Farming, Fishing, Forestry, and Transportation Occupations

Reprinted from the

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 workers
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

(O*NET 45-2011.00, 45-2021.00, 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 raising plants in greenhouses, to harvesting crops and tending to livestock outdoors, to inspecting agricultural products at border crossings.
- Farmworkers learn through short-term on-the-job training; agricultural inspectors and animal breeders require work experience or a college degree.
- Most farmworkers receive low pay and perform strenuous work outdoors in all kinds of weather but many enjoy the rural lifestyle.
- Employment is projected to decline slightly.

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 8 out of 10 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, cleaners, 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.

Animal breeders select and breed animals using their knowledge of genetics and animal science to produce offspring with desired traits and characteristics, such as chickens that lay more eggs, pigs that produce leaner meat, and sheep with more desirable wool. Animal breeders also raise and breed animals simply to sell their offspring for money, including cats and dogs and other household pets. The larger and more expensive animals that are bred, such as horses and cattle, are usually bred through artificial insemination, which requires the taking of semen from the male and then inseminating the female with it. Using this process ensures better results and also enables one prized male to sire many more offspring than through conventional mating. To know when and which animals to breed, breeders keep detailed records, including the health of the animal, its size and weight, and the amount and quality of the product produced by the animal. They also keep track of the traits of the offspring. Some breeders work as consultants for a number of farmers, while others breed and raise their own animals for eventual sale or to breed. For breeders that raise animals, they may also have to care and clean animal shelters, feed and water the animals, and oversee their day-to-day health or supervise others that perform these jobs. Additionally, animal breeders read journals and newsletters to remain current with the latest information on animal breeding and veterinary advice.

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, and work cannot be delayed when crops must be
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 to protect them from 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.

Animal breeders spend most of their time outdoors around animals, but can also work in offices or in laboratories. If consulting, breeders may have to travel from farm to farm. If they need to sell the offspring, breeders may have to travel to attend shows and to meet with potential buyers. While tending to the animals, breeders may be bitten or kicked.

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.

Training, Other Qualifications, and Advancement
Farmworkers learn through short-term on-the-job training. Most do not have a high school diploma. Workers without a high school diploma are particularly common 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.

The education and training requirements for animal breeders vary with the type of breeding they do. For those whose primary activity is breeding, particularly livestock and other large or expensive animals, rather than raising animals, a bachelor’s degree or higher in the animal sciences is recommended with courses in genetics, animal breeding, and animal physiology. For those with experience raising animals or those who are breeding their own animals, an associate’s degree or other postsecondary training in animal breeding is recommended. Experience working around animals, especially on a farm, is helpful, even for those getting a degree.

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. Knowl-
Farmworkers who work with farm and ranch animals perform work related to conservation, and logging workers; and grounds maintenance workers.

**Employment**

Agricultural workers held about 834,000 jobs in 2004. Of these, farmworkers were the most numerous, holding about 690,000 jobs. Graders and sorters held about 45,000 jobs, agricultural inspectors 14,000 jobs, agricultural equipment operators 60,000 jobs, and animal breeders 12,000 jobs. More than 66 percent of all agricultural workers worked for crop and livestock producers, while more than 5 percent worked for agricultural service providers, mostly farm labor contractors.

**Job Outlook**

Overall employment of agricultural workers is projected to decline slightly over the 2004-14 period, primarily reflecting the outlook for farmworkers in crops, nurseries, and greenhouses, which make up the large majority of all agricultural workers. Low wages, the physical demands of the work, and the large numbers of workers who leave these jobs for other occupation should result in abundant job opportunities, however.

Continued consolidation of farms and technological advancements in farm equipment that make farmworkers both more efficient and less needed will cause fewer of them to be hired. Farmworkers will increasingly work for farm labor contractors rather than being hired directly by the farm. The agriculture industry also is expected to undergo increased competition from foreign countries and rising imports, particularly from Central America, owing to the passing of a free trade agreement with that region. Nursery and greenhouse workers should experience some growth in this period, reflecting the increasing demand for landscaping services.

Slower-than-average employment growth 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, while employment of agricultural equipment operators is expected to decline slightly, reflecting the agriculture industry’s continuing ability to produce more with fewer workers. Animal breeders also will grow more slowly than the average, as large commercial farms continue to attempt to breed the perfect animal. However, because the occupation is so small there will be few job openings.

**Earnings**

Median hourly earnings in May 2004 for each of the occupations found in this statement are as follows:

- Agricultural inspectors: $14.92
- Animal breeders: 13.55
- Agricultural workers, all other: 10.15
- Agricultural equipment operators: 8.88
- Farmworkers, farm and ranch animals: 8.31
- Graders and sorters, agricultural products: 7.90
- Farmworkers and laborers, crop, nursery, and greenhouse: 7.70

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. Animal breeders may perform some duties related to those of veterinary technologists or veterinarians.

**Sources of Additional Information**

Information on agricultural worker jobs is available from:
- National FFA Organization, The National FFA Center, Attention: Career Information Requests, P.O. Box 68690, Indianapolis, IN 46268-0960. Internet: [http://www.ffao.org](http://www.ffao.org)
- Growing New Farmers Consortium, c/o New England Small Farm Institute, P.O. Box 11, Belchertown, MA 01007. Internet: [http://www.northeastnewfarmers.org](http://www.northeastnewfarmers.org)

Information on obtaining positions as an agricultural inspector with the Federal Government is available from the Office of Personnel Management through USAJOBS, the Federal Government’s official employment information system. This resource for locating and applying for job opportunities can be accessed through the Internet at [http://www.usajobs.opm.gov](http://www.usajobs.opm.gov) or through an interactive voice response telephone system at (703) 724-1850 or TDD (978) 461-8404. These numbers are not tollfree, and charges may result.

---

## Air Traffic Controllers

*(O*NET 53-2021.00)*

### Significant Points

- Nearly all air traffic controllers are employed by the Federal Aviation Administration (FAA), an agency of the Federal Government.
- Replacement needs will account for most job openings, reflecting the large number of air traffic controllers who will be eligible to retire over the next decade.
- Competition to get into FAA training programs is expected to remain keen; however, graduates of these programs have good job prospects.
- Air traffic 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 through designated airspaces; others regulate airport arrivals and departures.

Although airport tower controllers 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 controller in the tower of the plane’s presence. The controller informs the pilot of the current weather conditions and of any potential hazards. As a plane rises to cruising altitude, the controller assigns it a flight level or provides instructions for it to climb or descend as necessary.
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 20 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 busiest 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 and 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 might 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.

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, preflight and inflight weather information, suggested routes, and other information important to the safety of a flight. Flight service 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 FAA’s Air Traffic Control Systems Command Center in Herndon, VA, 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.

The FAA has implemented an 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. The NAS Architecture facilitates continuing discussion of modernization between the FAA and the aviation community.

Working Conditions
Controllers work a basic 40-hour week; however, they may work additional hours, for which they receive overtime, or premium, 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.

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. 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 Program or the Minneapolis Community & Technical College, Air Traffic Control Training Program. The test is administered by computer and takes about 8 hours to complete. To take the test, an applicant must apply under an open advertisement for air traffic control positions and be chosen to take the examination. When there are many more applicants than available positions, applicants are selected to take the test through random selection. In addition to the pre-employment test, applicants must have 3 years of full-time work experience, have completed a full 4 years of college, or a combination of both. In combining education and experience, 1 year of undergraduate study—30 semester or 45 quarter hours—is equivalent to 9 months of work experience. Certain kinds of aviation experience also may be substituted for these requirements.

Upon successful completion of an FAA-approved program, individuals who receive school recommendation, meet the basic qualification requirements (including being less than 31 years of age) in accordance with Federal law, and achieve 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, undergo drug screening, and obtain a security clearance before they can be hired.

Upon selection, employees attend the FAA Academy in Oklahoma City, OK, 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, candidates assigned to an air traffic control facility are classified as “developmental controllers” until they complete all requirements to be certified for all of the air traffic control positions within a defined area of a given facility. Generally, it takes new controllers with only initial controller training between 2 and 4 years, depending on the facility and the availability of facility staff or contractors to provide on-the-job training, to complete all the certification requirements to become certified professional controllers. Individuals who have had prior controller experience normally take less time to become fully certified. 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 to give pilots 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, such as air traffic control data systems computer specialist, 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.

**Employment**

Air traffic controllers held about 24,000 jobs in 2004. The vast majority were employed by the FAA. 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, NJ. Others serve as instructors at the FAA Academy in Oklahoma City, OK. 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.

**Job Outlook**

Employment of air traffic controllers is expected to grow about as fast as the average for all occupations through the year 2014. 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. 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. In addition, Federal budget constraints may limit hiring of air traffic controllers.

