

The robots are coming! The robots are coming!

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Oh, wait. . . they're already here!



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So, what does it all mean?

- ▶ Automation is more likely to impact specific tasks/skills rather than entire jobs
- ▶ Tasks/skills more likely to be automated are concentrated in specific industries and occupations
- ▶ Occupations threatened by automation are highly concentrated among lower-paid, lower-skilled and less-educated workers
- ▶ Many of the occupations with the highest risk of automation employ high percentages of younger workers

Automating skills not jobs

How susceptible is each activity to automation?



Source: Michael Chui, James Manyika, and Mehdi Miremadi, "Where machines could replace humans – and where they can't (yet)," McKinsey & Company, McKinsey Quarterly, July 2016

Occupations most and least susceptible to automation

Occupations with highest probability of automation	
Occupational title	Probability of automation
Telemarketers	0.990
Title examiners, abstractors and searchers	0.990
Sewers, hand	0.990
Mathematical technicians	0.990
Insurance underwriters	0.990
Watch repairers	0.990
Cargo and freight agents	0.990
Tax preparers	0.990
Photographic process workers and processing machine operators	0.990
New accounts clerks	0.990
Library technicians	0.990
Data entry keyers	0.990
Timing device assemblers and adjusters	0.980
Insurance claims and policy processing clerks	0.980
Brokerage clerks	0.980
Order clerks	0.980
Loan officers	0.980
Insurance appraisers, auto damage	0.980
Umpires, referees and other sports officials	0.980
Tellers	0.980

Occupations with lowest probability of automation	
Occupational title	Probability of automation
Recreational therapists	0.0028
First-line supervisors of mechanics, installers and repairers	0.0030
Emergency management directors	0.0030
Mental health and substance abuse social workers	0.0031
Audiologists	0.0033
Occupational therapists	0.0035
Orthotists and prosthetists	0.0035
Healthcare social workers	0.0035
Oral and maxillofacial surgeons	0.0036
First-line supervisors of fire fighting and prevention workers	0.0036
Dietitians and nutritionists	0.0039
Lodging managers	0.0039
Choreographers	0.0040
Sales engineers	0.0041
Physicians and surgeons	0.0042
Instructional coordinators	0.0042
Psychologists, all other	0.0042
First-line supervisors of police and detectives	0.0043
Dentists, general	0.0044
Elementary school teachers, except special education	0.0044

