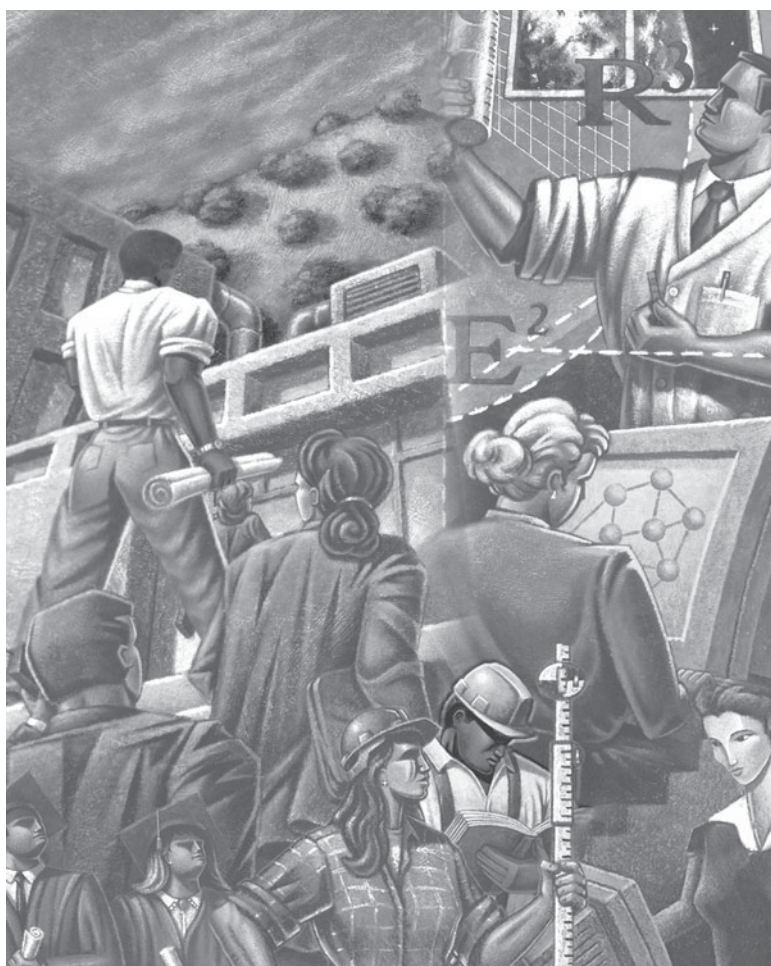


# Farming, Fishing, Forestry, and Transportation Occupations



Reprinted from the  
Occupational Outlook Handbook, 2004-05 Edition

U.S. Department of Labor  
Bureau of Labor Statistics



## Occupations Included in this Reprint

- Agricultural workers
- Air traffic controllers
- Aircraft pilots and flight engineers
- Bus drivers
- Farmers, ranchers, and agricultural managers
- Fishers and fishing vessel operators
- Forest, conservation, and logging workers
- Material moving occupations
- Rail transportation occupations
- Taxi drivers and chauffeurs
- Truck drivers and driver/sales workers
- Water transportation occupations

## Agricultural Workers

(0\*NET 45-2011.00, 45-2041.00, 45-2091.00, 45-2092.01, 45-2092.02, 45-2093.00, and 45-2099.99)

### Significant Points

- Duties and working conditions vary widely, from working in greenhouses, to producing crops and raising livestock outdoors, to inspecting agricultural products in plants.
- Most workers learn through short-term on-the-job training; agricultural inspectors need work experience or a college degree in a related field.
- Most farmworkers receive low pay and often must perform strenuous work outdoors in all kinds of weather, but many prefer to work and live in a rural area.
- Employment is projected to grow more slowly than average.

### Nature of the Work

Agricultural workers play a large role in getting food, plants, and other agricultural products to market. Working mostly on farms or ranches or in nurseries, slaughterhouses, or ports of entry, these workers have numerous and diverse duties. Among their activities are planting and harvesting crops, installing irrigation, delivering animals, and making sure that our food is safe.

More than 4 out of 5 agricultural workers are farmworkers and laborers. *Farmworkers and laborers, crop, nursery, and greenhouse* perform numerous activities related to growing and harvesting grains, fruits, vegetables, nuts, fiber, trees, shrubs, and other crops. Among their activities are planting and seeding, pruning, irrigating, harvesting, and packing and loading crops for shipment. Farmworkers also apply pesticides, herbicides, and fertilizers to crops; repair fences; and help with irrigation. Nursery and greenhouse workers prepare land or greenhouse beds for growing horticultural products, such as trees, plants, flowers, and sod. Their duties include planting, watering, pruning, weeding, and spraying the plants. They may cut, roll, and stack sod; stake trees; tie, wrap, and pack plants to fill orders; and dig up or move field-grown and containerized shrubs and trees.

*Farmworkers, farm and ranch animals* care for live farm, ranch, or aquacultural animals that may include cattle, sheep, swine, goats, horses, poultry, finfish, shellfish, and bees. The animals are usually raised to supply such products as meat, fur, skins, feathers, eggs, milk, and honey. The farmworkers' duties may include feeding, watering, herding, grazing, castrating, branding, debeaking, weighing, catching, and loading animals. On dairy farms, farmworkers operate milking machines; they also may maintain records on animals, examine animals to detect diseases and injuries, assist in delivering animals at their birth, and administer medications, vaccinations, or insecticides as appropriate. Daily duties of such farmworkers include cleaning and maintaining animal housing areas.

Other farmworkers known as *agricultural equipment operators* operate a variety of farm equipment used in plowing, sowing, maintaining, and harvesting agricultural products. The equipment may include tractors, fertilizer spreaders, haybines, raking equipment, balers, combines, and threshers, as well as trucks. These farmworkers also operate machines used in moving and treating crops after their harvest, such as conveyor belts, loading machines, separators, clean-

ers, and dryers. In addition, they may make adjustments and minor repairs to equipment. When not operating machines, agricultural equipment operators may perform other farm duties that are not typical of other farmworkers.

*Agricultural inspectors*, another type of agricultural worker, are employed by Federal and State governments to ensure compliance with laws and regulations governing the health, quality, and safety of agricultural commodities. Inspectors also make sure that the facilities and equipment used in processing the commodities meet quality standards. Meat safety is one of their prime responsibilities, and they try to ensure that the meat we eat is free of harmful ingredients or bacteria. In meat-processing facilities, inspectors may collect samples of suspected diseased animals or materials and send the samples to a laboratory for identification and analysis. They also may inspect livestock to help determine the effectiveness of medication and feeding programs. Some inspectors are stationed at export and import sites to weigh and inspect agricultural shipments leaving and entering the country, to ensure the quality and quantity of the shipments. A few work at logging sites, making sure that safety regulations are enforced.

*Graders and sorters* of agricultural products examine agricultural commodities being prepared to be packed for market and classify them according to quality or size guidelines. They grade, sort, or classify unprocessed food and other agricultural products by size, weight, color, or condition and discard inferior or defective products. For example, graders sort eggs by color and size and also examine the fat content, or marbling, of beef, assigning a grade of "Prime," "Choice," or something else, as appropriate. The grade that is assigned determines the price at which the commodity may be sold.

### Working Conditions

Working conditions for agricultural workers vary widely. Much of the work of farmworkers and laborers on farms and ranches takes place outdoors in all kinds of weather and is physical in nature. Harvesting fruits and vegetables, for example, may require much bending, stooping, and lifting. Workers may lack adequate sanitation facilities while working in the field, and their drinking water may be limited. The year-round nature of much livestock production work means that ranch workers must be out in the heat of summer, as well as the cold of winter. While some of these workers enjoy the day-to-day variability of the work, the rural setting, working on the land, and raising animals, the work hours are generally uneven and often long; work cannot be delayed when crops must be



Many agricultural workers work in nurseries and greenhouses.

planted and harvested or when animals must be sheltered and fed. Weekend work is common, and farmworkers may work a 6- or 7-day week during planting and harvesting seasons. Because much of the work is seasonal in nature, many workers also obtain other jobs during slow seasons. Migrant farmworkers, who move from location to location as crops ripen, live an unsettled lifestyle, which can be stressful.

Work also is seasonal for farmworkers in nurseries; spring and summer are the busiest times of the year. Greenhouse workers enjoy relatively comfortable working conditions while tending to plants indoors. However, during the busy seasons, when landscape contractors need plants, work schedules may be more demanding, requiring weekend work. Moreover, the transition from warm weather to cold weather means that nursery workers might have to work overtime with little notice given, in order to move plants indoors in case of a frost.

Federal meat inspectors may work in highly mechanized plants or with poultry or livestock in confined areas with extremely cold temperatures and slippery floors. The duties often require working with sharp knives, moderate lifting, and walking or standing for long periods. Many inspectors work long and often irregular hours. Inspectors may find themselves in adversarial roles when the organization or individual being inspected objects to the inspection or its potential consequences. Some inspectors travel frequently to visit farms and processing facilities. Others work at ports, inspecting cargo on the docks or on boats.

Graders and sorters may work with similar products for an entire shift, or they may be assigned a variety of items. They may be on their feet all day and may have to lift heavy objects, whereas others may sit during most of their shift and do little strenuous work. Some graders work in clean, air-conditioned environments, suitable for carrying out controlled tests. Some may work evenings or weekends because of the perishable nature of the products. Overtime may be required to meet production goals.

Farmworkers in crop production risk exposure to pesticides and other hazardous chemicals sprayed on crops or plants. However, exposure is relatively minimal if safety procedures are followed. Those who work on mechanized farms must take precautions to avoid injury when working with tools and heavy equipment. Those who work directly with animals risk being bitten or kicked.

## **Employment**

Agricultural workers held about 795,000 jobs in 2002. Of these, farmworkers were the most numerous, holding 670,000 jobs. Graders and sorters held 49,000 jobs, agricultural inspectors 16,000 jobs, and agricultural equipment operators 61,000 jobs. Approximately 69 percent of all agricultural workers worked for crop and livestock producers, while almost 5 percent worked for agricultural service providers, mostly farm labor contractors.

## **Training, Other Qualifications, and Advancement**

Farmworkers learn through short-term on-the-job training. Most do not have a high school diploma. The preponderance of workers without a high school diploma is particularly high in the crop production sector, where there are more labor-intensive establishments employing migrant farmworkers.

In nurseries, entry-level workers must be able to follow directions and learn proper planting procedures. If driving is an essential part of a job, employers look for applicants with a good driving record and some experience driving a truck. Workers who deal directly with customers must get along well with people. Employers also look for responsible, self-motivated individuals, because nursery workers sometimes work with little supervision.

For graders and sorters, training requirements vary on the basis of their responsibilities. For those who perform tests on various agricultural products, a high school diploma is preferred and may be required. Simple jobs requiring mostly visual inspection may be filled by beginners provided with short-term on-the-job training.

Becoming an agricultural inspector requires relevant work experience or some college course work in a field such as biology or agricultural science. Inspectors are trained in the applicable laws or inspection procedures through some combination of classroom and on-the-job training. In general, people who want to enter this occupation should be responsible, like detailed work, and be able to communicate well. Federal Government inspectors whose job performance is satisfactory advance through a career ladder to a specified full-performance level. For positions above this level—usually supervisory positions—advancement is competitive and based on agency needs and individual merit. Advancement opportunities in State and local governments and in the private sector often are similar to those in the Federal Government.

Advancement of agricultural workers depends on motivation and experience. Farmworkers who work hard and quickly, have good communication skills, and take an interest in the business may advance to crew leader or other supervisory positions. Some agricultural workers may aspire to become farm, ranch, and other agricultural managers, or farmers or ranchers themselves. (Farmers, ranchers, and agricultural managers are discussed elsewhere in the *Handbook*.) In addition, their knowledge of raising and harvesting produce may provide an excellent background for becoming purchasing agents and buyers of farm products. Knowledge of working a farm as a business can help agricultural workers become farm and home management advisors. Those who earn a college degree in agricultural science could become agricultural and food scientists.

## **Job Outlook**

Overall employment of agricultural workers is projected to grow more slowly than the average for all occupations over the 2002-12 period, primarily reflecting the outlook for farmworkers, who make up the large majority of all agricultural workers. Low wages, the physical demands of the work, and high job turnover should result in abundant job opportunities, however.

Continued consolidation of farms and technological advancements in farm equipment will dampen employment growth. Nevertheless, those farms remaining in operation will still need workers to help with their operations, and farm labor contractors' employment of farmworkers is expected to increase steadily. Nursery and greenhouse workers should have the most rapid job growth, reflecting the increasing demand for landscaping services.

Slower-than-average employment growth also is anticipated for agricultural inspectors. Governments at all levels are not expected to hire significant numbers of new inspectors, choosing to leave more of the routine inspection to businesses. Slower-than-average growth also is expected for graders and sorters, and agricultural equipment operators, reflecting the agriculture industry's continuing ability to produce more with fewer workers.

## **Earnings**

Median hourly earnings of the more numerous farmworkers in crops, nurseries, and greenhouses were \$7.24 in 2002. The middle 50 percent earned between \$6.85 and \$8.37 an hour, while the lowest 10 percent earned less than \$6.24 and the highest 10 percent earned more than \$10.32.

Median hourly earnings for farmworkers who work with livestock were \$8.22. The middle 50 percent earned between \$6.98 and

\$10.32 an hour, while the lowest 10 percent earned less than \$6.27 and the highest 10 percent earned more than \$13.01.

Median hourly earnings of graders and sorters of agricultural products were \$7.67 in 2002. The middle 50 percent earned between \$6.88 and \$9.30. The lowest 10 percent earned less than \$6.22, and the highest 10 percent earned more than \$11.80.

Median hourly earnings of agricultural inspectors were \$13.76 in 2002. The middle 50 percent earned between \$10.44 and \$18.79. The lowest 10 percent earned less than \$9.10, and the highest 10 percent earned more than \$23.94.

Median hourly earnings for agricultural equipment operators in 2002 were \$8.31. The middle 50 percent earned between \$6.96 and \$10.78. The lowest 10 percent earned less than \$6.11, the highest 10 percent more than \$13.89.

Few agricultural workers are members of unions.

### **Related Occupations**

The duties of farmworkers who perform outdoor labor are related to the work of fishers and operators of fishing vessels; forest, conservation, and logging workers; and grounds maintenance workers. Farmworkers who work with farm and ranch animals perform work related to that of animal care and service workers.

### **Sources of Additional Information**

Information on agricultural worker jobs is available from

► National FFA Organization, The National FFA Center, Career Information Requests, P.O. Box 68690, Indianapolis, IN, 46268-0960. Internet: <http://www.ffa.org>

Information on farmworker jobs is available from

► The New England Small Farm Institute, 275 Jackson St., Belchertown, MA 01007. Internet: <http://www.smallfarm.org/newoof/newoof.html>

Information on obtaining a position as an agricultural inspector with the Federal Government is available from the Office of Personnel Management (OPM) through a telephone-based system. Consult your telephone directory under "U.S. Government" for a local number, or call (703) 724-1850; Federal Relay Service: (800) 877-8339. The first number is not toll free, and charges may result. Information also is available from the OPM Internet site: <http://www.usajobs.opm.gov>

# Air Traffic Controllers

(0\*NET 53-2021.00)

## Significant Points

- Nearly all air traffic controllers are employed by the Federal Aviation Administration, part of the Federal Government.
- Large numbers of air traffic controllers will be eligible to retire over the next decade, potentially creating many job openings.
- Aircraft controllers earn relatively high pay and have good benefits.

## Nature of the Work

The air traffic control system is a vast network of people and equipment that ensures the safe operation of commercial and private aircraft. Air traffic controllers coordinate the movement of air traffic to make certain that planes stay a safe distance apart. Their immediate concern is safety, but controllers also must direct planes efficiently to minimize delays. Some regulate airport traffic; others regulate flights between airports.

Although *airport tower* or *terminal controllers* watch over all planes traveling through the airport's airspace, their main responsibility is to organize the flow of aircraft into and out of the airport. Relying on radar and visual observation, they closely monitor each plane to ensure a safe distance between all aircraft and to guide pilots between the hangar or ramp and the end of the airport's airspace. In addition, controllers keep pilots informed about changes in weather conditions such as wind shear—a sudden change in the velocity or direction of the wind that can cause the pilot to lose control of the aircraft.

During arrival or departure, several controllers direct each plane. As a plane approaches an airport, the pilot radios ahead to inform the terminal of the plane's presence. The controller in the radar room, just beneath the control tower, has a copy of the plane's flight plan and already has observed the plane on radar. If the path is clear, the controller directs the pilot to a runway; if the airport is busy, the plane is fitted into a traffic pattern with other aircraft waiting to land. As the plane nears the runway, the pilot is asked to contact the tower. There, another controller, who also is watching the plane on radar, monitors the aircraft the last mile or so to the runway, delaying any departures that would interfere with the plane's landing. Once the plane has landed, a ground controller in the tower directs it along the taxiways to its assigned gate. The ground controller usually works entirely by sight, but may use radar if visibility is very poor.

The procedure is reversed for departures. The ground controller directs the plane to the proper runway. The local controller then informs the pilot about conditions at the airport, such as weather, speed and direction of wind, and visibility. The local controller also issues runway clearance for the pilot to take off. Once in the air, the plane is guided out of the airport's airspace by the departure controller.

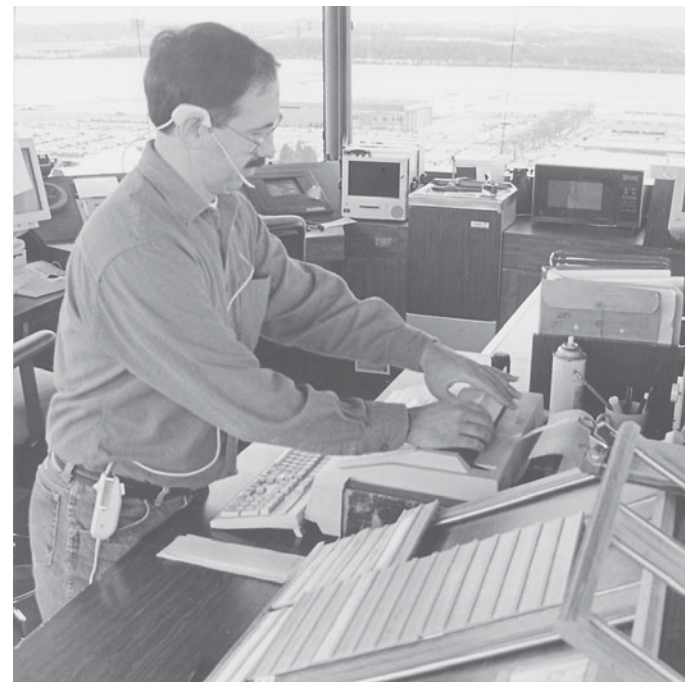
After each plane departs, airport tower controllers notify *enroute controllers* who will next take charge. There are 21 air route traffic control centers located around the country, each employing 300 to 700 controllers, with more than 150 on duty during peak hours at the busier facilities. Airplanes usually fly along designated routes; each center is assigned a certain airspace containing many different routes. Enroute controllers work in teams of up to three members,

depending on how heavy traffic is; each team is responsible for a section of the center's airspace. A team, for example, might be responsible for all planes that are between 30 to 100 miles north of an airport and flying at an altitude between 6,000 and 18,000 feet.

To prepare for planes about to enter the team's airspace, the radar associate controller organizes flight plans coming off a printer. If two planes are scheduled to enter the team's airspace at nearly the same time, location, and altitude, this controller may arrange with the preceding control unit for one plane to change its flight path. The previous unit may have been another team at the same or an adjacent center, or a departure controller at a neighboring terminal. As a plane approaches a team's airspace, the radar controller accepts responsibility for the plane from the previous controlling unit. The controller also delegates responsibility for the plane to the next controlling unit when the plane leaves the team's airspace.

The radar controller, who is the senior team member, observes the planes in the team's airspace on radar and communicates with the pilots when necessary. Radar controllers warn pilots about nearby planes, bad weather conditions, and other potential hazards. Two planes on a collision course will be directed around each other. If a pilot wants to change altitude in search of better flying conditions, the controller will check to determine that no other planes will be along the proposed path. As the flight progresses, the team responsible for the aircraft notifies the next team in charge of the airspace ahead. Through team coordination, the plane arrives safely at its destination.

Both airport tower and enroute controllers usually control several planes at a time; often, they have to make quick decisions about completely different activities. For example, a controller might direct a plane on its landing approach and at the same time provide pilots entering the airport's airspace with information about conditions at the airport. While instructing these pilots, the controller also would observe other planes in the vicinity, such as those in a holding pattern waiting for permission to land, to ensure that they remain well separated.



*Some air traffic controllers regulate airport traffic, while others regulate flights between airports.*

In addition to airport towers and enroute centers, air traffic controllers also work in flight service stations operated at more than 100 locations. These *flight service specialists* provide pilots with information on the station's particular area, including terrain, pre-flight and inflight weather information, suggested routes, and other information important to the safety of a flight. Flight service station specialists help pilots in emergency situations and initiate and coordinate searches for missing or overdue aircraft. However, they are not involved in actively managing air traffic.

Some air traffic controllers work at the Federal Aviation Administration's (FAA) Air Traffic Control Systems Command Center in Herndon, Virginia, where they oversee the entire system. They look for situations that will create bottlenecks or other problems in the system, then respond with a management plan for traffic into and out of the troubled sector. The objective is to keep traffic levels in the trouble spots manageable for the controllers working at enroute centers.

Currently, the FAA is implementing a new automated air traffic control system, called the National Airspace System (NAS) Architecture. The NAS Architecture is a long-term strategic plan that will allow controllers to more efficiently deal with the demands of increased air traffic. It encompasses the replacement of aging equipment and the introduction of new systems, technologies, and procedures to enhance safety and security and support future aviation growth.

