



Introduction

The Richmond Strategic Multimodal Transportation Plan is a year-long planning study that will update, revise, and reinvent the transportation plan for the City of Richmond. The philosophy of the plan is based on considering connections and how best to improve them within the city. Transportation can connect people to places, places to activities, and activities back to people. Richmond needs a transportation system that provides those connections – to multiple destinations, to multiple modes, and to multiple land uses within the city. For these reasons, the Richmond Strategic Multimodal Transportation, called “Richmond Connects”, will strive to improve connections throughout the city by improving transportation operations, safety, access, mobility, performance, and overall completeness.

To plan for the future, we need to understand of how the transportation system performs today. This report looks at the existing conditions for the multimodal transportation system within the City of Richmond. The conclusions are based on review of existing performance data and analysis of many of the important transportation studies and initiatives conducted since the last transportation plan was prepared in 1997. Based on this research, several themes emerged, that serve as the major sections of this report:

1. State of the commute – how are people currently commuting in Richmond? What are the current demographics affecting transportation?
2. How is the roadway system performing? Richmond needs an efficient roadway system to continue to be one of the top ten commuting cities in the nation, as identified by Kiplinger in 2010.
3. How effective is transit within the City of Richmond? Transit plays and will continue to play an integral role in providing access and mobility within Richmond and throughout the region.
4. How complete are the streets in Richmond? Richmond needs opportunities for residents to use streets and other facilities for bicycling and walking. Streets need to accommodate multiple modes of transportation.
5. How well does land use integrate with transportation services and facilities? Urban land use and development patterns affect trip-making, vehicle-miles traveled, and the City’s ability to support a sustainable transportation system.
6. How accessible are other regional modal opportunities? Richmond is fortunate to have a downtown and suburban Amtrak station, a major international airport, and a port located either within city limits or in close proximity.

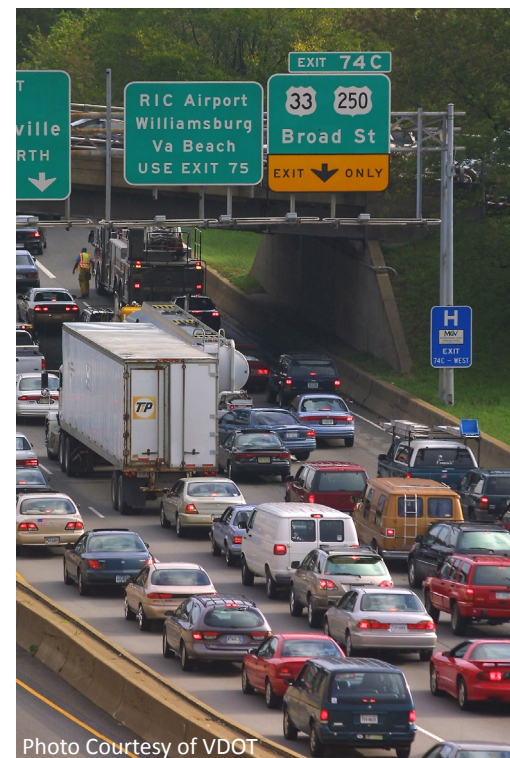


Photo Courtesy of VDOT



These transportation themes are discussed in the six sections that follow.

1: State of the Commute

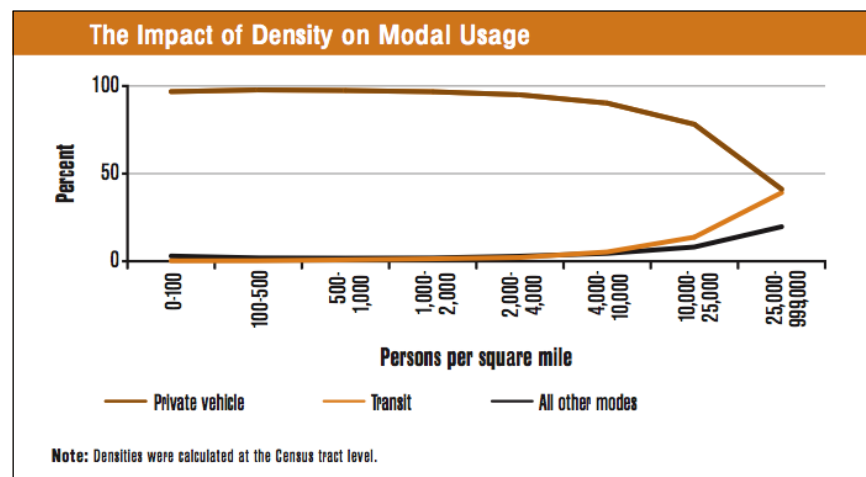
The majority of commuters in the City of Richmond commute to work by driving alone. Based on the existing population and employment densities and the existing transit and roadway infrastructure, this is not unexpected. While there are areas of relatively high population densities, and the employment density in the central business district is relatively high, the level of density and the extent of that density is not strongly supportive of increased transit service. Nevertheless, there are opportunities for increasing the use of alternative forms of transportation. In particular, the proximity of high population and high employment density areas within the zone from downtown to the near west end suggest opportunities for a higher bicycle mode share since these areas are all within a few miles of each other.

