



COMMONWEALTH *of* VIRGINIA
Office of the
SECRETARY *of* TRANSPORTATION

VTrans Update: Demographics Trends

Commonwealth Transportation Board Workshop

Nick Donohue, Director, Office of Intermodal Planning and Investment (OIPI)
John Miller, Ph.D., P.E., Virginia Transportation Research Council (VTRC)

June 18, 2019



AGENDA

- VTrans Requirements
- Demographic Trends
 - Demographics Overview
 - Population Trends
 - Employment Trends
 - Income Trends



VTRANS REQUIREMENTS

- Key Requirements
 - Federal requirements per [23 U.S.C. 135](#) and other
 - [§ 33.2-353](#): OIPI to assist the CTB in the development and update of a Statewide Transportation Plan.
 - [§ 2.2-229](#): OIPI to assist the Commonwealth Transportation Board in the [development of a comprehensive, multimodal transportation policy](#), which may be developed as part of the Statewide Transportation Plan pursuant to § 33.2-353.
- Several other business requirements

ON-GOING AND COMPLETED WORK

- Trends Analysis
 - Demographic and Land Use Trends (this presentation)
 - Vulnerability Assessment – Flooding and Sea Level Rise (next presentation)
 - Technology Trends
 - Financial Trends
- Economic Profiles
- Mid-Term Needs Assessment (next presentation)

Text: Indicates tasks covered today



VTRANS TRENDS ANALYSIS : DEMOGRAPHIC TRENDS

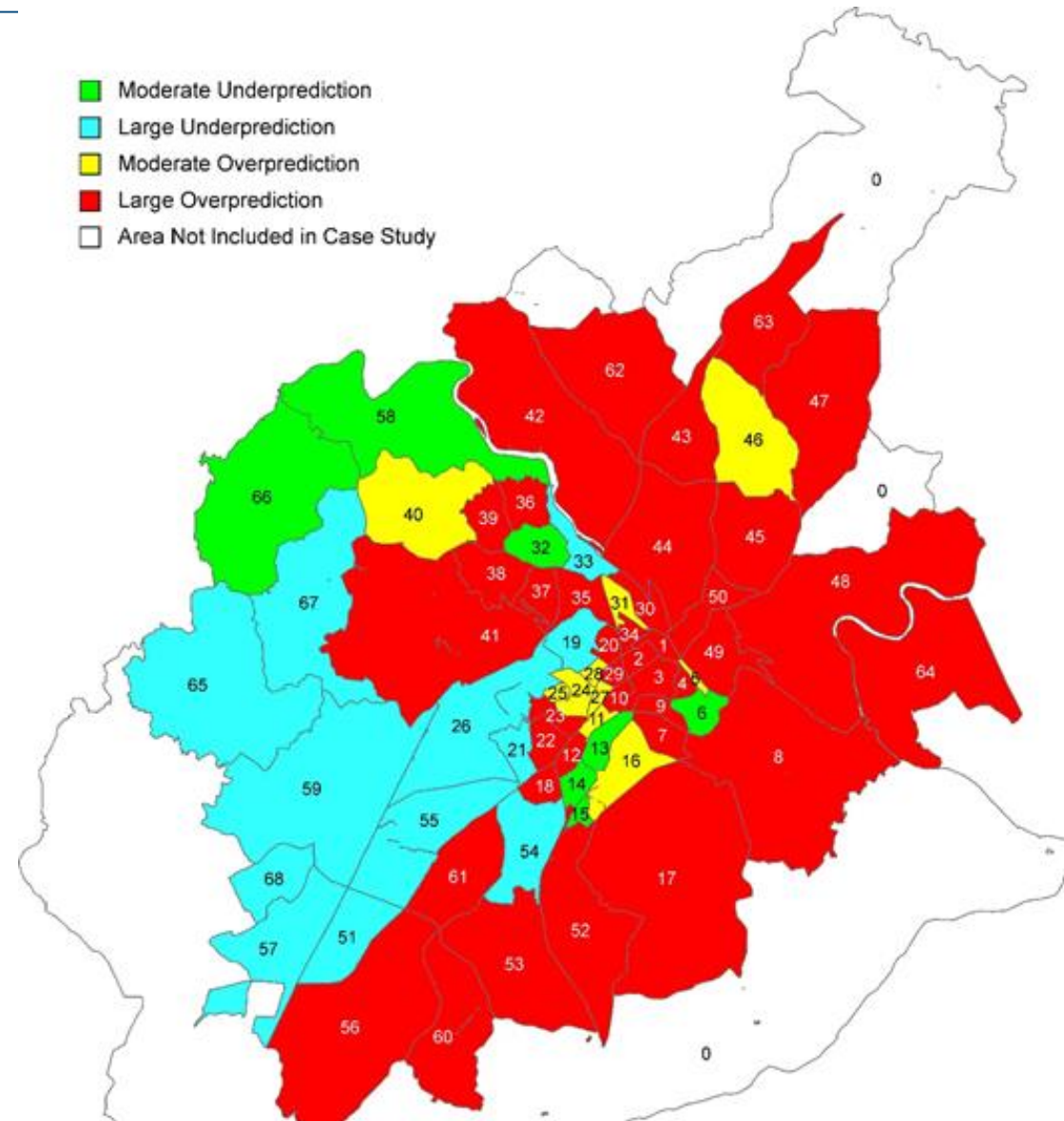
Authors: Haritha Bhairavabhatla, Amy O'Leary, Maddison Gasse, and John Miller

DEMOGRAPHICS OVERVIEW

- Geographies: Statewide, CTB Construction Districts and modified PDCs
- Population, employment, and income trends
- Major data sources:
 - Forecast population: Weldon Cooper Center for Public Service
 - Forecast employment: Woods & Poole
 - Forecast income: Moody's Analytics

WHY PDCs AND DISTRICTS?

- In 1980, the population for year 2000 was forecast. How accurate was the forecast?
- Average percent error:
 - By zone: 39%
 - By region: 10%



Source: McCray et al. *Improving Socioeconomic Land Use Forecasting for Medium-Sized Metropolitan Planning Organizations in Virginia, 2009.*



UNCERTAINTY IN FORECASTS IS ACKNOWLEDGED IN VIRGINIA

2045 Population Forecast for Arlington County + Alexandria City

Source	Forecast
Weldon Cooper Center for Public Service (2017)	548,405
Metropolitan Washington Council of Governments (2018)	509,618
Woods & Poole (2018)	442,444

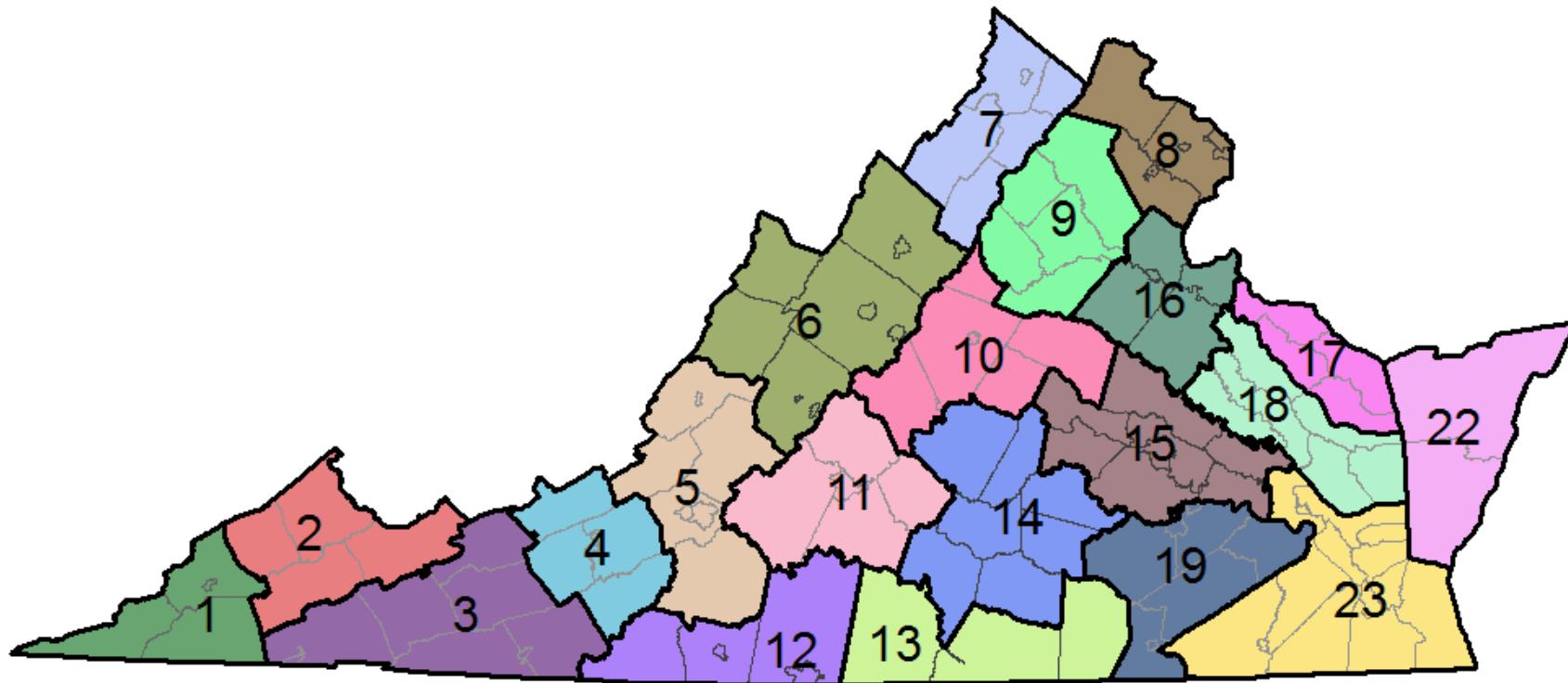
UNCERTAINTY IN FORECASTS IS ACKNOWLEDGED ELSEWHERE

Variable	Entity	2017-2040 Population
Population (Washington D.C.)	D.C. Office of Planning	49%
	MWCOG	28%
Employment (Washington D.C.)	D.C. Office of Planning	28%
	MWCOG	25%

Source: Calculated from data provided in Move DC: The District of Columbia's Multimodal Long-Range Transportation Plan, 2014

Note: MWCOG – Metropolitan Washington Council of Governments

IMPLICATION FOR TRANSPORTATION



- | | | |
|------------------------------|------------------------------------|---------------------------|
| (1) Lenowisco | (8) Northern Virginia | (15) Richmond Regional |
| (2) Cumberland Plateau | (9) Rappahannock-Rapidan | (16) George Washington |
| (3) Mount Rogers | (10) Thomas Jefferson | (17) Northern Neck |
| (4) New River Valley | (11) Central Virginia | (18) Middle Peninsula |
| (5) Roanoke Valley-Alleghany | (12) West Piedmont | (19) Crater |
| (6) Central Shenandoah | (13) Southside | (22) Accomack-Northampton |
| (7) Northern Shenandoah | (14) Commonwealth Regional Council | (23) Hampton Roads |

2017-2045
employment:

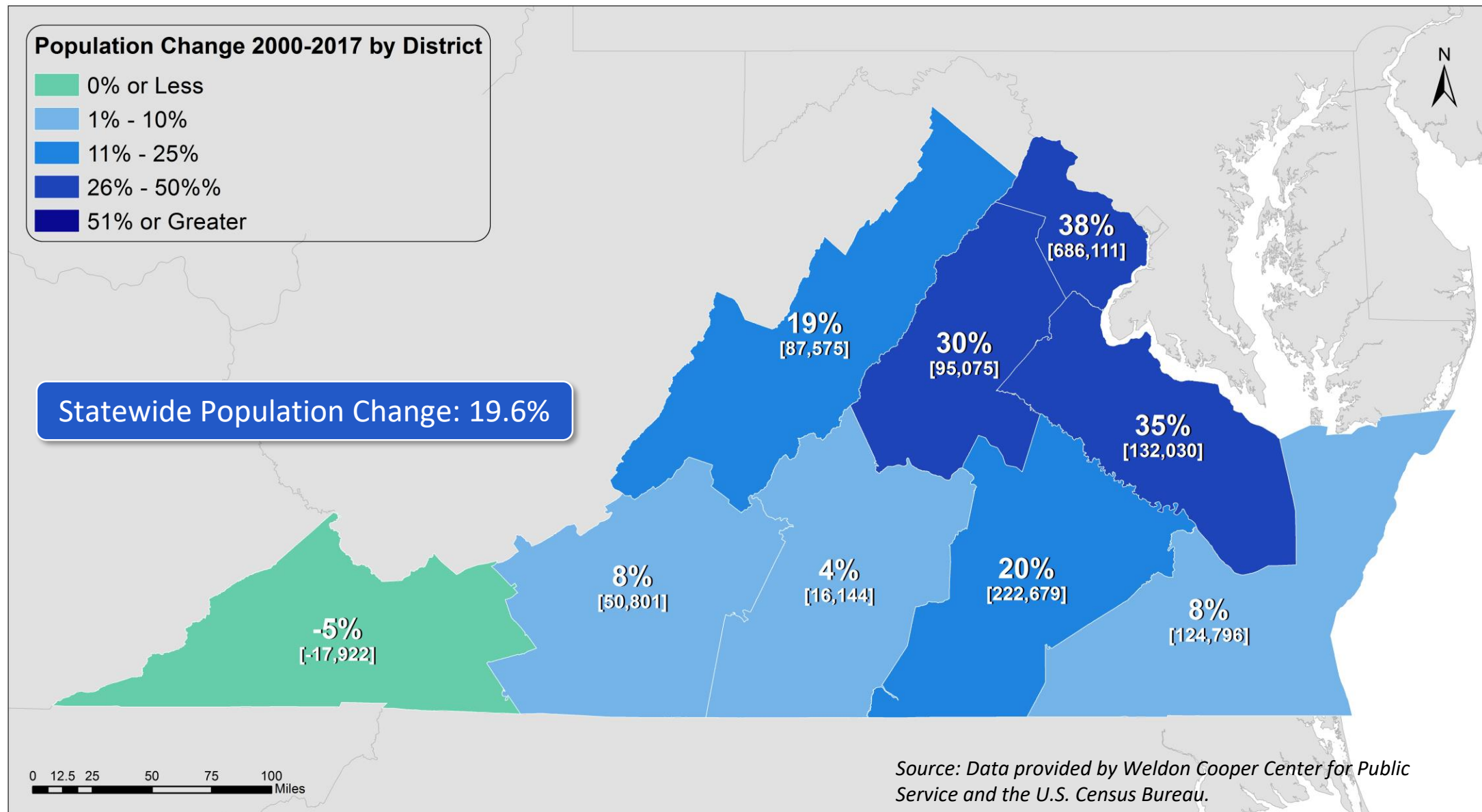
5% to 19%
forecast growth



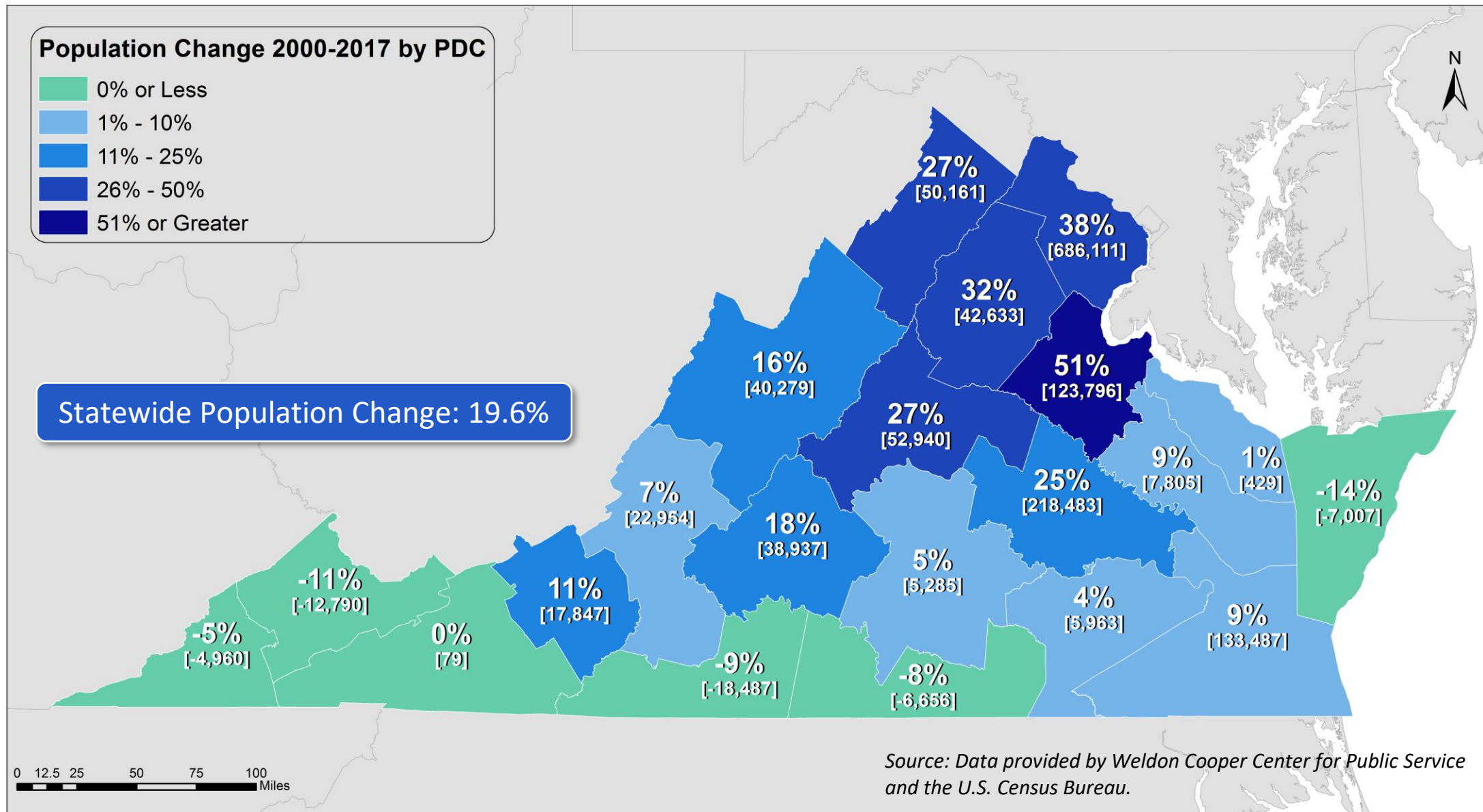


VTRANS TRENDS ANALYSIS: POPULATION TRENDS

HISTORICAL POPULATION CHANGE BY DISTRICT – 2000-2017



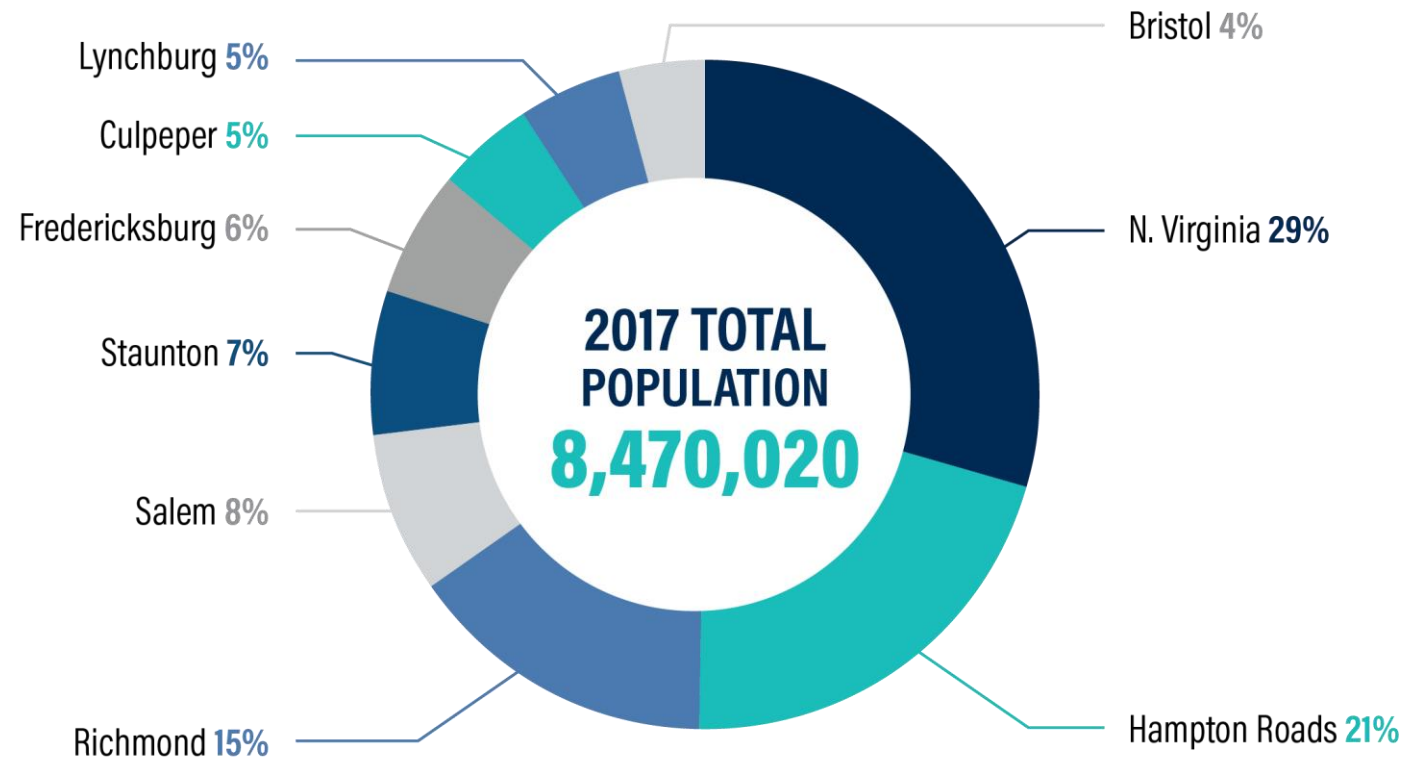
HISTORICAL POPULATION CHANGE BY PDC – 2000-2017



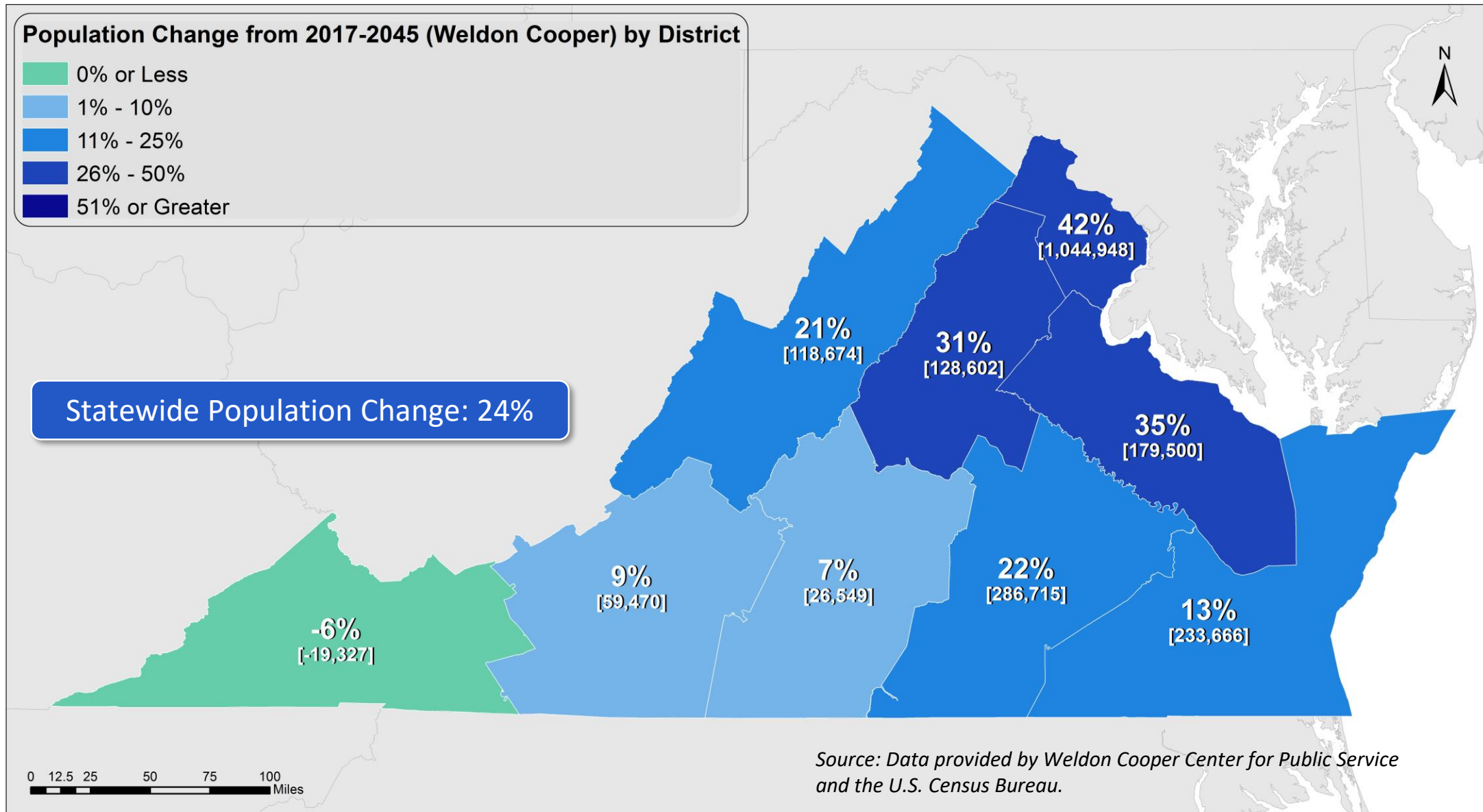
HISTORICAL POPULATION BY DISTRICT

- The Hampton Roads and Northern Virginia construction districts account for about 50% of Virginia's total population