### **Working Conditions**

Controllers work a basic 40-hour week; however, they may work additional hours for which they receive overtime pay or equal time off. Because most control towers and centers operate 24 hours a day, 7 days a week, controllers rotate night and weekend shifts.

During busy times, controllers must work rapidly and efficiently. Total concentration is required to keep track of several planes at the same time and to make certain that all pilots receive correct instructions. The mental stress of being responsible for the safety of several aircraft and their passengers can be exhausting for some persons.

### **Employment**

Air traffic controllers held about 26,000 jobs in 2002. The vast majority were employed by the FAA, which is part of the Federal Government. Air traffic controllers work at airports—in towers and flight service stations—and in air route traffic control centers. Some professional controllers conduct research at the FAA's national experimental center near Atlantic City, New Jersey. Others serve as instructors at the FAA Academy in Oklahoma City, Oklahoma. A small number of civilian controllers work for the U.S. Department of Defense. In addition to controllers employed by the Federal Government, some work for private air traffic control companies providing service to non-FAA towers.

### **Training, Other Qualifications, and Advancement**

To become an air traffic controller, a person must enroll in an FAA-approved education program and pass a pre-employment test that measures his or her ability to learn the controller's duties in order to qualify for job openings in the air traffic control system. Exceptions are air traffic controllers with prior experience and military veterans. The pre-employment test is currently offered only to students in the FAA Air Traffic Collegiate Training Initiative (ATCTI) Program or the Minneapolis Community & Technical College, Air Traffic Control Training Program. In addition, applicants must have 3 years of full-time work experience or 4 years of college, or a combination of both. In combining education and experi-

ence, 1 year of undergraduate study (30 semester or 45 quarter hours) is equivalent to 9 months of work experience.

Upon successful completion of an FAA-approved program, individuals who receive school recommendation and who meet the basic qualification requirements, including age limit and achievement of a qualifying score on the FAA authorized pre-employment test, become eligible for employment as an air traffic controller. Candidates also must pass a medical exam, drug screening, and security clearance before they can be hired.

Upon selection, employees attend the FAA Academy in Oklahoma City for 12 weeks of training, during which they learn the fundamentals of the airway system, FAA regulations, controller equipment, and aircraft performance characteristics, as well as more specialized tasks.

After graduation, it takes several years of progressively more responsible work experience, interspersed with considerable classroom instruction and independent study, to become a fully qualified controller. Controllers who fail to complete either the academy or the on-the-job portion of the training usually are dismissed. Controllers must pass a physical examination each year and a job performance examination twice each year. Failure to become certified in any position at a facility within a specified time also may result in dismissal. Controllers also are subject to drug screening as a condition of continuing employment.

Air traffic controllers must be articulate, because pilots must be given directions quickly and clearly. Intelligence and a good memory also are important because controllers constantly receive information that they must immediately grasp, interpret, and remember. Decisiveness also is required because controllers often have to make quick decisions. The ability to concentrate is crucial because controllers must make these decisions in the midst of noise and other distractions.

At airports, new controllers begin by supplying pilots with basic flight data and airport information. They then advance to the position of ground controller, then local controller, departure controller, and, finally, arrival controller. At an air route traffic control center, new controllers first deliver printed flight plans to teams, gradually advancing to radar associate controller and then radar controller.

Controllers can transfer to jobs at different locations or advance to supervisory positions, including management or staff jobs in air traffic control and top administrative jobs in the FAA. However, there are only limited opportunities for a controller to switch from a position in an enroute center to a tower.

### **Job Outlook**

Employment of air traffic controllers is expected to grow about as fast as the average through the year 2012. Increasing air traffic will require more controllers to handle the additional work. Employment growth, however, is not expected to keep pace with growth in the number of aircraft flying because of the increasing automation of the air traffic control system and Federal budget constraints. New computerized systems will assist the controller by automatically making many of the routine decisions. This will allow controllers to handle more traffic, thus increasing their productivity. Federal budget constraints also may limit hiring of air traffic controllers.

More job openings are expected due to replacement needs. The majority of today's air traffic controllers will be eligible to retire over the next decade, although not all are expected to do so. Nevertheless, replacement needs will be substantial and will result in hundreds of job opportunities each year for those graduating from the FAA training programs. Despite the increasing number of jobs coming open, competition to get into the FAA training programs is expected to remain keen, as there generally are many more applicants

to get into the schools than there are openings. But those that graduate have good prospects of getting a job as a controller.

Air traffic controllers who continue to meet the proficiency and medical requirements enjoy more job security than do most workers. The demand for air travel and the workloads of air traffic controllers decline during recessions, but controllers seldom are laid off.

### **Earnings**

Median annual earnings of air traffic controllers in 2002 were \$91,600. The middle 50 percent earned between \$65,480 and \$112,550. The lowest 10 percent earned less than \$46,410, and the highest 10 percent earned more than \$131,610.

The average annual salary, excluding overtime earnings, for air traffic controllers in the Federal Government—which employs 90 percent of the total—in nonsupervisory, supervisory, and managerial positions was \$95,700 in 2002. Both the worker's job responsibilities and the complexity of the particular facility determine a controller's pay. For example, controllers who work at the FAA's busiest air traffic control facilities earn higher pay.

Depending on length of service, air traffic controllers receive 13 to 26 days of paid vacation and 13 days of paid sick leave each year, life insurance, and health benefits. In addition, controllers can retire at an earlier age and with fewer years of service than other Federal employees. Air traffic controllers are eligible to retire at age 50 with 20 years of service as an active air traffic controller or after 25 years of active service at any age. There is a mandatory retirement age of 56 for controllers who manage air traffic. However, Federal law provides for exemptions to the mandatory age of 56, up to age 61, for controllers having exceptional skills and experience.

### **Related Occupations**

Airfield operations specialists also are involved in the direction and control of traffic in air transportation.

### **Sources of Additional Information**

For further information on how to qualify and apply for a job as an air traffic controller, contact

► Federal Aviation Administration, 800 Independence Ave., SW., Washington, DC 20591. Internet: <http://www.faa.gov>

# Aircraft Pilots and Flight Engineers

(0\*NET 53-2011.00, 53-2012.00)

## Significant Points

- The best opportunities for jobs will be with the regional airlines and business aviation.
- Pilots usually start with smaller commuter and regional airlines to acquire the experience needed to qualify for higher paying jobs with national airlines.
- Most pilots traditionally have learned to fly in the military, but growing numbers have college degrees with flight training from civilian flying schools that are certified by the Federal Aviation Administration (FAA).

## Nature of the Work

Pilots are highly trained professionals who fly airplanes and helicopters to carry out a wide variety of tasks. Most are *airline pilots, copilots, and flight engineers* who transport passengers and cargo, but 1 out of 5 pilots is a *commercial pilot* involved in more unusual tasks, such as dusting crops, spreading seed for reforestation, testing aircraft, flying passengers and cargo to areas not served by regular airlines, directing firefighting efforts, tracking criminals, monitoring traffic, and rescuing and evacuating injured persons.

Except on small aircraft, two pilots usually make up the cockpit crew. Generally, the most experienced pilot, the *captain*, is in command and supervises all other crew members. The pilot and the copilot, often called the first officer, share flying and other duties, such as communicating with air traffic controllers and monitoring the instruments. Some large aircraft have a third pilot—the *flight engineer*—who assists the other pilots by monitoring and operating many of the instruments and systems, making minor in-flight repairs, and watching for other aircraft. New technology can perform many flight tasks, however, and virtually all new aircraft now fly with only two pilots, who rely more heavily on computerized controls.

Before departure, pilots plan their flights carefully. They thoroughly check their aircraft to make sure that the engines, controls, instruments, and other systems are functioning properly. They also make sure that baggage or cargo has been loaded correctly. They confer with flight dispatchers and aviation weather forecasters to find out about weather conditions en route and at their destination. Based on this information, they choose a route, altitude, and speed that will provide the fastest, safest, and smoothest flight. When flying under instrument flight rules—procedures governing the operation of the aircraft when there is poor visibility—the pilot in command, or the company dispatcher, normally files an instrument flight plan with air traffic control so that the flight can be coordinated with other air traffic.

Takeoff and landing are the most difficult parts of the flight, and require close coordination between the pilot and first officer. For example, as the plane accelerates for takeoff, the pilot concentrates on the runway while the first officer scans the instrument panel. To calculate the speed they must attain to become airborne, pilots consider the altitude of the airport, outside temperature, weight of the plane, and speed and direction of the wind. The moment the plane reaches takeoff speed, the first officer informs the pilot, who then pulls back on the controls to raise the nose of the plane.

Unless the weather is bad, the actual flight is relatively easy. Airplane pilots, with the assistance of autopilot and the flight management computer, steer the plane along their planned route and are monitored by the air traffic control stations they pass along the way. They regularly scan the instrument panel to check their fuel supply, the condition of their engines, and the air-conditioning, hydraulic, and other systems. Pilots may request a change in altitude or route if circumstances dictate. For example, if the ride is rougher than expected, they may ask air traffic control if pilots flying at other altitudes have reported better conditions. If so, they may request an altitude change. This procedure also may be used to find a stronger tailwind or a weaker headwind to save fuel and increase speed.

In contrast, helicopters are used for short trips at relatively low altitude, so pilots must be constantly on the lookout for trees, bridges, powerlines, transmission towers, and other dangerous obstacles. Regardless of the type of aircraft, all pilots must monitor warning devices designed to help detect sudden shifts in wind conditions that can cause crashes.

Pilots must rely completely on their instruments when visibility is poor. On the basis of altimeter readings, they know how high above ground they are and whether they can fly safely over mountains and other obstacles. Special navigation radios give pilots precise information that, with the help of special maps, tells them their exact position. Other very sophisticated equipment provides directions to a point just above the end of a runway and enables pilots to land completely “blind.” Once on the ground, pilots must complete records on their flight for their organization and the FAA report.

The number of nonflying duties that pilots have depends on the employment setting. Airline pilots have the services of large support staffs, and consequently, perform few nonflying duties. Pilots employed by other organizations such as charter operators or businesses have many other duties. They may load the aircraft, handle all passenger luggage to ensure a balanced load, and supervise refueling; other nonflying responsibilities include keeping records, scheduling flights, arranging for major maintenance, and performing minor aircraft maintenance and repairwork.

Some pilots are instructors. They teach their students the principles of flight in ground-school classes and demonstrate how to operate aircraft in dual-controlled planes and helicopters. A few



*One in five pilots is a commercial pilot who performs a wide range of tasks, such as crop-dusting, firefighting, traffic monitoring, and policing from the air.*



specially trained pilots are “examiners” or “check pilots.” They periodically fly with other pilots or pilot’s license applicants to make sure that they are proficient.

### **Working Conditions**

By law, airline pilots cannot fly more than 100 hours a month or more than 1,000 hours a year. Most airline pilots fly an average of 75 hours a month and work an additional 75 hours a month performing nonflying duties. Most pilots have a variable work schedule, working several days on, then several days off. Most spend a considerable amount of time away from home because the majority of flights involve overnight layovers. When pilots are away from home, the airlines provide hotel accommodations, transportation between the hotel and airport, and an allowance for meals and other expenses. Airlines operate flights at all hours of the day and night, so work schedules often are irregular. Flight assignments are based on seniority.

Commercial pilots also may have irregular schedules, flying 30 hours one month and 90 hours the next. Because these pilots frequently have many nonflying responsibilities, they have much less free time than do airline pilots. Except for business pilots, most do not remain away from home overnight. They may work odd hours. Flight instructors may have irregular and seasonal work schedules, depending on their students’ available time and the weather. Instructors frequently work in the evening or on weekends.

Airline pilots, especially those on international routes, often suffer jet lag—fatigue caused by many hours of flying through different time zones. To guard against excessive pilot fatigue that could result in unsafe flying conditions, the FAA requires airlines to allow pilots at least 8 hours of uninterrupted rest in the 24 hours before finishing their flight duty. The work of test pilots, who check the flight performance of new and experimental planes, may be dangerous. Pilots who are crop dusters may be exposed to toxic chemicals and seldom have the benefit of a regular landing strip. Helicopter pilots involved in rescue and police work may be subject to personal injury.

Although flying does not involve much physical effort, the mental stress of being responsible for a safe flight, regardless of the weather, can be tiring. Pilots must be alert and quick to react if something goes wrong, particularly during takeoff and landing.

### **Employment**

Civilian aircraft pilots and flight engineers held about 100,000 jobs in 2002. About 79,000 worked as airline pilots, copilots, and flight engineers. The remainder were commercial pilots who worked as flight instructors at local airports or for large businesses that fly company cargo and executives in their own airplanes or helicopters. Some commercial pilots flew small planes for air-taxi companies, usually to or from lightly traveled airports not served by major airlines. Others worked for a variety of businesses, performing tasks such as dusting crops, inspecting pipelines, or conducting sightseeing trips. Federal, State, and local governments also employed pilots. A few pilots were self-employed.

Pilots are located across the country, but airline pilots usually are based near major metropolitan airports or airports operating as hubs for the major airlines.

### **Training, Other Qualifications, and Advancement**

All pilots who are paid to transport passengers or cargo must have a commercial pilot’s license with an instrument rating issued by the FAA. Helicopter pilots must hold a commercial pilot’s certificate with a helicopter rating. To qualify for these licenses, applicants must be at least 18 years old and have at least 250 hours of flight

experience. The experience required can be reduced through participation in certain flight school curricula approved by the FAA. Applicants also must pass a strict physical examination to make sure that they are in good health and have 20/20 vision with or without glasses, good hearing, and no physical handicaps that could impair their performance. They must pass a written test that includes questions on the principles of safe flight, navigation techniques, and FAA regulations, and must demonstrate their flying ability to FAA or designated examiners.

To fly during periods of low visibility, pilots must be rated by the FAA to fly by instruments. Pilots may qualify for this rating by having 105 hours of flight experience, including 40 hours of experience in flying by instruments; they also must pass a written examination on procedures and FAA regulations covering instrument flying and demonstrate to an examiner their ability to fly by instruments.

Airline pilots must fulfill additional requirements. Pilots must have an airline transport pilot’s license. Applicants for this license must be at least 23 years old and have a minimum of 1,500 hours of flying experience, including night and instrument flying, and must pass FAA written and flight examinations. Usually, they also have one or more advanced ratings, such as multiengine aircraft or aircraft-type ratings, dependent upon the requirements of their particular flying jobs. Because pilots must be able to make quick decisions and accurate judgments under pressure, many airline companies reject applicants who do not pass required psychological and aptitude tests. All licenses are valid so long as a pilot can pass the periodic physical and eye examinations and tests of flying skills required by Federal Government and company regulations.

The U.S. Armed Forces have always been an important source of trained pilots for civilian jobs. Military pilots gain valuable experience on jet aircraft and helicopters, and persons with this experience usually are preferred for civilian pilot jobs. This primarily reflects the extensive flying time military pilots receive. Persons without Armed Forces training may become pilots by attending flight schools or by taking lessons from individual FAA-certified flight instructors. The FAA has certified about 600 civilian flying schools, including some colleges and universities that offer degree credit for pilot training. Over the projection period, trained pilots leaving the military are not expected to increase very much in number as the need for pilots grows in civilian aviation. As a result, FAA-certified schools will train a larger share of pilots than in the past.

Although some small airlines will hire high school graduates, most airlines require at least 2 years of college and prefer to hire college graduates. In fact, most entrants to this occupation have a college degree. Because the number of college educated applicants continues to increase, many employers are making a college degree an educational requirement.

Depending on the type of aircraft, new airline pilots start as first officers or flight engineers. Although some airlines favor applicants who already have a flight engineer’s license, they may provide flight engineer training for those who have only the commercial license. Many pilots begin with smaller regional or commuter airlines, where they obtain experience flying passengers on scheduled flights into busy airports in all weather conditions. These jobs often lead to higher paying jobs with bigger, national airlines.

Initial training for airline pilots includes a week of company indoctrination, 3 to 6 weeks of ground school and simulator training, and 25 hours of initial operating experience, including a check-ride with an FAA aviation safety inspector. Once trained and “on the line,” pilots are required to attend recurrent training and simulator checks twice a year throughout their career.

Organizations other than airlines usually require less flying experience. However, a commercial pilot’s license is a minimum re-

quirement, and employers prefer applicants who have experience in the type of craft they will be flying. New employees usually start as first officers, or fly less sophisticated equipment. Test pilots often are required to have an engineering degree.

Advancement for all pilots usually is limited to other flying jobs. Many pilots start as flight instructors, building up their flying hours while they earn money teaching. As they become more experienced, these pilots occasionally fly charter planes or perhaps get jobs with small air transportation firms, such as air-taxi companies. Some advance to flying corporate planes. A small number get flight engineer jobs with the airlines.

In the airlines, advancement usually depends on seniority provisions of union contracts. After 1 to 5 years, flight engineers advance according to seniority to first officer and, after 5 to 15 years, to captain. Seniority also determines which pilots get the more desirable routes. In a nonairline job, a first officer may advance to pilot and, in large companies, to chief pilot or director of aviation in charge of aircraft scheduling, maintenance, and flight procedures.

### **Job Outlook**

The passenger airline industry is undergoing many changes, with some airlines posting increases in passenger traffic and adding routes while others are cutting back. Overall, the employment of aircraft pilots is projected to increase about as fast as average for all occupations through 2012. In the long run, demand for air travel is expected to track increases in the population and growth of the economy. In the short run, however, employment of pilots is generally sensitive to cyclical swings in the economy. During recessions, when a decline in the demand for air travel forces airlines to curtail the number of flights, airlines may temporarily furlough some pilots.

After September 11, 2001, air travel was severely depressed. A number of the major airlines were forced to reduce schedules, lay-off pilots, and even declare bankruptcy. At the same time, hiring continued at regional and low-fare airlines. It is expected that job opportunities will continue to be better with the regional airlines and low-fare carriers, which are growing faster than the more well-known major airlines. Opportunities with air cargo carriers also are expected to be good due to increasing security requirements for shipping freight on passenger airlines and growth in e-business.

Pilots attempting to get jobs at the major airlines will face strong competition, as those firms tend to attract many more applicants than they have jobs. They also will have to compete with laid off pilots for any available jobs. Pilots who have logged the greatest number of flying hours in the more sophisticated equipment typically have the best prospects. For this reason, military pilots often have an advantage over other applicants. However, prior to September 11, 2001, some airlines reported a shortage of qualified pilots to operate the most sophisticated aircraft. Thus, when hiring improves, jobseekers with the most FAA licenses will have a competitive advantage. Opportunities for pilot jobs should be better at smaller airlines and in corporate travel.

The number of flight engineers is projected to decline through 2012 as new planes needing only two pilots replace older planes that required flight engineers. Pilots also will experience some productivity improvements as airlines switch to larger planes and adopt the low-fare carrier model that emphasizes faster turnaround times for flights, keeping more pilots in the air rather than waiting on the ground.

### **Earnings**

Earnings of aircraft pilots and flight engineers vary greatly depending whether they work as airline or commercial pilots. Earnings of airline pilots are among the highest in the Nation, and depend on factors such as the type, size, and maximum speed of the plane and

the number of hours and miles flown. For example, pilots who fly jet aircraft usually earn higher salaries than do pilots who fly turbo-props. Airline pilots and flight engineers may earn extra pay for night and international flights. In 2002, median annual earnings of airline pilots, copilots, and flight engineers were \$109,580. The lowest 10 percent earned less than \$55,800. More than 25 percent earned over \$145,000.

Median annual earnings of commercial pilots were \$47,970 in 2002. The middle 50 percent earned between \$33,830 and \$70,140. The lowest 10 percent earned less than \$26,100, and the highest 10 percent earned more than \$101,460.

Airline pilots usually are eligible for life and health insurance plans financed by the airlines. They also receive retirement benefits and, if they fail the FAA physical examination at some point in their careers, they get disability payments. In addition, pilots receive an expense allowance, or "per diem," for every hour they are away from home. Some airlines also provide allowances to pilots for purchasing and cleaning their uniforms. As an additional benefit, pilots and their immediate families usually are entitled to free or reduced-fare transportation on their own and other airlines.

More than half of all aircraft pilots are members of unions. Most of the pilots who fly for the major airlines are members of the Airline Pilots Association, International, but those employed by one major airline are members of the Allied Pilots Association. Some flight engineers are members of the Flight Engineers' International Association.

### **Related Occupations**

Although they are not in the cockpit, air traffic controllers and airfield operation specialists also play an important role in making sure flights are safe and on schedule, and participate in many of the decisions that pilots must make.

### **Sources of Additional Information**

Information about job opportunities, salaries for a particular airline, and qualifications required may be obtained by writing to the personnel manager of the airline.

For information on airline pilots, contact:

- ▶ Air Line Pilots Association, 533 Herndon Parkway, Herndon, VA 22070..
- ▶ Air Transport Association of America, Inc., 1301 Pennsylvania Ave. NW., Suite 1100, Washington, DC 20004.

For information on helicopter pilots, contact:

- ▶ Helicopter Association International, 1635 Prince Street, Alexandria, VA 22314.

For information about job opportunities in companies other than airlines, consult the classified section of aviation trade magazines and apply to companies that operate aircraft at local airports.

## Bus Drivers

(0\*NET 53-3021.00, 53-3022.00)

### Significant Points

- Opportunities should be good, particularly for schoolbus driver jobs.
- A commercial driver's license is required to operate a bus.
- Work schedules vary considerably among various types of bus drivers.
- Bus drivers must possess strong customer service skills, including communication skills and the ability to manage large groups of people with varying needs.

### Nature of the Work

Every day, millions of Americans every day leave the driving to bus drivers. Bus drivers are essential in providing passengers with an alternative to their automobiles or other forms of transportation. Intercity bus drivers transport people between regions of a State or of the country; local-transit bus drivers do so within a metropolitan area or county; motor coach drivers take customers on charter excursions and tours; and schoolbus drivers take children to and from schools and related events.

