

# Us, Robots?

## *Possible Impacts of Automation on Jobs in Metro Atlanta*

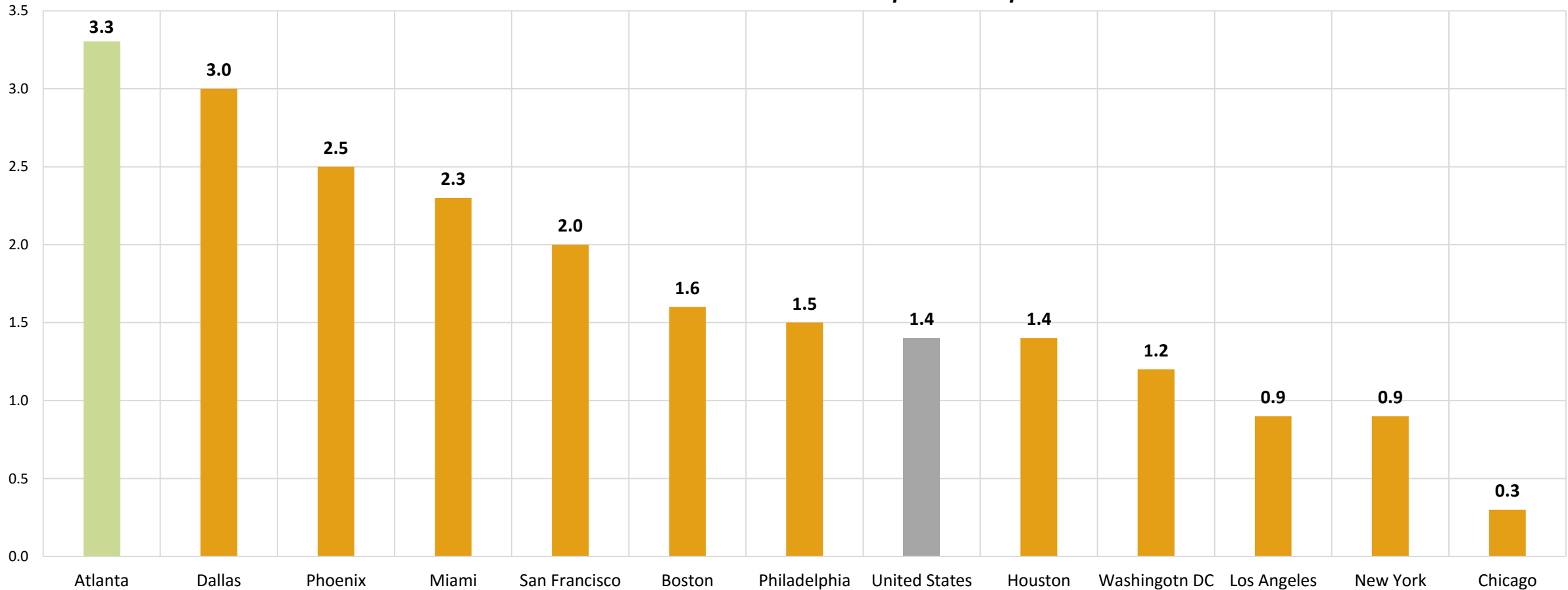
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# In Sum

- Overall, employment growth is strong in metro Atlanta, but several occupations that employ thousands of residents are at-risk for automation in the future.
- The “Retail Salespersons” occupation employs the most workers in metro Atlanta and is at high risk of automation as more and more technologies come online.
- Many of the “safest” occupations are concentrated in healthcare and other services that require a “human touch”.
- Low-skill and low-paying occupations, in general, are at the highest risk of automation.
- Most of the occupations with the highest risk of automation employ high percentages of younger workers.

# Metro Atlanta A National Leader in Job Growth

Year-Over-Year Percent Job Growth April 2016- April 2017



Overall, metro Atlanta’s job growth has been near the top nationally for several years now, signaling a full recovery from the effects of the Great Recession that lingered locally until 2012. Though job growth remains strong in metro Atlanta, this month’s Regional Snapshot explores potential job market disruption due to automation.

