



# VTrans2040 Update

## Commonwealth Transportation Board

October 14, 2014



# The Statewide Planning & Programming Process

## VTrans & HB2 Framework



# VTrans2035 Update Goals



**Safety and Security**



**System Maintenance and Preservation**



**Mobility, Connectivity and Accessibility**



**Environmental Stewardship**



**Economic Vitality**



**Coordination of Transportation and Land Use**



**Program Delivery**



# VTrans2035 Update Goals



## **Safety and Security**

Provide a safe and secure transportation system



## **System Maintenance and Preservation**

Preserve and maintain the condition of the existing transportation system



## **Mobility, Connectivity and Accessibility**

Facilitate the easy movement of people and goods, improve interconnectivity of regions and activity centers, and provide access to different modes of transportation



# VTrans2035 Update Goals



## **Environmental Stewardship**

Protect the environment and improve the quality of life for Virginians



## **Economic Vitality**

Provide a transportation system that supports economic prosperity



## **Coordination of Transportation and Land Use**

Facilitate the effective coordination of transportation and land use that promotes livable communities



# VTrans2035 Update Goals



## Program Delivery

Achieve excellence in the execution of programs and delivery of services





# VTrans2040 Trends

# TRENDS ANALYSIS:

- Part of the first phase of developing VTrans2040
- To understand how future trends may shape transportation demand, supply and performance

## TRENDS

(what the world may look like in 2040)

## OUTCOMES

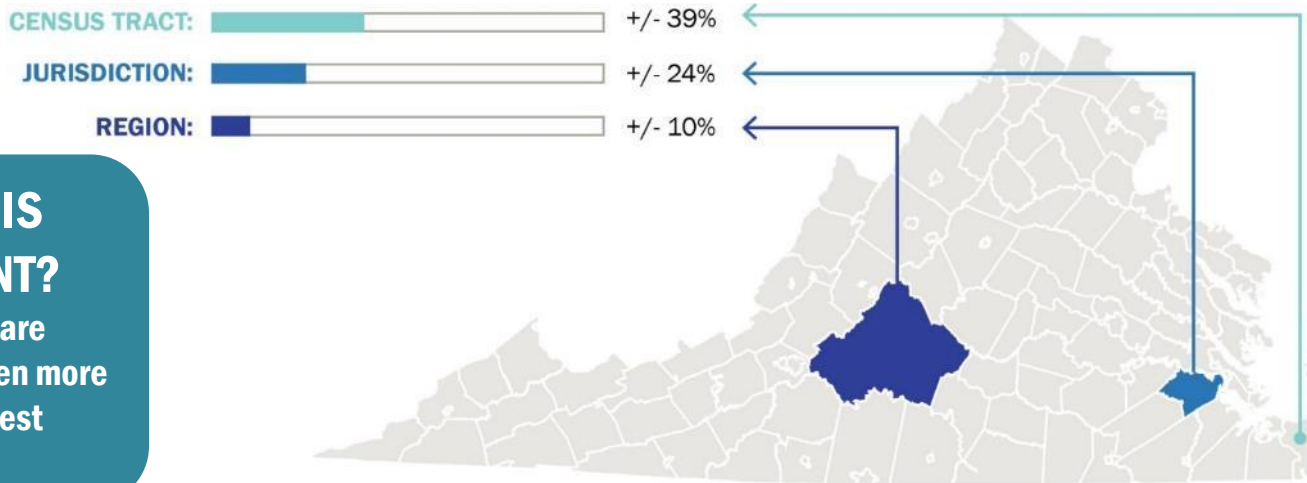
(what transportation may look like in 2040)