Drivers pick up and drop off passengers at bus stops, stations, or, in the case of students, at regularly scheduled neighborhood locations based on strict time schedules. Drivers must operate vehicles safely, especially when traffic is heavier than normal. However, they cannot let light traffic put them ahead of schedule so that they miss passengers.

*Local-transit and intercity bus drivers* report to their assigned terminal or garage, where they stock up on tickets or transfers and prepare trip report forms. In some transportation firms, maintenance departments are responsible for keeping vehicles in good condition. In others, drivers may check their vehicle's tires, brakes, windshield wipers, lights, oil, fuel, and water supply before beginning their routes. Drivers usually verify that the bus has safety equipment, such as fire extinguishers, first aid kits, and emergency reflectors in case of an emergency.

During the course of their shift, local-transit and intercity bus drivers collect fares; answer questions about schedules, routes, and transfer points; and sometimes announce stops. Intercity bus drivers may make only a single one-way trip to a distant city or a round trip each day. They may stop at towns just a few miles apart or only at large cities hundreds of miles apart. Local-transit bus drivers may make several trips each day over the same city and suburban streets, stopping as frequently as every few blocks.

Local-transit bus drivers submit daily trip reports with a record of trips, significant schedule delays, and mechanical problems. Intercity drivers who drive across State or national boundaries must comply with U.S. Department of Transportation regulations. These include completing vehicle inspection reports and recording distances traveled and the periods they spend driving, performing other duties, and off duty.

*Motorcoach drivers* transport passengers on charter trips and sightseeing tours. Drivers routinely interact with customers and tour guides to make the trip as comfortable and informative as possible. They are directly responsible for keeping to strict schedules, adhering to the guidelines of the tours' itinerary, and ensuring the overall success of the trip. These drivers act as customer service representative, tour guide, program director, and safety guide. Trips

frequently last more than 1 day. The driver may be away for more than a week if assigned to an extended tour. As with all drivers who drive across State or national boundaries, motorcoach drivers must comply with Department of Transportation regulations.

*Schoolbus drivers* usually drive the same routes each day, stopping to pick up pupils in the morning and return them to their homes in the afternoon. Some schoolbus drivers also transport students and teachers on field trips or to sporting events. In addition to driving, some schoolbus drivers work part time in the school system as janitors, mechanics, or classroom assistants when not driving buses.

Bus drivers must be alert in order to prevent accidents, especially in heavy traffic or in bad weather, and to avoid sudden stops or swerves that jar passengers. Schoolbus drivers must exercise particular caution when children are getting on or off the bus. They must maintain order on their bus and enforce school safety standards by allowing only students to board. In addition, they must know and enforce rules regarding student conduct used throughout the school system.

Schoolbus drivers do not always have to report to an assigned terminal or garage. In some cases, they have the choice of taking their bus home, or parking it in a more convenient area. Schoolbus drivers do not collect fares. Instead, they prepare weekly reports on the number of students, trips or "runs," work hours, miles, and fuel consumption. Their supervisors set time schedules and routes for the day or week.

### Working Conditions

Driving a bus through heavy traffic while dealing with passengers is more stressful and fatiguing than physically strenuous. Many drivers enjoy the opportunity to work without direct supervision, with full responsibility for their bus and passengers. To improve working conditions and retain drivers, many buslines provide ergonomically designed seats and controls for drivers.

Intercity bus drivers may work nights, weekends, and holidays and often spend nights away from home, during which they stay in hotels at company expense. Senior drivers with regular routes have regular weekly work schedules, but others do not have regular schedules and must be prepared to report for work on short notice. They report for work only when called for a charter assignment or to drive extra buses on a regular route. Intercity bus travel and charter work tends to be seasonal. From May through August, drivers may work the maximum number of hours per week that regulations al-



*Drivers must operate vehicles safely and still try to maintain their schedule.*

low. During winter, junior drivers may work infrequently, except for busy holiday travel periods, and may be furloughed at times.

Schoolbus drivers work only when school is in session. Many work 20 hours a week or less, driving one or two routes in the morning and afternoon. Drivers taking field or athletic trips, or who also have midday kindergarten routes, may work more hours a week. As more students with a variety of physical and behavioral disabilities assimilate into mainstream schools, schoolbus drivers must learn how to accommodate their special needs.

Regular local-transit bus drivers usually have a 5-day workweek; Saturdays and Sundays are considered regular workdays. Some drivers work evenings and after midnight. To accommodate commuters, many work “split shifts,” for example, 6 a.m. to 10 a.m. and 3 p.m. to 7 p.m., with time off in between.

Tour and charter bus drivers may work any day and all hours of the day, including weekends and holidays. Their hours are dictated by the charter trips booked and the schedule and prearranged itinerary of tours. However, like all bus drivers, their weekly hours must be consistent with the Department of Transportation’s rules and regulations concerning hours of service. For example, a driver may drive for 10 hours and work for up to 15 hours—including driving and nondriving duties—before having 8 hours off-duty. A driver may not drive after having worked for 70 hours in the past 8 days. Most drivers are required to document their time in a logbook.

### **Employment**

Bus drivers held about 654,000 jobs in 2002. Over one-third worked part time. More than two-thirds of all bus drivers were schoolbus drivers working primarily for school systems or for companies providing schoolbus services under contract. Most of the remainder worked for private and local government transit systems; some also worked for intercity and charter buslines.

### **Training, Other Qualifications, and Advancement**

Bus driver qualifications and standards are established by State and Federal regulations. All drivers must comply with Federal regulations and with any State regulations that exceed Federal requirements. Federal regulations require drivers who operate commercial motor vehicles to hold a commercial driver’s license (CDL) from the State in which they live.

To qualify for a commercial driver’s license, applicants must pass a written test on rules and regulations and then demonstrate that they can operate a bus safely. A national databank permanently records all driving violations incurred by persons who hold commercial licenses. A State may not issue a commercial driver’s license to a driver who has already had a license suspended or revoked in another State. A driver with a CDL must accompany trainees until the trainees get their own CDL. Information on how to apply for a commercial driver’s license may be obtained from State motor vehicle administrations.

While many States allow those who are 18 years of age and older to drive buses within State borders, the Department of Transportation establishes minimum qualifications for bus drivers engaged in interstate commerce. Federal Motor Carrier Safety Regulations require drivers to be at least 21 years old and to pass a physical examination once every 2 years. The main physical requirements include good hearing, at least 20/40 vision with or without glasses or corrective lenses, and a 70-degree field of vision in each eye. Drivers must not be colorblind. They must be able to hear a forced whisper in one ear at not less than 5 feet, with or without a hearing aide. Drivers must have normal use of arms and legs and normal blood pressure. They may not use any controlled substances, unless prescribed by a licensed physician. Persons with

epilepsy or diabetes controlled by insulin are not permitted to be interstate bus drivers. Federal regulations also require employers to test their drivers for alcohol and drug use as a condition of employment, and require periodic random tests of the drivers while they are on duty. In addition, a driver must not have been convicted of a felony involving the use of a motor vehicle; a crime involving drugs; driving under the influence of drugs or alcohol; or hit-and-run driving that resulted in injury or death. All drivers must be able to read and speak English well enough to read road signs, prepare reports, and communicate with law enforcement officers and the public. In addition, drivers must take a written examination on the Motor Carrier Safety Regulations of the U.S. Department of Transportation.

Many employers prefer high school graduates and require a written test of ability to follow complex bus schedules. Many intercity and public transit bus companies prefer applicants who are at least 24 years of age; some require several years of experience driving a bus or truck. In some States, schoolbus drivers must pass a background investigation to uncover any criminal record or history of mental problems.

Because bus drivers deal with passengers, they must be courteous. They need an even temperament and emotional stability because driving in heavy, fast-moving, or stop-and-go traffic and dealing with passengers can be stressful. Drivers must have strong customer service skills, including communication skills and the ability to coordinate and manage large groups of people.

Most intercity bus companies and local-transit systems give driver trainees 2 to 8 weeks of classroom and “behind-the-wheel” instruction. In the classroom, trainees learn Department of Transportation and company work rules, safety regulations, State and municipal driving regulations, and safe driving practices. They also learn to read schedules, determine fares, keep records, and deal courteously with passengers.

Schoolbus drivers also are required to obtain a commercial driver’s license from the State in which they live. Many persons who become school bus drivers have never driven any vehicle larger than an automobile. They receive between 1 and 4 weeks of driving instruction plus classroom training on State and local laws, regulations, and policies of operating schoolbuses; safe driving practices; driver-pupil relations; first aid; special needs of disabled and emotionally troubled students; and emergency evacuation procedures. Schoolbus drivers also must be aware of the school system’s rules for discipline and conduct for bus drivers and the students they transport.

During training, bus drivers practice driving on set courses. They practice turns and zigzag maneuvers, backing up, and driving in narrow lanes. Then, they drive in light traffic and, eventually, on congested highways and city streets. They also make trial runs, without passengers, to improve their driving skills and learn the routes. Local-transit trainees memorize and drive each of the runs operating out of their assigned garage. New drivers begin with a “break-in” period. They make regularly scheduled trips with passengers, accompanied by an experienced driver who gives helpful tips, answers questions, and evaluates the new driver’s performance.

New intercity and local-transit drivers are usually placed on an “extra” list to drive charter runs, extra buses on regular runs, and special runs (for example, during morning and evening rush hours and to sports events). They also substitute for regular drivers who are ill or on vacation. New drivers remain on the extra list, and may work only part time, for perhaps several years, until they have enough seniority to be given a regular run.

Senior drivers may bid for the runs that they prefer, such as those with more work hours, lighter traffic, weekends off, or, in the case of intercity bus drivers, higher earnings or fewer workdays per week.

Opportunities for promotion are generally limited. However, experienced drivers may become supervisors or dispatchers, assigning buses to drivers, checking whether drivers are on schedule, re-routing buses to avoid blocked streets or other problems, and dispatching extra vehicles and service crews to scenes of accidents and breakdowns. In transit agencies with rail systems, drivers may become train operators or station attendants. A few drivers become managers. Promotion in publicly owned bus systems is often by competitive civil service examination. Some motorcoach drivers purchase their own equipment and open their own business.

### Job Outlook

Persons seeking jobs as bus drivers should encounter good opportunities. Individuals who have good driving records and who are willing to work a part-time or irregular schedule should have the best job prospects. Schoolbus driving jobs, particularly in rapidly growing suburban areas, should be easiest to acquire because most are part-time positions with high turnover and minimal training requirements. Those seeking higher paying intercity and public transit bus driver positions may encounter competition. Employment prospects for motorcoach drivers will fluctuate with the cyclical nature of the economy, as demand for motorcoach services is very dependent on tourism.

Employment of bus drivers is expected to increase about as fast as the average for all occupations through the year 2012, primarily to meet the transportation needs of the growing general population and the school-age population. Many additional job openings are expected to occur each year because of the need to replace workers who take jobs in other occupations or who retire or leave the occupation for other reasons.

The number of schoolbus drivers is expected to increase as a result of growth in elementary and secondary school enrollments. In addition, more schoolbus drivers will be needed as more of the Nation's population is concentrated in suburban areas, where students generally ride schoolbuses, and less in central cities, where transportation is not provided for most pupils.

Employment growth of local-transit bus drivers will be spurred by increases in the number of passengers and in funding levels. Funding levels for public transit may fluctuate as the public's interest in transportation changes. There may be competition for positions with more regular hours and steady driving routes.

Competition from other modes of transportation—airplane, train, or automobile—will temper job growth among intercity bus drivers. Most growth in intercity bus transportation will occur in group charters to locations not served by other modes of transportation. Like automobiles, buses have a far greater number of possible destinations than airplanes or trains. Due to greater cost savings and convenience over automobiles, buses usually are the most economical option for tour groups traveling to out-of-the-way destinations.

Full-time bus drivers are rarely laid off during recessions. However, employers might reduce hours of part-time local-transit and intercity bus drivers if the number of passengers decreases, because fewer extra buses would be needed. Seasonal layoffs are common. Many intercity bus drivers with little seniority, for example, are furloughed during the winter when regular schedule and charter business declines; schoolbus drivers seldom work during the summer or school holidays.

### Earnings

Median hourly earnings of transit and intercity bus drivers were \$14.22 in 2002. The middle 50 percent earned between \$10.51 and \$18.99 an hour. The lowest 10 percent earned less than \$8.37, and the highest 10 percent earned more than \$22.51 an hour. Median hourly earnings in the industries employing the largest numbers of transit and intercity bus drivers in 2002 were as follows:

Local government .....	\$16.95
Interurban and rural bus transportation .....	15.15
Urban transit systems .....	15.02
School and employee bus transportation .....	11.29
Charter bus industry .....	10.64

Median hourly earnings of schoolbus drivers were \$10.77 in 2002. The middle 50 percent earned between \$7.73 and \$13.53 an hour. The lowest 10 percent earned less than \$6.24, and the highest 10 percent earned more than \$16.44 an hour. Median hourly earnings in the industries employing the largest numbers of schoolbus drivers in 2002 were as follows:

School and employee bus transportation .....	\$11.44
Local government .....	11.09
Elementary and secondary schools .....	10.50
Other transit and ground passenger transportation .....	9.79
Individual and family services .....	8.27

The benefits bus drivers receive from their employers vary greatly. Most intercity and local-transit bus drivers receive paid health and life insurance, sick leave, vacation leave, and free bus rides on any of the regular routes of their line or system. Schoolbus drivers receive sick leave, and many are covered by health and life insurance and pension plans. Because they generally do not work when school is not in session, they do not get vacation leave. In a number of States, local-transit and schoolbus drivers employed by local governments are covered by a statewide public employee pension system. Increasingly, school systems extend benefits to drivers who supplement their driving by working in the school system during off hours.

Most intercity and many local-transit bus drivers are members of the Amalgamated Transit Union. Local-transit bus drivers in New York and several other large cities belong to the Transport Workers Union of America. Some drivers belong to the United Transportation Union or the International Brotherhood of Teamsters.

### Related Occupations

Other workers who drive vehicles on highways and city streets include taxi drivers and chauffeurs and truck drivers and driver/sales workers.

### Sources of Additional Information

For information on employment opportunities, contact local-transit systems, intercity buslines, school systems, or the local offices of the State employment service.

General information on schoolbus driving is available from:

► National School Transportation Association, 625 Slaters Lane, Suite 205, Alexandria, VA 22314.

General information on local-transit bus driving is available from:

► American Public Transportation Association, 1666 K St. NW., Suite 1100, Washington, DC 20006.

General information on motorcoach driving is available from:

► United Motorcoach Association, 113 S. West St., 4th Floor, Alexandria, VA 22314.

# Farmers, Ranchers, and Agricultural Managers

(0\*NET 11-9011.01, 11-9011.02, 11-9011.03, 11-9012.00)

## Significant Points

- Modern farming requires knowledge of new developments in agriculture, and work experience acquired through growing up on a farm or through a small number of internships now available.
- Overall employment is projected to decline because of increasing productivity and consolidation of farms.
- Aquaculture and horticulture should provide better employment opportunities.
- Developments in value-added marketing and organic farming are making small-scale farming economically viable again.

## Nature of the Work

American farmers, ranchers, and agricultural managers direct the activities of one of the world's largest and most productive agricultural sectors. They produce enough food and fiber to meet the needs of the United States and produce a surplus for export.

*Farmers and ranchers* own and operate mainly family-owned farms. They may also lease land from a landowner and operate it as a working farm. The type of farm they operate determines their specific tasks. On crop farms—farms growing grain, cotton, and other fibers, fruit, and vegetables—farmers are responsible for preparing, tilling, planting, fertilizing, cultivating, spraying, and harvesting. After the harvest, they make sure the crops are properly packaged, stored, or marketed. Livestock, dairy, and poultry farmers must feed, and care for the animals and keep barns, pens, coops, and other farm buildings clean and in good condition. They also plan and oversee breeding and marketing activities. Horticultural specialty farmers oversee the production of ornamental plants, nursery products—such as flowers, bulbs, shrubbery, and sod—and fruits and vegetables grown in greenhouses. Aquaculture farmers raise fish and shellfish in marine, brackish, or fresh water, usually in ponds, floating net pens, raceways, or recirculating systems. They stock, feed, protect, and otherwise manage aquatic life sold for consumption or used for recreational fishing.

Responsibilities of farmers and ranchers range from caring for livestock, to operating machinery, to maintaining equipment and facilities. The size of the farm or ranch often determines which of these tasks farmers and ranchers will handle themselves. Operators of small farms usually perform all tasks, physical and administrative. They keep records for management and tax purposes, service machinery, maintain buildings, and grow vegetables and raise animals. Operators of large farms, on the other hand, have employees who help with the physical work that small-farm operators do themselves. Although employment on most farms is limited to the farmer and one or two family workers or hired employees, some large farms have 100 or more full-time and seasonal workers. Some of these employees are in nonfarm occupations, working as truck drivers, sales representatives, bookkeepers, and computer specialists.

*Agricultural managers* manage the day-to-day activities of one or more farms, ranches, nurseries, timber tracts, greenhouses, and other agricultural establishments for farmers, absentee landowners, or corporations. Their duties and responsibilities vary widely, but are concentrated on the business aspects of running a farm. On

small farms, they may oversee the entire operation, while on large farms they may oversee a single activity, such as marketing. Agricultural managers usually do not perform production activities; instead they hire and supervise farm and livestock workers, who perform most of the daily production tasks. In these cases, managers may establish output goals; determine financial constraints; monitor production and marketing; hire, assign, and supervise workers; determine crop transportation and storage requirements; and oversee maintenance of the property and equipment.

Farmers, ranchers, and agricultural managers make many managerial decisions. Farm output is strongly influenced by the weather, disease, fluctuations in prices of domestic and foreign farm products, and Federal farm programs. In crop production operations, farmers and managers usually determine the best time to plant seed, apply fertilizer and chemicals, harvest, and market. They use different strategies to protect themselves from unpredictable changes in the markets for agricultural products. Many farmers and managers carefully plan the combination of crops they grow so that if the price of one crop drops, they will have sufficient income from another to make up for the loss. While most farm output is sold to middlemen—primarily food processing companies—some farmers, particularly operators of smaller farms, may choose to sell their goods directly through farmers' markets, or use cooperatives to reduce their financial risk and to gain a larger share of consumers' expenditures on food. For example, in Community Supported Agriculture (CSA), cooperatives sell to consumers shares of a harvest prior to the planting season, thus freeing the farmer from having to bear all the financial risks and ensuring the farmer a market for the produce of the coming season.

Farmers, ranchers, and agricultural managers also negotiate with banks and other credit lenders to get the best financing deals for their equipment as well as their livestock and seed. They must also keep abreast of constantly changing prices for their products and be able to manage the risk of fluctuating prices. Those who plan ahead may be able to store their crops or keep their livestock to take advantage of better prices later in the year. Those who participate in the risky futures market, where contracts on agricultural goods are bought and sold at specified prices in the future, can minimize the risk of sudden price changes by buying futures contracts that guarantee they will get at least a certain price for their agricultural goods when they are ready to sell.

Like other businesses, farming operations have become more complex in recent years, so many farmers use computers to keep



*Getting a crop to market is a prime responsibility of farmers and agricultural managers.*

financial and inventory records. They also use computer databases and spreadsheets to manage breeding, dairy, and other farm operations.

### **Working Conditions**

The work of farmers, ranchers, and agricultural managers is often strenuous; work hours are frequently long; and they rarely have days off during the planting, growing, and harvesting seasons. Nevertheless, for those who enter farming or ranching, the disadvantages are outweighed by the quality of life in a rural area, working outdoors, being self-employed, and making a living working the land. Farmers and farm managers on crop farms usually work from sunrise to sunset during the planting and harvesting seasons. During the rest of the year they plan next season's crops, market their output, and repair machinery; some may earn additional income by working a second job off the farm.

On livestock producing farms and ranches, work goes on throughout the year. Animals, unless they are grazing, must be fed and watered every day, and dairy cows must be milked two or three times a day. Many livestock and dairy farmers monitor and attend to the health of their herds, which may include assisting in the birthing of animals. Such farmers rarely get the chance to get away unless they hire an assistant or arrange for a temporary substitute.

Farmers who grow produce and perishables have different demands on their time. For example, organic farmers must maintain cover crops during the cold months, which keep them occupied with farming beyond the typical growing season.

Farm work also can be hazardous. Tractors and other farm machinery can cause serious injury, and workers must be constantly alert on the job. The proper operation of equipment and handling of chemicals is necessary to avoid accidents and protect the environment.

On very large farms, farmers spend substantial time meeting with farm managers or farm supervisors in charge of various activities. Professional farm managers overseeing several farms may divide their time between traveling to meet farmers or landowners and planning the farm operations in their offices. As farming practices and agricultural technology become more sophisticated, farmers and farm managers are spending more time in offices and at computers, where they electronically manage many aspects of their businesses. Some farmers also spend time at conferences, particularly during the winter months, exchanging information.

### **Employment**

Farmers, ranchers, and agricultural managers held nearly 1.4 million jobs in 2002. About 84 percent were self-employed. Most farmers, ranchers, and agricultural managers oversee crop production activities, while others manage livestock and dairy production. A smaller number are involved in agricultural services, such as contract harvesting and farm labor contracting.

The soil, topography of the land, and climate determine the type of farming and ranching done in a particular area. For example, California, Wisconsin, New York, and Pennsylvania lead the country in milk production, while Iowa, Ohio, Pennsylvania, and California lead in egg production. Texas, California, Mississippi, Georgia, and Arizona are the biggest cotton producers; and Kansas, North Dakota, Washington, and Montana are the biggest wheat producers.