More job openings are expected as the result of replacement needs from workers leaving the occupation. 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 result in 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 who 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**

Air traffic controllers earn relatively high pay and have good benefits. Median annual earnings of air traffic controllers in May 2004 were $102,030. The middle 50 percent earned between $78,170 and $126,260. The lowest 10 percent earned less than $57,720, and the highest 10 percent earned more than $139,210.

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 $106,380 in May 2004. The Air Traffic Control pay system classifies each air traffic facility into one of eight levels with corresponding pay bands. Under this pay system, controllers’ salaries are determined by the rating of the facility. The higher the rating, the higher the controller’s salary and the greater the demand on the controller’s judgment, skill, and decision making ability.

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, in addition to life insurance and health benefits. Controllers also 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 the FAA:
▸ Federal Aviation Administration, 800 Independence Ave. SW., Washing-
ton, DC 20591. Internet: http://www.faa.gov

Aircraft Pilots and Flight Engineers
(O*NET 53-2011.00, 53-2012.00)

Significant Points
● Regional and low-fare airlines offer the best opportunities; pilots attempting to get jobs at the major airlines will face strong competition.
● Pilots usually start with smaller commuter and regional airlines to acquire the experience needed to qualify for higher paying jobs with national or major airlines.
● Many pilots 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).
● Earnings of airline pilots are among the highest in the Nation.

Nature of the Work
Pilots are highly trained professionals who either fly airplanes or 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 tasks such as dusting crops, spreading seed for reforestation, testing aircraft, handling luggage to ensure a balanced load, and supervising refueling; other nonflying responsibilities include keeping records on their flight and the aircraft maintenance status for their company and the FAA.

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, pilots 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, because helicopters are used for short trips at relatively low altitude, helicopter pilots must be constantly on the lookout for trees, bridges, power lines, 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 without an outside visual reference. Once on the ground, pilots must complete records on their flight and the aircraft maintenance status for their company and the FAA.

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. However, because of the large numbers of passengers, airline pilots may be called upon to coordinate handling of disgruntled or disruptive passengers. 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 repairs.

Some pilots are flight instructors. They teach their students in-ground-school classes, in simulators, and in dual-controlled planes and helicopters. A few 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
Because of FAA regulations, airline pilots flying large aircraft, 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. An airline seniority number is normally assigned to a pilot on completion of training. The sooner pilots are hired, the lower their seniority number and the stronger their bidding power.

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 corporate flight department pilots, most commercial pilots do not remain away from home overnight. But, they may work odd hours. However, if the company owns a fleet of planes, pilots may fly a regular schedule. 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 experience jet lag—fatigue caused by many hours of flying through different time zones. To guard against pilot fatigue, which 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.

Commercial pilots face other types of job hazards. 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.

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 the required 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. Requirements for the instrument rating vary depending on the certification level of flight school.

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 depending on the requirements of their particular job. 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 the FAA 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—because of the extensive flying time military pilots receive—usually are preferred for civilian pilot jobs. Those without Armed Forces training may become pilots by attending flight schools or by taking lessons from 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. Until 2014, 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 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

Before departure, pilots thoroughly check their aircraft to make sure that the engines, controls, instruments, and other systems are functioning properly.
busy airports in all weather conditions. These jobs often lead to higher paying jobs with bigger, national or major 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, pilots are required to attend recurrent training and simulator checks once or twice a year throughout their career.

Companies other than airlines usually require less flying experience. However, a commercial pilot’s license is a minimum requirement, 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.

**Employment**

Civilian aircraft pilots and flight engineers held about 106,000 jobs in 2004. About 84,000 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.

**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 2014. In the long run, demand for air travel is expected to grow along with the population and 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. Job opportunities are expected to 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 should arise because of increasing security requirements for shipping freight on passenger airlines and growth in electronic commerce. Business and corporate travel also should provide some new jobs for pilots.

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 using 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.

Fewer flight engineers will be needed as new planes requiring 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 turboprops. Airline pilots and flight engineers may earn extra pay for night and international flights. In May 2004, median annual earnings of airline pilots, copilots, and flight engineers were $129,250. Median annual earnings of commercial pilots were $53,870 in May 2004. The middle 50 percent earned between $37,170 and $79,390. The lowest 10 percent earned less than $26,300, and the highest 10 percent earned more than $110,070.

Airline pilots usually are eligible for life and health insurance plans. 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:

Bus Drivers
(O*NET 53-3021.00, 53-3022.00)

**Significant Points**

- Opportunities should be good, particularly for school bus driver jobs; applicants for higher paying public transit bus driver positions may encounter competition.
- State and Federal governments establish bus driver qualifications and standards, which include a commercial driver’s license.
- 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**

Bus drivers provide transportation for millions of people every year, from commuters to school children to vacationers. There are two major kinds of bus drivers: *Transit and Intercity bus drivers*, who transport people between regions of a State or of the country, along routes run within a metropolitan area or county, or on chartered excursions and tours; and *school bus drivers*, who take children to and from schools and related events.

Bus drivers pick up and drop off passengers at bus stops, stations, or—in the case of students—at regularly scheduled neighborhood locations, all according to strict time schedules. Drivers must operate vehicles safely, especially in heavy traffic. They cannot let light traffic put them ahead of schedule so that they miss passengers. Bus drivers drive a range of vehicles from 15-passenger buses to 60-foot articulated buses that can carry more than 100 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 be expected to 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.

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.

Some intercity drivers operate motor coaches which transport passengers on chartered 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 tour’s 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 a day. The driver may be away for more than a week if assigned to an extended tour. As with all commercial drivers who drive across State or national boundaries, motor coach drivers must comply with U.S. Department of Transportation and State regulations.

*School bus 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 school bus drivers also transport students and teachers on field trips or to sporting events. In addition to driving, some school bus drivers work part time in the school system as janitors, mechanics, or classroom assistants when not driving buses.

Bus drivers must be alert to prevent accidents, especially in heavy traffic or in bad weather, and to avoid sudden stops or swerves that jar passengers. School bus 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 the school system’s rules regarding student conduct.

School bus 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. School bus 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. Many bus companies use Global Positioning Systems to help dispatchers manage their bus fleets and help drivers navigate.

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 tend to be seasonal. From May through August, drivers may work the maximum number of hours per week that regulations allow. During winter, junior drivers may work infrequently, except for busy holiday travel periods, and may be furloughed at times.

School bus 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, school bus 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.

Intercity bus drivers operating tour and charter buses may work any day and all hours of the day, including weekends and holidays. Their hours are dictated by the destinations, schedules, and itineraries of charted tours. Like all commercial drivers, their weekly hours must be consistent with the Department of Transportation’s rules and regulations concerning hours of service. For example, drivers may drive for 10 hours and work for up to 15 hours—including driving and nondriving duties—before having 8 hours off duty. Drivers may not drive after having worked for 60 hours in the past 7 days or 70 hours in the past 8 days. Most drivers are required to document their time in a logbook.

Training, Other Qualifications, and Advancement

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, school bus drivers must pass a background investigation to uncover any criminal record or history of mental problems.

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 in excess of 26,000 pounds gross vehicle weight rating or designed to carry 16 or more persons, including the driver, to hold a commercial driver’s license (CDL) with the appropriate endorsements from the State in which they live.

To qualify for a CDL, applicants must pass a knowledge test on rules and regulations and then demonstrate in a skills test that they can operate a bus safely. A national databank records all driving violations incurred by persons who hold commercial licenses, and a State may not issue a CDL to a person who has already had a license suspended or revoked in another State. To be issued a CDL, a driver must surrender all other driver’s licenses. A driver with a CDL must accompany trainees until the trainees get their own CDL. In addition, to having a CDL, all bus drivers must have a “passenger” endorsement for their CDL, which requires passing a knowledge test and demonstrating the necessary skills in a vehicle of the same type as the one they would be driving in their duties. Information on how to apply for a CDL and each type of endorsement can 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 cannot 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 blood pressure as well as normal use of their arms and legs. They may not use any controlled substances, unless prescribed by a licensed physician. Persons with epilepsy or with 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, refusing to submit to an alcohol test required by a State or its implied consent laws or regulations, leaving the scene of a crime, or causing a fatality through negligent operation of a commercial vehicle. 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.

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.

School bus drivers also are required to obtain a CDL from the State in which they live. They must additionally have a “school bus” endorsement for their CDL. To receive this endorsement, they must pass a written test and demonstrate necessary skills. The skills portion of the test is taken in a bus of the same type that they would be driving on their route. Both of these tests are specific to school buses and are in addition to the testing required to receive a CDL and the “passenger” endorsement. 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 and classroom training on State and local laws, regulations, and policies.

