

Current Practices of Rail Vehicle Technician Training and Measures of Competency – Summary of Transportation Learning Center Survey Findings

I. Research Methodology and Survey Responses

In August 2008, the Transportation Learning Center (TLC or “the Center”) designed and conducted a comprehensive survey on the transit rail car mechanic population and their current training and certification practices based on recommendations from the TCRP E-7 panel. The Center reached out to transit rail agency managers as well as their union counterparts to complete the online survey. The survey was piloted at four rail locations before being distributed to all 29 rail agencies across the country¹. At the September 29th Rail Car Training Standards Committee meeting in New York City, the committee members strongly recommended that the Center expand the section on current training practices in the survey questionnaire. Subsequently, a follow-up questionnaire was emailed to those who have already responded and an updated online survey to those who have not.

By the end of December 2008, the Center received responses representing 20 out of the 29 rail agencies, from the management and/or union sides. These agencies employ roughly 86 percent of the transit rail maintenance employees at all rail agencies in the US. See table 1 below for details.

Table 1: Details of Survey Responses

# of Rail Systems Included in TLC Survey	# of Completed Responses to TLC Survey	% of Rail Systems Represented in the TLC Survey	# of Rail Car Maintenance Employees Reported in TLC Survey	# of Estimated Total Rail Car Maint. Employees from 2006 National Transit Database (NTD) Represented in TLC Survey²	% of Employees Represented in TLC Survey Responses
29	20	69%	7846	9,156	86%

¹ Rail agencies with less than ten maintenance employees and no existing contact with the Center are not included in the survey. Five agencies are in this category. In addition, the Center was not able to locate contact information for either the union or management for seven rail agencies, despite its best effort to reach out. These agencies are also excluded.

² The 9,156 employee count comes from the Estimated # for all Rail Systems table on page 3 of the Appendix.

Chart 1: Percentage of Respondents from Agencies & Unions

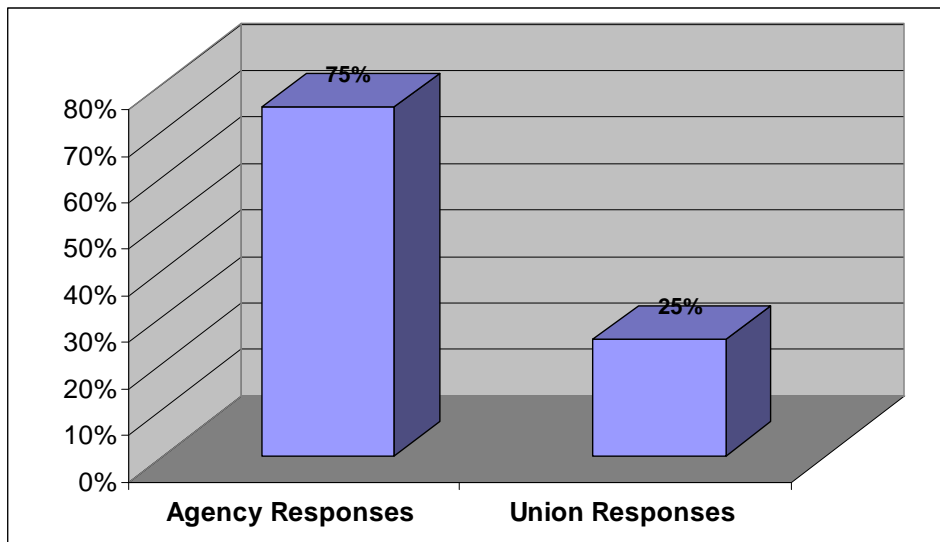


Chart 2: Size of Rail Systems Surveyed

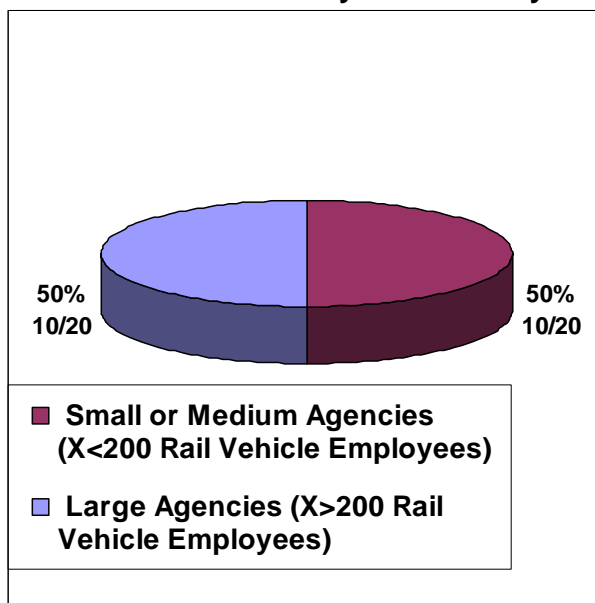
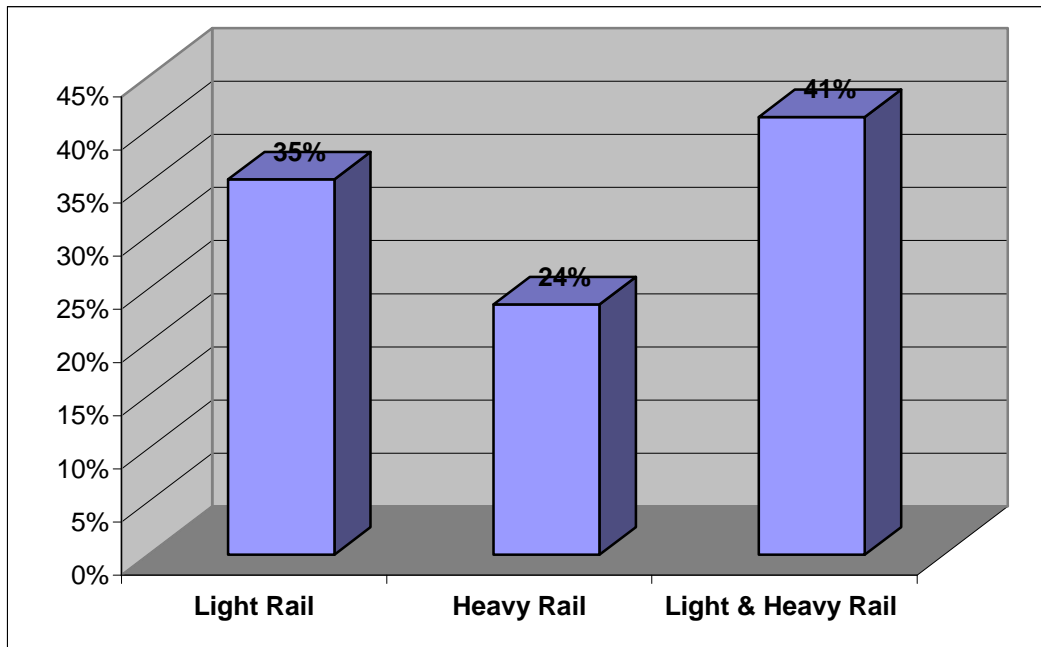