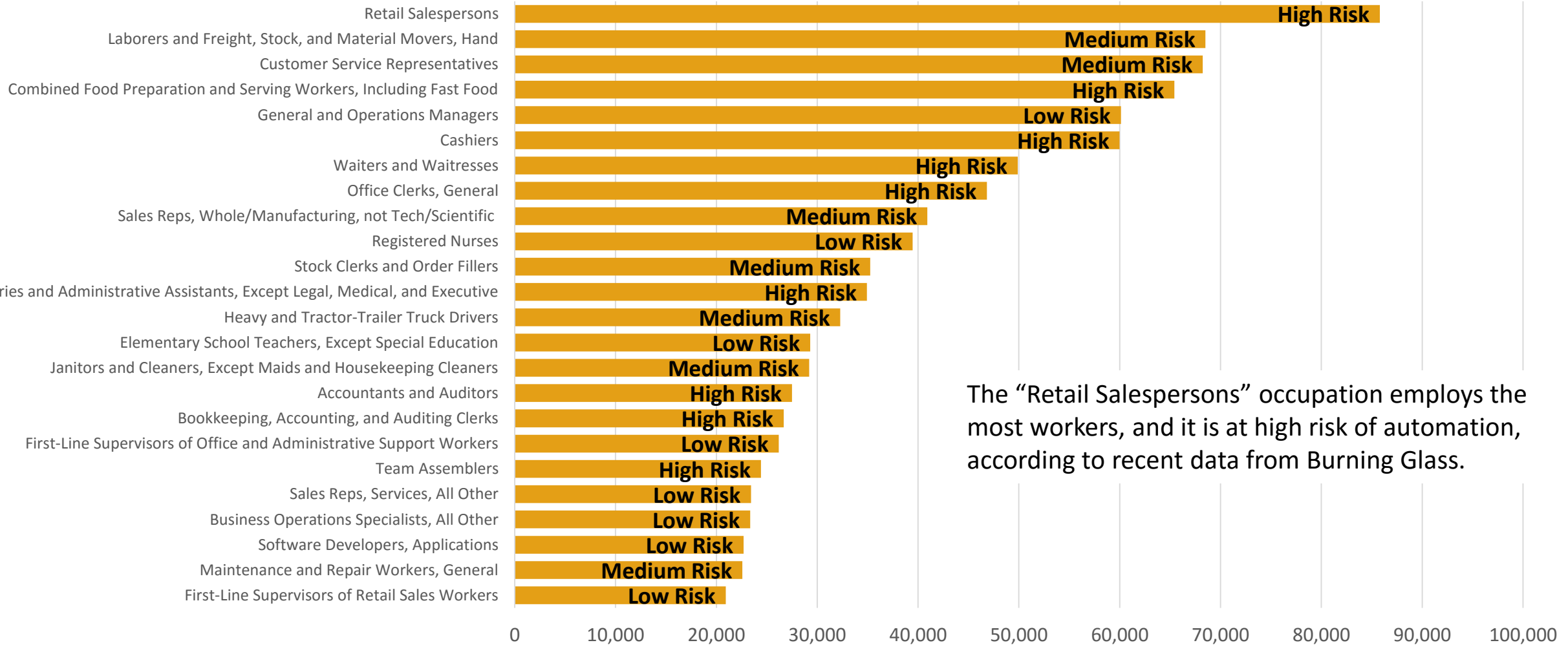


# The Risk Factor of Automation

- Other major concerns in the job landscape are threats from technology, defined as (the chances of) “automation”
- A 2013 [Oxford University study](#) found that 47% of US jobs were at risk
  - A [more recent Oxford report](#) put the risk for certain occupations higher
    - Transportation and logistics at 80%
    - Sales at 63%
- A [recent perception survey](#) done by Survey Monkey indicates that 60% of workers are threatened by automation
- New data from Burning Glass allows us to assess the risks by occupation at the metro area
  - Burning Glass defines automation risk as the probability that a given occupation will be computerized within the next 20 years
  - Burning Glass classified occupations by scoring into risk category quartiles. The bottom two quartiles of scores (including occupations such as Home Health Aides) are designated as having low risk of automation; the third quartile of scores e.g. Machinists have medium risk; the top quartile e.g. Insurance Underwriters are classified as having high risk of automation.

# Top Occupations and Risk Levels Due to Automation

## Top 20 Occupations and Risk of Automation



The “Retail Salespersons” occupation employs the most workers, and it is at high risk of automation, according to recent data from Burning Glass.