Percentage of Population *(By District)*

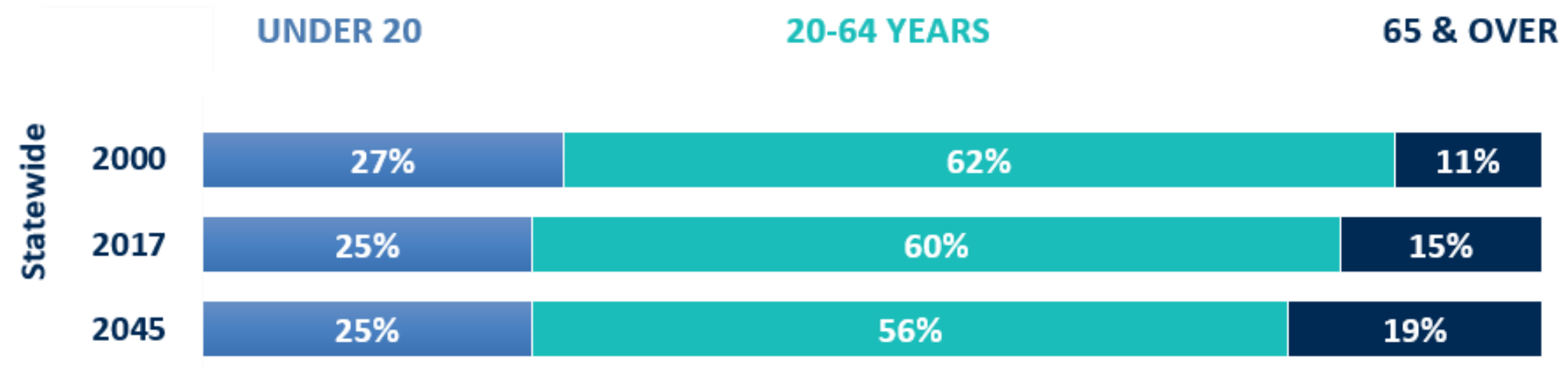


FORECAST POPULATION CHANGE BY DISTRICT – 2017-2045

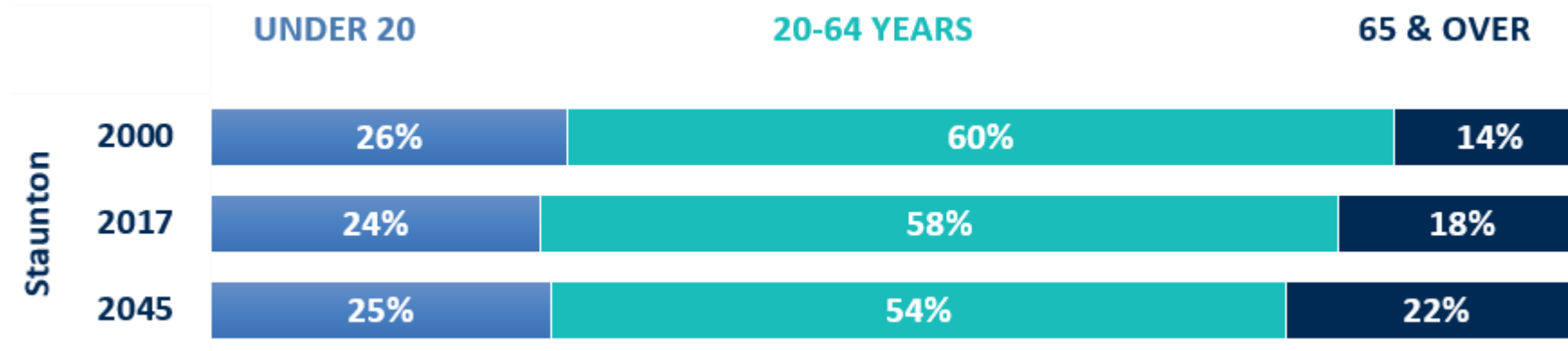
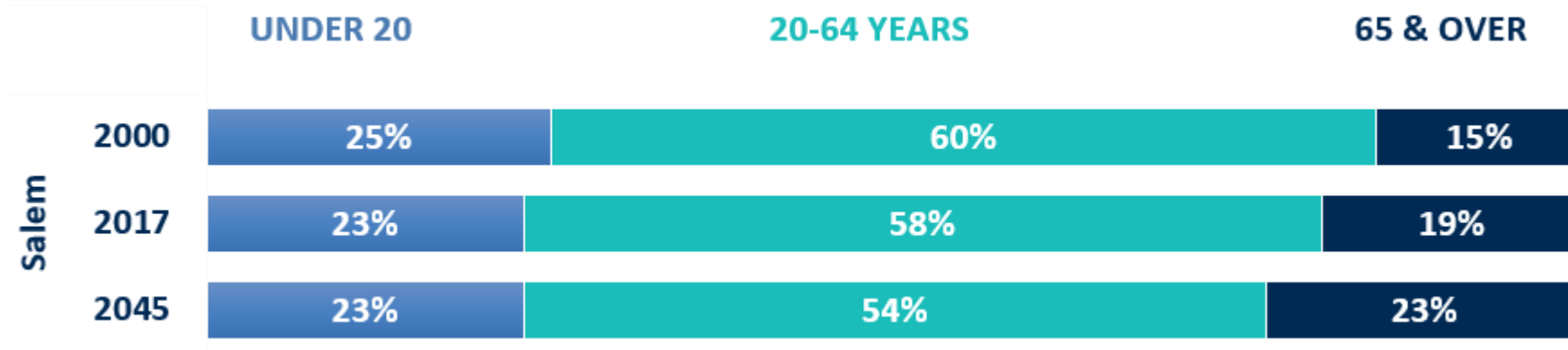


AGE DISTRIBUTION - STATEWIDE

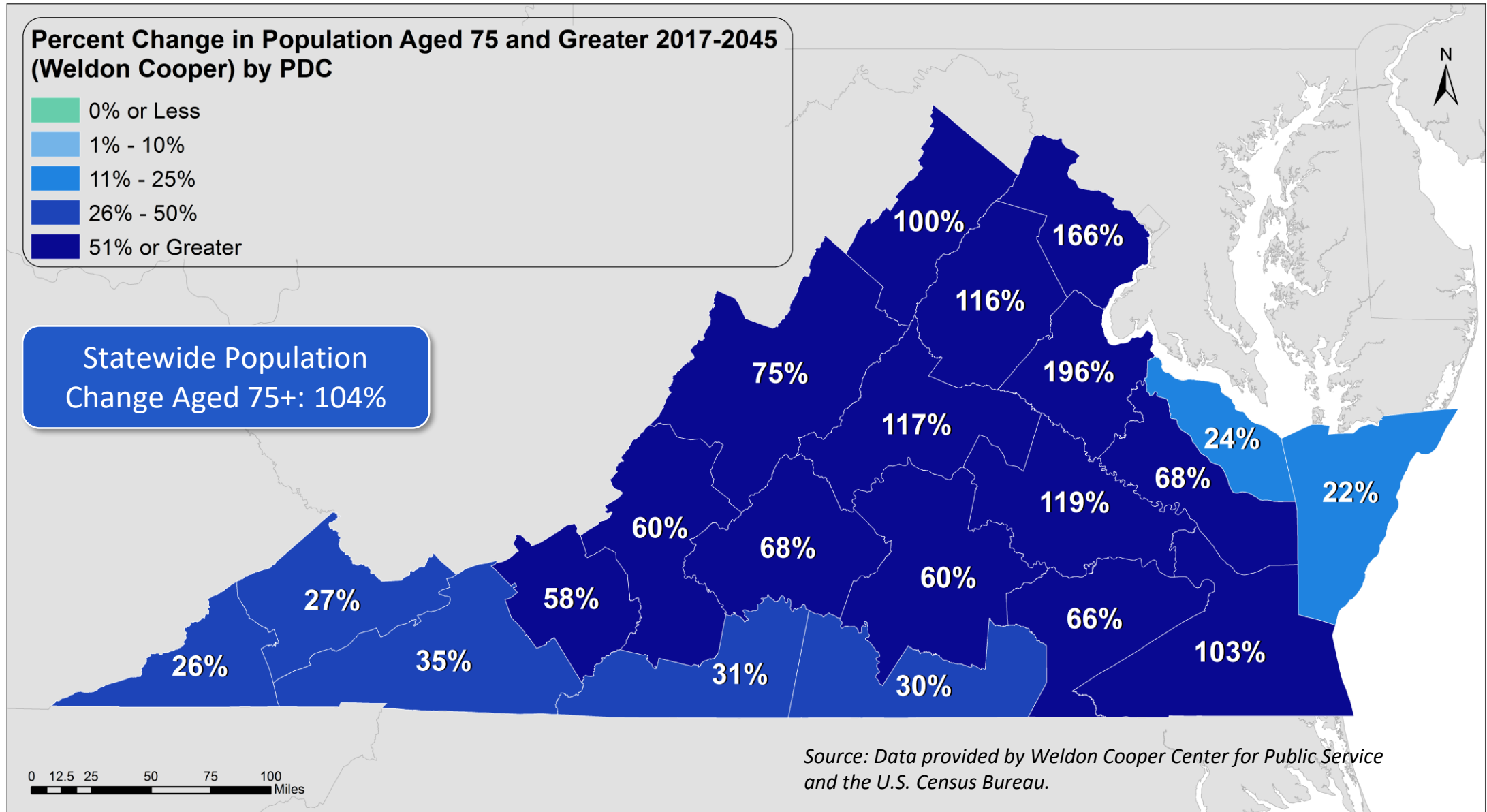
- For 2017 to 2045
 - Persons age 65+ are forecast to increase 56% (to 1.99 million)
 - Persons age 75+ are forecast to increase 104% (to 1.05 million)



AGE DISTRIBUTION BY DISTRICT



POPULATION FORECAST CHANGE AGED 75+ – 2017-2045



IMPLICATION FOR TRANSPORTATION

- **Transportation Needs of Persons Age 65+**

- Currently account for a smaller proportion of population in urban areas, yet urban areas may see a larger relative increase out to 2045

District	2017 Age 65+	2045 Age 65+
Hampton Roads	14%	19%
Lynchburg	20%	22%

- Percent adults who drive:

- 88% (at age 65)
- 69% (at age 75)

- **Virginia's border states recognize this need. Examples:**

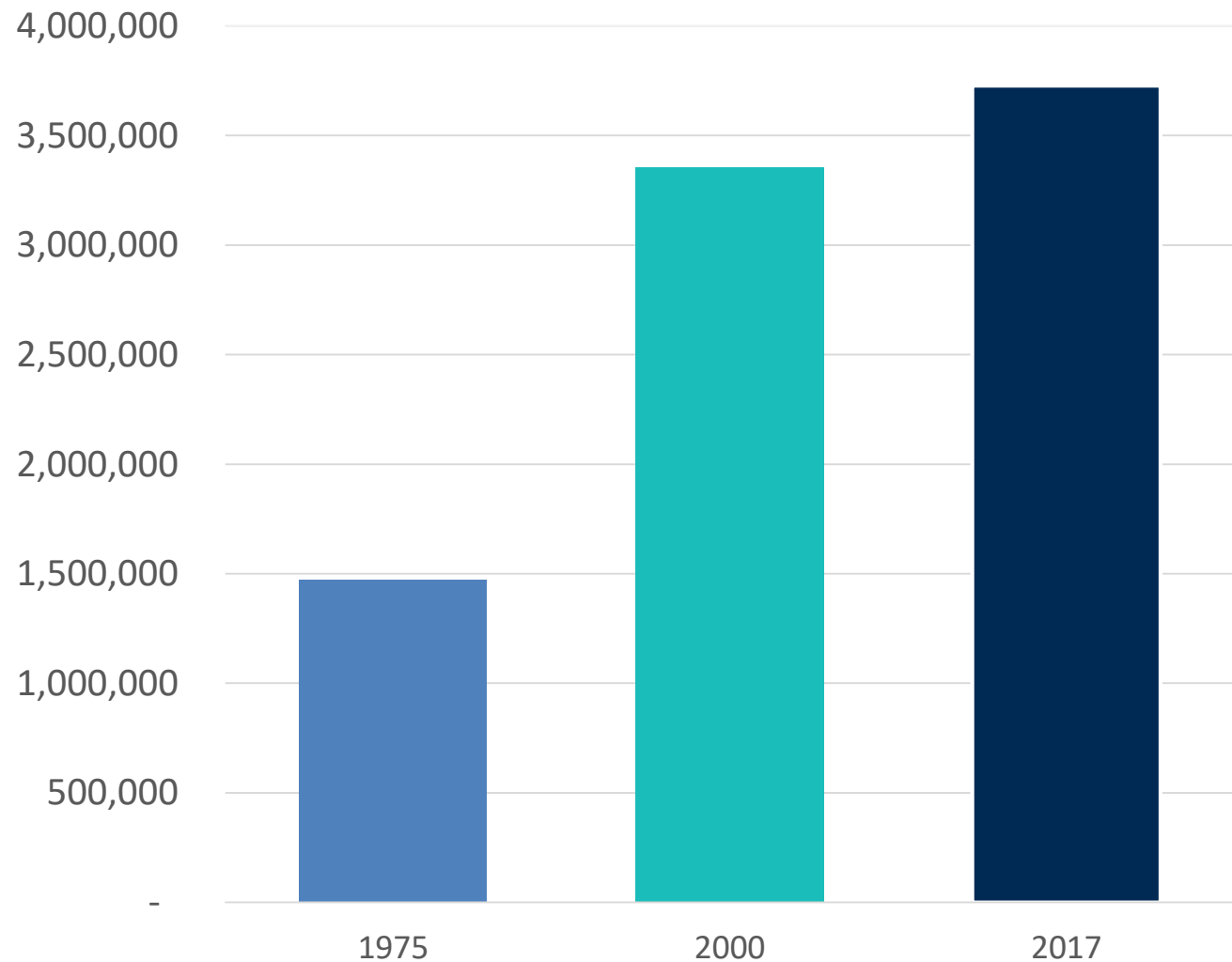
- Tennessee is emphasizing roadway design elements for this population
- North Carolina notes aging in place trends and needs for paratransit



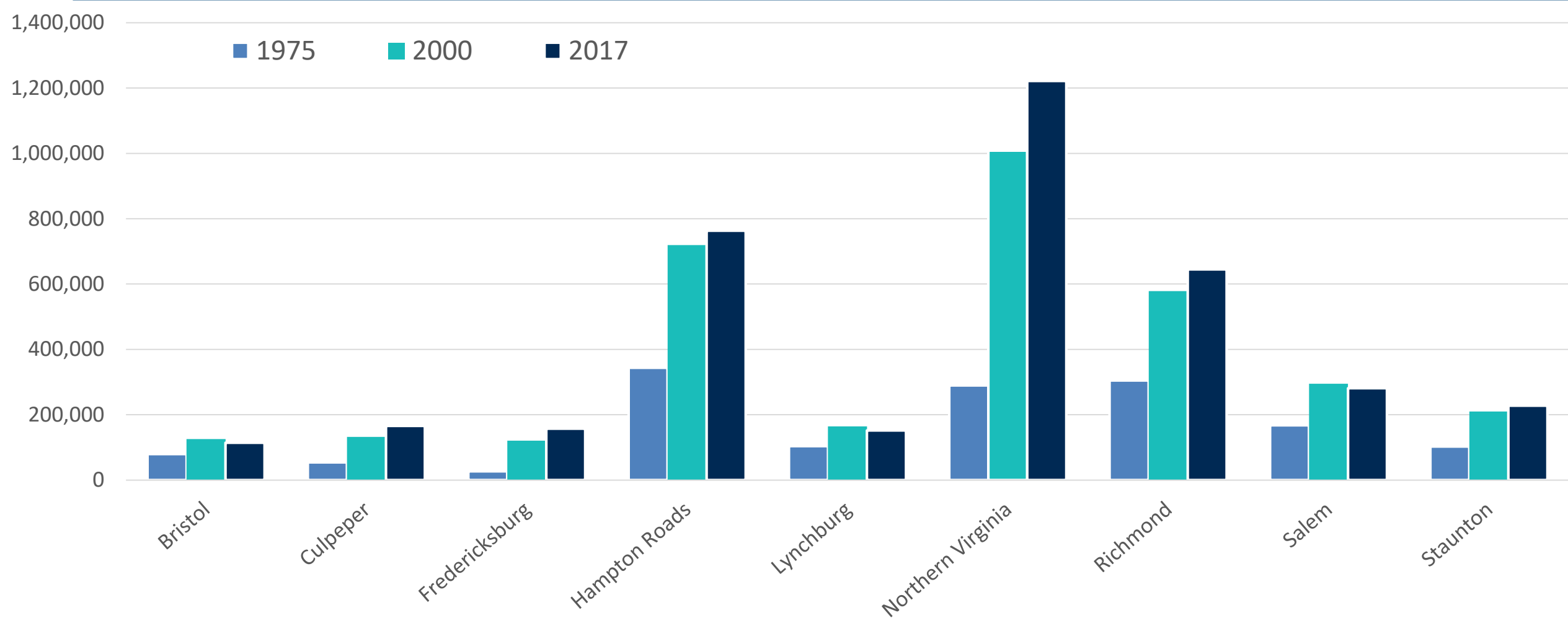
VTRANS TRENDS ANALYSIS: EMPLOYMENT TRENDS

HISTORICAL EMPLOYMENT – STATE

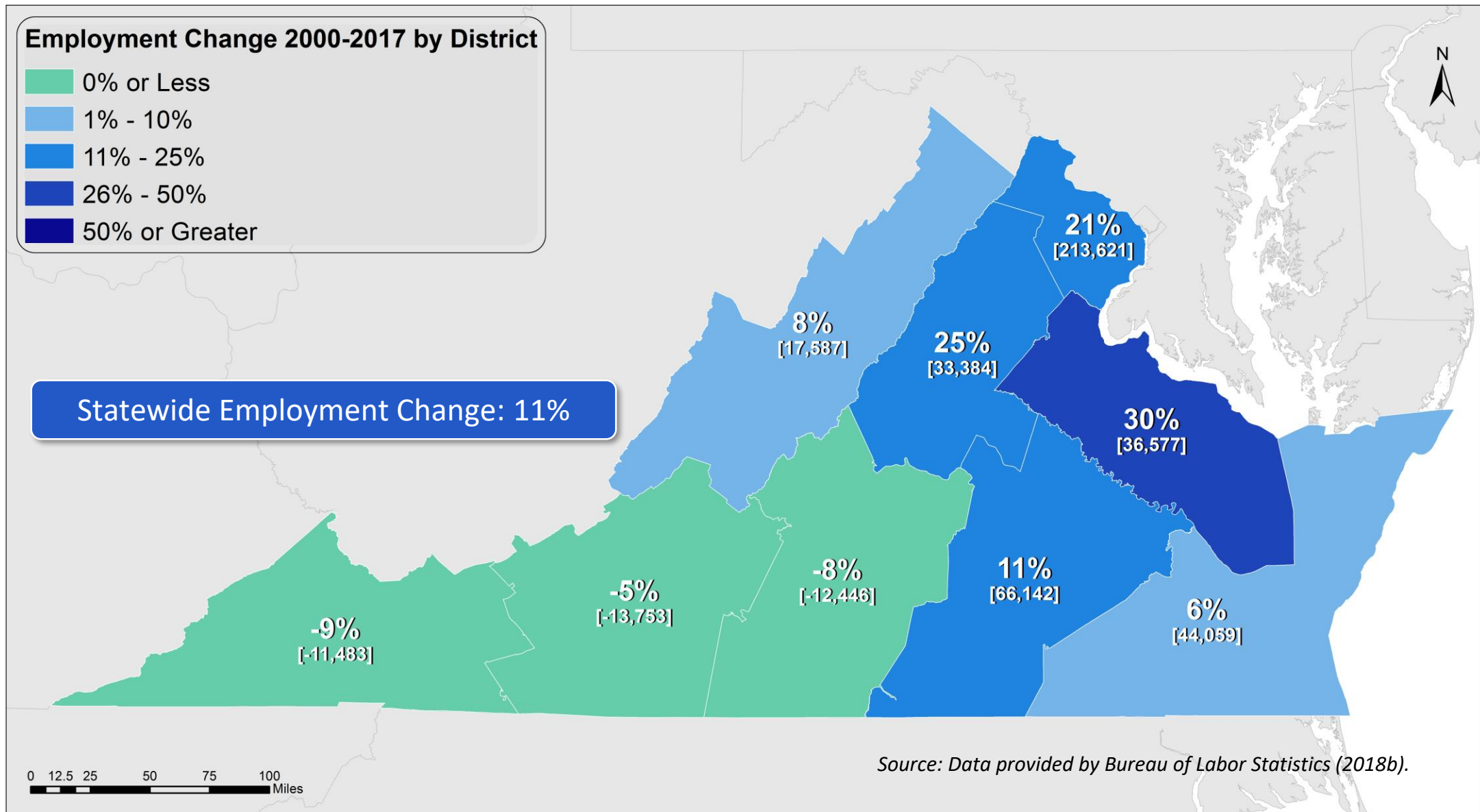
- Employment growth slowed after 2000.
- Before 2000: 3.3%
- After 2000: 0.6%



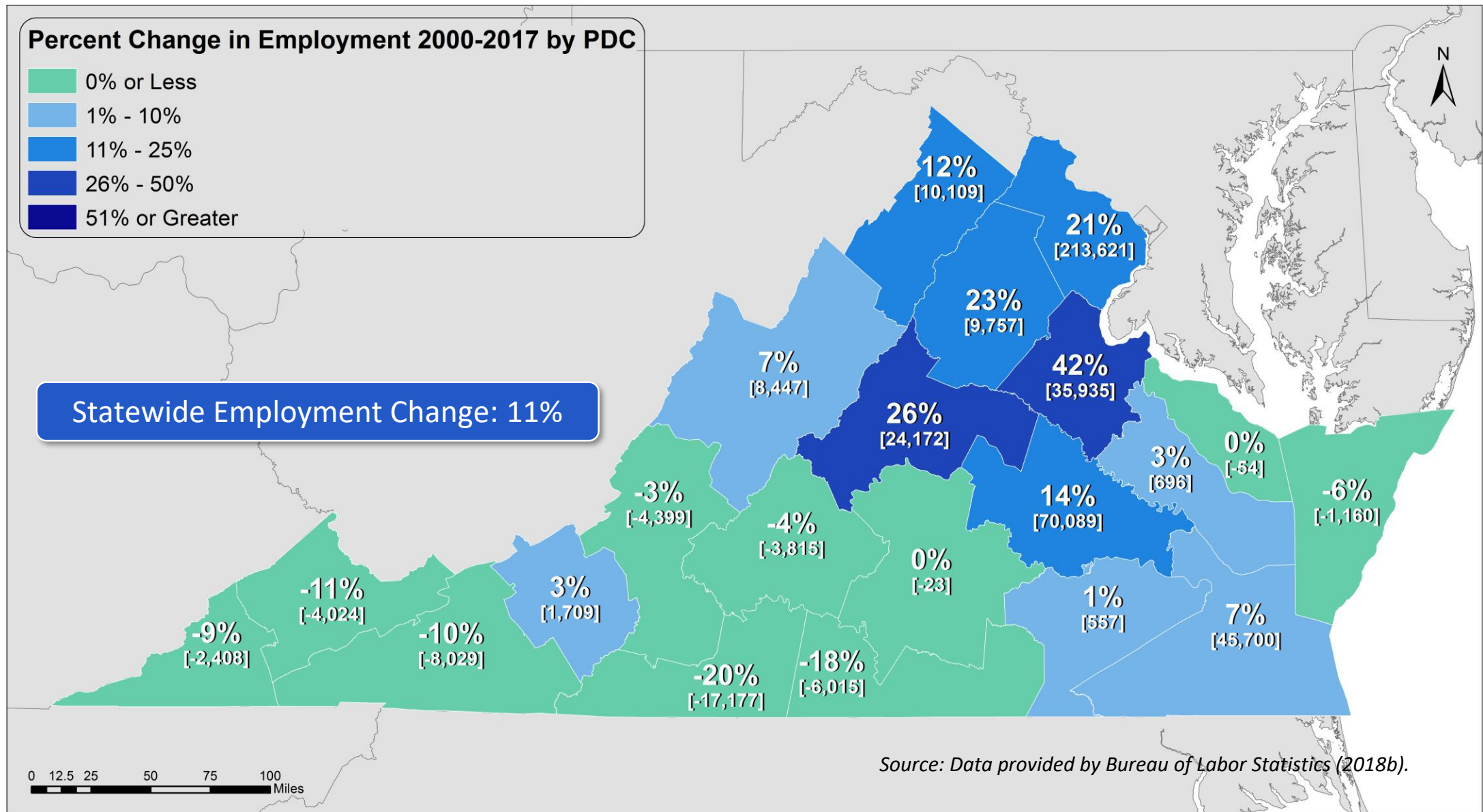
HISTORICAL EMPLOYMENT BY DISTRICT



HISTORICAL EMPLOYMENT CHANGE BY DISTRICT – 2000-2017



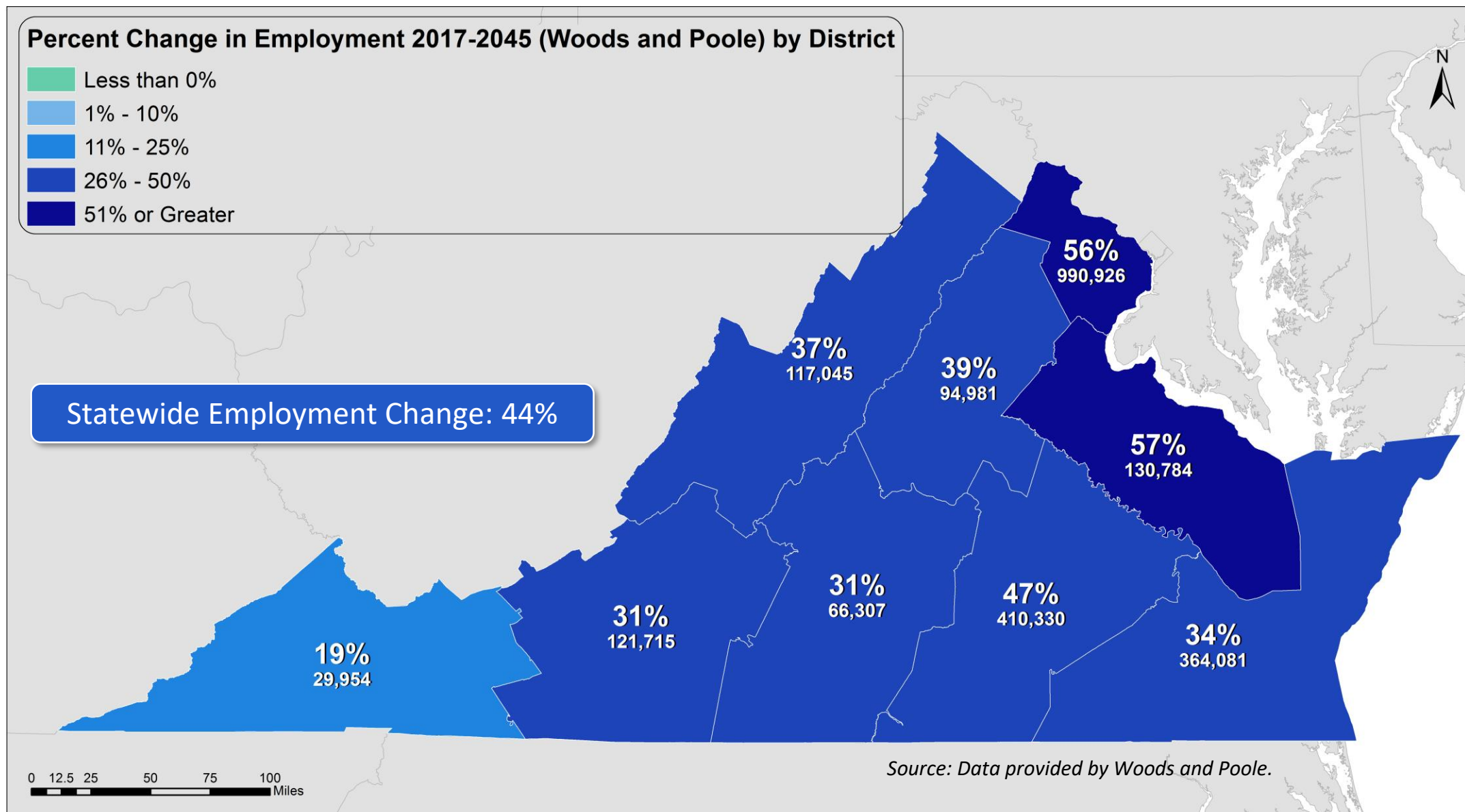
HISTORICAL EMPLOYMENT CHANGE BY PDC – 2000-2017