Chart 3: Type of Rail System Represented in Survey



II. Estimated rail mechanic population

One of the tasks under the E-7 feasibility study is to analyze the number of rail mechanics likely to participate in the potential national certification program each year. Due to the limitations of existing National Transit Database (NTD) transit employee counts, the survey was designed to collect the exact number of transit rail technicians and maintenance support employees. The chart on the left below shows the number of rail maintenance employees by job types (vehicle mechanics, helpers, cleaners and apprentices) at the respondent agencies. The chart on the right estimates the number of technical rail maintenance employees in the entire transit industry at around 9,156, with 6,280 in the more skilled mechanic ranks.

Survey Responses by Jobs

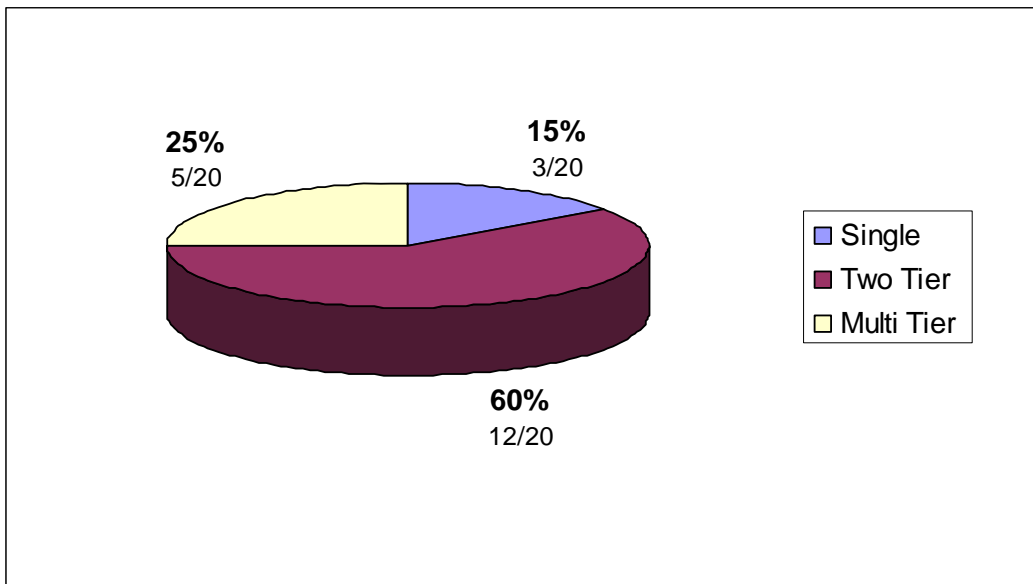
# of Rail Vehicle Mechanic (A)	5,381
# of Helpers	202
# of Cleaners	1,763
# of Apprentices	500
Total # (B)	7,846
Rail Car Maint. Employee # from NTD Data for TLC Surveyed Systems (C)	9,692

Estimated # for all US Rail Systems

% of Mechanics, Helpers, Cleaners, & Apprentices found in TLC survey compared to NTD's Total Rail Vehicle Maintenance Employee Figure (D = B/C)	81%
Rail Vehicle Maintenance Employees from NTD for all US Systems (E)	11,310
Estimated Total Mechanics, Helpers, Cleaners & Apprentices for All US systems (=D*E)	9,156
% of Mechanics in all Rail Maintenance. Employees for TLC Surveyed Systems (F = A/C)	56%
Estimated Total Mechanics for All US systems (= E*F)	6,280

It is interesting to note the three types of job classification systems for the transit rail maintenance employees. Sixty percent of the surveyed agencies utilize a “two tier” system where technical employees are categorized into two classifications such as Apprentice and Journeyman, Technicians and Leaders or Technicians and Mechanics. Twenty-five percent have multiple tiers or career ladders, an example being Apprentice, 3rd class, 2nd class, 1st class, and Specialist. The remaining 15 percent have only a single classification, such as Rail Vehicle Repairer. They “handle all aspects of vehicle repair from the ‘rail to the roof,’” according to a training manager.