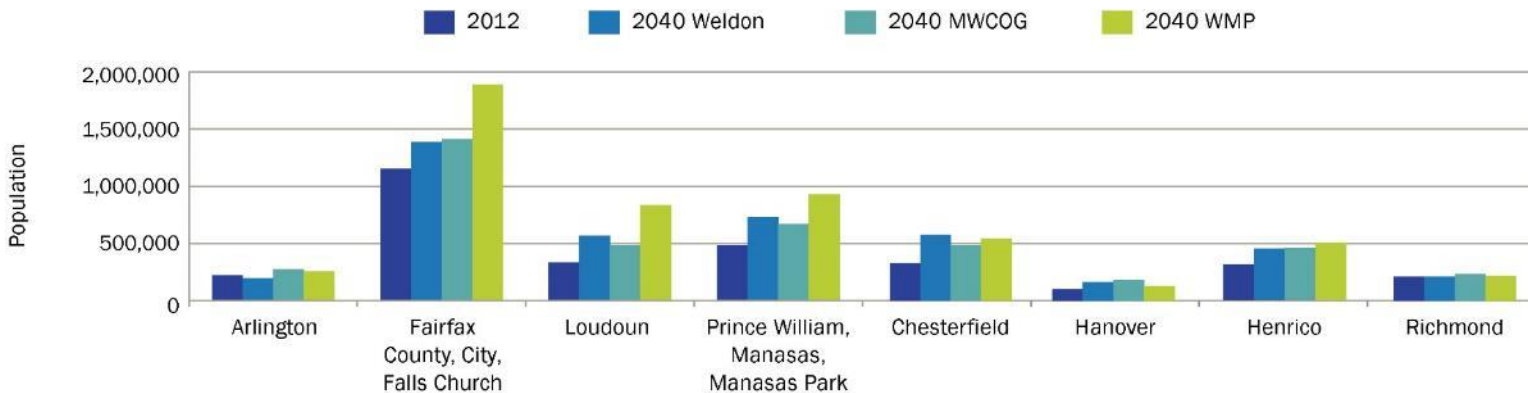
# Forecasts are Imperfect

## Projected Population vs. Actual Population over 20 Years



**WHY IS THIS IMPORTANT?**  
Our forecasts are uncertain – even more so in the smallest areas of study

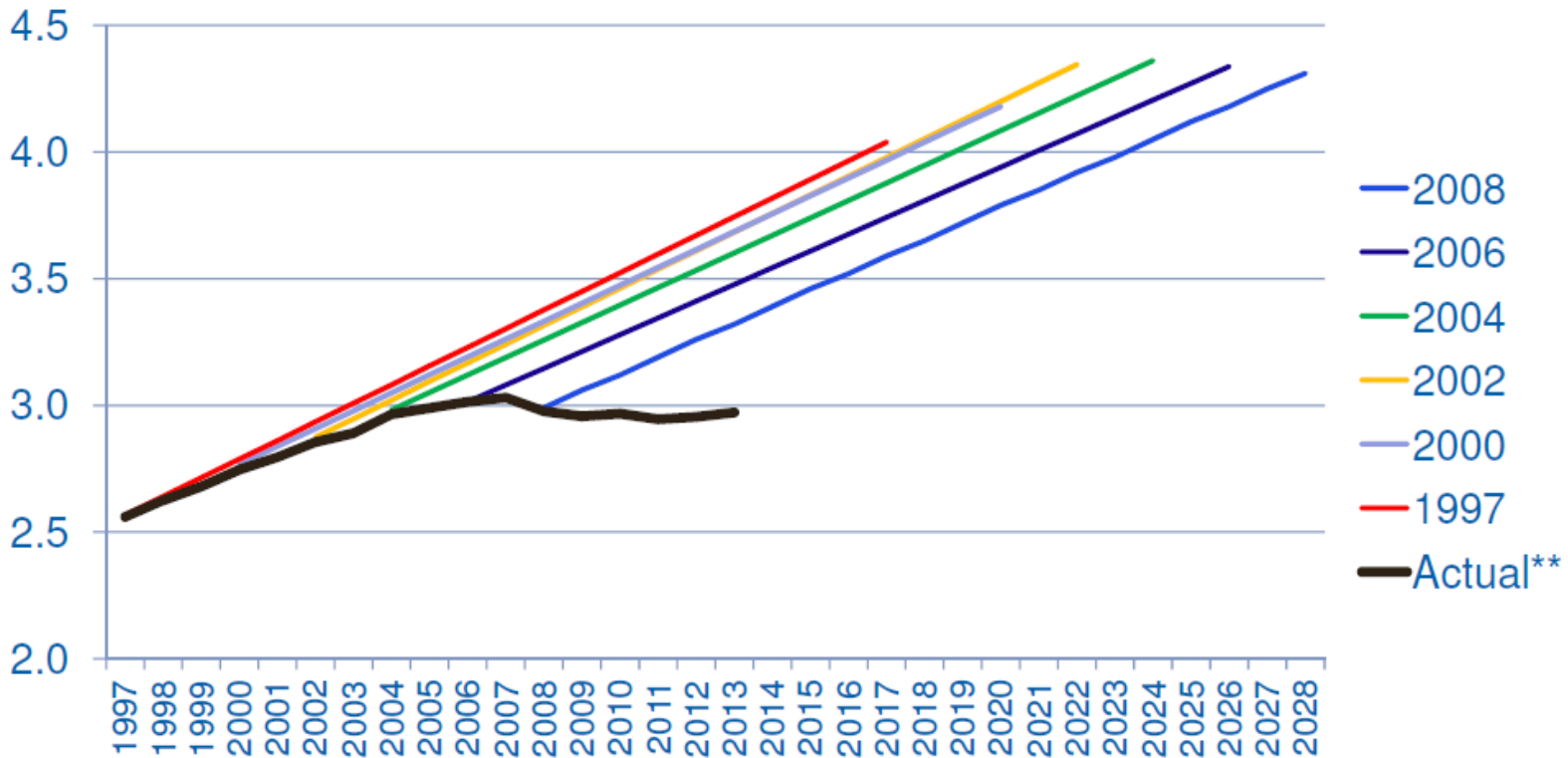
## Forecasts Can Disagree



# Forecasts are Humbling

- Recognize that long-term behavioral forecasts cannot be accurate
- Need to better understand the factors affecting behavior

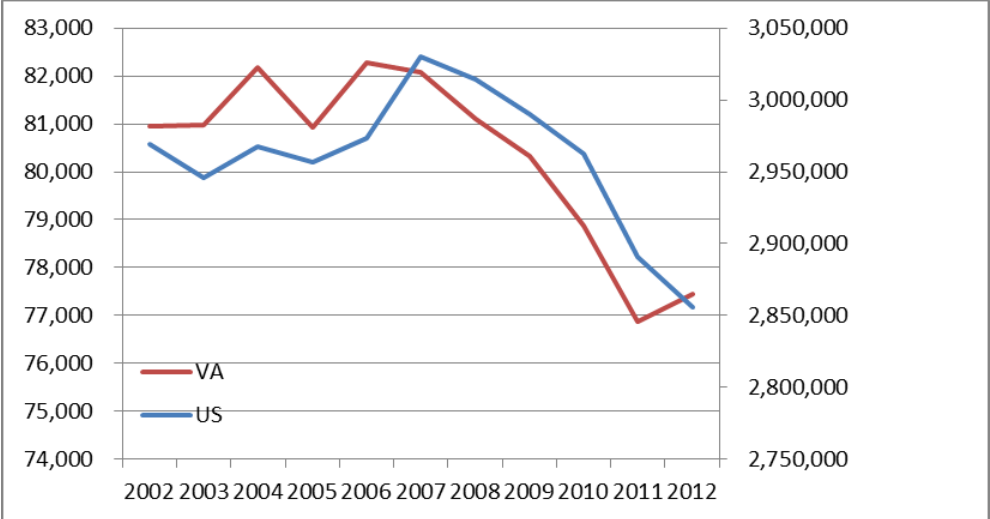
## National Vehicle Miles Traveled (in Millions): Actual versus Projections



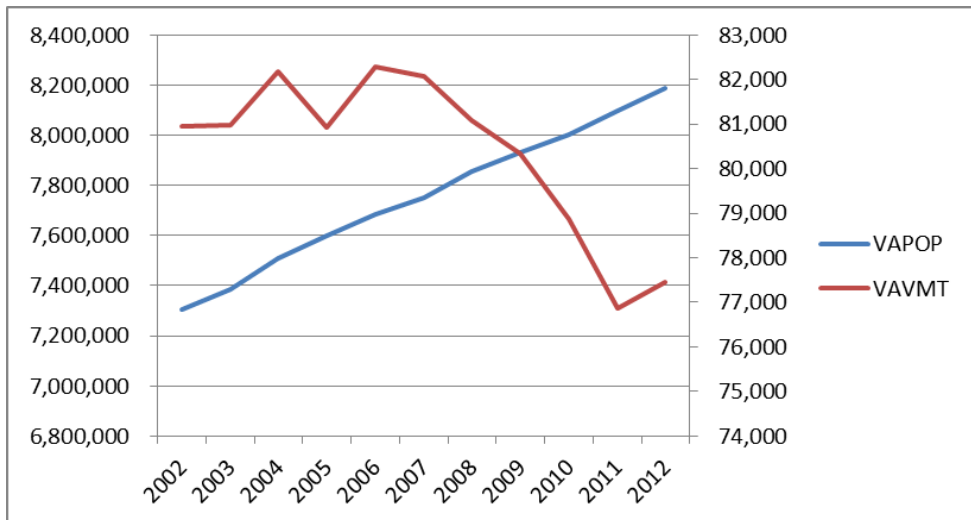
# Travel Behavior is Changing

**WHY IS THIS IMPORTANT?**  
After a turning point, such as decline in VMT, forecasting becomes more challenging

## Aside from Recent Uptick, Virginia VMT Mirrors National Trends



## Virginia Population Increasing while Vehicle Miles Traveled has Declined

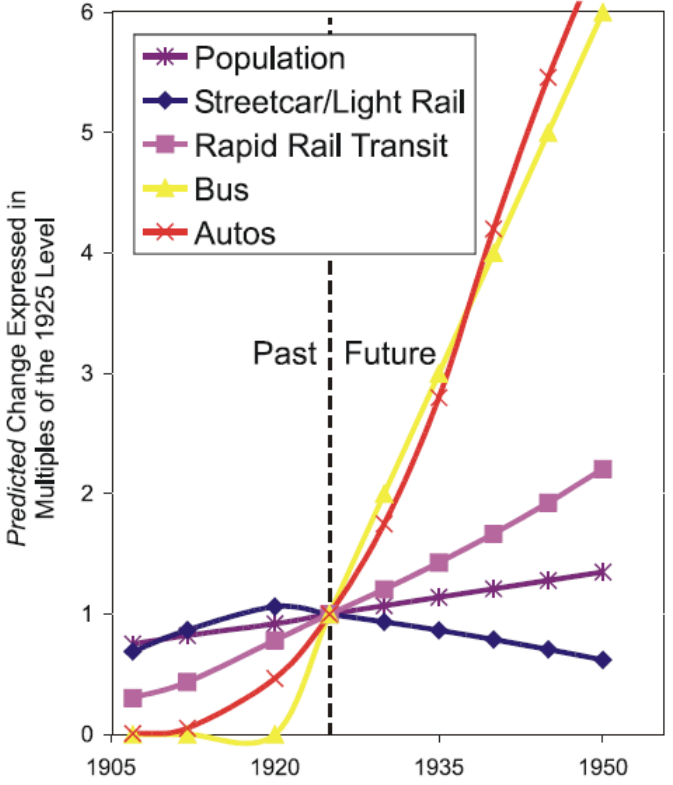
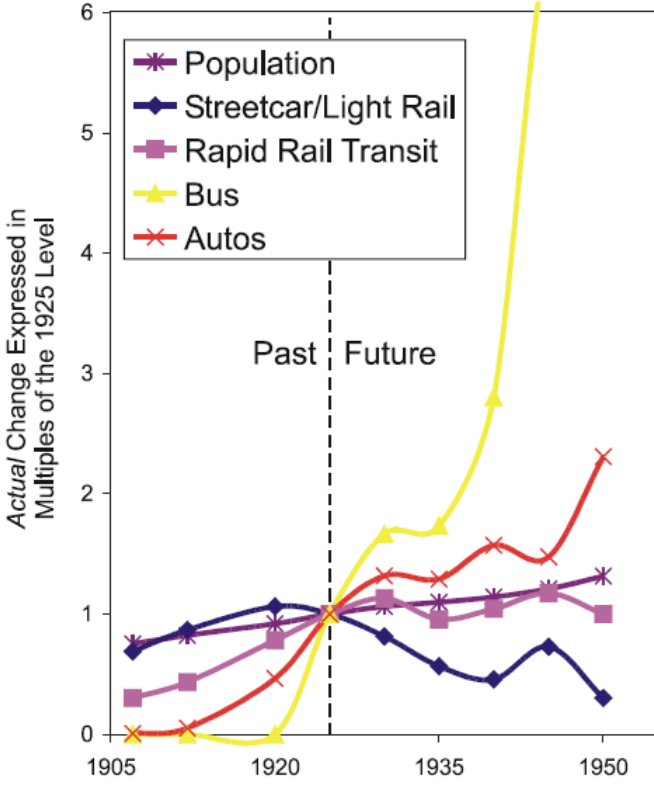


