

hourly earnings in the industries employing the largest numbers of light or delivery services truckdrivers in 2000 were as follows:

Air transportation, scheduled .....	\$16.61
Trucking and courier services, except air .....	12.60
Groceries and related products .....	11.34
Motor vehicles, parts, and supplies .....	8.19
Eating and drinking places .....	6.56

Median hourly earnings of driver/sales workers, including commission, were \$9.79 in 2000. The middle 50 percent earned between \$6.70 and \$14.28 an hour. The lowest 10 percent earned less than \$5.88, and the highest 10 percent earned more than \$18.77 an hour. Median hourly earnings in the industries employing the largest numbers of driver/sales workers in 2000 were as follows:

Beer, wine, and distilled beverages .....	\$14.49
Laundry, cleaning, and garment services .....	13.79
Groceries and related products .....	12.27
Nonstore retailers .....	11.05
Eating and drinking places .....	6.41

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

Most self-employed truckdrivers are primarily engaged in long-distance hauling. After deducting their living expenses and the costs

associated with operating their trucks, they commonly have earnings of \$20,000 to \$25,000 a year.

Many truckdrivers are members of the International Brotherhood of Teamsters. Some truckdrivers 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; busdrivers; and taxi drivers and chauffeurs.

**Sources of Additional Information**

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

Information on career opportunities in truckdriving may be obtained from:

- American Trucking Associations, Inc., 2200 Mill Rd., Alexandria, VA 22314. Internet: <http://www.truckline.com>
- American Trucking Association Foundation, 2200 Mill Rd., Alexandria, VA 22314.

The Professional Truck Driver Institute, a nonprofit organization established by the trucking industry, manufacturers, and others, certifies truckdriver training courses meeting industry standards. A free 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>

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## Rail Transportation Occupations

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

**Significant Points**

- Overall employment in the railroad transportation industry is expected to decline due to productivity gains.
- Employment of locomotive engineers is projected to grow slowly, but all other rail transportation occupations are projected to decline.
- Nearly 8 out of 10 rail transportation workers are members of unions and many have relatively high earnings.

**Nature of the Work**

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

*Locomotive engineers* are among the most experienced and skilled workers on the railroad. Locomotive engineers operate large trains carrying cargo and passengers between stations. Most engineers

run diesel locomotives, while a few operate electrically powered locomotives.

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

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

*Locomotive firers*, or *assistant engineers*, monitor instruments during runs and watch for dragging equipment, track obstructions, and train signals. In rail yards, they watch for and relay traffic signals from yard workers to yard engineers. *Rail yard engineers*, *dinkey operators*, and *hostlers* drive switching or small "dinkey" engines within railroad yards, industrial plants, mines and quarries, or construction projects.

*Railroad conductors* coordinate the activities of freight and passenger train crews. Railroad conductors assigned to freight trains review schedules, switching orders, way bills, and shipping records to obtain cargo loading and unloading information. Conductors assigned to passenger trains ensure passenger safety and comfort. They collect tickets and fares, and coordinate crew activities to provide boarding, porter, maid, and meal services.

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

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

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

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

In contrast to other rail transportation workers, subway and streetcar operators generally work for public transit authorities instead of railroads. *Subway operators* control trains that transport passengers throughout a city and its suburbs. The trains run on rail-guided tracks in underground tunnels, on the surface, or on elevated platforms above streets. 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, and ensure that passengers get on and off the subway safely.

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

*Streetcar operators* drive electric-powered streetcars or trolleys that transport passengers in metropolitan areas. Some tracks may be recessed in city streets or have grade crossings, so operators must observe traffic signals and cope with car and truck traffic. Operators start, slow, and stop their cars so passengers may get on or off



*Control center personnel communicate with other rail transportation workers via two-way radio or mobile telephone.*

with ease. They 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. Nearly 40 percent work more than a 40-hour workweek. Seniority usually dictates who receives the more desirable shifts.

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

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

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

### **Employment**

Rail transportation workers held 115,000 jobs in 2000—including 37,000 locomotive engineers and firers; 3,800 rail yard engineers, dinkey operators, and hostlers; 45,000 railroad conductors and yardmasters; and 22,000 railroad brake, signal, and switch operators. Railroads employ more than 92 percent of all rail transportation workers. The rest primarily work for local governments as subway and streetcar operators, and for mining and manufacturing establishments operating their own locomotives and dinkey engines that move rail cars containing ore, coal, and other bulk materials.

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

Most railroad transportation workers begin as yard laborers, and later may have the opportunity to train for engineer or conductor jobs. Railroads require that applicants have a minimum of a high school diploma or equivalent. Applicants must have good hearing, eyesight, and color vision, as well as good hand-eye coordination, manual dexterity, and mechanical aptitude. Physical stamina is required for these entry-level jobs. Employers require railroad transportation

job applicants to pass a physical examination and drug and alcohol screening. Under Federal law, all train crewmembers are subject to random drug and alcohol testing while on duty.

Applicants for locomotive engineer jobs must be at least 21 years old. Frequently, employers 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 is usually administered by the rail company in programs approved by the Federal Railroad Administration. At the end of the training period, they 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 successfully passes the examinations. Other conditions and rules may apply to entry-level engineers, and these rules usually vary by employer.

To maintain certification, railroad companies must monitor their engineers. Additionally, 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 certain speed through a turn 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 are generally 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. On some railroads, conductors start in the yards, then move to freight or passenger service.

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

For subway and streetcar operator jobs, subway transit systems prefer applicants with a high school education. Applicants also must be in good health, have good communication skills, and be able to make quick, responsible judgments.

New operators generally complete training programs that last from a few weeks to 6 months. At the end of the period of classroom and on-the-job training, operators usually must pass qualifying examinations covering the operating system, troubleshooting, and evacuation and emergency procedures. Some operators with sufficient seniority can advance to station managers or other supervisory positions.