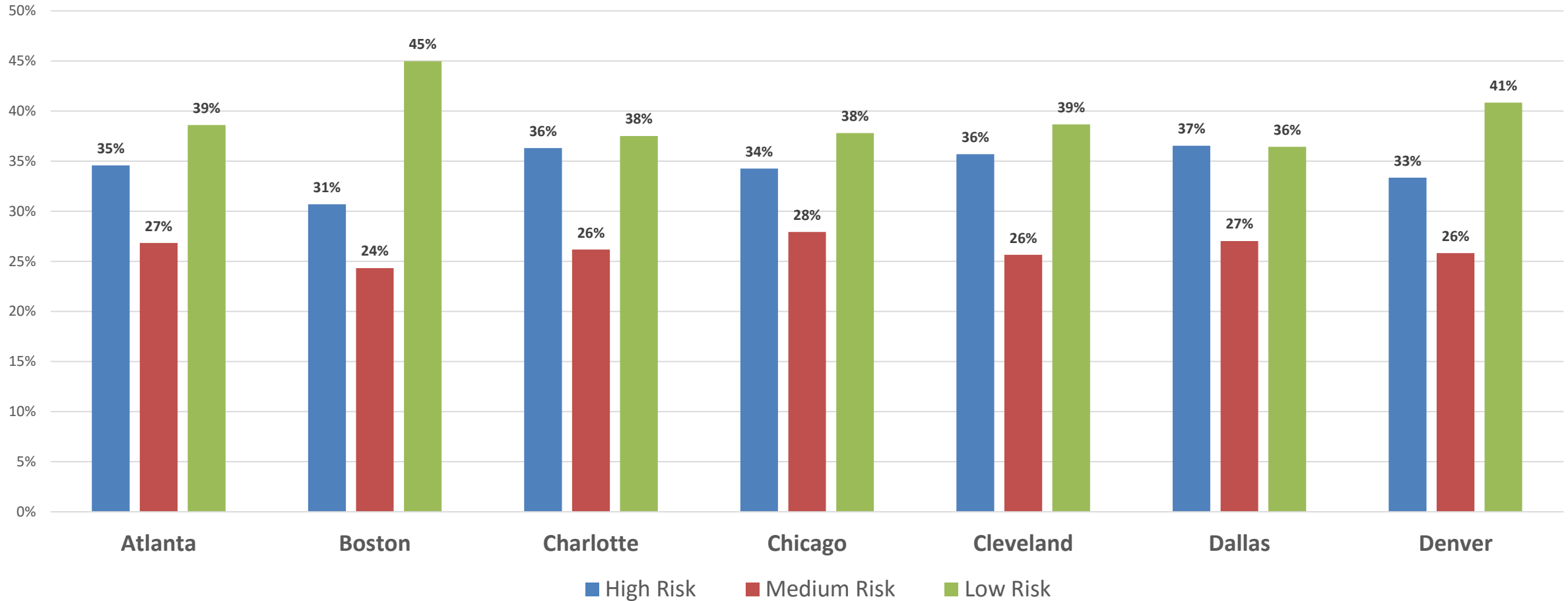
# “Safest” And “Most Threatened” Occupations

Occupation Name	Probability of Computerization
Recreational Therapists	0.28%
Emergency Management Directors	0.30%
First-Line Supervisors of Mechanics, Installers, and Repairers	0.30%
Mental Health and Substance Abuse Social Workers	0.31%
Audiologists	0.33%
Healthcare Social Workers	0.35%
Occupational Therapists	0.35%
Orthotists and Prosthetists	0.35%
Oral and Maxillofacial Surgeons	0.36%
First-Line Supervisors of Fire Fighting and Prevention Workers	0.36%
Lodging Managers	0.39%
Dietitians and Nutritionists	0.39%
Choreographers	0.40%
Sales Engineers	0.41%
Instructional Coordinators	0.42%
Psychologists, All Other	0.43%
Elementary School Teachers, Except Special Education	0.44%
Dentists, General	0.44%
First-Line Supervisors of Police and Detectives	0.44%
Medical Scientists, Except Epidemiologists	0.45%

Occupation Name	Probability of Computerization
Legal Secretaries	98%
Insurance Claims and Policy Processing Clerks	98%
Timing Device Assemblers and Adjusters	98%
Milling and Planing Machine Setters, Operators, and Tenders, Metal and Plastic	98%
Inspectors, Testers, Sorters, Samplers, and Weighers	98%
Packaging and Filling Machine Operators and Tenders	98%
Etchers and Engravers	98%
Driver/Sales Workers	98%
Insurance Underwriters	99%
Tax Preparers	99%
Mathematical Technicians	99%
Title Examiners, Abstractors, and Searchers	99%
Library Technicians	99%
Telemarketers	99%
New Accounts Clerks	99%
Cargo and Freight Agents	99%
Data Entry Keyers	99%
Watch Repairers	99%
Sewers, Hand	99%
Photographic Process Workers and Processing Machine Operators	99%