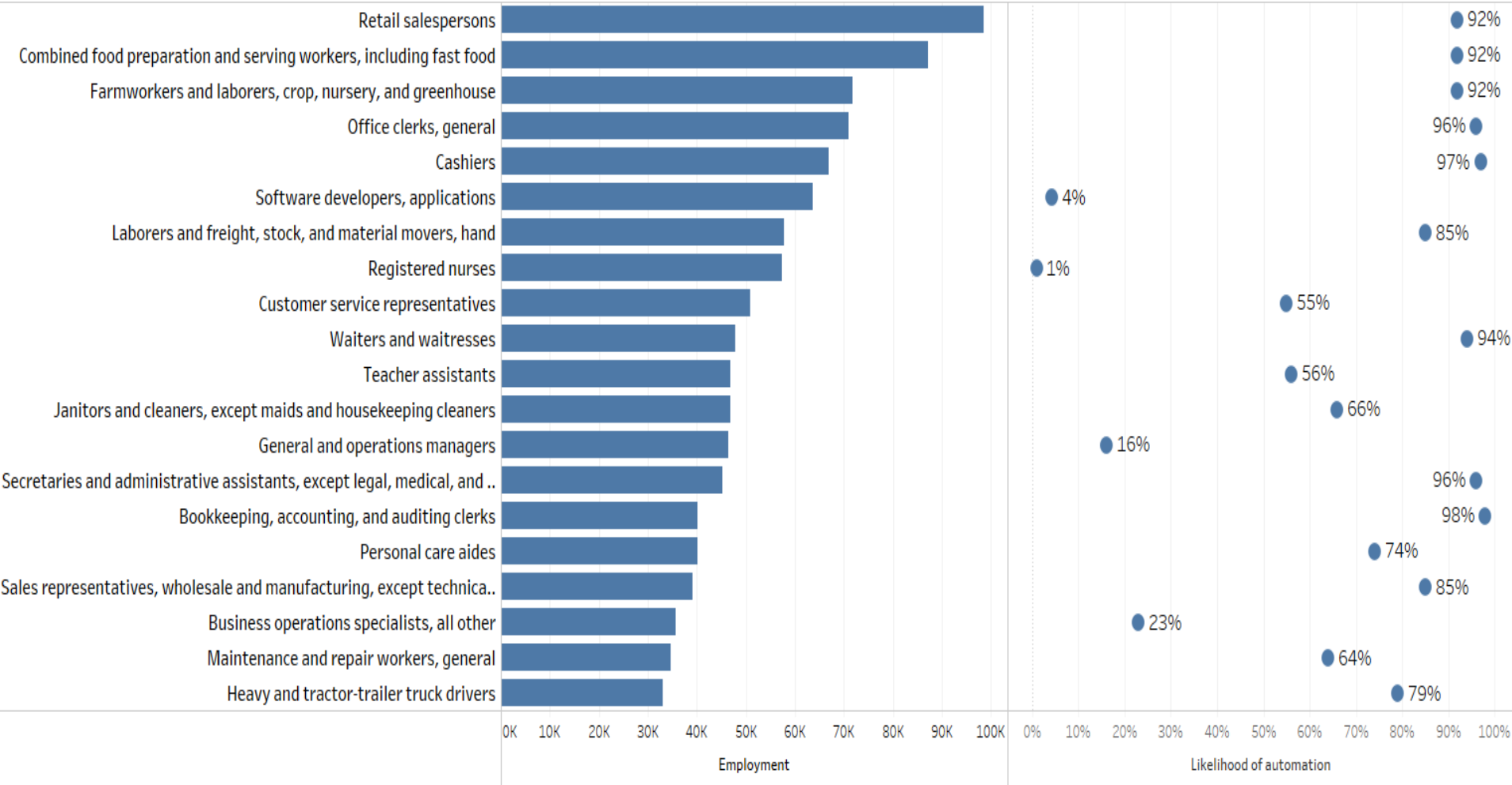
Source: Carl Frey and Michael Osborne, "The Future of Employment: How Susceptible are Jobs to Computerization," Oxford University, 2013

Current and projected employment in Washington state for occupations at highest risk of automation

Occupational title	June 2016 employment	2025 employment
Telemarketers	2,566	3,110
Title examiners, abstractors and searchers	1,479	2,206
Sewers, hand	28	72
Mathematical technicians	11	11
Insurance underwriters	2,162	2,250
Watch repairers	17	23
Cargo and freight agents	1,738	1,946
Tax preparers	878	1,098
Photographic process workers and processing machine operators	310	252
New accounts clerks	743	685
Library technicians	2,830	3,117
Data entry keyers	2,689	2,997
Timing device assemblers and adjusters	0	0
Insurance claims and policy processing clerks	5,054	5,354
Brokerage clerks	718	734
Order clerks	4,685	5,487
Loan officers	6,383	6,682
Insurance appraisers, auto damage	276	292
Umpires, referees, and other sports officials	306	390
Tellers	10,519	10,651