Chart 4: Job Classification Systems for U.S. Transit Rail Maintenance Employees



All surveyed agencies believe **that there will be an increase in the demand to hire mechanics** due to rail system expansion and the retirement of the baby boomer population. An estimated **19 percent** of rail mechanics will retire in the next 5 years.

Eighty-one percent of the agencies currently contract out some rail maintenance work, including component repair, overhaul and cleaning, among others.

III. Current Practices of Rail Vehicle Technician Training

Ninety-three percent of surveyed agencies currently have programs to train rail technicians. Forty-Seven percent of those agencies extend training eligibility to helpers and cleaners. Nearly all training is done on company time. The following table gives details on the number of training opportunities, classes and hours offered to mechanics as well as training budgets. For large systems with more than 200 rail maintenance employees, 10 hours of training is provided to each worker on an annual basis. This can be translated into less than ½ of one percent of payroll, which confirms the Center's earlier finding on transit workforce development investment through TRB studies. For smaller agencies, the amount of existing training is even more lacking, with 4 hours provided to each employee annually, or less than 1/5 of one percent of payroll. However, when examining the actual budget for trainer wages, training materials and trainee wages, smaller agencies are performing significantly better at a total of \$5,063 per employee per year versus \$831 at large agencies.

Table 2: Details of Training*

	Average Training Courses Provided Each Year (# per year)	Average Hours of training provided each year? (# hours per year)	Average Training opportunities (seats) offered per year	Average Annual Budget For Trainers and Materials (A)	Average Annual Budget For Trainee Wages (B)	Average Total Annual Budget for Training (A+B)
Large Rail Systems	23	8,618	280	\$556,400	\$156,960	\$713,360
Small/Medium rail Systems	6	283	88	\$112,875	\$283,273	\$396,148
Per Worker						
Large Rail Systems		10	0.3	\$648	\$183	\$831
Small/Medium rail Systems		4	1.1	\$1,443	\$3,621	\$5,063

*Large Rail Systems had over 200 rail vehicle maintenance employees. Systems with less than 200 rail vehicle maintenance employees are considered small/medium in size.

The most commonly used methods to determine training needs are new equipment procurement, manager/supervisor request, worker request, analysis of maintenance records, manager training needs survey and worker needs survey (by the ranking of responses; see charts 5 and 6 on the following page).

Once the training needs are identified, agencies provide in-house training through their internal training departments (94 percent), OEM/supplier training as part of a fleet

procurement (69 percent), peer-to-peer training/mentoring (57 percent) and OEM/supplier refresher training (50 percent). Forty percent of the agencies send their own trainers to learn instruction techniques. One third trains maintenance personnel to serve as mentors. Half of the agencies that have a mentoring program offer a pay premium to mentors, ranging from 25 cents to \$1.35 per hour. Agencies find mentoring, OEM refresher training, mentor training and in-house training the most effective. Only 23 percent of the agencies contract colleges and technical schools to provide training and they find this type of training the least effective.