# Past Predictions vs Outcomes

## - 1950

Suppose it is 1925. We make forecasts for 1950. How accurate would we be?

Source: VCTIR



Variable	Accuracy
Demographic trend: population	High—past predicted the present
Behavioral trend: rapid rail ridership	Low— went in the wrong direction
Combination trend: auto ownership	Medium - missed Depression and WWII rationing

# Summary Trend:

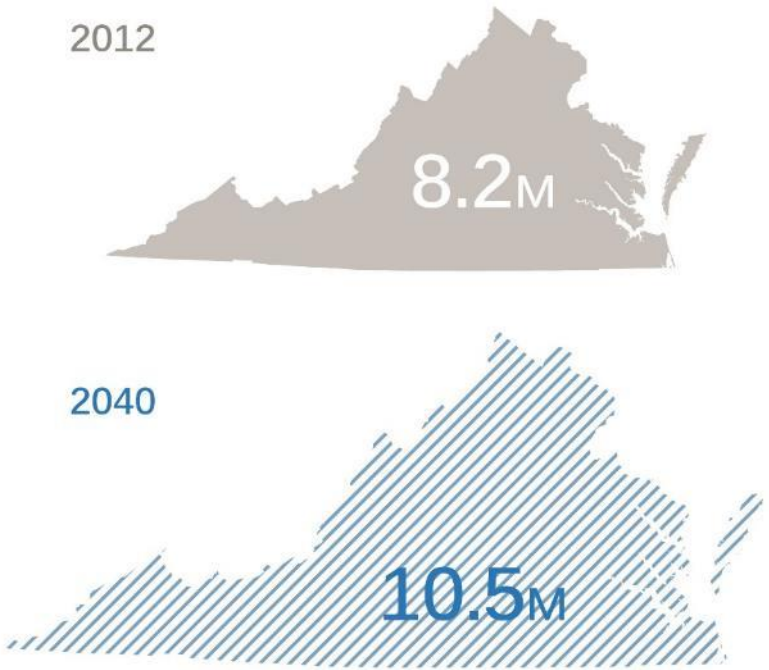


## Population & Demographics



# Virginia's Population is Forecasted to Grow

## Virginia's Projected Population Growth by 2040

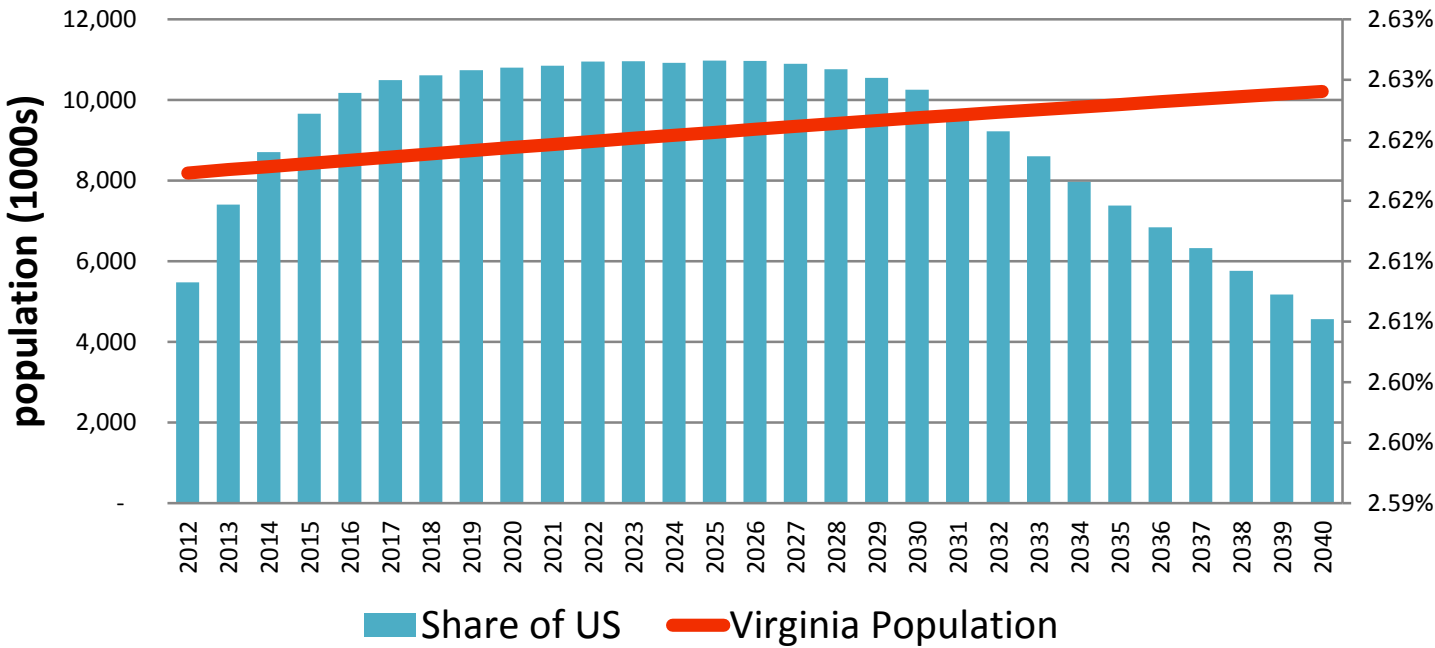


## Projected Population Growth (2040) in US vs. VA



# Annual Growth Rates May Taper Off

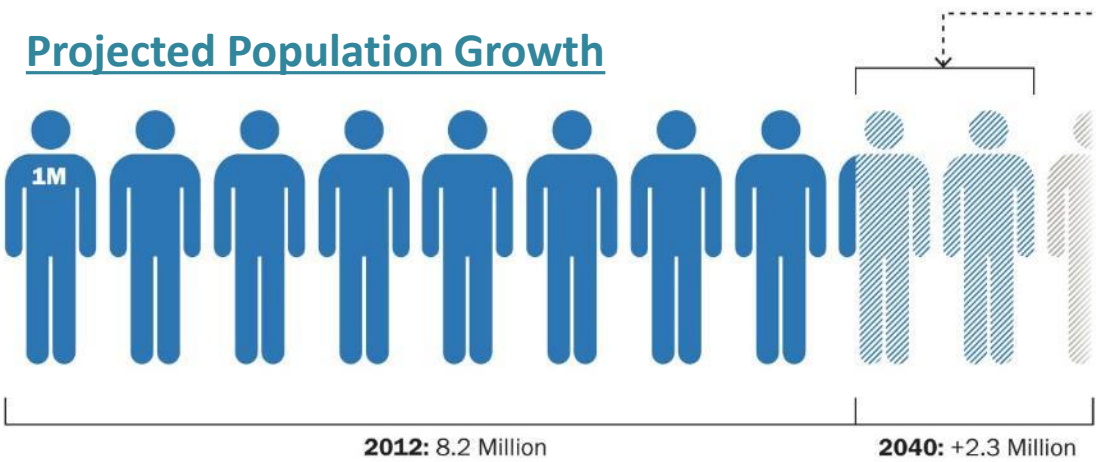
Virginia Population Forecast, Share of US