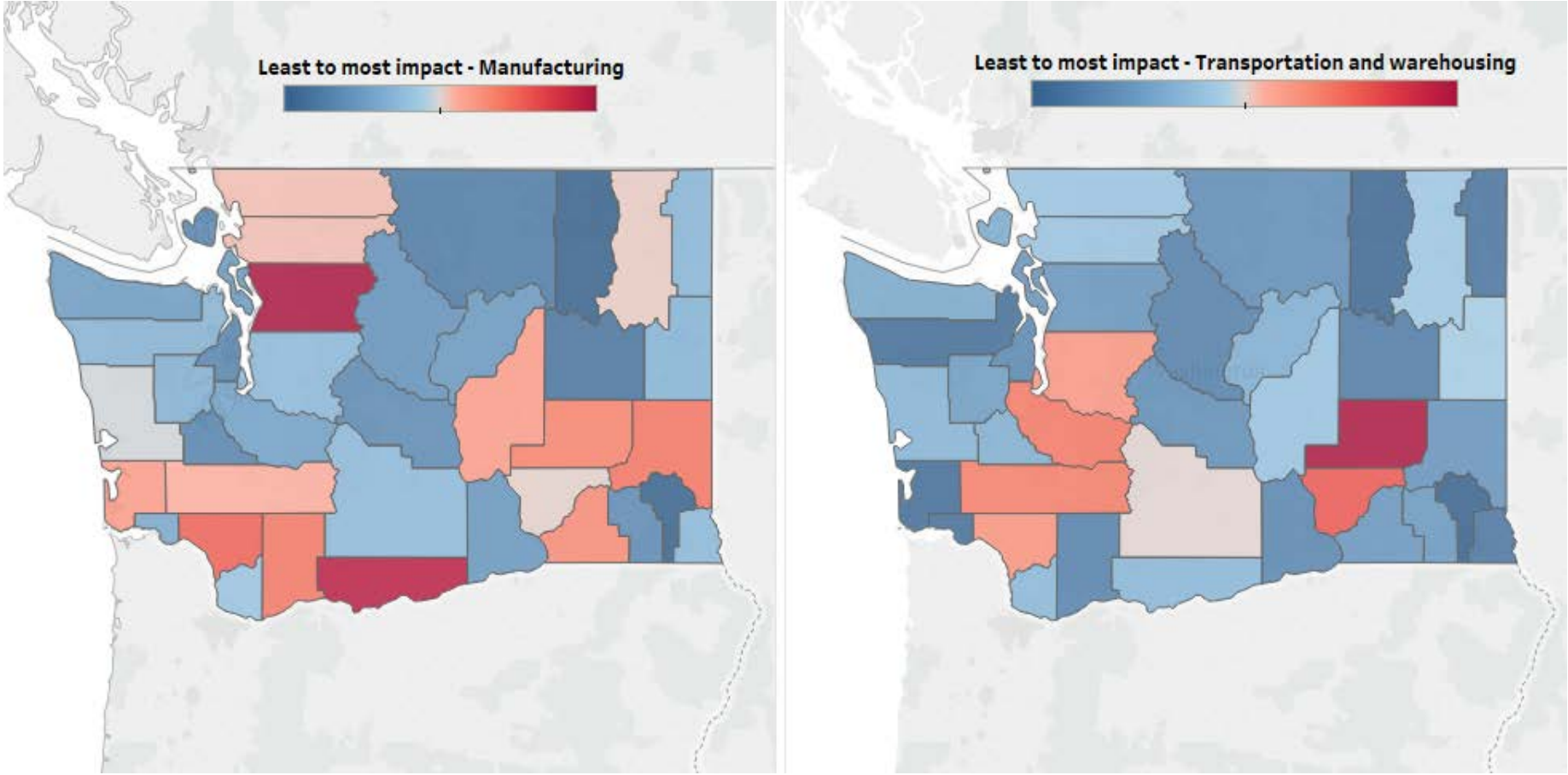
Source: Employment Security Department/WITS; U.S. Bureau of Labor Statistics, Occupational Employment Statistics, 2017; Carl Frey and Michael Osborne, "The Future of Employment: How Susceptible are Jobs to Computerization," Oxford University, 2013

