

# Smart Investment Partnership

## New York State's Transit Workforce Training Proves its Worth



LOCAL 1321



LOCAL 580



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# Executive Summary

Forged in 2006, the Project Empire Transit Career Ladder Partnership is an innovative labor-management partnership focused on improving training for bus mechanics. It addresses the skill needs of members of Amalgamated Transit Union (ATU) Locals 1321 and 580 employed at the Capital District Transportation Authority (CDTA) and Central New York Regional Transportation Authority (CENTRO).

The Project Empire partnership is focused on alleviating the substantial skills shortage in transit. Transit's skills crisis is driven by pervasive technological advances, impending large-scale retirements of skilled workers, changing workforce demographics and the continuing expansion of transit systems and riders. To deal with these issues, transit agencies and their respective local unions have agreed on three major objectives for the partnership to address:

- Meeting the training needs of the incumbent maintenance workforce;
- Providing career ladder opportunities for incumbent technicians;
- Building capacity for maintenance training within agencies.

A policy steering committee of top union and management leadership agreed to a data-based decision-making process. This process included conducting a job task analysis, a workforce skills survey and an analysis of skill gaps through joint shop-floor working groups. The data was used to create a maintenance training curriculum that consists of four types of training: Basic Skills, Advanced and Specialized Skills, Train-the-Trainer and Career Ladder Promotional Training. During the first eleven months of the program, CDTA maintenance employees took advantage of more than 200 training opportunities through the Project Empire Transit Career Ladder Partnership. Average post-training test scores improved by 43 percent, indicating significant learning gains. At CENTRO, initial training has been offered at bus manufacturer locations and in-house training will begin in early 2009.

While the program is still in its early stages, an analysis of CDTA's vehicle maintenance performance data indicates significant gains including an 18 percent increase in Mean Distance Between Failures, 30 percent fewer bus defects, improvements in on-time Preventive Maintenance Inspections, reductions in bus spare ratios and the insourcing of previously outsourced maintenance work. Interviews of twenty front-line supervisors, managers, workers, union officials and project staff revealed the further significant benefits that come from a constructive training partnership, especially in improving labor-management relationships, boosting worker morale, increasing job satisfaction and establishing trust between supervisors and workers.

# Introduction

## The Transit Agencies and Unions Working Together

Participants in Project Empire include the Capital District Transit Authority (CDTA) and Local 1321 of the Amalgamated Transit Union (ATU) in Albany. CDTA serves Albany, Schenectady, Rensselaer and Saratoga Counties with a daily ridership of over 40,000 passengers and a maintenance workforce of 152 individuals. In Syracuse and the surrounding counties the participating transit agency is the Central New York Regional Transportation Authority (CENTRO) working with ATU Local 580. CENTRO is headquartered in Syracuse and serves Onondaga, Oswego, Cayuga and Oneida Counties with a daily ridership of approximately 41,000 passengers and a maintenance workforce of 133 individuals. In 2006, the American Public Transportation Association (APTA) named CENTRO the best midsize transit system in the United States.

## Labor-Management Relations

At CDTA, labor and management had a very strained relationship from 2003 through 2005. "It was definitely an 'us and them' mentality. We always felt a little on the lower rung," as one mechanic described the relationship. One hundred and forty-four grievances and four unfair labor charges were filed over a three month period. Finding common ground for the development of the training partnership was necessary but challenging. Thanks to conscious efforts from both parties, the relationship improved over time, laying the groundwork for developing a productive training partnership. Labor relations at CENTRO were very positive but they faced their own unique set of challenges. One union representative from Local 580 commented that the union was given some say, "The only stumbling block I see is that they include us in the decision-making process on a regular basis within this project."



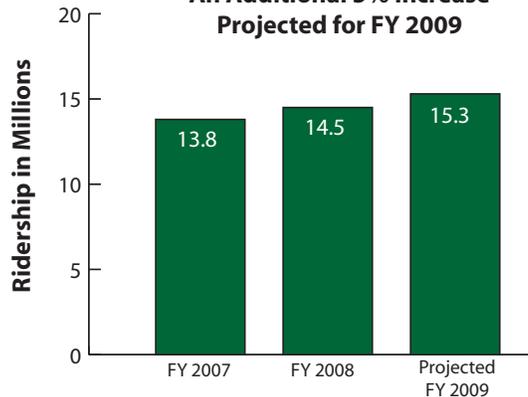
## Necessity of Partnership Training

Driven by high gas prices, the demand for public transit is greater now than it has ever been in recent decades. Both CDTA and CENTRO have