Chart 5: How Training Needs are Determined

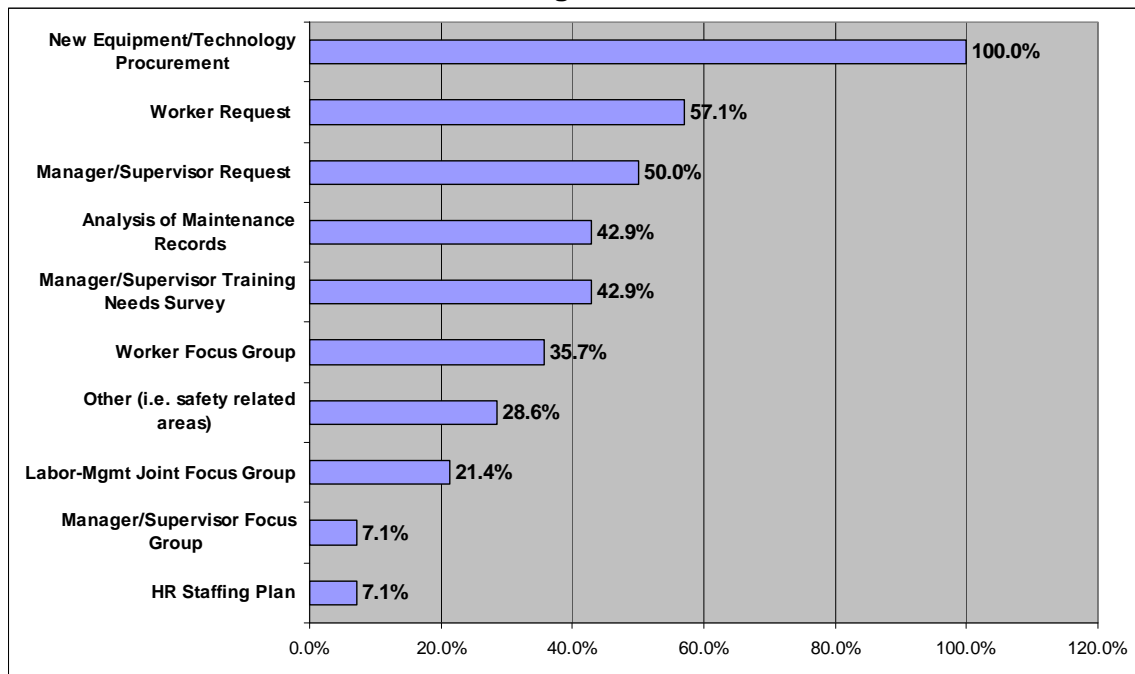


Chart 6: Percent of Rail Systems that Currently Offer these Types of Training

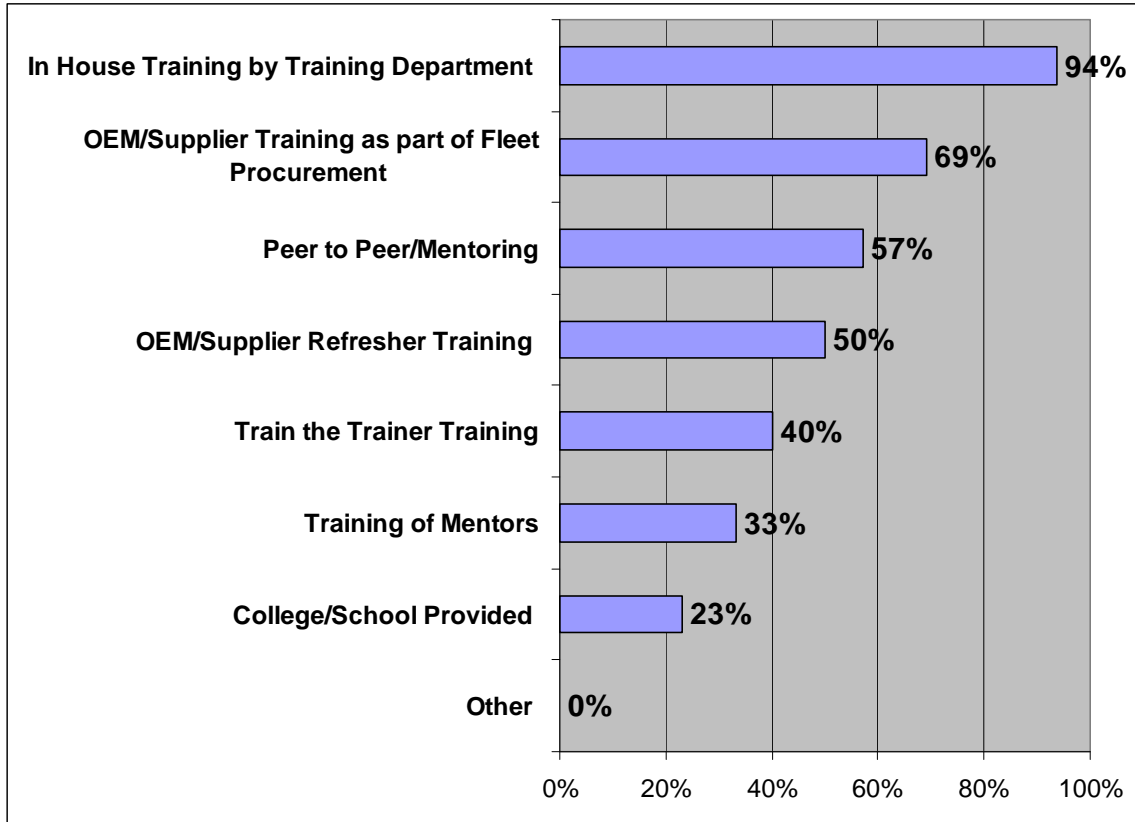
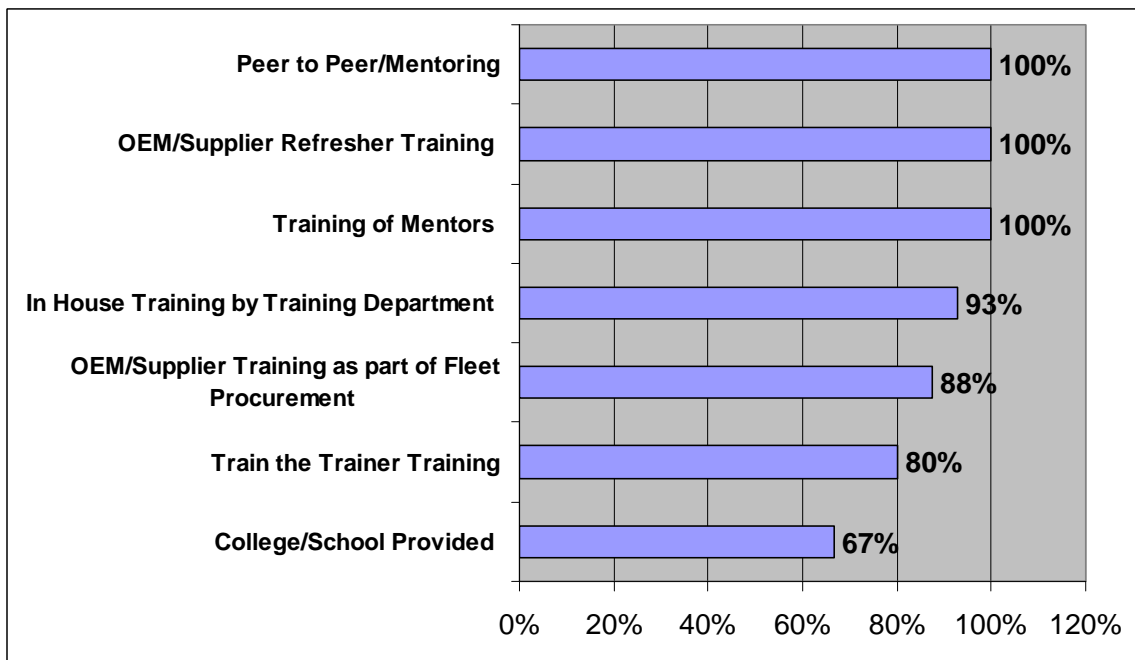


Chart 7: Percent of Rail Systems that Perceive these Types of Training as Effective



All respondent agencies deliver classroom training and hands-on training in a lab or on the shop floor. 92 percent also have On-the-Job training including mentoring programs.