Top occupations in Washington state and risk of automation



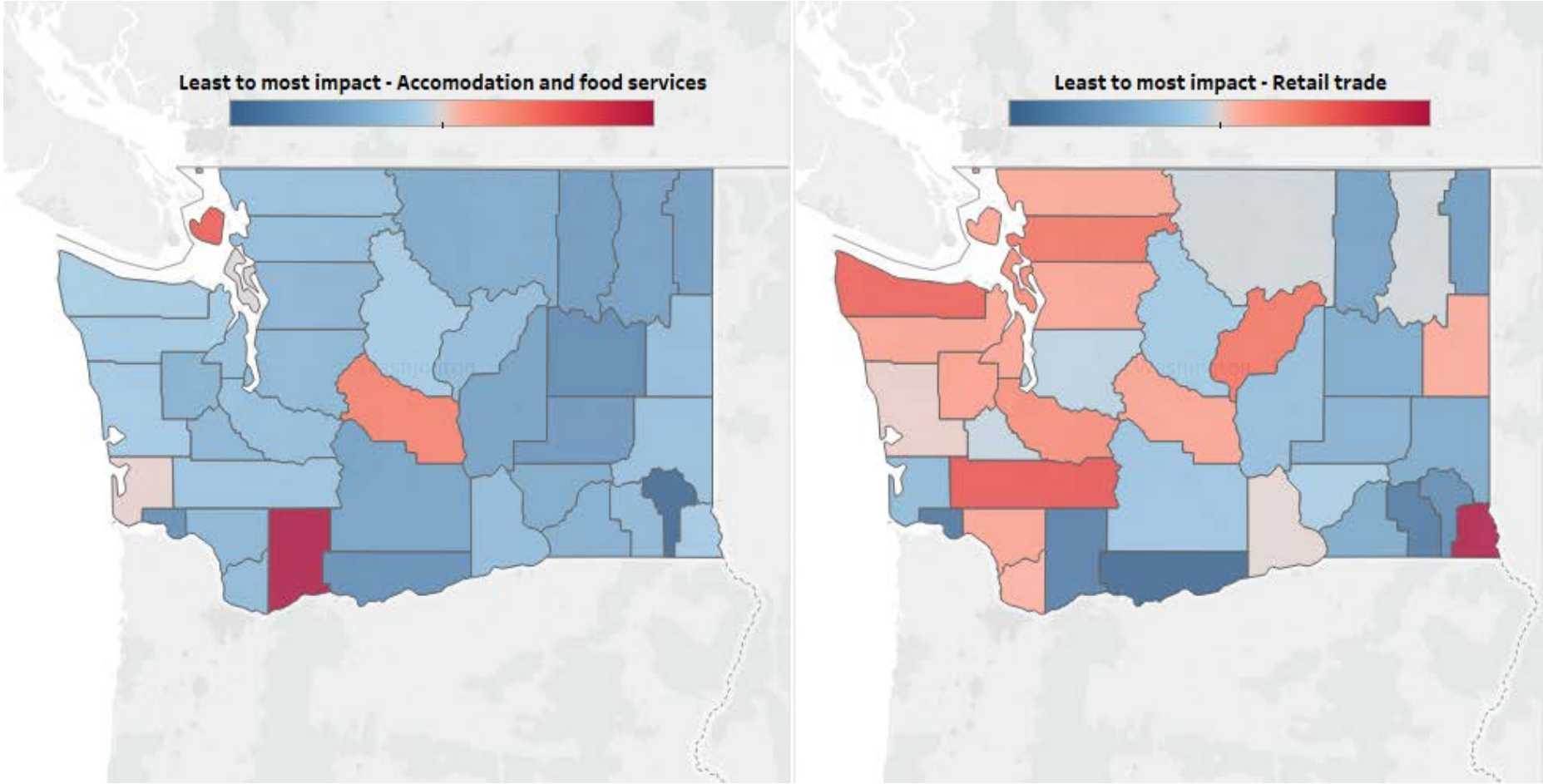
Source: Employment Security Department/WITS; U.S. Bureau of Labor Statistics, Occupational Employment Statistics, 2017; Carl Benedict Frey and Michael A. Osborne, "The Future of Employment: How Susceptible are Jobs to Computerization," Oxford Martin Programme on Technology and Employment, September 2013

Concentration of employment in select industries susceptible to automation



Source: Employment Security Department/WITS; U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages, First Quarter 2017