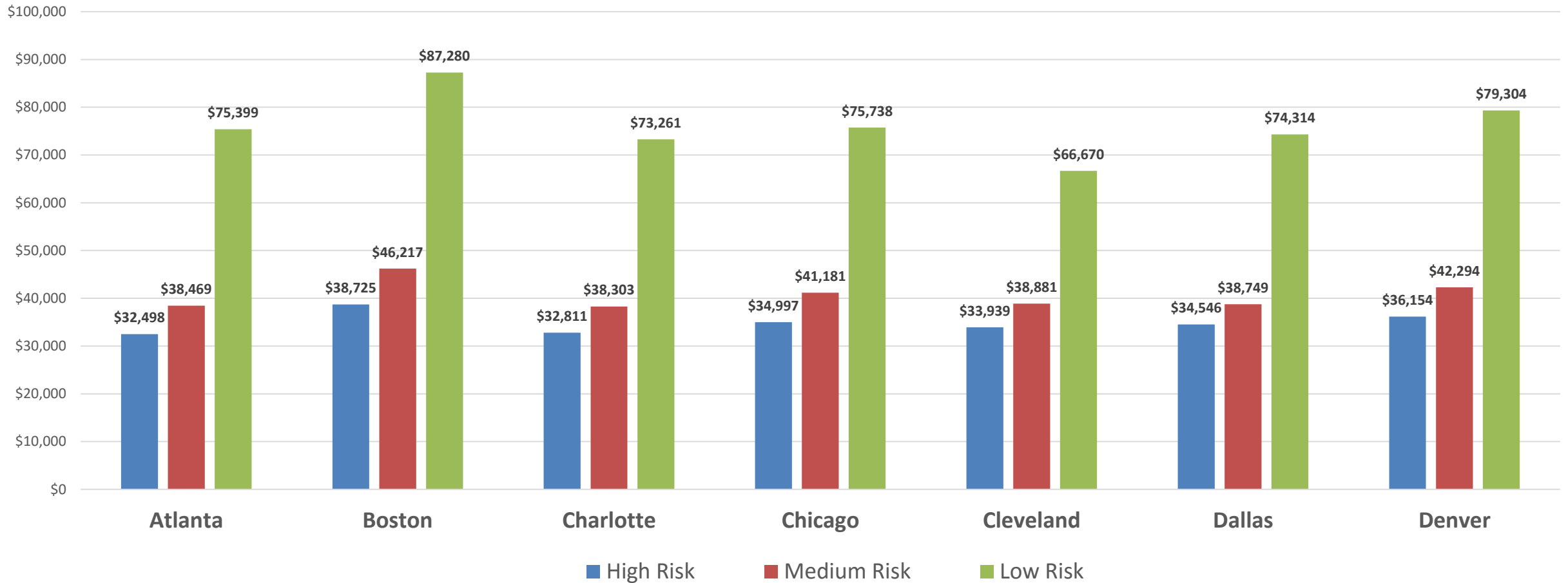
Many of the occupations that seem to be the “safest” are those in the health care field which requires personal interactions, like therapists and social workers.

## Metro Comparison Share of Employment by Risk of Automation



The above chart uses data from Burning Glass to compare automation risk, by category, for Atlanta and peer metros. 62 percent of Atlanta jobs are in occupation groupings with “medium” or “high” risk of automation. Overall, there are not large differences among metros, regarding the overall shares of jobs at risk of automation. However, metros like Boston and Denver—with higher levels of educational attainment and higher concentrations of higher-tech industries—have larger shares of jobs at “low-risk” of automation.

## Metro Comparison Mean Wage by Risk of Automation



This chart compares average wages by automation risk category, across peer metros. In general, the high risk categories have the lowest wages. The Atlanta metro’s mean wage in the “high-risk” category is lower than that in any other metro. While some of the explanation may lie in our relatively low cost of living, our area’s relative ranking on this measure is still cause for concern.





# Top 10 Employing Occupations at Risk of Automation

Rank	Occupation	Number of Workers	Percent Change, 2015-16	Share of Total Workers	Mean Wage	Educational Attainment Nationally		
						% with a HS Diploma or less	% with Some College or an Associate's	% with a Bachelor's or higher
1	Retail Salespersons	85,800	1%	3.45%	\$ 25,490	36%	43%	21%
2	Combined Food Preparation and Serving Workers, Including Fast Food	65,430	13%	2.63%	\$ 18,660	62%	33%	4%
3	Cashiers	59,980	4%	2.41%	\$ 20,030	55%	38%	8%
4	Waiters and Waitresses	49,890	0%	2.00%	\$ 19,230	44%	45%	12%
5	Office Clerks, General	46,830	-1%	1.88%	\$ 30,430	33%	48%	19%
6	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	34,930	0%	1.40%	\$ 37,260	31%	49%	20%
7	Accountants and Auditors	27,500	-4%	1.11%	\$ 79,070	4%	17%	78%
8	Bookkeeping, Accounting, and Auditing Clerks	26,670	0%	1.07%	\$ 41,110	32%	50%	19%
9	Team Assemblers	24,420	11%	0.98%	\$ 27,800	66%	29%	5%
10	Cooks, Restaurant	19,920	5%	0.80%	\$ 24,050	70%	26%	4%

This table ranks the high-risk occupations (as classified by Burning Glass) by number of jobs in those occupations, as well as provides data on each occupation’s share of jobs, recent growth trends, mean wages, and workforce educational attainment. Four of the top ten job occupations at risk of automation have 50 percent or more of their workers holding a high school diploma or less. These workers will have great need for retraining and upskilling to fill other higher-demand jobs in the “new economy”.