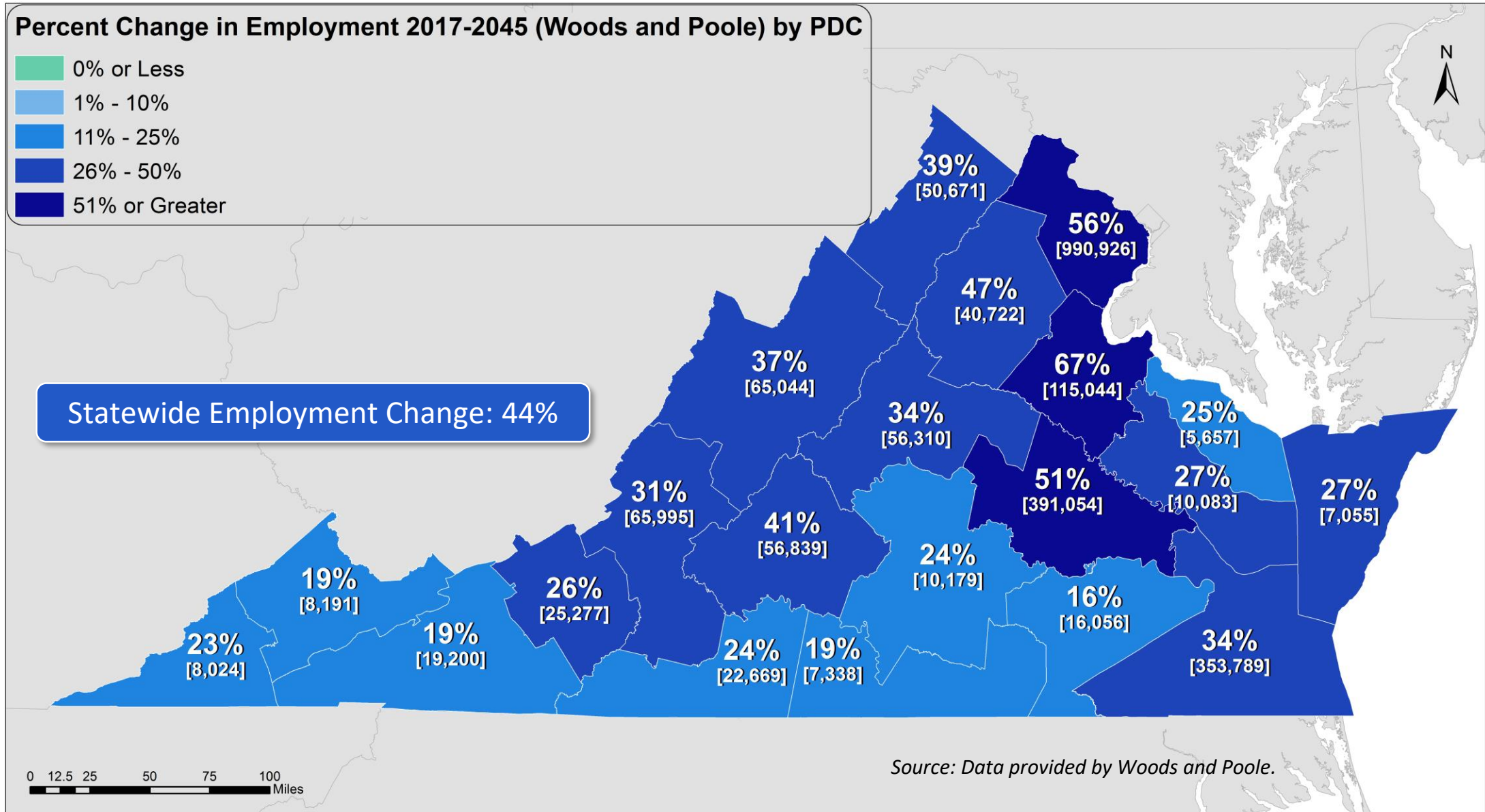
HISTORICAL EMPLOYMENT- KEY TAKEAWAYS

- Since 1975, employment has become more concentrated in fewer PDCs (as has population)
- Share of statewide employment for the Northern Virginia and George Washington PDCs grew from 21% (in 1975) to 36% (in 2017)
- Almost half of PDCs saw employment drop (2000-2017) compared to none (1975-2000)

FORECAST EMPLOYMENT CHANGE BY DISTRICT – 2017-2045



FORECAST EMPLOYMENT CHANGE BY PDC – 2017-2045



HOW DO THESE FORECASTS ACCOUNT FOR THE UNEXPECTED ARRIVAL OF A LARGE EMPLOYER?

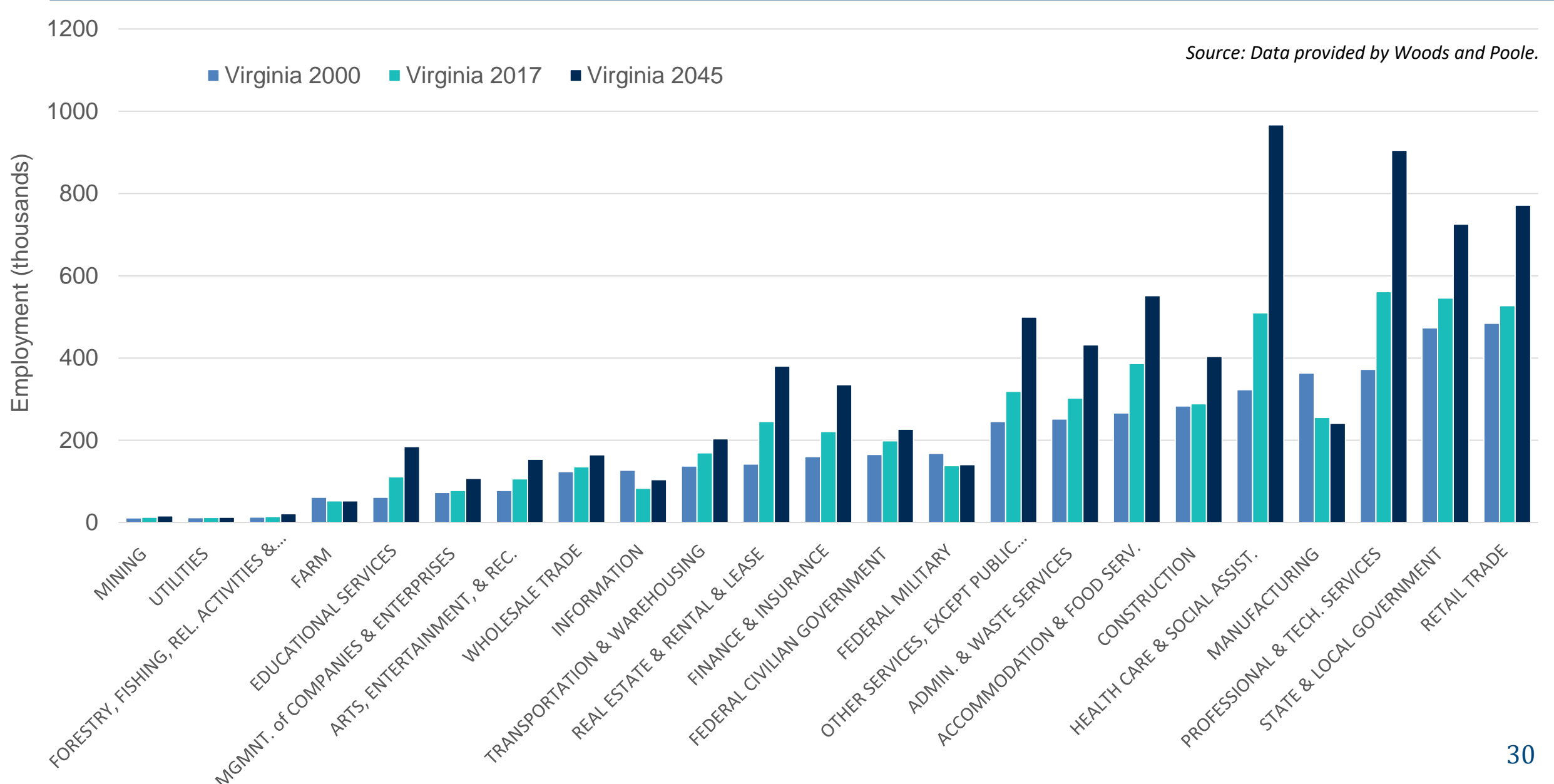
- Example: Amazon HQ2 comes. What happens to our forecasts?

Employment Growth 2017-2045	Without Amazon	With Amazon
Local (Arlington County)	17.6%	44.4%
PDC Level (Northern Virginia)	56.4%	61.8%

Population Growth 2017-2045	Without Amazon	With Amazon
Local (Arlington County)	16.2%	24.2%
PDC Level (Northern Virginia)	41.8%	50.7%

Source: Local changes from Fuller and Chapman (2018). PDC level data from Woods & Poole.

DEMOGRAPHIC TRENDS: STATEWIDE EMPLOYMENT BY INDUSTRY



FORECAST EMPLOYMENT- KEY TAKEAWAYS

- Employment concentration grows: PDCs of Northern Virginia and George Washington had 21% of Virginia jobs (1975) yet may have 41% of jobs in the future (2045)
- For new jobs being created 2017-2045:
 - Three PDCs account for 75% (Hampton Roads, Northern Virginia, Richmond Regional)
 - Six PDCs account for 85% (Three above plus George Washington, Roanoke Valley, Central Shenandoah)
- Job growth 2017-2045 uneven by sector:
 - Health care and social assistance: 90%
 - Professional and technical services employment: 61%
 - Manufacturing: - 6%



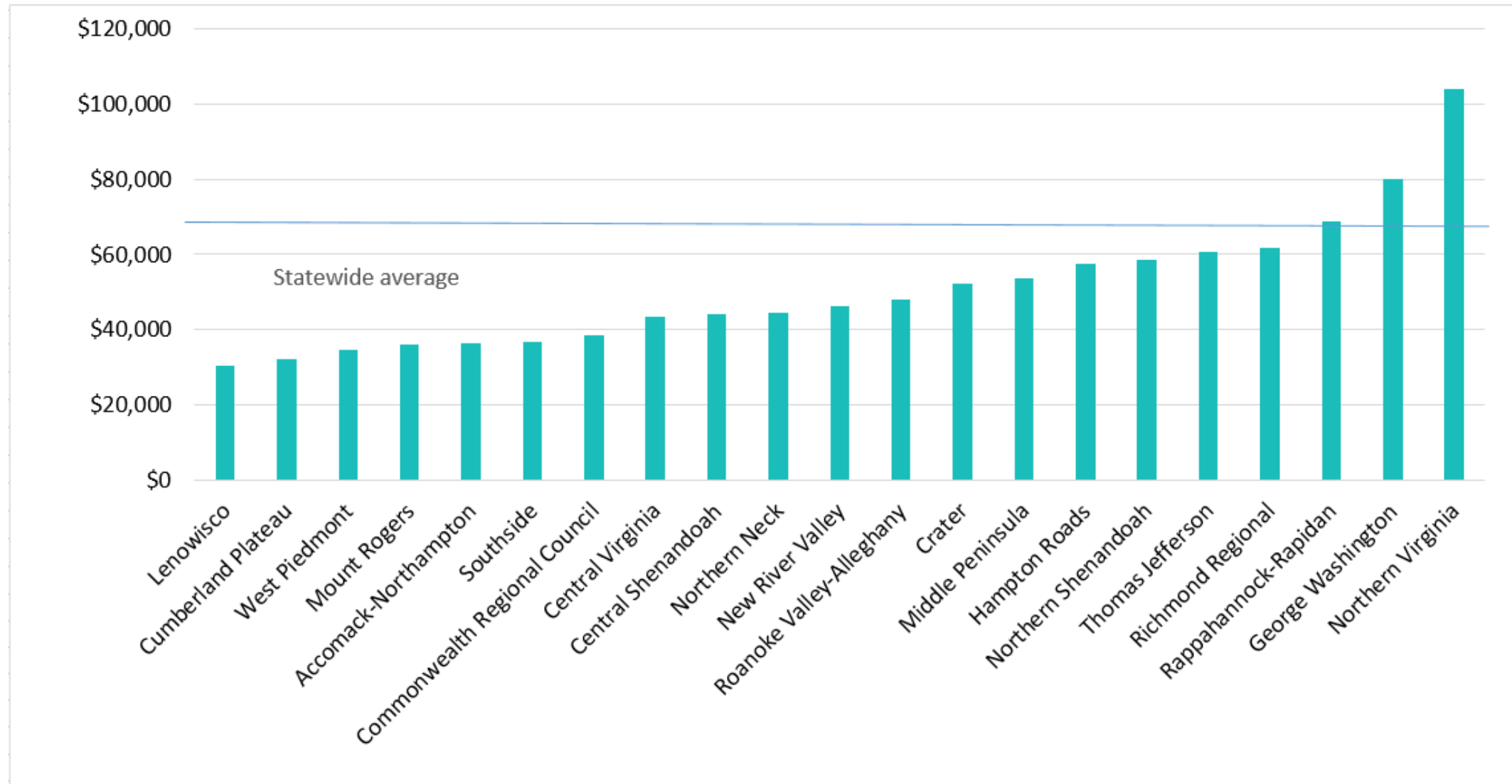
VTRANS TRENDS ANALYSIS: INCOME TRENDS

HISTORICAL/FORECAST MEDIAN HOUSEHOLD INCOME – STATE

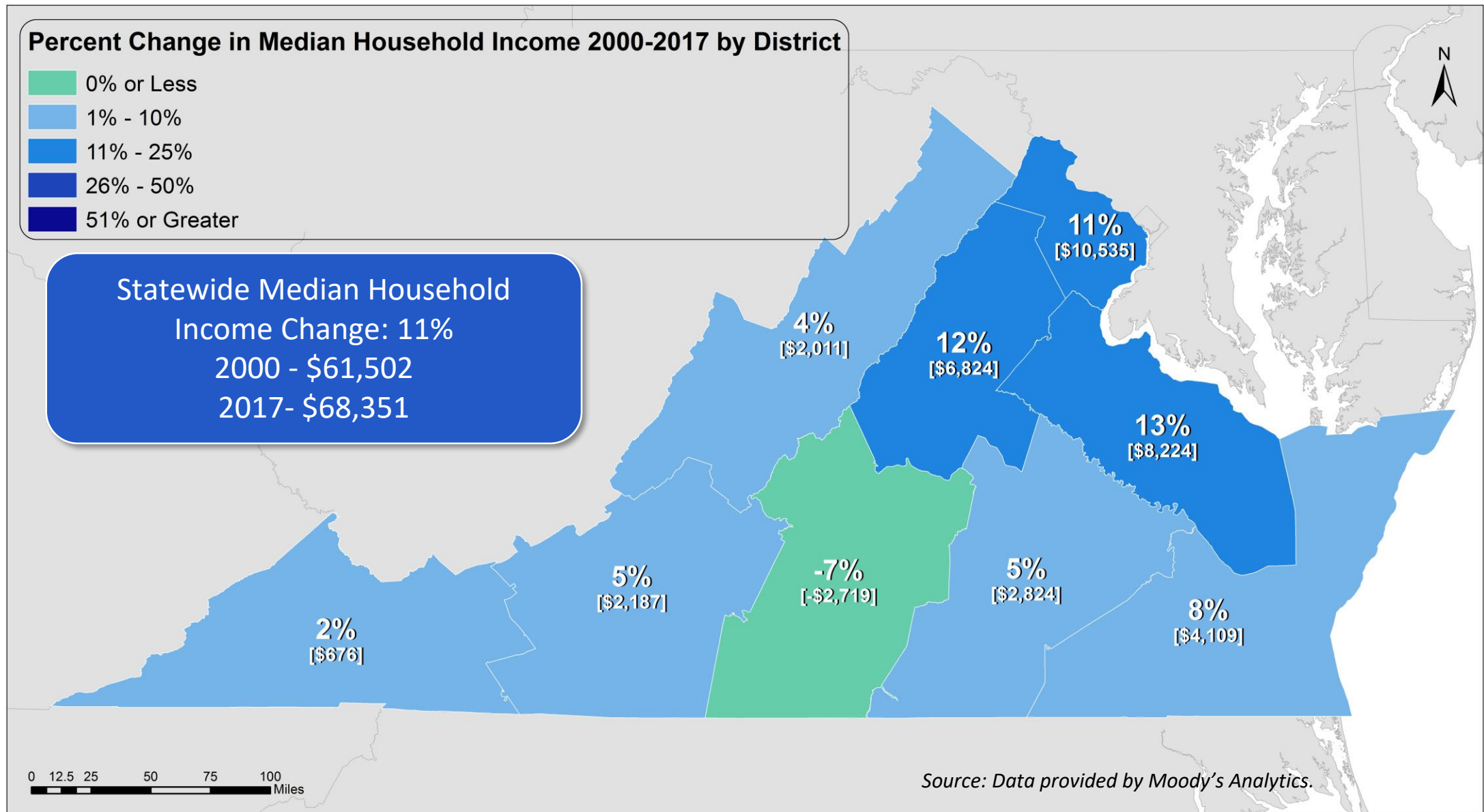
(All in 2009 \$)

2000	2017	2045
\$61,502	\$68,351	\$85,741

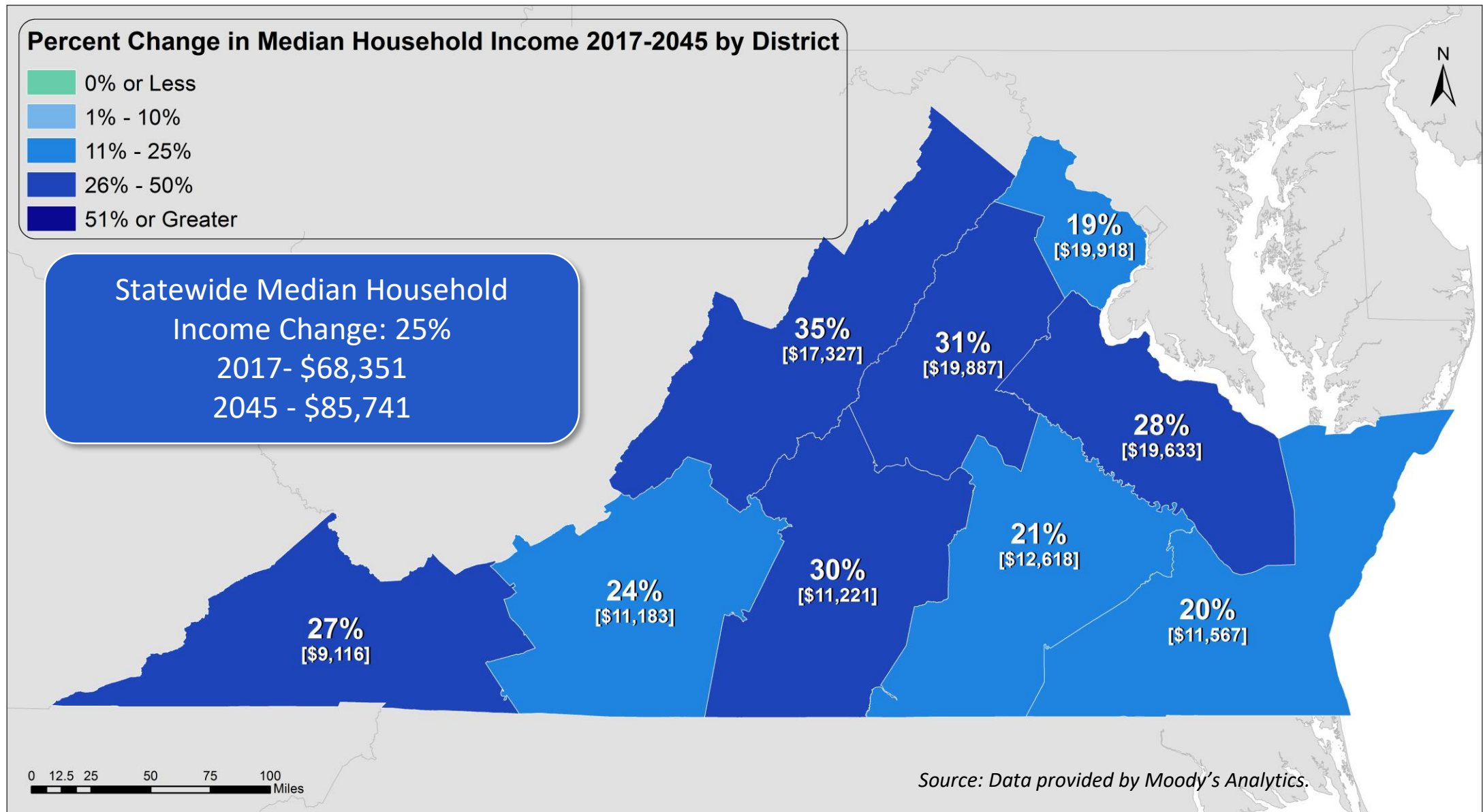
2017 MEDIAN HOUSEHOLD INCOME



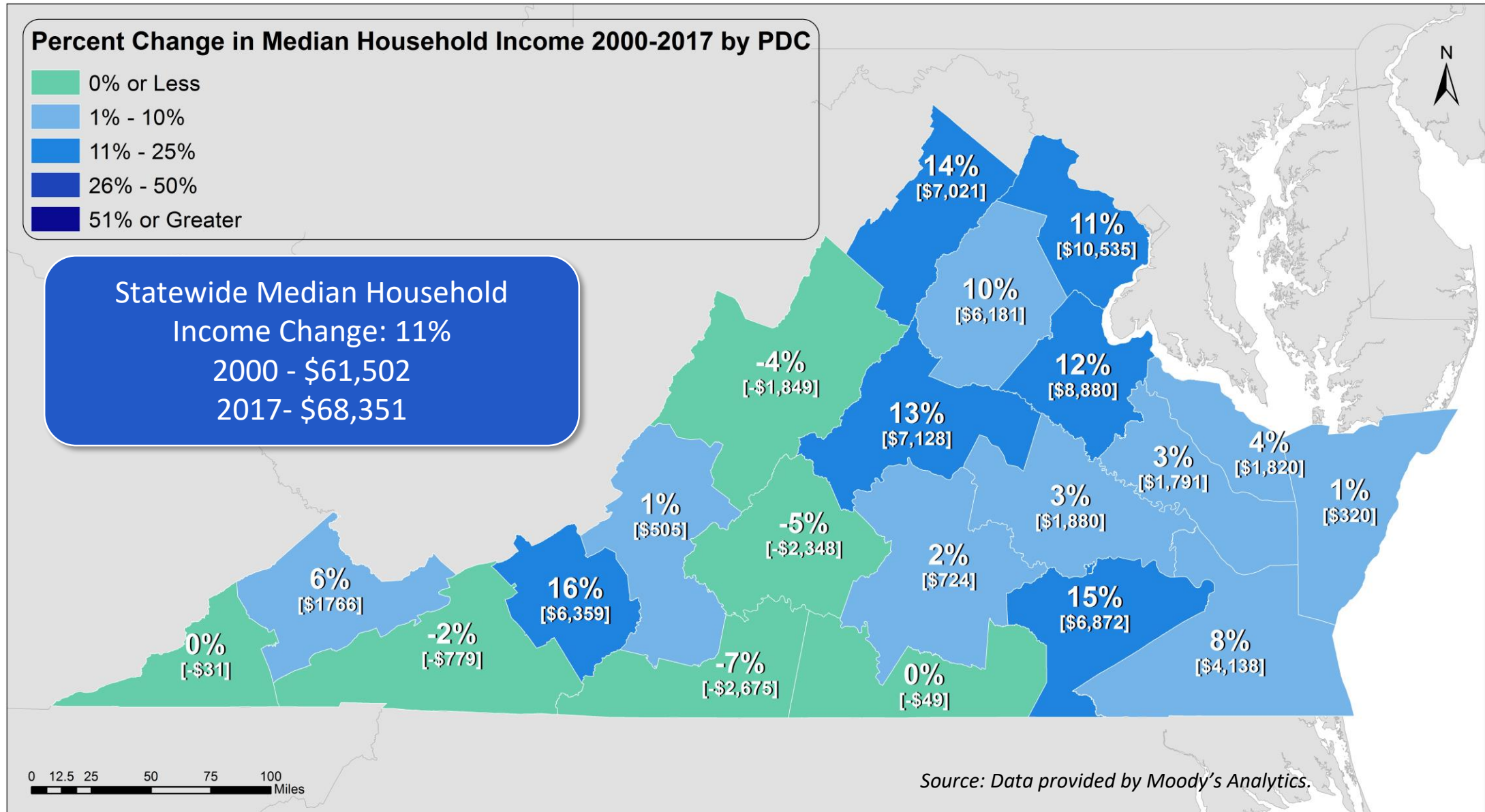
MEDIAN HOUSEHOLD INCOME CHANGE BY DISTRICT – 2000-2017