### Job Outlook

Competition for available opportunities is expected to be keen. Many persons qualify for rail transportation occupations because education beyond high school is generally not required. Many more desire employment than can be hired because the pay is good and the work steady.

Employment for a majority of railroad transportation occupations is expected to decline through the year 2010, with only locomotive engineers expected to grow. The need to replace workers who transfer to other occupations or retire will be the main source

of job openings. Employment in most rail occupations, other than locomotive engineers, will continue to decline due to consolidation of railroads and job duties. To remain competitive with other modes of transportation, railroads will strive to control labor costs.

Demand for railroad freight service will grow as the economy and the intermodal transportation of goods expand. Intermodal systems use trucks to pick-up and deliver the shippers' sealed trailers or containers, and trains to transport them long distance. This saves customers time and money by efficiently carrying goods across the country. For railroads, the benefit has been the increased efficiency of equipment use, allowing increases in the number of runs each train makes in a year. In order to compete with other modes of transportation such as trucks, ships, and aircraft, railroads are improving delivery times and on-time service while reducing shipping rates. As a result, businesses are expected to increasingly use railroads to carry their goods.

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

### Earnings

Median hourly earnings of locomotive engineers were \$21.26 in 2000. The middle 50 percent earned between \$15.77 and \$25.30 an hour. The lowest 10 percent earned less than \$12.84, and the highest 10 percent earned more than \$29.67 an hour.

Median hourly earnings of railroad conductors and yardmasters were \$18.86 in 2000. The middle 50 percent earned between \$15.47 and \$22.08 an hour. The lowest 10 percent earned less than \$12.92, and the highest 10 percent earned more than \$31.03 an hour.

Median hourly earnings of railroad brake, signal, and switch operators were \$18.82 in 2000. The middle 50 percent earned between \$14.60 and \$25.26 an hour. The lowest 10 percent earned less than \$11.87, and the highest 10 percent earned more than \$31.83 an hour.

Median hourly earnings of rail yard engineers, dinkey operators, and hostlers were \$17.69 in 2000. The middle 50 percent earned between \$14.43 and \$20.38 an hour. The lowest 10 percent earned less than \$11.70, and the highest 10 percent earned more than \$24.66 an hour.

Most railroad workers in road service 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.

According to the National Railroad Labor Conference (NRLC) in 1999, the average annual earnings for Class I railroad engineers ranged from \$61,400 for yard-freight engineers, to \$81,000 for passenger engineers. For conductors, earnings ranged from \$53,500 for yard-freight conductors, up to \$68,300 for passenger conductors. The NRLC reported that brake operators averaged from \$40,800 for yard-freight operators, up to \$58,700 for local-freight operators.

According to data from the American Public Transportation Association, in early 2001 the top-rate full-time hourly earnings of operators for commuter rail ranged from \$17.50 to \$30.10; operators for heavy rail from \$16.20 to \$27.70; and operators for light rail from \$14.40 to \$23.90. Transit workers in the northeastern United States typically had the highest wages.

Nearly 80 percent of railroad transportation workers are members of unions. Many different railroad unions represent various crafts on the railroads. Most railroad engineers are members of the Brotherhood of Locomotive Engineers, while most other railroad transportation workers are members of the United Transportation Union. Many subway operators are members of the Amalgamated Transit Union, while others belong to the Transport Workers Union of North America.

### Related Occupations

Other related transportation workers include aircraft pilots and flight engineers, busdrivers, truckdrivers and driver/sales workers, and water transportation occupations.

### Sources of Additional Information

To obtain information on employment opportunities, contact the

employment offices of the various railroads and rail transit systems, or State employment service offices.

For general information about the rail transportation industry, contact:

► Association of American Railroads, 50 F St. NW., Washington, DC 20001. Internet: <http://www.aar.org>.

► Federal Railroad Administration, 400 7th St. SW., Washington, DC 20590. Internet: <http://www.fra.dot.gov>

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

► American Public Transportation Association, 1666 K St. NW., Suite 1100, Washington, DC 20006. Internet: <http://www.apta.com>

General information on rail transportation occupations and career opportunities as a locomotive engineer is available from:

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

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## Water Transportation Occupations

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(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

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

### Nature of the Work

Movement of huge amounts of cargo, as well as passengers, between nations and within our nation depends on workers in water transportation occupations. 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 and canals, other waterways, and 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*.)

Captain, 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 any other officers and crew. They determine the course and speed, maneuver to avoid hazards, and continuously monitor the vessel's position using charts and navigational aides. Captains either direct or oversee crew members who steer the vessel, determine its location, operate engines, communicate to other vessels, perform maintenance, handle lines, or operate vessel equipment. Captains and their department heads ensure that proper procedures and safety practices are followed, check 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/passenger carrying records.

*Deck officers* or *mates* perform the work for captains on vessels when they are on watch. Mates also supervise and coordinate activities of the crew aboard the ship. They inspect the cargo holds during loading to ensure the load is stowed according to specifications and regulations. Mates supervise crew members engaged in maintenance and the primary up-keep of the vessel. 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, and Third Mate.

*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 are usually regular crew members, like mates. Harbor pilots are generally independent contractors, who accompany vessels while they enter or leave port. They may pilot many ships in a single day. *Motorboat operators* operate small, motor-driven boats to carry passengers and freight. They also take depth soundings in turning basins, and serve as liaisons between ships, between ship and shore, harbor and beach, or 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 proper running order of their vessels in the engine spaces below decks under the direction of the ship's engineering officers. They lubricate gears, shafts, bearings, and other moving parts of engines and motors; read pressure and temperature gauges and record data; and may 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