# Top 10 Automation Risk Occupations by Industry Concentration

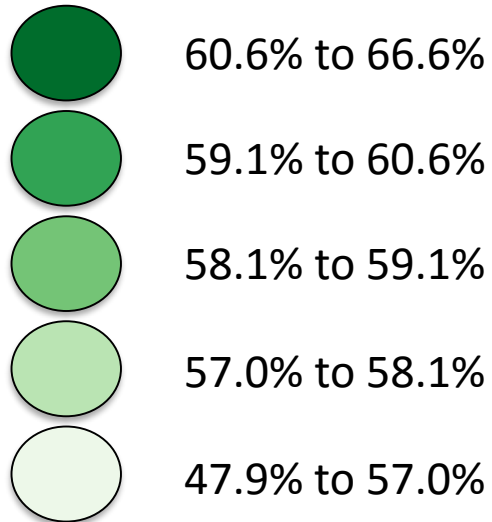
Analysis performed by ARC's Research & Analytics Group

Major Industry Sector	Detailed Occupation (SOC)									
	Accountants and Auditors	Cooks	Combined Food Preparation and Serving Workers, Including Fast Food	Waiters and Waitresses	Cashiers	Retail Salespersons	Bookkeeping, Accounting, and Auditing Clerks	Secretaries and Administrative Assistants	Office Clerks, General	Miscellaneous Assemblers and Fabricators
Agriculture, Forestry, Fishing and Hunting										
Mining, Quarrying, and Oil and Gas Extraction										
Utilities										
Construction										
Manufacturing										
Wholesale Trade										
Retail Trade										
Transportation & Warehousing										
Information										
Finance and Insurance										
Real Estate and Rental and Leasing										
Professional, Scientific, and Technical Services										
Management of Companies and Enterprises										
Administrative and Support and Waste Management and Remediation Services										
Educational Services										
Health Care and Social Assistance										
Arts, Entertainment, and Recreation										
Accommodation and Food Services										
Other Services (except Public Administration)										
Public Administration										
Unspecified Manufacturing										
Unspecified Trade										

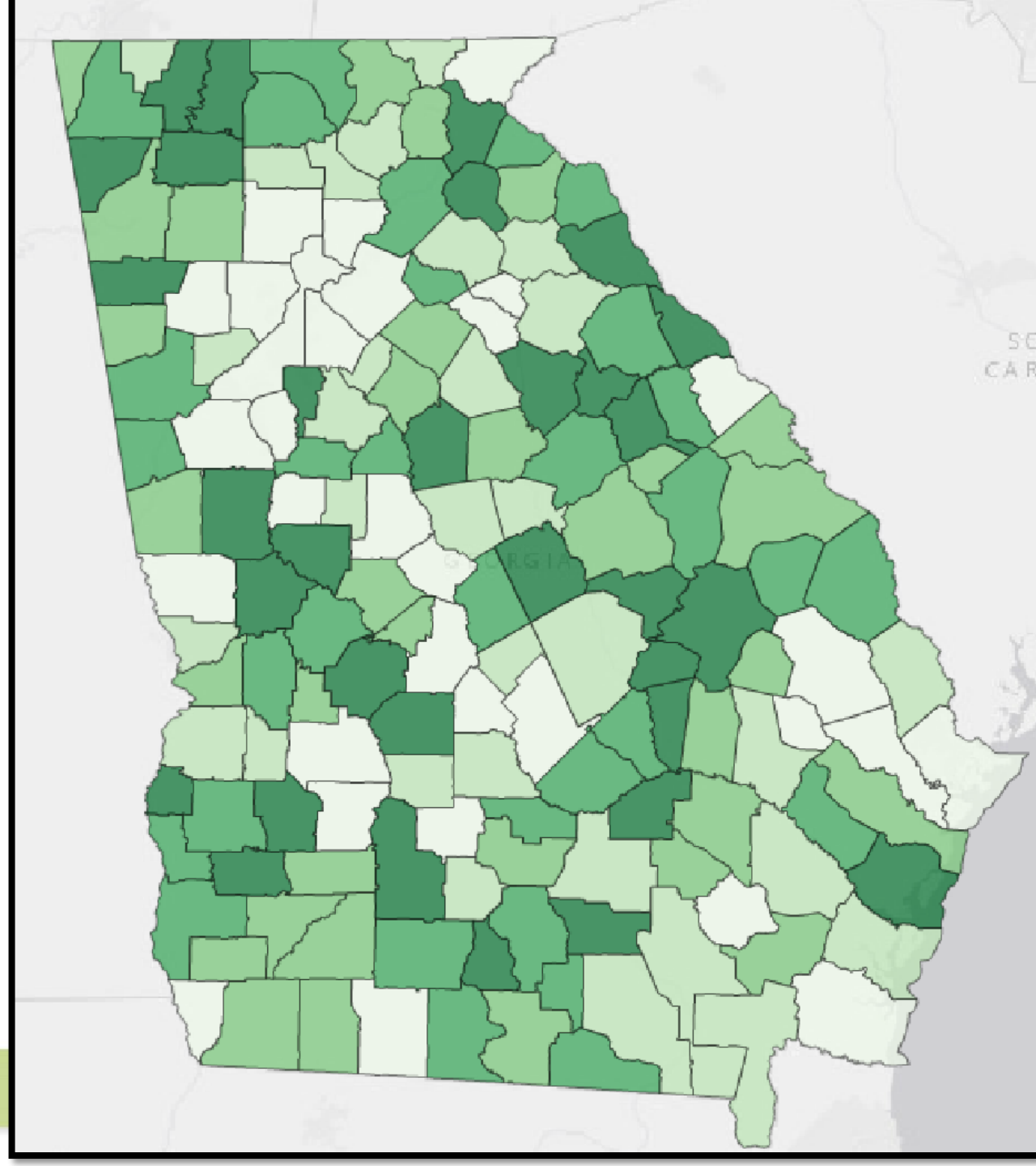
The Burning Glass automation risk data are available by occupation only, but assessing trends by industry is also critical. This table analyzes Census micro-data to categorize at-risk occupations by two-digit NAICS sector. Retail Trade and Accommodation & Food Services sectors are the most vulnerable, but there is also some exposure in the higher-wage Manufacturing and Professional, Scientific, and Technical Services sectors.



