

The Effect of Demographic Changes on Transit Ridership Trends

Presenter: Richard Driscoll

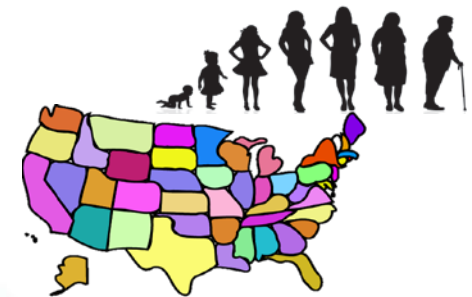
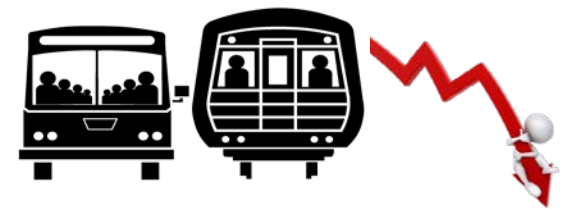
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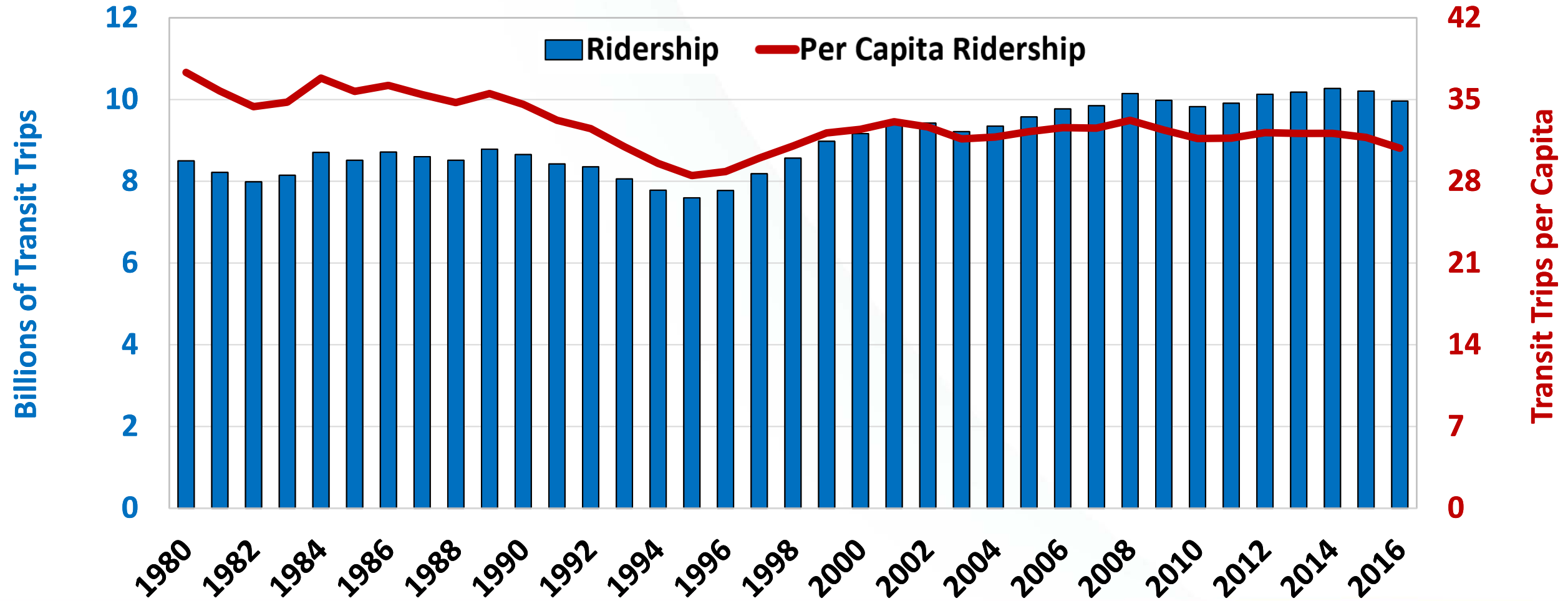


