



## US CRITICAL INFRASTRUCTURE

*Prepared by: Sanjana Ravi*

**Presidential Policy Directive 21** (PPD-21, Critical Infrastructure Security and Resilience) advances a national unity of effort to strengthen and maintain secure, functioning, and resilient critical infrastructure. PPD-21 identifies 16 critical infrastructure sectors.<sup>1,2</sup>

- **Chemical:** Manufactures, stores, uses, and transports potentially dangerous chemicals on which a wide range of other critical infrastructure sectors rely.
  - Sector-specific agency: Department of Homeland Security
  - In 2016, the US chemical industry employed more than 811,000 workers, with indirect employment by industry suppliers of more than 2.7 million.<sup>3</sup>
- **Commercial Facilities:** Includes a diverse range of sites that draw large crowds of people for shopping, business, entertainment, or lodging. The majority of these facilities are privately owned and operated, with minimal interaction with the federal government and other regulatory entities.
  - Sector-specific agency: Department of Homeland Security
  - Numbers of workers and jobs in various subsectors: 1.9 million workers in media production, 1.7 million jobs in gaming, more than 1.9 million workers in lodging, 142,000 jobs in zoos & aquariums, 42 million jobs in retail, 133,000 jobs in sports leagues.<sup>4</sup>
- **Communications:** The sector has evolved from predominantly a provider of voice services into a diverse, competitive, and interconnected industry using terrestrial, satellite, and wireless transmission systems. The transmission of these services has become interconnected; satellite, wireless, and wireline providers depend on each other to carry and terminate their traffic, and companies routinely share facilities and technology to ensure interoperability.
  - Sector-specific agency: Department of Homeland Security
  - Number of workers employed in broadcasting (except internet) (as of December 2017):<sup>5</sup> 258,900
  - Telecommunications:<sup>6</sup> 753,300
- **Critical Manufacturing:** Includes primary metals manufacturing (ie, iron, steel, ferro alloy, aluminum, and nonferrous metal production and processing); machinery manufacturing (ie, engine, turbine, power transmission, and earth moving, mining, agricultural, and construction equipment manufacturing); electrical equipment, appliance, and component manufacturing (ie, electric motors, transformers, and generators); and transportation

equipment manufacturing (ie, vehicles, commercial ships, aerospace products and parts, locomotives, railroad and transit cars, and rail track equipment).

- Sector-specific agency: Department of Homeland Security
- Number of workers employed in primary metal manufacturing (as of December 2017):<sup>7</sup> 390,300
- Machinery manufacturing:<sup>8</sup> 1,112,700
- Electrical equipment, appliance, and component manufacturing:<sup>9</sup> 397,300
- Transportation equipment manufacturing:<sup>10</sup> 1,616,900
- **Dams:** Delivers critical water retention and control services in the United States, including hydroelectric power generation, municipal and industrial water supplies, agricultural irrigation, sediment and flood control, river navigation for inland bulk shipping, industrial waste management, and recreation.
  - Sector-specific agency: Department of Homeland Security
- **Defense Industrial Base:** The worldwide industrial complex that enables research and development, as well as design, production, delivery, and maintenance, of military weapons systems, subsystems, and components or parts, to meet US military requirements.
  - Sector-specific agency: Department of Defense
- **Emergency Services:** A community of millions of highly skilled, trained personnel, along with the physical and cyber resources, that provide a wide range of prevention, preparedness, response, and recovery services during both day-to-day operations and incident response.
  - Sector-specific agency: Department of Homeland Security
  - Number of first responders nationwide (as of 2015):<sup>11</sup> 4.6 million total, across law enforcement, fire & rescue services, emergency medical services, emergency management, and public works.
  - Firefighters (2017):<sup>11</sup> 1,066,300; civilian staff and non-firefighting personnel: 151,000
  - Law enforcement (2017):<sup>11</sup>
    - 120,000 full-time officers authorized to make arrests and carry firearms
    - 860,950 state, local, tribal, and territorial officers
    - 1,103,120 private-sector security company employees
  - Emergency medical services (2017):<sup>11</sup> 826,000 EMS professionals
  - Public works (2017):<sup>11</sup> 641,870 employees
  - Emergency management (2017):<sup>11</sup>
    - Emergency management directors: 9,840
    - Public safety answering points (PSAPs, 9-1-1 receivers): 5,874 primary and secondary PSAPs across the US
    - National Guard WMD-civil support teams: 57 across the US
    - Fusion centers: 78
- **Energy:** More than 80% of the country's energy infrastructure is owned by the private sector, supplying fuels to the transportation industry, electricity to households and

businesses, and other sources of energy that are integral to growth and production across the nation.