### **Training, Other Qualifications, and Advancement**

Growing up on a family farm and participating in agricultural programs for young people (sponsored by the National FFA Organization, formerly known as the Future Farmers of America, or the 4-H

youth educational programs, or other educational opportunities offered by the Extension Service) are important sources of training for those interested in pursuing agriculture as a career. However, modern farming requires increasingly complex scientific, business, and financial decisions. Therefore, even people who were raised on farms must acquire the appropriate education.

Not all agricultural managers grew up on farms or ranches. For these people, a bachelor's degree in business with a concentration in agriculture is important. In addition to formal education, they need several years of work experience in the different aspects of farm and ranch operations in order to qualify for an agricultural manager position.

Students should select the college most appropriate to their specific interests and location. In the United States, all State university systems have one land-grant university with a school of agriculture. Common programs of study include agronomy, dairy science, agricultural economics and business, horticulture, crop and fruit science, and animal science. For students interested in aquaculture, formal programs are available, and include coursework in fisheries biology, fish culture, hatchery management and maintenance, and hydrology. Whatever one's interest, the college curriculum should include courses in agricultural production, marketing, and economics.

Professional status can be enhanced through voluntary certification as an Accredited Farm Manager (AFM) by the American Society of Farm Managers and Rural Appraisers. Certification requires several years of farm management experience, the appropriate academic background—a bachelor's degree or, preferably, a master's degree in a field of agricultural science—and the passing of courses and examinations relating to business, financial, and legal aspects of farm and ranch management.

Farmers, ranchers, and agricultural managers need to keep abreast of continuing advances in agricultural methods both in the United States and abroad, as well as changes in governmental regulations that may impact methods or markets for particular crops. Besides print journals that inform the agricultural community, the spread of the Internet allows quick access to the latest developments in areas such as agricultural marketing, legal arrangements, or growing crops, vegetables, and livestock. Electronic mail, on-line journals, and newsletters from agricultural organizations also speed the exchange of information directly between farming associations and individual farmers.

Farmers, ranchers, and agricultural managers also must have enough technical knowledge of crops, growing conditions, and plant diseases to make decisions ensuring the successful operation of their farms. A rudimentary knowledge of veterinary science, as well as animal husbandry, is important for livestock and dairy farmers. Knowledge of the relationship between farm operations—for example, the use of pesticides—and environmental conditions is essential. Mechanical aptitude and the ability to work with tools of all kinds are also valuable skills for the operator of a small farm, who often maintains and repairs machinery or farm structures.

Farmers, ranchers, and agricultural managers need the managerial skills necessary to organize and operate a business. A basic knowledge of accounting and bookkeeping is essential in keeping financial records, while knowledge of credit sources is vital for buying seed, fertilizer, and other inputs necessary for planting. It is also necessary to be familiar with complex safety regulations and requirements of governmental agricultural support programs. Computer skills are increasingly important, especially on large farms, where computers are widely used for recordkeeping and business analysis. For example, some farmers, ranchers, and agricultural managers use personal computers to access the Internet to get the

latest information on prices of farm products and other agricultural news. Additionally, skills in personnel management, communication, and conflict resolution are equally important in the operation of a farm or ranch business.

High school training should include courses in mathematics and in biology and other life sciences. Completion of a 2-year degree, and preferably a 4-year bachelor's degree program in a college of agriculture, is becoming increasingly important. But even after obtaining formal education, novices may need to spend time working under an experienced farmer to learn how to put into practice the skills learned through academic training. A small number of farms offer, on a formal basis, apprenticeships to help young people acquire such practical skills.

### **Job Outlook**

Market pressures and low prices for many agricultural goods, will cause more farms to go out of business over the 2002-2012 period. The complexity of modern farming and keen competition among farmers leaves little room for the marginally successful farmer. Therefore, the long-term trend toward consolidation of farms into fewer and larger farms is expected to continue over the 2002-12 period, and result in the continued decline in employment of self-employed farmers and ranchers and slower than average growth in employment of salaried agricultural managers. As land, machinery, seed, and chemicals become more expensive, only well capitalized farmers and corporations are able to acquire many of the farms that become available. It is the larger, more productive farms that are better able to withstand the adverse effects of climate and price fluctuations upon farm output and income and to cover operating costs for livestock, feed, seed, and fuel, for example. Larger farms also have advantages in competing for government subsidies and payments.

In addition, the agriculture sector continues to produce more with fewer workers. Increasing productivity in the U.S. agricultural production industry is expected to allow greater domestic consumption needs and export requirements to be met with fewer farmers, ranchers, and agricultural managers overall. The overwhelming majority of job openings for self-employed farmers and ranchers will result from the need to replace farmers who retire or leave the occupation for economic or other reasons.

Despite the expected continued consolidation of farm land and the projected decline in overall employment of farmers, ranchers, and agricultural managers, an increasing number of small-scale farmers have developed successful market niches that involve personalized, direct contact with their customers. Many are finding opportunities in organic food production, as more consumers demand food grown without pesticides or chemicals. Others use farmers' markets that cater directly to urban and suburban consumers, allowing the farmers to capture a greater share of consumers' food dollars. Some small-scale farmers, such as some dairy farmers, belong to collectively owned marketing cooperatives that process and sell their product. Other farmers participate in community-supported agriculture cooperatives that allow consumers to directly buy a share of the farmer's harvest.

Aquaculture also should continue to provide some new employment opportunities over the 2002-12 period. Overfishing has resulted in declining ocean catches even as public demand for the consumption of seafood continues to grow. This has spurred the growth of aquaculture farms that raise selected aquatic species—such as shrimp, salmon, trout and catfish—in pens or ponds. Aquaculture's presence in even landlocked States has increased as farmers attempt to diversify and cater to the growing demand for fish by consumers. Additionally, growing consumer demand for

horticulture products, such as flowers and ornamentals, trees, shrubs, and other non-edibles, is expected to produce better employment opportunities for greenhouse and nursery farmers and managers.

### **Earnings**

Incomes of farmers and ranchers vary greatly from year to year because prices of farm products fluctuate depending upon weather conditions and other factors that influence the quantity and quality of farm output and the demand for those products. A farm that shows a large profit in one year may show a loss in the following year. Farmers, however, often receive government subsidies or other payments that supplement their incomes and reduce some of the risk of farming. Price supports for dairy farmers, though, are being phased out and may result in lower incomes for these farmers. Many farmers—primarily operators of small farms—have income from off-farm business activities or careers, often greater than that of their farm income.

Full-time, salaried farm managers had median annual earnings of \$43,740 in 2002. The middle half earned between \$32,620 and \$59,330. The highest paid 10 percent earned more than \$81,100, and the lowest paid 10 percent earned less than \$24,410.

Farmers and self-employed farm managers make their own provisions for benefits. As members of farm organizations, they may derive benefits such as group discounts on health and life insurance premiums.

### **Related Occupations**

Farmers, ranchers, and agricultural managers strive to improve the quality of agricultural products and the efficiency of farms. Others whose work is related to agricultural products include agricultural engineers, agricultural and food scientists, agricultural workers, and purchasing agents and buyers of farm products.

### **Sources of Additional Information**

For general information about farming and agricultural occupations, contact:

- ▶ Center for Rural Affairs, P.O. Box 406, Walthill, NE 68067. Internet: <http://www.cfra.org>
- ▶ National FFA Organization, The National FFA Center, Attention Career Information Requests, P.O. Box 68690, Indianapolis, IN 46268-0960. Internet: <http://www.ffa.org>

For information about certification as an accredited farm manager, contact:

- ▶ American Society of Farm Managers and Rural Appraisers, 950 Cherry St., Suite 508, Denver, CO 80222. Internet: <http://www.asfmra.org>

For information on the USDA's program to help small farmers get started, contact:

- ▶ Small Farm Program, U.S. Department of Agriculture, Cooperative State, Research, Education, and Extension Service, Stop 2220, Washington, DC 20250-2220. Internet: <http://www.ree.usda.gov/smallfarm/>

For information on aquaculture, education, training, or Community Supported Agriculture, contact:

- ▶ Alternative Farming System Information Center (AFSIC), National Agricultural Library USDA, 10301 Baltimore Ave., Room 132, Beltsville, MD 20705-2351. Internet: <http://www.nal.usda.gov/afsic>
- ▶ Appropriate Technology Transfer for Rural Areas, P.O. Box 3657, Fayetteville, AR 72702. Internet: <http://www.attra.org>



# Fishers and Fishing Vessel Operators

(0\*NET 45-3011.00)

## Significant Points

- More than half of all workers are self-employed, among the highest proportion in the workforce.
- Many jobs require strenuous work and long hours and provide only seasonal employment.
- Employment is projected to decline, due to the depletion of fish stocks and new Federal and State laws restricting both commercial and recreational fishing.

## Nature of the Work

Fishers and fishing vessel operators catch and trap various types of marine life for human consumption, animal feed, bait, and other uses. (Aquaculture—the raising and harvesting, under controlled conditions, of fish and other aquatic life in ponds or confined bodies of water—is covered in the *Handbook* statement on farmers, ranchers, and agricultural managers.)

Fishing hundreds of miles from shore with commercial fishing vessels—large boats capable of hauling a catch of tens of thousands of pounds of fish—requires a crew that includes a captain, or skipper, a first mate and sometimes a second mate, a boatswain (called a deckboss on some smaller boats), and deckhands with specialized skills.

The *fishing boat captain* plans and oversees the fishing operation—the fish to be sought, the location of the best fishing grounds, the method of capture, the duration of the trip, and the sale of the catch.

The captain ensures that the fishing vessel is seaworthy; oversees the purchase of supplies, gear, and equipment, such as fuel, netting, and cables; obtains the required fishing permits and licenses; and hires qualified crew members and assigns their duties. The captain plots the vessel's course, often using electronic navigational equipment such as autopilots, loran systems, and satellite navigation systems. However, traditional navigational equipment (for example, compasses, sextants, and charts) is still in use. Ships also use radar to avoid obstacles and utilize depth sounders to indicate the water depth and whether there is marine life between the vessel and sea bottom. Sophisticated tracking technology allows captains to better locate and analyze schools of fish. The captain directs the fishing operation through the officers' actions and records daily activities in the ship's log. Upon returning to port, the captain arranges for the sale of the catch—directly to buyers or through a fish auction—and ensures that each crew member receives the prearranged portion of adjusted net proceeds from the sale of the catch. Some captains have begun buying and selling fish via the Internet, and as electronic commerce grows as a method of finding buyers for fresh catch, more captains may use computers.

The *first mate*—the captain's assistant, who must be familiar with navigation requirements and the operation of all electronic equipment—assumes control of the vessel when the captain is off duty. Duty shifts, called watches, usually last 6 hours. The mate's regular duty, with the help of the boatswain and under the captain's oversight, is to direct the fishing operations and sailing responsibilities of the deckhands, including the operation, maintenance, and repair of the vessel and the gathering, preservation, stowing, and unloading of the catch.

The *boatswain*, a highly experienced deckhand with supervisory responsibilities, directs the *deckhands* as they carry out the sailing and fishing operations. Before departure, the boatswain directs the deckhands to load equipment and supplies, either by hand or with hoisting equipment, and to untie lines from other boats and the dock. When necessary, boatswains repair fishing gear, equipment, nets, and accessories. They operate the fishing gear, letting out and pulling in nets and lines, and extract the catch, such as pollock, flounder, and tuna, from the nets or the lines' hooks. Deckhands use dip nets to prevent the escape of small fish and gaffs to facilitate the landing of large fish. They then wash, salt, ice, and stow away the catch. Deckhands also must ensure that decks are clear and clean at all times and that the vessel's engines and equipment are kept in good working order. Upon return to port, they secure the vessel's lines to and from the docks and other vessels. Unless "lumpers" (laborers or longshore workers) are hired, the deckhands unload the catch.

Large fishing vessels that operate in deep water generally have technologically advanced equipment, and some may have facilities on board where the fish are processed and prepared for sale. Such vessels are equipped for long stays at sea and can perform the work of several smaller boats.

Some full-time and many part-time fishers work on small boats in relatively shallow waters, often in sight of land. Navigation and communication needs are vital and constant for almost all types of boats. Crews are small—usually, only one or two people collaborate on all aspects of the fishing operation, which may include placing gill nets across the mouths of rivers or inlets, entrapment nets in bays and lakes, or pots and traps for fish or shellfish such as lobsters and crabs. Dredges and scrapes are sometimes used to gather shellfish such as oysters and scallops. A very small proportion of commercial fishing is conducted as diving operations. Depending upon the water's depth, divers—wearing regulation diving suits with an umbilical (air line) or a scuba outfit and equipment—use spears to catch fish and use nets and other equipment to gather shellfish, coral, sea urchins, abalone, and sponges. In very shallow waters, fish are caught from small boats having an outboard motor, from rowboats, or by wading or seining from shore. Fishers use a wide variety of hand-operated equipment—for example, nets, tongs, rakes, hoes, hooks, and shovels—to gather fish and shellfish; catch amphibians and reptiles such as frogs and turtles; and harvest marine vegetation such as Irish moss and kelp.



Fishing vessel operators must check their gear before heading out.

Although most fishers are involved in commercial fishing, some captains and deckhands use their expertise in fishing for sport or recreational purposes. For this type of fishing, a group of people charter a fishing vessel for periods ranging from several hours to a number of days and embark upon sportfishing, socializing, and relaxation, employing a captain and possibly several deckhands.

### **Working Conditions**

Fishing operations are conducted under various environmental conditions, depending on the region of the country and the kind of species sought. Storms, fog, and wind may hamper fishing vessels or cause them to suspend fishing operations and return to port. Divers are affected by murky water and unexpected shifts in underwater currents. In relatively busy fisheries, smaller boats have to take care not to be hit by larger vessels.

Fishers and fishing vessel operators work under some of the most hazardous conditions of any occupation, and often help is not readily available when injuries occur. Malfunctioning navigation or communication equipment may lead to collisions or shipwrecks. The crew must be on guard against the danger of injury from malfunctioning fishing gear, entanglement in fishing nets and gear, slippery decks resulting from fish-processing operations, ice formation in the winter, or being swept overboard—a fearsome situation. Also, treatment for any serious injuries may have to await transfer to a hospital. Divers must guard against entanglement of air lines, malfunction of scuba equipment, decompression problems, and attacks by predatory fish.

Fishers and fishing vessel operators face strenuous outdoor work and long hours. Commercial fishing trips may require a stay of several weeks or even months—hundreds of miles away from one's home port. The pace of work may vary, but even during travel between the home port and the fishing grounds, deckhands on smaller boats try to finish their cleaning duties so that there are no chores remaining to be done at port. However, lookout watches are a regular responsibility, and crew members must be prepared to stand watch at prearranged times of the day or night. Although fishing gear has improved, and operations have become more mechanized, netting and processing fish are strenuous activities. Whereas newer vessels have improved living quarters and amenities such as television and shower stalls, crews still experience the aggravations of confined quarters, continuous close personal contact, and the absence of family.

### **Employment**

Fishers and fishing vessel operators held an estimated 36,000 jobs in 2002. More than 5 out of 10 were self-employed. Most fishing takes place off the coasts, with Alaska, Louisiana, Virginia, California, and Washington bringing in the greatest volume of fish. While fishing off the New England coast has declined in recent years because of restrictions on catching certain species, it still ranks high in total value of fish caught, according to the National Marine Fisheries Society.

### **Training, Other Qualifications, and Advancement**

Fishers usually acquire their occupational skills on the job, many as members of families involved in fishing activities. No formal academic requirements exist. Operators of large commercial fishing vessels are required to complete a Coast Guard-approved training course. Students can expedite their entrance into these occupations by enrolling in 2-year vocational-technical programs offered

by secondary schools. In addition, some community colleges and universities offer fishery technology and related programs that include courses in seamanship, vessel operations, marine safety, navigation, vessel repair and maintenance, health emergencies, and fishing gear technology. Courses include hands-on experience. Secondary and postsecondary programs are normally offered in or near coastal areas.

Experienced fishers may find short-term workshops offered through various postsecondary institutions especially useful. These programs provide a good working knowledge of electronic equipment used in navigation and communication and offer the latest improvements in fishing gear.

Captains and mates on large fishing vessels of at least 200 gross tons must be licensed. Captains of sportfishing boats used for charter, regardless of the boats' size, must also be licensed. Crew members on certain fish-processing vessels may need a merchant mariner's document. The U.S. Coast Guard issues these documents and licenses to individuals who meet the stipulated health, physical, and academic requirements. (For information about merchant marine occupations, see the statement on water transportation occupations elsewhere in the *Handbook*.)

Fishers must be in good health and possess physical strength. Good coordination, mechanical aptitude, and the ability to work under difficult or dangerous conditions are necessary to operate, maintain, and repair equipment and fishing gear. Fishers need stamina to work long hours at sea, often under difficult conditions. On large vessels, they must be able to work as members of a team. Fishers must be patient, yet always alert, to overcome the boredom of long watches when they are not engaged in fishing operations. The ability to assume any deckhand's functions on short notice is important. As supervisors, mates must be able to assume all duties, including the captain's, when necessary. The captain must be highly experienced, mature, and decisive and also must possess the business skills needed to run business operations.

On fishing vessels, most fishers begin as deckhands. Deckhands who acquire experience and whose interests are in ship engineering—the maintenance and repair of ship engines and equipment—can eventually become licensed chief engineers on large commercial vessels after meeting the Coast Guard's experience, physical, and academic requirements. Experienced, reliable deckhands who display supervisory qualities may become boatswains, who, in turn, may become second mates, first mates, and, finally, captains. Almost all captains become self-employed, and the overwhelming majority eventually own, or have an interest in, one or more fishing ships. Some may choose to run a sport or recreational fishing operation. When their seagoing days are over, experienced individuals may work in or, with the necessary capital, own stores selling fishing and marine equipment and supplies. Some captains may assume advisory or administrative positions in industry trade associations or government offices, such as harbor development commissions, or in teaching positions in industry-sponsored workshops or educational institutions. Divers in fishing operations can enter a commercial diving activity—for example, repairing ships or maintaining piers and marinas—usually after the completion of a certified training program sponsored by an educational institution or industry association.

### **Job Outlook**

Employment of fishers and fishing vessel operators is expected to decline through the year 2012. These workers depend on the natu-

ral ability of fish stocks to replenish themselves through growth and reproduction, as well as on governmental regulation of fisheries. Many operations are currently at or beyond the maximum sustainable yield, partially because of habitat destruction, and the number of workers who can earn an adequate income from fishing is expected to decline. Many fishers and fishing vessel operators leave the occupation because of the strenuous and hazardous nature of the job and the lack of steady, year-round income. Some job openings will nevertheless arise from the need to replace workers who leave the occupation or retire.

The use of sophisticated electronic equipment for navigation, for communication, and for locating fish has raised the efficiency of finding fish stocks. Also, improvements in fishing gear and the use of highly automated floating processors, where the catch is processed aboard the vessel, have greatly increased fish hauls. In many areas, particularly the North Atlantic and Pacific Northwest, damage to spawning grounds and excess fishing capacity have adversely affected the stock of fish and, consequently, the employment opportunities for fishers. Some States have issued various types of restrictions on harvesting, to allow stocks of fish and shellfish to replenish themselves, thereby idling many fishers. In addition, low prices for some species and rising seafood imports are adversely affecting fishing income. Sportfishing boats, however, will continue to provide some job opportunities.

Governmental efforts to replenish stocks are having positive results, which should increase the stock of fish at some point in the future. Furthermore, efforts by private fishers' associations on the West Coast to increase government monitoring of the fisheries may help significantly to prevent the type of decline in fish stocks found in waters off the East Coast. Nevertheless, fewer fishers and fishing vessel operators are expected to make their living from the Nation's waters in the years ahead.

### **Earnings**

Based on limited information, the majority of full-time wage and salary fishers earn between \$300 and \$700 per week. Earnings of fishers and fishing vessel operators normally are highest in the summer and fall—when demand for services peaks and environmental conditions are favorable—and lowest during the winter. Many full-time and most part-time workers supplement their income by working in other activities during the off-season. For example, fishers may work in seafood-processing plants, in establishments selling fishing and marine equipment, in construction, or in a number of unrelated seasonal occupations.

Earnings of fishers vary widely, depending upon their position, their ownership percentage of the vessel, the size of their ship, and the amount and value of the catch. The costs of the fishing operation—the physical aspects of operating the ship, such as the fuel costs, repair and maintenance of gear and equipment, and the crew's supplies—are deducted from the sale of the catch. Net proceeds are distributed among the crew members in accordance with a pre-arranged percentage. Generally, the ship's owner—usually its captain—receives half of the net proceeds. From this amount, the owner pays for depreciation, maintenance and repair, and replacement and insurance costs of the ship and its equipment; the money that remains is the owner's profit.

### **Related Occupations**

Other occupations that involve outdoor work with fish and watercraft include water transportation occupations and fish and game wardens.

### **Sources of Additional Information**

Names of postsecondary schools offering fishing and related marine educational programs are available from

► Marine Technology Society, 5565 Sterrett Place, Suite 108, Columbia, MD 21044. Internet: <http://www.mtsociety.org>

Information on licensing of fishing vessel captains and mates and on requirements for merchant mariner documentation is available from the U.S. Coast Guard Marine Inspection Office or Marine Safety Office in your State. Or contact either of the following agencies:

► Office of Compliance, Commandant (G-MOC-3) 2100 Second St. SW., Washington, DC 20593. Internet:

[http://www.access.gpo.gov/nara/cfr/waisidx\\_01/46cfr28\\_01.html](http://www.access.gpo.gov/nara/cfr/waisidx_01/46cfr28_01.html)

► Licensing and Evaluation Branch, National Maritime Center, 4200 Wilson Blvd., Suite 630, Arlington, VA 22203-1804.

# Forest, Conservation, and Logging Workers

(0\*NET 45-4011.00, 45-4021.00, 45-4022.01, 45-4023.00)

## Significant Points

- Workers spend all their time outdoors, sometimes in poor weather and often in isolated areas.
- Most jobs are physically demanding and can be hazardous.
- A small decline in overall employment is expected in the occupation.

