15	7,343,620	113	1.5388
2009	1,987,773	20	9,331,393	133	1.4253
2010	2,056,261	12	11,387,654	145	1.2733
2011	2,101,289	7	13,488,943	152	1.1268
2012	2,103,215	13	15,592,158	165	1.0582

	2005	2006	2007	2008	2009	2010	2011	2012
Annual RSO	42.00	37.00	19.00	15.00	20.00	12.00	7.00	13.00
Rate per Cumulative Car Mile	2.68	2.34	1.84	1.54	1.43	1.27	1.13	1.06



Appendix C  
 Metro Transit LRT Planned Tests Per Year

YEAR	ANNUAL CAR MILES	ANNUAL PLANNED TESTS CONDUCTED	ANNUAL PLANNED TESTS PER 100,000 CAR MILES	ANNUAL OBSERVATION TESTS CONDUCTED	ANNUAL OBSERVATION TESTS PER 100,000 CAR MILES
2009	1,987,773	0	0.00	18133	912.23
2010	2,056,261	905	44.01	16717	812.98
2011	2,101,289	1928	91.75	16885	803.55
2012	2,103,215	3787	180.06	19928	947.50



APPENDIX D  
 Metro Transit LRT  
 Safety Stats: PLANNED TESTS VS OBSERVATIONS

YEAR	ANNUAL PLANNED TESTS CONDUCTED	ANNUAL PLANNED TESTS - PASS	PASS AS % OF ANNUAL PLANNED TESTS	ANNUAL PLANNED TESTS - FAILURES	FAILURES AS % OF ANNUAL PLANNED TESTS	ANNUAL OBSERVATION TESTS CONDUCTED	ANNUAL OBSERVATION TESTS - PASS	PASS AS % OF ANNUAL OBSERVATION TESTS	ANNUAL OBSERVATION TESTS - FAILURES	FAILURES AS % OF ANNUAL OBSERVATION TESTS
2009	0	0	0.00	0	0.00	18133	17,982	0.99	151	0.01
2010	905	862	0.95	43	0.05	16717	16,562	0.99	155	0.01
2011	1928	1891	0.98	37	0.02	16885	16,721	0.99	164	0.01
2012	3787	3754	0.99	33	0.01	19928	19,789	0.99	139	0.01