Population Density

Population density was calculated using the 2008 Richmond Area Metropolitan Planning Organization's Traffic Analysis Zone Socioeconomic Forecast. The persons per square mile for each Traffic Analysis Zone (TAZ) within the city was calculated and is shown in Figure 1. Densely populated areas are primarily located in the Fan district between Broad Street and the Downtown Expressway (VA 195) and in public housing developments maintained by the Richmond Redevelopment and Housing Authority (RRHA) in eastern Richmond. The population density decreases on the periphery of the city, particularly in south Richmond, where more recent, suburban-style, single-family housing is typical. Low population densities are found in the industrial areas around I-95, the Diamond, and in the downtown core, where high density office space and institutional uses hinders higher population densities. Nevertheless, downtown has seen a nearly 80% increase in population from 2000 to 2010. Comparing the density patterns to patterns of mode share from the Transportation Research Board's *Commuting in America III*, one sees that those areas most amenable to higher transit use are the areas around VCU, Monroe Ward, the Fan and some of the RRHA public housing developments. These areas have population densities greater than 10,000 persons per square mile. Nationwide research indicates a population density of 4,000 persons per square mile is the minimum density needed to see an increase in transit mode shares. Vast swaths of the City's north side, west end and older portions of the south side and east end have densities between 4,000 and 10,000 persons per square mile.

Population densities over 10,000 persons per square mile are highly supportive of alternative transportation modes.

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Source: *Commuting in America III: Third National Report on Commuting Patterns and Trends*, NCHRP Report 550, TCRP Report 110