- Sector-specific agency: Department of Energy
  - Number of employees working in utilities (ie, electric power, natural gas, water, and sewage) (as of December 2017):<sup>12</sup> 552,300
- **Financial Services:** Includes thousands of depository institutions, providers of investment products, insurance companies, other credit and financing organizations, and the providers of the critical financial utilities and services that support these functions.
  - Sector-specific agency: Department of the Treasury
  - Number of workers (as of December 2017):<sup>13</sup> 8,498,000
- **Food and Agriculture:** Is almost entirely under private ownership and is composed of an estimated 2.1 million farms, 935,000 restaurants, and more than 200,000 registered food manufacturing, processing, and storage facilities.
  - Sector-specific agencies: Departments of Agriculture & Health and Human Services
  - Number of agricultural equipment operators (as of 2016):<sup>14</sup> 17,480
  - Farmworkers and laborers:<sup>14</sup> 218,500
- **Government Facilities:** Includes a wide variety of buildings, located in the United States and overseas, that are owned or leased by federal, state, local, and tribal governments.
  - Sector-specific agencies: Department of Homeland Security & General Services Administration
- **Healthcare and Public Health:** Protects all sectors of the economy from hazards such as terrorism, infectious disease outbreaks, and natural disasters. Operating in all US states, territories, and tribal areas, the sector plays a significant role in response and recovery across all other sectors in the event of a natural or manmade disaster.
  - Sector-specific agency: Department of Health and Human Services
  - Number of ambulatory health care services workers (December 2017):<sup>15</sup> 7,400,300
  - Hospital workers:<sup>16</sup> 5,152,800
  - Nursing & residential care workers:<sup>17</sup> 3,341,100
  - Social assistance workers:<sup>18</sup> 3,746,300
- **Information Technology:** These virtual and distributed functions produce and provide hardware, software, and information technology systems and services, and—in collaboration with the communications sector—the internet.
  - Sector-specific agency: Department of Homeland Security
  - Number of workers in data processing, hosting, and related services (as of December 2017):<sup>19</sup> 307,000
- **Nuclear Reactors, Materials, and Waste:** From the power reactors that provide electricity to millions of Americans, to the medical isotopes used to treat cancer patients, the nuclear reactors, materials, and waste sector covers most aspects of America’s civilian nuclear infrastructure.

- Sector-specific agency: Department of Homeland Security
- Number of workers in the nuclear industry:<sup>20</sup> more than 120,000
- **Transportation Systems:** The nation's transportation system quickly, safely, and securely moves people and goods through the country and overseas. Key subsectors include: aviation, highway and motor carrier, maritime transportation systems, mass transit and passenger rail, pipeline systems, freight rail, and postal and shipping.
  - Sector-specific agency: Departments of Homeland Security & Transportation
  - Number of workers in air transportation (as of December 2017):<sup>21</sup> 493,200
  - Rail transportation workers:<sup>22</sup> 204,400
  - Water transportation workers:<sup>23</sup> 66,000
  - Truck transportation workers:<sup>24</sup> 1,475,300
  - Transit and ground passenger transportation workers:<sup>25</sup> 479,000
  - Pipeline transportation workers:<sup>26</sup> 46,900
  - Postal service:<sup>27</sup> 540,680
- **Water and Wastewater Systems:** There are approximately 153,000 public drinking water systems and more than 16,000 publicly owned wastewater treatment systems in the United States. More than 80% of the US population receives their potable water from these drinking water systems, and about 75% of the US population has its sanitary sewage treated by these wastewater systems.
  - Sector-specific agency: Environmental Protection Agency

## References

1. The White House. Presidential Policy Directive—Critical Infrastructure Security and Resilience (PPD-21). February 12, 2013. <https://obamawhitehouse.archives.gov/the-press-office/2013/02/12/presidential-policy-directive-critical-infrastructure-security-and-resil>. Accessed February 1, 2018.
2. US Department of Homeland Security. Critical infrastructure sectors. July 11, 2017. <https://www.dhs.gov/critical-infrastructure-sectors>. Accessed February 1, 2018.
3. International Trade Administration. Chemical Spotlight. <https://www.selectusa.gov/chemical-industry-united-states>. Accessed February 1, 2018.
4. US Department of Homeland Security. *Commercial Facilities Sector-Specific Plan*. 2015. <https://www.dhs.gov/sites/default/files/publications/nipp-ssp-commercial-facilities-2015-508.pdf>. Accessed February 1, 2018.
5. US Department of Labor. Bureau of Labor Statistics. Broadcasting. 2018. <https://www.bls.gov/iag/tgs/iag515.htm>. Accessed February 1, 2018.
6. US Department of Labor. Bureau of Labor Statistics. Telecommunications. 2018. <https://www.bls.gov/iag/tgs/iag517.htm>. Accessed February 1, 2018.
7. US Department of Labor. Bureau of Labor Statistics. Primary metal manufacturing. 2018. <https://www.bls.gov/iag/tgs/iag331.htm>. Accessed February 1, 2018.