These three are considered effective training delivery methods by all respondents. Eight out of ten agencies provide computer-based training. Seven out of ten have employee self-study programs using manuals and guides, which is ranked the least effective delivery method.

Chart 8: Percent of Rail Systems that use these Types of Delivery Methods

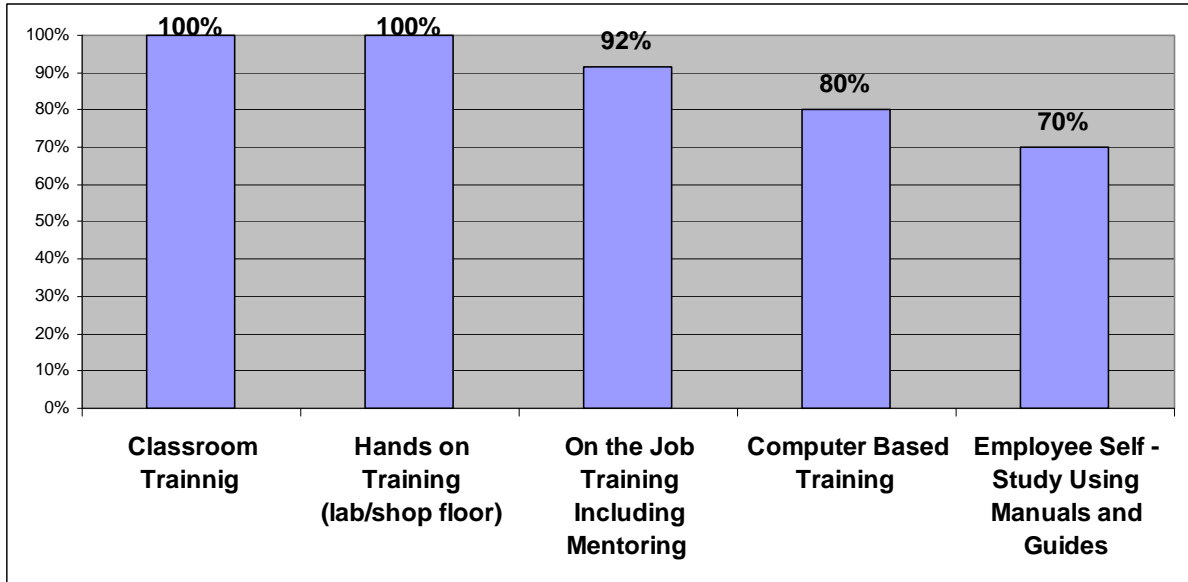
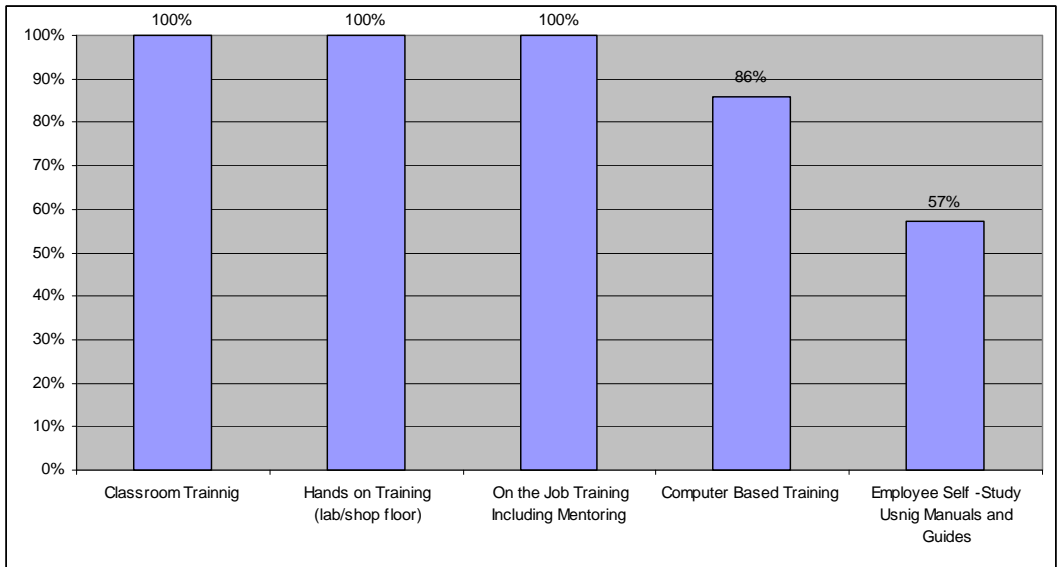
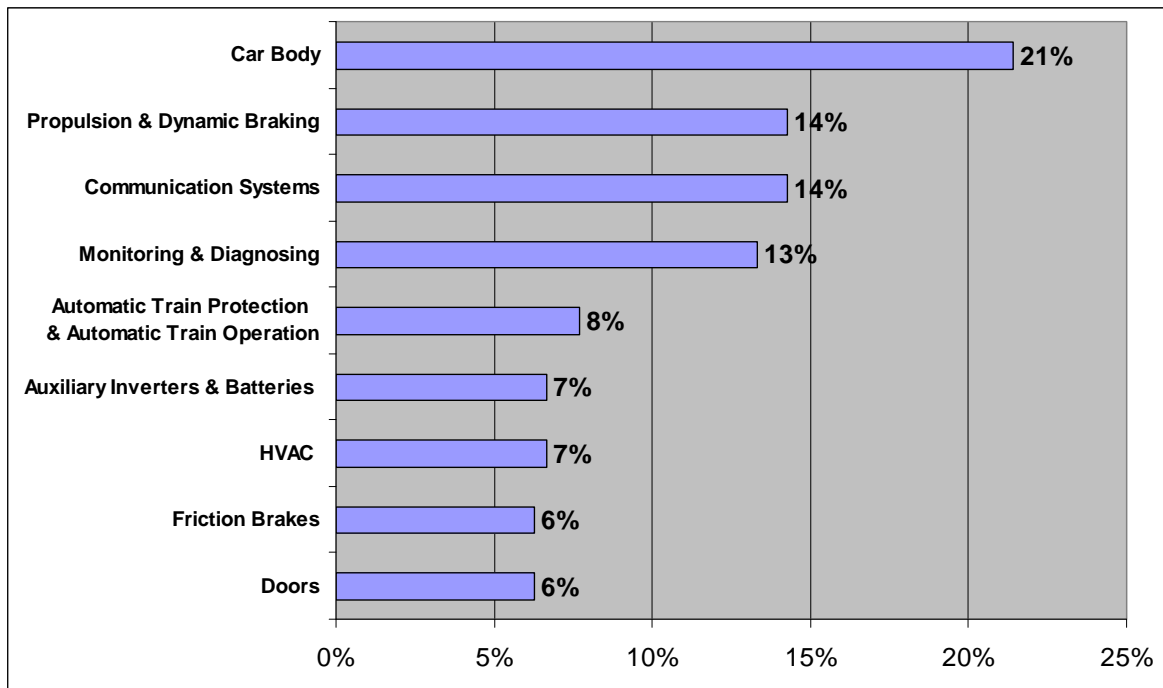


