where market and welfare considerations are clearly delineated.

There are a number of major impediments to increasing labor productivity. Most important probably is the historical adversary relationship in this country between labor and management. A major dichotomy between management and labor objectives has developed in all sectors of the economy, including transportation. Concepts of individual success are changing, and there is a growing lack of unanimity among individual aspirations. Even where traditional monetary-based objectives remain, inequities between individual effort and reward may mitigate increased productivity.

To gain comparative economic advantage, the labor force has become specialized. Such specialization has brought boredom and lack of attentiveness to quality or pride in craftmanship. As the economy shifts from a production- to a service-oriented economy, traditional concepts of specialization of labor and the comparative advantage gained by it will have to be reconsidered.

To increase labor productivity will require major attitudinal changes by both management and labor. A new approach toward participatory management is now required. Management will have to better understand labor's needs and objectives, and labor in turn must understand and accept its responsibility to see that it is responsive to market and political forces. Both parties must learn to listen to each other, both must be willing to share in the gains and the losses. Both will have to review the work situation to mutually improve it. To a great extent government regulation exists because labor and management have failed in their responsibilites toward each other. Finally, both need to better understand and manage risk in order to assure a more predictable future.

It is easy to state what is necessary; it is difficult to alter institutional arrangements to accomplish goals. When past behavior patterns are no longer successful, instead of abandoning them and searching for more appropriate responses, people generally redouble their efforts with old but unsuccessful response patterns. There is a growing body of knowledge, primarily outside transportation, that can assist the transportation sector to look toward new cooperative arrangements between management and labor in order to achieve the desired level of increased productivity and to improve the quality of work.

The articles that follow discuss attempts at improving productivity both in transportation and in industry through innovative employee-management arrangements. The articles were prepared for recent TRB Annual Meetings or for the Task Force on Employee-Management Relations and the Quality of Working Life. Some apply directly to transportation. Others examine the private sector. The purpose in presenting them here is to disseminate information on changing employee-management relationships and to suggest that they may be equally as applicable in the public sector of transportation as well as in the private sector.

SPECIAL REPORT

Productivity Improvement Programs and Techniques in Transportation

Linda R. Laughlin and Rhoda Pauley

Like many other government activities, transportation agencies are expected to maintain, improve, or even add services at the same time that they are facing revenue constraints brought on by high inflation, soaring energy costs, reduced tax bases, and shortages of capital funds. In the public mind, they are being asked to demonstrate that they operate efficiently and effectively.

Because the largest share of government expenditures is for salaries and related costs of personnel—as much as 80 percent of costs in the transit industry—the greatest potential for productivity improvement obviously is on the people-management side. More is being done than catches the public eye to reduce costs, improve job satisfaction and, thereby, performance, and tap workers' and unions' potential for joint problem-solving. Several examples of this are noted here.

- In Syracuse, New York, to increase the desirability of first-line supervisory positions and maintain its promote-from-within policy, CNY Centro introduced alternative work schedules, making the position a 4-day/10 h job. Shifts were rotated to make sure no supervisor would work nights or weekends on a regular basis, which had the added benefit of enlarging the job by requiring familiarization with all facets of all shifts.
- In Cincinnati, cleaning production was increased 300 percent in quantity. Buses were cleaner when handicapped personnel were hired through special agencies and trained to do this work. Pay scales were determined with the union. Job turnover of these positions has totaled 3 (of 14) in a 3-year period.

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Pauley is Assistant National Executive Director for Communications of the Girl Scouts of America, whose program is designed to develop the decision-making and planning abilities of girls and adults involved in scouting. She is an honors graduate in international relations of Smith College and chairs TRB's Task Force on Employee-Management Relations and Quality of Working Life.