## Nature of the Work

The Nation's forests are a rich natural resource, providing beauty and tranquility, varied recreational areas, and wood for commercial use. Managing forests and woodlands requires many different kinds of workers. Forest and conservation workers help develop, maintain, and protect the forests by growing and planting new seedlings, fighting insects and diseases that attack trees, and helping to control soil erosion. Timber-cutting and logging workers harvest thousands of acres of forests each year for the timber that provides the raw material for countless consumer and industrial products.

*Forest and conservation workers* perform a variety of tasks to reforest and conserve timberlands and maintain forest facilities, such as roads and campsites. Some forest workers, called tree planters, use digging and planting tools called "dibble bars" and "hoedads" to plant seedlings to reforest timberland areas. Forest workers also remove diseased or undesirable trees with power saws or handsaws, spray trees with insecticides and fungicides to kill insects and to protect against disease, and apply herbicides on undesirable brush and trees to reduce competing vegetation. Forest workers in private industry usually work for professional foresters and paint boundary lines, assist with prescribed burning, and aid in marking and measuring trees by keeping a tally of those examined and counted. Forest workers who work for State and local governments or who are under contract to the Federal Government also clear away brush and debris from camp trails, roadsides, and camping areas under their employers' jurisdiction. Some clean kitchens and rest rooms at recreational facilities and campgrounds.

Other forest and conservation workers work in forest nurseries, sorting out tree seedlings and discarding those not meeting prescribed standards of root formation, stem development, and condition of foliage.

Some forest workers are employed on tree farms, where they plant, cultivate, and harvest many different kinds of trees. Their duties vary with the type of farm. Those who work on specialty farms, such as farms growing Christmas or ornamental trees for nurseries, are responsible for shearing treetops and limbs to control the growth of the trees under their care, to increase the density of limbs, and to improve the shapes of the trees. In addition, these workers' duties include planting the seedlings, spraying to control surrounding weed growth and insects, and harvesting the trees.

Other forest workers gather, by hand or with the use of handtools, products from the woodlands, such as decorative greens, tree cones and barks, moss, and other wild plant life. Still others tap trees for sap to make syrup or to produce chemicals.

The timber-cutting and logging process is carried out by a variety of workers who make up a logging crew. *Fallers* cut down trees with hand-held power chain saws or, occasionally, axes. Usually

using gas-powered chain saws, *buckers* trim off the tops and branches and buck (cut) the resulting logs into specified lengths.

*Choke setters* fasten chokers (steel cables or chains) around logs to be skidded (dragged) by tractors or forwarded by the cable-yarding system to the landing or deck area, where the logs are separated by species and type of product, such as pulpwood, sawlogs, or veneer logs, and loaded onto trucks. *Rigging slingers* and *chasers* set up and dismantle the cables and guy wires of the yarding system. *Log sorters, markers, movers, and debarkers* sort, mark, and move logs, based on species, size, and ownership, and tend machines that debark logs.

*Logging equipment operators* on a logging crew perform a number of duties. They use tree harvesters to shear the tops off of trees, cut and limb the trees, and then cut the logs into desired lengths. They drive tractors mounted on crawler tracks called crawlers, and self-propelled machines called skidders or forwarders, which drag or transport logs from the felling site in the woods to the log landing area for loading. They operate grapple loaders, which lift and load logs into trucks, and tree fellers or shears, which cut the trees. Some logging equipment operators use tracked or wheeled equipment similar to a forklift to unload logs and pulpwood off of trucks or gondola railroad cars, usually in a sawmill or a pulp-mill woodyard. Some newer, more efficient logging equipment is now equipped with state-of-the-art computer technology, requiring more skilled operators with more training.

*Log graders* and *scalars* inspect logs for defects, measure logs to determine their volume, and estimate the marketable content or value of logs or pulpwood. These workers often use hand-held data collection terminals to enter data about individual trees; later, the data can be downloaded or sent from the scaling area to a central computer via modem.

Other timber-cutting and logging workers have a variety of responsibilities. Some hike through forests to assess logging conditions. Some clear areas of brush and other growth to prepare for logging activities or to promote the growth of desirable species of trees.

The timber-cutting and logging industry is characterized by a large number of small crews of four to eight workers. A typical crew might consist of one or two fallers or one feller machine operator, one buckler, two logging tractor operators to drag cut trees to the loading deck, and one equipment operator to load the logs onto trucks. Most crews work for self-employed logging contractors who possess substantial logging experience, the capital to purchase



*Most forestry and logging jobs are physically demanding and often require the use of dangerous equipment.*

equipment, and the skills needed to run a small business successfully. Most contractors work alongside their crews as supervisors and often operate one of the logging machines, such as the grapple loader or the tree harvester. Many manage more than one crew and function as owners-supervisors.

Although timber-cutting and logging equipment has greatly improved and operations are becoming increasingly mechanized, many logging jobs still are labor intensive. These jobs require various levels of skill, ranging from the unskilled task of manually moving logs, branches, and equipment to skillfully using chain saws, peavies (hooked poles), and log jacks to cut and position logs for further processing or loading. To keep costs down, some timber-cutting and logging workers maintain and repair the equipment they use. A skillful, experienced logger is expected to handle a variety of logging operations.

### Working Conditions

Forestry and logging jobs are physically demanding. Workers spend all their time outdoors, sometimes in poor weather and often in isolated areas. The increased use of enclosed machines has decreased some of the discomforts caused by inclement weather. A few lumber camps in Alaska house workers in bunkhouses or company towns. Workers in sparsely populated western States commute long distances between their homes and logging sites. In the more densely populated eastern and southern States, commuting distances are much shorter.

Most logging occupations involve lifting, climbing, and other strenuous activities, although machinery has eliminated some of the heavy labor. Loggers work under unusually hazardous conditions. Falling trees and branches are a constant menace, as are the dangers associated with log-handling operations and the use of sawing equipment, especially delimiting devices. Special care must be taken during strong winds, which can even halt operations. Slippery or muddy ground and hidden roots or vines not only reduce efficiency, but also present a constant danger, especially in the presence of moving vehicles and machinery. Poisonous plants, brambles, insects, snakes, heat, and humidity are minor annoyances. If safety precautions are not taken, the high noise level of sawing and skidding operations over long periods may impair one's hearing. Experience, the exercise of caution, and the use of proper safety measures and equipment—such as hardhats, eye and ear protection, and safety clothing and boots—are extremely important to avoid injury.

The jobs of forest and conservation workers generally are much less hazardous than those of loggers. It may be necessary for some forestry aides or forest workers to walk long distances through densely wooded areas to do their work.

### Employment

Forest, conservation, and logging workers held about 81,000 jobs in 2002, distributed among the following occupations:

Logging equipment operators .....	43,000
Forest and conservation workers .....	14,000
Fallers .....	14,000
Log graders and scalers .....	10,000

Most wage and salary fallers and logging equipment operators are employed in logging camps and in the logging contractors industry, although some work in sawmills and planing mills. Employment of log graders and scalers is concentrated largely in sawmills and planing mills.

More than half of all forest and conservation workers work for government, primarily at the State and local level. Twenty percent are employed by companies that operate timber tracts, tree farms,

or forest nurseries, or for contractors that supply services to agriculture and forestry industries. Some of those employed in forestry services work on a contract basis for the U.S. Department of Agriculture's Forest Service. A small number of forest and conservation workers work in sawmills and planing mills. Although forest and conservation workers are located in every State, employment is concentrated in the West and Southeast, where many national and private forests and parks are located.

Self-employed forestry, conservation, and logging workers account for almost 3 of every 10 such workers—a much higher proportion of self-employment than in most other occupations.

Seasonal demand for forest, conservation, and logging workers varies by region. For example, in the northern States, winter work is common because the frozen ground facilitates logging. In the Southeast, logging and related activities occur year-round.

### Training, Other Qualifications, and Advancement

Most forest, conservation, and logging workers develop skills through on-the-job training, with instruction coming primarily from experienced workers. Logging workers must familiarize themselves with the character and dangers of the forest environment and the operation of logging machinery and equipment. However, large logging companies and trade associations, such as the Northeastern Loggers Association and the Forest Resources Association, Inc., offer special programs, particularly for workers training to operate large, expensive machinery and equipment. Often, a representative of the manufacturer or company spends several days in the field explaining and overseeing the operation of newly purchased machinery. Safety training is a vital part of the instruction of all logging workers.

Many State forestry or logging associations provide training sessions for fallers, whose job duties require more skill and experience than do other positions on the logging team. Sessions may take place in the field, where trainees, under the supervision of an experienced logger, have the opportunity to practice various felling techniques. Fallers learn how to manually cut down extremely large or expensive trees safely and with minimal damage to the felled or surrounding trees.

Training programs for loggers and foresters are becoming common in many States, largely in response to a collaborative effort by the American Forest & Paper Association and others in the forestry industry. Such programs are designed to encourage the health and productivity of the Nation's forests through the Sustainable Forest Initiative program. Logger training programs vary by State, but generally include some type of classroom or field training in a number of areas: best management practices, safety, endangered species, reforestation, and business management. Some programs lead to certification as a logger.

Experience in other occupations can expedite one's entry into some logging occupations. For example, equipment operators, such as truckdrivers and bulldozer and crane operators, can assume skidding and yarding functions. Some loggers have worked in sawmills or on family farms with extensive wooded areas. Some logging contractors were formerly crew members of family-owned businesses operated over several generations.

Generally, little formal education is required for most forest, conservation, and logging occupations. Many secondary schools, including vocational and technical schools and some community colleges, offer courses or a 2-year degree in general forestry, wildlife, conservation, and forest harvesting, which could be helpful in obtaining a job. A curriculum that includes field trips to observe or participate in forestry or logging activities provides a particularly good background. There are no educational requirements for

forest worker jobs. Many of these workers are high school or college students who are hired on a part-time or seasonal basis to perform short-term, labor-intensive tasks, such as planting tree seedlings.

Forest, conservation, and logging workers must be in good health and able to work outdoors every day. They also must be able to work as part of a team. Many logging occupations require physical strength and stamina. Maturity and good judgment are important in making quick, intelligent decisions in dealing with hazards as they arise. Mechanical aptitude and coordination are necessary qualities for operators of machinery and equipment, who often are responsible for repair and maintenance as well. Initiative and managerial and business skills are necessary for success as a self-employed logging contractor.

Experience working at a nursery or as a laborer can be useful in obtaining a job as a forest or conservation worker. Logging workers generally advance from occupations involving primarily manual labor to those involving the operation of expensive, sometimes complicated, machinery and other equipment. Inexperienced entrants usually begin as laborers, carrying tools and equipment, clearing brush, and loading and unloading logs and brush. For some, familiarization with logging operations may lead to jobs such as log-handling equipment operator. Further experience may lead to jobs involving the operation of more complicated machinery and yarding towers to transport, load, and unload logs. Those who have the motor skills required for the efficient use of power saws and other equipment may become fallers and buckers.

### Job Outlook

Overall employment of forest, conservation, and logging workers is expected to decline slightly through the year 2012. Most job openings will result from replacement needs. Many logging workers transfer to other jobs that are less physically demanding and dangerous, or else they retire. In addition, some forestry workers are youths who are not committed to the occupation on a long-term basis. Some take jobs to earn money for school; others work in this occupation only until they find a better paying job.

Employment of forest and conservation workers is expected to grow more slowly than the average for all occupations. Setting aside more land to protect natural resources or wildlife habitats helps to create demand for more forest and conservation workers. In addition, under the latest farm bill, small, private farmowners were offered incentives to convert all or part of their land to forest for ecological purposes. This conversion may indirectly cause the hiring of forest and conservation workers to work on the property.

Despite steady demand for lumber and other wood products, employment of timber-cutting and logging occupations is expected to decline, primarily because of increased mechanization and increasing imports. New federal policy allowing some access to federal timberland may moderate any decline, however, and job opportunities also will arise from owners of privately owned forests and tree farms. However, domestic timber producers face increasing competition from foreign producers, who can harvest the same amount of timber at lower cost. As competition increases, the logging industry is expected to continue to consolidate in order to reduce costs, thereby eliminating some jobs.

Increased mechanization of logging operations and improvements in logging equipment will continue to depress demand for many timber-cutting and logging workers. Employment of fallers, buckers, choke setters, and other workers—whose jobs are labor intensive—should decline as safer laborsaving machinery and other equipment are increasingly used. Employment of machinery and equipment operators, such as logging tractor and log-handling equipment operators, should be less adversely affected.

Weather can force the curtailment of logging operations during the muddy spring season and the cold winter months, depending on

the geographic region. Changes in the level of construction, particularly residential construction, also affect logging activities in the short term. In addition, logging operations must be relocated when timber in a particular area has been completely harvested. During prolonged periods of inactivity, some workers may stay on the job to maintain or repair logging machinery and equipment; others are forced to find jobs in other occupations or be without work.

### Earnings

Earnings vary with the particular forestry or logging occupation and with experience. Earnings range from the minimum wage in some beginning forestry and conservation positions to about \$28.23 an hour for some experienced fallers. Median hourly earnings in 2002 for forest, conservation, and logging occupations were as follows:

Fallers .....	\$13.54
Log graders and scalers .....	13.08
Logging equipment operators .....	12.88
Forest and conservation workers .....	9.12

Earnings of logging workers vary by size of establishment and by geographic area. Workers in the largest establishments earn more than those in the smallest ones. Workers in Alaska and the Northwest earn more than those in the South, where the cost of living is generally lower.

Forest and conservation workers who work for State and local governments or for large, private firms generally enjoy more generous benefits than do workers in smaller firms. Small logging contractors generally offer timber-cutting and logging workers few benefits. However, some employers offer full-time workers basic benefits, such as medical coverage, and provide safety apparel and equipment.

### Related Occupations

Other occupations concerned with the care of trees and their environment include conservation scientists and foresters, forest and conservation technicians, and grounds maintenance workers. Logging equipment operators have skills similar to material-moving equipment operators, such as industrial truck and tractor operators and crane and tower operators.

### Sources of Additional Information

For information about timber-cutting and logging careers and about secondary and postsecondary programs offering training for logging occupations, contact either of the following sources:

- ▶ Northeastern Loggers Association, P.O. Box 69, Old Forge, NY 13420. Internet: <http://www.loggertraining.com>
  - ▶ Forest Resources Association, Inc., 600 Jefferson Plaza, Suite 350, Rockville, MD 20852. Internet: <http://www.forestresources.org>
- For information on the Sustainable Forestry Initiative training programs, contact
- ▶ American Forest & Paper Association, 1111 19th St. NW., Suite 800, Washington, DC 20036. Internet: <http://www.afandpa.org>

A list of State forestry associations and other forestry-related State associations is available at most public libraries. Schools of forestry at States' land-grant colleges or universities also should be useful sources of information.

## Material Moving Occupations

(0\*NET 53-1021.00, 53-7011.00, 53-7021.00, 53-7031.00, 53-7032.01, 53-7032.02, 53-7033.00, 53-7041.00, 53-7051.00, 53-7061.00, 53-7062.01, 53-7062.02, 53-7062.03, 53-7063.00, 53-7064.00, 53-7071.01, 53-7071.02, 53-7072.00, 53-7073.00, 53-7081.00, 53-7111.00, 53-7121.00, 53-7199.99)

### Significant Points

- Job openings should be numerous because the occupation is very large and turnover is relatively high.
- Most jobs require little work experience or specific training.
- Pay is low, and the seasonal nature of the work may reduce earnings.

### Nature of the Work

Material moving workers are categorized into two groups—operators and laborers. Operators use machinery to move construction materials, earth, petroleum products, and other heavy materials. Generally, they move materials over short distances—around a construction site, factory, or warehouse. Some move materials onto or off of trucks and ships. Operators control equipment by moving levers or foot pedals, operating switches, or turning dials. They may also set up and inspect equipment, make adjustments, and perform minor repairs when needed. Laborers and hand material movers manually handle freight, stock, or other materials; clean vehicles, machinery, and other equipment; feed materials into or remove materials from machines or equipment; and pack or package products and materials.

Material moving occupations are classified by the type of equipment they operate or goods they handle. Each piece of equipment requires different skills to move different types of loads. (For information on *operating engineers; paving, surfacing, and tamping equipment operators; and piledriver operators*, see the statement on construction equipment operators elsewhere in the *Handbook*.)

*Industrial truck and tractor operators* drive and control industrial trucks or tractors equipped to move materials around a warehouse, storage yard, factory, or construction site. A typical industrial truck, often called a forklift or lift truck, has a hydraulic lifting mechanism and forks. Industrial truck and tractor operators also may operate tractors that pull trailers loaded with materials, goods, or equipment within factories and warehouses, or around outdoor storage areas.

*Excavating and loading machine and dragline operators* operate or tend machinery equipped with scoops, shovels, or buckets, to dig and load sand, gravel, earth, or similar materials into trucks or onto conveyors. Construction and mining industries employ the majority of excavation and loading machine and dragline operators. *Dredge operators* excavate and maintain navigable channels in waterways by operating dredges to remove sand, gravel, or other materials from lakes, rivers, or streams. *Underground mining loading machine operators* operate underground loading machine to load coal, ore, or rock into shuttle or mine car or onto conveyors. Loading equipment may include power shovels, hoisting engines equipped with cable-drawn scraper or scoop, or machines equipped with gathering arms and conveyor.

*Crane and tower operators* operate mechanical boom and cable or tower and cable equipment to lift and move materials, machin-

ery, or other heavy objects. They extend or retract a horizontally mounted boom to lower or raise a hook attached to the loadline. Most operators coordinate their maneuvers in response to hand signals and radioed instructions. Operators position the loads from the onboard console or from a remote console at the site. While crane and tower operators are noticeable at office building and other construction sites, the biggest group works in primary metal, metal fabrication, and transportation equipment manufacturing industries that use heavy, bulky materials. *Hoist and winch operators* control movement of cables, cages, and platforms to move workers and materials for manufacturing, logging, and other industrial operations. They work in such positions as derrick operators and hydraulic boom operators. Many hoist and winch operators are found in manufacturing or construction industries.

*Pump operators* and their helpers tend, control, or operate power-driven pumps and manifold systems that transfer gases, oil, or other materials to vessels or equipment. They maintain the equipment to regulate the flow of materials according to a schedule set up by petroleum engineers and production supervisors. *Gas compressor and gas pumping station operators* operate steam, gas, electric motor, or internal combustion engine-driven compressors. They transmit, compress, or recover gases, such as butane, nitrogen, hydrogen, and natural gas. *Wellhead pumpers* operate power pumps and auxiliary equipment to produce flow of oil or gas from wells in oilfields.

*Tank, car, truck, and ship loaders* operate ship loading and unloading equipment, conveyors, hoists, and other specialized material handling equipment such as railroad tank car unloading equipment. They may gauge or sample shipping tanks and test them for leaks. *Conveyor operators and tenders* control or tend conveyor systems that move materials to or from stockpiles, processing stations, departments, or vehicles. *Shuttle car operators* operate diesel or electric-powered shuttle car in underground mine to transport materials from working face to mine cars or conveyor.

*Laborers and hand freight, stock, and material movers* manually move materials or perform other unskilled general labor. These workers move freight, stock, and other materials to and from storage and production areas, loading docks, delivery vehicles, ships, and containers. Their specific duties vary by industry and work setting. Specialized workers within this group include baggage and cargo handlers, who work in transportation industries, and truck loaders and unloaders. In factories, they may move raw materials



Many material moving workers perform their duties outdoors in every type of climate and weather condition.

or finished goods between loading docks, storage areas, and work areas as well as sort materials and supplies and prepare them according to their work orders

*Hand packers and packagers* manually pack, package, or wrap a variety of materials. They may inspect items for defects, label cartons, stamp information on products, keep records of items packed, and stack packages on loading docks. This group also includes order fillers, who pack materials for shipment, as well as grocery store courtesy clerks. In grocery stores, they may bag groceries, carry packages to customers' cars, and return shopping carts to designated areas.

*Machine feeders and offbearers* feed materials into or remove materials from automatic equipment or machines tended by other workers. *Cleaners of vehicles and equipment* clean machinery, vehicles, storage tanks, pipelines, and similar equipment using water and other cleaning agents, vacuums, hoses, brushes, cloths, and other cleaning equipment. *Refuse and recyclable material collectors* gather trash, garbage, and recyclables from homes and businesses along a regularly scheduled route, and deposit the refuse in their truck for transport to a dump, landfill, or recycling center. They lift and empty garbage cans or recycling bins by hand, or operate a hydraulic lift truck that picks up and empties dumpsters.

### Working Conditions

Many material moving workers work outdoors in every type of climate and weather condition. The work tends to be repetitive and physically demanding. They may lift and carry heavy objects, and stoop, kneel, crouch, or crawl in awkward positions. Some work at great heights, or outdoors in all weather conditions. Some jobs expose workers to harmful materials or chemicals, fumes, odors, loud noise, or dangerous machinery. To avoid injury, these workers wear safety clothing, such as gloves and hardhats, and devices to protect their eyes, mouth, or hearing. These jobs have become much safer as safety equipment such as overhead guards on forklift trucks has become common. As with most machinery, accidents usually can be avoided by observing proper operating procedures and safety practices.

Material movers generally work 8-hour shifts, though longer shifts also are common. In many industries that work around the clock, material movers work evening or "graveyard" shifts. Some may work at night because the establishment may not want to disturb customers during normal business hours. Refuse and recyclable material collectors often work shifts starting at 5 or 6 a.m. Some material movers work only during certain seasons, such as when the weather permits construction activity.