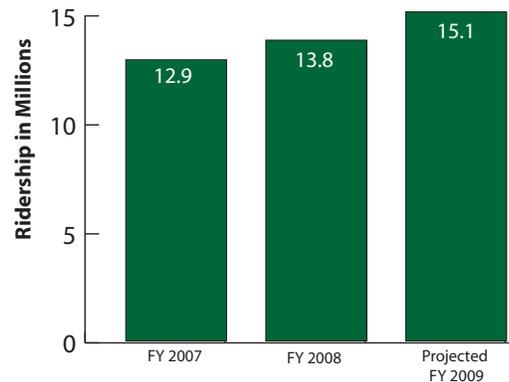
experienced increases in ridership over the past two years. With increased demand comes a greater need for functioning buses. [See charts to the right]. Maintenance workers, who keep the system running smoothly behind the scenes, must keep buses on the road and functioning efficiently. Without training, it is difficult for mechanics to properly assess and correct deficiencies.

The need for high quality mechanic training is further complicated by pervasive technological advances, changing workforce demographics and a general lack of existing training capacity at the transit agencies. Newer and more technologically advanced buses comprise portions of the fleets at both CDTA and CENTRO. These buses are equipped with sophisticated electronic systems designed to make transit more user friendly. [See figure 1.] Without quality training, workers are ill-equipped to repair and maintain these systems. A CDTA mechanic summed up the problem best, "We can't go out and tape things together and hit it with a wrench anymore....It is not 1960 anymore." Another person quoted in the Albany Times Union mentioned, "You really get hit over the head when you don't replace buses for 10 or 15 years and you get hit with 10 or 15 years of changes." Historically, the only training workers received was conducted by vendors who produce and sell the new equipment and this training was sporadic and ineffective.

**CENTRO Ridership Rose 5% From Fiscal Year 2007 to Fiscal Year 2008; An Additional 5% Increase Projected for FY 2009**



**CDTA Ridership Rose 7% From Fiscal Year 2007 to Fiscal Year 2008; An Additional 9% Increase Projected for FY 2009**



**Figure 1 Percentage of Buses with Advanced Electronic Equipment**

Equipment Type	CDTA 2002	CDTA 2008	CENTRO 2002	CENTRO 2008
Air-conditioning	89%	100%	66%	97%
Automated Stop Announcement Equipment	0%	100%	N/A	N/A
Automatic Passenger Counter	7%	N/A	0%	30%
Automatic Vehicle Location Equipment	89%	100%	0%	85%
Electronic Farebox	93%	100%	95%	100%
Electronic Destination Signs	89%	N/A	55%	98%
Operator/Base 2-way Radio	89%	100%	95%	100%
Public Address System	N/A	N/A	87%	100%
Security Camera	N/A	N/A	0%	90%

\*2002 Data from APTA Transit Vehicle Database; 2008 Data from CDTA and CENTRO.

The demographics of transit's workforce are changing and creating a skills shortage. "Retirement is a huge issue...within nine years CENTRO will lose an estimated 25 percent of its most experienced mechanics with [each having] 30 to 40 years experience," stated one CENTRO mechanic. This workforce must be replenished by well-trained individuals. Replenishing the workforce is a challenge by itself. According to APTA, the perception of transit jobs is that they are old-fashioned, slow-growing and the work is dull and difficult. In reality, transit is a fast-growing sector with jobs that require advanced technological skills.

A lack of in-house training means that the skills of mechanics are not kept up to par. An independent audit done in 2004 by a firm specializing in transit bus fleet maintenance noted "a remarkable dilution of the skill level, competency and productivity in the [CDTA] repair shop, resulting in deterioration of the fleet." Mechanics received virtually no training on much of the equipment they were assigned to fix, leading to poor bus service and a frustrated public that relies on public transportation.

## **Partnership Initiation and Development**

To help the agency overcome these challenges, in 2005, CDTA developed a five-year Strategic Business Plan for Maintenance Operations. One of the underlying objectives of the plan was to implement "clearly established systems ...in order to effectively train and promote qualified, technically proficient mechanics." The union has long recognized the need for training the workers it represents and urged management to adopt a training program that would include cooperation with college and vocational programs. By 2006, ATU and CDTA agreed on the need for a training program. Both labor and management soon realized that an Upstate New York regional training partnership could maximize the resources and training capacity of the transit agencies in the region, and CENTRO was brought into the partnership with CDTA. The Transportation Learning Center (the Center), a nonprofit organization that builds productive training partnerships in transit, was enlisted to assist in developing the partnership program. ATU successfully secured funding from the New York State legislature, which the agencies receive through the Workforce Development Institute.