Introduction

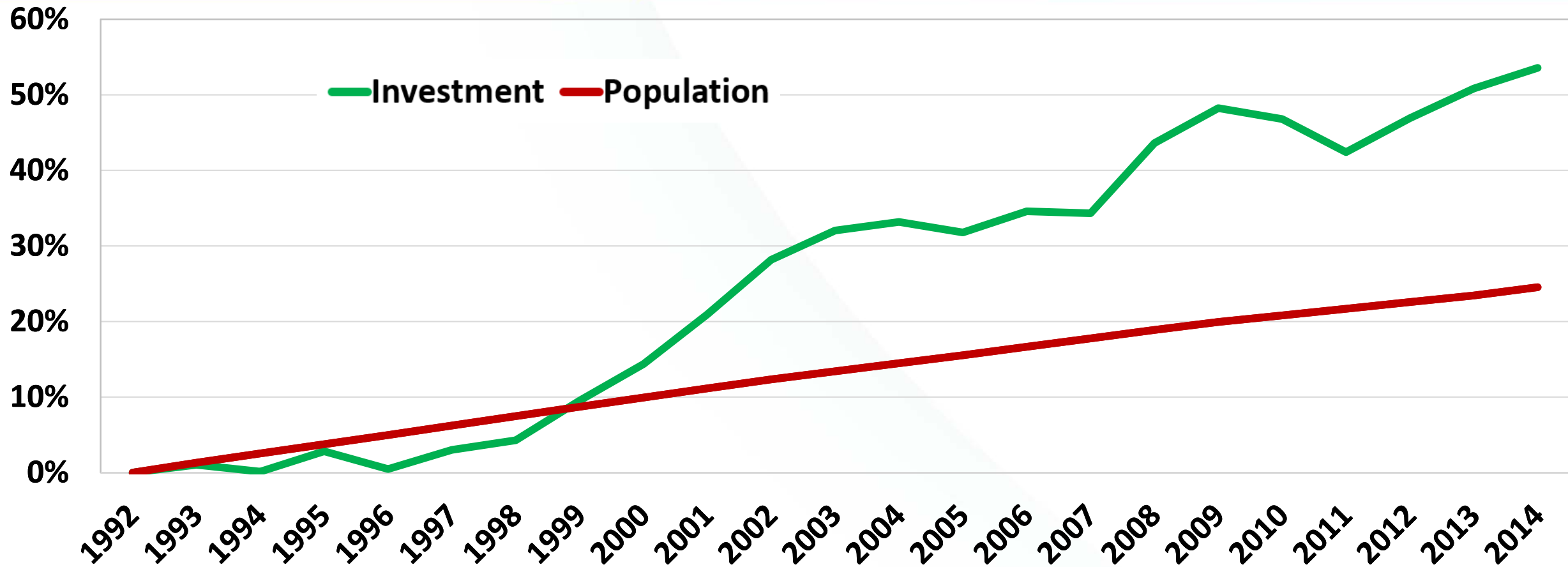
- Despite growing population and improving economy, **transit ridership** has been in an **accelerated decline** for the past 3+ years.
- **Analysts are attempting to diagnose why**, so service can be adapted.
- We believe **two demographic considerations** – **aging and population distribution** – are contributing to the decline.



National Bus and Rail Transit Ridership and Ridership per Capita, 1980-2016



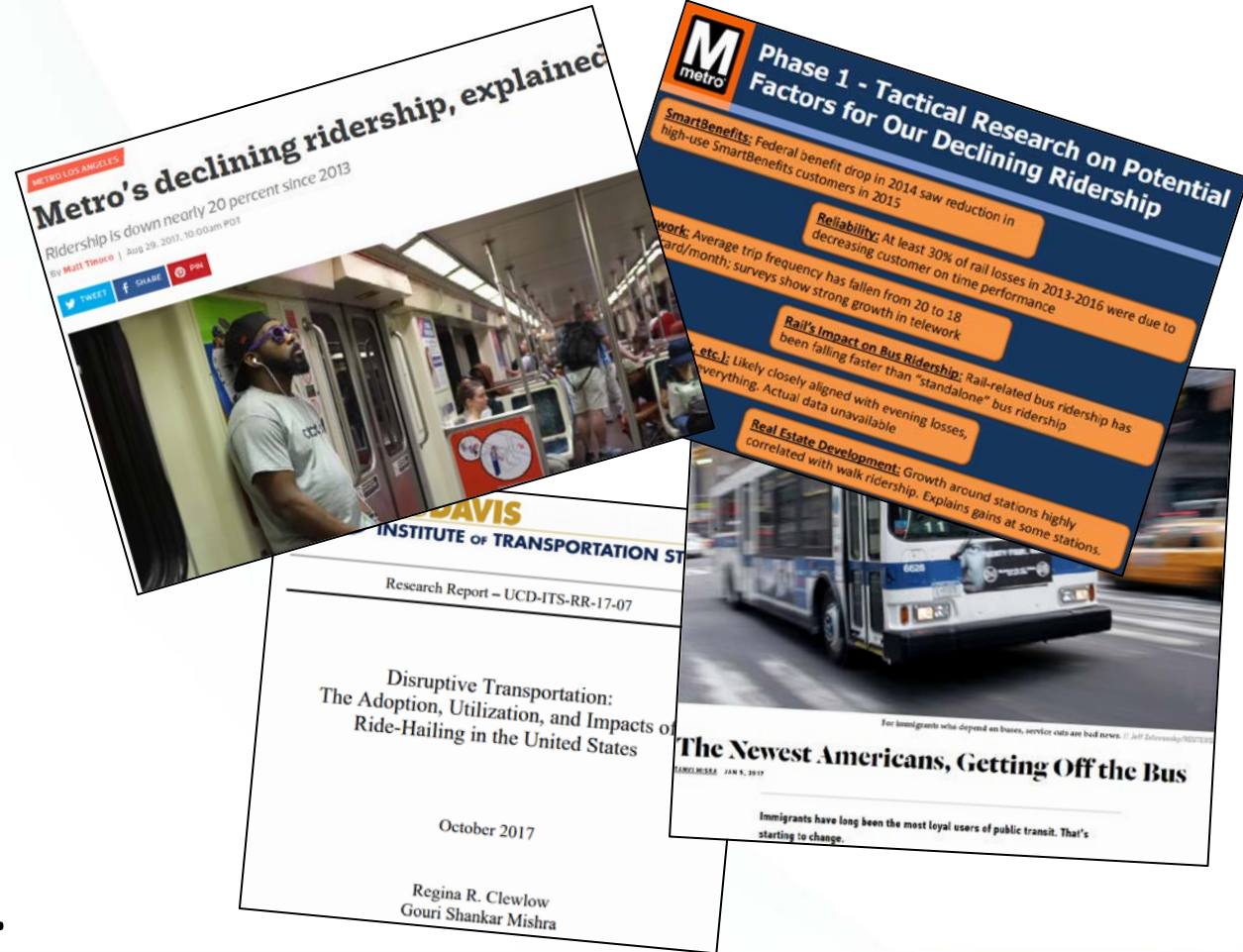
Population and Transit Investment (2014 dollars), Percent Changes from 1992