School bus drivers hold 7 out of 10 bus driving jobs.
of operating school buses; safe driving practices; driver-pupil relations; first aid; special needs of disabled and emotionally troubled students; and emergency evacuation procedures. School bus 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 make regularly scheduled trips with passengers, accompanied by an experienced driver who gives helpful tips, answers questions, and evaluates the new driver’s performance. Most bus drivers get brief supplemental training at regular periods to keep abreast of safety issues and regulatory changes.

New intercity and local-transit drivers usually are placed on an “extra” list to drive charted 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, perhaps for 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, rerouting 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. Opportunities exist for bus drivers to become either instructors of new bus drivers or master-instructors, who train new instructors. A few drivers become managers. Promotion in publicly owned bus systems is often determined by competitive civil service examination. Some motor coach drivers purchase their own equipment and open their own business.

**Employment**

Bus drivers held about 653,000 jobs in 2004. About 35 percent worked part time. Around 71 percent of all bus drivers were school bus drivers working primarily for school systems or for companies providing school bus services under contract. Most of the remainder worked for private and local government transit systems; some also worked for intercity and charter bus lines.

**Job Outlook**

Persons seeking jobs as bus drivers likely will encounter many opportunities. Individuals who have good driving records and who are willing to work a part-time or irregular schedule probably will have the best job prospects. School bus driving jobs, particularly in rapidly growing suburban areas, should be easiest to acquire because most are part-time positions with high turnover and less training required than for other bus-driving jobs. Those seeking higher paying public transit bus driver positions may encounter competition. Opportunities for intercity driving positions should be good, although employment prospects for motor coach drivers will depend on tourism which fluctuates with the cyclical nature of the economy.

Employment of bus drivers overall is expected to increase about as fast as the average for all occupations through the year 2014, primarily to meet the transportation needs of the growing general population and the school-aged population. Most 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 school bus drivers is expected to increase as fast as average over the next 10 years, although at a decreasing rate. School enrollments are projected to increase in 30 States and to decrease in 20 States. The net effect will be a slowdown in school enrollment and, therefore, in employment growth of school bus drivers. This, as well as the part-time nature of the occupation, will result in most openings for school bus drivers being to replace those who leave the occupation.

Employment growth for local-transit bus drivers is expected to be faster than the average for all occupations in 2004, and will likely be the result of the increasing popularity of mass transit due to congestion and rising fuel prices, as well as the demand for transit services in expanding portions of metropolitan areas. 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. Since they offer 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 rarely are laid off during recessions. If the number of passengers decreases, however, employers might reduce the hours of part-time local-transit and intercity bus drivers since 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 regularly scheduled and charter business declines, while school bus drivers seldom work during the summer or school holidays.

**Earnings**

Median hourly earnings of transit and intercity bus drivers were $14.30 in May 2004. The middle 50 percent earned between $10.74 and $19.31 an hour. The lowest 10 percent earned less than $8.66, and the highest 10 percent earned more than $23.53 an hour. Median hourly earnings in the industries employing the largest numbers of transit and intercity bus drivers in May 2004 were as follows:

- Local government ........................................ $17.10
- Interurban and rural bus transportation .................. 15.86
- Urban transit systems ........................................ 13.49
- Charter bus industry ......................................... 10.81
- Other transit and ground passenger transportation ....... 10.74

Median hourly earnings of school bus drivers were $11.18 in May 2004. The middle 50 percent earned between $8.10 and $13.92 an hour. The lowest 10 percent earned less than $6.23, and the highest 10 percent earned more than $16.81 an hour. Median hourly earnings in the industries employing the largest numbers of school bus drivers in May 2004 were as follows:

- School and employee bus transportation ................. $11.97
- Elementary and secondary schools ........................ 10.74
- Other transit and ground passenger transportation .... 10.62
- Child day care services ...................................... 9.28
- Individual and family services .............................. 8.75
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. School bus 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.

Many intercity and 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 to 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 school bus driving is available from:
- National School Transportation Association, 113 South West St., 4th Floor, Alexandria, VA 22314.
- National Association of State Directors of Pupil Transportation Services, 6298 Rock Hill Road, The Plains, VA 20198-1916.

General information on motor coach driving is available from:
- United Motorcoach Association, 113 South West St., 4th Floor, Alexandria, VA 22314.

Farmers, Ranchers, and Agricultural Managers

(O*NET 11-9011.01, 11-9011.02, 11-9011.03, 11-9012.00)

Significant Points
- Modern farming requires knowledge of new developments in agriculture, as well as work experience acquired through growing up on a farm or through postsecondary education.
- Overall employment is projected to decline because of increasing productivity and consolidation of farms.
- Horticulture and organic farming will provide better employment opportunities.
- Small-scale farming is a major growth area and offers the best opportunity for entering the occupation.

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 for export.

Farmers and ranchers own and operate mainly family-owned farms. They also may 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, other fibers, fruit, and vegetables—farmers are responsible for preparing, tilling, planting, fertilizing, cultivating, spraying, and harvesting. After the harvest, they make sure that 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 marshy, 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, by contrast, 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 focus on the business aspects of running a farm. On small farms, they may oversee the entire operation; on larger 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 and income are 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, and harvest and market the crops. 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 crop to make up for the loss. While most farm output is sold directly to food-processing companies, some farmers—particularly operators of smaller farms—may choose to sell their goods directly through farmers’ markets or may use cooperatives to reduce their financial risk and to gain a larger share of the retail dollar. For example, in community-supported agriculture (CSA), cooperatives sell shares of a harvest to consumers 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, livestock, and seed. They also must keep abreast of constantly changing prices for their products and 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 higher prices later in the year. Those who participate in the risky futures market, where contracts on future production of agricultural goods are bought and sold, can minimize the risk of sudden price changes by buying futures contracts which guarantee that 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 financial and inventory records. They also use computer databases and spreadsheets to manage breeding, dairy, and other farm operations.

**Working Conditions**

The work of full-time 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 counterbalanced by the quality of life in a rural area, working outdoors, being self-employed, and making a living off the land. Farmers and farm managers on crop farms usually work from sunrise to sunset during the planting and harvesting seasons. The rest of the year, they plan next season’s crops, market their output, and repair machinery.

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, thus keeping them occupied with farming beyond the typical growing season.

Farmwork 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 are necessary to avoid accidents, safeguard one’s health, 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 exchanging information, particularly during the winter months.

**Training, Other Qualifications, and Advancement**

Growing up on a family farm and participating in agricultural programs for young people, such as the National FFA Organization or the 4-H youth educational programs, 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, so postsecondary education in agriculture is important even for people who were raised on farms.

The completion of a 2-year degree, or better, a 4-year bachelor’s degree program in a college of agriculture, is becoming increasingly important for farm managers and for farmers and ranchers who expect to make a living at farming. A degree in business or farm management with a concentration in agriculture is 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.

Students should select the college most appropriate to their specific interests and location. All State university systems have at least one land-grant college or 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 also 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.

Agricultural managers can enhance their professional status through voluntary certification as an Accredited Farm Manager (AFM) by the American Society of Farm Managers and Rural Appraisers. Accreditation 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 the 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 monitor changes in governmental regulations that may affect 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, and growing crops, vegetables, and livestock. Electronic mail, online 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 that ensure 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 also are valuable skills for a small-farm operator, 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 sources of credit is vital for buying seed, fertilizer, and other inputs necessary for planting. It also is necessary to be familiar with complex safety regulations and requirements of governmental agricultural support programs. Computer skills are becoming 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. In addition, skills in personnel management, communication, and conflict resolution are equally important in the operation of a farm or ranch business.

Employment
Farmers, ranchers, and agricultural managers held nearly 1.3 million jobs in 2004. About 83 percent were self-employed. Most farmers, ranchers, and agricultural managers oversee crop production activities, while others manage livestock and dairy production. Most farmers and ranchers operate small farms on a part-time basis.

The soil, topography of the land, and climate often determine the type of farming and ranching done in a particular area. California, Texas, Iowa, Nebraska, and Kansas are the leading agricultural States.

Job Outlook
Market pressures and low prices for many agricultural goods will cause more farms to go out of business over the 2004–14 period. The complexity of modern farming and keen competition among farmers leave little room for the marginally successful farmer. Therefore, the long-term trend toward the consolidation of farms into fewer and larger ones is expected to continue over the 2004–14 period and result in a 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 will be able to acquire many of the farms that become available. The larger, more productive farms are better able to withstand the adverse effects of climate and price fluctuations upon farm output and income. Larger farms also may have advantages in obtaining government subsidies and payments as these payments are usually based on per-unit production.