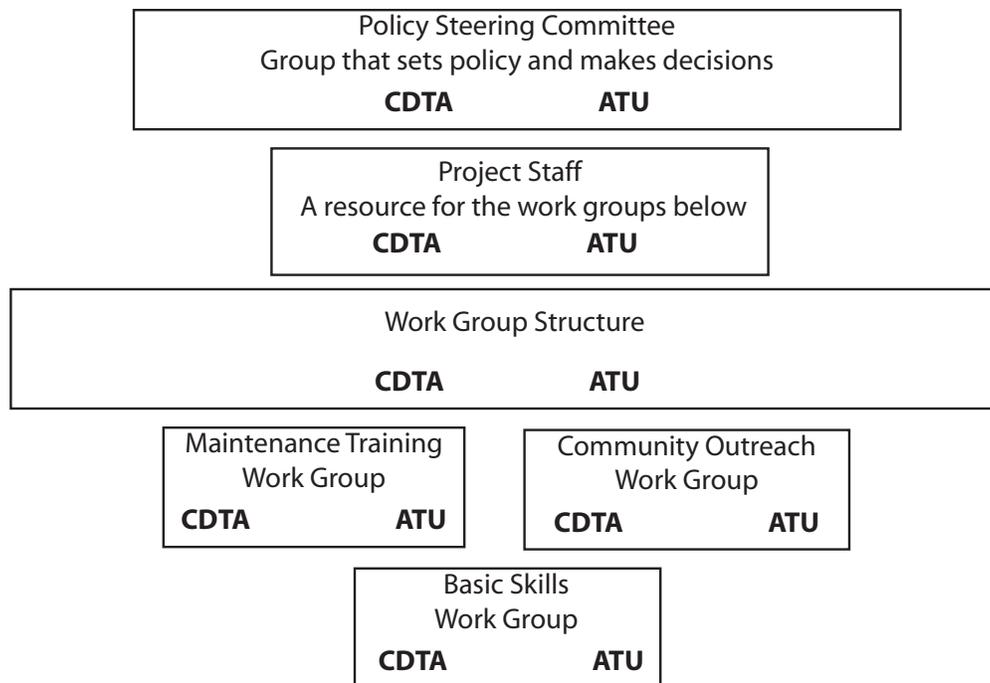
Both the employers and the local unions saw the benefit of creating a joint, cooperative partnership. A CDTA employee described the partnership building process as follows, "The team work aspect in pulling together in one unified effort to train employees, specifically mechanics, has given us something in common that we have been able to work together on." Creating the partnership required that the involved parties put aside differences unrelated to training. Essentially, training is where labor and management found a common ground. A mechanic at CDTA explained, "There was an agreement on both sides that anything that happened outside of Project Empire would not enter the room and would be left aside so we could concentrate solely on Project Empire and not have anything interfere with [it]."

Through initial policy steering committee meetings, CDTA with Local 1321 and CENTRO with Local 580 agreed on a decision-making structure based on equal representation of labor and management. [See Figure 2 on the following page.] The parties also agreed on a series of steps to move the partnership forward:

1. Determining the specific skills needed to do the various jobs in the transit system;
2. Assessing the actual job skills of maintenance personnel against the standards of those skill requirements, and developing surveys and focus groups to determine workers' and supervisors' attitudes toward training;
3. Creating a detailed skill gap analysis by comparing the skill requirements analysis with the assessed skills;
4. Developing curriculum to progressively close the gaps between needed skills and current skills;
5. Delivering training based on that curriculum on a pilot basis prior to further training delivery down the road.

Educational Data Systems Incorporated (EDSI) was brought in to assist with the job task analysis, skills assessment, gap analysis and development of curriculum.

**Figure 2 Sample Project Empire Organization Chart  
CDTA and ATU Local 1321**



To conduct the job task analysis, labor and management identify subject matter experts (SME) to be interviewed; these are knowledgeable and experienced maintenance workers. The workers are interviewed about their job tasks and how they go about their work. The next step is to develop a workforce skills survey based on the SME interviews. This survey is given to all mechanics and is designed to assess their skill levels or their ability to perform a given task. The survey uses a 0-4 scale, with 0 meaning “unaware of this type of work” and 4 meaning “able to instruct others in this type of work”.

This process enables the partnership to compare current maintenance worker knowledge, skills and abilities with the skills required to perform well on the job. The skills gap analysis highlights the skill areas in a particular maintenance occupation that need to be addressed. For example, multiplexing systems become a training need if a large percentage of mechanics rate their ability on multiplex systems at level two or below. Finally, a training plan is developed to address current skill gaps and lay the groundwork for a sustainable training program for maintenance workers at all skill levels.

The training program itself consists of several types of training. Basic skills training equips mechanics with the tools needed to move to the next stage of training, focusing on improving their computer, math and electrical skills. Advanced and specialized training relates to the individual’s area of expertise, which could fall under the following categories: types of vehicles and equipment; engines, cooling and fuel systems; electrical systems; body and paint; brakes and suspension; air systems; transmissions; heating and A/C; troubleshooting diagnostics among others.