Moody's and Cambridge Systematics

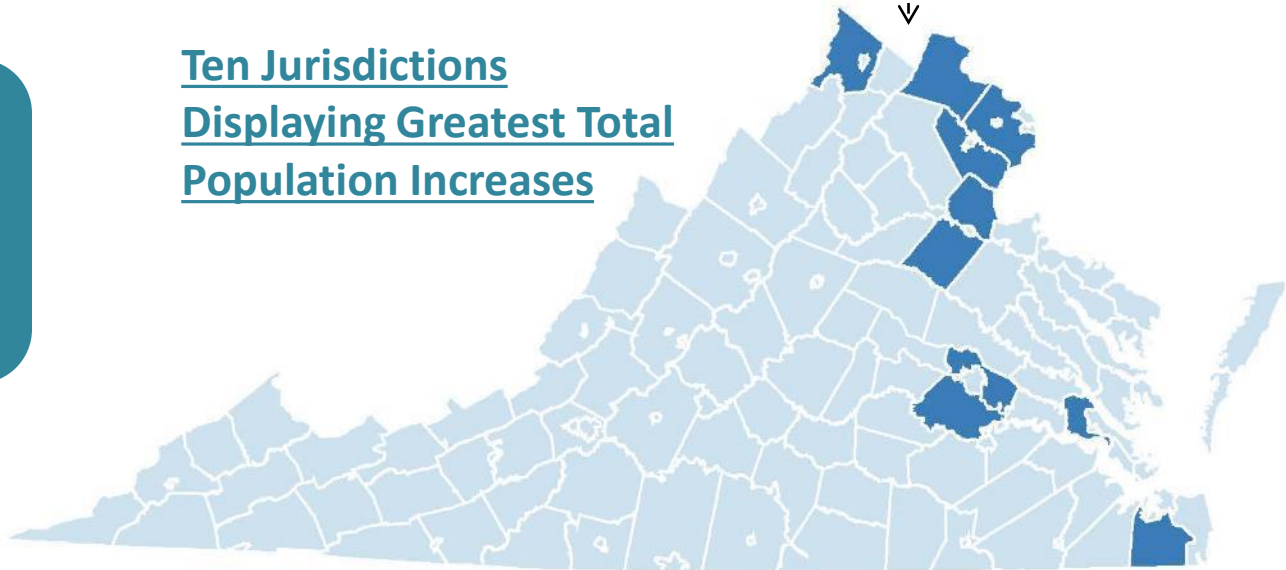
# Continued Population Concentrations

## Projected Population Growth



71% percent of new growth concentrated in ten cities and counties.

## Ten Jurisdictions Displaying Greatest Total Population Increases

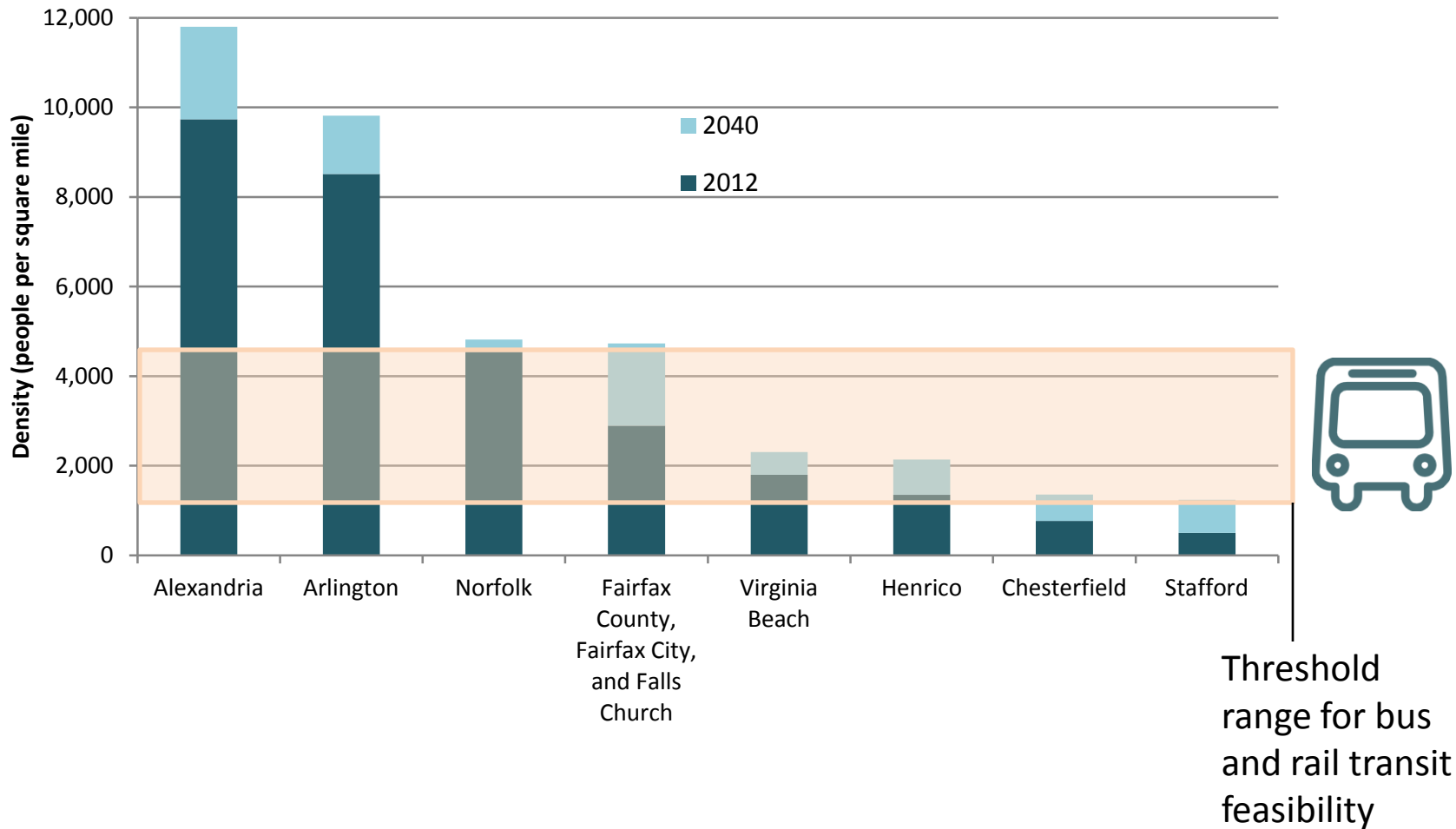


**WHY IS THIS IMPORTANT?**  
To understand where transportation needs will be concentrated



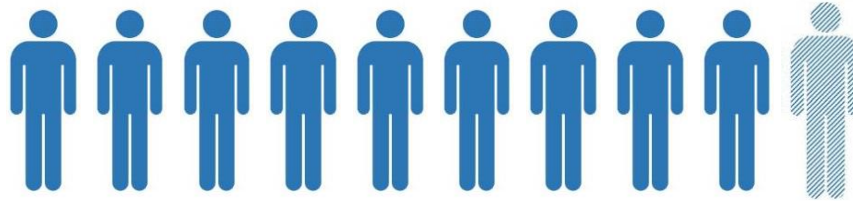
# Population Densities will Rise

More jurisdictions should be within the threshold density range for transit



# Population Growth Will Occur State-wide

Forecasts indicate 85 – 91 percent of Virginia jurisdictions will grow between 2012 and 2040.