Note: Investment includes operating and capital expenses. Bus and rail only.

Why is Ridership Declining?

- TNC Use
 - 6% Reduction Transit
- Immigrant Behavior
- Reliability
- Telecommuting
- SmartBenefits Reduction
- Traffic Delay
- Reduced Fuel Prices
- Housing Cost
- And Many Other Reasons...

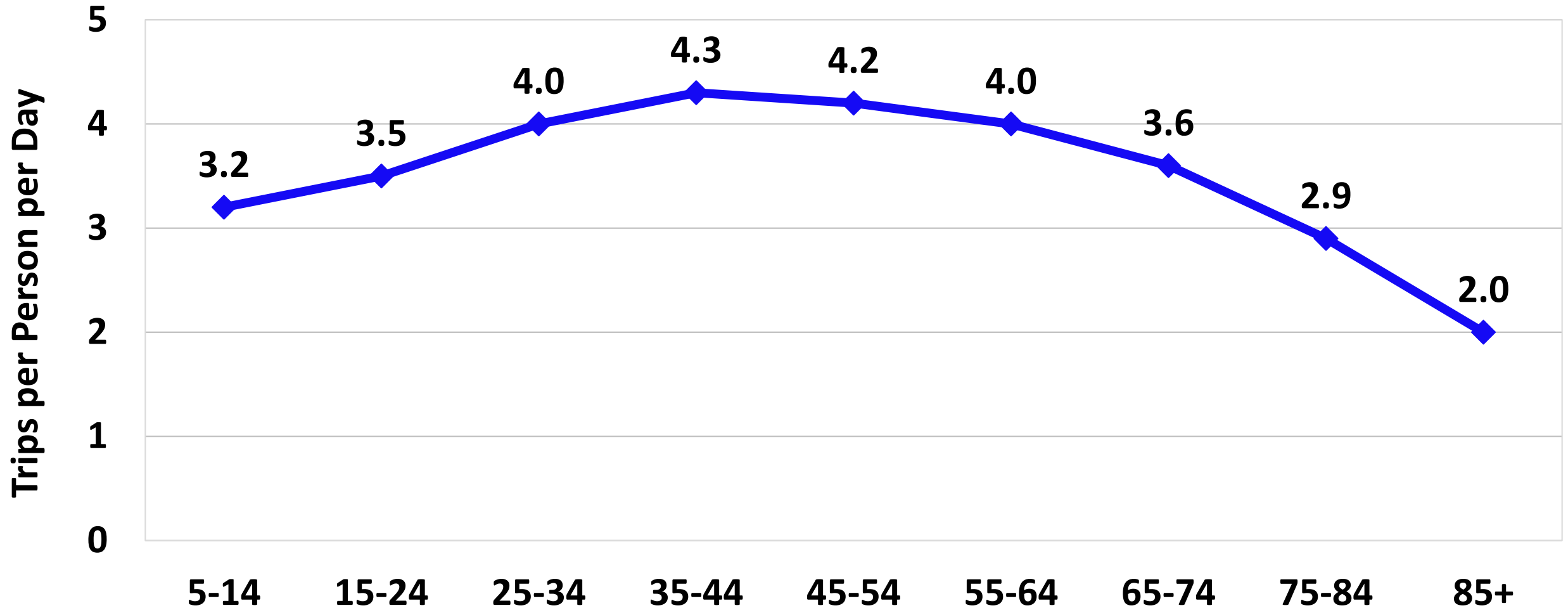


How Do Age Demographics Affect Transit Use Tendency?