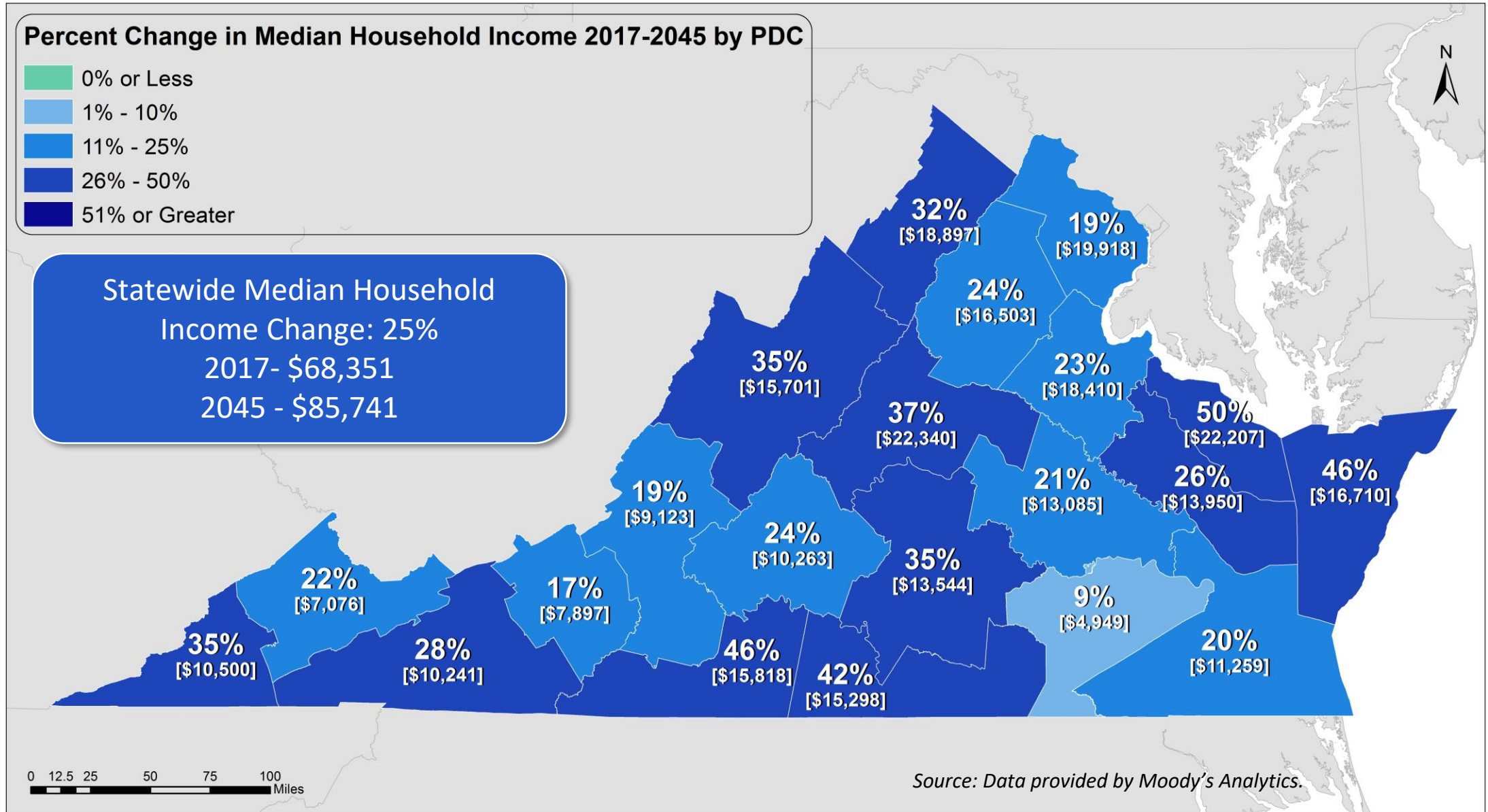
FORECAST MEDIAN HOUSEHOLD INCOME CHANGE BY DISTRICT – 2017-2045



MEDIAN HOUSEHOLD INCOME CHANGE BY PDC – 2000-2017



FORECAST MEDIAN HOUSEHOLD INCOME CHANGE BY PDC – 2017-2045



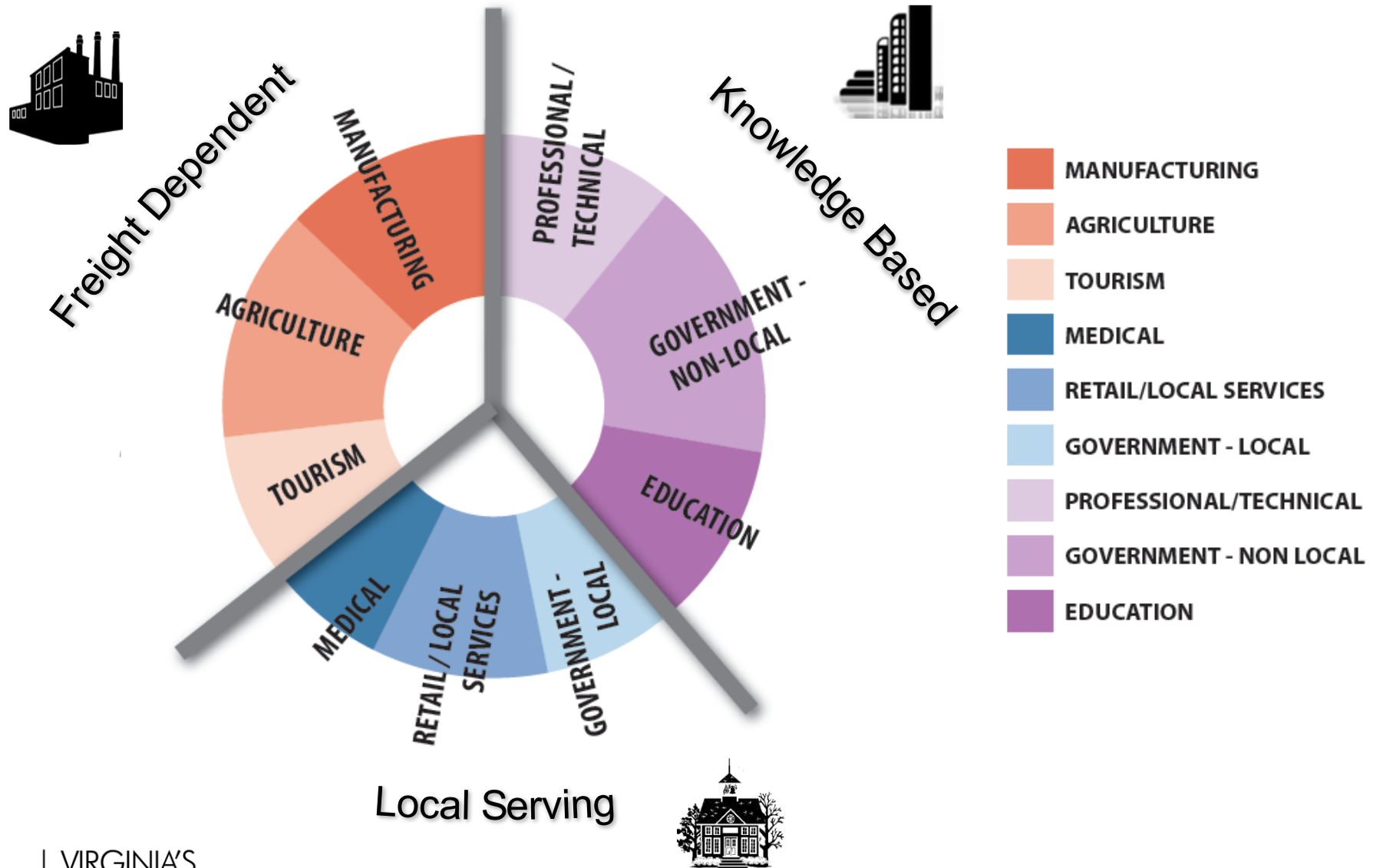
MEDIAN HOUSEHOLD INCOME- KEY TAKEAWAYS

- Median household income (in 2017) varies by more than a factor of three among PDCs, from \$30,356 (Lenowisco) to \$104,225 (Northern Virginia).
- Median household income (in constant 2009 dollars) is forecast to grow, between 2017 and 2045, by 25%.
- Larger percentage increases in income are forecast for some districts and PDCs with lower 2017 median incomes.
- Presently, 18 of 21 PDCs have incomes below the statewide average

IMPLICATIONS FOR TRANSPORTATION

- Implication 1. Historically, higher incomes have been associated with increased demand for travel.
 - Example: In the past, VMT increases were associated with income increases.
 - Caveat: This linkage may be diminishing, but affected by several factors
- Implication 2. Certain occupations presently have longer commute times than other occupations. Examples:
 - Educational services employment: 23.1 minutes
 - Professional and technical services employment: 29.3 minutes

ECONOMIC-TRANSPORTATION LINKAGES | INDUSTRY CLUSTERS



ECONOMIC-TRANSPORTATION LINKAGES | INDUSTRY CLUSTERS

Different industry clusters have different *Needs, Opportunities* and *Constraints* for efficient transportation



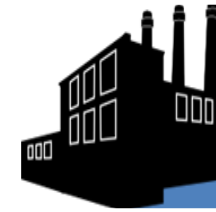
Knowledge-Based

- Mixed-use development
- Walking between destinations
- Traditional peak commute times
- Airport access



Local Serving

- Different peak commute times
- Customer traffic
- Trip-chaining destinations
- Truck deliveries

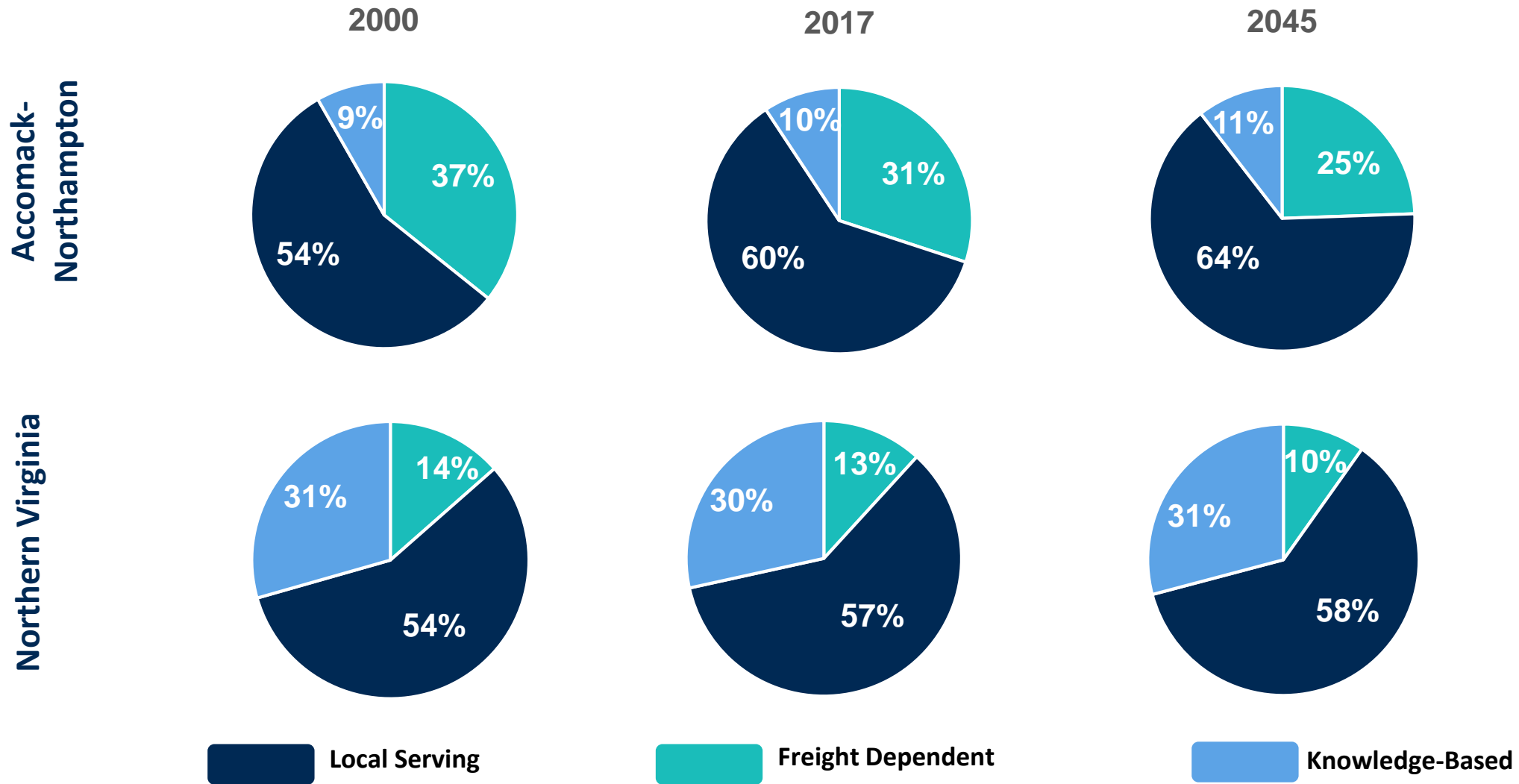


Freight Dependent

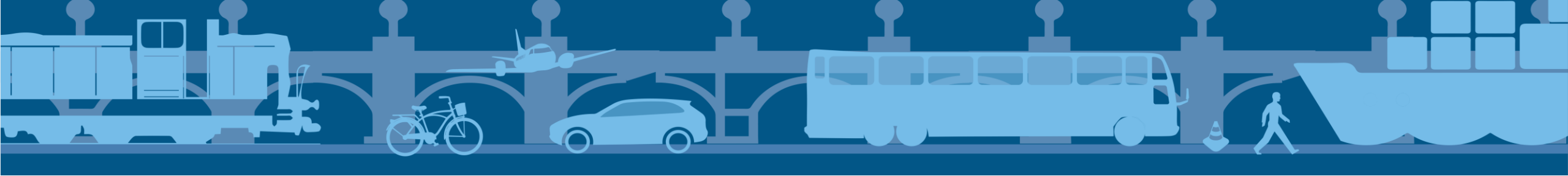
- Shift hours
- Truck origins and destinations
- Rail, port and/or airport access
- Remote locations



DEMOGRAPHIC TRENDS: EXAMPLE PDC EMPLOYMENT BY INDUSTRY

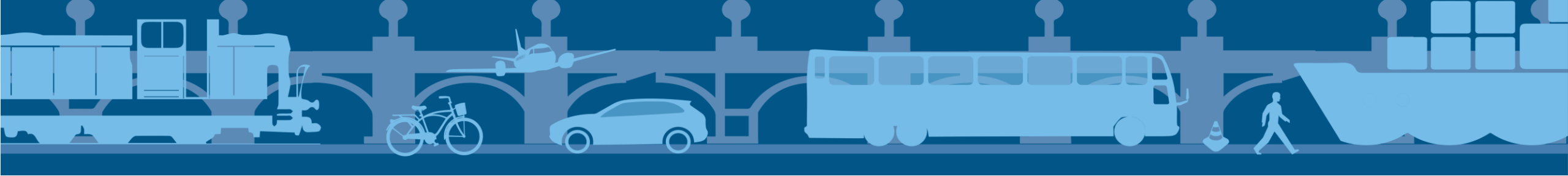


Source: Data provided by Woods and Poole



VTRANS DEMOGRAPHIC TRENDS

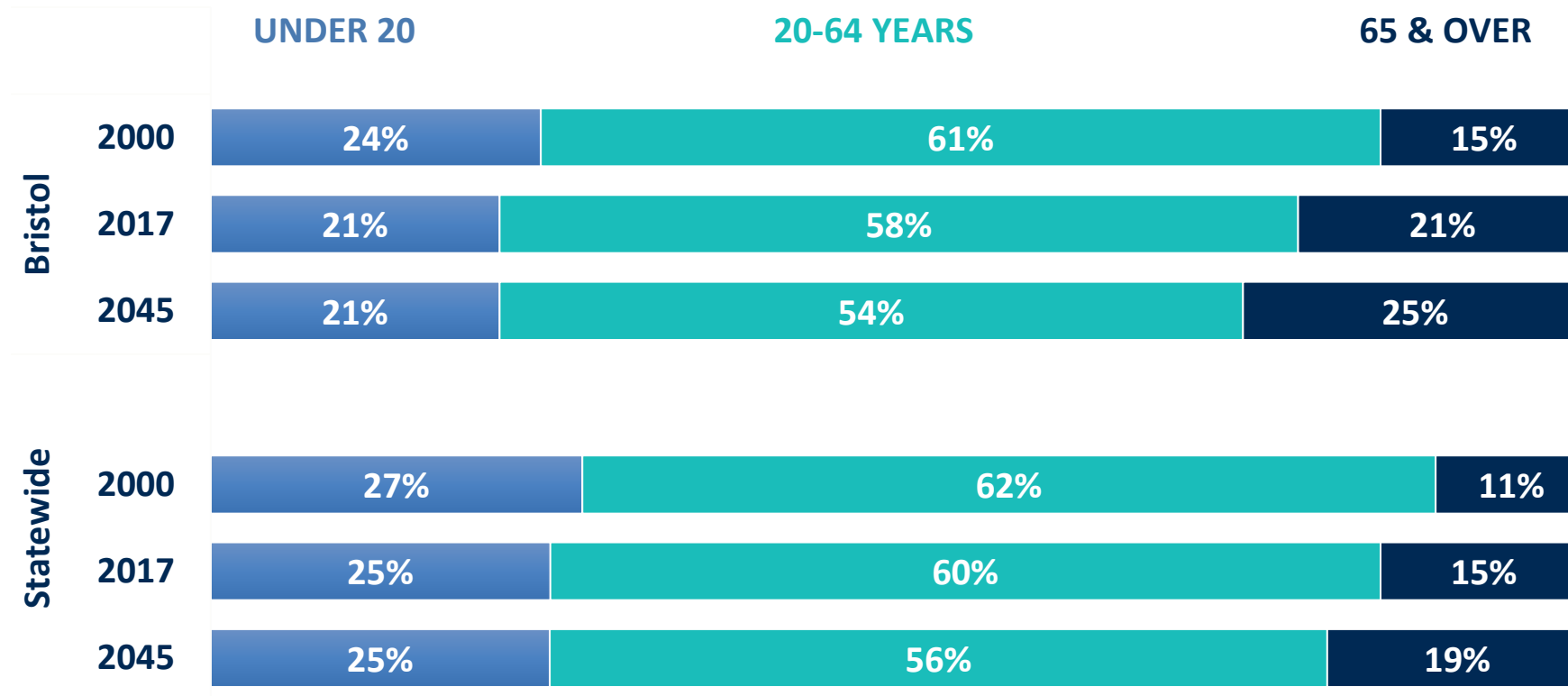
ADDITIONAL DATA – DEMOGRAPHIC DATA BY CONSTRUCTION DISTRICT



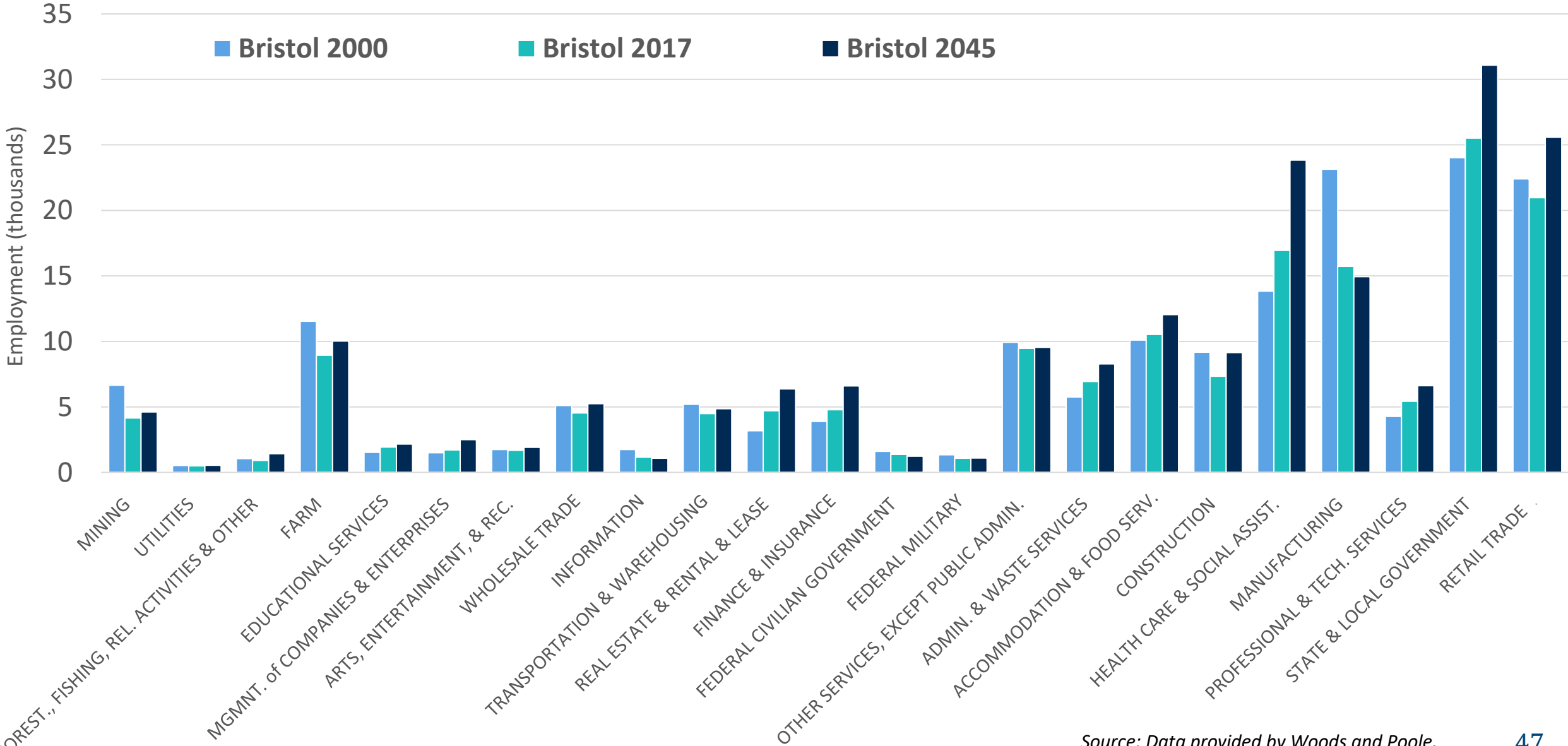
Bristol District

DEMOGRAPHIC TRENDS: AGE DISTRIBUTION BY DISTRICT

Bristol District



DEMOGRAPHIC TRENDS: DISTRICT EMPLOYMENT BY INDUSTRY

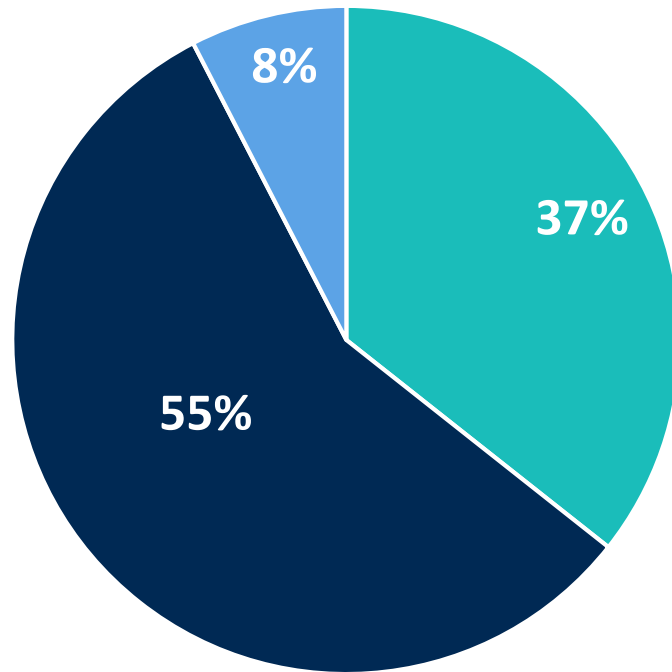


Source: Data provided by Woods and Poole.