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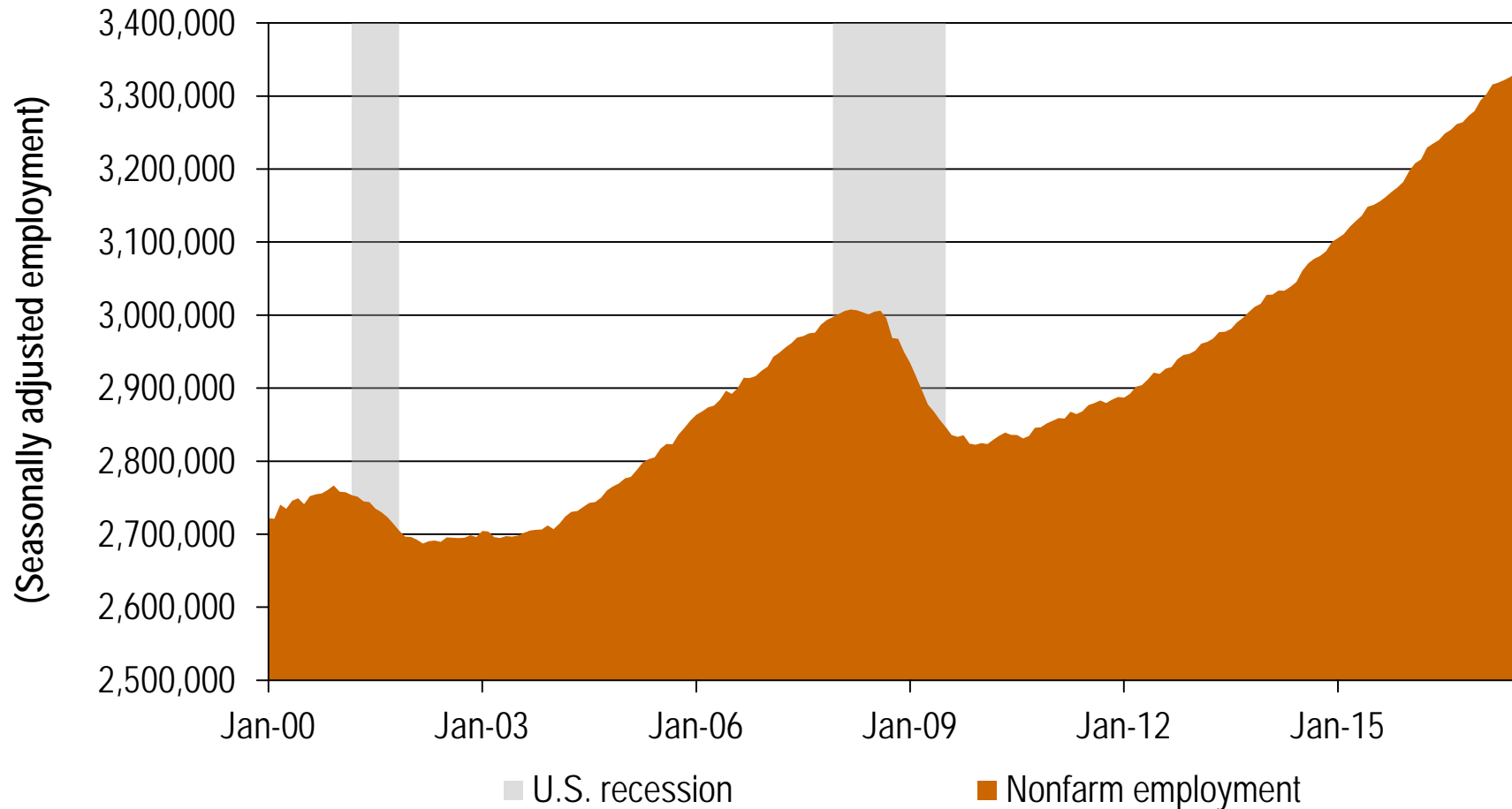
But, automation isn't simply a question of technical feasibility

- ▶ Technical feasibility
- ▶ Costs to automate
- ▶ Scarcity, skills and cost of workers who do that work
- ▶ Benefits beyond cost savings
- ▶ Regulatory and social considerations

Source: Michael Chui, James Manyika, and Mehdi Miremadi, "Where machines could replace humans – and where they can't (yet)," McKinsey & Company, McKinsey Quarterly, July 2016