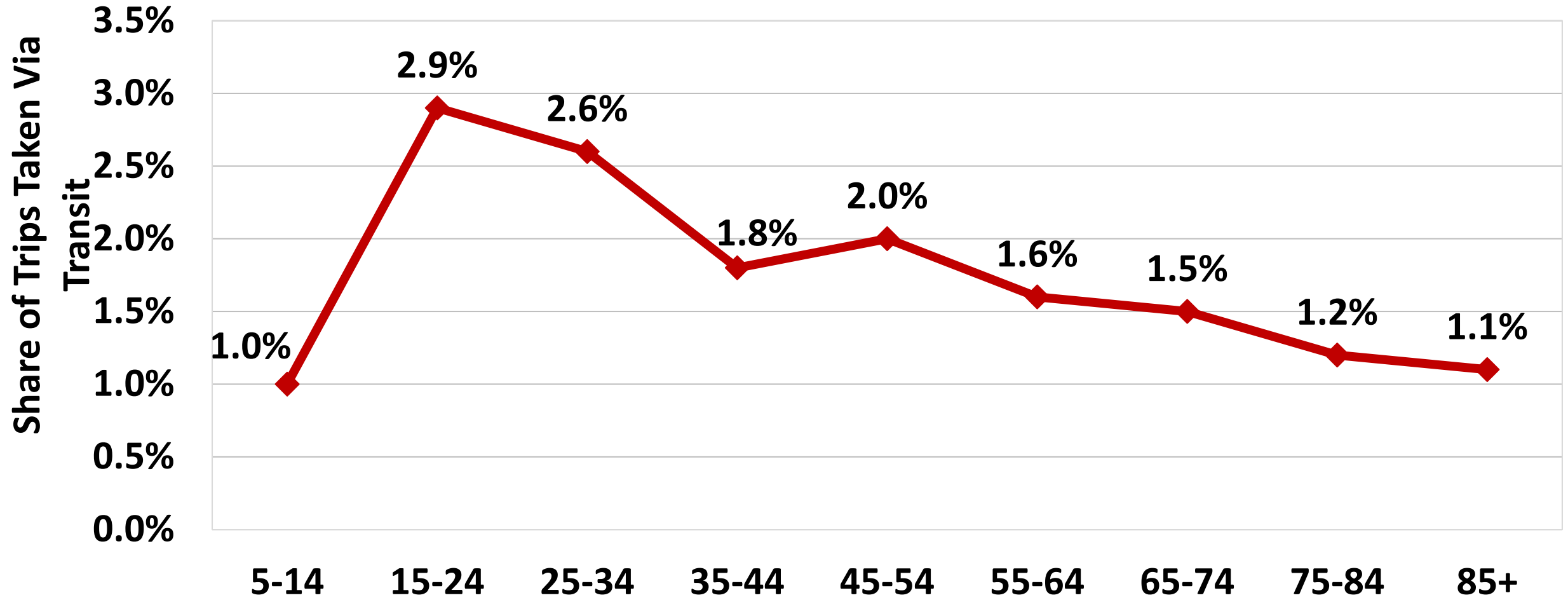
- U.S. Population has been aging.
- Travel behavior characteristics change with age.
- Has more of the population been moving to different age cohorts less conducive to transit use?