- In Sacramento, the job of supervisor and dispatcher was combined for night duty when service was lower by installing a radio system in road supervisors' cars. Return on the investment will be met in two-and-one-half years.
- The efforts of a joint labor-management committee in New York City's Transit System raised the average number of wheels repaired from six to eight a day, cut the time required to overhaul a bus in half, reduced road failures by two-thirds, and brought sick leave abuses under control.
- Employee participation in problem-solving in the Communication and Electrical Division of San Diego's city government decreased the work hours needed for repairs in 57 percent of its work categories, reduced the cost of repairing traffic signals by $105.76 per unit, and increased the overall productivity of the division by 29 percent.

Improving Management to Improve Productivity

A number of familiar techniques of good management in general can be specifically applied for productivity improvement, such as management by objectives, performance appraisal, personnel management, and development of a management information system. Less familiar is the management philosophy statement—a careful, detailed articulation in writing of how management will operate.

Another familiar area, training and human resource planning, probably represents the most important area of internal management control. Declining safety records of 2-year employees in Minneapolis, for instance, were reversed when a retraining program was introduced after 18 months of employment.

Small capital investments, especially on labor-saving equipment, can also bring large, long-term savings. The New Jersey state government, as part of a multifaceted program, operates a Productivity Improvement Investment Account (PIIA) that funds agency productivity improvement projects. Its first 16 projects, including investments in a word processing center, license document processors, and radio paging devices, have saved the state approximately $2.5 million.

Role of States in Productivity Improvement

Many state governments have established formal executive branch productivity programs. Like New Jersey, North Carolina and Florida have layered, multifaceted programs involving a gubernatorially appointed Productivity Commission, a coordinating control staff unit, and productivity designees in line agencies.

New York State has established a unique Joint Labor-Management Committee on the Work Environment and Productivity (CWEP). In Pennsylvania, the Department of Transportation has a single-agency effort. In states, such as Oregon and Colorado, there are informal programs run through existing units not designated for productivity per se.

Some states have efficiency task forces. A third state vehicle lies in legislative programs. Texas and Indiana have interim committees. Mississippi has a staff unit—the Performance Evaluation and Expenditure Review Committee.

Categories of Productivity Programs That May Help You to Design Your Own

Organizations are unique. Therefore, any existing program or combination of programs will have to be adapted to the characteristics of individual systems. There are various kinds of programs that have been tried and have met with some success.

Process and Structure—Two Kinds of Programs

A useful distinction can be drawn between programs that focus on the process or approach to effect change for productivity improvement and those that focus on structure. Programs concerned with process are defined as those that change the work environment through greater involvement of employees in decisions affecting their work lives. Those concerned with structure attempt to change the intrinsic nature of work itself. Neither type of program is exclusive; and the most successful frequently combines both emphases.

Process Programs—Quality of Work Life and Participation

There have been numerous uses and misuses of the label "quality-of-work-life" programs. Accurately, a quality-of-work-life program epitomizes an approach to improving productivity, not a specific method of doing so. Whatever methods are used to achieve the goal of greater organizational effectiveness, there must be a commitment on the part of management to share responsibility with employees in solving problems. The aspects of sharing and problem-solving are central to the quality-of-work-life concept. Such sharing in the problem definition and solutions characterizes a number of participation programs. Perhaps best known among these are recent efforts at joint union-management involvement, frequently facilitated by the formation of joint committees.

Labor-Management Committees

As has been pointed out, "Establishment of a labor and management committee does not provide some magic formula for bringing two protagonists. . . into overnight harmony. It does, however, provide a mechanism for improving communications, for maximizing the opportunity for the two parties to discuss problems in a forum away from the pressure and point-making atmosphere of the bargaining table. It tends to encourage viewing problems as matters to be solved rather than capitalized upon. In this setting there is likely to be greater attention to common purpose and common objectives—recognition that serving the public does not necessarily mean that as improvements are made one side loses something and the other gains; that both can benefit by improvements—that government does not have to be a zero sum game" (National Center for Productivity and Quality of Working Life. Labor-Management Committees in the Public Sector. Washington, DC, Nov. 1975, p. 2).