### Employment

Material movers held 4.9 million jobs in 2002. They were distributed among the detailed occupations as follows:

Laborers and freight, stock, and material movers, hand .....	2,231,000
Hand packers and packagers .....	920,000
Industrial truck and tractor operators .....	594,000
Cleaners of vehicles and equipment .....	344,000
Machine feeders and offbearers .....	164,000
First-line supervisors/managers of helpers, laborers, and material movers, hand .....	147,000
Refuse and recyclable material collectors .....	134,000
Excavating and loading machine and dragline operators .....	80,000
Conveyor operators and tenders .....	58,000
Crane and tower operators .....	50,000
Tank car, truck, and ship loaders .....	17,000
Pump operators, except wellhead pumpers .....	13,000
Wellhead pumpers .....	11,000
Hoist and winch operators .....	9,000

Gas compressor and gas pumping station operators .....	7,300
Loading machine operators, underground mining .....	4,000
Dredge operators .....	3,500
Shuttle car operators .....	3,200
All other material moving workers .....	78,000

About 29 percent of all material movers worked in the wholesale trade or retail trade industries. About 23 percent worked in manufacturing and 14 percent worked in transportation and warehousing. Significant numbers of material movers also worked in construction and mining. In addition, 13 percent of material moving workers were employed in the employment services industry where they are employed on a temporary or contract basis. For example, companies that need workers for only a few days, to move materials or to clean up a site, may contract with temporary help agencies specializing in providing suitable workers on a short-term basis. A small proportion of material movers were self-employed.

Material movers work in every part of the country. Some work in remote locations on large construction projects, such as highways and dams, or in factory or mining operations.

### Training, Other Qualifications, and Advancement

Most material moving jobs require little work experience or specific training. Some employers prefer applicants with a high school diploma, but most simply require workers to be at least 18 years old and physically able to perform the work. For those jobs requiring physical exertion, employers may require that applicants pass a physical exam. Some employers also require drug testing or background checks before employment. These workers often are younger than workers in other occupations—reflecting the limited training but significant physical requirements of many of these jobs.

Material movers generally learn skills informally, on the job, from more experienced workers or supervisors. However, workers who use industrial trucks, other dangerous equipment, or handle toxic chemicals must receive specialized training in safety awareness and procedures. Many of the training requirements are standardized through the U.S. Occupational Safety and Health Administration (OSHA). This training usually is provided by the employer. Employers must also certify that each operator has received the training and evaluate each operator at least once every three years.

Material moving equipment operators need a good sense of balance, distance judgment, and eye-hand-foot coordination. For those jobs that involve dealing with the public, such as grocery store courtesy clerks, workers should be pleasant and courteous. Most jobs require reading and basic mathematics skills to read procedures manuals and billing and other documents. Mechanical aptitude and high school training in automobile or diesel mechanics are helpful because workers may perform some maintenance on their equipment. Experience operating mobile equipment, such as tractors on farms or heavy equipment in the Armed Forces, is an asset. As material moving equipment becomes more automated, many workers will need basic computer and technical knowledge to operate the equipment.

Experience in many of these jobs may allow workers to qualify or become trainees for jobs such as construction trades workers; assemblers or other production workers; motor vehicle operators; or vehicle and mobile equipment mechanics, installers, and repairers. In many workplaces, new workers often work in a material moving position before being promoted to a better paying and more highly skilled job. Some may eventually advance to become supervisors.



## Job Outlook

Job openings should be numerous because the occupation is very large and turnover is relatively high—characteristic of occupations requiring little formal training. Many openings will arise from the need to replace workers who transfer to other occupations, or who retire or leave the labor force for other reasons.

Employment in material moving occupations will increase more slowly than average for all occupations through 2012. Employment growth will stem from an expanding economy and increased spending on the Nation's infrastructure, such as highways and bridges. However, equipment improvements, including the growing automation of material handling in factories and warehouses, will continue to raise productivity and moderate the demand for material movers.

Job growth for material movers largely depends on growth in the industries employing them and the type of equipment the workers operate or the materials they handle. For example, employment of operators in manufacturing will decline due to increased automation and efficiency in the production process. On the other hand, employment will grow rapidly in temporary help organizations as firms contract out material moving services. Employment also will grow in warehousing and storage as more firms contract out their warehousing functions to firms that specialize in them.

Both construction and manufacturing are very sensitive to changes in economic conditions, so the number of job openings in these industries may fluctuate from year to year. Although increasing automation may eliminate some manual tasks, new jobs will be created to operate and maintain material moving equipment.

## Earnings

Median hourly earnings of material moving workers in 2002 were relatively low, as indicated by the following tabulation:

Gas compressor and gas pumping station operators .....	\$20.44
First-line supervisors/managers of helpers, laborers, and material movers, hand .....	17.87
Pump operators, except wellhead pumpers .....	17.53
Crane and tower operators .....	17.47
Wellhead pumpers .....	16.24
Tank car, truck, and ship loaders .....	15.63
Excavating and loading machine and dragline operators .....	15.58
Hoist and winch operators .....	15.09
Industrial truck and tractor operators .....	12.54
Conveyor operators and tenders .....	11.66
Refuse and recyclable material collectors .....	11.60
Machine feeders and offbearers .....	10.50
Laborers and freight, stock, and material movers, hand .....	9.48
Cleaners of vehicles and equipment .....	8.20
Hand packers and packagers .....	8.03
All other material moving workers .....	12.58

Pay rates vary according to experience and job responsibilities. Pay usually is higher in metropolitan areas. The seasonality of work may reduce earnings.

## Related Occupations

Other workers who operate mechanical equipment include bus drivers; construction equipment operators; machine setters, operators, and tenders—metal and plastic; rail transportation workers; and truck drivers and driver/sales workers. Other entry-level workers who perform mostly physical work are agricultural workers; building cleaning workers; construction laborers; forest, conservation, and logging workers; and grounds maintenance workers.

## Sources of Additional Information

For information about job opportunities and training programs, contact local State employment service offices, building or construction contractors, manufacturers, and wholesale and retail establishments.

Information on safety and training requirements is available from:

► U.S. Department of Labor, Occupational Safety and Health Administration (OSHA), 200 Constitution Ave. NW., Washington, DC 20210. Internet: <http://www.osha.gov>

Information on industrial truck and tractor operators is available from:

► Industrial Truck Association, 1750 K St. NW., Suite 460, Washington, DC 20006.

## Rail Transportation Occupations

0\*NET 53-4011.00, 53-4012.00, 53-4013.00, 53-4021.01, 53-4021.02, 53-4031.00, 53-4041.00, 53-4099.99)

### Significant Points

- Most workers begin as yard laborers, and later may have the opportunity to train for engineer or conductor jobs.
- Employment of most rail transportation occupations is expected to decline; however, employment of subway and streetcar operators will have average growth.
- Competition for available job opportunities is expected to be keen.
- Nearly 3 out of 4 workers are members of unions, and earnings are relatively high.

### Nature of the Work

More than a century ago, freight and passenger railroads were the ties binding the Nation together and the engine driving the economy. Today, rail transportation remains a vital link in our Nation's transportation network and economy. Railroads deliver billions of tons of freight and thousands of travelers to destinations throughout the Nation, while subways and light-rail systems transport millions of passengers within metropolitan areas.

*Locomotive engineers* are among the most experienced and skilled workers on the railroad. Locomotive engineers operate large trains carrying cargo and passengers between stations. Most engineers run diesel locomotives, while a few operate electrically powered locomotives.

Before and after each run, engineers check the mechanical condition of their locomotive and make minor adjustments on the spot. Engineers receive starting instructions from conductors and move controls such as throttles and airbrakes to drive the locomotive. They monitor gauges and meters that measure speed, amperage, battery charge, and air pressure, both in the brake lines and in the main reservoir.

On the open rail and in the yard, engineers confer with conductors and traffic control center personnel via two-way radio or mobile telephone to issue or receive information concerning stops, delays, and train locations. They interpret and comply with orders, signals, speed limits, and railroad rules and regulations. They must have a thorough knowledge of the signaling systems, yards, and terminals on routes over which they operate. Engineers must be constantly aware of the condition and makeup of their train, because trains react differently to acceleration, braking, and curves, depending on the grade and condition of the rail, the number of cars, the ratio of empty to loaded cars, and the amount of slack in the train.

*Rail yard engineers, dinky operators, and hostlers* drive switching or small "dinky" engines within railroad yards, industrial plants, mines and quarries, or construction projects.

*Railroad conductors* coordinate the activities of freight and passenger train crews. Railroad conductors assigned to freight trains review schedules, switching orders, waybills, and shipping records to obtain loading and unloading information regarding their cargo. Conductors assigned to passenger trains also ensure passenger safety and comfort as they go about collecting tickets and fares, making announcements for the benefit of passengers, and coordinating activities of the crew to provide passenger services.

Before a train leaves the terminal, the conductor and engineer discuss instructions received from the dispatcher concerning the train's route, timetable, and cargo. During the run, conductors use two-way radios and mobile telephones to communicate with dispatchers, engineers, and conductors of other trains. Conductors use dispatch or electronic monitoring devices that relay information about equipment problems on the train or the rail. They may arrange for the removal of defective cars from the train for repairs at the nearest station or stop. In addition, conductors may discuss alternative routes if there is a defect or obstruction on the rail.

*Yardmasters* coordinate activities of workers engaged in railroad traffic operations. These activities include making up or breaking up trains and switching inbound or outbound traffic to a specific section of the line. Some cars are sent to unload their cargo on special tracks, while other cars are moved to other tracks to await assemblage into new trains destined for different cities. Yardmasters inform engineers where to move the cars to fit the planned train configuration. Switches, many of them operated remotely by computer, divert the locomotive or cars to the proper track for coupling and uncoupling.

*Railroad brake, signal, and switch operators* perform a variety of activities, such as operating track switches to route cars to different sections of the yard. They may signal engineers and set warning signals, help to couple and uncouple rolling stock to make up or break up trains, or inspect couplings, airhoses, and handbrakes.



*Most railroad transportation workers begin as yard laborers, and later may have the opportunity to train for engineer or conductor jobs.*

Traditionally, freight train crews included either one or two brake operators—one in the locomotive with the engineer and another who rode with the conductor in the rear car. Brake operators worked under the direction of conductors and did the physical work involved in adding and removing cars at railroad stations and assembling and disassembling trains in railroad yards. In an effort to reduce costs and take advantage of new technology, most railroads have phased out brake operators. Many modern freight trains use only an engineer and a conductor, stationed with the engineer, because new visual instrumentation and monitoring devices have eliminated the need for crewmembers located at the rear of the train.

In contrast to other rail transportation workers, subway and streetcar operators generally work for public transit authorities instead of railroads. *Subway operators* control trains that transport passengers throughout a city and its suburbs. The trains run in underground tunnels, on the surface, or on elevated tracks. Operators must stay alert to observe signals along the track that indicate when they must start, slow, or stop their train. They also make announcements to riders, may open and close the doors of the train, and ensure that passengers get on and off the subway safely.

To meet predetermined schedules, operators must control the train's speed and the amount of time spent at each station. Increasingly, however, these functions are controlled by computers and not by the operator. When breakdowns or emergencies occur, operators contact their dispatcher or supervisor and may have to evacuate cars.

*Streetcar operators* drive electric-powered streetcars, trolleys, or light-rail vehicles that are similar to streetcars that transport passengers in metropolitan areas. Some tracks may be recessed in city streets or have grade crossings, so operators must observe traffic signals and cope with car and truck traffic. Operators start, slow, and stop their cars so that passengers may get on and off with ease. Operators may collect fares and issue change and transfers. They also answer questions from passengers concerning fares, schedules, and routes.

### Working Conditions

Many rail transportation employees work nights, weekends, and holidays because trains operate 24 hours a day, 7 days a week. Many work more than a 40-hour workweek. Seniority usually dictates who receives the more desirable shifts.

Most freight trains are unscheduled, and few workers on these trains have scheduled assignments. Instead, workers place their names on a list and wait for their turn to work. Jobs usually are assigned on short notice and often at odd hours. Those who work on trains operating between points hundreds of miles apart may spend several nights at a time away from home.

Workers on passenger trains ordinarily have regular and reliable shifts. Also, the appearance, temperature, and accommodations of passenger trains are more comfortable than those of freight trains.

Rail yard workers spend most of their time outdoors in varying weather. The work of conductors and engineers on local runs, on which trains frequently stop at stations to pick up and deliver cars, is physically demanding. Climbing up and down and getting off moving cars is strenuous and can be dangerous.

### Employment

Rail transportation workers held 101,000 jobs in 2002, distributed among the detailed occupations as follows:

Railroad conductors and yardmasters .....	38,000
Locomotive engineers and firers .....	33,000
Railroad brake, signal, and switch operators .....	15,000
Subway, streetcar operators and all other rail transportation workers .....	15,000

Most rail transportation workers are employed in either the rail transportation industry or support activities for the industry. The rest work primarily for local governments as subway and streetcar operators and for mining and manufacturing establishments who operate their own locomotives and dinkey engines to move railcars containing ore, coal, and other bulk materials.

### Training, Other Qualifications, and Advancement

Most railroad transportation workers begin as yard laborers and later may have the opportunity to train for engineer or conductor jobs. Railroads require that applicants have a minimum of a high school diploma or its equivalent. Applicants must have good hearing, eyesight, and color vision, as well as good hand-eye coordination, manual dexterity, and mechanical aptitude. Physical stamina is required for these entry-level jobs. Employers require railroad transportation job applicants to pass a physical examination, drug and alcohol screening, and a criminal background check. Under Federal law, all train crewmembers are subject to random drug and alcohol testing while on duty.

Applicants for locomotive engineer jobs must be at least 21 years old. Employers almost always fill engineer positions with workers who have experience in other railroad-operating occupations. Federal regulations require beginning engineers to complete a formal engineer training program, including classroom, simulator, and hands-on instruction in locomotive operation. The instruction usually is administered by the rail company in programs approved by the Federal Railroad Administration. At the end of the training period, engineers must pass a hearing and visual acuity test, a safety conduct background check, a railroad operation knowledge test, and a skills performance test. The company issues the engineer a license after the applicant passes the examinations. Other conditions and rules may apply to entry-level engineers and usually vary by employer.

To maintain certification, railroad companies must monitor their engineers. In addition, engineers must periodically pass an operational rules efficiency test. The test is an unannounced event requiring engineers to take active or responsive action in certain situations, such as maintaining a particular speed through a curve or yard.

Engineers undergo periodic physical examinations and drug and alcohol testing to determine their fitness to operate locomotives. In some cases, engineers who fail to meet these physical and conduct standards are restricted to yard service; in other instances, they may be disciplined, trained to perform other work, or discharged.

Conductor jobs generally are filled from the ranks of experienced rail transportation workers who have passed tests covering signals, timetables, operating rules, and related subjects. Seniority usually is the main factor in determining promotion to conductor. Entry-level conductors must generally be at least 21 years of age and are either trained by their employers or required to complete a formal conductor training program through a community college.

Newly trained engineers and conductors are placed on the "extra board" until permanent positions become available. Extra-board workers receive assignments only when the railroad needs substitutes for regular workers who are absent because of vacation, illness, or other personal reasons. Seniority rules may allow workers with greater seniority to select their type of assignment. For example, an engineer may move from an initial regular assignment in yard service to road service.

For subway and streetcar operator jobs, subway transit systems prefer applicants with a high school education. Most transit systems that operate subways and streetcars also operate buses. In these systems, subway or streetcar operators usually must start as

bus drivers. Applicants also must be in good health, have good communication skills, and be able to make quick, responsible judgments. New operators generally complete training programs that last from a few weeks to 6 months. At the end of the period of classroom and on-the-job training, operators usually must pass qualifying examinations covering the operating system, troubleshooting, and evacuation and emergency procedures. Some operators with sufficient seniority can advance to station manager or other supervisory positions.

### Job Outlook

Competition for available job opportunities is expected to be keen. Many persons qualify for rail transportation occupations because education beyond high school generally is not required. Rail transportation occupations attract more applicants than the number of available job openings, because the pay is good and the work is steady.

Employment of most railroad transportation occupations is expected to decline through the year 2012. The need to replace workers who transfer to other occupations or retire will be the main source of job openings. Employment in most rail occupations will continue to decline as both railroads and job duties are consolidated. Locomotive engineers and conductors will increasingly take on the job duties of other workers as railroads control labor costs to remain competitive with other modes of transportation. However, employment of subway and streetcar operators will grow about as fast as the average for all occupations, due to increased demand for light-rail transportation systems around the Nation.

Demand for railroad freight service will grow as the economy and the intermodal transportation of goods expand. Intermodal systems use trucks to pick up and deliver the shippers' sealed trailers or containers and employ trains to transport them long distance. This practice saves customers time and money because it carries goods across the country efficiently. For railroads, the benefit has been an increase in the efficiency of equipment use, allowing each train to make more runs each year. In order to compete with other modes of transportation, such as trucks, ships, and aircraft, railroads are improving delivery times and ontime service while reducing shipping rates.

However, growth in the number of railroad transportation workers will be adversely affected by innovations such as larger, faster, more fuel-efficient trains and computerized classification yards that make it possible to move freight more economically. Computers help to keep track of freight cars, match empty cars with the closest loads, and dispatch trains. Computer-assisted devices alert engineers to malfunctions, and work rules now allow trains to operate with two-person crews instead of the traditional three- to five-person crews.

### Earnings

Median hourly earnings of rail transportation occupations in 2002 were relatively high, as indicated by the following tabulation:

Locomotive engineers and locomotive firers .....	\$23.26
Subway and streetcar operators and all other rail transportation workers .....	21.48
Railroad conductors and yardmasters .....	21.39
Railroad brake, signal, and switch operators .....	20.93

Most railroad workers are paid according to miles traveled or hours worked, whichever leads to higher earnings. Full-time employees have steadier work, more regular hours, increased opportunities for overtime work, and higher earnings than do those assigned to the extra board.

Almost three-quarters of railroad transportation workers are members of unions. Many different railroad unions represent various crafts on the railroads. Most railroad engineers are members of the Brotherhood of Locomotive Engineers, while most other railroad transportation workers are members of the United Transportation Union. Many subway operators are members of the Amalgamated Transit Union, while others belong to the Transport Workers Union of North America.

### Related Occupations

Other related transportation workers include bus drivers, truck drivers and driver/sales workers, and those working in water transportation occupations.

### Sources of Additional Information

To obtain information on employment opportunities, contact the employment offices of the various railroads and rail transit systems, or State employment service offices.

For general information about the rail transportation industry, contact either of the following organizations:

- ▶ Association of American Railroads, 50 F St. NW., Washington, DC 20001. Internet: <http://www.aar.org>
- ▶ Federal Railroad Administration, 1120 Vermont Ave. NW., Washington, DC 20590. Internet: <http://www.fra.dot.gov>

For general information about career opportunities in passenger transportation, contact:

- ▶ American Public Transportation Association, 1666 K St. NW., Suite 1100, Washington, DC 20006.

General information on career opportunities as a locomotive engineer is available from:

- ▶ Brotherhood of Locomotive Engineers, 1370 Ontario Ave., Cleveland, OH 44113-1702. Internet: <http://www.ble.org>

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## Taxi Drivers and Chauffeurs

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(0\*NET 53-3041.00)

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### Significant Points

- Taxi drivers and chauffeurs may work any schedule, including full-time, part-time, night, evening, and weekend work.
- Many taxi drivers and chauffeurs like the independent, unsupervised work of driving their automobile.
- Local governments set license standards that include minimum qualifications for driving experience and training; many taxi and limousine companies set higher standards.
- Job opportunities will be good because of the need to replace the many people who work in this occupation for short periods and then leave.

### Nature of the Work

Anyone who has been in a large city knows the importance of taxi and limousine service. *Taxi drivers*, also known as *cab drivers* help passengers get to and from their homes, workplaces, and recreational pursuits such as dining, entertainment, and shopping. They also help out-of-town business people and tourists get around in unfamiliar surroundings.

At the start of their driving shift, taxi drivers usually report to a taxicab service or garage where they are assigned a vehicle, most frequently a large, conventional automobile modified for commercial passenger transport. They record their name, work date, and cab identification number on a trip sheet. Drivers check the cab's fuel and oil levels, and make sure that the lights, brakes, and windshield wipers are in good working order. Drivers adjust rear and side mirrors and their seat for comfort. Any equipment or part not in good working order is reported to the dispatcher or company mechanic.

Taxi drivers pick up passengers in 1 of 3 ways: "Cruising" the streets to pick up random passengers; prearranging pickups; and picking up passengers from taxistands established in highly trafficked areas. In urban areas, the majority of passengers "wave down" drivers cruising the streets. Customers may also prearrange a pickup by calling a cab company and giving a location, approximate pickup time, and destination. The cab company dispatcher then relays the information to a driver by two-way radio, cellular telephone, or onboard computer. Outside of urban areas, the majority of trips are dispatched in this manner. Drivers also pick up passengers waiting at cabstands or in taxi lines at airports, train stations, hotels, restaurants, and other places where people frequently seek taxis.

Some drivers transport individuals with special needs, such as those with disabilities and the elderly. These drivers, also known as *paratransit drivers*, operate specially equipped vehicles designed to accommodate a variety of needs in nonemergency situations. Although special certification is not necessary, some additional training on the equipment and passenger needs may be required.

Drivers should be familiar with streets in the areas they serve so they can use the most efficient route to destinations. They should know the locations of frequently requested destinations, such as airports, bus and railroad terminals, convention centers, hotels, and other points of interest. In case of emergency, the driver should also know the location of fire and police stations and hospitals.

Upon reaching the destination, drivers determine the fare and announce it to the rider. Fares often consist of many parts. In many

cabs, a taximeter measures the fare based on the length of the trip and the amount of time the trip took. Drivers turn the taximeter on when passengers enter the cab and turn it off when they reach the final destination. The fare also may include a surcharge for additional passengers, a fee for handling luggage, or a drop charge—an additional flat fee added for use of the cab. In some cases, fares are determined by a system of zones through which the taxi passes during a trip. Each jurisdiction determines the rate and structure of the fare system covering licensed taxis. Passengers generally add a tip or gratuity to the fare. The amount of the gratuity depends on the passengers' satisfaction with the quality and efficiency of the ride and courtesy of the driver. Drivers issue receipts upon request by the passenger. They enter onto the trip sheet all information regarding the trip, including the place and time of pickup and dropoff and the total fee. These logs help taxi company management check the driver's activity and efficiency. Drivers also must fill out accident reports when necessary.