Beyond basic skills and advanced technical training, the program also focuses on providing promotional training that allows lesser skilled mechanics to move into higher skilled jobs. To expand the Partnership's internal training capacity, Project Empire provides Train-the-Trainer classes to new staff and SMEs so the most qualified and motivated individuals have the opportunity to become in-house trainers.

To cultivate the next generation of public transportation technicians, the Partnership started outreach efforts to recruit workers from high schools and other community venues. Local 1321 and CDTA management have also engaged in discussions to initiate an apprenticeship program to develop future mechanics.

**Figure 3 Number of Classes Offered and Students Trained  
Project Empire Albany  
October 2007 -September 2008**

Type of Class	Number of Classes Offered	Number of Students
Advanced Electrical/MPX	1	5
Air/Air Brakes	2	14
Allison Hybrid Familiarization	3	49
Chevy 6.6 & Ford 6.0 Engine	1	11
Cummins Diagnostics	1	13
Cummins Familiarization	1	22
Electrical I	3	19
Engine Principles & Diagnostic	2	14
Heating, Ventilation & AC	1	7
Helper Promotional Training	1	3
Hydraulics	1	8
Preventive Maintenance	1	8
Second Class Promotional Training	4	20
Trans. Principles & Diagnostic	1	9
	<b>Total Number of Classes</b>	<b>Total Number of Students</b>
	<b>23</b>	<b>202</b>

## Training Results

Between October 2007 and September 2008, CDTA maintenance employees took advantage of more than 200 training opportunities through the Project Empire Transit Career Ladder Partnership. On average, that is at least one course for each of the 152 individuals in maintenance, from helpers to 1st class mechanics. Training classes developed in-house cover basic through advanced technical knowledge in a variety of subject areas such as engine, transmission, brakes and electrical. Promotional training for helpers and second class mechanics was included in the course offering to help these workers move up the career ladder. [See Figure 3 above for the name and number of classes offered and the number of students trained at Albany.] At CENTRO, initial training has been offered at engine manufacturer locations. Students also attended computer basics and Microsoft Excel classes. A new on-site training center will be available in early 2009 to provide in-house training to CENTRO employees.

# Impact of Training

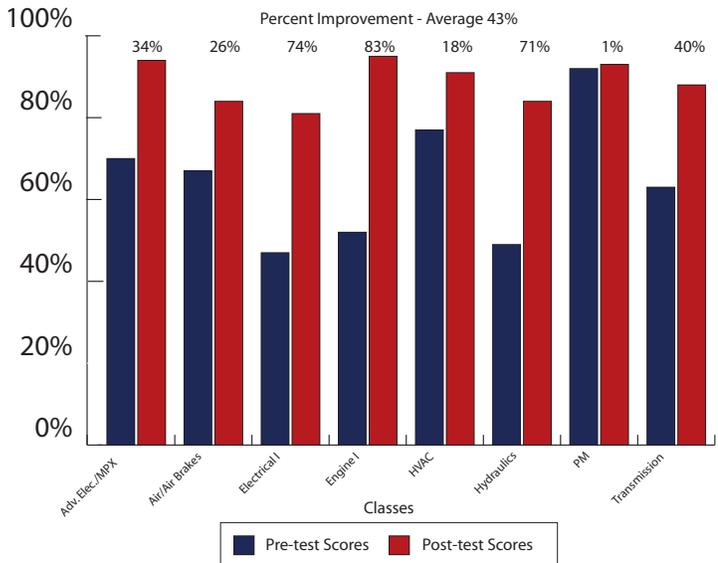
## A. Joint Training Improves Skills, Maintenance Efficiency and Reliability

Even at a fairly early stage of the program, the positive impact of the joint labor-management training has been demonstrated by a number of direct and indirect measures.

### • Improvements in Post-Training Test Results

Project Empire trainees are routinely tested on their subject knowledge at the beginning and end of a class, using the same test. The graph on the right shows the test score comparisons before and after training for all in-house courses provided at CDTA. Average test scores improved by 43 percent after training, indicating significant learning gains. In areas where employee pre-training knowledge was very limited such as electrical, engine and hydraulics, post-training scores improved by over 70 percent.