8. US Department of Labor. Bureau of Labor Statistics. Machinery manufacturing. 2018. <https://www.bls.gov/iag/tgs/iag333.htm>. Accessed February 1, 2018.
9. US Department of Labor. Bureau of Labor Statistics. Electrical equipment, appliance, and component manufacturing. <https://www.bls.gov/iag/tgs/iag335.htm>. Accessed February 1, 2018.
10. US Department of Labor. Bureau of Labor Statistics. Transportation equipment manufacturing. 2018. <https://www.bls.gov/iag/tgs/iag336.htm>. Accessed February 1, 2018.
11. US Department of Homeland Security. Emergency services sector profile. 2017. [https://www.dhs.gov/sites/default/files/publications/18\\_0126\\_NPPD\\_emergency-services-sector-profile.pdf](https://www.dhs.gov/sites/default/files/publications/18_0126_NPPD_emergency-services-sector-profile.pdf). Accessed February 1, 2018.
12. US Department of Labor. Bureau of Labor Statistics. Utilities. 2018. <https://www.bls.gov/iag/tgs/iag22.htm>. Accessed February 1, 2018.
13. US Department of Labor. Bureau of Labor Statistics. Financial activities. 2018. <https://www.bls.gov/iag/tgs/iag50.htm>. Accessed February 1, 2018.
14. US Department of Labor. Bureau of Labor Statistics. Agriculture, forestry, fishing and hunting. 2018. <https://www.bls.gov/iag/tgs/iag11.htm>. Accessed February 1, 2018.
15. US Department of Labor. Bureau of Labor Statistics. Ambulatory health care services. 2018. <https://www.bls.gov/iag/tgs/iag621.htm>. Accessed February 1, 2018.
16. US Department of Labor. Bureau of Labor Statistics. Hospitals. 2018. <https://www.bls.gov/iag/tgs/iag622.htm>. Accessed February 1, 2018.
17. US Department of Labor. Bureau of Labor Statistics. Nursing and residential care facilities. 2018. <https://www.bls.gov/iag/tgs/iag623.htm>. Accessed February 1, 2018.
18. US Department of Labor. Bureau of Labor Statistics. Social assistance. 2018. <https://www.bls.gov/iag/tgs/iag624.htm>. Accessed February 1, 2018.
19. US Department of Labor. Bureau of Labor Statistics. Data processing, hosting, and related services. 2018. <https://www.bls.gov/iag/tgs/iag518.htm>. Accessed February 1, 2018.
20. US Department of Homeland Security. *Nuclear Reactors, Materials, and Waste Sector-Specific Plan*. 2015. <https://www.dhs.gov/sites/default/files/publications/nipp-ssp-nuclear-2015-508.pdf>. Accessed February 1, 2018.
21. US Department of Labor. Bureau of Labor Statistics. Air transportation. 2018. <https://www.bls.gov/iag/tgs/iag481.htm>. Accessed February 1, 2018.
22. US Department of Labor. Bureau of Labor Statistics. Rail transportation. 2018. <https://www.bls.gov/iag/tgs/iag482.htm>. Accessed February 1, 2018.
23. US Department of Labor. Bureau of Labor Statistics. Water transportation. 2018. <https://www.bls.gov/iag/tgs/iag483.htm>. Accessed February 1, 2018.
24. US Department of Labor. Bureau of Labor Statistics. Truck transportation. 2018. <https://www.bls.gov/iag/tgs/iag484.htm>. Accessed February 1, 2018.
25. US Department of Labor. Bureau of Labor Statistics. Transit and ground passenger transportation. 2018. <https://www.bls.gov/iag/tgs/iag485.htm>. Accessed February 1, 2018.



26. US Department of Labor. Bureau of Labor Statistics. Pipeline transportation. 2018.  
<https://www.bls.gov/iag/tgs/iag486.htm>. Accessed February 1, 2018.
27. US Department of Labor. Bureau of Labor Statistics. Postal service. 2018.  
<https://www.bls.gov/iag/tgs/iag491.htm>. Accessed February 1, 2018.

*Date: February 1, 2018*