Chart 9: Percent of Rail Systems that Find these Types of Delivery Methods Effective



Respondents find the current training for car body repair the most problematic with propulsion and dynamic braking, communication systems, and monitoring and diagnosing also somewhat inadequate.

Chart 10: Percent of Rail Systems that Believe Training for these Skill Areas Are Inadequate



IV. Apprenticeship Programs

Forty percent of the agencies currently have a rail maintenance apprenticeship program. Eleven percent of agencies who responded had an apprenticeship program that was discontinued for reasons such as budget constraints. Of the agencies that have or had an apprenticeship programs, two are currently registered with the Department of Labor at the state level. Existing apprenticeship programs range anywhere from one to two and a half years long. Eighty-eight percent of the agencies perceive their apprenticeship programs as effective or somewhat effective. Agencies distinguished between categories of employees that could participate in apprenticeship programs as can be seen in Chart 12 below. Seven out of 13 agencies allow those outside of the distinguished categories to participate. Three out of 13 rail systems allow for all internal employees to participate in apprenticeship programs however precedence is given to those employees who have seniority. Two rail systems also allow for bus mechanics to participate in apprenticeship programs.

Chart 11: Percent of Agencies that had/have Apprenticeship Programs and the Length of Time for these Programs

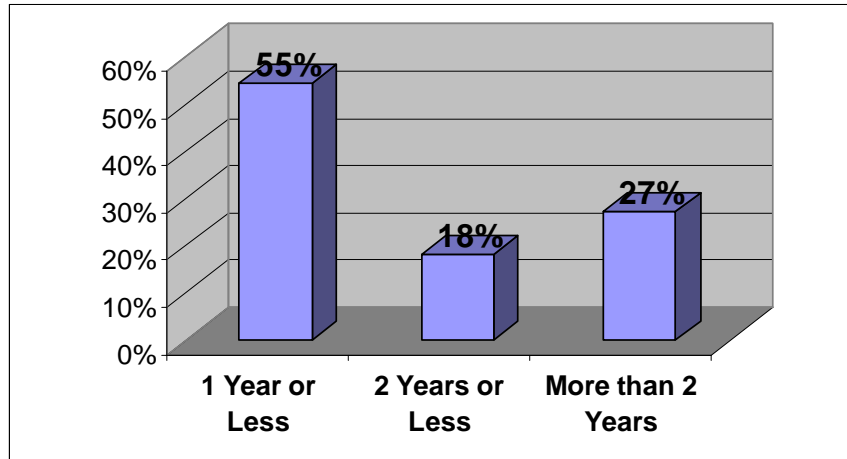
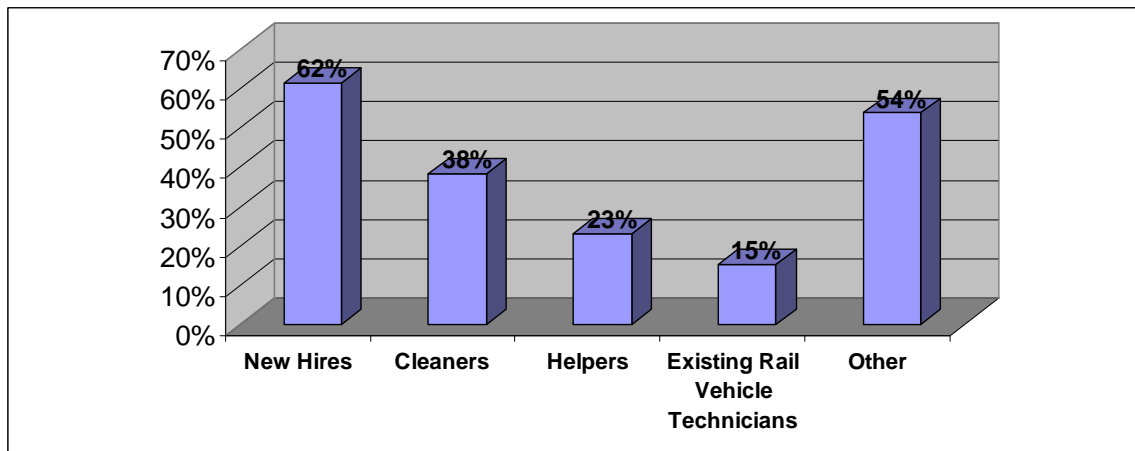