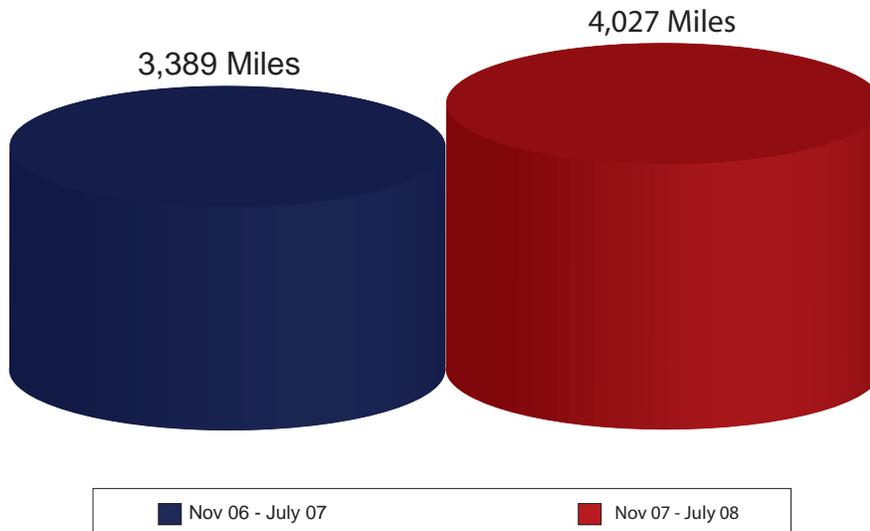
Project Empire Albany Pre-training and Post-training Test Results Indicate Significant Learning Gains



### • Improvement in Mean Distance Between Failures (MDBF)

The MDBF measures the number of miles a vehicle travels before breaking down. A higher MDBF indicates better vehicle reliability and longer stretches of uninterrupted service for transit customers. As a general rule, MDBF tends to deteriorate over time as the equipment ages. Without any addition of new fleet, CDTA improved its monthly average MDBF by 638 miles, or 18 percent, following the joint training program. [See graph below.]

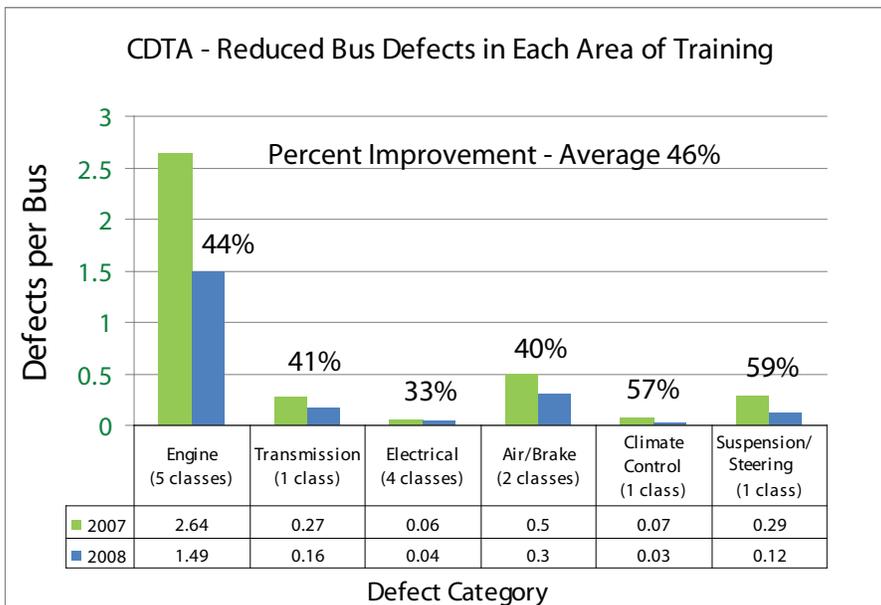
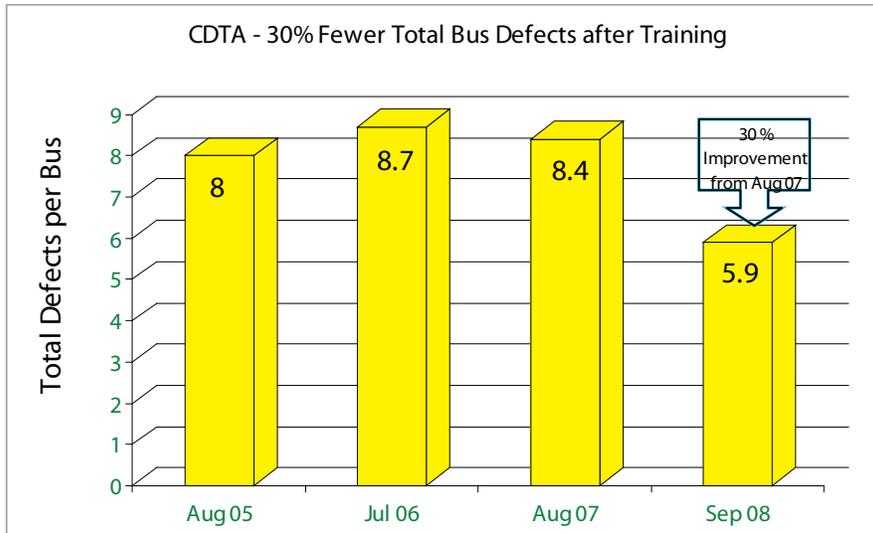
CDTA System-wide Monthly Average MDBF (Mean Distance Between Failures) Significantly Improves after Training