In a midwestern bus company, for example, a number of innovations were introduced through its joint labor-management quality-of-work committee. Such efforts included information meetings with all drivers when new bids were cut; revision of paycheck distribution; administration of a major diagnosis of the workplace (with a 94 percent questionnaire response rate); designing and testing of a major restructuring of the organization into teams of union and management leaders for every 15 drivers; and facilitation of negotiations by providing process training to the bargaining teams in advance of contract negotiations.

Structure Programs—Job Enlargement, Enrichment, Quality Circles, and Autonomous Work Groups

Structure programs include a broad array of efforts that all ultimately redesign some aspect of how work is done, from the redesign of an individual employee's job to the jobs of several individuals or teams of employees, to efforts that restructure the entire organization. Specifically, some of the better known programs include:

1. Job enlargement—The combining of many separate functions performed by different individuals into one "enlarged" job;
2. Job enrichment—Not only the enlarging of sequential elements of individual functions, but providing the individual employee more latitude in planning and controlling all aspects of his or her job and work environment;
3. Quality circles—Sometimes called quality-control circles, efforts in which the supervisor and immediate work group meet regularly, usually weekly, on company time to discuss, brainstorm, and solve problems of quality performance; and
4. Autonomous work groups—An extension of job enrichment, efforts in which a group of employees is granted the authority to determine for itself the assignments of each of its members, its work and leadership structure, the composition of its group, and the quantity and quality of work it will do within broad management guidelines.

A Case Example

How some of these efforts, both process and structure, can be actualized in transportation organizations is illustrated by the case of the Milwaukee Road, a 3500-mile regional railroad in the Midwest. The lever for specific programs is held by the Labor-Management Action Group (LMAG), established in mid-1980 to join company executives with unionized employees in an effort to identify better ways of doing the job. Not surprisingly, the LMAG was established in a period of crisis; the carrier had declared bankruptcy.

Among the many changes brought by the collaboration of the LMAG was a work rule change that enabled the railroad to avoid heretofore costly switching; 25 such switches cost more than $5500. There have also been savings of two days for each avoided switch in addition to the basic cost savings.

Job enlargement efforts have expanded the authority of yard engines beyond switching chores within the yard to deliveries within a 6-mile radius. Flexible scheduling has allowed maintenance work to occur in lull periods on weekends as a straight-time assignment with crews off in midweek. Maintenance is better and the crews work under safer conditions.

Job enrichment has also been effected by having operating (union) employees accompany freight salespersons on calls to shippers, providing the on-train employees a greater understanding of the level of service required by shippers from the railroad. A quality-control circle in its Milwaukee shop wrote a materials-handling manual that has since been adopted as the company's standard source.

Finally, a major change in routing that could be made unilaterally by management has gone to the union for ratification. The assistant general manager stated that bringing in the employees on the change will save an additional $200 000 to $300 000.

Incentive Programs

The importance of incentives for employees should not be overlooked. Incentive programs ideally combine both monetary and nonmonetary approaches to recognize exceptional performance. Some primarily monetary incentive programs include attendance incentives, competition and contests, output-oriented merit increases, performance bonuses, piecework, safety incentives, shared savings, and suggestion awards.

In addition to job enlargement, some nonmonetary incentives include

1. Performance targets—Goals against which performance can be measured.
2. Recognition and similar nonmonetary awards—Testimonial dinners, citations, special emblems or badges, pictures taken with the mayor or governor, publicity in an organization newsletter, letters of recommendation, verbal praise from supervisors and others.
3. Task systems—Clear specification of the activities that represent a "fair day's work" enable workers to leave as soon as their assignment task is completed while being paid for 8 h of work.
4. Variations in working hours—Gives employees control over their own work schedules by expanding the workday with extra days off; using staggered hours; instituting flexible or gliding hours that allow employees to determine their own time for reporting for 8 h of work; variable hours that permit employees to set their own schedules.