- Data used:
 - Census
 - NHTS

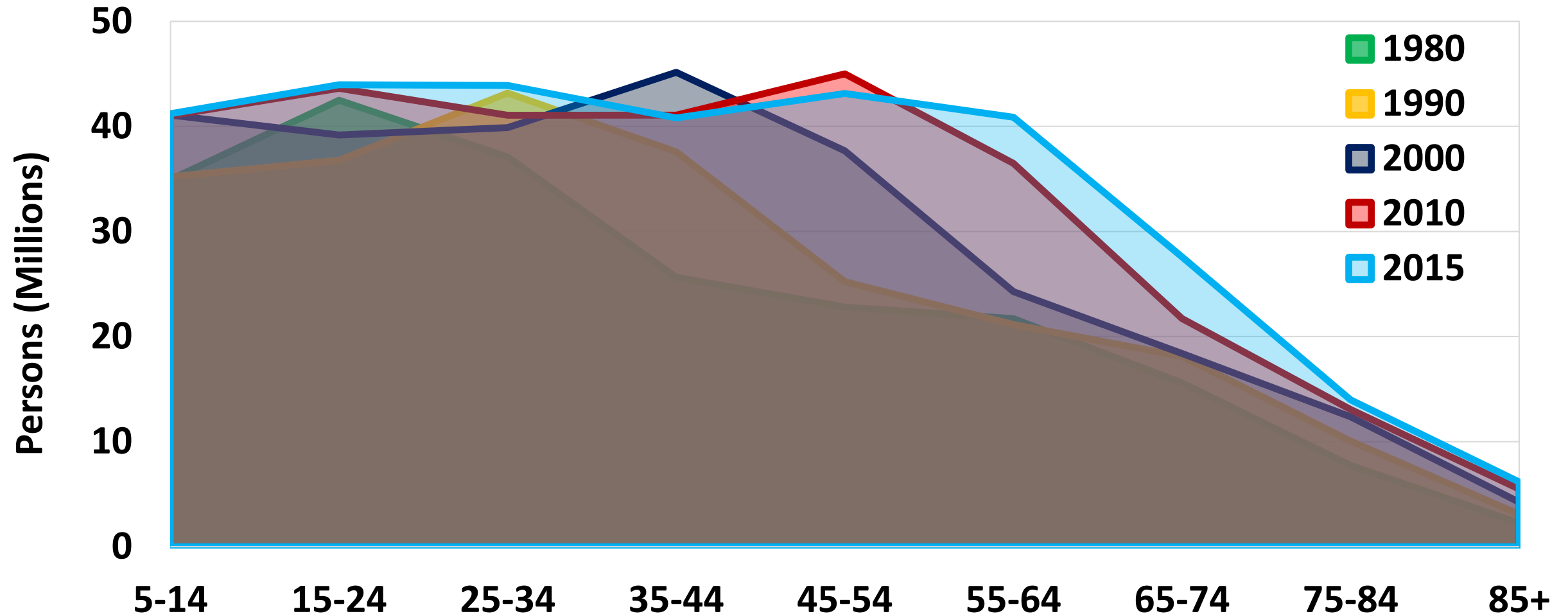
NHTS Trips per Person per Day by Age Group, 2009



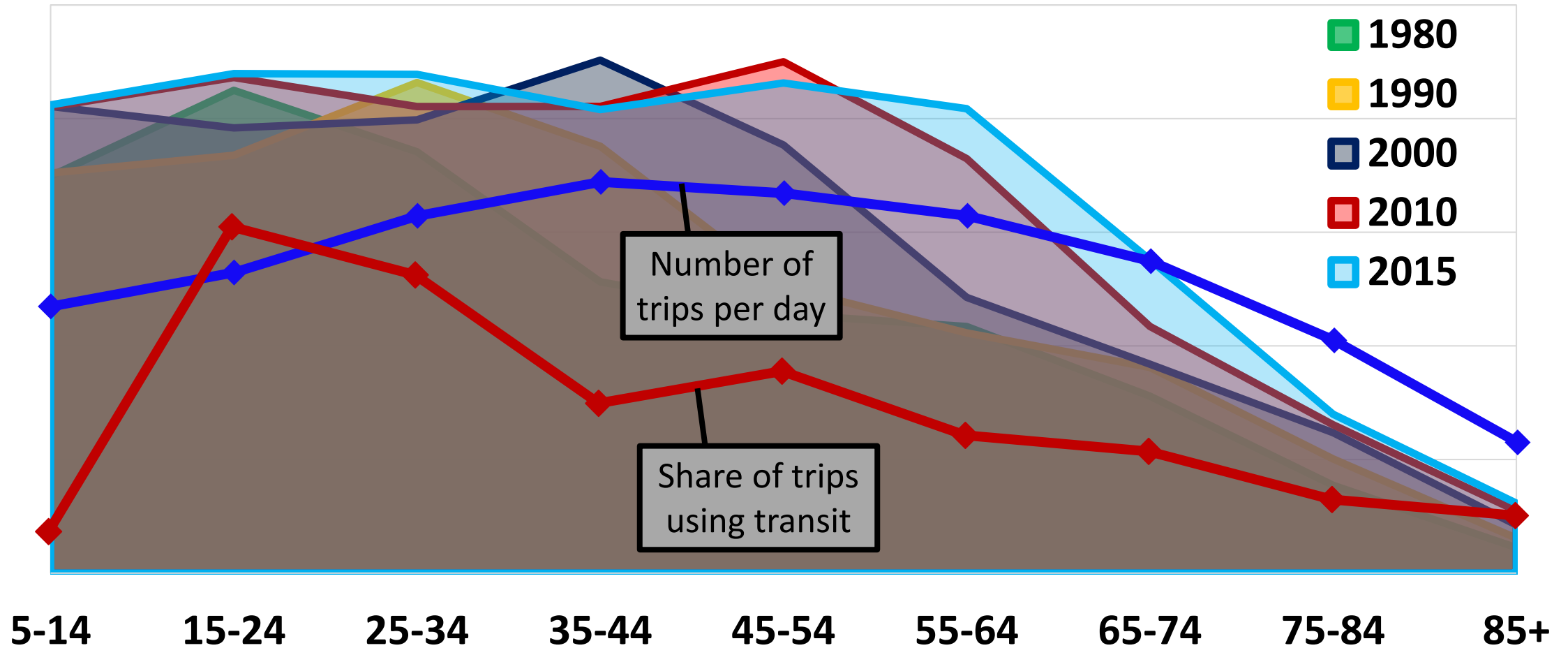
NHTS Shares of Trips Via Transit by Age Group, 2009