## WHY IS THIS IMPORTANT?

Growth dynamics will vary across the Commonwealth

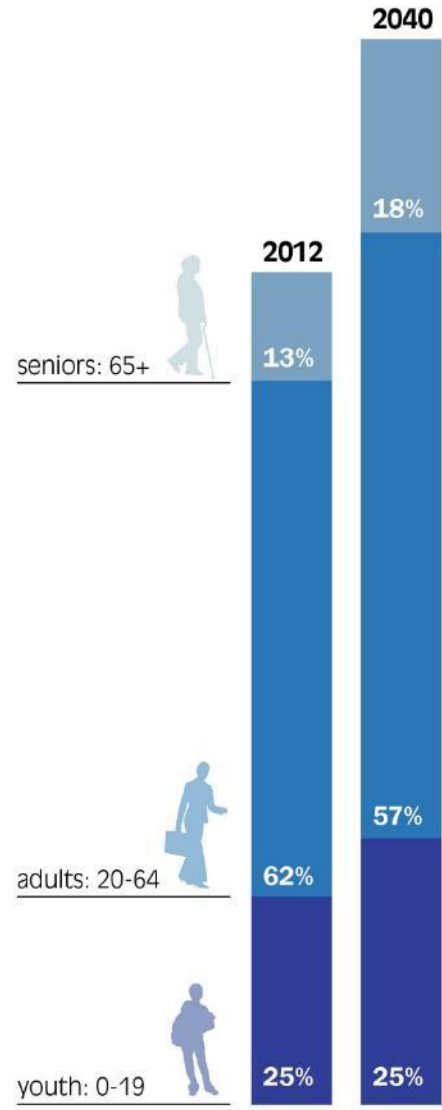
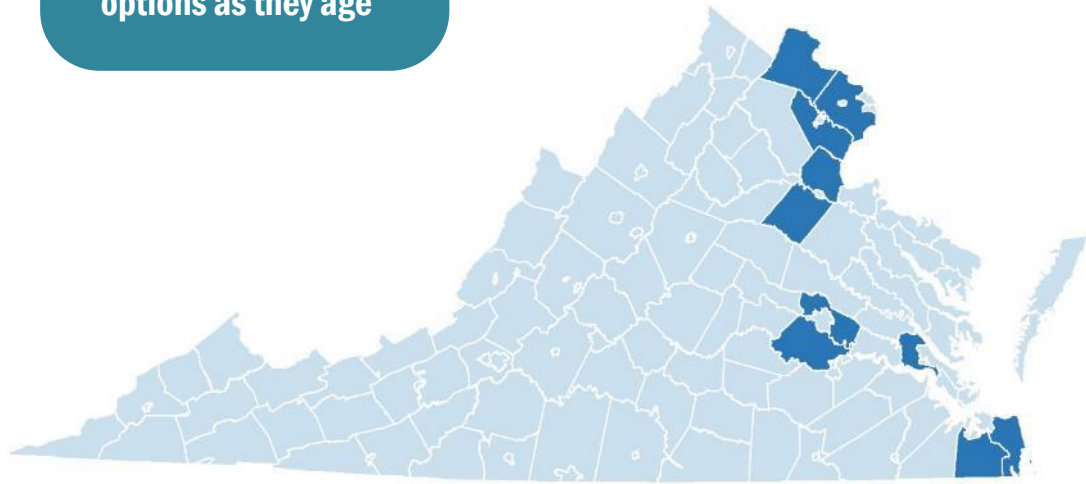


# Virginia is Aging

Older Virginians are an expanding proportion of the population in 2040

**WHY IS THIS IMPORTANT?**  
Some elderly will need more travel options as they age

Ten Jurisdictions Displaying Highest Increases in 65+ Population by 2040

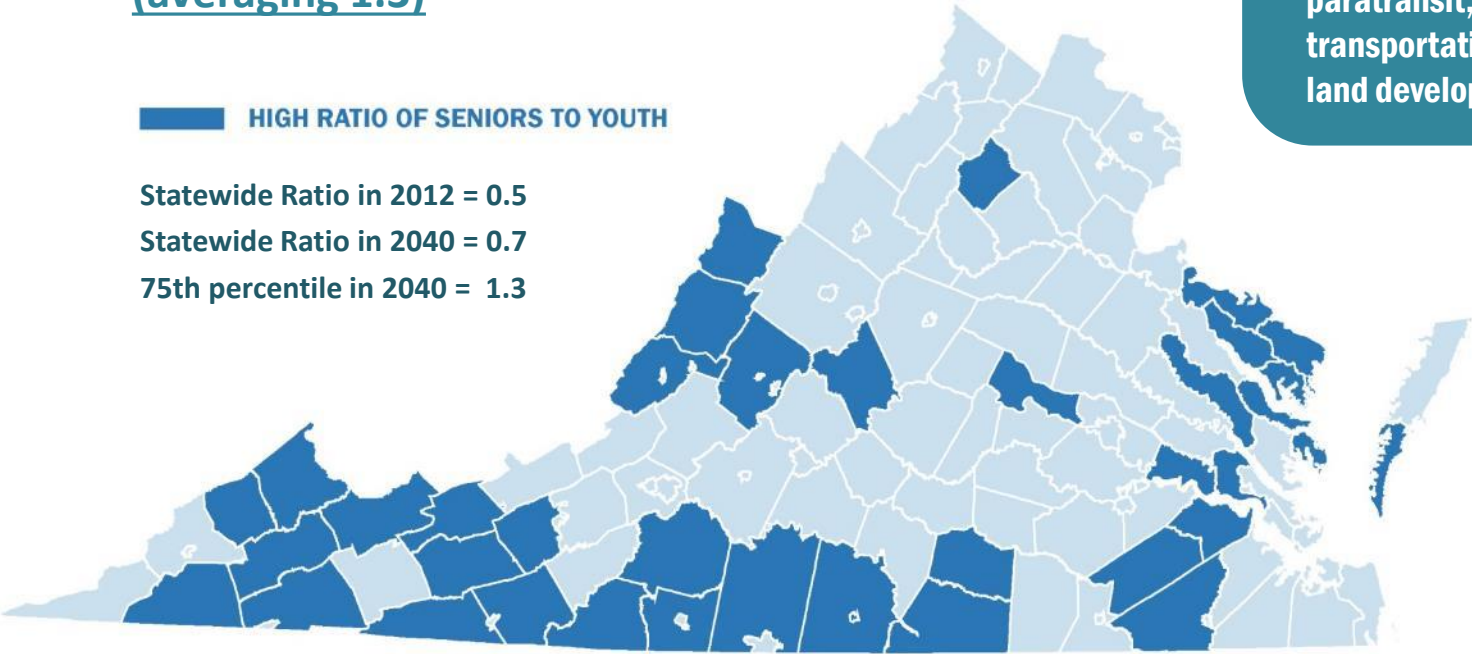


# 2040 Ratio of Seniors to Youth

Top Quartile of Jurisdictions with Highest Seniors to Youth Ratios (averaging 1.3)

 HIGH RATIO OF SENIORS TO YOUTH

Statewide Ratio in 2012 = 0.5  
Statewide Ratio in 2040 = 0.7  
75th percentile in 2040 = 1.3