*Chauffeurs* operate limousines, vans, and private cars for limousine companies, private businesses, government agencies, and wealthy individuals. Chauffeur service differs from taxi service in that all trips are prearranged. Many chauffeurs transport customers in large vans between hotels and airports, bus, or train terminals. Others drive luxury automobiles, such as limousines, to business events, entertainment venues, and social events. Still others provide full-time personal transportation for wealthy families and private companies.

At the start of the workday, chauffeurs prepare their automobiles or vans for use. They inspect the vehicle for cleanliness and, when needed, vacuum the interior and wash the exterior body, windows, and mirrors. They check fuel and oil levels and make sure the lights, tires, brakes, and windshield wipers work. Chauffeurs may perform routine maintenance and make minor repairs, such as changing tires or adding oil and other fluids when needed. If a vehicle requires more complicated repair, they take it to a professional mechanic.

Chauffeurs cater to passengers with attentive customer service and a special regard for detail. They help riders into the car by holding open doors, holding umbrellas when it is raining, and loading packages and luggage into the trunk of the car. They may perform errands for their employers such as delivering packages or picking up clients arriving at airports. Many chauffeurs offer conveniences and luxuries in their limousines to ensure a pleasurable ride, such as newspapers, magazines, music, drinks, televisions, and telephones. A growing number of chauffeurs work as full-service



*Customers may prearrange a pickup by calling a cab company and giving a location, approximate pickup time, and destination.*

*executive assistants*, simultaneously acting as driver, secretary, and itinerary planner.

### **Working Conditions**

Taxi drivers and chauffeurs occasionally have to load and unload heavy luggage and packages. Driving for long periods can be tiring and uncomfortable, especially in densely populated urban areas. Drivers must be alert to conditions on the road, especially in heavy and congested traffic or in bad weather. They must take precautions to prevent accidents and avoid sudden stops, turns, and other driving maneuvers that would jar passengers. Taxi drivers also risk robbery because they work alone and often carry large amounts of cash.

Work hours of taxi drivers and chauffeurs vary greatly. Some jobs offer full-time or part-time employment with work hours that can change from day to day or remain the same every day. It is often necessary for drivers to report to work on short notice. Chauffeurs who work for a single employer may be on call much of the time. Evening and weekend work are common for limousine and taxicab services.

The needs of the client or employer dictate the work schedule for chauffeurs. The work of taxi drivers is much less structured. Working free of supervision, they may break for a meal or a rest whenever their vehicle is unoccupied. Many taxi drivers and chauffeurs like the independent, unsupervised work of driving their automobile.

This occupation is attractive to individuals seeking flexible work schedules, such as college and postgraduate students, and to anyone seeking a second source of income. For example, other service workers, such as ambulance drivers and police officers, often consider moonlighting as taxi drivers and chauffeurs.

Full-time taxi drivers usually work one shift a day, which may last from 8 to 12 hours. Part-time drivers may work half a shift each day, or work a full shift once or twice a week. Drivers may work shifts at all times of the day and night, because most taxi companies offer services 24 hours a day. Early morning and late night shifts are common. Drivers work long hours during holidays, weekends, and other special times during which demand for their services may be heavier. Independent drivers, however, often set their own hours and schedules.

Design improvements in newer cabs have reduced the stress and increased the comfort and efficiency of drivers. Many regulatory bodies overseeing taxi and chauffeur services require standard amenities such as air-conditioning and general upkeep of the vehicles. Modern taxicabs also are sometimes equipped with sophisticated tracking devices, fare meters, and dispatching equipment. Satellites and tracking systems link many of these state-of-the-art vehicles with company headquarters. In a matter of seconds, dispatchers can deliver directions, traffic advisories, weather reports, and other important communications to drivers anywhere in the transporting area. The satellite link also allows dispatchers to track vehicle location, fuel consumption, and engine performance. Drivers can easily communicate with dispatchers to discuss delivery schedules and courses of action should there be mechanical problems. For instance, automated dispatch systems help dispatchers locate the closest driver to a customer in order to maximize efficiency and quality of service. When threatened with crime or violence, drivers may have special "trouble lights" to alert authorities of emergencies and guarantee that help arrives quickly.

Taxi drivers and chauffeurs meet many different types of people. Dealing with rude customers and waiting for passengers requires patience. Many municipalities and taxicab and chauffeur compa-

nies require taxi drivers to wear clean and neat clothes. Many chauffeurs wear formal attire such as a tuxedo, a coat and tie, a dress, or a uniform and cap.

### **Employment**

Taxi drivers and chauffeurs held about 132,000 jobs in 2002. Over one quarter worked for taxi and limousine service companies. Many taxi drivers and chauffeurs were self-employed.

### **Training, Other Qualifications, and Advancement**

Local governments set license standards and requirements for taxi drivers and chauffeurs that include minimum qualifications for driving experience and training. Many taxi and limousine companies set higher standards than required by law. It is common for companies to review applicants' medical, credit, criminal, and driving records. In addition, many companies require a higher minimum age than that which is legally required and prefer that drivers be high school graduates.

Persons interested in driving a limousine or taxicab must first have a regular automobile driver's license. They also must acquire a chauffeur or taxi driver's license, commonly called a "hack" license. Local authorities generally require applicants for a hack license to pass a written exam or complete a training program that may include up to 80 hours of classroom instruction. To qualify through either an exam or a training program, applicants must know local geography, motor vehicle laws, safe driving practices, regulations governing taxicabs, and display some aptitude for customer service. Many training programs include a test on English proficiency, usually in the form of listening comprehension; applicants who do not pass the English exam must take an English course along with the formal driving program. In addition, some classroom instruction includes route management, mapreading, and service for passengers with disabilities. Many taxicab or limousine companies sponsor applicants and give them a temporary permit that allows them to drive, although the applicant may not yet have finished the training program or passed the test. However, some jurisdictions, such as New York City, have discontinued this practice and now require driver applicants to complete the licensing process before operating a taxi or limousine.

Some taxi and limousine companies give new drivers on-the-job training. They show drivers how to operate the taximeter and communications equipment, and how to complete paperwork. Other topics covered may include driver safety and popular sightseeing and entertainment destinations. Many companies have contracts with social service agencies and transportation services to transport elderly and disabled citizens in nonemergency situations. To support these services, new drivers may get special training on how to handle wheelchair lifts and other mechanical devices.

Taxi drivers and chauffeurs should be able to get along with many different types of people. They must be patient when waiting for passengers or when dealing with rude customers. It is also helpful for drivers to be tolerant and have even tempers when driving in heavy and congested traffic. Drivers should be dependable because passengers expect to be picked up at a prearranged time and taken to the correct destination. To be successful, drivers must be responsible and self-motivated because they work with little supervision. Increasingly, companies encourage drivers to develop their own loyal customer base to improve their businesses.

Many taxi drivers and chauffeurs are called *lease drivers*. These drivers pay a daily, weekly, or monthly fee to the company allowing them to lease their vehicle. In the case of limousines, leasing also permits the driver access to the company's dispatch system. The fee also may include a charge for vehicle maintenance, insurance, and a deposit on the vehicle. Lease drivers may take their cars home with them when they are not on duty.

Opportunities for advancement are limited for taxi drivers and chauffeurs. Experienced drivers may obtain preferred routes or shifts. Some advance to dispatcher or manager jobs; others may start their own limousine company.

In small and medium-sized communities, drivers are sometimes able to buy their taxi, limousine, or other type of automobile and go into business for themselves. These independent owner-drivers require an additional permit allowing them to operate their vehicle as a company. Some big cities limit the number of operating permits. In these cities, drivers become owner-drivers by buying permits from owner-drivers who leave the business. Although many owner-drivers are successful, some fail to cover expenses and eventually lose their permit and automobile. Good business sense and courses in accounting, business, and business arithmetic can help an owner-driver to become successful. Knowledge of mechanics enables owner-drivers to perform their own routine maintenance and minor repairs to cut expenses.

### Job Outlook

Persons seeking jobs as taxi drivers and chauffeurs should encounter good opportunities, because of the need to replace the many people who work in this occupation for short periods and then transfer to other occupations or leave the labor force. However, opportunities for drivers vary greatly in terms of earnings, work hours, and working conditions, depending on economic and regulatory conditions. Opportunities should be best for persons with good driving records and the ability to work flexible schedules.

Employment of taxi drivers and chauffeurs is expected to grow faster than the average for all occupations through the year 2012, as local and suburban travel increases with population growth. Employment growth also will stem from Federal legislation requiring services for persons with disabilities. Rapidly growing metropolitan areas should offer the best job opportunities.

The number of job openings can fluctuate with the cycle of the overall economy because the demand for taxi and limousine transportation depends on travel and tourism. During economic slowdowns, drivers are seldom laid off, but they may have to increase their work hours and earnings may decline. In economic upturns, job openings are numerous as many drivers transfer to other occupations. Extra drivers may be hired during holiday seasons and peak travel and tourist times.

### Earnings

Earnings of taxi drivers and chauffeurs vary greatly, depending on factors such as the number of hours worked, customers' tips, and geographic location. Median hourly earnings of salaried taxi drivers and chauffeurs, including tips, were \$8.91 in 2002. The middle 50 percent earned between \$7.31 and \$11.45 an hour. The lowest 10 percent earned less than \$6.31, and the highest 10 percent earned more than \$15.18 an hour. Median hourly earnings in the industries employing the largest numbers of taxi drivers and chauffeurs in 2002 were as follows:

Taxi and limousine service .....	\$9.71
Other transit and ground passenger transportation .....	8.70
Individual and family services .....	8.14
Automotive equipment rental and leasing .....	7.99
Traveler accommodation .....	7.96

### Related Occupations

Other workers who have similar jobs include bus drivers and truck drivers and driver/sales workers.

### Sources of Additional Information

Information on licensing and registration of taxi drivers and chauffeurs is available from local government agencies that regulate taxicabs. For information about work opportunities as a taxi driver or chauffeur, contact local taxi or limousine companies or State employment service offices.

For general information about the work of limousine drivers, contact:

► National Limousine Association, 49 South Maple Ave., Marlton, NJ 08053. Internet: <http://www.limo.org>

## Truck Drivers and Driver/Sales Workers

(0\*NET 53-3031.00, 53-3032.01, 53-3032.02, 53-3033.00)

### Significant Points

- Job opportunities should be favorable.
- Competition is expected for jobs offering the highest earnings or most favorable work schedules.
- A commercial driver's license is required to operate most larger trucks.

### Nature of the Work

Truck drivers are a constant presence on the Nation's highways and interstates, delivering everything from automobiles to canned foods. Firms of all kinds rely on trucks for pickup and delivery of goods because no other form of transportation can deliver goods door to door. Even if goods travel in part by ship, train, or airplane, trucks carry nearly all goods at some point in their journey from producer to consumer.

Before leaving the terminal or warehouse, truck drivers check the fuel level and oil in their trucks. They also inspect the trucks to make sure the brakes, windshield wipers, and lights are working and that a fire extinguisher, flares, and other safety equipment are aboard and in working order. Drivers make sure their cargo is secure and adjust their mirrors so that both sides of the truck are visible from the driver's seat. Drivers report equipment that is inoperable, missing, or loaded improperly to the dispatcher.

Once under way, drivers must be alert to prevent accidents. Drivers can see farther down the road, because large trucks sit higher than most other vehicles. This allows drivers to seek traffic lanes that allow for a steady speed, while keeping sight of varying road conditions.

Delivery time varies according to the type of merchandise and its final destination. Local drivers may provide daily service for a specific route, while other drivers make intercity and interstate deliveries that take longer and may vary from job to job. The driver's responsibilities and assignments change according to the time spent on the road, the type of payloads transported, and vehicle size.

New technologies are changing the way truck drivers work, especially long-distance truck drivers. Satellites and Global Positioning Systems (GPS) link many trucks with company headquarters. Troubleshooting information, directions, weather reports, and other important communications can be delivered to the truck, anywhere, within seconds. Drivers can easily communicate with the dispatcher to discuss delivery schedules and courses of action in the event of mechanical problems. The satellite linkup also allows the dispatcher to track the truck's location, fuel consumption, and engine performance. Many drivers also work with computerized inventory tracking equipment. It is important for the producer, warehouse, and customer to know the product's location at all times, in order to keep costs low and the quality of service high.

*Heavy truck and tractor-trailer drivers* drive trucks or vans with a capacity of at least 26,000 pounds Gross Vehicle Weight (GVW). They transport goods including cars, livestock, and other materials in liquid, loose, or packaged form. Many routes are from city to city and cover long distances. Some companies use two drivers on very long runs—one drives while the other sleeps in a berth behind the cab. "Sleeper" runs may last for days, or even weeks, usually with the truck stopping only for fuel, food, loading, and unloading.

Some heavy truck and tractor-trailer drivers who have regular runs transport freight to the same city on a regular basis. Other drivers perform unscheduled runs because shippers request varying service to different cities every day.

After these truck drivers reach their destination or complete their operating shift, the U.S. Department of Transportation requires that they complete reports detailing the trip, the condition of the truck, and the circumstances of any accidents. In addition, Federal regulations require employers to subject drivers to random alcohol and drug tests while they are on duty.

Long-distance heavy truck and tractor-trailer drivers spend most of their working time behind the wheel, but may load or unload their cargo after arriving at the final destination. This is especially common when drivers haul specialty cargo, because they may be the only one at the destination familiar with procedures or certified to handle the materials. Auto-transport drivers, for example, position cars on the trailers at the manufacturing plant and remove them at the dealerships. When picking up or delivering furniture, drivers of long-distance moving vans hire local workers to help them load or unload.

*Light or delivery services truck drivers* drive trucks or vans with a capacity under 26,000 pounds GVW. They deliver or pick up merchandise and packages within a specific area. This may include short "turnarounds" to deliver a shipment to a nearby city, pick up another loaded truck or van, and drive it back to their home base the same day. These services may require use of electronic delivery tracking systems to track the whereabouts of the merchandise or packages. Light or delivery services truck drivers usually load or unload the merchandise at the customer's place of business. They may have helpers if there are many deliveries to make during the day, or if the load requires heavy moving. Typically, before the driver arrives for work, material handlers load the trucks and arrange items to improve delivery efficiency. Customers must sign receipts for goods and pay drivers the balance due on the merchandise if there is a cash-on-delivery arrangement. At the end of the day, drivers turn in receipts, money, records of deliveries made, and any reports on mechanical problems with their trucks.

Some local truck drivers have sales and customer service responsibilities. The primary responsibility of *driver/sales workers*, or *route drivers*, is to deliver and sell their firm's products over established routes or within an established territory. They sell goods such as food products, including restaurant takeout items, or pick



*Even if goods travel in part by ship, train, or airplane, trucks carry nearly all goods at some point in their journey from producer to consumer.*



up and deliver items such as laundry. Their response to customer complaints and requests can make the difference between a large order and a lost customer. Route drivers may also take orders and collect payments.

The duties of driver/sales workers vary according to their industry, the policies of their particular company, and the emphasis placed on their sales responsibility. Most have wholesale routes that deliver to businesses and stores, rather than to homes. For example, wholesale bakery driver/sales workers deliver and arrange bread, cakes, rolls, and other baked goods on display racks in grocery stores. They estimate how many of each item to stock by paying close attention to what is selling. They may recommend changes in a store's order or encourage the manager to stock new bakery products. Laundries that rent linens, towels, work clothes, and other items employ driver/sales workers to visit businesses regularly to replace soiled laundry. From time to time, they solicit new orders from businesses along their route.

After completing their route, driver/sales workers order items for the next delivery based on product sales trends, weather, and customer requests.

### **Working Conditions**

Truck driving has become less physically demanding because most trucks now have more comfortable seats, better ventilation, and improved, ergonomically-designed cabs. Although these changes make the work environment more attractive, driving for many hours at a stretch, unloading cargo, and making many deliveries can be tiring. Local truck drivers, unlike long-distance drivers, usually return home in the evening. Some self-employed long-distance truck drivers who own and operate their trucks spend most of the year away from home.

Design improvements in newer trucks reduce stress and increase the efficiency of long-distance drivers. Many of the newer trucks are virtual mini-apartments on wheels, equipped with refrigerators, televisions, and bunks.

The U.S. Department of Transportation governs work hours and other working conditions of truck drivers engaged in interstate commerce. A long-distance driver cannot work more than 60 hours in any 7-day period. Federal regulations also require that truckers rest 10 hours for every 11 hours of driving. Many drivers, particularly on long runs, work close to the maximum time permitted because they typically are compensated according to the number of miles or hours they drive. Drivers on long runs may face boredom, loneliness, and fatigue. Drivers frequently travel at night, and on holidays and weekends, to avoid traffic delays and deliver cargo on time.

Local truck drivers frequently work 50 or more hours a week. Drivers who handle food for chain grocery stores, produce markets, or bakeries typically work long hours, starting late at night or early in the morning. Although most drivers have regular routes, some have different routes each day. Many local truck drivers, particularly driver/sales workers, load and unload their own trucks. This requires considerable lifting, carrying, and walking each day.

### **Employment**

Truck drivers and driver/sales workers held about 3.2 million jobs in 2002. Of these workers, 431,000 were driver/sales workers and 2.8 million were truck drivers. Most truck drivers find employment in large metropolitan areas along major interstate roadways where major trucking, retail, and wholesale companies have distribution outlets. Some drivers work in rural areas, providing specialized services such as delivering newspapers to customers or coal to a railroad.

The truck transportation industry employed almost one-quarter of all truck drivers and driver/sales workers in the United States. Another quarter worked for companies engaged in wholesale or retail trade. The remaining truck drivers and driver/sales workers were distributed across many industries, including construction and manufacturing.

Over 10 percent of all truck drivers and driver/sales workers were self-employed. Of these, a significant number were owner-operators who either served a variety of businesses independently or leased their services and trucks to a trucking company.

### **Training, Other Qualifications, and Advancement**

State and Federal regulations govern the qualifications and standards for truck drivers. All drivers must comply with Federal regulations and any State regulations that are stricter than Federal requirements. Truck drivers must have a driver's license issued by the State in which they live, and most employers require a clean driving record. Drivers of trucks designed to carry 26,000 pounds or more—including most tractor-trailers, as well as bigger straight trucks—must obtain a commercial driver's license (CDL) from the State in which they live. All truck drivers who operate trucks transporting hazardous materials must obtain a CDL, regardless of truck size. Federal regulations governing the CDL exempt certain groups, including farmers, emergency medical technicians, firefighters, some military drivers, and snow and ice removers. In many States, a regular driver's license is sufficient for driving light trucks and vans.

To qualify for a commercial driver's license, applicants must pass a written test on rules and regulations, and then demonstrate that they can operate a commercial truck safely. A national database permanently records all driving violations incurred by persons who hold commercial licenses. A State will check these records and deny a commercial driver's license to a driver who already has a license suspended or revoked in another State. Licensed drivers must accompany trainees until the trainees get their own CDL. Information on how to apply for a commercial driver's license may be obtained from State motor vehicle administrations.

While many States allow those who are at least 18 years old to drive trucks within their borders, the U.S. Department of Transportation establishes minimum qualifications for truck drivers engaged in interstate commerce. Federal Motor Carrier Safety Regulations require drivers to be at least 21 years old and to pass a physical examination once every 2 years. The main physical requirements include good hearing, at least 20/40 vision with glasses or corrective lenses, and a 70-degree field of vision in each eye. Drivers cannot be colorblind. Drivers must be able to hear a forced whisper in one ear at not less than 5 feet, with a hearing aide if needed. Drivers must have normal use of arms and legs and normal blood pressure. Drivers cannot use any controlled substances, unless prescribed by a licensed physician. Persons with epilepsy or diabetes controlled by insulin are not permitted to be interstate truck drivers. Federal regulations also require employers to test their drivers for alcohol and drug use as a condition of employment, and require periodic random tests of the drivers while they are on duty. In addition, drivers must have no criminal records such as felonies involving the use of a motor vehicle; any crime involving drugs, including driving under the influence of drugs or alcohol; and any hit-and-run accident that resulted in injury or death. All drivers must be able to read and speak English well enough to read road signs, prepare reports, and communicate with law enforcement officers and the public. Also, drivers must take a written examination on the Motor Carrier Safety Regulations of the U.S. Department of Transportation.

Many trucking operations have higher standards than those described. Many firms require that drivers be at least 22 years old, be able to lift heavy objects, and have driven trucks for 3 to 5 years. Many prefer to hire high school graduates and require annual physical examinations. Companies have an economic incentive to hire less risky drivers. Good drivers drive more efficiently, using less fuel and costing less to insure.

Taking driver-training courses is a desirable method of preparing for truck driving jobs and for obtaining a commercial driver's license. High school courses in driver training and automotive mechanics also may be helpful. Many private and public vocational-technical schools offer tractor-trailer driver training programs. Students learn to maneuver large vehicles on crowded streets and in highway traffic. They also learn to inspect trucks and freight for compliance with regulations. Some programs provide only a limited amount of actual driving experience, and completion of a program does not guarantee a job. Persons interested in attending a driving school should check with local trucking companies to make sure the school's training is acceptable. Some States require prospective drivers to complete a training course in basic truck driving before being issued their CDL. The Professional Truck Driver Institute (PTDI), a nonprofit organization established by the trucking industry, manufacturers, and others, certifies driver training programs at truck driver training schools that meet industry standards and Federal Highway Administration guidelines for training tractor-trailer drivers.