Chart 12: Percent of Agencies that allow New Hires, Cleaners, Helpers, and Existing Technicians to Participate in Apprenticeship Programs



V. Current Measures of Competency for Rail Technicians

The Center defined the term "Certification" for this study to include any type of formal process of ensuring that rail vehicle maintenance employees are qualified in terms of the particular knowledge or skill set necessary to transit rail vehicle maintenance.

When measuring rail technicians on their technical competency 75 percent of the surveyed agencies have an in-house certification program. However, due to the broad definition of "Certification" in the survey, some rail systems reported in-house certification systems that may not be in the traditional sense. For example one agency reported as "in-house certification" a job classification system where mechanics go through structured training and testing to qualify for promotion.

Of the rail systems that provide in-house certification 100 percent believe the program is effective. Sixty-seven percent train mechanics to pass the in-house certification and of those, 90 percent think that training is effective. When delivering the certification tests, computer-based testing is used less than paper-and-pencil based or hands-on demonstration of skills.

Less than half of the agencies surveyed have a recertification/requalification program. Of those who have it, all believe the program is effective. Sixty-nine percent of responding systems provide refresher or requalification training and of those 89 percent consider the training effective.

Chart 13: In-house Certification—Percent of Agencies that:

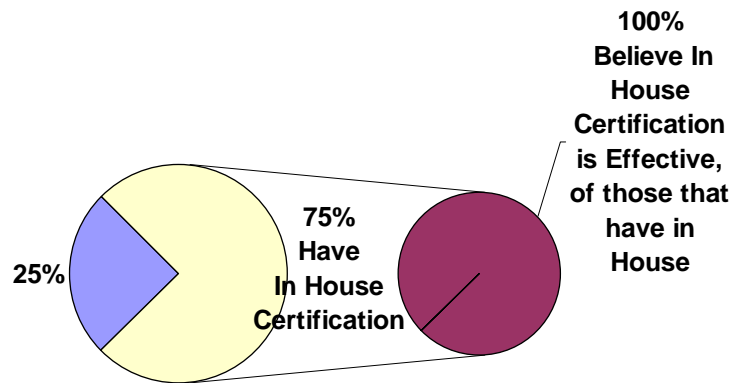


Chart 14: Training for In-house Certification—Percent of Agencies that:

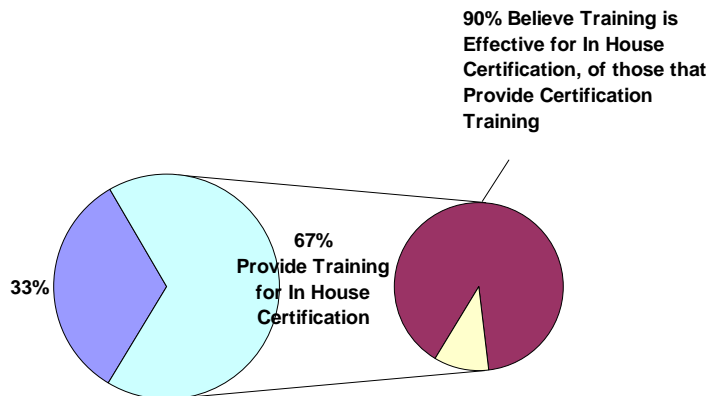


Chart 15: For In-house Certification—Percent of Agencies that Use:

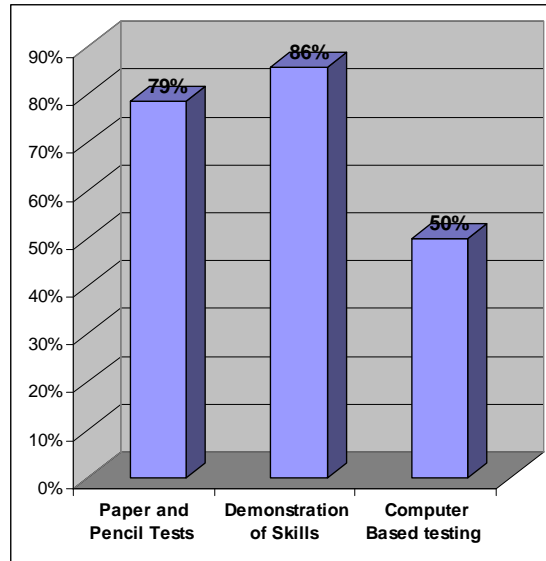


Chart 16: For In-House Certification—Of those that use the Method, Percent of Agencies that Believe the Method is Effective:

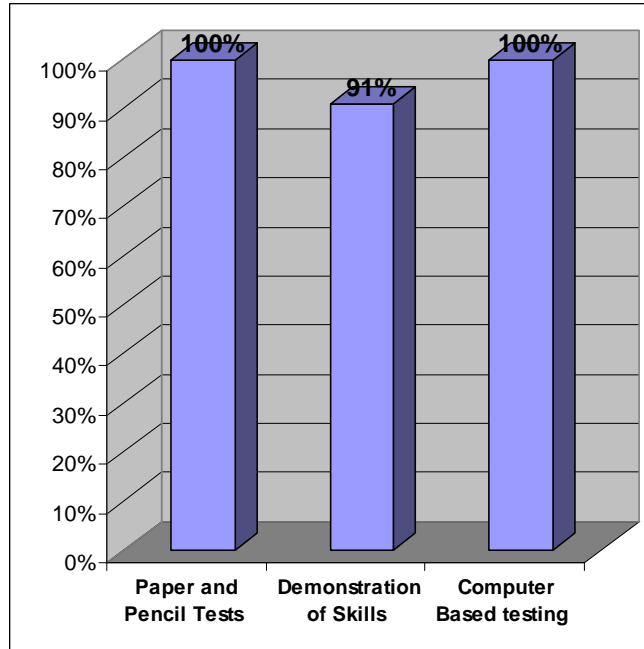


Chart 17: Recertification/Requalification—Percent of Agencies that:

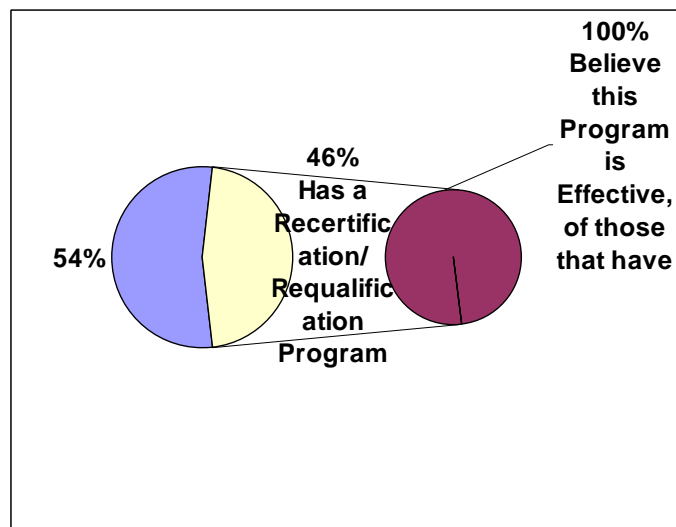
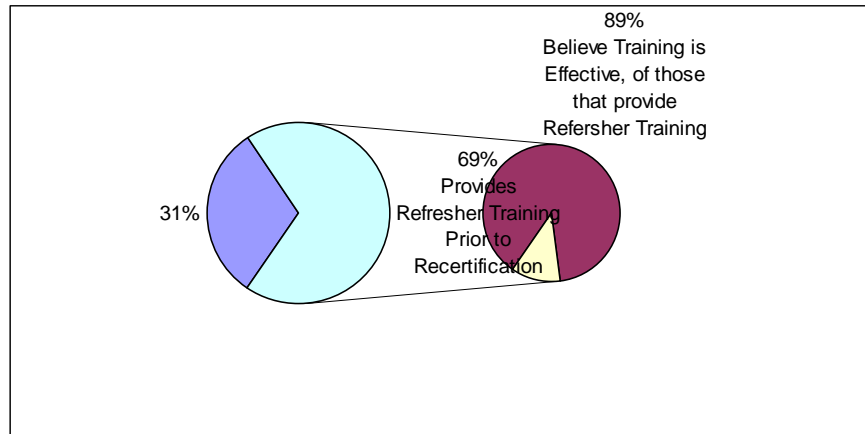


Chart 18: Training for Recertification/Requalification—Percent of Agencies that:



**Appendix A: Rail Vehicle Technician Training and
Measures of Competency Survey
Survey Respondents by Geographic Area**

Survey Respondents By Geographic Area

California	San Francisco Bay Area Rapid Transit District (BART)
California	Los Angeles County Metro, CA, (LACMTA)
California	Sacramento Regional Transit District (Sacramento RT)
California	San Francisco Municipal Railway (MUNI)
California	Santa Clara Valley Transportation Authority (VTA)
Colorado	Denver Regional Transportation District (RTD)
Florida	Miami Dad Transit (MDT)
Georgia	Metropolitan Atlanta Rapid Transit Authority
Illinois	Chicago Transit Authority (CTA)
Maryland	Maryland Transit Administration (MTA)
Massachusetts	Massachusetts Bay Transportation Authority (MBTA)
Minnesota	Metro Transit
New York	MTA New York City Transit (NYCT)
New Jersey	New Jersey Transit Corporation (NJ Transit)
Oregon	Tri County Metropolitan Transportation District of Oregon (TriMet)
Pennsylvania	Southeastern Pennsylvania Transportation Authority (SEPTA)
Pennsylvania	Port Authority of Allegheny County (Port Authority)
Texas	Dallas Area rapid Transit (DART)
Texas	Metropolitan Transit Authority of Harris County, Texas (Metro)
Utah	Utah Transit Authority (UTA)