Some other types of incentives, both monetary and nonmonetary, believed to affect productivity indirectly, are (a) career development—well-defined opportunities for promotion integrated with training programs to qualify employees for wage increases through promotion and thus personal achievement; (b) educational incentives—generally tuition reimbursement, time off to attend courses, wage increases based on educational achievements, or a combination of these; (c) productivity bargaining—labor-management negotiations in which increased productivity is traded for improved worker benefits (e.g., wages, pensions, or other fringe benefits); and (d) work standards—measures of the amount of time necessary to complete a job and used to delineate a desired level of performance.

Principles on Which Any Productivity Improvement Program Must Be Based

In designing a productivity improvement program, we suggest you keep the following principles in mind.

1. There is no single or simple solution and no "quick fix." Effective change takes time. Organizations, like individual human beings, are complex living systems.
2. Often what appear to be the problems are only the symptoms. It is necessary to conduct as thorough a diagnosis as possible. Do not accept the perspectives of only one individual or group.
3. The way change is introduced is as important as what the change is. A solution cannot be unilaterally imposed on the organization. Even the "right" productivity improvement program will not be effective if all of those involved do not want it implemented. This is as true for union or employee-initiated ideas as for those initiated by management. Whoever is spearheading the program, time spent in involving the other groups to be affected before a program is designed or selected is time more than well spent.
4. Be aware that a change in any part of the organization will inevitably affect other parts as well.
5. An outside consultant or expert can be critically important in serving as a neutral diagnostician and facilitator.
6. Solutions must be monitored and evaluated. Getting a program accepted and implemented is a major step, but just the beginning. Various measures need to be considered on an ongoing basis: (a) workload—the amount of work done; (b) efficiency—the amount of output produced related to the amount of input required to produce it; and (c) effectiveness—the extent to which the goals and objectives of the program are being met. Adaptations in the programs should also be made as needed.
7. Do not be afraid to admit failure, to learn from your mistakes, and to continue trying.

Recommended Reading

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Resources for More Information

Productivity Resource Center
Office of Productivity Programs
Office Of Personnel Management
Washington, DC 20044

State Government Productivity Research Center
Council of State Governments
P.O. Box 11910
Lexington, KY 40578

Productivity Information Center
National Technical Information Service
425 13th Street, N.W., Suite 620
Washington, DC 20004

SPECIAL REPORT

Human Side of Work

Rhoda Pauley

Today, the world of work is changing as radically as it did during the Industrial Revolution, only this time the changes that are occurring put people, instead of machines, first.

Why is this happening? There are two major reasons. First, there is a growing recognition on the part of top management that what employees do—or do not do—on the job carries a high cost. The effects of good, bad, or indifferent performance on the quality of our products or services have become more important in this age of continuing inflation, periodic recessions, and increased foreign competition. Put simply, we have learned—sometimes painfully—that alienated employees can produce alienated customers.

Management is also concerned with the high costs of absenteeism, turnover, recruitment, and training as jobs become more complex and specialized. When the problems of waste, pilferage and sabotage plus grievances, work stoppages, and strikes are added, the cost of employee dissatisfaction in terms of lost material and lost days can become staggering.

Productivity studies show that people account for 50 percent or more of controllable costs; in government and services, this can run as high as 75 or 80 percent. These studies also show that the human factor contributes between 10 and 25 percent to productivity growth. In the past decade, the pursuit of profitability and productivity relied heavily on financial steps and measures. Now the merger and acquisition fever has abated somewhat in the industrial sector, and realizing that major new capital and technological investments could be exorbitant, many executives are thinking about their return on the investment they have already made in people, not just plant and equipment.

Today's Worker Is Different

A second reason why major changes have been occurring in work organizations is that today's work force is markedly different from yesterday's. The postwar baby boom has helped make it, on the whole, younger, better-educated, and more affluent. As they entered the labor force, young people born during the boom introduced new values and attitudes brewed in the cultural and social revolutions of the 1960s.