



## **Safety First! Projected growth in safety inspection occupations 2016–26**

*By Alan Zilberman*

A safety inspection can be a valuable tool in the prevention of mishaps in the buildings we live in or work in, the food we eat, and the products we use in our daily lives. There are a number of occupations whose major task is to perform safety inspections in order to help keep our lives safe. Through quality assurance and regulation compliance, often in the form of tests and measurement of hazards, these occupations help prevent harm to workers, property, the environment, and the general public.

Almost every product and public utility requires some of kind of safety inspection or quality control, including buildings, construction sites, consumer products, farms, and railroads. People who work in these occupations use their technical knowledge and detailed understanding of safety regulations to perform crucial inspection and

monitoring services. This **Beyond the Numbers** article looks at a select group of occupations whose major task involves conducting safety inspections and it explores the forces behind their projected employment growth over the 2016–26 period. Demand for the safety inspections will stem from the need for safe structures, utilities, products, and workplaces. However, continued improvements in technology allow manufacturers to automate some inspection tasks, increasing workers’ productivity and reducing the demand for inspectors.

## Projected employment growth by occupation, 2016–26

The Employment Projections program at the Bureau of Labor Statistics (BLS) releases long-term employment projections for more than 800 detailed occupations, including those involved in safety inspections.

The average employment growth for all occupations is projected to be 7.4 percent between 2016 and 2026. Many of the selected safety inspection occupations are projected to have growth faster than the average, or close-to-average growth during the 2016–26 decade. (See table 1.)

**Table 1. Projected employment change, median annual wage, and typical education requirements for selected safety inspection occupations, 2016–26 (Numbers in thousands)**

| Occupation                                 | Employment |           | Employment change, 2016–26 |         | Typical education needed for entry | Median annual wage, May 2018 |
|--|------------|-----------|----------------------------|---------|------------------------------------|------------------------------|
|  | 2016       | 2026      | Number                     | Percent |                                    |                              |
| Total, all occupations                     | 156,063.8  | 167,582.3 | 11,518.6                   | 7.4     | --                                 | \$38,640                     |
| Fire inspectors and investigators          | 12.3       | 13.2      | 0.9                        | 7.3     | Postsecondary nondegree award      | 62,510                       |
| Construction and building inspectors       | 105.1      | 115.7     | 10.5                       | 10.0    | High school diploma or equivalent  | 59,700                       |
| Occupational health and safety specialists | 83.7       | 90.5      | 6.8                        | 8.1     | Bachelor's degree                  | 73,020                       |
| Occupational health and safety technicians | 18.1       | 19.9      | 1.8                        | 10.1    | High school diploma or equivalent  | 50,780                       |
| Agricultural inspectors                    | 15.6       | 16.3      | 0.7                        | 4.6     | Bachelor's degree                  | 44,140                       |
| Transportation inspectors                  | 28.2       | 29.8      | 1.7                        | 5.9     | High school diploma or equivalent  | 73,780                       |
| Health and safety engineers                | 25.9       | 28.1      | 2.2                        | 8.6     | Bachelor's degree                  | 89,130                       |
| Quality control inspectors                 | 520.7      | 465.2     | -55.5                      | -10.7   | High school diploma or equivalent  | 38,250                       |

Source: U.S. Bureau of Labor Statistics.

**Fire inspectors and investigators** examine buildings in order to detect fire hazards and ensure that federal, state, and local fire codes are met. They also may collect and analyze evidence from scenes of fires and explosions to determine the origin and cause. Fire inspectors and investigators typically have previous experience as a firefighter. Employment of fire inspectors and investigators is projected to grow 7.3 percent.

**Construction and building inspectors** review construction plans to ensure that they meet building codes, local ordinances, zoning regulations, and contract specifications. They examine buildings, highways and streets, sewer and water systems, dams, bridges, and other structures. In addition to reviewing for structural quality, building inspectors examine all building systems and features. Construction and building inspectors typically need a high school diploma and previous work experience in a construction trade. Employment of construction and building inspectors is projected to grow 10.0 percent.

**Occupational health and safety specialists and technicians** collect data on and analyze many types of work environments and work procedures. Specialists inspect and evaluate workplaces, equipment, and practices to ensure that they follow safety standards and government regulations. Specialists also investigate incidents and accidents to identify what caused them and how they may be prevented in the future. Technicians typically collect data for analysis by specialists and may implement and evaluate programs designed to limit risks to workers. Employment of occupational health and safety specialists is projected to grow 8.1 percent from 2016 to 2026, while employment of occupational health and safety technicians is projected to grow 10.1 percent.

**Agricultural inspectors** examine agricultural commodities, processing equipment and facilities, and fish and logging operations to ensure compliance with regulations and laws governing health, quality, and safety. They also set standards for the production of meat or poultry products or for food ingredients and additives. Employment of agricultural inspectors is projected to grow 4.6 percent.

**Transportation inspectors** examine equipment or goods in connection with the safe transport of cargo or people. They identify modifications to engines, fuel systems, emissions control equipment, or other vehicle systems to determine the impact of the modifications. This occupation includes rail transportation inspectors, aircraft inspectors, and other inspectors of transportation vehicles. Employment of transportation inspectors is projected to grow 5.9 percent.

**Health and safety engineers** develop procedures and design systems to protect people from illness and injury, and property from damage. They ensure that buildings or products comply with health and safety regulations, especially after an inspection that required changes. Health and safety engineers also investigate industrial accidents and injuries to determine their causes and to determine whether the incidents were avoidable or can be prevented in the future. Employment of health and safety engineers is projected to grow 8.6 percent.