Figure 1: Population Density in the City of Richmond

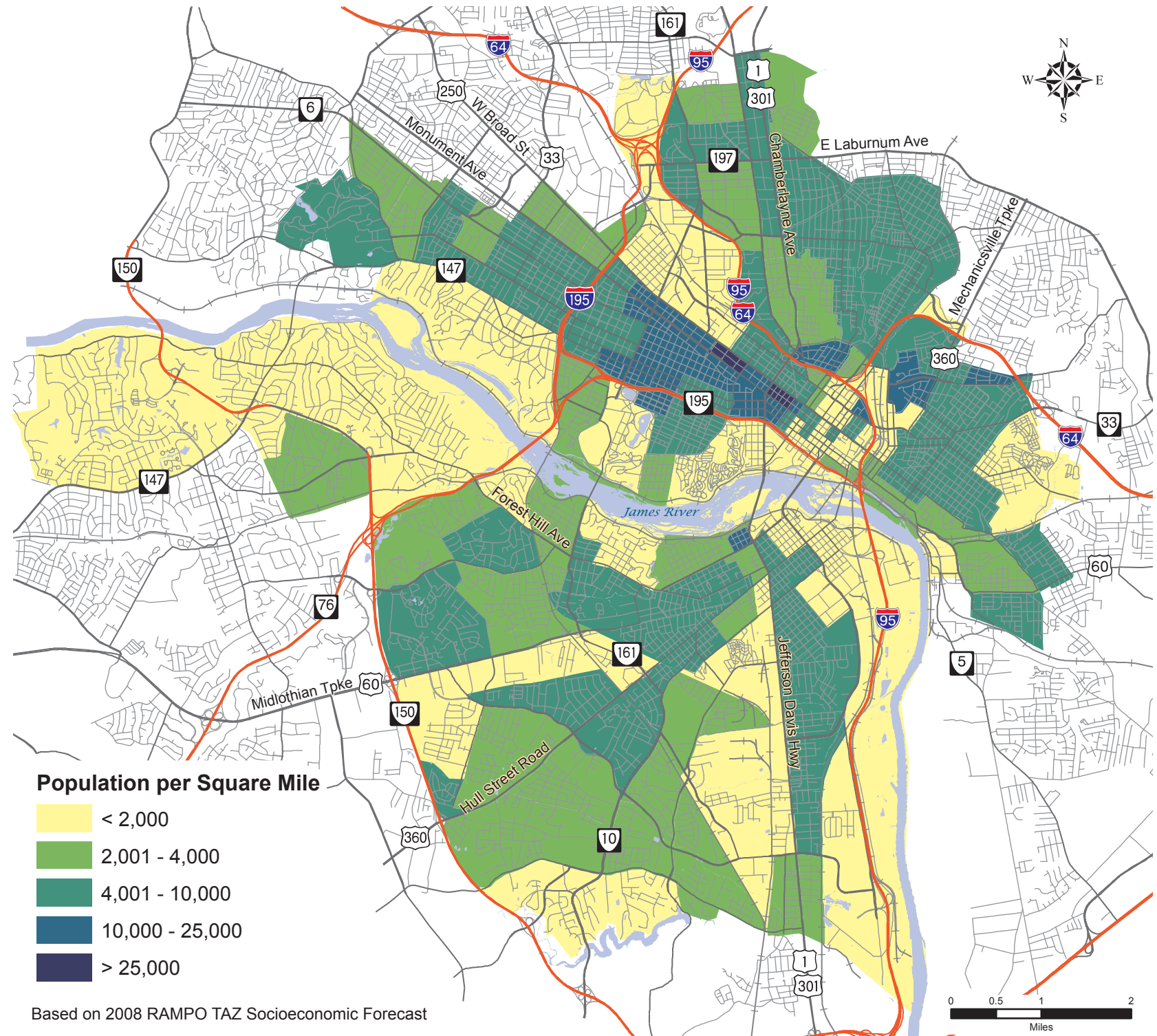
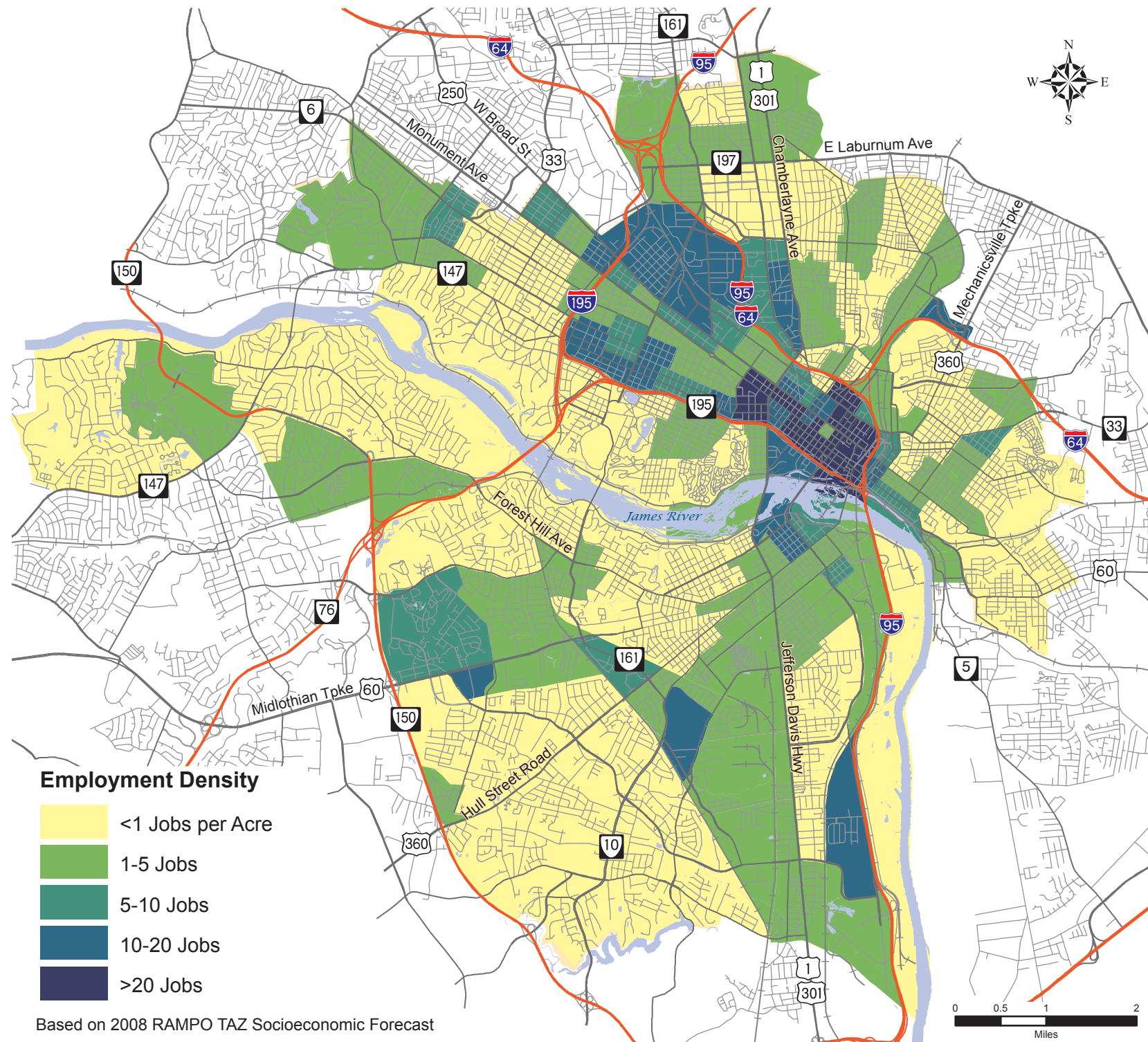