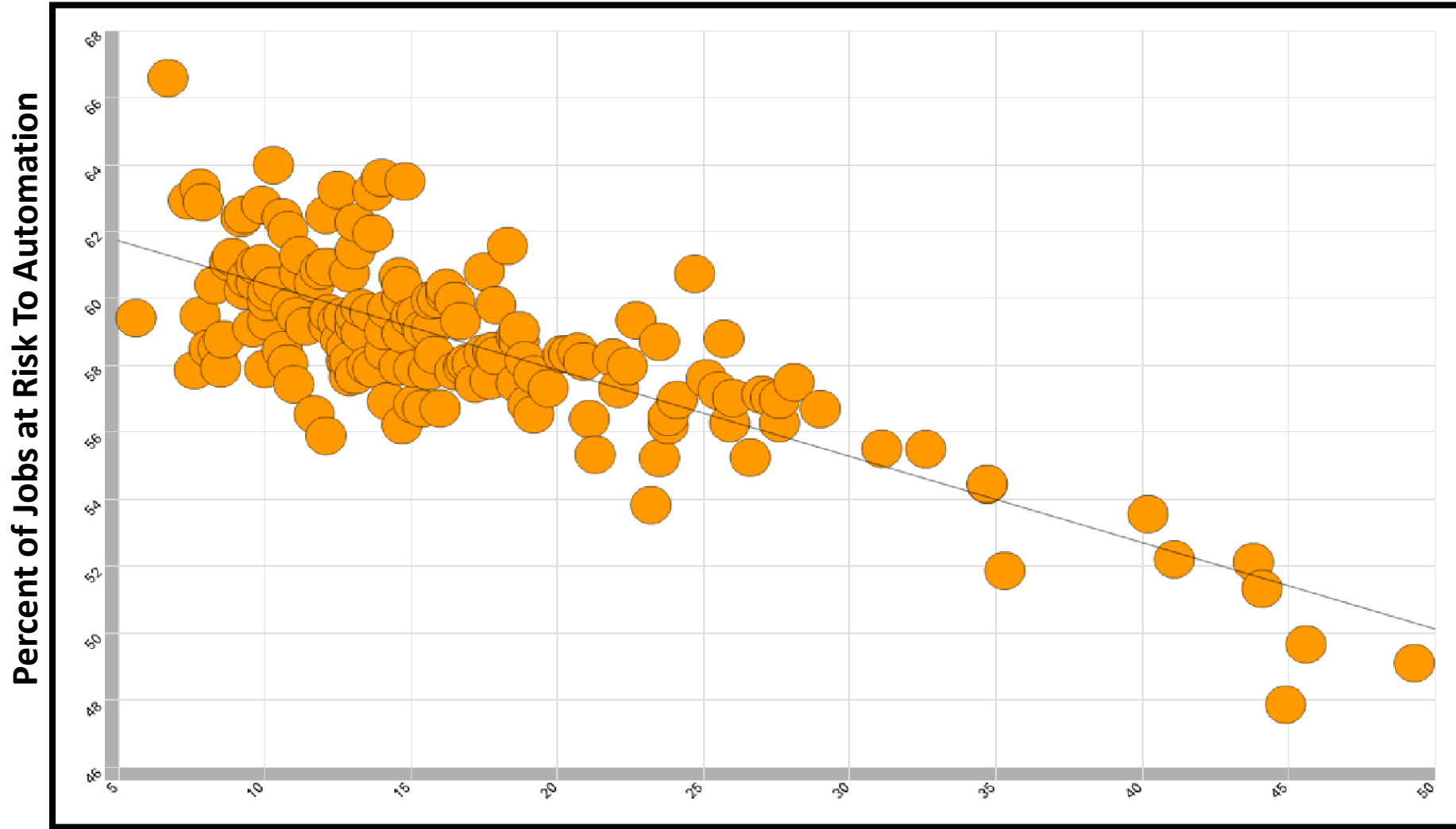
## Percent of Jobs At Risk of Automation, By County