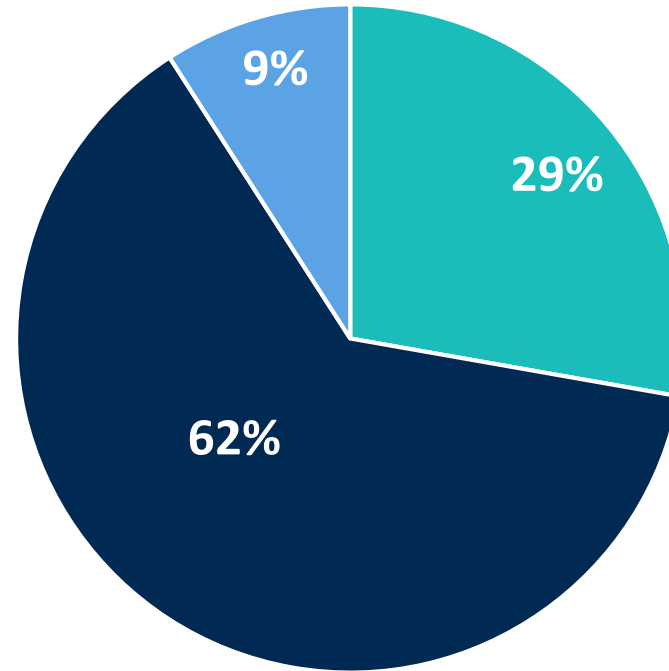
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Bristol

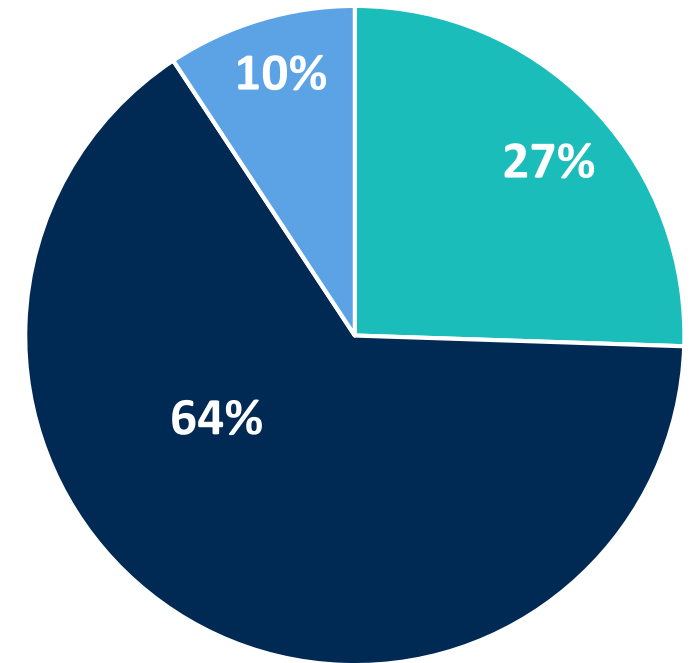
2000



2017



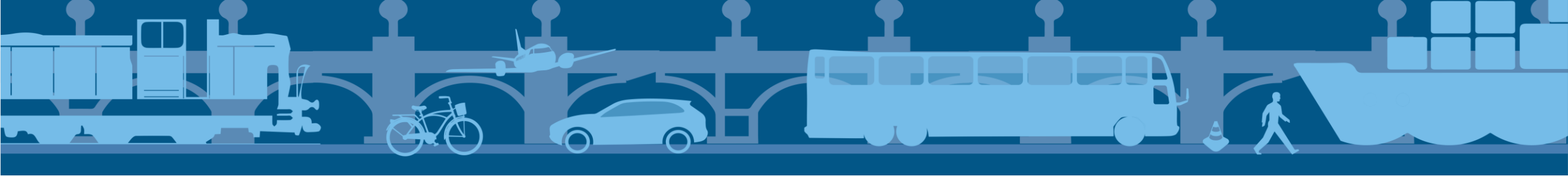
2045



Local Serving

Freight Dependent

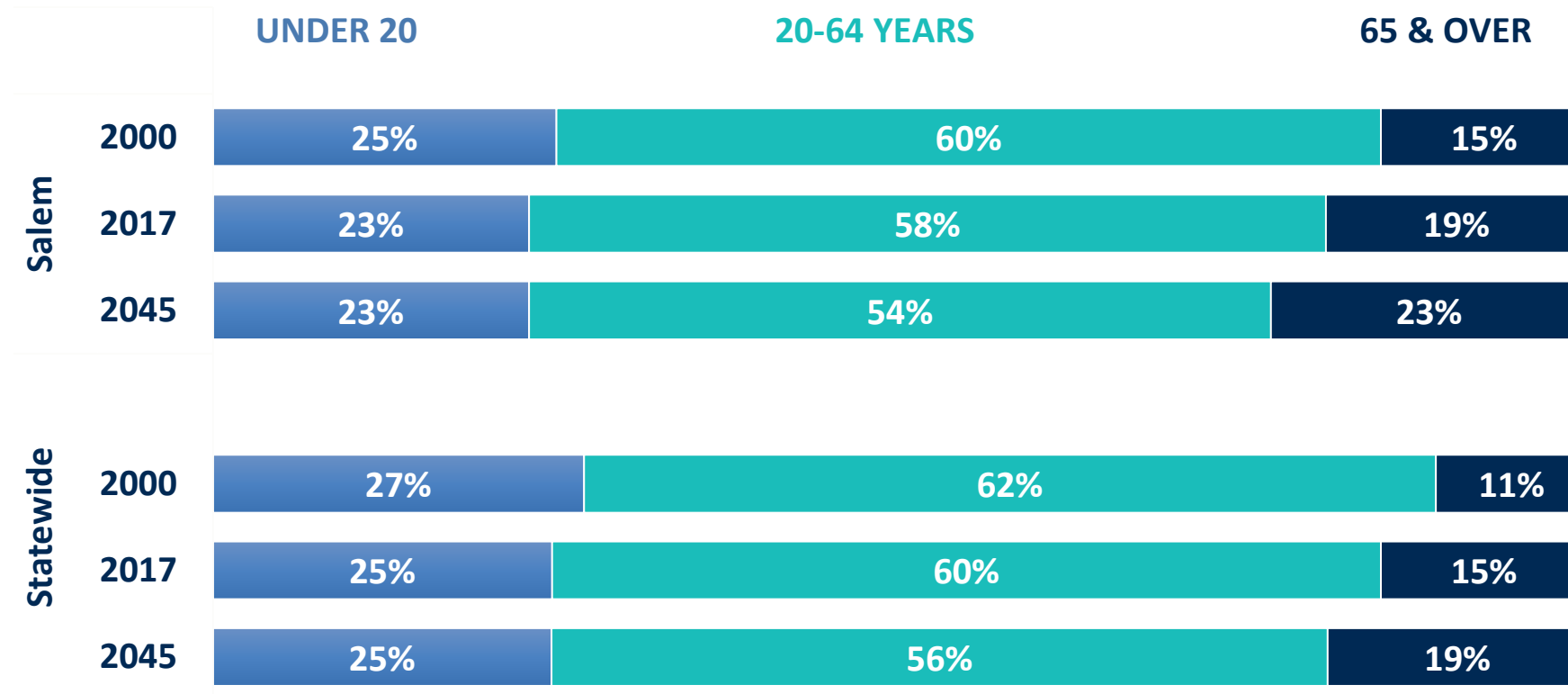
Knowledge-Based



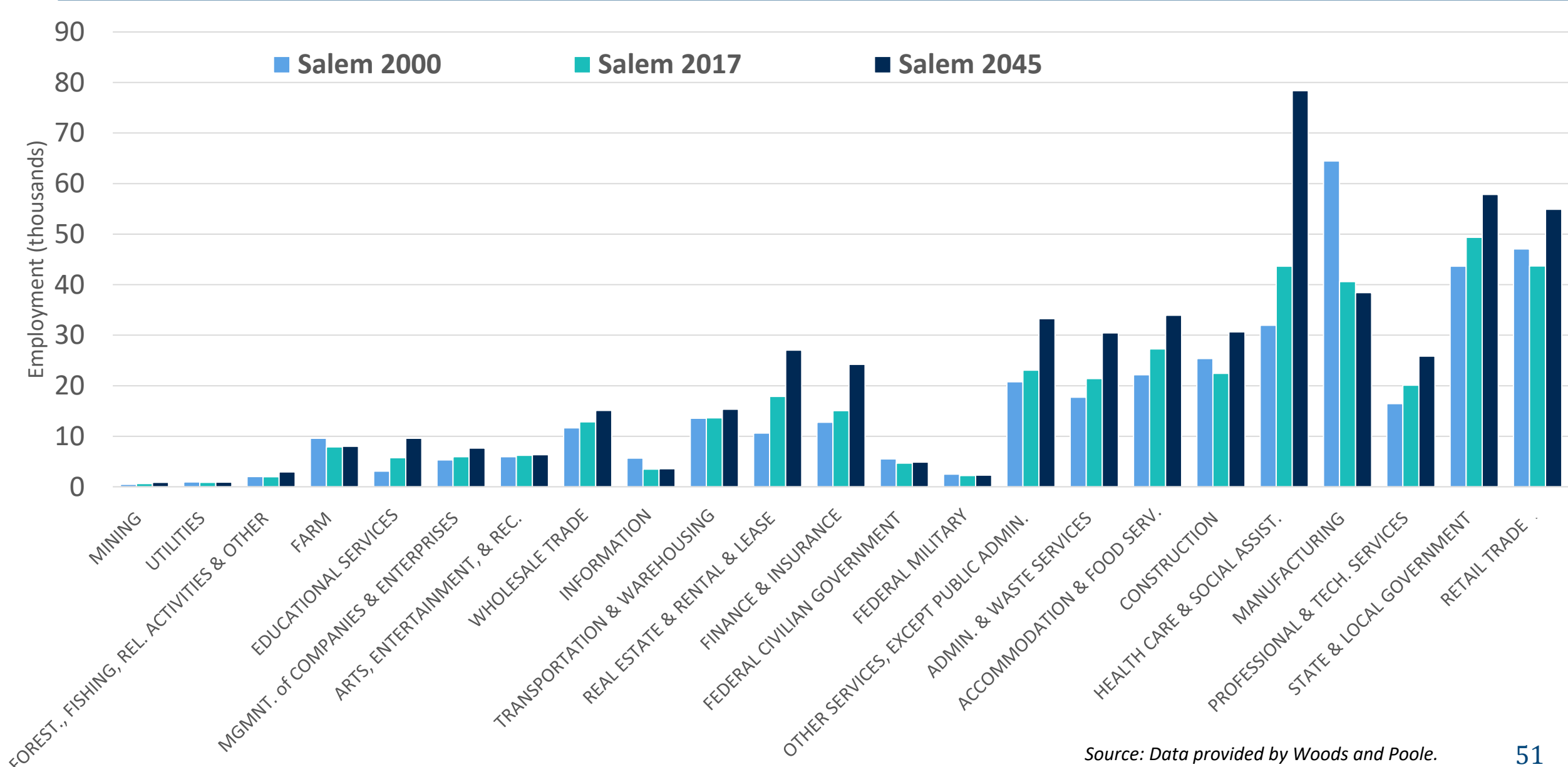
Salem District

DEMOGRAPHIC TRENDS: AGE DISTRIBUTION BY DISTRICT

Salem District



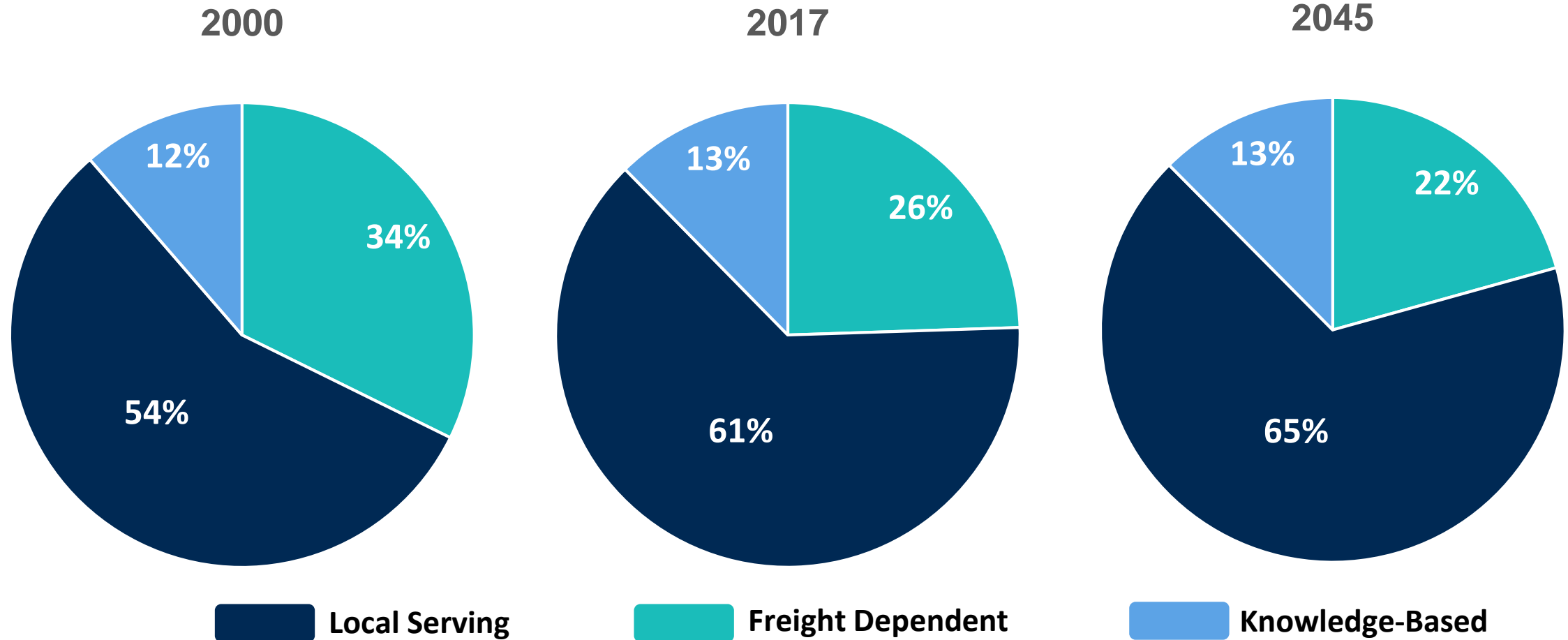
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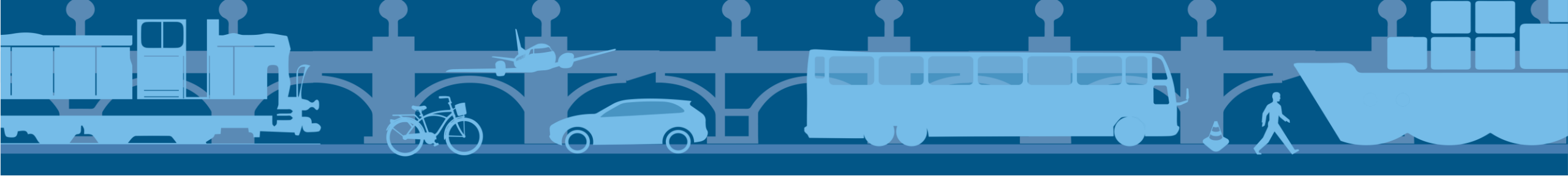


Source: Data provided by Woods and Poole.

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Salem

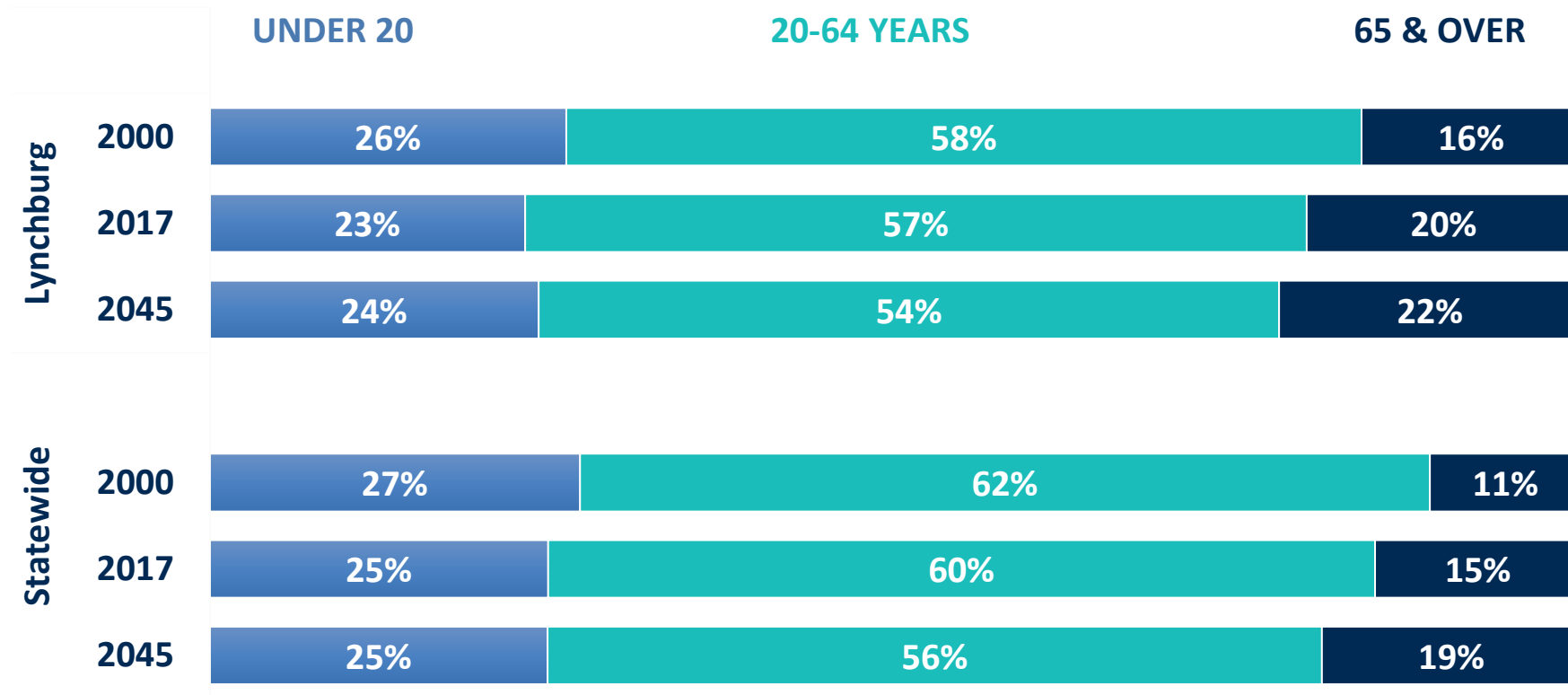




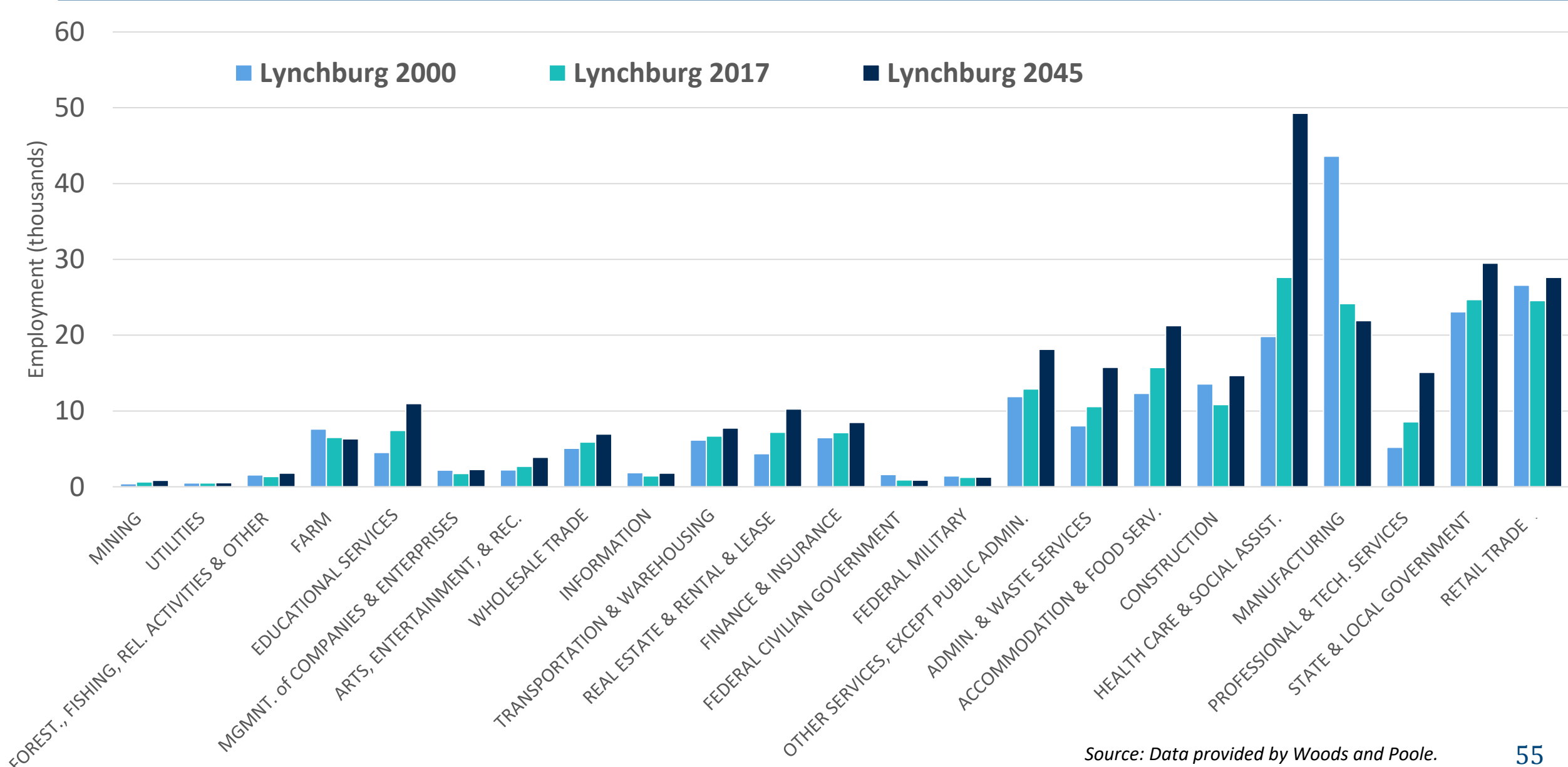
Lynchburg District

DEMOGRAPHIC TRENDS: AGE DISTRIBUTION BY DISTRICT

Lynchburg District

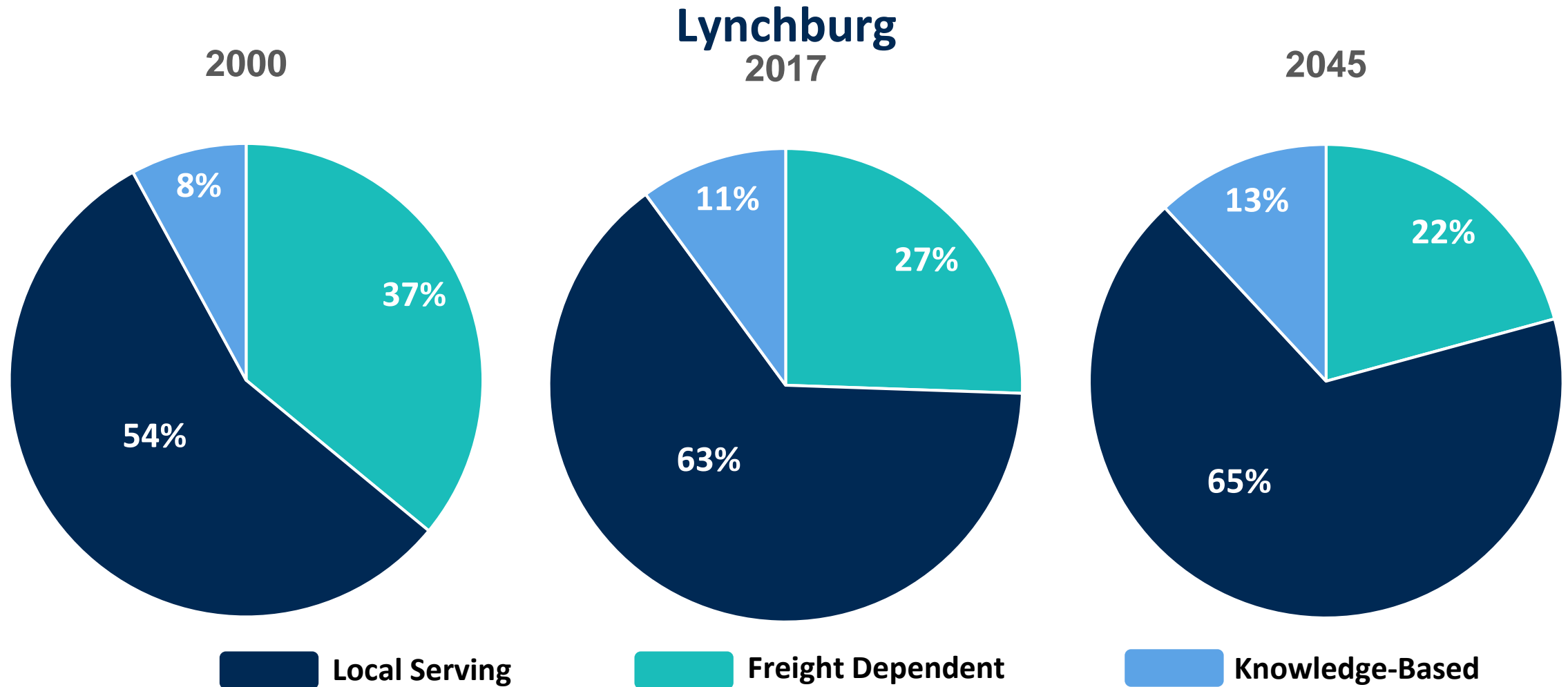


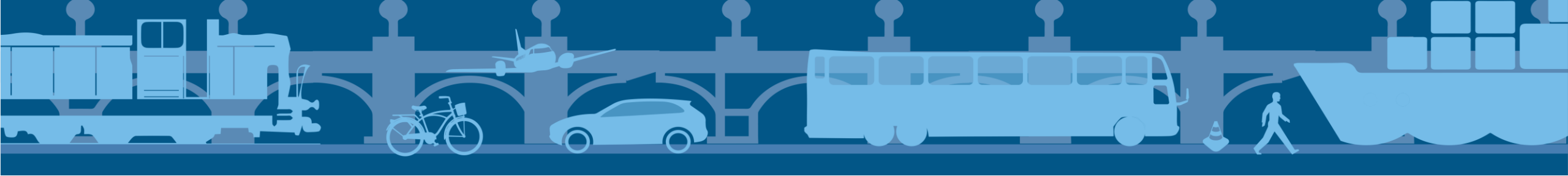
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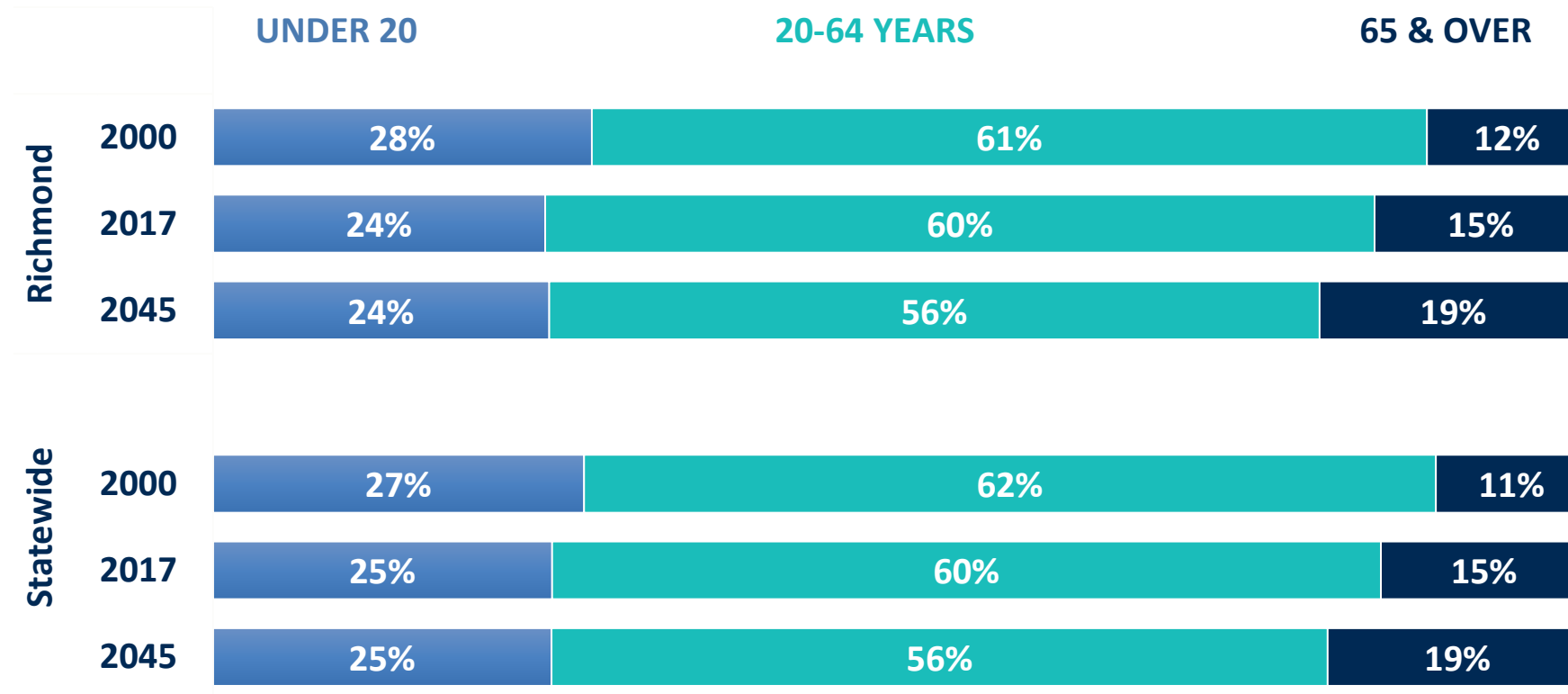