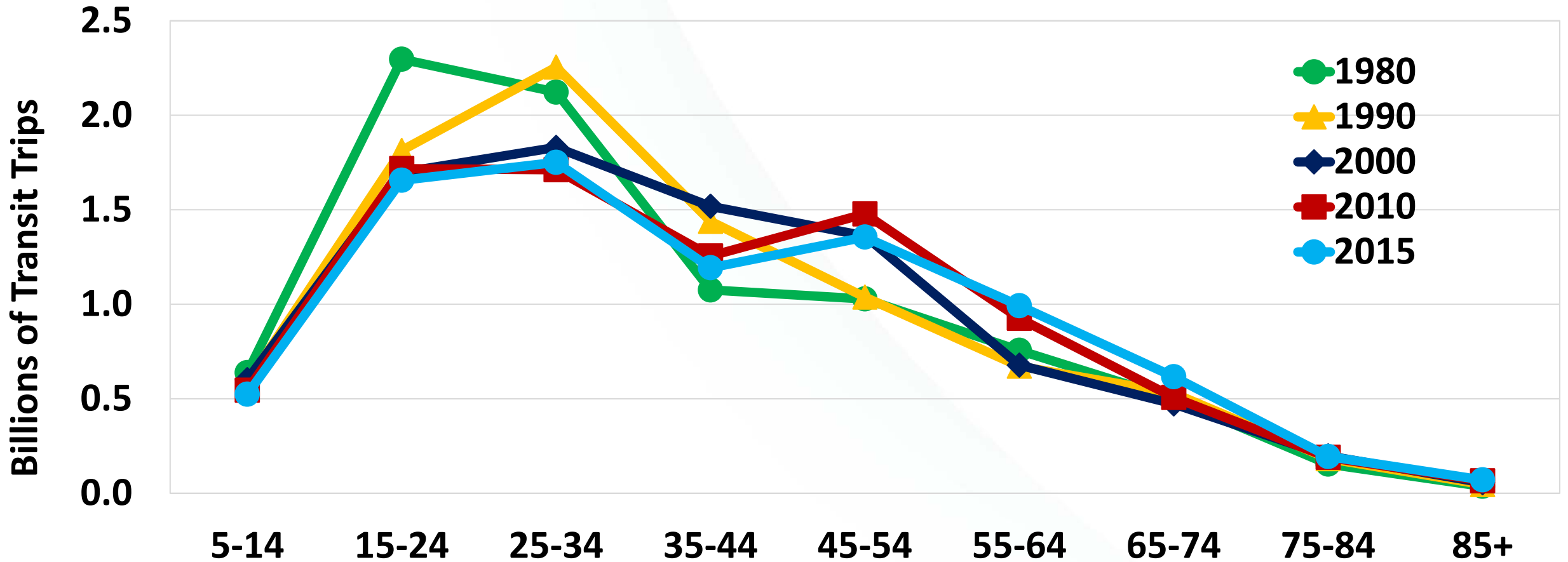
Select U.S. Census Population Age Distributions, 1980-2015