- **Fewer bus defects**

After initiating joint training, there was a decrease in the number of defects found in CDTA buses. According to the Vehicle Maintenance Audit report conducted by an independent auditor in September 2008, the 5.9

defects per bus for the year following training (2008) represent a 30 percent decrease when compared to the average of 8.4 defects in previous years (2005, 2006 and 2007). [See graph on the left]. This represents a 30 percent reduction in total defects. In areas where there is focused training, such as suspension and steering, defects per bus have dropped by as much as 59 percent. [See graph below for a breakdown by defect categories.]



- **Strengthened Preventive Maintenance Program**

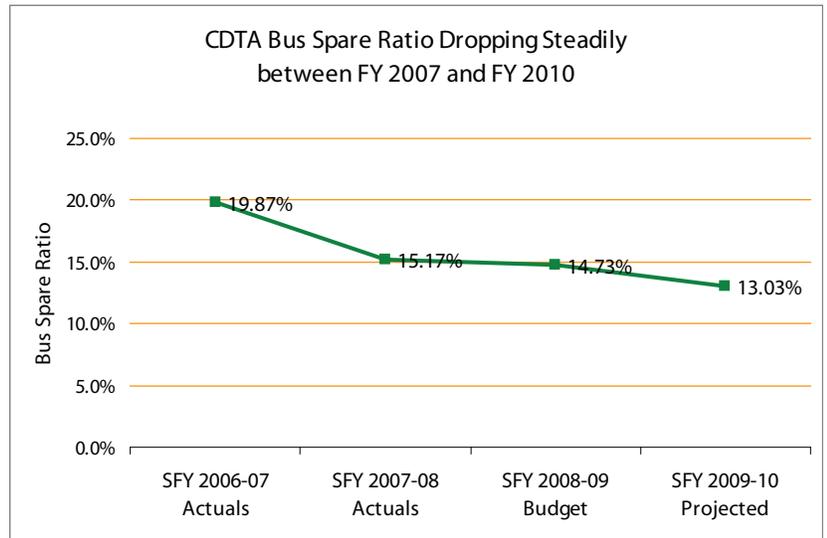
A transit maintenance department's ability to perform preventive maintenance inspections (PMI) on time is essential to preventing unscheduled failures and ensuring vehicle reliability. At CDTA, the need for PMI improvements has been evident for years. In 2003, after a state Public Transportation Safety Board examined a string of seemingly unrelated bus fires, the panel expressed concern about "serious safety issues" stemming from failures in preventive maintenance. The 2004 auditing report also concluded that "there was an absence of the

preventive maintenance program components required to ensure the availability of an adequate number of safe, clean, reliable buses."

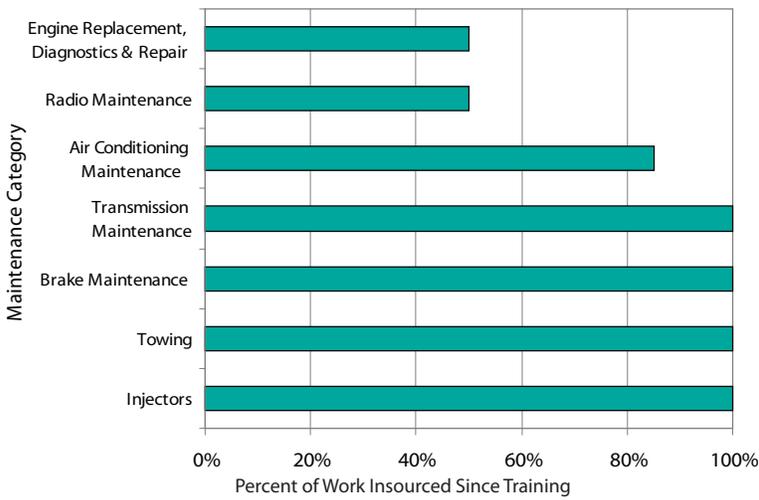
During the six months following the 2008 Preventive Maintenance class, CDTA achieved its goal for PMI on-time performance at a rate of 97.3 percent, as compared to 93.9 percent the year before. The improvement appears to be related to CDTA's implementation of a new preventive maintenance program strengthening PMI scheduling and procedures, as documented in the Strategic Business Plan for Maintenance Operations for 2005-2010. However, this initiative could not have been successful in the absence of enhanced PMI training.