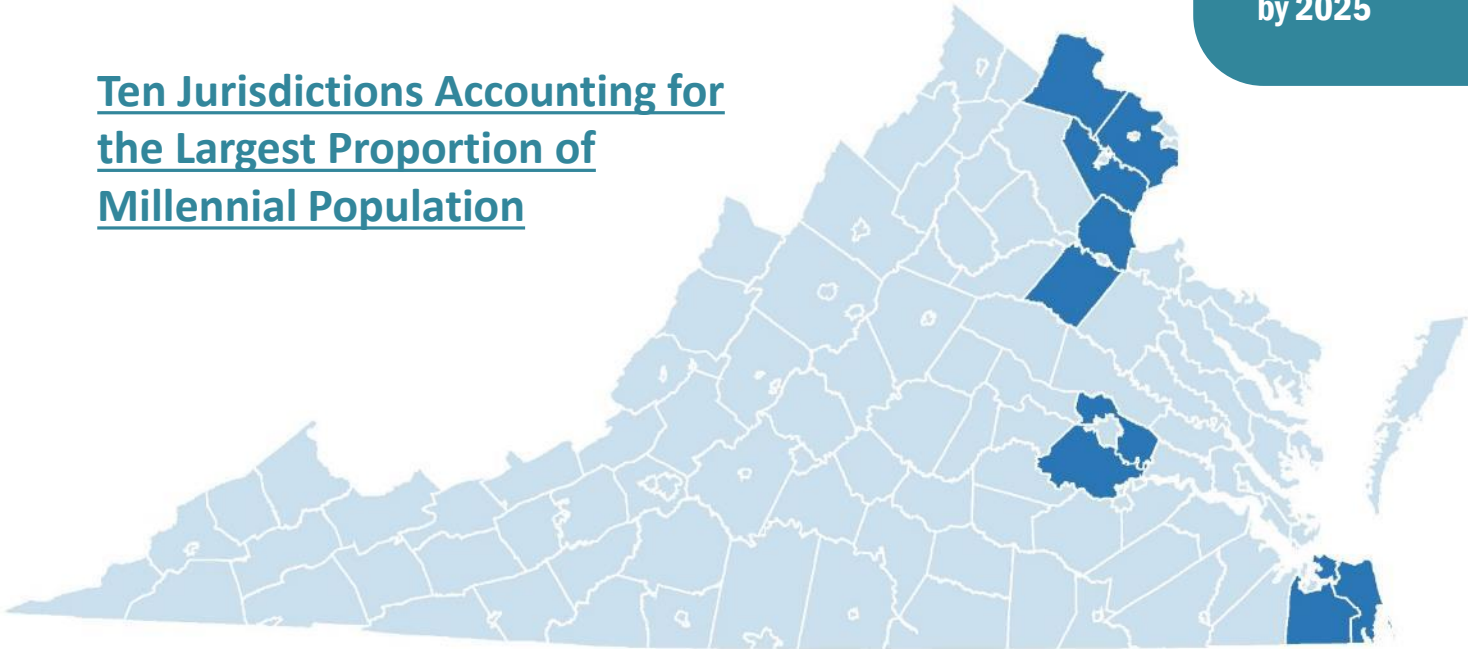


**WHY IS THIS IMPORTANT?**  
This trend has implications for paratransit, school transportation, and land development

# Millennial Population

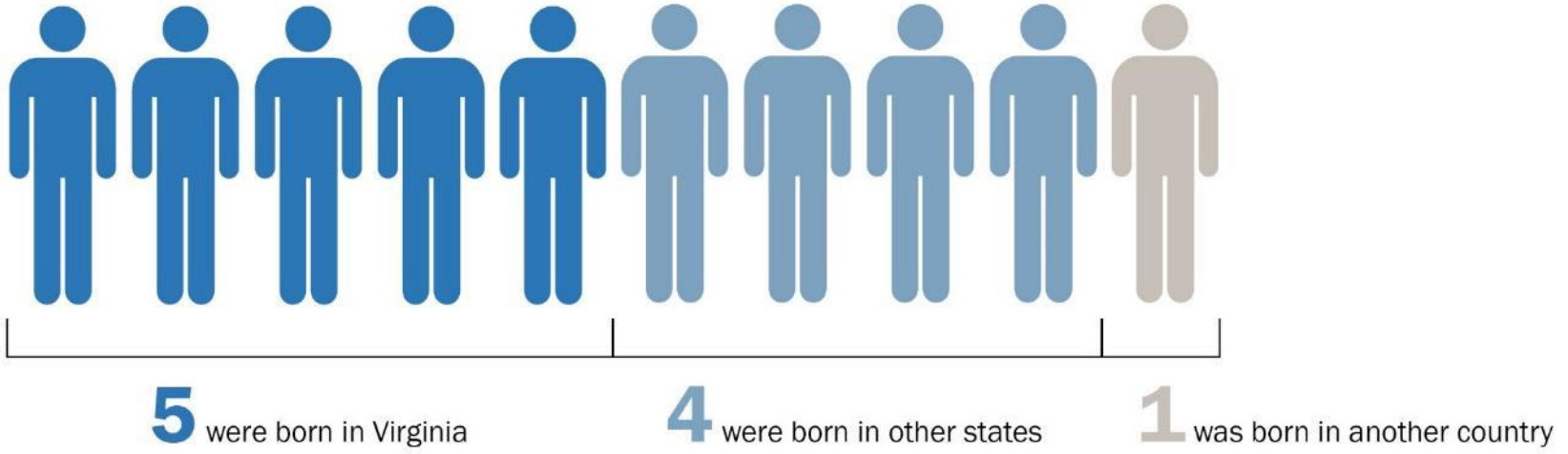
**WHY IS THIS IMPORTANT?**  
Millennials are projected to make up 75% of the workforce by 2025

Ten Jurisdictions Accounting for the Largest Proportion of Millennial Population



# Migration & Immigration

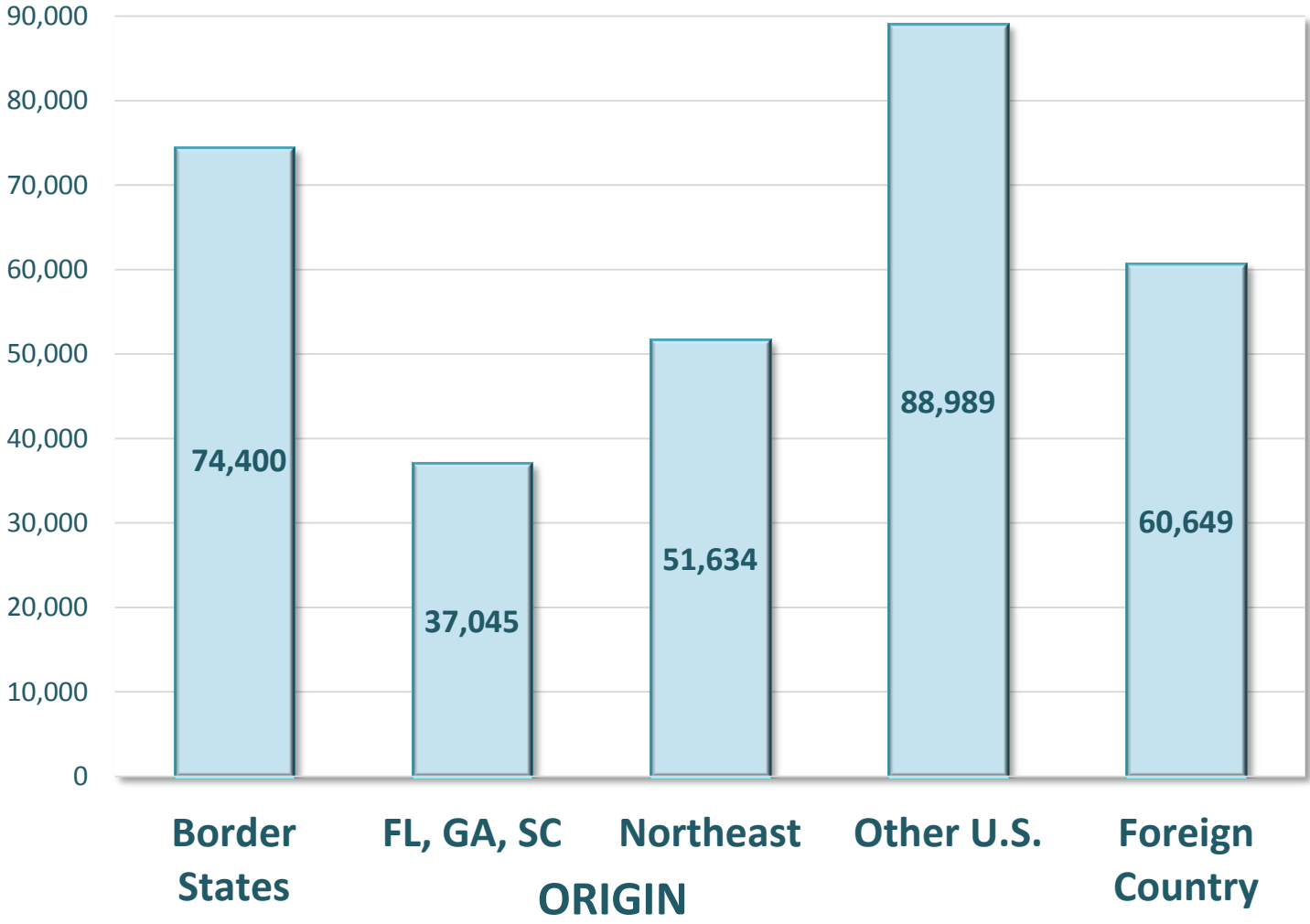
For Every Ten Virginians in 2012:



**WHY IS THIS IMPORTANT?**  
Economic growth depends on attractiveness to migrants / immigrants

# Population Growth Depends on Domestic Migration and International Immigration

MIGRATION INTO VIRGINIA IN THE PAST YEAR





# What do Millennials and Boomers Want?



- We may be able to draw retirees & job-seekers to places with good access.

**81%**  
OF MILLENNIALS

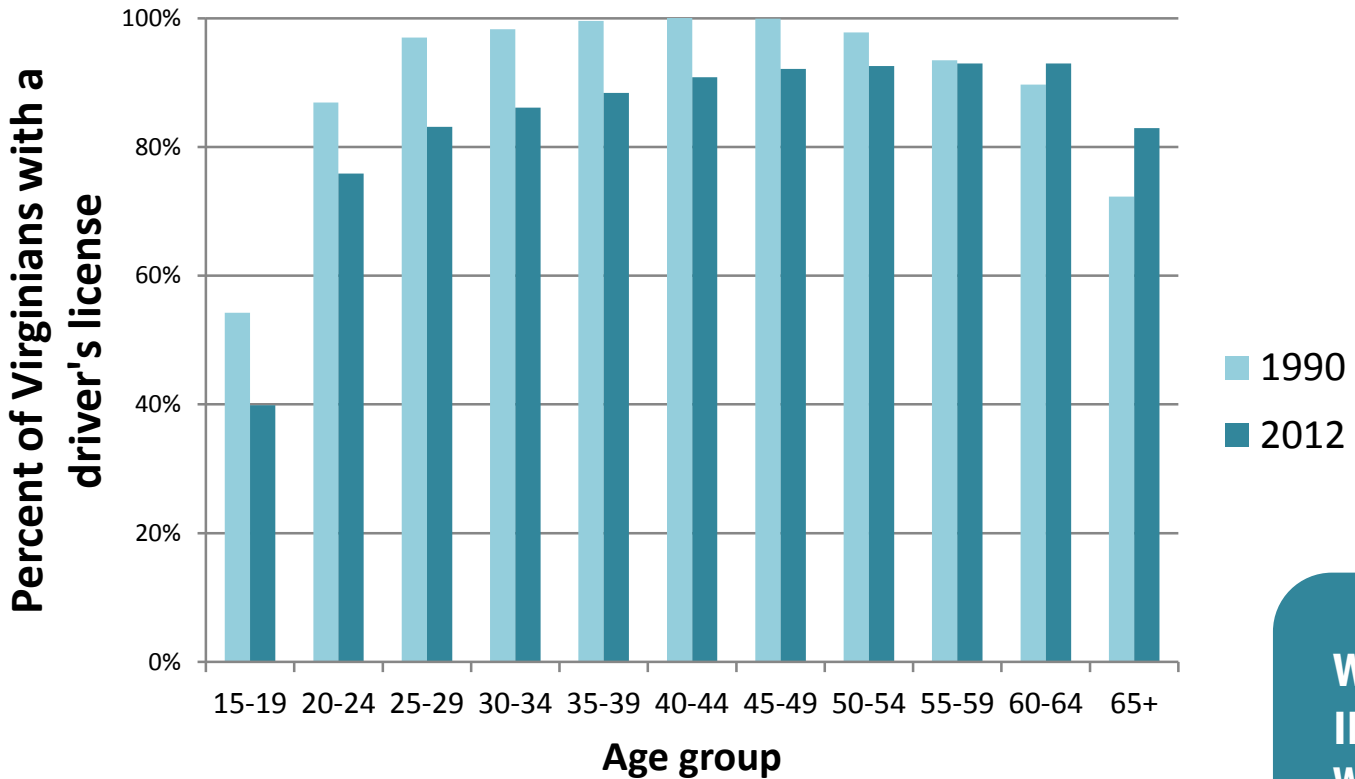
**77%**  
ACTIVE BOOMERS

say affordable and convenient transportation alternatives to the car are at least somewhat important when deciding where to live and work.

Investing in place for economic growth and competitiveness; A Research Summary; May 2014



# Licensure & age groups



**WHY IS THIS IMPORTANT?**  
Will this trend mean fewer drivers in the future?

# Summary Trend:



**SHARED USE MOBILITY &  
SMART INFRASTRUCTURE  
TRENDS**



# Shared Use Mobility

## Because of:

- Congested commutes
- Limited/expensive parking
- Declining car ownership

### WHY IS THIS IMPORTANT?

Technology has made it easier than ever for travelers to access and acquire transportation services



**CAR SHARING**



**RIDE SHARING**



**BIKE SHARING**



**RIDE MATCHING**



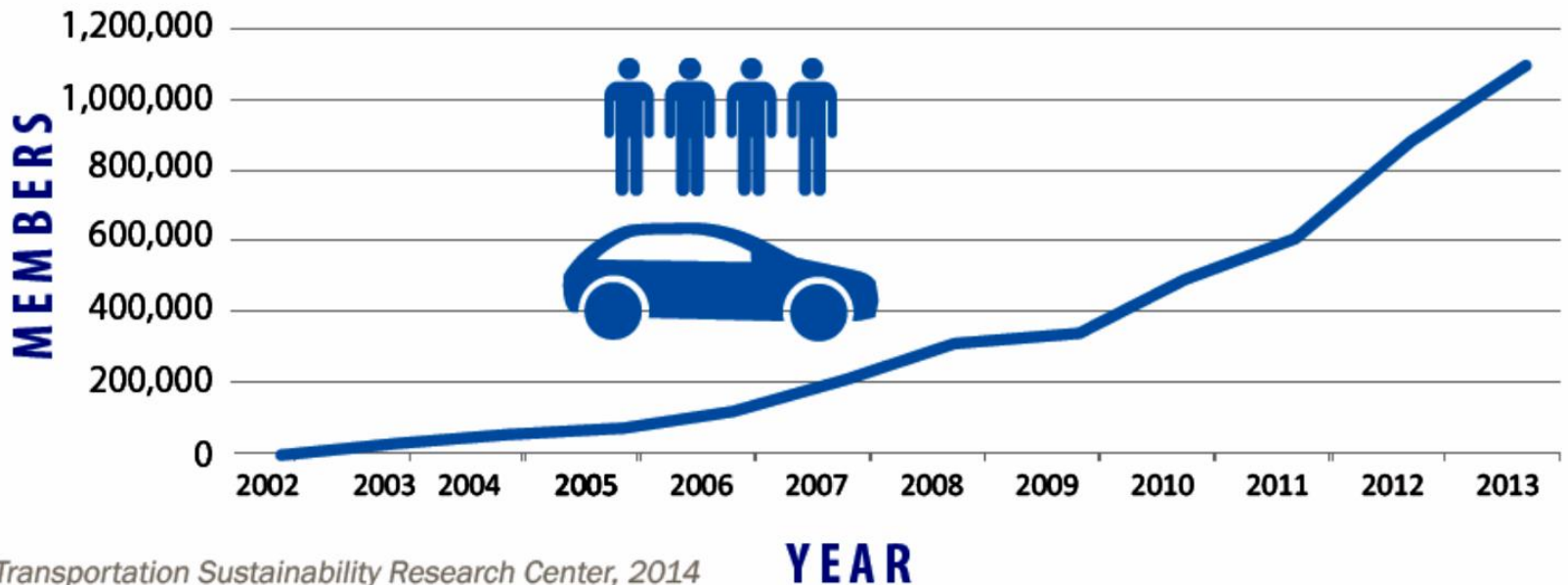
# Shared Use Mobility

## Car Sharing

- Zipcar in Virginia (Virginia Tech & VCU)