Select U.S. Census Population Age Distributions, 1980-2015

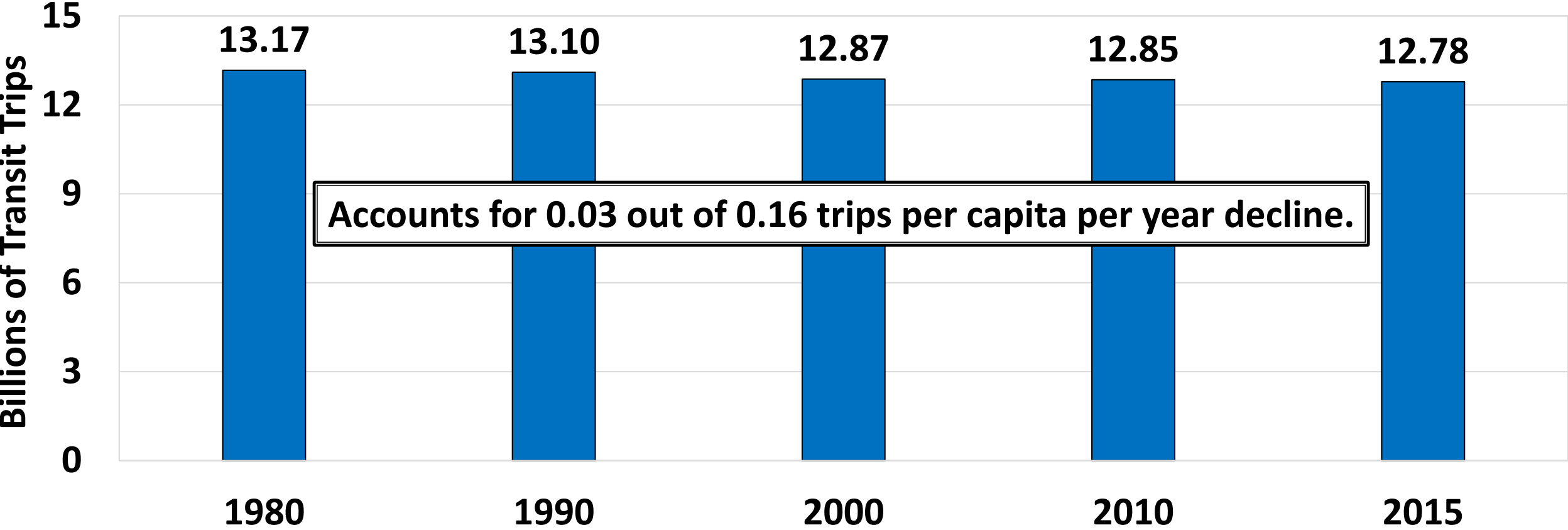


Theoretical Transit Trips by Age Group



Note: Adjusted for population growth (2015).

Theoretical Transit Trips by Year



Note: Adjusted for population growth (2015).

How Does Geographical Distribution Affect Transit Use Tendency?

- National average transit commuting share is **5.1%**.
- Top 10 counties **increasing** population: average transit commute share was **4.4%**.
- Top 10 counties **decreasing** population: average commute share was **11.4%**.
- Is population moving out of areas with quality transit?
- Data used
 - ACS
 - APTA

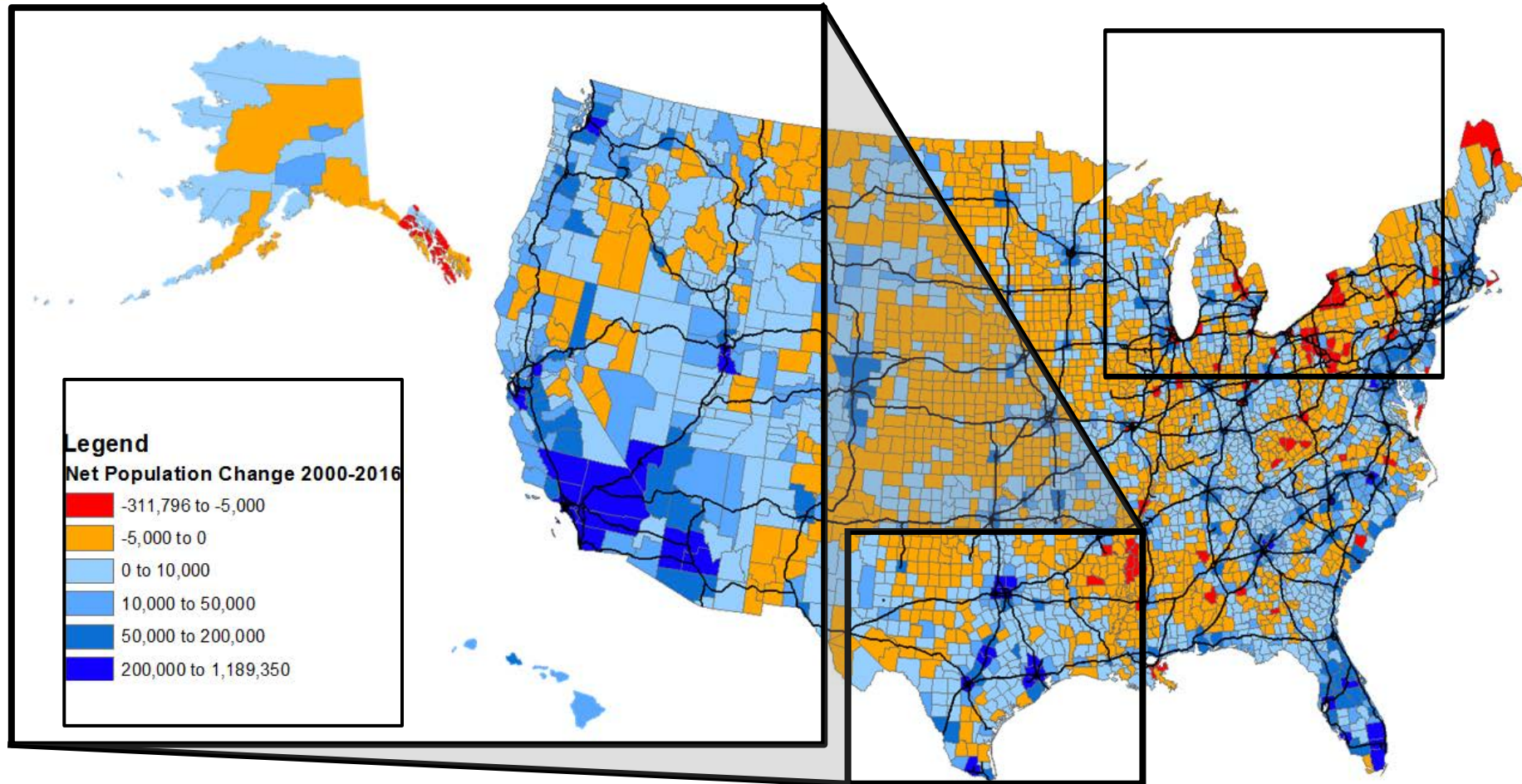
ACS Transit Commuting Share by Largest Nominal Population Increase