• **Reduction in Bus Spare Ratio**

Large numbers of “spare” buses kept on hand to replace the frequently malfunctioning buses increase overall fleet procurement and maintenance costs. Transit industry research\*\* suggests that an active and continuous training program for the maintenance staff is critical to superior maintenance practices and lower spare bus needs. With joint training alongside an intensive fleet management campaign, CDTA has successfully reduced its bus spare ratio from close to 20 percent in FY 07 to 15 percent in FY 08. [See graph on the right.] As a result, eight additional buses are available for service, even as the total fleet size is reduced by seven. The spare ratio is projected to drop even further in the next two fiscal years. With a smaller number of vehicles kept in reserve to meet maximum service needs, potential savings on fleet procurement, inventory and non-beneficial maintenance costs for out-of-service buses may add up to hundreds of thousands of dollars.\*\*\*



CDTA - More Previously Outsourced Maintenance Work Brought In House since Project Empire Training



• **Insourcing of Maintenance Work**

Prior to the initiation of the Project Empire partnership, a substantial amount of CDTA’s maintenance work was performed by outside contractors because CDTA could not meet basic requirements. According to one manager:

We just didn’t have the people with the adequate training to make things happen. Everything from engine to transmission to basic repairs was being sent out on a daily basis. The service quality, efficiency and cost [can be] summed up under maintenance catastrophic failure.

With the partnership-based training program, CDTA has raised the level of competence of its maintenance workforce, allowing previously outsourced maintenance work to be brought back in house. According to the maintenance department, nearly 50 percent of the engine replacement, diagnostics and repair and 100 percent of the transmission, brake and injector repair jobs have been insourced since the beginning of Project Empire. [See graph above.] Before joint training, CDTA was not able to maintain its own radios. In July 2008, the maintenance department was able to start doing radio maintenance internally because they had made the investment in electronics training through Project Empire.

\*\*Pierce, Judith T. and Elizabeth, K. Moser. 1995. Synthesis of Transit Practice 11: System-Specific Spare Bus Ratios. Transit Cooperative Research Program. Washington, D.C. Leveraging Information for Better Transit Maintenance. Transit Cooperative Research Program, Research Results Digest. November 1996, Number 13.

\*\*\*Savings from a reduced spare bus ratio is to be examined in future studies. For a similar study on the effect of reduced spare ratio on maintenance cost savings, see the Transportation Learning Center’s report on the Keystone Transit Career Ladder Partnership - Measuring Up, Volume 2: Transit Partnership Training Proves to be a Smart Investment that Continues to Pay Off (2007), available at [http://transportcenter.org/images/uploads/MeasuringUpV2\\_5-4-2007.pdf](http://transportcenter.org/images/uploads/MeasuringUpV2_5-4-2007.pdf)

## B. Joint Training Brings More Positive Culture Change



Project Empire began with the goal of establishing a system of training at CDTA and CENTRO. Adopting the partnership approach to transit training, these agencies have been able to build a cooperative relationship between labor and management. Through the highly participative decision-making process and the provision of quality maintenance training, Project Empire precipitated a change in the work culture at CDTA and CENTRO. Interviews of twenty front-line supervisors, managers, workers, union officials and project staff point to the significant benefits that have come from a constructive training partnership. Project Empire reflects a new culture in transit characterized by improved labor-management relations, a re-energized workforce and the establishment of transit as a high performance industry.

Establishing a jointly developed system of training helped create more positive labor relations. In order to develop the partnership, workers and managers agreed to put aside and wall off any negativity resulting from the collective bargaining process. Prior to the Project Empire experience, both management representatives and union officials at CDTA described the labor-management relationship as “strained” and “contentious.” Just getting labor and management to talk to each other was a daunting task. One trainer at CDTA expressed that “a major accomplishment is just management and the union actually getting together and starting a great program like this.” Setting aside disagreements unrelated to training enabled this partnership to move forward in a constructive manner. Labor and management felt like they were working together toward a common goal.

Project Empire also laid the foundation for a stronger relationship within the training partnership that can then model more positive labor-management relations in areas outside of training, a sentiment reflected in both labor and management interviews. One union member at CDTA succinctly summarized the initial labor-management atmosphere as “Fifteen arbitrations. Six improper-practice charges...It was just terrible.” That same union representative went on to explain that since initiating Project Empire the overall labor-management relationship has improved tremendously resulting in fewer arbitrations and more positive agreements emerging between labor and management. A management official at CDTA explained that this positive shift attributed to Project Empire “point[s] to improved labor-management relations leading up to next years contract negotiations. There is a foundation of trust that did not exist before.” Labor and management at CENTRO expressed a similar sentiment regarding the partnership with one manager at CENTRO describing the union relationship as “incredible.”