**Quality control inspectors**—also known as inspectors, testers, sorters, samplers, and weighers—examine products and materials for defects or deviations from specifications. Most of these inspectors work in manufacturing and examine items before they leave the manufacturing plant, such as food, textiles, clothing, glassware, motor vehicles, electronic components, computers, and structural steel. Employment of quality control inspectors is projected to decline 10.7 percent due to automation and advances in scanning technology.

## What's driving growth in these occupations?

Many of these occupations are projected to have employment growth because important parts of our economy—our workforce and infrastructure—need to remain safe and productive. For example, construction and building inspectors visit worksites for adherence to codes, regulations, and ordinances. These inspectors are experts in building code compliance. They must pay attention to detail, and typically must also have experience in construction, such as work experience as a carpenter or electrician.

Output in the construction industry is projected to grow by 2.7 percent annually from 2016 to 2026.<sup>1</sup> And buildings and structures under construction—both residential and commercial, along with infrastructure projects—require multiple inspections for adherence to standards. In Pennsylvania, for example, new building construction can require at least 14 inspections, with a potential for more if any of them result in a failure.<sup>2</sup> Because inspections are mandatory, increased construction activity will lead to demand for these inspectors.

Along similar lines, the need for safe workplaces—particularly for industries in which accidents are frequent—means that there will be demand for occupations that inspect workplaces, including occupational health and safety specialists and technicians. Maintaining high safety standards in our workspaces means that these inspectors are an integral part of the workplace, a kind of quality assurance to keep worksites functioning at an optimum safety level.<sup>3</sup> In addition to compliance, companies that conduct their own internal regular inspections can lead to fewer workplace injuries and greater employee morale.<sup>4</sup>

## Impacts of automation and increased technology

Quality control inspectors are projected to have employment declines because machines are replacing the work they perform. Automated optical inspections systems involve machines that are able to detect faults and defects through cameras, then remove the faulty products with a robotic arm. These systems are being used in various manufacturing industries, including the manufacturing of printed circuit boards, for example.<sup>5</sup> Among the selected safety occupations, only quality control inspectors are affected by automation because the manufacturing assembly line requires strict parameters in order to function at optimal levels. Assembly-line machinery can often perform repetitive tasks more efficiently than assembly line works.

There are other innovations, such as intelligent networks in pharmaceutical companies that avoid issues, such as human error.<sup>6</sup> The basic principle is that by connecting machines and systems, intelligent networks along the value chain can autonomously control each other. A value chain is the full range of activities, including design, production, marketing, and distribution that businesses conduct to bring a product or service from conception to delivery. For example, “smart” machines would be able to predict failures and trigger maintenance tasks, or self-organize logistics when there is a change in production.

These new safety checks can replace the work that quality control inspectors perform, or in other cases, make these workers more efficient at the duties they do perform. And unlike human inspectors, machines never feel fatigue in a way that is inevitable for people who perform the job.

## Conclusion

In addition to helping keeping the nation safe, most of the safety inspection occupations are projected to have employment growth. The workers in these occupations share similar skills, such as careful observation and an attention to detail. Safety inspection occupations vary in terms of the typical education that applicants are required to have. Some occupations only need applicants who have a high school diploma or equivalent, while other occupations require applicants to have a bachelor’s degree. Some of the occupations typically need applicants who have work experience in a related occupation, like fire inspectors. Yet anyone who can see the little things along with the big picture should consider a career in these occupations— just as long as what they inspect cannot be outdone by a machine or robot.

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**NOTES**

<sup>1</sup> Table 2.2, Output by major industry sector, 2006, 2016, and projected 2026, Bureau of Labor Statistics, <https://www.bls.gov/emp/tables/output-by-major-industry-sector.htm>.

<sup>2</sup> “Uniform Construction Code Inspection Procedures” *Commonwealth of Pennsylvania*, Department of Labor and Industry, <https://www.dli.pa.gov/Individuals/Labor-Management-Relations/bois/Documents/UCC/ucc-9.pdf>.

<sup>3</sup> Safety standards are usually set by regulatory agencies like the Department of Labor Occupational Safety and Health Administration (OSHA).

<sup>4</sup> Cary Usrey, “Why Do Safety Inspections?” (Occupational Health & Safety: June 1, 2017), <https://ohsonline.com/Articles/2017/05/12/Why-Do-Safety-Inspections.aspx>.

<sup>5</sup> “Automated Optical Inspection Market Is Expected to Reach \$1,376.9 Mn by 2024,” *Digital Journal*, September 2018, <http://www.digitaljournal.com/pr/3931708>.

<sup>6</sup> Peter Guilfoyle, “Pharma 4.0: Industry 4.0 Applied to Pharmaceutical Manufacturing,” *R&D Magazine*, October 23, 2018, <https://www.rdmag.com/article/2018/10/pharma-40-industry-40-applied-pharmaceutical-manufacturing>.

**SUGGESTED  
CITATION**

Alan Zilberman, “Safety First! Projected growth in safety inspection occupations 2016–26,” *Beyond the Numbers: Employment and Unemployment*, vol. 8, no. 6 (U.S. Bureau of Labor Statistics, April 2019), <https://www.bls.gov/opub/btn/volume-8/safety-first-projected-growth-in-safety-inspection-occupations-2016-26.htm>