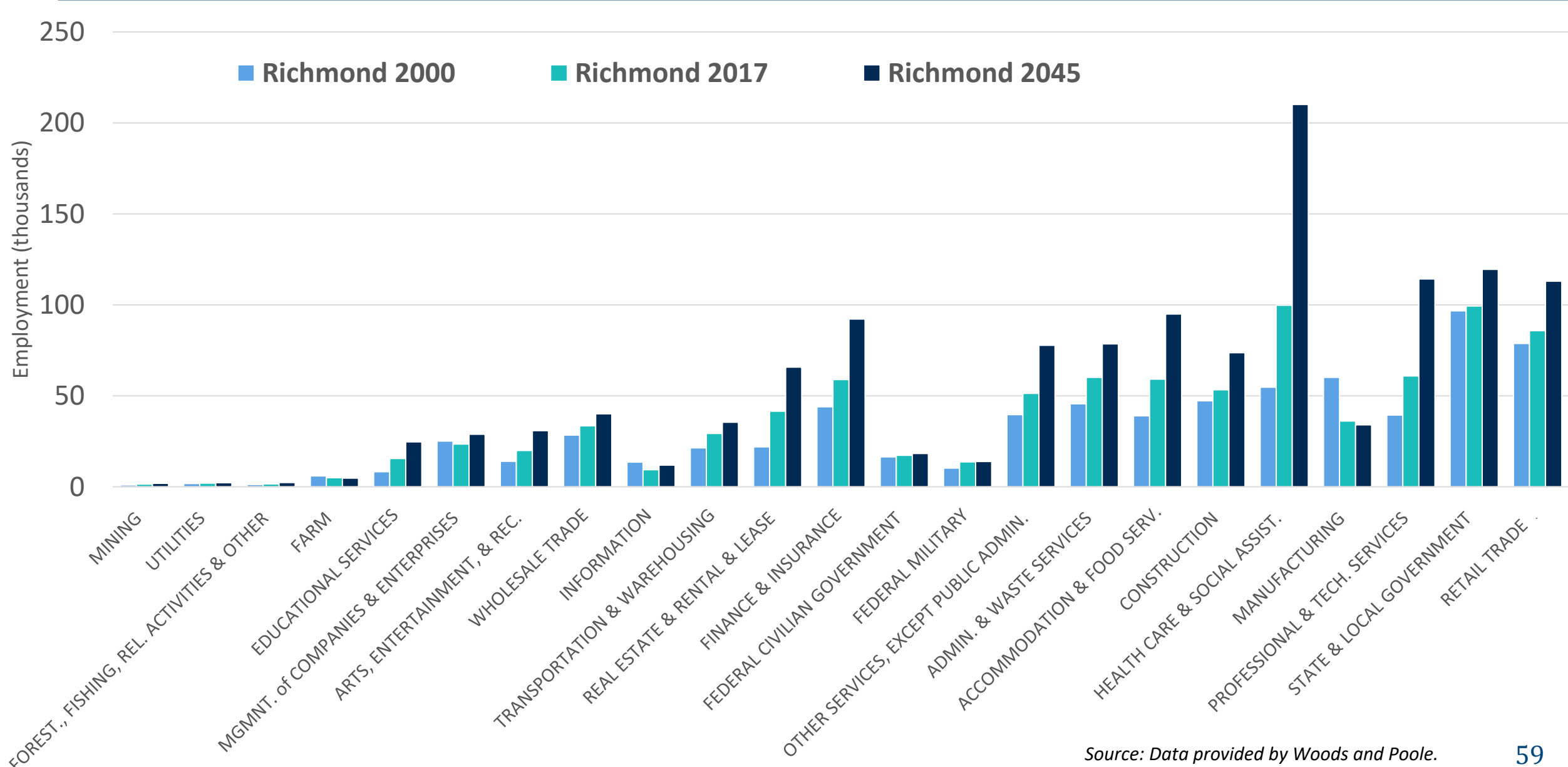
Richmond District

DEMOGRAPHIC TRENDS: AGE DISTRIBUTION BY DISTRICT

Richmond District



DEMOGRAPHIC TRENDS: DISTRICT EMPLOYMENT BY INDUSTRY

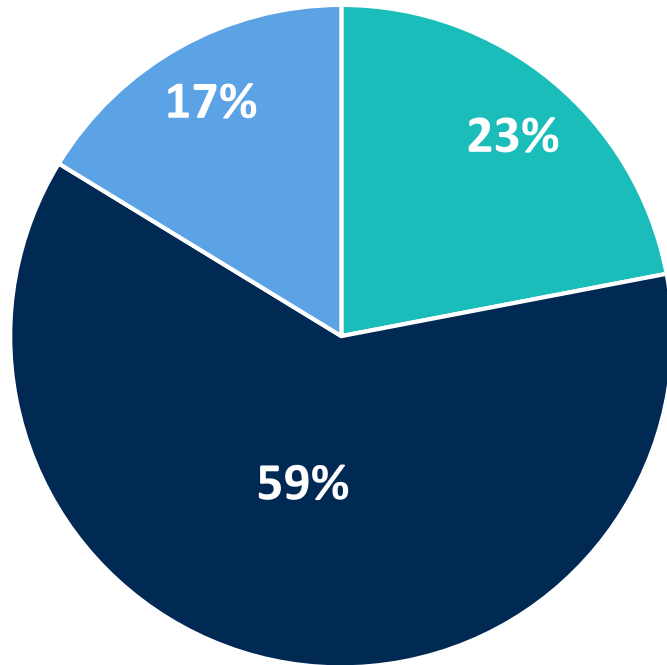


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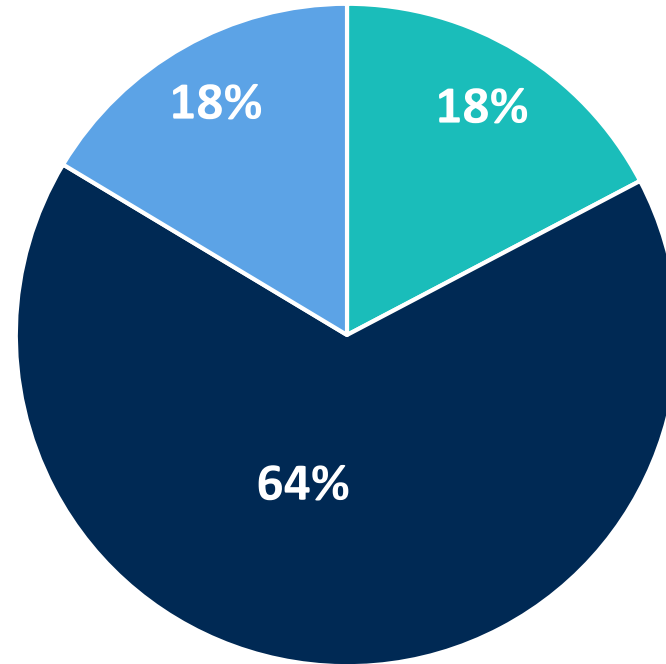
DEMOGRAPHIC TRENDS: DISTRICT EMPLOYMENT BY INDUSTRY

Richmond

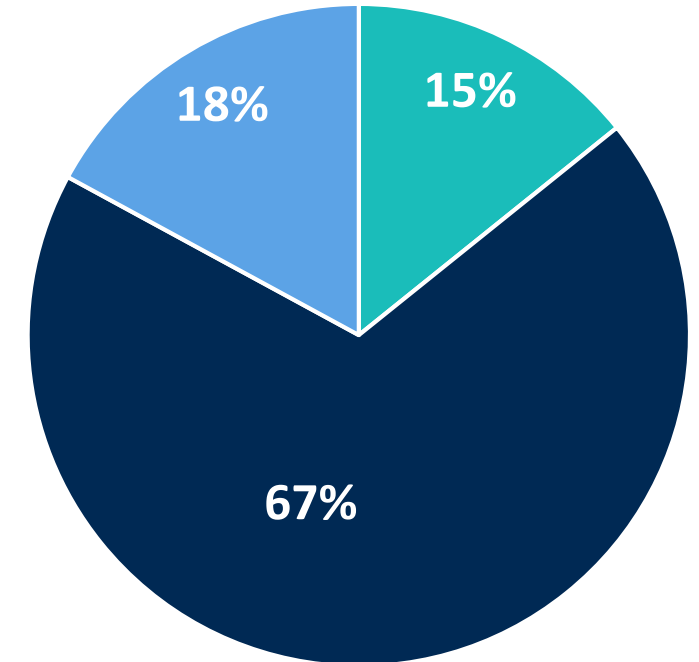
2000



2017



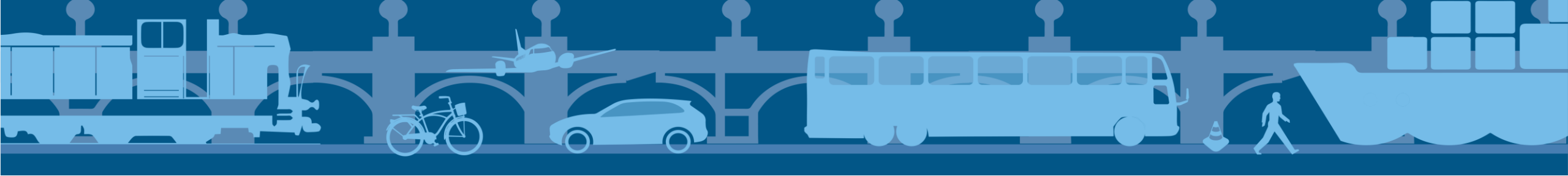
2045



Local Serving

Freight Dependent

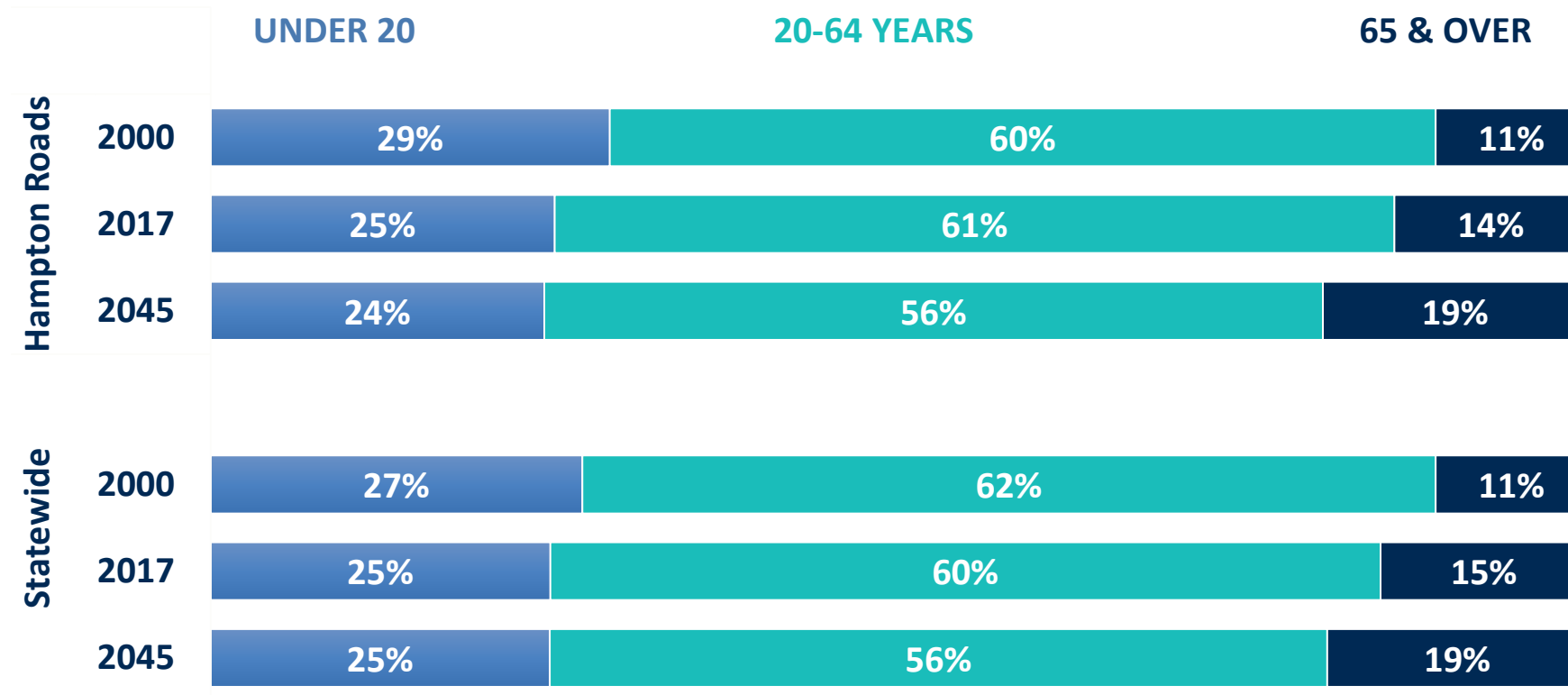
Knowledge-Based



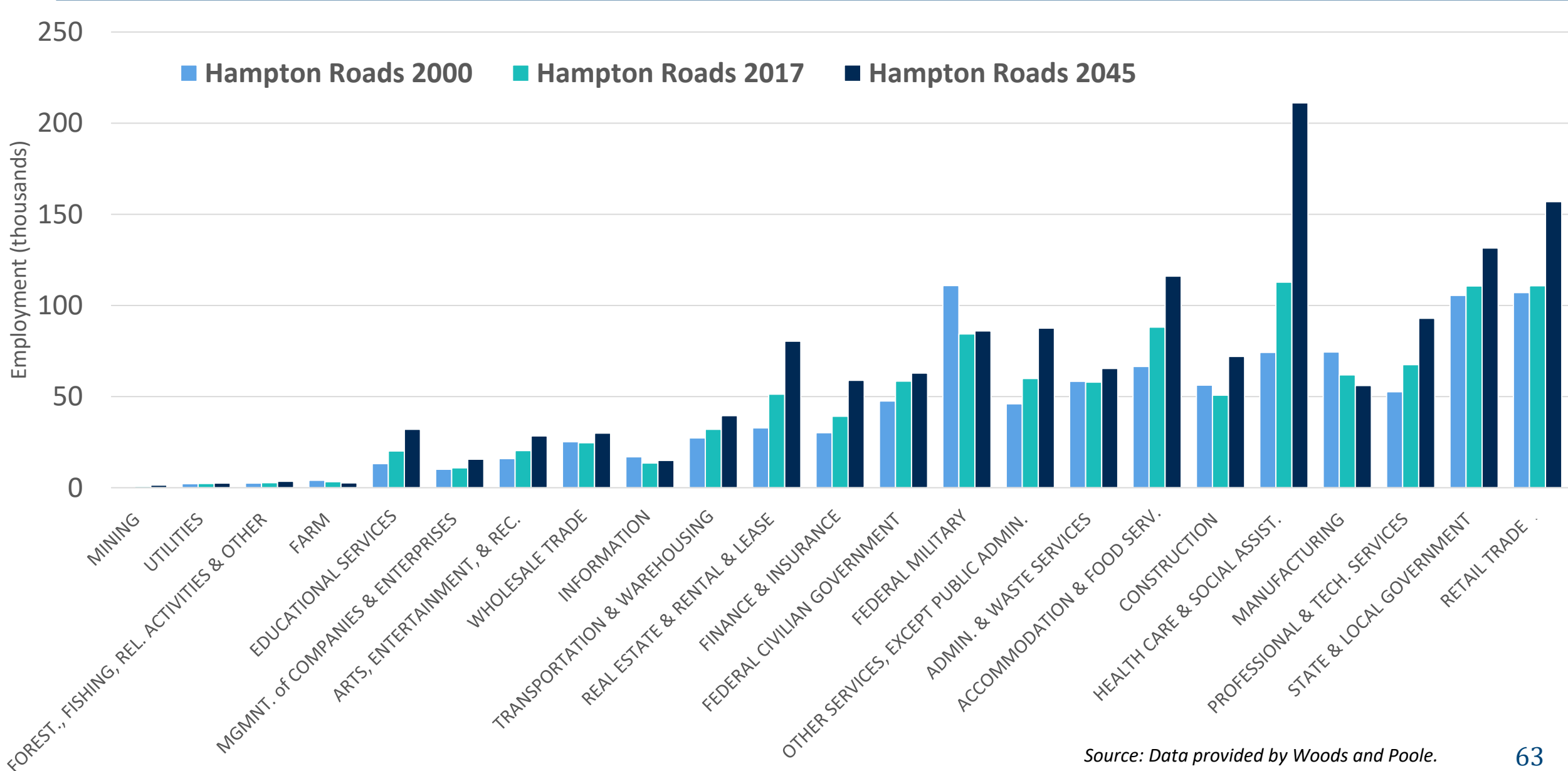
Hampton Roads District

DEMOGRAPHIC TRENDS: AGE DISTRIBUTION BY DISTRICT

Hampton Roads District



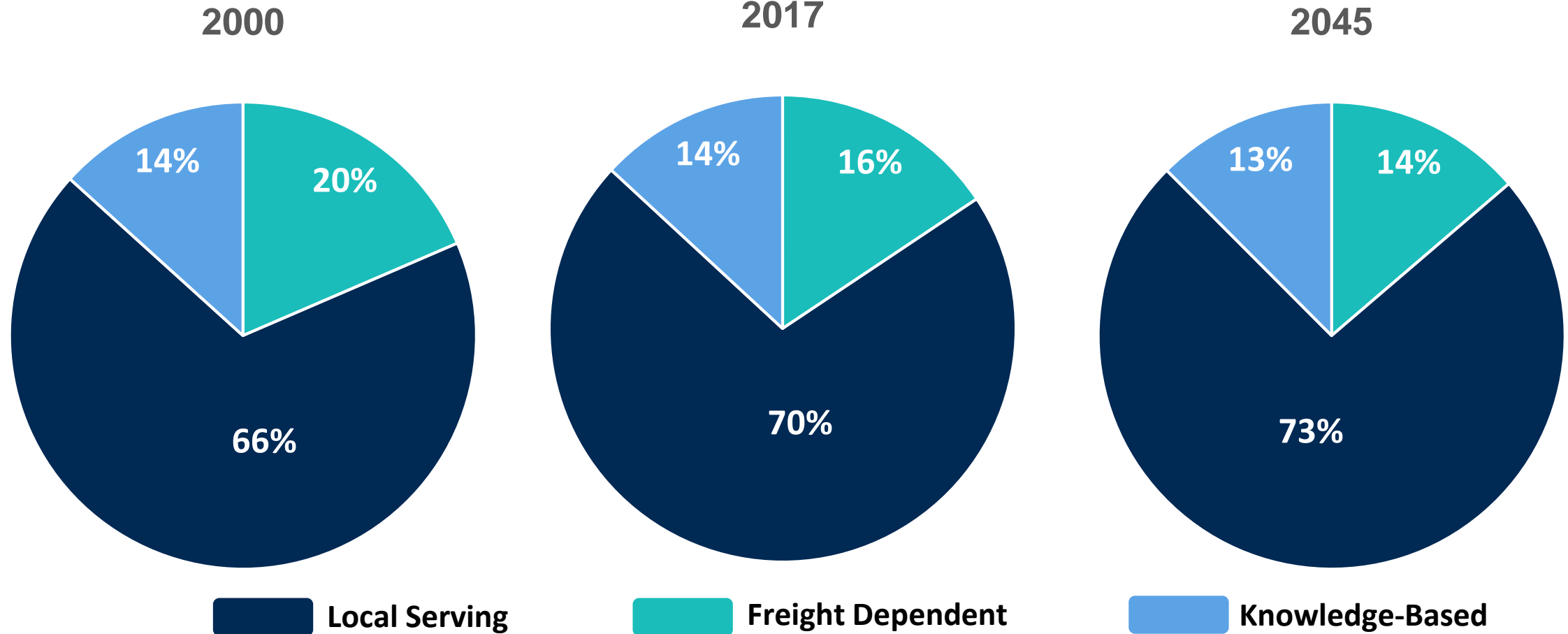
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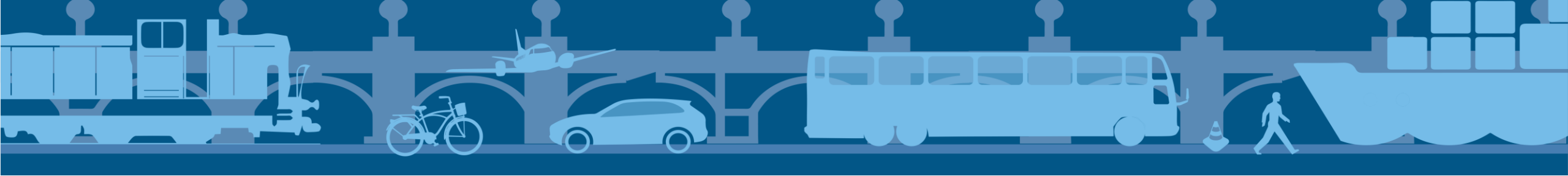


Source: Data provided by Woods and Poole.