In addition, the agriculture sector continues to produce more with fewer workers. Increasing productivity in the U.S. agriculture 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 farmland 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 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 may continue to provide some new employment opportunities over the 2004–14 period. New concerns about overfishing and the depletion of the stock of some wild fish species will likely lead to more restrictions on deep-sea fishing, even as public demand for the consumption of seafood continues to grow. This demand 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 even in landlocked States has increased as farmers attempt to diversify and cater to the growing demand for fish by consumers. In addition, growing demand for horticulture products, such as flowers, ornamentals, trees, shrubs, and other nonedibles, 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 with weather conditions and other factors influencing the quantity and quality of farm output and the demand for those products. A farm that shows a large profit one year may show a loss the following year. According to the U.S. Department of Agriculture, the average net cash farm business income for farm operator households in 2004 was $15,603. This figure, however, does not reflect that farmers often receive government subsidies or other payments that supplement their incomes and reduce some of the risk of farming. Additionally, most 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 weekly earnings of $621 in 2004. The middle half earned between $464 and $890. The highest paid 10 percent earned more than $1,264, and the lowest paid 10 percent earned less than $350.

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 either of the following organizations:
➤ 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://wwwffa.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.asfma.org

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

For information on aquaculture, diversified agriculture, education, training, or community-supported agriculture, contact either of the following organizations:
➤ 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 (ATTRA), the National Sustainable Agriculture Information Service, P.O. Box 3657, Fayetteville, AR 72702. Internet: http://www.attra.ncat.org

---

**Fishers and Fishing Vessel Operators**

(O*NET 45-3011.00)

**Significant Points**

- More than 50 percent 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* section 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 using compasses, charts, and often electronic navigational equipment such as autopilots, loran systems, and satellite navigation systems. 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 clean 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 seineing 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.

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, the captain, and possibly several deckhands for periods ranging from several hours to a number of days and embark upon sportfishing, socializing, and relaxation.
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. Treatment for any serious injuries may have to await transfer to a hospital. 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. Malfunctioning navigation or communication equipment may lead to collisions or shipwrecks. 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. Newer vessels have improved living quarters and amenities such as television and shower stalls, but crews still experience the aggravations of confined quarters, continuous close personal contact, and the absence of family.

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 information on 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 section 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. Experienced, reliable deckhands who display supervisory qualities may become boatswains, who, in turn, may become second mates, first mates, and, finally, captains. 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. 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, manage, or 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 with experience 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.

Employment
Fishers and fishing vessel operators held an estimated 38,000 jobs in 2004. One out of two was self-employed. Most fishing takes place off the coasts, with Alaska, Louisiana, Virginia, California, and Massachusetts 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 Service.
Job Outlook

Employment of fishers and fishing vessel operators is expected to decline through the year 2014. Some job openings will nevertheless arise from the need to replace workers who leave the occupation or retire. Fishers and fishing vessel operators depend on the natural ability of fish stocks to replenish themselves through growth and reproduction, as well as on governmental regulation to promote replenishment 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.

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 processing systems, in which 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 fish harvesting capacity have adversely affected the stock of fish and, consequently, the employment opportunities for fishers. Some fisheries councils have issued various types of restrictions on harvesting, to allow stocks of fish and shellfish to naturally replenish, thereby idling many fishers. In addition, low prices for some species and rising seafood imports are adversely affecting fishing income and also causing some fishers to leave the industry. Fishers are also facing competition from farm-raised fish. Sportfishing boats, however, will continue to provide some job opportunities.

Governmental efforts to replenish stocks are having some positive results, which should increase the stock of fish 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 $322 and $775 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 prearranged 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:


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


Forest, Conservation, and Logging Workers

(O*NET 45-4011.00, 45-4021.00, 45-4022.01, 45-4023.00, 45-4029.99)

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 slight increase in overall employment is expected.

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 and harvesting the forests and woodlands require 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 to 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 working under the direction of professional foresters, paint boundary lines, assist with prescribed burning, aid in marking and measuring trees, and keep tallies of those trees 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. Some of these workers 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, commonly known as tree fallers, cut down trees with hand-held power chain saws or mobile felling machines. Usually using gas-powered chain saws, buckers trim off the tops and branches and bucket (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, saw logs, 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 chippers sort, mark, and move logs, based on species, size, and ownership, and tend machines that chip up logs.

Logging equipment operators on a logging crew perform a number of duties. They use tree harvesters to fell the trees, shear the limbs off 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 also operate grapple loaders, which lift and load logs into trucks. 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 at 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 scalers 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 devices 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 tree fallers or one tree harvesting machine operator, one bucker, two logging skidder 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 equipment, and the skills needed to run a small business successfully. Many contractors work alongside their crews as supervisors and often operate one of the logging machines, such as the grapple loader or the tree harvester. Some manage more than one crew and function as owner-supervisors.

Although timber-cutting and logging equipment has greatly improved and operations are becoming increasingly mechanized, many logging jobs still are dangerous and very 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 to fell trees, and heavy equipment to skid and load logs onto trucks. To keep costs down, many timber-cutting and logging workers maintain and repair the equipment they use. A skillful, experienced logging worker 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 and in general made the tasks to be performed much safer. A few logging camps in Alaska and Maine house workers in bunkhouses. Workers in some sparsely populated western States, as well as northern Maine, commute long distances between their homes and logging sites. In the more densely populated eastern and southern States, commuting distances are 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 branches, vines, and rough terrains are constant hazards, as are the dangers associated with tree-felling and log-handling operations. Special care must be taken during strong winds, which can even halt logging operations. Slippery or muddy ground, 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, humidity, and extreme cold are everyday occurrences where loggers work. The use of hearing protection devices is required on logging operations because the high noise level of felling 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 accomplish their work tasks.

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, logging companies and trade associations, such as the Northeastern Loggers Association, the American Loggers Council, and the Forest Resources Association, Inc., offer training programs for workers who operate large, expensive machinery and equipment. Often, a representative of the equipment manufacturer spends several days in the field explaining and overseeing the operation of newly purchased machinery. Safety training is a vital and required part of the instruction of all logging workers.
Many State forestry or logging associations provide training sessions for tree 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 common in many States. These training programs also include sessions on encouraging the health and productivity of the Nation’s forests through the forest product industry’s Sustainable Forest Initiative program. Logger training programs vary by State, but generally include classroom or field training in a number of areas: best management practices, environmental compliance, safety, endangered species, reforestation, and business management. Some programs lead to logger certification.

Generally, a college education is not required for most forest, conservation, and logging occupations. Many secondary schools, including vocational and technical schools and some community colleges, offer courses leading to a two-year technical degree in forestry, wildlife management, conservation, and forest harvesting, all of which are 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. Generally, 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 or conducting precommercial tree thinnings.

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 logging equipment. Inexperienced entrants usually begin as laborers, carrying tools and equipment, clearing brush, performing equipment maintenance, 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.

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.

**Employment**

Forest, conservation, and logging workers held about 92,000 jobs in 2004, distributed among the following occupations:

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logging equipment operators</td>
<td>43,000</td>
</tr>
<tr>
<td>Forest and conservation workers</td>
<td>17,000</td>
</tr>
<tr>
<td>Fallers</td>
<td>15,000</td>
</tr>
<tr>
<td>Log graders and scalers</td>
<td>9,000</td>
</tr>
<tr>
<td>Logging workers, all other</td>
<td>7,000</td>
</tr>
</tbody>
</table>

Most tree fallers, and almost half of all logging equipment operators, are employed in logging, although some work for sawmills and planing mills. Employment of log graders and scalers is concentrated largely in sawmills and planing mills.

About 45 percent of all forest and conservation workers work for government, primarily at the State and local level. Twenty one 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 forest, conservation, and logging workers account for more than 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, except during periods of very wet weather.

**Job Outlook**

Overall employment of forest, conservation, and logging workers is expected to increase more slowly than the average for all occupations through the year 2014. 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.

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, recent Federal legislation designed to prevent destructive wildfires by thinning the forests and setting controlled burns may create more jobs for forest and conservation workers in those areas of the Nation with drier climates and higher susceptibility to forest fires.

New federal policy allowing some access to federal timberland may create some logging jobs, and job opportunities also will arise from owners of privately owned forests and tree farms. Nevertheless,
domestic timber producers continue to 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 manual timber-cutting and logging workers. Employment of fallers, buckers, choker 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 tree harvesting, skidding, and handling equipment operators, will be less adversely affected and should rise slightly as logging companies switch away from manual tree felling.

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 harvested. During prolonged periods of inactivity, some workers may stay on the job to maintain or repair logging machinery and equipment; while others are laid off or forced to find jobs in other occupations.