A [different study](#) out of Ball State University compiled results across several separate studies that assessed the risk of automation. Using data from one particular study out of Oxford (referenced earlier), the authors estimated the percent of all jobs at risk to automation by county. The values range from roughly 48 percent to 67 percent in the state. However, many of metro Atlanta counties have among the lowest automation risks in the state. Educational attainment is a key factor.



# Relationship Between Automation Risk and Educational Attainment is Strong



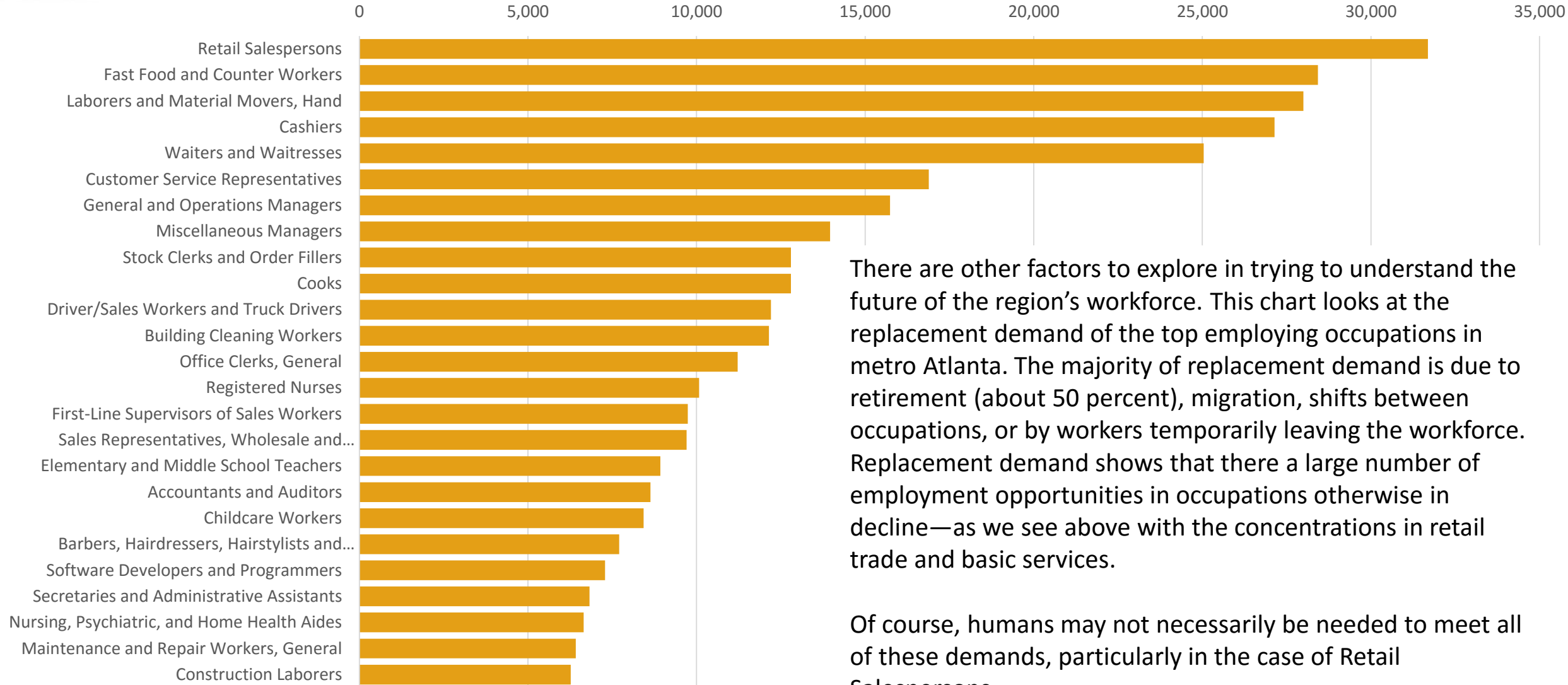
Percent of Jobs at Risk To Automation

Percent of Adult Population (25+) with at Least a Bachelor's Degree

One key determinant of vulnerability of jobs to automation is the educational attainment for the workforce in a given county. This scatterplot shows that relationship. The counties with highest percent of adults with at least a bachelor's degree have, in general, the lowest risk of job losses due to automation.