County	Population 2016	Population Change (Percent Change) 2013-2016	2015 Commuting, Share Using Transit
Harris County, Texas	4,589,928	243,045 (5.6%)	2.9%
Maricopa County, Arizona	4,242,997	231,778 (5.8%)	2.4%
Clark County, Nevada	2,155,664	130,568 (6.4%)	4.0%
Los Angeles County, California	10,137,915	122,479 (1.2%)	6.8%
Bexar County, Texas	1,928,680	106,624 (5.9%)	2.8%
Tarrant County, Texas	2,016,872	104,371 (5.5%)	0.6%
King County, Washington	2,149,970	104,096 (5.1%)	12.1%
San Diego County, California	3,317,749	99,330 (3.1%)	3.0%
Riverside County, California	2,387,741	96,289 (4.2%)	1.4%
Dallas County, Texas	2,574,984	95,174 (3.8%)	2.9%
Weighted Average:			4.4%

ACS Transit Commuting Share by Largest Nominal Population Decrease

County	Population 2016	Population Change (Percent Change) 2013-2016	2015 Commuting, Share Using Transit
Cook County, Illinois	5,203,499	-36,784 (-0.7%)	18.4%
Wayne County, Michigan	1,749,366	-25,257 (-1.4%)	3.2%
Cuyahoga County, Ohio	1,249,352	-13,982 (-1.1%)	4.9%
San Juan County, New Mexico	115,079	-11,439 (-9.0%)	0.3%
Allegheny County, Pennsylvania	1,225,365	-8,266 (-0.7%)	9.1%
Baltimore City, Maryland	614,664	-8,194 (-1.3%)	18.6%
Suffolk County, New York	1,492,583	-8,193 (-0.5%)	6.5%
Genesee County, Michigan	408,615	-6,938 (-1.7%)	1.2%
St. Louis City, Missouri	311,404	-6,543 (-2.1%)	9.4%
Caddo Parish, Louisiana	248,851	-6,373 (-2.5%)	1.8%
Weighted Average:			11.4%

2015 Transit Commuting Share by County



Theoretical Commute Trip Method, 2013-2016

Using the following assumptions:

- Constant workforce participation rate
- 2015 transit commute share for both years
- 1.53 unlinked trips per linked trip
- 235 working days per year

Theoretical Commute Trip Method, 2013-2016

$$\begin{aligned} \text{Unlinked} \\ \text{Commute} \\ \text{Trips} \end{aligned} = \text{Workers} * \begin{aligned} \text{2015} \\ \text{transit} \\ \text{commute} \\ \text{share} \end{aligned} * 2 * 1.53 * 235$$

This equation was calculated for every county in the U.S. for 2016 under 2 conditions:

1. 2016 county populations derived from 2013 county populations given a 0.7% annual growth rate for every county.
2. Real 2016 county populations.

Theoretical Commute Trip Method, 2013-2016

- Estimated commute ridership for:
 - Condition 1: 5,334 million
 - Condition 2: 5,314 million

Makes up 6.7 million commute trips out of 73.0 million total trips per year decline.

Commute trips make up fewer than half of all transit trips, so expect the real effect of geographic distribution to make up more of the total.

Policy Implications

- Consider tailoring portions of service toward addressing older cohorts' needs and preferences.
- Shift service nationally to meet population growth in traditionally transit-deprived counties.

Areas for Future Research

- Use 2016 NHTS, upon release, to study changing travel behavior among age groups.
- Perform similar geographical distribution analyses with areas smaller than counties.
- Compare the heterogeneity of other demographic characteristics such as income level and immigrant population with age.

Thank you!



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