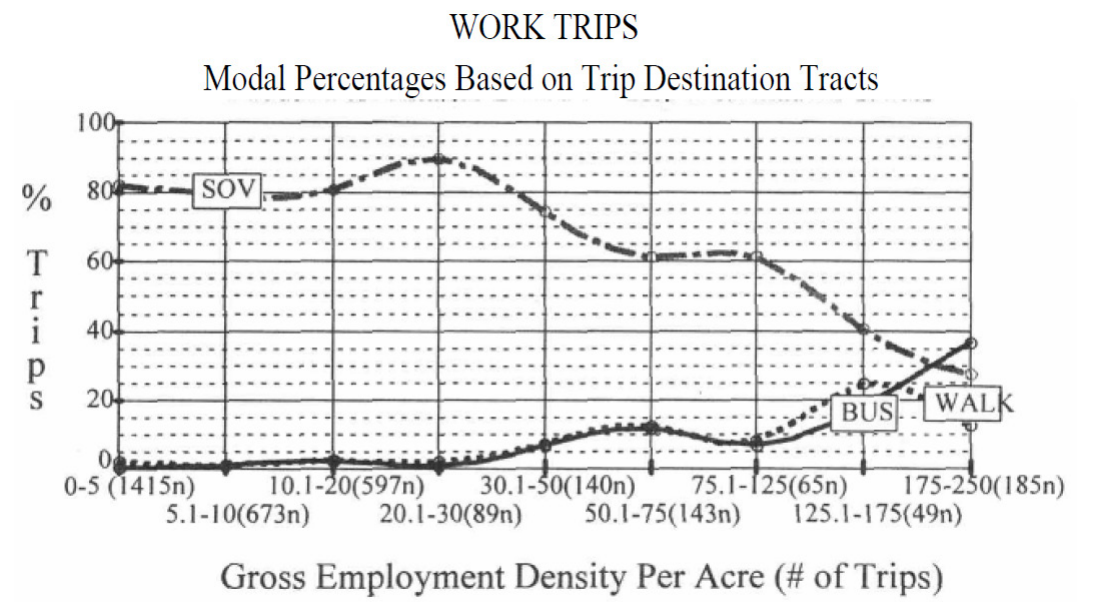
Figure 2: Employment Density in the City of Richmond



Employment Density

To spatially portray the distribution of employment within the City of Richmond, employment density was analyzed by calculating the number of jobs per acre for each Traffic Analysis Zone (TAZ). As seen in Figure 2, TAZs with high employment densities are located in the downtown area between I-95 and Virginia Commonwealth University’s Monroe Park campus. Other areas with relatively high employment densities, in TAZ’s with more than 10 jobs per acre, are also found in the retail areas of Carytown and the Southside Plaza, as well as the industrial sections south of the James River along I-95 and around the Diamond and in Scotts Addition. Conversely, areas with low employment densities are found on the periphery of the city where predominately residential neighborhoods are located. The employment density analysis suggests that downtown is still a major jobs center and the focus for a sizeable portion of commuting trips but there are some significant job densities in certain outlying areas. Research indicates that the percentage of commuting trips by single-occupancy vehicles (SOV) tends to decline rapidly as employment densities increase above 20 jobs per acre. The graph below, from Frank and Pivo, shows that as the gross employment density per acre rises from left to right across the x-axis, the bus and walk percentage of work trips rises and the SOV percentage decreases, with the biggest changes beginning at about 20 jobs per acre.