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 $25.46 an hour for some experienced fallers. Median hourly earnings in May 2004 for forest, conservation, and logging occupations were as follows:

Logging workers, all other ......................................................... $14.29
Fallers ................................................................................... 13.23
Logging equipment operators ............................................... 13.18
Log graders and scalers .......................................................... 12.29
Forest and conservation workers ......................................... 9.51

Sources of Additional Information
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 contractor firms generally offer timber-cutting and logging workers few benefits beyond vacation leave. However, some employers offer full-time workers basic benefits, such as medical coverage, and provide safety apparel and equipment.

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 contractor firms generally offer timber-cutting and logging workers few benefits beyond vacation leave. 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 operators, such as industrial truck and tractor operators, and crane and tower operators.

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 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 construction sites, factories, or warehouses. Some move materials onto or off of trucks and ships. Operators control equipment by moving levers, wheels, and/or foot pedals; operating switches; or turning dials. They also may set up and inspect equipment, make adjustments, and perform minor maintenance or repairs. 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 the goods they handle. Each piece of equipment requires different skills, as do different types of loads. (For information on operating engineers; paving, surfacing, and tamping equipment operators; and pile-driver 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 warehouses, storage yards, factories, or construction sites. A typical industrial truck, often called a forklift or lift truck, has a hydraulic lifting mechanism and forks for moving heavy and large objects. 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 tend or operate 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 waterways, removing sand, gravel, rock, or other materials from harbors, lakes, rivers, and streams. Dredges are used primarily to maintain navigable channels but also are used to restore wetlands and other aquatic habitats; reclaim land; and create and maintain beaches. Underground mining loading machine operators use underground loading machines to load coal, ore, or rock into shuttles and mine cars or onto conveyors. Loading equipment may include power shovels, hoisting engines equipped with cable-drawn scrapers or scoops, and machines equipped with gathering arms and conveyors.

Crane and tower operators work mechanical boom and cable or tower and cable equipment to lift and move materials, machinery, and other heavy objects. Operators extend and retract horizontally mounted booms and lower and raise hooks attached to load lines. Most operators are guided by other workers using hand signals or a radio. Operators position loads from an 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 positions such as derrick operators and hydraulic boom operators. Many hoist and winch operators are found in manufacturing or construction industries.

Pump operators tend, control, and 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 flows of oil or gas from extraction sites.

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 and tend conveyor systems that move materials to or from stockpiles, processing stations, departments, or vehicles. Shuttle car operators run diesel or electric-powered shuttle cars in underground mines, transporting materials from the working face to mine cars or conveyors.

Laborers and hand freight, stock, and material movers manually move materials and 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. In factories, they may move raw materials 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. Specialized workers within this group include baggage and cargo handlers, who work in transportation industries, and truck loaders and unloaders.

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 refuse and recyclables from homes and businesses into 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. They work along scheduled routes.

Working Conditions
Material moving work tends to be repetitive and physically demanding. Workers may lift and carry heavy objects and stoop, kneel, crouch, or crawl in awkward positions. Some work at great heights and some work outdoors, regardless of weather and climate. Some jobs expose workers to fumes, odors, loud noises, harmful materials and chemicals, or dangerous machinery. To protect their eyes, respiratory systems, and hearing, these workers wear safety clothing, such as gloves, hardhats, and other safety devices. These jobs have become much less dangerous as safety equipment—such as overhead guards on lift trucks—has become common. 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 not uncommon. In industries that work around the clock, material movers may work overnight shifts. Some do this because the establishment does 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.

Training, Other Qualifications, and Advancement
Little work experience or training is required for most material moving occupations. 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. Material movers 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 their supervisors. Workers who handle toxic chemicals or use industrial trucks or other dangerous equipment 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. This training is usually provided by the
employer. Employers also must certify that each operator has received the training and evaluate each operator at least once every 3 years. For other operators, such as crane operators and those working with specialized loads, there are some training and apprenticeship programs, as such as offered by the International Union of Operating Engineers, as well as certifying institutions, such as the National Commission for the Certification of Crane Operators. Some employers may require crane operators to be certified. Twelve States have laws requiring crane operators to be licensed. Licensing requirements typically include a written as well as a skills test to demonstrate that the licensee can operate a crane safely.

Material moving equipment operators need a good sense of balance, the ability to judge distances, and eye-hand-foot coordination. For jobs that involve dealing with the public, such as grocery store courtesy clerks, workers should be pleasant and courteous. Most jobs require basic arithmetic skills and the ability to read procedural manuals, to understand orders, and other billing documents. Mechanical aptitude and training in automobile or diesel mechanics can be helpful because some operators may perform basic 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 advanced, workers will need to be increasingly comfortable with technology.

In many of these occupations, experience 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 employees gain experience in a material moving position before being promoted to a better paying and more highly skilled job. Some may eventually advance to become supervisors.

**Employment**

Material movers held 5.1 million jobs in 2004. They were distributed among the detailed occupations as follows:

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Employment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laborers and freight, stock, and material movers, hand</td>
<td>2,430,000</td>
</tr>
<tr>
<td>Packers and packagers, hand</td>
<td>877,000</td>
</tr>
<tr>
<td>Industrial truck and tractor operators</td>
<td>635,000</td>
</tr>
<tr>
<td>Cleaners of vehicles and equipment</td>
<td>347,000</td>
</tr>
<tr>
<td>First-line supervisors/managers of helpers, laborers, and material movers, hand</td>
<td>173,000</td>
</tr>
<tr>
<td>Refuse and recyclable material collectors</td>
<td>149,000</td>
</tr>
<tr>
<td>Machine feeders and offbearers</td>
<td>148,000</td>
</tr>
<tr>
<td>Excavating and loading machine and dragline operators</td>
<td>86,000</td>
</tr>
<tr>
<td>Conveyor operators and tenders</td>
<td>53,000</td>
</tr>
<tr>
<td>Crane and tower operators</td>
<td>44,000</td>
</tr>
<tr>
<td>Tank car, truck, and ship loaders</td>
<td>17,000</td>
</tr>
<tr>
<td>Wellhead pumpers</td>
<td>11,000</td>
</tr>
<tr>
<td>Pump operators, except wellhead pumpers</td>
<td>11,000</td>
</tr>
<tr>
<td>Hoist and winch operators</td>
<td>5,600</td>
</tr>
<tr>
<td>Gas compressor and gas pumping station operators</td>
<td>5,100</td>
</tr>
<tr>
<td>Loading machine operators, underground mining</td>
<td>4,300</td>
</tr>
<tr>
<td>Shuttle car operators</td>
<td>3,100</td>
</tr>
<tr>
<td>Dredge operators</td>
<td>2,500</td>
</tr>
<tr>
<td>All other material moving workers</td>
<td>58,000</td>
</tr>
</tbody>
</table>

About 29 percent of all material movers worked in the wholesale trade or retail trade industries. Another 22 percent worked in manufacturing; 14 percent in transportation and warehousing; 4 percent in construction and mining; and 15 percent in the employment services industry, 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, while others work in factories, warehouses, or mining operations.

**Job Outlook**

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

Employment in material moving occupations is projected to increase more slowly than the average for all occupations through 2014. Improvements in equipment, such as automated storage and retrieval systems and conveyors, will continue to raise productivity and moderate the demand for material movers.

Employment growth will stem from an expanding economy, especially in industries involved with the production, distribution, and sales of goods. Employment also will grow in the warehousing and storage industry as more firms contract out their warehousing functions to this industry. For example, a frozen food manufacturer may reduce its costs by outsourcing these functions to a refrigerated warehousing firm, which can more efficiently deal with the specialized storage needs of frozen food. Job growth for material movers depends on the growth or decline of employing industries and the type of equipment the workers operate or the materials they handle. For example, jobs in mining are expected to decline due to continued productivity increases within that industry. Job growth generally will be slower in large establishments, as they increasingly turn to automation for their material moving needs.

Both construction and manufacturing are very sensitive to changes in economic conditions, so the number of job openings in these industries will fluctuate. Although increasing automation will eliminate some routine tasks, new jobs will be created by the need to operate and maintain new equipment.
Earnings
Median hourly earnings of material moving workers in May 2004 were relatively low, as indicated by the following tabulation:

- First-line supervisors/managers of helpers, laborers, and material movers, hand: $18.40
- Crane and tower operators: 17.99
- Pump operators, except wellhead pumps: 17.04
- Wellhead pumps: 16.31
- Hoist and winch operators: 16.19
- Tank car, truck, and ship loaders: 15.59
- Excavating and loading machine and dragline operators: 15.37
- Material moving workers, all other: 13.87
- Industrial truck and tractor operators: 12.78
- Refuse and recyclable material collectors: 12.38
- Conveyor operators and tenders: 12.23
- Machine feeders and offbearers: 10.68
- Laborers and freight, stock, and material movers, hand: 9.67
- Cleaners of vehicles and equipment: 8.41
- Packers and packagers, hand: 8.25

Wages vary according to experience and job responsibilities. Wages usually are higher in metropolitan areas. Seasonal peaks and lulls in workload can affect the number of hours scheduled and, therefore, earnings. Certified crane operators tend to have a slightly higher hourly rate than those who are not certified.