DEMOGRAPHIC TRENDS: DISTRICT EMPLOYMENT BY INDUSTRY

Hampton Roads

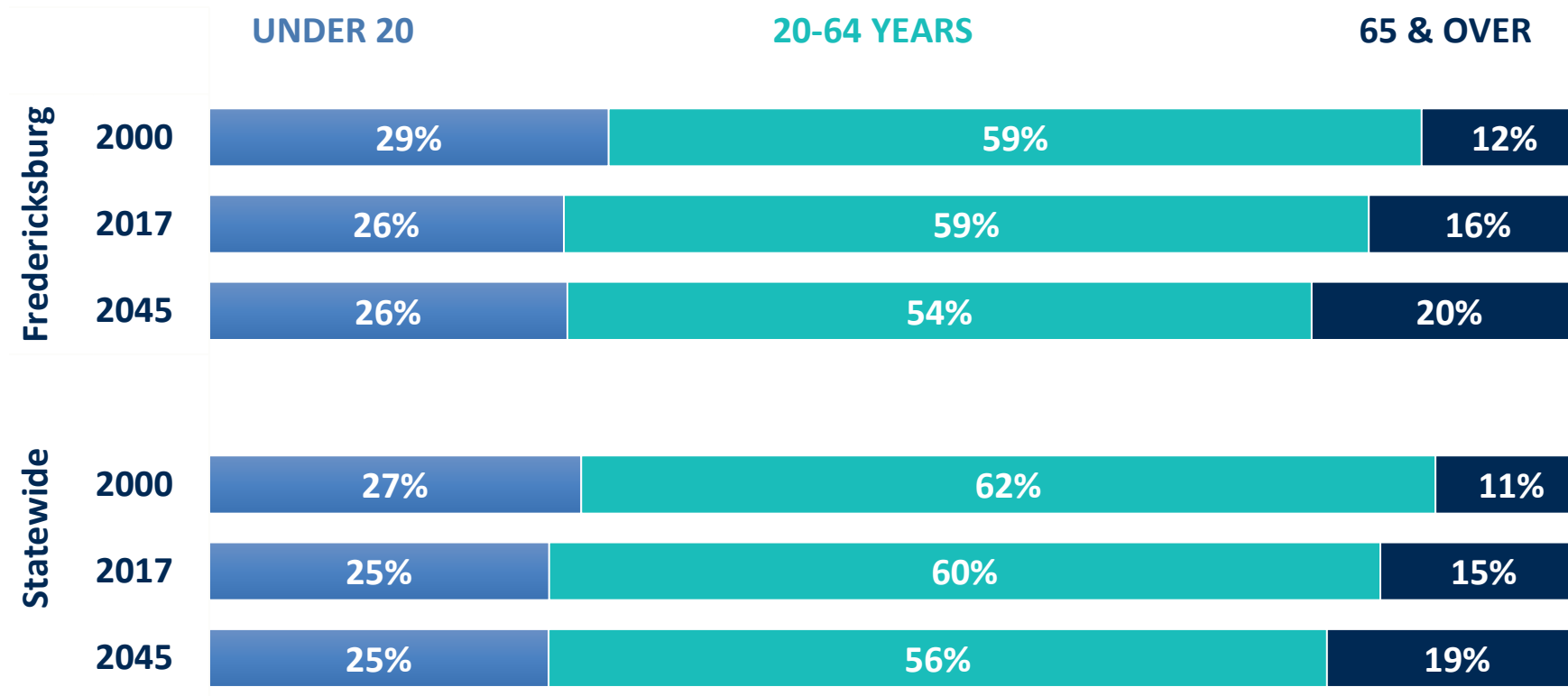




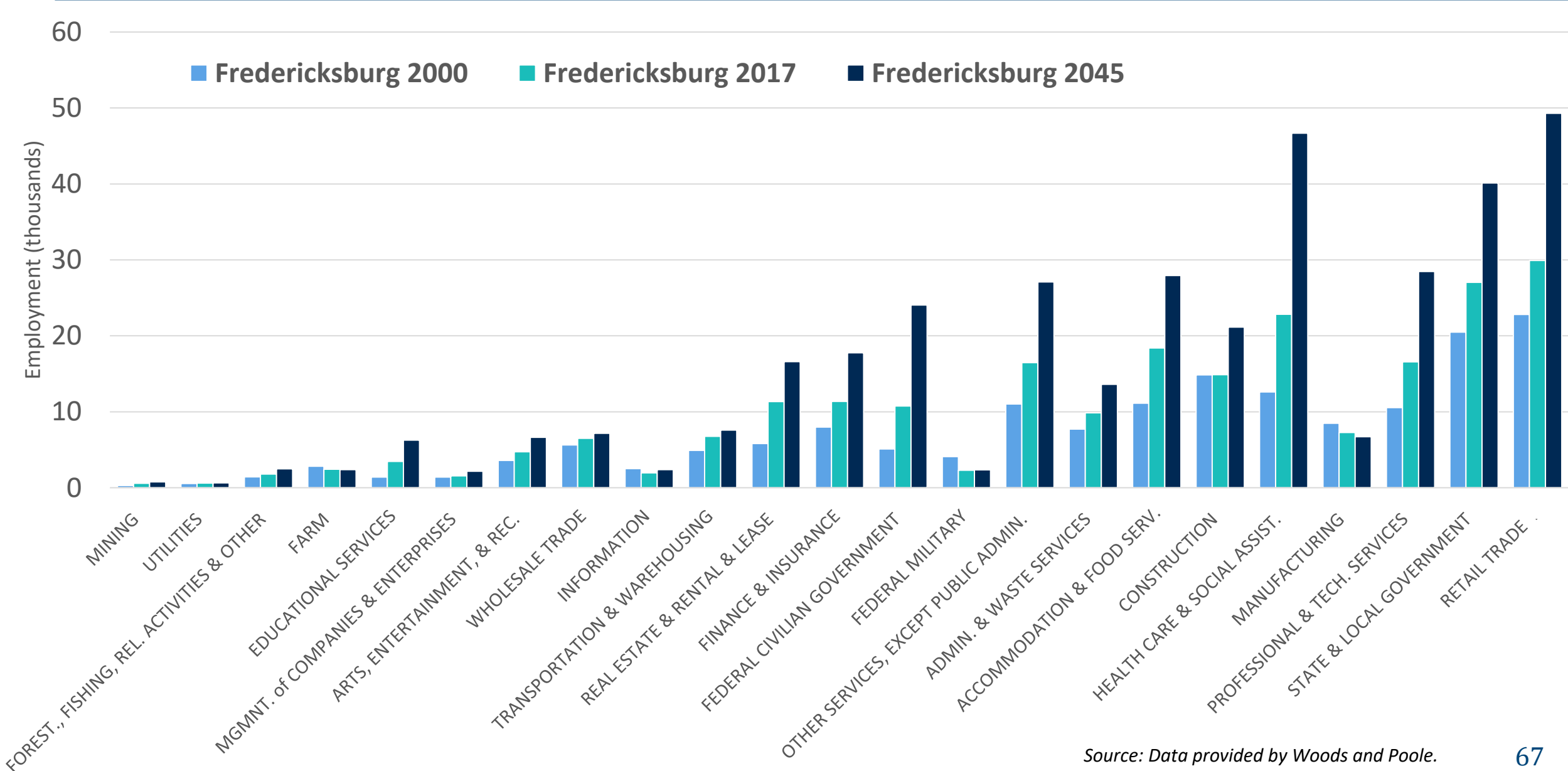
Fredericksburg District

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Fredericksburg District



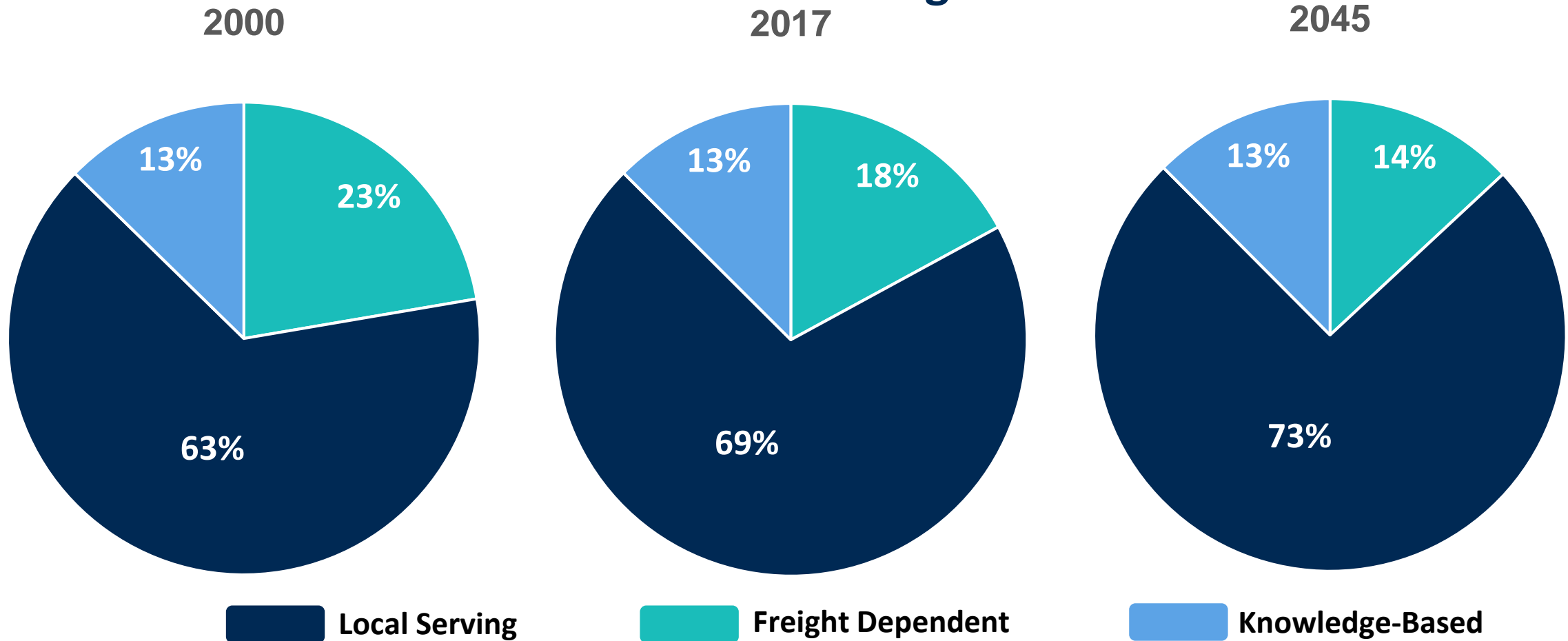
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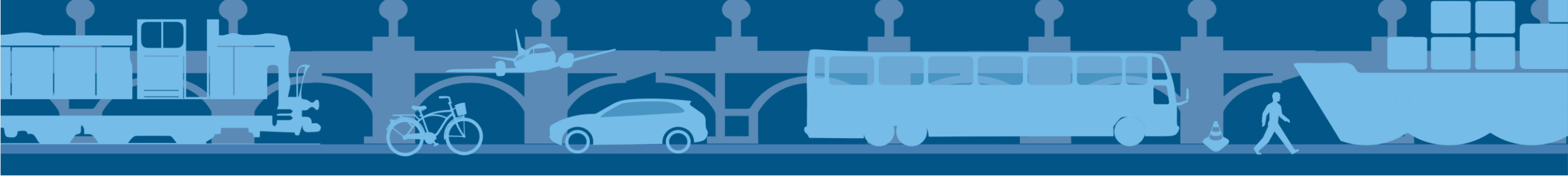


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Fredericksburg

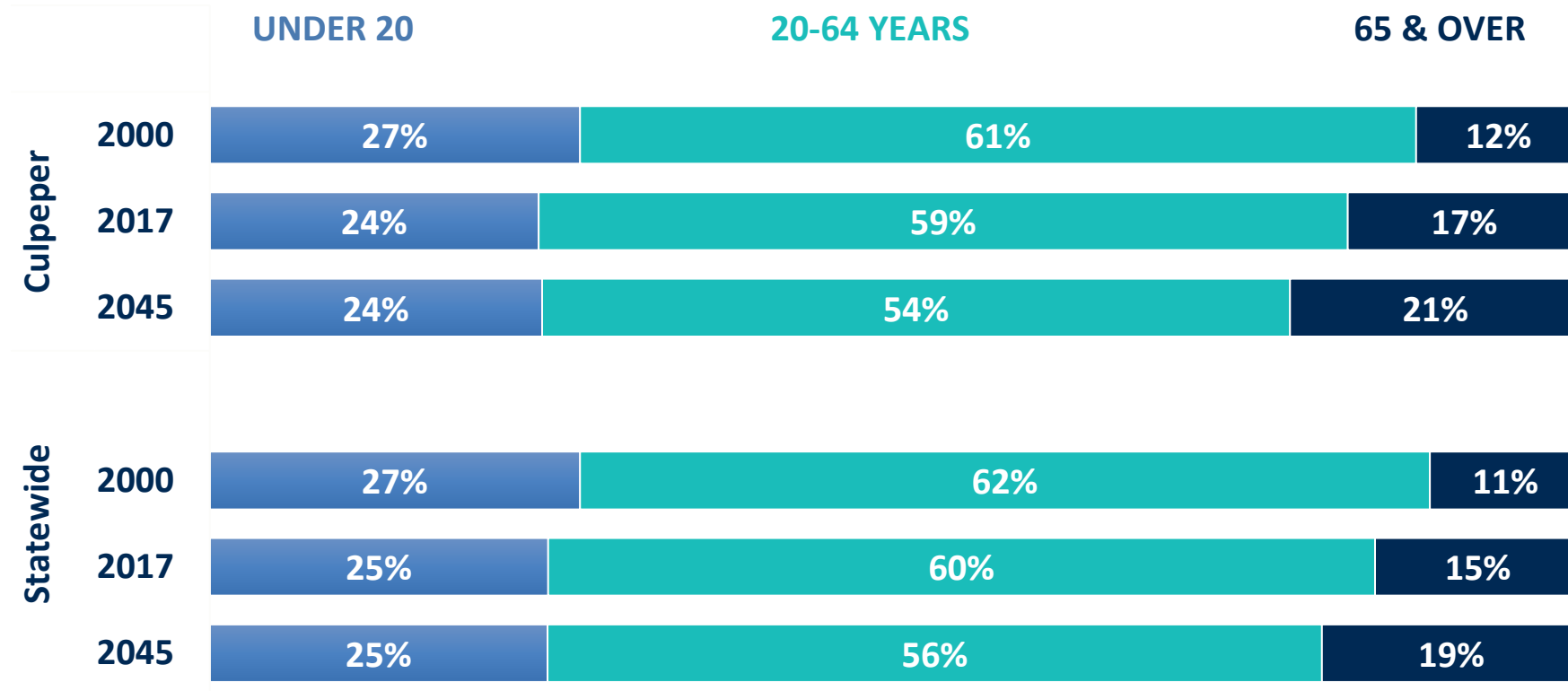




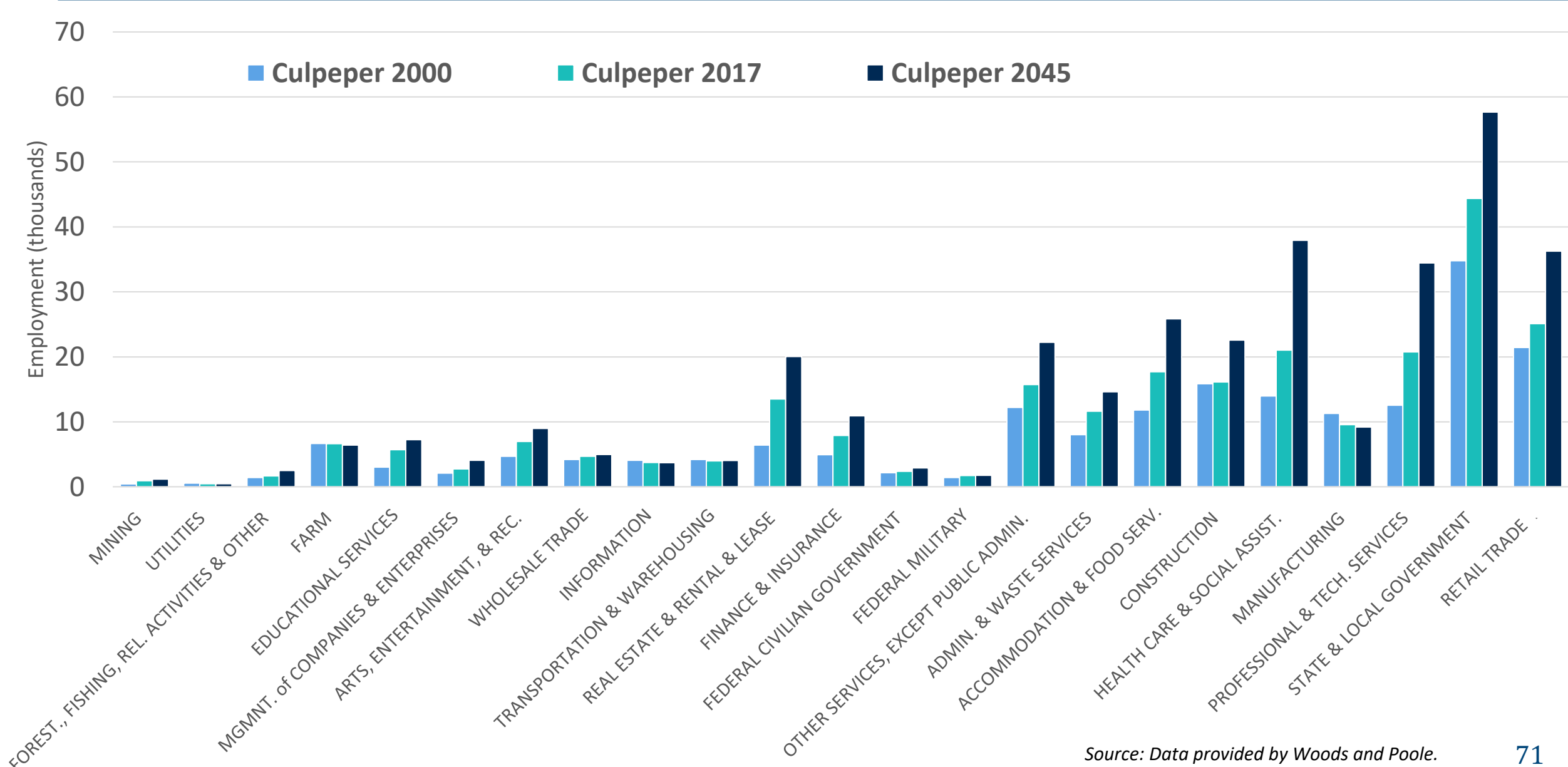
Culpeper District

DEMOGRAPHIC TRENDS: AGE DISTRIBUTION BY DISTRICT

Culpeper District



DEMOGRAPHIC TRENDS: DISTRICT EMPLOYMENT BY INDUSTRY



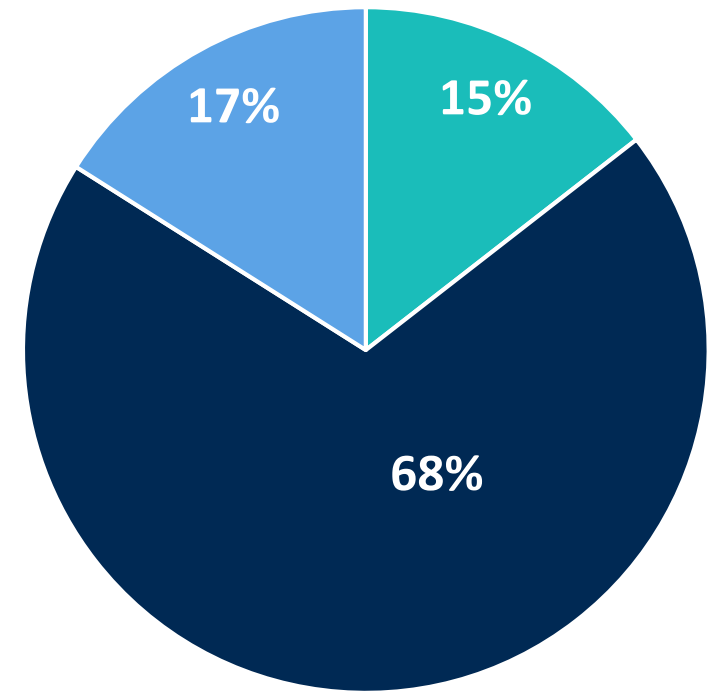
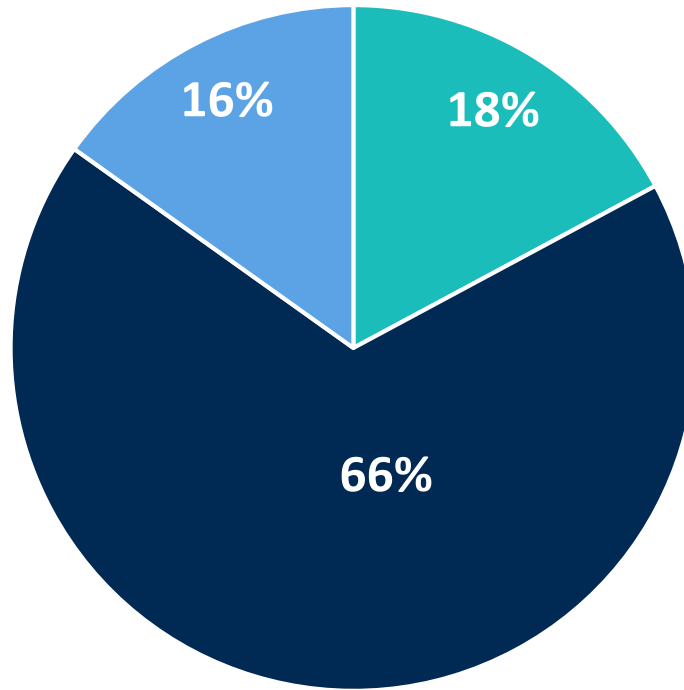
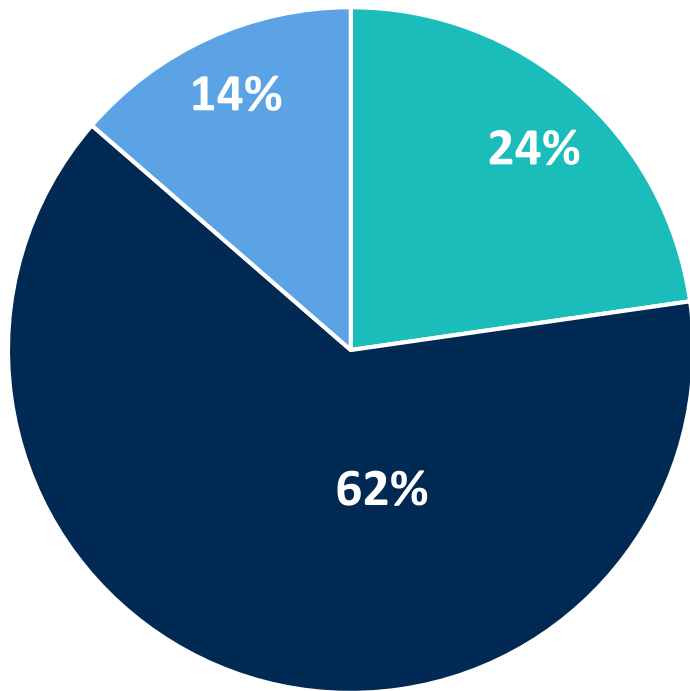
Source: Data provided by Woods and Poole.