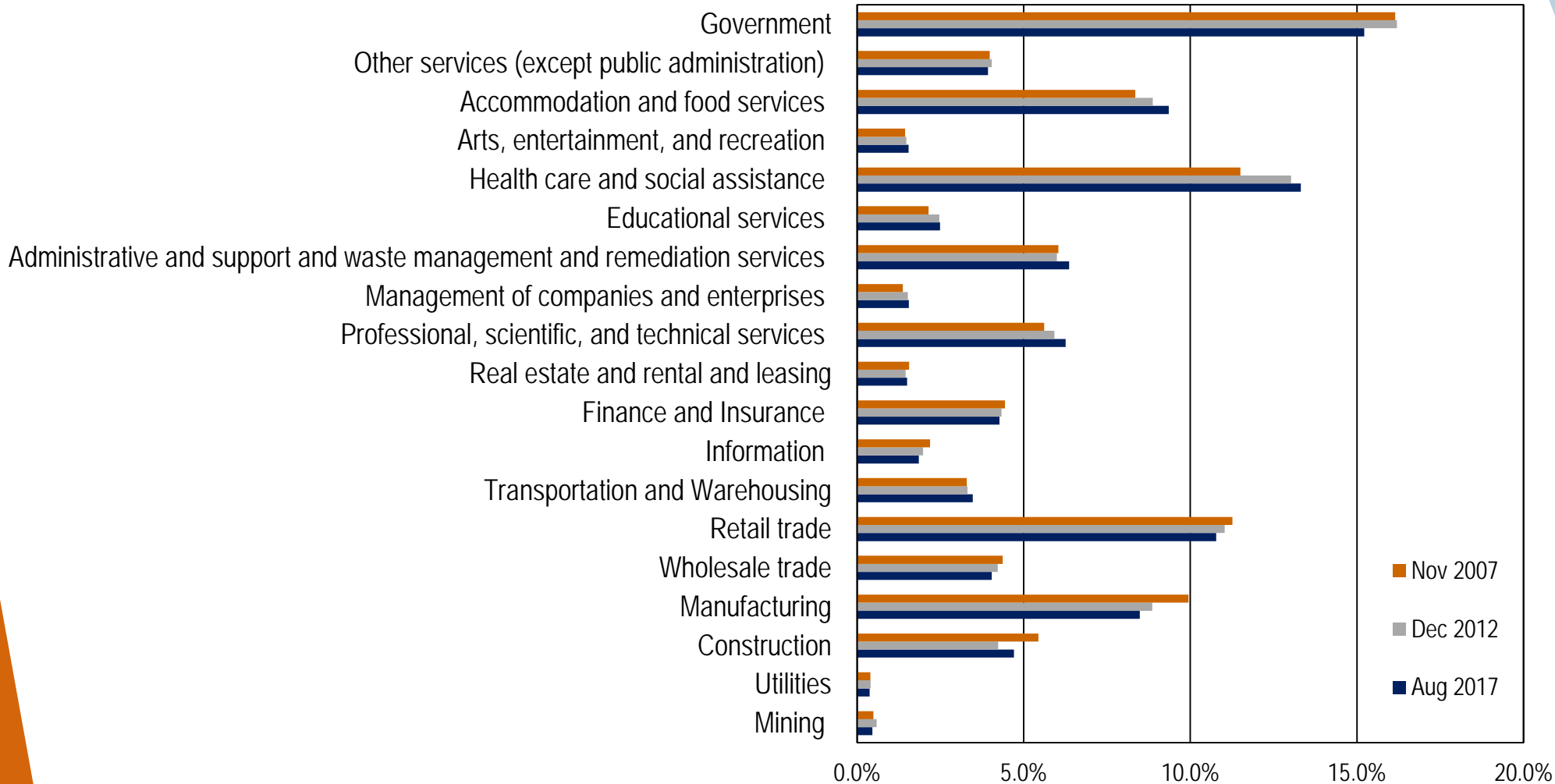
Nonfarm employment in Washington

Currently up 11 percent from previous employment peak



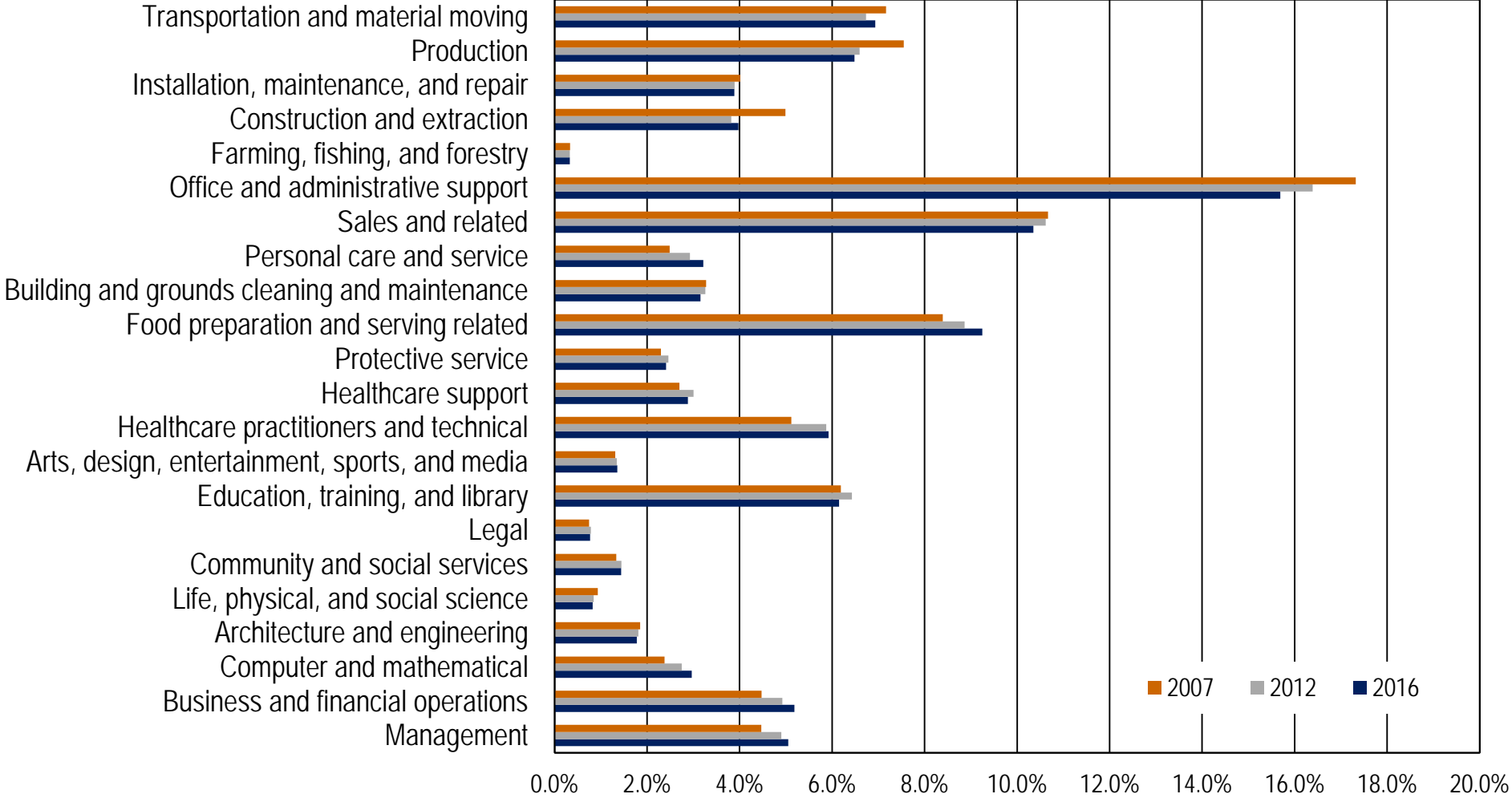
Source: Employment Security Department/WITS; U.S. Bureau of Labor Statistics, Current Employment Statistics. U.S. recessions are shaded.

Industry share of total employment – pre/post recession



Source: Employment Security Department/WITS; U.S. Bureau of Labor Statistics, Current Employment Statistics

Occupational share of total employment – pre/post recession



Source: Employment Security Department/WITS; U.S. Bureau of Labor Statistics, Occupational Employment Statistics



Any questions?

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