Related Occupations
Other workers who operate mechanical equipment include construction equipment operators; machine setters, operators, and tenders—metal and plastic; rail transportation workers; and truck drivers and 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:

Information on industrial truck and tractor operators is available from:

Information on crane and derrick certification and licensure is available from:

Rail Transportation Occupations

(O*NET 53-4011.00, 53-4012.00, 53-4013.00, 53-4021.01, 53-4013.02, 53-4031.00, 53-4041.00, 53-4099.99)

Significant Points
- Opportunities are expected to be good for qualified applicants, mainly because of the large number of workers expected to retire or leave these occupations in the next decade.
- Employment is expected to decline due to productivity increases.
- Most workers begin as yard laborers and later may have the opportunity to train for engineer or conductor jobs.
- Eight out of 10 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 millions of travelers per year to destinations throughout the country, while subways and light-rail systems transport millions of passengers around metropolitan areas.

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

Before and after each run, engineers check the mechanical condition of their locomotives, making any minor adjustments necessary. Engineers receive starting instructions from conductors. They move controls such as throttles and airbrakes to drive the locomotive. They monitor instruments 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 the locations of trains. 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 the routes over which they travel. 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 cars to loaded cars, and the amount of slack in the train.

Rail yard engineers operate engines within the rail yard. Dinkey operators drive smaller engines, mainly within industrial plants, mines and quarries, or construction projects. Hostlers operate engines—without attached cars—within the yard, as well as driving them to maintenance shops.

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. In switching operations, conductors may move engines using radio control devices. Conductors assigned to passenger trains also ensure passenger safety and comfort as they go about collecting tickets and fares, making announce-
ments for the benefit of passengers, and coordinating activities of the crew to provide passenger services.

Before a train leaves the terminal, the conductor and the 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 rails. 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 in, or obstruction on, the rails.

Yardmasters coordinate the 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 others are moved to different tracks to await assembly into new trains, based on their destinations. Yardmasters tell 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 operators act as assistants to engineers, handling the coupling and uncoupling of cars as well as operating some switches. Signal operators install, maintain, and repair the signals on tracks and in yards. Switch operators control the track switches within a rail yard.

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, most railroads have phased out brake operators. Many modern freight trains use only an engineer and a conductor. New visual instrumentation and monitoring devices have eliminated the need for crewmembers located at the rear of the train, so the conductor is now stationed with the engineer.

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 through cities and their 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. During breakdowns or emergencies, operators contact their dispatcher or supervisor and may have to evacuate cars.

Streetcar operators drive electric-powered streetcars, trolleys, or light-rail vehicles that transport passengers around 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.

Many freight trains are dispatched according to the needs of customers; as a result many train crews have irregular schedules. Many 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; working weekends is common. 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 and work regardless of weather conditions. 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.

Training, Other Qualifications, and Advancement
Most railroad transportation workers begin as yard laborers; later they may have the opportunity to train for engineer or conductor jobs. Most workers begin as yard laborers and later may have the opportunity to train for engineer or conductor jobs.
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 entry-level jobs. Employers require railroad transportation job applicants to pass a physical examination, drug and alcohol screening, and a criminal background check. Federal regulations require that the driving record of anybody applying for a job operating an engine be checked for evidence of drug or alcohol problems. Similarly, under Federal regulation, all persons licensed to operate engines 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 with the 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 generally must 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. Workers on the extras-board receive assignments only when the railroad needs substitutes for regular workers who are absent because of vacation, illness, or other 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 brake and signal operator jobs, railroad firms will train applicants either in a company program or—especially with smaller railroads—at an outside training facility. Typical training programs combine classroom and on-site training and last between 4 and 6 weeks for signal operators and between 10 and 18 weeks for brake operators.

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 start as bus drivers. Applicants 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 another supervisory position.

For yard occupations, a commercial driver’s license may be required because these workers often operate trucks and other heavy vehicles. For more information on commercial driver’s licenses, contact your State motor vehicle administration and see the Handbook statements on truck drivers and driver/sales workers or bus drivers.

**Employment**

Rail transportation workers held 112,000 jobs in 2004, distributed among the detailed occupations as follows:

- Locomotive engineers and operators .................. 40,000
- Railroad conductors and yardmasters ................ 38,000
- Railroad brake, signal, and switch operators ........ 17,000
- Subway and streetcar operators ....................... 9,200
- Rail transportation workers, all other .................. 8,100

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 that operate their own locomotives and dinkey engines to move railcars containing ore, coal, and other bulk materials.

**Job Outlook**

Even though employment in most railroad transportation occupations is expected to decline through the year 2014, opportunities are expected to be good for qualified applicants, due mainly to the large number of workers expected to retire or leave these occupations in the next decade. Employment is expected to decline, despite expected increases in the amount of freight carried, due to productivity increases.

Opportunities for long-distance train crews are expected to be better than those for yard jobs, because yard occupations generally require little education beyond high school and do not require as much travel. 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 country.

Demand for railroad freight service will grow as the economy and the intermodal transportation of goods expand. Intermodal systems use trucks to move shippers’ sealed trailers or containers to and from terminals and employ trains—which are more fuel-efficient than trucks—to transport them over the long distances between terminals. Railroads are improving delivery times and on-time service, while reducing shipping rates, in order to compete with other modes of transportation, such as trucks, ships, and aircraft.

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 efficiently. Computers help to keep track of freight cars, match empty cars with the closest
loads, and dispatch and control 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 May of 2004 were relatively high, as indicated in the following tabulation:

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Hourly Earnings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Locomotive engineers</td>
<td>$24.30</td>
</tr>
<tr>
<td>Subway and streetcar operators</td>
<td>23.70</td>
</tr>
<tr>
<td>Railroad conductors and yardmasters</td>
<td>22.28</td>
</tr>
<tr>
<td>Railroad brake, signal, and switch operators</td>
<td>21.46</td>
</tr>
</tbody>
</table>

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.

Eight out of 10 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 and Trainmen, 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 either the employment offices of railroads and rail transit systems or State employment service offices.

General information about the rail transportation industry is available from:

- United Transportation Union, 14600 Detroit Ave., Cleveland, OH 44107. Internet: http://www.utu.org

General information about career opportunities is available from:

- Brotherhood of Locomotive Engineers and Trainmen, 1370 Ontario St. Mezzanine, Cleveland, OH 44113. Internet: http://www.ble.org

**Significant Points**

- Taxi drivers and chauffeurs may work any schedule, including full-time, part-time, night, evening, weekend, and seasonal work.
- Many taxi drivers like the independent, unsupervised work of driving their automobile.
- Local governments set license standards 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 services. **Taxi drivers** and **chauffeurs** help passengers get to and from their homes, workplaces, and recreational pursuits such as dining, entertainment, and shopping, as well as to and from business-related events. These professional drivers also help out-of-town business people and tourists get around in unfamiliar surroundings. Some drivers offer sight-seeing services around their city.

At the beginning 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, the date, and the cab's 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 by “cruising” for fares, prearranging pickups, and picking up passengers from taxistands in high-traffic areas. In urban areas, the majority of passengers flag down drivers cruising the streets. Customers also may 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, 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 that 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 know the location of fire and police stations as well as hospitals.

Upon reaching the destination, drivers determine the fare and announce it to their riders. Fares often consist of many parts. In many cabs, a taximeter measures the fare based on the distance covered and the amount of time the trip took. Drivers turn on the taximeter
private companies. provide full-time personal transportation for wealthy families and terminals. Others drive luxury automobiles, such as limousines, to loaded vans between hotels and airports as well as bus or train stations. Many chauffeurs transport custom and time of pickup and dropoff and the total fee; these logs help taxi drivers and chauffeurs to maintain records and quality of service. Drivers issue receipts upon request by the passenger. They enter onto the trip sheet all information regarding the trip, including the pick-up, drop-off, and any services rendered. The trip sheet also helps to track fuel costs as well as fees for additional passengers, a fee for handling luggage, and 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 the 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 drivers’ 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 as well as 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 beginning 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 a more complicated repair, they take it to a professional mechanic.

Chauffeurs cater to passengers by providing attentive customer service and paying attention to 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. Chauffeurs may perform errands for their employers such as delivering packages or picking up clients arriving at airports. To ensure a pleasurable ride in their limousines, many chauffeurs offer conveniences and luxuries such as newspapers, magazines, music, drinks, televisions, and telephones. Increasingly, chauffeurs work as full-service 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 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 is common for drivers and chauffeurs employed by limousine and taxicab services. Whereas 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 like the independent, unsupervised work of driving.