Despite this strong correlation, a high percentage of jobs in all counties are at risk to automation.

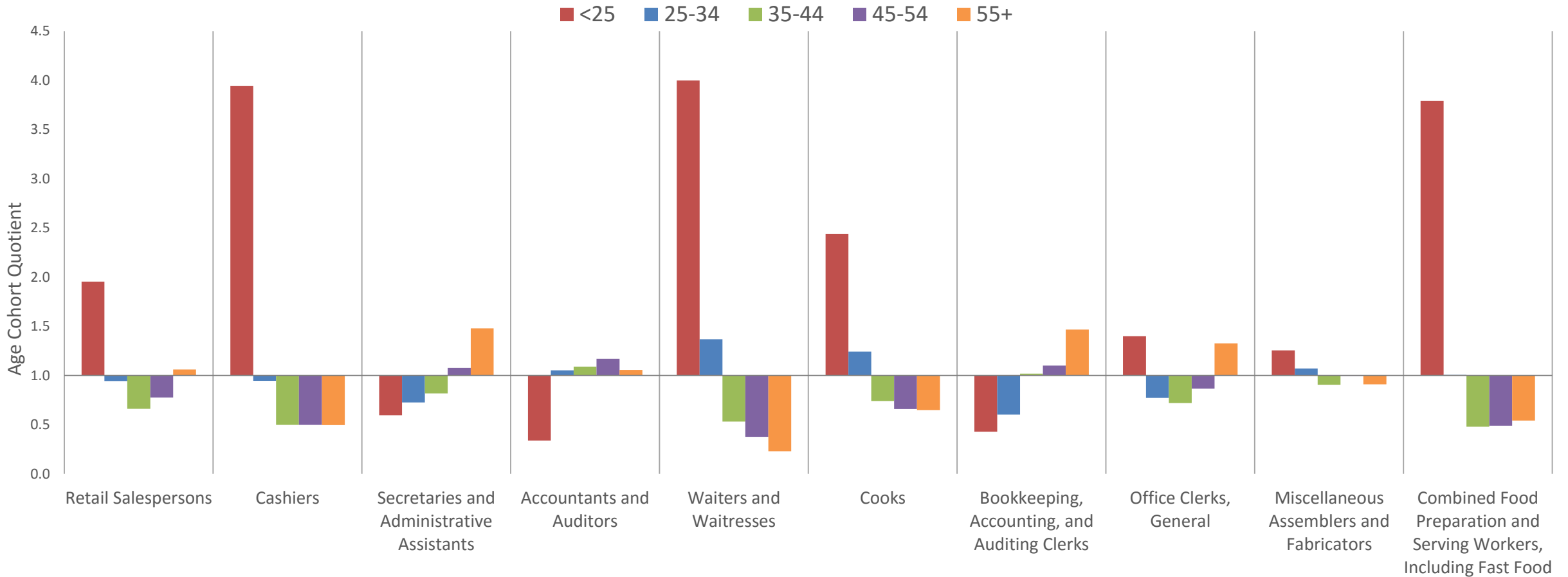
## Top 25 Employing Occupations by Total Approx. Replacement Demand 2017 to 2027



There are other factors to explore in trying to understand the future of the region's workforce. This chart looks at the replacement demand of the top employing occupations in metro Atlanta. The majority of replacement demand is due to retirement (about 50 percent), migration, shifts between occupations, or by workers temporarily leaving the workforce. Replacement demand shows that there a large number of employment opportunities in occupations otherwise in decline—as we see above with the concentrations in retail trade and basic services.

Of course, humans may not necessarily be needed to meet all of these demands, particularly in the case of Retail Salespersons.

## Top 10 Automation Risk Occupations by Age Cohort Quotient 2011-2015 ACS



Finally, this chart looks at the concentration of workers by age in those occupations that are at the highest risk due to automation. Values above 1.0 indicate higher concentrations for given age groups. For example, in the “Retail Salespersons” occupation, workers are twice as likely to be under the age of 25 than the workforce as a whole—the “quotient” on the left axis is 2.0. This is the case for four of the ten occupations shown. Thus, with the current age profile of these occupations, younger workers are more likely to be impacted by automation.