Drivers must get along well with people because they often deal directly with customers. Employers seek driver/sales workers who speak well and have self-confidence, initiative, tact, and a neat appearance. Employers also look for responsible, self-motivated individuals able to work with little supervision.

Training given to new drivers by employers is usually informal, and may consist of only a few hours of instruction from an experienced driver, sometimes on the new employee's own time. New drivers may also ride with and observe experienced drivers before assignment of their own runs. Drivers receive additional training to drive special types of trucks or handle hazardous materials. Some companies give 1 to 2 days of classroom instruction covering general duties, the operation and loading of a truck, company policies, and the preparation of delivery forms and company records. Driver/sales workers also receive training on the various types of products the company carries, so that they will be effective sales workers.

Although most new truck drivers are assigned immediately to regular driving jobs, some start as extra drivers, substituting for regular drivers who are ill or on vacation. They receive a regular assignment when an opening occurs.

New drivers sometimes start on panel trucks or other small straight trucks. As they gain experience and show competent driving skills, they may advance to larger and heavier trucks, and finally to tractor-trailers.

Advancement of truck drivers generally is limited to driving runs that provide increased earnings or preferred schedules and working conditions. For the most part, a local truck driver may advance to driving heavy or special types of trucks, or transfer to long-distance truck driving. Working for companies that also employ long-distance drivers is the best way to advance to these positions. A few truck drivers may advance to dispatcher, manager, or traffic work—for example, planning delivery schedules.

Some long-distance truck drivers purchase a truck and go into business for themselves. Although many of these owner-operators are successful, some fail to cover expenses and eventually go out of business. Owner-operators should have good business sense as well

as truck driving experience. Courses in accounting, business, and business mathematics are helpful, and knowledge of truck mechanics can enable owner-operators to perform their own routine maintenance and minor repairs.

### Job Outlook

Job opportunities should be favorable for truck drivers. In addition to growth in demand for truck drivers, numerous job openings will occur as experienced drivers leave this large occupation to transfer to other fields of work, retire, or leave the labor force for other reasons. Jobs vary greatly in terms of earnings, weekly work hours, number of nights spent on the road, and quality of equipment operated. Because this occupation does not require education beyond high school, competition is expected for jobs with the most attractive earnings and working conditions.

Overall employment of truck drivers and driver/sales workers is expected to increase as fast as the average for all occupations through the year 2012, due to growth in the economy and in the amount of freight carried by truck. The increased use of rail, air, and ship transportation requires truck drivers to pick up and deliver shipments. Demand for long-distance drivers will remain strong because these drivers transport perishable and time-sensitive goods more efficiently than do alternative modes of transportation, such as railroads. Job opportunities for truck drivers with less-than-truckload carriers will be more competitive than those with truckload carriers because of the more desirable working conditions for less-than-truckload carriers.

Faster than average growth of light and heavy truck driver employment will outweigh relatively slow growth in driver/sales worker jobs. The number of truck drivers with sales responsibilities is expected to increase more slowly than the average for all other occupations as companies increasingly shift sales, ordering, and customer service tasks to sales and office staffs, and use regular truck drivers to make deliveries to customers.

Job opportunities may vary from year to year, because the strength of the economy dictates the amount of freight moved by trucks. Companies tend to hire more drivers when the economy is strong and deliveries are in high demand. Consequently, when the economy slows, employers hire fewer drivers, or even lay off drivers. Independent owner-operators are particularly vulnerable to slowdowns. Industries least likely to be affected by economic fluctuation, such as grocery stores, tend to be the most stable places for employment.

### Earnings

Median hourly earnings of heavy truck and tractor-trailer drivers were \$15.97 in 2002. The middle 50 percent earned between \$12.51 and \$20.01 an hour. The lowest 10 percent earned less than \$10.01, and the highest 10 percent earned more than \$23.75 an hour. Median hourly earnings in the industries employing the largest numbers of heavy truck and tractor-trailer drivers in 2002 were as follows:

General freight trucking .....	\$17.56
Grocery and related product wholesalers .....	16.90
Specialized freight trucking .....	15.79
Other specialty trade contractors .....	14.25
Cement and concrete product manufacturing .....	14.14

Median hourly earnings of light or delivery services truck drivers were \$11.48 in 2002. The middle 50 percent earned between \$8.75 and \$15.57 an hour. The lowest 10 percent earned less than

\$7.03, and the highest 10 percent earned more than \$20.68 an hour. Median hourly earnings in the industries employing the largest numbers of light or delivery services truck drivers in 2002 were as follows:

Couriers .....	\$17.48
General freight trucking .....	14.92
Grocery and related product wholesalers .....	12.26
Building material and supplies dealers .....	10.83
Automotive parts, accessories, and tire stores .....	7.82

Median hourly earnings of driver/sales workers, including commission, were \$9.92 in 2002. The middle 50 percent earned between \$6.98 and \$14.70 an hour. The lowest 10 percent earned less than \$6.07, and the highest 10 percent earned more than \$19.60 an hour. Median hourly earnings in the industries employing the largest numbers of driver/sales workers in 2002 were as follows:

Specialty food stores .....	\$14.98
Drycleaning and laundry services .....	14.74
Grocery and related product wholesalers .....	12.66
Limited-service eating places .....	6.78
Full-service restaurants .....	6.47

As a general rule, local truck drivers receive an hourly wage and extra pay for working overtime, usually after 40 hours. Employers pay long-distance drivers primarily by the mile. Their rate per mile can vary greatly from employer to employer and may even depend on the type of cargo. Typically, earnings increase with mileage driven, seniority, and the size and type of truck driven. Most driver/sales workers receive a commission based on their sales in addition to an hourly wage.

Most self-employed truck drivers are primarily engaged in long-distance hauling. Many truck drivers are members of the International Brotherhood of Teamsters. Some truck drivers employed by companies outside the trucking industry are members of unions representing the plant workers of the companies for which they work.

### **Related Occupations**

Other driving occupations include ambulance drivers and attendants, except emergency medical technicians; bus drivers; and taxi drivers and chauffeurs.

### **Sources of Additional Information**

Information on truck driver employment opportunities is available from local trucking companies and local offices of the State employment service.

Information on career opportunities in truck driving may be obtained from:

► American Trucking Associations, Inc., 2200 Mill Rd., Alexandria, VA 22314. Internet: <http://www.trucking.org>

A list of certified tractor-trailer driver training courses may be obtained from:

► Professional Truck Driver Institute, 2200 Mill Rd., Alexandria, VA 22314. Internet: <http://www.ptdi.org>

## Water Transportation Occupations

(0\*NET 53-5011.01, 53-5011.02, 53-5021.01, 53-5021.02, 53-5021.03, 53-5022.00, 53-5031.00)

### Significant Points

- Many jobs in water transportation occupations require a merchant mariner's document or a license from the U.S. Coast Guard.
- Merchant mariners on oceangoing ships are hired for periods ranging from a single voyage to several continuous voyages and may be away from home continuously for months.
- Jobs aboard oceangoing vessels have high pay, but competition for them remains keen, and merchant mariners might have to wait months between work opportunities.

### Nature of the Work

The movement of huge amounts of cargo, as well as passengers, between nations and within our Nation depends on workers in water transportation occupations, also known on commercial ships as merchant mariners. They operate and maintain deep-sea merchant ships, tugboats, towboats, ferries, dredges, excursion vessels, and other waterborne craft on the oceans, the Great Lakes, rivers, canals, and other waterways, as well as in harbors. (Workers who operate watercraft used in commercial fishing are described in the section on fishers and fishing vessel operators elsewhere in the *Handbook*.)

Captains, mates, and pilots of water vessels command or supervise the operations of ships and water vessels, both within domestic waterways and on the deep sea. *Captains* or *masters* are in overall command of the operation of a vessel, and they supervise the work of all other officers and crew. They determine the course and speed of the vessel, maneuver to avoid hazards, and continuously monitor the vessel's position with charts and navigational aides. Captains either direct or oversee crew members who steer the vessel, determine its location, operate engines, communicate with other vessels, perform maintenance, handle lines, or operate equipment on the vessel. Captains and their department heads ensure that proper procedures and safety practices are followed, check to make sure that machinery and equipment are in good working order, and oversee the loading and discharging of cargo or passengers. They also maintain logs and other records tracking the ships' movements, efforts at controlling pollution, and cargo and passengers carried.

*Deck officers* or *mates* direct the routine operation of the vessel for the captain during the shifts when they are on watch. All mates stand watch for specified periods, usually 4 hours on and 8 hours off. However, on smaller vessels, there may be only one mate (called a *pilot* on some inland towing vessels), who alternates watches with the captain. The mate would assume command of the ship if the captain became incapacitated. When more than one mate is necessary aboard a ship, they typically are designated chief mate or first mate, second mate, third mate, etc. Mates also supervise and coordinate activities of the crew aboard the ship. They inspect the cargo holds during loading to ensure that the load is stowed according to specifications and regulations. Mates supervise crew members engaged in maintenance and the primary upkeep of the vessel.

*Pilots* guide ships in and out of harbors, through straits, and on rivers and other confined waterways where a familiarity with local

water depths, winds, tides, currents, and hazards such as reefs and shoals are of prime importance. Pilots on river and canal vessels usually are regular crew members, like mates. Harbor pilots are generally independent contractors who accompany vessels while they enter or leave port. Harbor pilots may pilot many ships in a single day. *Motorboat operators* operate small, motor-driven boats that carry six or fewer passengers on fishing charters. They also take depth soundings in turning basins and serve as liaisons between ships, between ship and shore, between harbors and beaches, or on area patrol.

*Ship engineers* operate, maintain, and repair propulsion engines, boilers, generators, pumps, and other machinery. Merchant marine vessels usually have four engineering officers: A chief engineer and a first, second, and third assistant engineer. Assistant engineers stand periodic watches, overseeing the safe operation of engines and machinery.

*Marine oilers* and more experienced *qualified members of the engine department*, or QMEDs, maintain the vessel in proper running order in the engine spaces below decks, under the direction of the ship's engineering officers. These workers lubricate gears, shafts, bearings, and other moving parts of engines and motors; read pressure and temperature gauges; record data; and sometimes assist with repairs and adjust machinery.

*Sailors* operate the vessel and its deck equipment under the direction of the ship's officers and keep the nonengineering areas in good condition. They stand watch, looking out for other vessels and obstructions in the ship's path, as well as for navigational aids such as buoys and lighthouses. They also steer the ship, measure water depth in shallow water, and maintain and operate deck equipment such as lifeboats, anchors, and cargo-handling gear. On vessels handling liquid cargo, mariners designated as *pumpmen* hook up hoses, operate pumps, and clean tanks; on tugboats or tow vessels, they tie barges together into tow units, inspect them periodically, and disconnect them when the destination is reached. When docking or departing, they handle lines. They also perform routine maintenance chores, such as repairing lines, chipping rust, and painting and cleaning decks or other areas. Experienced sailors are designated *able seamen* on oceangoing vessels, but may be called simply *deckhands* on inland waters; larger vessels usually have a *boatswain*, or head seaman.

A typical deep-sea merchant ship has a captain, three deck officers or mates, a chief engineer and three assistant engineers, a



Water transportation workers guide ships in and out of harbors, being careful to avoid other ships and other hazards.

radio operator, plus six or more unlicensed seamen, such as able seamen, oilers, QMEDs, and cooks or food handlers. The size and service of the ship determine the number of crewmembers for a particular voyage. Small vessels operating in harbors, on rivers, or along the coast may have a crew comprising only a captain and one deckhand. The cooking responsibilities usually fall under the deckhands' duties.

On larger coastal ships, the crew may include a captain, a mate or pilot, an engineer, and seven or eight seamen. Some ships may have special unlicensed positions for entry level apprentice trainees. Unlicensed positions on a large ship may include a full-time cook, an electrician, and machinery mechanics. On cruise ships, *bedroom stewards* keep passengers' quarters clean and comfortable.

### Working Conditions

Merchant mariners spend extended periods at sea. Most deep-sea mariners are hired for one or more voyages that last for several months; there is no job security after that. The length of time between voyages varies depending on job availability and personal preference.

The rate of unionization for these workers is about 24 percent, much higher than the average for all occupations. Consequently, merchant marine officers and seamen, both veterans and beginners, are hired for voyages through union hiring halls or directly by shipping companies. Hiring halls rank the candidates by the length of time the person has been out of work and fill open slots accordingly. Hiring halls typically are found in major seaports.

At sea, these workers usually stand watch for 4 hours and are off for 8 hours, 7 days a week. Those employed on Great Lakes ships work 60 days and have 30 days off, but do not work in the winter when the lakes are frozen. Workers on rivers, on canals, and in harbors are more likely to have year-round work. Some work 8- or 12-hour shifts and go home every day. Others work steadily for a week or a month and then have an extended period off. When working, they usually are on duty for 6 or 12 hours and off for 6 or 12 hours. Those on smaller vessels are normally assigned to one vessel and have steady employment.

People in water transportation occupations work in all weather conditions. Although merchant mariners try to avoid severe storms while at sea, working in damp and cold conditions often is inevitable. While it is uncommon nowadays for vessels to suffer disasters such as fire, explosion, or a sinking, workers face the possibility that they may have to abandon their craft on short notice if it collides with other vessels or runs aground. They also risk injury or death from falling overboard and hazards associated with working with machinery, heavy loads, and dangerous cargo. However, modern safety management procedures, advanced emergency communications, and effective international rescue systems place modern mariners in a much safer position.

Most newer vessels are air conditioned, soundproofed from noisy machinery, and equipped with comfortable living quarters. For some mariners, these amenities have helped ease the sometimes difficult circumstances of long periods away from home. Also, modern communications, especially email, link modern mariners to their families. Nevertheless, some mariners dislike the long periods away from home and the confinement aboard ship and consequently leave the occupation.

### Employment

Water transportation workers held about 68,000 jobs in 2002. The total number that worked at some point in the year was perhaps twice as large because many merchant marine officers and seamen worked only part of the year. The following tabulation shows employment in the occupations that make up this group:

Sailors and marine oilers .....	27,000
Captains, mates, and pilots of water vessels .....	25,000
Ship engineers .....	8,200
Motorboat operators .....	4,100
All other water transportation workers .....	3,600

About 30 percent of all workers were employed in water transportation services. About one half worked in inland water transportation—primarily the Mississippi River system—while the other half were employed in water transportation on the deep seas, along the coasts, and on the Great Lakes. About another 28 percent worked in establishments related to port and harbor operations, marine cargo handling, or navigational services to shipping. The Federal government employed approximately 5 percent of all water transportation workers, most of whom worked on supply ships and are Civilian Mariners of the Department Navy's Military Sealift Command.

### Training, Other Qualifications

Entry, training, and educational requirements for most water transportation occupations are established and regulated by the U.S. Coast Guard, an agency of the U.S. Department of Homeland Security. All officers and operators of commercially operated vessels must be licensed by the Coast Guard, which offers various kinds of licenses, depending on the position and type of vessel.

There are two ways to qualify for a deck or engineering officer's license: applicants either must accumulate sea time and meet regulatory requirements or must graduate from the U.S. Merchant Marine Academy or one of the six State maritime academies. In both cases, applicants must pass a written examination. Federal regulations also require that an applicant pass a physical examination, a drug screening, and a National Driver Register Check before being considered. Persons without formal training can be licensed if they pass the written exam and possess sea service appropriate to the license for which they are applying. However, it is difficult to pass the examination without substantial formal schooling or independent study. Also, because seamen may work 6 or fewer months a year, it can take 5 to 8 years to accumulate the necessary experience. The academies offer a 4-year academic program leading to a bachelor-of-science degree, a license (issued only by the Coast Guard) as a third mate (deck officer) or third assistant engineer (engineering officer), and, if the person is qualified, a commission as ensign in the U.S. Naval Reserve, Merchant Marine Reserve, or Coast Guard Reserve. With experience and additional training, third officers may qualify for higher rank.

Sailors and unlicensed engineers working on U.S. flagged deep-sea and Great Lakes vessels must hold a Coast Guard-issued document. In addition, they must hold certification when working aboard liquid-carrying vessels. Able seamen also must hold government-issued certification. For employment in the merchant marine as an unlicensed seaman, a merchant mariner's document issued by the Coast Guard is needed. Most of the jobs must be filled by U.S. citizens; however, a small percentage of applicants for merchant mariner documents do not need to be U.S. citizens, but must at least be aliens legally admitted into the United States and holding a green card. A medical certificate of excellent health attesting to vision, color perception, and general physical condition is required for higher level deckhands and unlicensed engineers. While no experience or formal schooling is required, training at a union-operated school is the best source. Beginners are classified as ordinary seamen and may be assigned to any of the three unlicensed departments: Deck, engine, or steward. With experience at sea and perhaps union-sponsored training, an ordinary seaman can pass the able-seaman exam and move up with 3 years of service.

No special training or experience is needed to become a seaman or deckhand on vessels operating in harbors or on rivers or other waterways. Newly hired workers generally are given a short introductory course and then learn skills on the job. After sufficient experience, they are eligible to take a Coast Guard exam to qualify as a mate, pilot, or captain. Substantial knowledge gained through experience, courses taught at approved schools, and independent study is needed to pass the exam.

Harbor pilot training usually consists of an extended apprenticeship with a towing company or a pilots' association. Entrants may be able seamen or licensed officers.

### Job Outlook

Keen competition is expected to continue for jobs in water transportation occupations. Overall, employment in these occupations is projected to grow more slowly than the average for all occupations through the year 2012. Opportunities will vary by sector, and some of the best opportunities will be in scenic transportation and sightseeing and deep sea, coastal, and Great Lakes transportation.

Employment in deep-sea shipping for American mariners is expected to stabilize after several years of decline. New international regulations have raised shipping standards with respect to safety, training, and working conditions. Consequently, competition from ships that sail under foreign *flags of convenience* should lessen as insurance rates rise for ships that do not meet the new standards. Insuring ships under industrialized countries' flags, including that of the United States, should become less expensive, increasing the amount of international cargo carried by U.S. ships. A fleet of deep-sea U.S.-flagged ships is considered to be vital to the Nation's defense, so some receive Federal support through a maritime security subsidy and other provisions in laws that limit certain Federal cargoes to ships that fly the U.S. flag. Possible future developments include "fast ships"—ocean-going cargo vessels that use jet propulsion—which would decrease ocean-crossing times significantly. If such plans are successful, the industry will benefit in terms of increased business and employment.

Vessels on rivers and canals and on the Great Lakes carry mostly bulk products, such as coal, iron ore, petroleum, sand and gravel, grain, and chemicals. Although shipments of these products are expected to grow through the year 2012, current imports of steel are dampening employment on the Lakes, but actually leading to greater chances for overall employment for transport up the Mississippi River system. Employment in water transportation services is likely to rise, and efforts are underway at the Federal level that could lead to significantly greater use of ferries to handle commuter traffic around major metropolitan areas.

Employment growth also is expected in passenger cruise ships within U.S. waters. Vessels that operate between U.S. ports are required by law to be U.S.-flagged vessels. The building and staffing of several new cruise ships that will travel around the Hawaiian Islands will create new opportunities for employment at sea in the cruise line industry, which is composed mostly of foreign-flagged ships.

Openings within the traditional water transportation sector for mariners, although expanding only slightly, should be quite numerous because of the sizable need to replace those leaving the occupation. Some experienced merchant mariners may continue to go without work for varying periods. However, this situation appears to be changing, with demand for licensed and unlicensed personnel rising. Maritime academy graduates who have not found licensed shipboard jobs in the U.S. merchant marine find jobs in related industries. Because they are commissioned as ensigns in the Naval or Coast Guard Reserve, some are selected for active

duty in those branches of the Service. Some find jobs as seamen on U.S.-flagged or foreign-flagged vessels, tugboats, and other watercraft or enter civilian jobs with the U.S. Navy or Coast Guard. Some take land-based jobs with shipping companies, marine insurance companies, manufacturers of boilers or related machinery, or other related jobs.

### Earnings

Earnings vary widely with the particular water transportation position and the worker's experience, ranging from the minimum wage for some beginning seamen or mate positions to more than \$37.37 an hour for some experienced ship engineers. Median hourly earnings of water transportation occupations in 2002 were as follows:

Ship engineers .....	\$24.61
Captains, mates, and pilots of water vessels .....	23.97
All other water transportation workers .....	14.67
Sailors and marine oilers .....	13.64
Motorboat operators .....	12.71

Annual pay for captains of larger vessels, such as container ships, oil tankers, or passenger ships, may exceed \$100,000, but only after many years of experience. Similarly, captains of tugboats often earn more than the median reported here, with earnings dependent on the port and the nature of the cargo.

### Related Occupations

Workers in other occupations who make their living on the seas and coastal waters include fishers and fishing vessel operators and some members of branches of the Armed Forces.

### Sources of Additional Information

Information on a program called "Careers Afloat", which includes a substantial listing of training and employment descriptive information and contacts in the U.S., may be obtained through:

► Maritime Administration, U.S. Department of Transportation, 400 7th St. SW., Room 7302, Washington, DC 20590. Internet: <http://www.marad.dot.gov>

Information on merchant marine careers, training, and licensing requirements is available from any of the following organizations:

► Military Sealift Command, APMC, PO Box 120, Camp Pendleton, Virginia Beach, VA 23548-0120. Internet: <http://www.sealiftcommand.com>

► Seafarers' International Union, 5201 Auth Way, Camp Springs, MD 20746.

► Paul Hall Center for Maritime Training and Education, P.O. Box 75, Piney Point, MD 20674-0075. Internet: <http://www.seafarers.org/phc>

► International Organization of Masters, Mates, and Pilots, 700 Maritime Boulevard, Linthicum Heights, MD 21090-1941.

► U.S. Coast Guard National Maritime Center, 4200 Wilson Boulevard, Suite 630, Arlington, VA 22203-1804. Internet: <http://www.uscg.mil/stcw/index.htm>