**CAR SHARING IN THE U.S 2002 - 2013**



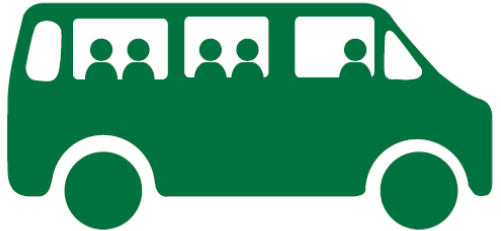
Transportation Sustainability Research Center, 2014

# Shared Use Mobility

## Ride Sharing in the U.S.



**612**  
**CARPOOLING**  
Services



**153**  
**VANPOOLING**  
Services



**127 Services offer**  
**Both CARPOOLING**  
**& VANPOOLING**

**WHY IS THIS IMPORTANT?**  
Ridesharing is an evolving system of services and operators



Source: Transportation Sustainability Research Center, 2014

# Shared Use Mobility

## Vanpooling in Virginia

- 1,000+ vans operating
- 10,000+ commuters daily
- Removes 9,000 vehicles from system daily
- 181,440,000 VMT eliminated annually

### WHY IS THIS IMPORTANT?

Vanpooling provides a significant return on investment to the state



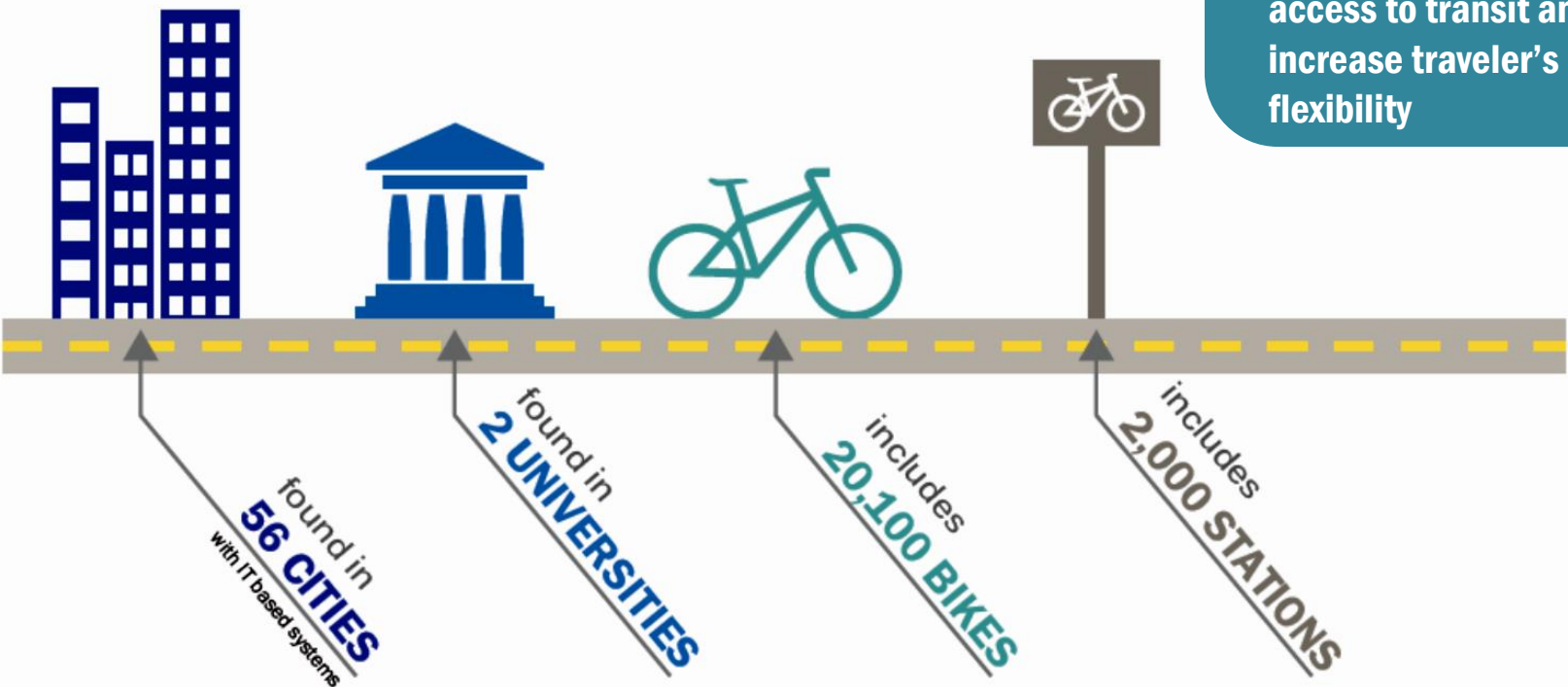
**1,000 VANS  
OPERATING IN  
VIRGINIA**



# Shared Use Mobility

## Bicycle Sharing in the U.S.

**WHY IS THIS IMPORTANT?**  
Bike sharing is a rapidly growing trend that can improve access to transit and increase traveler's flexibility



Transportation Sustainability Research Center, 2014

# Shared Use Mobility

## Ride Matching/Transportation Network Companies

- Ex. SideCar, Uber, & Lyft
- Popular with millennials for short trips
- More research still needed

### WHY IS THIS IMPORTANT?

As these companies become more popular, car ownership may decline with younger drivers.

Side•car  
a whole new way to get around





# Smart Infrastructure

- Information system technologies are used to communicate information to users and operators to make “smarter” use of transport networks

## WHY IS THIS IMPORTANT?

Research now underway on fuel economy, safety, congestion reduction



- **TEST BED ON I-66, I-495 (FAIRFAX)**
- **VIRGINIA SMART ROAD BY VTTI AND VDOT**
- **DYNAMIC PAINT, ANTI-ICING**
- **INNOVATIONS IN ROADWAY MATERIAL**



# Smart Infrastructure

## Crash Avoidance Technology

- In Vehicle Warning Systems
- Vehicle-to-Vehicle Communications
- Vehicle-to-Infrastructure Communications



- **WIRELESS VEHICLE COMMUNICATION**
- **WIRELESS ELECTRIC-CHARGING**



# Smart Infrastructure

## Autonomous Vehicles

- Google's self-driving car
- Major automakers are testing capabilities
- Mass-market by 2022 or 2025
- 75% of all vehicles by 2040



Photo: Google

*Complex questions remain relating to legal, liability, privacy, licensing, security, and insurance regulation (ENO Foundation 2013)*



## Autonomous Vehicle Legislation in U.S.

- Nevada, California and Florida have passed laws approving operation of autonomous cars
- District of Columbia, Hawaii, New Jersey and Oklahoma have bills pending

**Virginia's DMV is currently researching autonomous vehicle policy needs for the Commonwealth**