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, sometimes moonlight as taxi drivers or 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 not uncommon. Drivers work long hours during holidays, weekends, and other special times when demand for their services may be heavier. Independent drivers, however, often set their own hours and schedules.

Design improvements in newer cars 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. Some modern taxicabs also are 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

- Taxi drivers and chauffeurs may work any schedule, including full-time, part-time, night, evening, weekend, and seasonal work.

when passengers enter the cab and turn it off when they reach the final destination. The fare also may include surcharges to help cover fuel costs as well as fees for additional passengers, a fee for handling luggage, and 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 the 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 drivers’ 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 as well as 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.
can deliver directions, traffic advisories, weather reports, and other important communications to drivers anywhere in the area. The satellite link also allows dispatchers to track vehicle location, fuel consumption, and engine performance. Automated dispatch systems help dispatchers locate the closest driver to a customer in order to minimize individual wait time and increase the quality of service. Drivers easily can communicate with dispatchers to discuss delivery schedules and courses of action if there are mechanical problems. When threatened with crime or violence, drivers may have special “trouble lights” to alert authorities of emergencies and guarantee that help arrives quickly.

Many municipalities and taxicab and chauffeur companies require drivers to have a neat appearance. Many chauffeurs wear formal attire, such as a tuxedo, a coat and tie, a dress, or a uniform and cap.

Training, Other Qualifications, and Advancement

Local governments set licensing standards and requirements for taxi drivers and chauffeurs which may include minimum amounts of driving experience and training. Many taxi and limousine companies set higher standards than those required by law. It is common for companies to review applicants’ medical, credit, criminal, and driving records. In addition, many companies require applicants to be 21, higher than the age typically required by law. Most companies also prefer that an applicant be a high school graduate.

Persons interested in driving a taxicab or a limousine first must have a regular automobile driver’s license. Usually, applicants then must acquire a taxi driver or chauffeur’s license, commonly called a “hack” license. Some States require only a passenger endorsement on a driver’s license; some require only that drivers be certified by their employer; while others require a Commercial Driver’s License with a passenger endorsement. While States set licensing requirements, local regulatory bodies usually set other terms and conditions. These often include requirements for training, which can vary greatly. Some localities require new drivers to enroll in training programs consisting of up to 80 hours of classroom instruction before they are allowed to work. To qualify through either an exam or a training program, applicants must know local geography, motor vehicle laws, safe driving practices, and relevant regulations and display some aptitude for customer service. Some localities require an English proficiency test, usually in the form of listening comprehension; applicants who do not pass the English exam must take an English course in addition to any formal driving programs. Some classroom instruction includes route management, mapreading, and service for passengers with disabilities. Many taxicab or limousine companies sponsor applicants, giving them a temporary permit that allows them to drive before they have finished the training program and passed the test. 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. This training is typically informal and often lasts only about a week. Companies show drivers how to operate the taximeter and communications equipment and how to complete paperwork. Other topics covered may include driver safety and the best routes to 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 in 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 and when dealing with rude customers. It also is helpful for drivers to be tolerant and level-headed when driving in heavy and congested traffic. Drivers should be dependable since 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, so as to improve their business.

Many taxi drivers and chauffeurs are lease drivers. These drivers pay a daily, weekly, or monthly fee to the company allowing them to lease their vehicles. In the case of limousines, leasing also permits the driver access to the company’s dispatch system. The fee also may include charges 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 become lead drivers, who help to train new drivers, or to take dispatching and managerial positions. Many managers start their careers as drivers. Some people start their own limousine companies.

In small and medium-size communities, drivers sometimes are able to buy their own 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, or by purchasing or leasing them from the city. Although many owner-drivers are successful, some fail to cover expenses and eventually lose their permits and automobiles. For both taxi and limousine service owners, good business sense and courses in accounting, business, and business arithmetic can help an owner-driver to be successful. Knowledge of mechanics enables owner-drivers to perform their own routine maintenance and minor repairs to cut expenses.

Employment

Taxi drivers and chauffeurs held about 188,000 jobs in 2004. About 27 percent of taxi drivers and chauffeurs were self-employed.

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. 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, good customer service instincts, 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 2014, as local and suburban travel increases. Employment growth also will stem from Federal legislation requiring increased services for persons with disabilities. Rapidly growing metropolitan areas should offer the best job opportunities.

The number of job openings can fluctuate with the overall movements of the economy because the demand for taxi and limousine transportation depends on travel and tourism. During economic slowdowns, drivers seldom are laid off, but they may have to increase their work hours, and earnings may decline. When the economy is strong, job openings are numerous as many drivers transfer to other occupations. Extra drivers may be hired during holiday seasons as well as during peak travel and tourist times.
Earnings
Earnings of taxi drivers and chauffeurs vary greatly, depending on factors such as the number of hours worked, regulatory conditions, customers’ tips, and geographic location. Median hourly earnings of salaried taxi drivers and chauffeurs, including tips, were $9.41 in May 2004. The middle 50 percent earned between $7.61 and $11.94 an hour. The lowest 10 percent earned less than $6.43, and the highest 10 percent earned more than $15.62 an hour. Median hourly earnings in the industries employing the largest numbers of taxi drivers and chauffeurs in May 2004 were:

- Taxi and limousine service: $10.68
- Other transit and ground passenger transportation: 9.23
- Traveler accommodation: 8.48
- Automobile dealers: 8.45
- Automotive equipment rental and leasing: 8.25

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

Sources of Additional Information
Information on necessary permits and the registration of taxi drivers and chauffeurs is available from local government agencies that regulate taxicabs. Questions regarding licensing should be directed to your State motor vehicle administration. 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 taxi drivers, chauffeurs, and paratransit drivers, contact:
➤ Taxicab, Limousine & Paratransit Association, 3849 Farragut Ave., Kensington, MD 20895.

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

Truck Drivers and Driver/Sales Workers
(O*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. They deliver everything from automobiles to canned food. Firms of all kinds rely on trucks to pick up and deliver goods because no other form of transportation can deliver goods door-to-door. Even if some goods travel most of the way by ship, train, or airplane, almost everything is carried by trucks at some point in its journey.

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 that 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 the 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 in order to prevent accidents. Drivers can see farther down the road because large trucks seat them higher off the ground than other vehicles. This allows them to see the road ahead and select lanes that are moving more smoothly as well as giving them warning of any dangerous road conditions ahead of them.

The duration of runs vary according to the types of cargo and the destinations. Local drivers may provide daily service for a specific route or region, while other drivers make longer, intercity and interstate deliveries. Interstate and intercity cargo tends to vary from job to job more than local cargo. A driver’s responsibilities and assignments change according to the type of loads transported and their vehicle’s size.

New technologies are changing the way truck drivers work, especially long-distance truck drivers. Satellites and the Global Positioning System link many trucks with their company’s headquarters. Troubleshooting information, directions, weather reports, and other important communications can be instantly relayed to the truck. Drivers can easily communicate with the dispatcher to discuss delivery schedules and courses of action in the event of mechanical problems. The satellite link also allows the dispatcher to track the truck’s location, fuel consumption, and engine performance. Some drivers also work with computerized inventory tracking equipment. It is important for the producer, warehouse, and customer to know their product’s location at all times so they can maintain a high quality of service.

Heavy truck and tractor-trailer drivers operate 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. These “sleeper” runs can last for days, or even weeks. Trucks on sleeper runs typically stop 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 ad hoc runs because shippers request varying service to different cities every day.

The U.S. Department of Transportation requires that drivers keep a log of their activities, the condition of the truck, and the circumstances of any accidents.

Long-distance heavy truck and tractor-trailer drivers spend most of their working time behind the wheel, but also may have to load or unload their cargo. This is especially common when drivers haul specialty cargo, because they may be the only ones 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 operate vans and trucks weighing less than 26,000 pounds GVW. They pick up or deliver 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 for ease of delivery. 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, payments, 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 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 employer, 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. Their duties also may include soliciting new customers along their sales route.

After completing their route, driver/sales workers place orders for their next deliveries based on product sales 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 less taxing, driving for many hours at a stretch, loading and 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 have reduced stress and increased the efficiency of long-distance drivers. Many newer trucks are 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 may drive for 11 hours and work for up to 14 hours—including driving and non-driving duties—after having 10 hours off-duty. A driver may not drive after having worked for 60 hours in the past 7 days or 70 hours in the past 8 days unless they have taken at least 34 consecutive hours off-duty. Most drivers are required to document their time in a logbook. 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 face boredom, loneliness, and fatigue. Drivers often travel nights, holidays, and weekends to avoid traffic delays.

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.