DEMOGRAPHIC TRENDS: DISTRICT EMPLOYMENT BY INDUSTRY

Culpeper 2017

2000

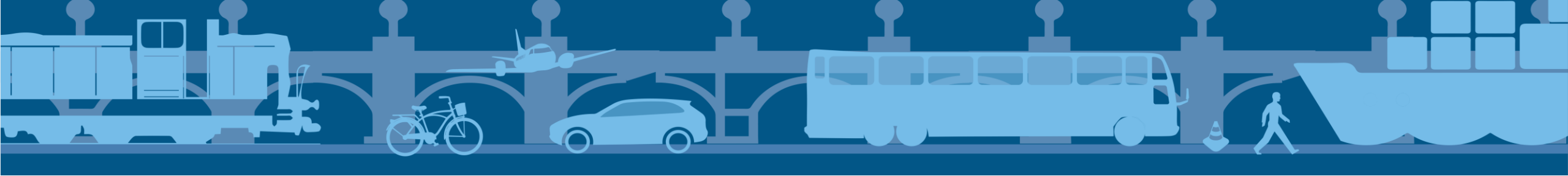
2045



Local Serving

Freight Dependent

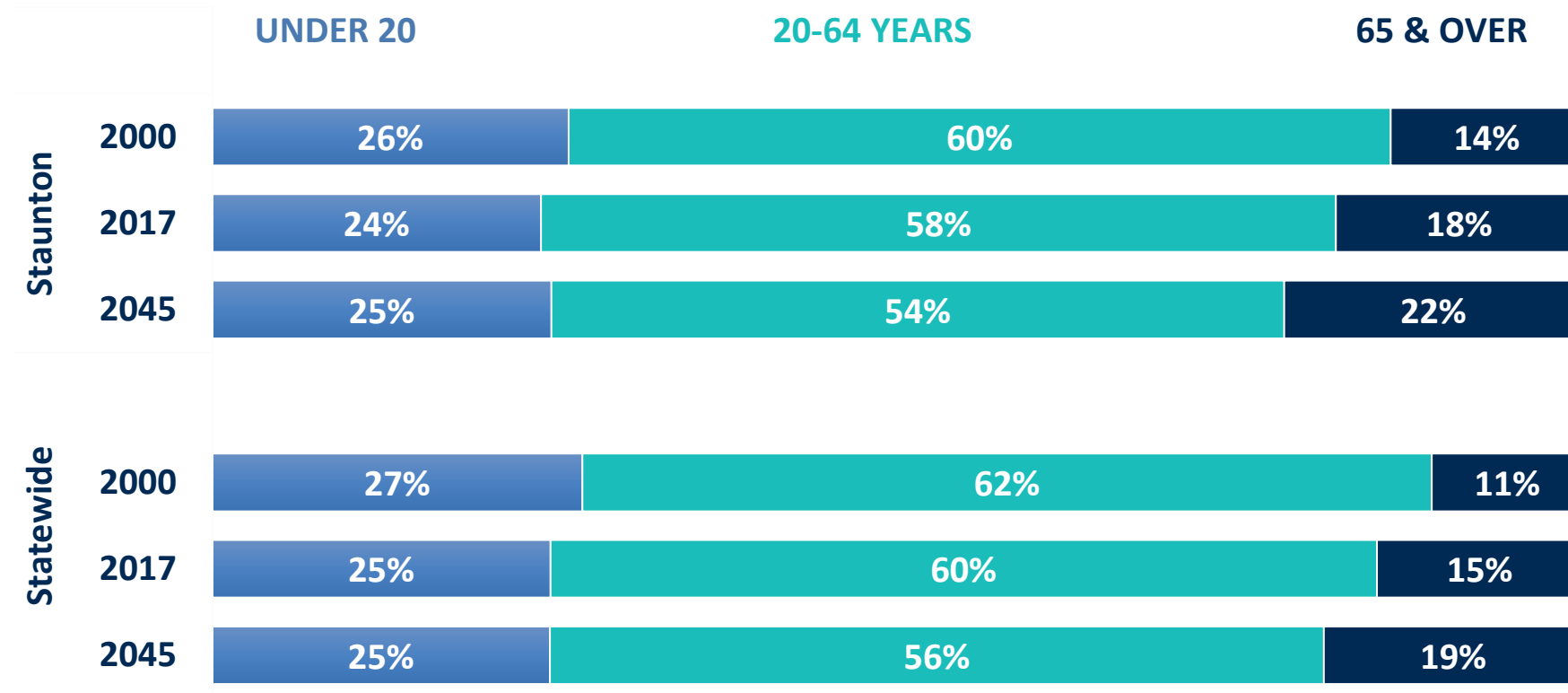
Knowledge-Based



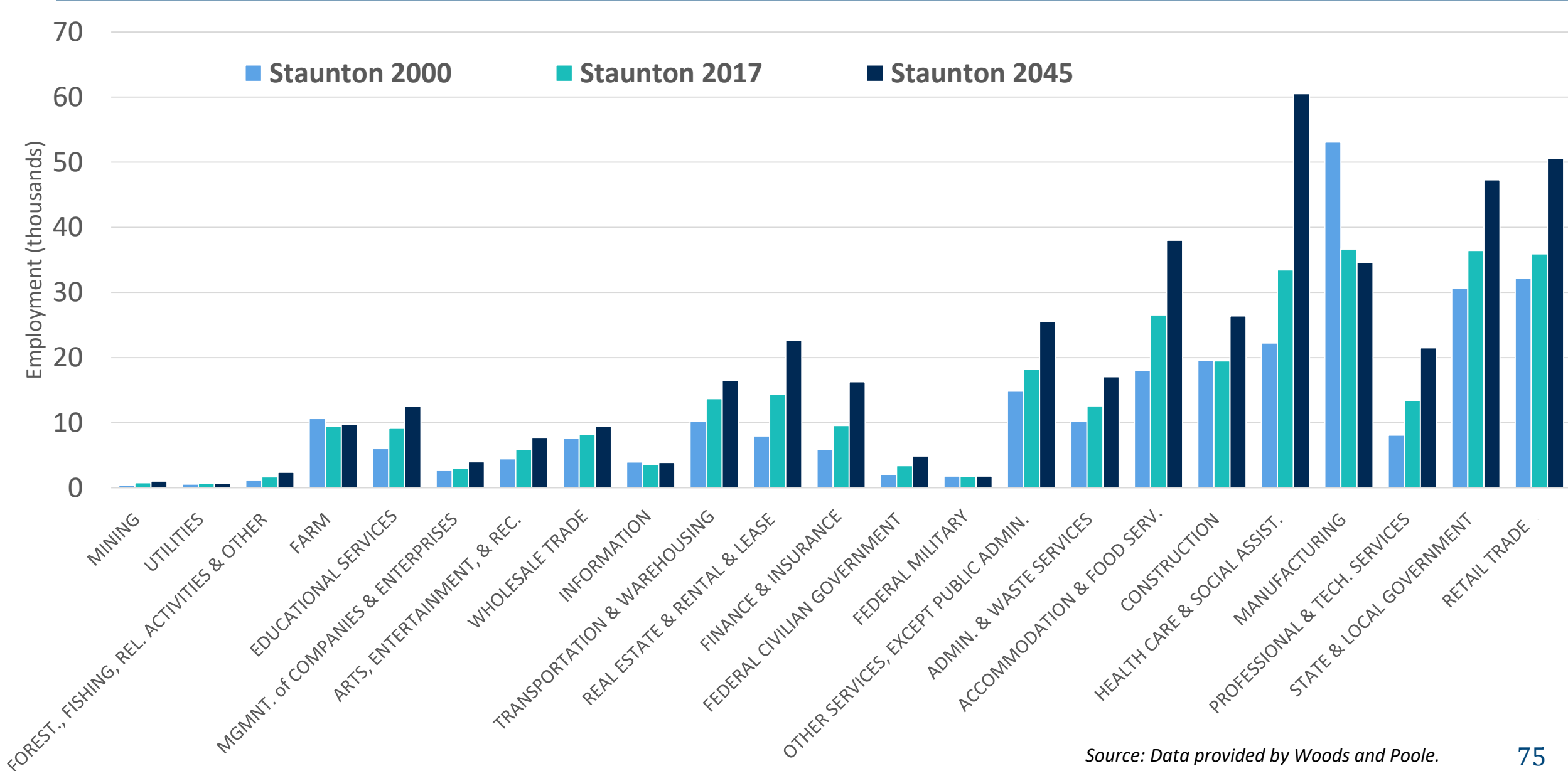
Staunton District

DEMOGRAPHIC TRENDS: AGE DISTRIBUTION BY DISTRICT

Staunton District

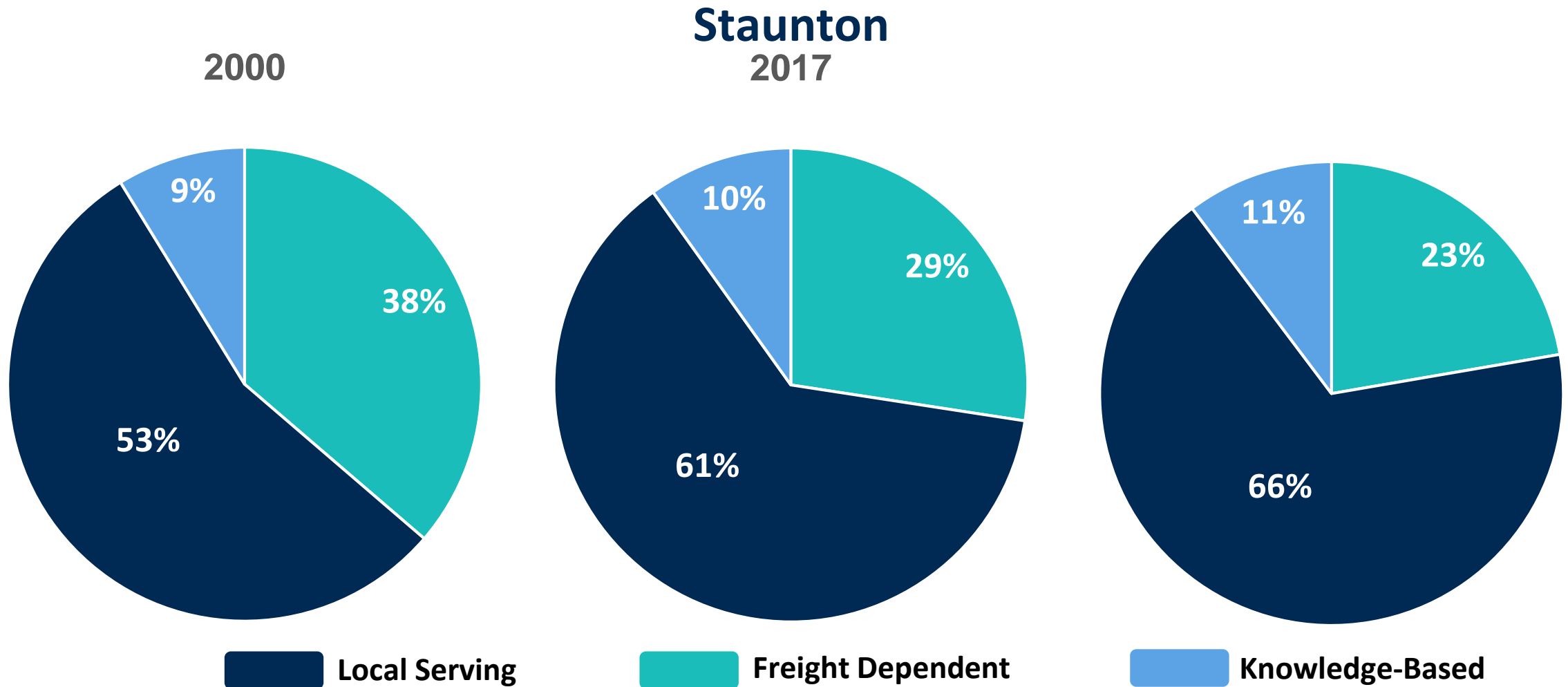


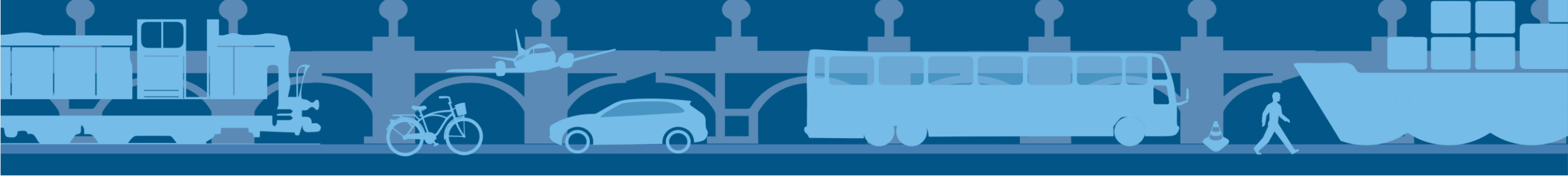
DEMOGRAPHIC TRENDS: DISTRICT EMPLOYMENT BY INDUSTRY



Source: Data provided by Woods and Poole.

DEMOGRAPHIC TRENDS: DISTRICT EMPLOYMENT BY INDUSTRY

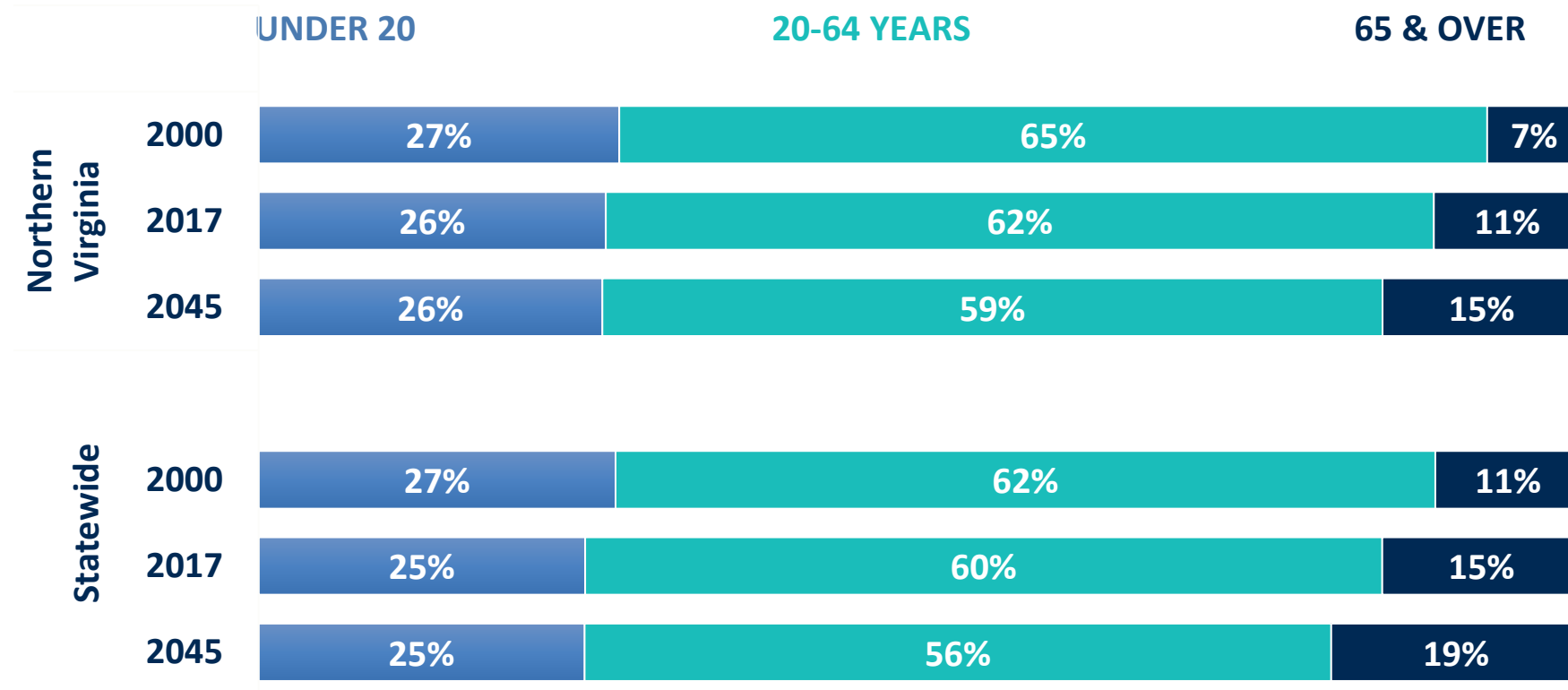




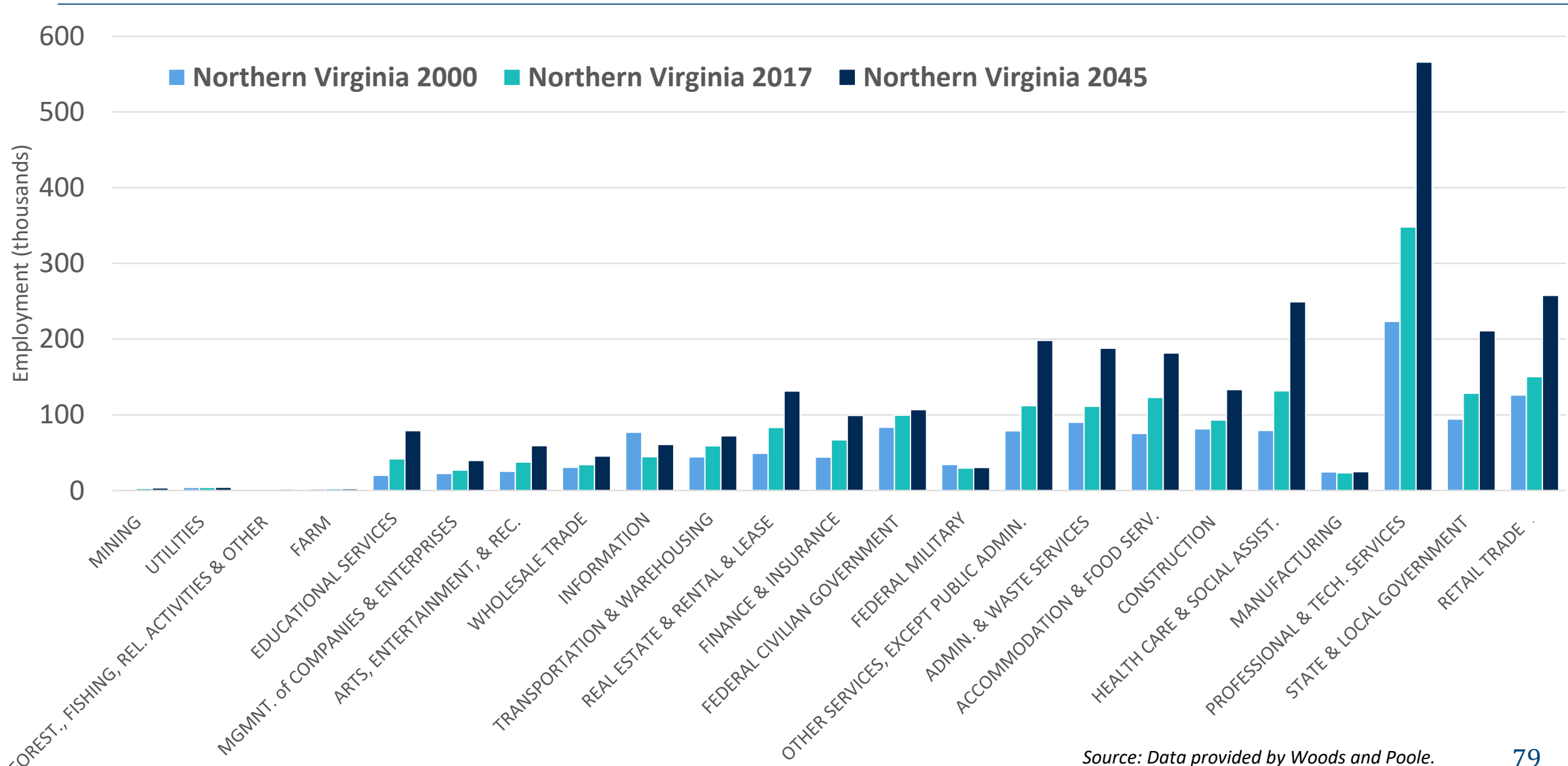
Northern Virginia District

DEMOGRAPHIC TRENDS: AGE DISTRIBUTION BY DISTRICT

Northern Virginia District



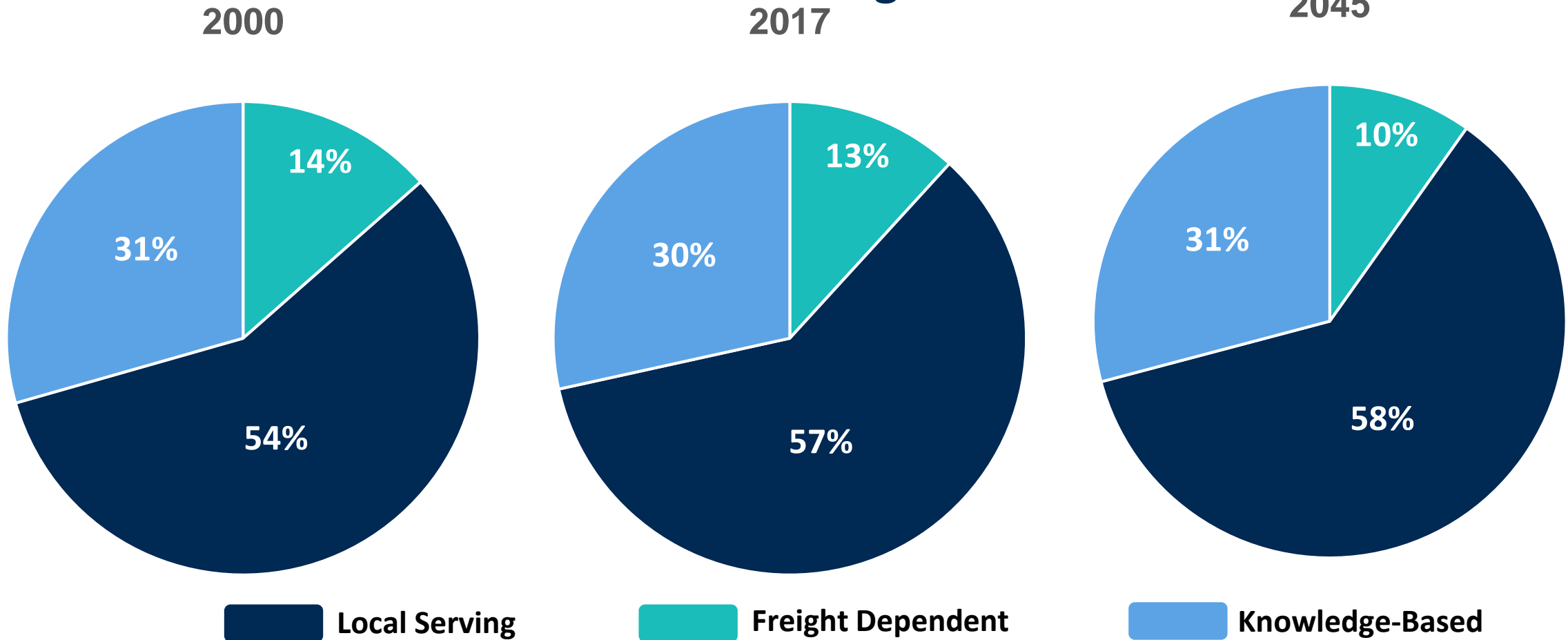
DEMOGRAPHIC TRENDS: DISTRICT EMPLOYMENT BY INDUSTRY

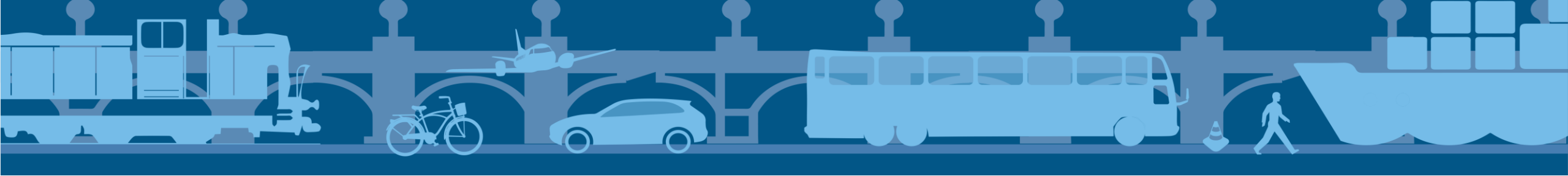


Source: Data provided by Woods and Poole.

DEMOGRAPHIC TRENDS: DISTRICT EMPLOYMENT BY INDUSTRY

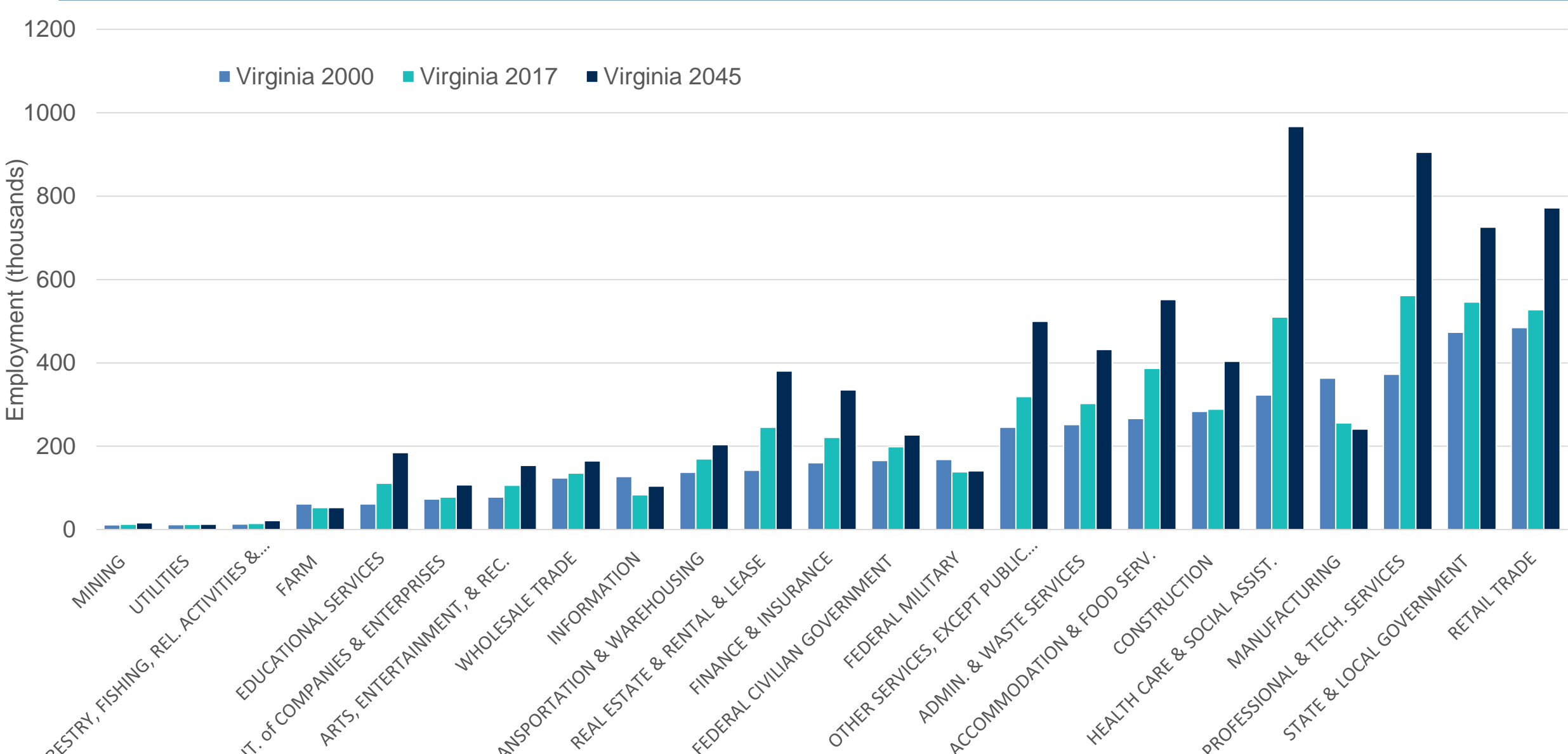
Northern Virginia





Statewide

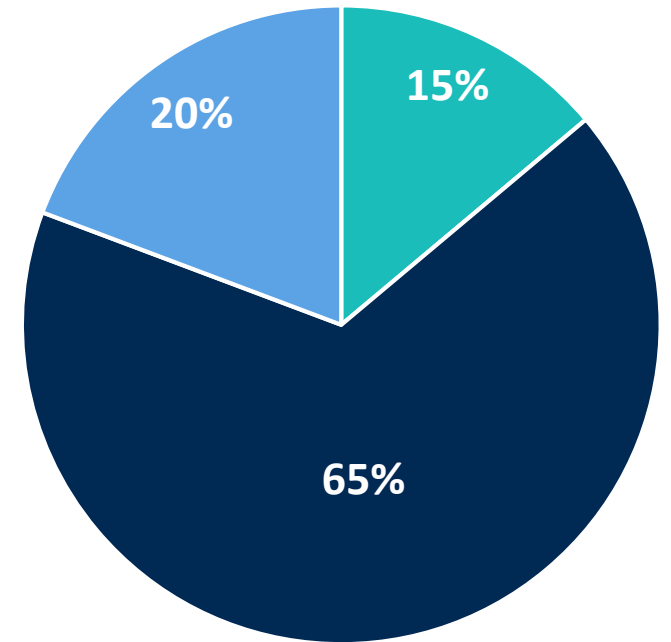
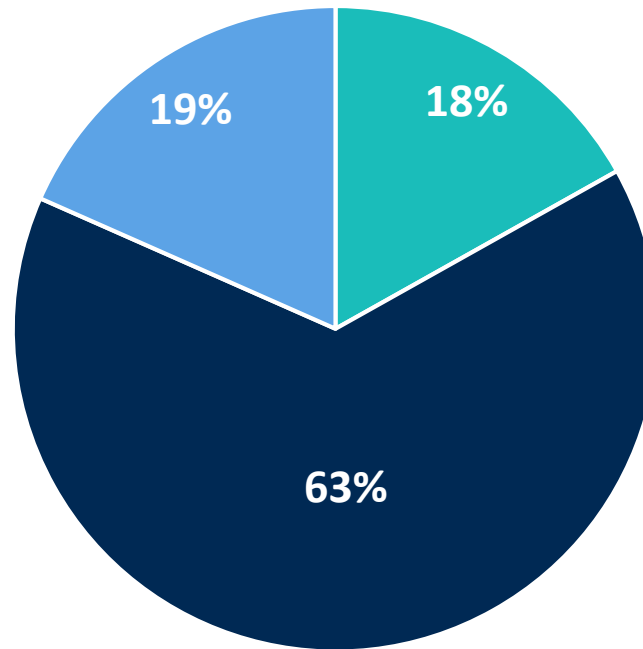
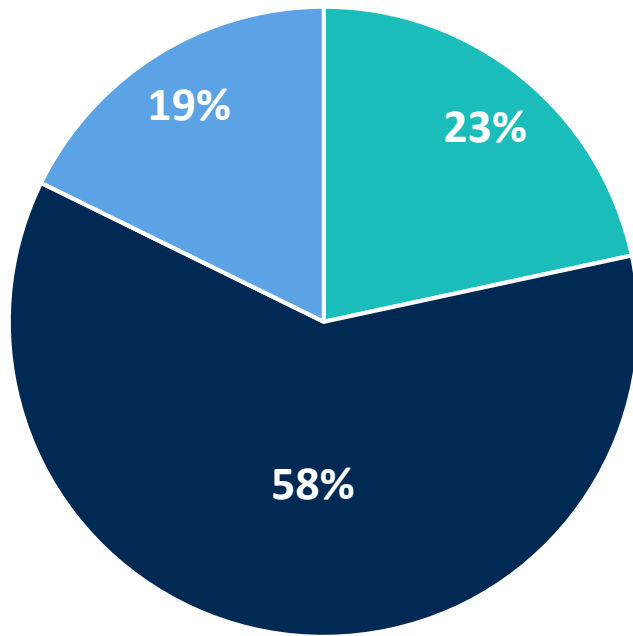
DEMOGRAPHIC TRENDS: STATEWIDE EMPLOYMENT BY INDUSTRY



Source: Data provided by Woods and Poole.

DEMOGRAPHIC TRENDS: STATEWIDE EMPLOYMENT BY INDUSTRY

Statewide



 Local Serving

 Freight Dependent

 Knowledge-Based