<u><i>Past Practices</i></u>		<u><i>Looking Forward</i></u>
Centralized Authority	————➤	Empowered Employees
Reactive	————➤	Proactive
Diagnose & Replace	————➤	Diagnose & Assign
Learn by Watching	————➤	Learn by Doing

Trust between supervisors and workers creates a more positive and productive workplace. Workers know that they can have an open and honest dialogue with their supervisors. A management representative at CDTA evaluated the importance of trust when he explained that before training “a lot of guys were afraid to ask questions because they think if they ask a question, somebody is going to question their ability to do the job.” Now, if an employee needs additional training in an area, they can talk to their supervisor without fear of retribution.

Project Empire has boosted morale and increased job satisfaction. When CDTA and CENTRO made an investment in training, they made an investment in their workforce. The transit agencies have demonstrated the value and worth of their employees by empowering them to improve their workplace skills through quality training classes. Management at CDTA explained the importance of training investments, “I don’t think any transit property will be successful if it does not continually invest in its workforce.” A union official at CENTRO simply stated that when workers are trained they are worth more to the agency and they take more pride in their work. Providing continual training and education opportunities allows workers to expand their skills, advance up the career ladder and perform higher quality work.

W. Edwards Deming was right to note that all workers want to do a better job but most feel they are not given

**“I don’t think any transit property will be successful if it does not continually invest in its workforce.”**

an opportunity to do so. \*\*\*\* One manager noted that at CDTA the workforce “welcomes the training.” An employee of CENTRO resonated, “The majority of the people here want to learn.” Given the opportunity to do a good job with the best possible training, workers experience heightened job satisfaction and better morale.

In many ways, Project Empire is transforming CDTA and CENTRO into high performance organizations, characterized by commitments to partnership, quality, modern technology, productivity, decentralized

decision-making and promotion of education in the workplace. The training partnership institutes the fundamental principles of a high performance workplace. The commitment coming from both labor and management represents a major shift in the workplace culture of transit. Traditionally, a command-and-control leadership style dominated labor-management relationships in transit. This model, often called “militaristic” within the transit industry, is outdated and ineffective. Transit today requires a new approach to leadership and a new workplace culture. Cooperation, trust and decentralized decision-making are critical to the success of transit agencies. A CDTA manager described the change in workplace culture as reflective of a “pattern of progressive positive change. This program has enabled us to focus on continuous improvement.” Leaders at CDTA and CENTRO are well aware of this and have embraced this new culture in transit. A CDTA mechanic summed up the gains from this culture change in transit, “I believe we will get better and stronger with the training we have been receiving.”



\*\*\*\*Deming believed that every worker has nearly unlimited potential if placed in an environment that adequately supports, educates, and nurtures senses of pride and responsibility.” - <http://skymark.com/resources/leaders/deming.asp>

## Conclusion

The data analyzed in this report presents only a partial picture of the value and benefits of the Project Empire Partnership to employers and employees alike. Data availability and the difficulty quantifying certain measures limit the extent to which training benefits can be fully documented. Interviews with managers and union officials helped reveal some of these additional benefits that have not been formally measured to date. For example, four years ago air-conditioning was rarely repaired before CDTA buses were put back to service. Additionally, 40 to 50 percent of the fleet did not have functioning wheel-chair ramps. With Project Empire, CDTA has 100 percent availability for wheel-chair ramps and runs 90 percent availability for climate-control systems. Better training has also resulted in fewer unnecessary part replacements. A CDTA trainer observed positive changes in employee job behaviors, “instead of guys just taking a battery out, putting it on the shelf and getting a new one, now they are actually checking them and putting the tester on it and seeing actually why they are testing, which is something they didn’t do before.” Training is not the only factor contributing to these improvements, but both labor and management agree that joint training has enabled the overall transformation from “catastrophic failure” to “continuous improvement” in CDTA’s maintenance operations.

As the partnership training program deepens and strengthens, there will be more positive changes in maintenance. In the recent maintenance audit of CDTA, a certain agency location and certain bus maintenance categories were found to have higher numbers of defects than before, even as the total bus defects went down. Utilizing data from the auditing report, labor and management partners can bring well-designed training to the problem areas and end up reducing the number of these defects down the road.

Continuous investments in workforce training produce multi-year benefits that go well beyond the current research observation period. The “capitalized” benefits resulting from higher skills and organizational capacity have not been included in estimating the benefits to partnership training. As one CDTA manager rightly put it, “those investments [in workforce development] are latent investments that pay out for years. I think that [the] transfer of knowledge that we have established will pay back tenfold over the course of time that those mechanics stay in the shop.”



Project Empire is a joint project between transit properties and labor unions in upstate New York. For more information about transit training partnerships please contact:

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