**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 in excess of those 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. In order to receive the hazardous materials endorsement a driver must be fingerprinted and submit to a criminal background check by the Transportation Security Administration. Federal regulations governing CDL administration allow for States to exempt farmers, emergency medical technicians, firefighters, some military drivers, and snow and ice removers from the need for a CDL at the State’s discretion. In many States a regular driver’s license is sufficient for driving light trucks and vans.

To qualify for a CDL an applicant must have a clean driving record, pass a written test on rules and regulations, and then demonstrate that they can operate a commercial truck safely. A national
standards and Federal Highway Administration guidelines for training courses at truck driver training schools that meet industry standards. The Professional Truck Driver Institute (PTDI), a nonprofit organization established by the trucking industry, manufacturers, and others, certifies driver training courses 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 who are able to work well 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 getting their own assignments. 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 their company carries so that they can effectively answer questions about the products and more easily market them to their customers.

Although most new truck drivers are assigned to regular driving jobs immediately, some start as extra drivers—substituting for regular drivers who are ill or on vacation. Extra drivers 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, heavier trucks and finally to tractor-trailers.

The advancement of truck drivers generally is limited to driving runs that provide increased earnings, preferred schedules, or working conditions. Local truck drivers may advance to driving heavy or specialized 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. Few truck drivers become dispatchers or managers.

Some long-distance truck drivers purchase trucks and go into business for themselves. Although some of these owner-operators are successful, others fail to cover expenses and 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. Knowledge of truck mechanics can enable owner-operators to perform their own routine maintenance and minor repairs.

**Employment**

Truck drivers and driver/sales workers held about 3.2 million jobs in 2004. Of these workers, 451,000 were driver/sales workers and 2.8 million were truck drivers. Most truck drivers find employment in large metropolitan areas or along major interstate roadways where trucking, retail, and wholesale companies tend to have their distribution outlets. Some drivers work in rural areas, providing specialized services such as delivering newspapers to customers.

The truck transportation industry employed 25 percent of all truck drivers and driver/sales workers in the United States. Another 25 percent 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.

Around 9 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.
## 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, the amount of nights spent on the road, and quality of equipment. There may be competition for the jobs with the highest earnings and most favorable work schedules.

Overall employment of truck drivers and driver/sales workers is expected to increase about as fast as the average for all occupations through the year 2014, due to growth in the economy and in the amount of freight carried by truck. Competing forms of freight transportation—rail, air, and ship transportation—still require trucks to move the goods between ports, depots, airports, warehouses, retailers, and final consumers who are not connected to these other modes of transportation. Demand for long-distance drivers will remain strong because they can transport perishable and time-sensitive goods more effectively than alternate modes of transportation. Job opportunities for truck drivers with local carriers will be more competitive than those with long-distance carriers because of the more desirable working conditions of local carriers.

Job opportunities may vary from year to year, since the output of the economy dictates the amount of freight to be moved. Companies tend to hire more drivers when the economy is strong and their services are in high demand. When the economy slows, employers hire fewer drivers or may lay off some 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 employers of truck drivers and driver/sales workers.

## Earnings

Median hourly earnings of heavy truck and tractor-trailer drivers were $16.11 in May 2004. The middle 50 percent earned between $12.67 and $20.09 an hour. The lowest 10 percent earned less than $10.18, and the highest 10 percent earned more than $24.07 an hour. Median hourly earnings in the industries employing the largest numbers of heavy truck and tractor-trailer drivers in May 2004 were:

<table>
<thead>
<tr>
<th>Industry</th>
<th>Median Hourly Earnings</th>
</tr>
</thead>
<tbody>
<tr>
<td>General freight trucking</td>
<td>$17.56</td>
</tr>
<tr>
<td>Grocery and related product wholesalers</td>
<td>17.32</td>
</tr>
<tr>
<td>Specialized freight trucking</td>
<td>15.61</td>
</tr>
<tr>
<td>Employment services</td>
<td>14.82</td>
</tr>
<tr>
<td>Cement and concrete product manufacturing</td>
<td>14.47</td>
</tr>
</tbody>
</table>

Median hourly earnings of light or delivery services truck drivers were $11.80 in May 2004. The middle 50 percent earned between $8.96 and $16.00 an hour. The lowest 10 percent earned less than $7.20, and the highest 10 percent earned more than $20.83 an hour. Median hourly earnings in the industries employing the largest numbers of light or delivery services truck drivers in May 2004 were:

<table>
<thead>
<tr>
<th>Industry</th>
<th>Median Hourly Earnings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Courier</td>
<td>$17.94</td>
</tr>
<tr>
<td>General freight trucking</td>
<td>14.79</td>
</tr>
<tr>
<td>Grocery and related product wholesalers</td>
<td>12.44</td>
</tr>
<tr>
<td>Building material and supplies dealers</td>
<td>10.85</td>
</tr>
<tr>
<td>Automotive parts, accessories, and tire stores</td>
<td>8.07</td>
</tr>
</tbody>
</table>

Median hourly earnings of driver/sales workers, including commissions, were $9.66 in May 2004. The middle 50 percent earned between $6.94 and $14.59 an hour. The lowest 10 percent earned less than $5.96, and the highest 10 percent earned more than $19.81 an hour. Median hourly earnings in the industries employing the largest numbers of driver/sales workers in May 2004 were:

<table>
<thead>
<tr>
<th>Industry</th>
<th>Median Hourly Earnings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drycleaning and laundry services</td>
<td>$14.67</td>
</tr>
<tr>
<td>Direct selling establishments</td>
<td>13.55</td>
</tr>
<tr>
<td>Grocery and related product wholesalers</td>
<td>12.36</td>
</tr>
<tr>
<td>Limited-service eating places</td>
<td>6.77</td>
</tr>
<tr>
<td>Full-service restaurants</td>
<td>6.59</td>
</tr>
</tbody>
</table>

Local truck drivers tend to be paid by the hour, with extra pay for working overtime. Employers pay long-distance drivers primarily by the mile. The per-mile rate can vary greatly from employer to employer and may even depend on the type of cargo they are hauling. Some long-distance drivers are paid a percent of each load’s revenue. Typically, earnings increase with mileage driven, seniority, and the size and type of truck driven. Most driver/sales workers receive commissions based on their sales in addition to their hourly wages.

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. Another occupation involving sales duties is sales representatives, wholesale and manufacturing.

## 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:


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](http://www.ptdi.org)

Information on union truck driving can be obtained from:

- The International Brotherhood of Teamsters, 25 Louisiana Ave., NW., Washington, DC 20001.
Water Transportation Occupations

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

Significant Points

- Merchant mariners spend extended periods at sea.
- 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.
- Increasing global trade and tourism will generate growth in water transportation occupations.

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 aids. 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 of 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 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 be-
between voyages varies depending on job availability and personal preference.

The rate of unionization for these workers is about 36 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-hour 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.

Training and 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.

Employment

Water transportation workers held more than 72,000 jobs in 2004. The total number who 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:

- Captains, mates, and pilots of water vessels: 29,000
- Sailors and marine oilers: 28,000
- Ship engineers: 12,000
- Motorboat operators: 3,400

About 33 percent of all workers were employed in water transportation services. About 17 percent worked in inland water transportation—primarily the Mississippi River system—while the other 16 percent were employed in water transportation on the deep seas, along the coasts, and on the Great Lakes. Another 25 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.

Job Outlook

Employment in water transportation occupations is projected to grow more slowly than the average for all occupations through the year 2014. Job growth will stem from increasing tourism and increases in shipping traffic due to rising imports that will provide greater employment in and around major port cities.

Employment in deep-sea shipping for American mariners is expected to stabilize after several years of decline. 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 has lessened as the standards of operation become more uniform. This has made the costs of operating a U.S. ship more comparable to foreign-flagged ships and has modestly increased the amount of international cargo carried by U.S. ships. A fleet of deep-sea U.S.-flagged ships is also 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.

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. In addition efforts are underway at the Federal level that could lead to greater use of ferries to handle commuter traffic around major metropolitan areas, which may cause more workers to be hired.

Moderating the growth in water transportation occupations is a projected decline in vessels operating in the Great Lakes and inland waterways. 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 most of these products are expected to grow through the year 2014, imports of steel are dampening employment on the Lakes.

Job openings will also result from the 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 $42.02 an hour for some experienced ship engineers. Median hourly earnings of water transportation occupations in May 2004 were:

- Ship engineers: $26.42
- Captains, mates, and pilots of water vessels: $24.20
- Motorboat operators: $15.39
- Sailors and marine oilers: $14.00

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 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:


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 23458-0120. Internet: [http://www.sealiftcommand.com](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](http://www.seafarers.org/phc)
- International Organization of Masters, Mates, and Pilots, 700 Maritime Blvd., Linthicum Heights, MD 21090-1941.