Downtown is still a major employment center and has densities that can support more alternative transportation modes.



Lawrence Frank and Gary Pivo (1995), "Impacts of Mixed Use and Density on Utilization of Three Modes of Travel: SOV, Transit and Walking," Transportation Research Record 1466, TRB (www.trb.org), pp. 44-55

Jobs-Housing

Figure 3 shows the jobs-to-housing ratio for each traffic analysis zone (TAZ) within the City of Richmond. Jobs-rich TAZs are primarily located within the Central Business District of Richmond and along the I-95 corridor. These are the areas with the greatest number of jobs and the fewest households, thus leading to high jobs-to-housing ratios. Areas with low jobs-to-housing ratios are located in residential sections, on the periphery of the city limits. Research indicates that TAZs with extremely high (>2.0) and low (<0.5) jobs-to-housing ratios often indicate TAZs dominated by a single land use, whereas TAZs with jobs-to-housing ratios around 1.0 typically have a mix of residential and commercial or office land uses. For commuting purposes, an ideal range of jobs-to-households is between 1.0 and 2.0. Areas with a fair jobs-housing ratio are scattered throughout the city. These areas are primarily located along Jefferson Davis Highway and Forest Hill Avenue, the Downtown Expressway and I-95, and along West Broad Street around the I-95/Belvidere Street interchange.

Most areas of Richmond are either housing-rich or jobs-rich but only a few areas have a balance of both.

Means of Transportation to Work

While the City of Richmond does have a multimodal transportation system already in place, the single occupancy vehicle remains the overwhelming means of transportation within the city. Based on the means of transportation to work data included in the American Community Survey, about 71% of workers drive alone to work, 12% carpool, and 13% use alternative means such as walking, cycling, or public transportation. While non-automobile alternatives exist, much of Richmond's transportation system is still dominated by the automobile.

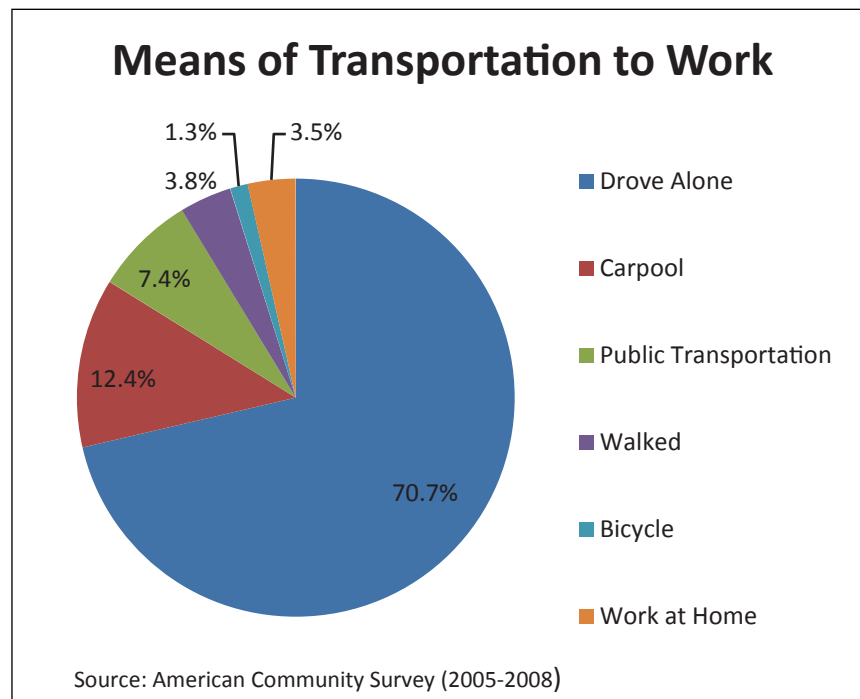


Figure 3: Jobs Housing Balance in the City of Richmond

