



SUSTAINABLE COMMUNITIES

Building for the Future of the
Greater Richmond Region





The Southern Environmental Law Center is a nonprofit organization dedicated to protecting the natural areas and resources of the South. SELC works with more than 100 local, state, and national groups, providing legal and policy expertise on issues relating to transportation and land use, air and water quality, forests, coasts and wetlands.

SELC's Land and Community Program promotes smarter growth, sensible transportation choices, community revitalization, and open space conservation.

This report was developed and released in collaboration with the Partnership for Housing Affordability.

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Southern Environmental Law Center

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Overview

Rapid growth has brought many benefits to the Greater Richmond Region, but the sprawling, auto-dependent pattern of most recent development carries a high price tag for taxpayers, our environment, and our communities.

Businesses, citizens, and political leaders increasingly recognize the need to adopt a less costly, more environmentally sound approach to development. This recognition is being fueled by the convergence of a number of major trends, including:

- Demographic changes, such as the shifting composition of households, with an increase in younger households, empty nesters, and seniors.

- Rapid land development. If recent rates continue, more land will be developed in the region in the next 20 years than in the previous 400.
- Declining vitality of certain corridors and neighborhoods in suburban areas.
- People in the region driving over 30 million miles daily, traveling roughly the distance to the sun every three days. The region has the highest driving rate of any major metro area in Virginia.
- The rising cost of housing and transportation.
- Changing individual and business needs and preferences.



There is a growing awareness of the unintended consequences of current transportation and land use patterns. These problems include the high cost of serving sprawling development, increased congestion, greater energy consumption and vulnerability to rising and volatile fuel prices, rising greenhouse gas emissions, and air and water pollution.

The current economic and budget crises and the real estate slump underscore the need to reorient our approach to growth.



Better alternatives are available. A more sustainable development approach emphasizes well-designed mixed use, walkable communities that better integrate where we live, work, and shop, reducing the need to drive everywhere. This approach places a premium on guiding development to designated areas and on infill, redevelopment, and revitalization. It is also important to offer a range of housing styles, sizes,

Before and after: potential transformation of Marshall Street

and prices to meet the various needs and preferences of people, including families, single people, older adults, and the disabled. Other key elements of more sustainable communities include providing a greater range of transportation alternatives, promoting development closer to mass transit, and protecting farms, forests, and natural and historic resources. In addition, green building techniques improve energy and resource efficiency and thus significantly reduce the environmental and health impacts of buildings while cutting utility bills, making housing more affordable in the long run.

Sustainable development is essential to addressing the challenges of growth. It offers a way to reduce infrastructure costs and to promote thriving and diverse communities. If we grow wisely we can better manage our energy consumption, provide a healthier environment, and enhance our quality of life, as well as the economic competitiveness of the region.

There are abundant opportunities to promote sustainable communities. Government incentives and regulations have an enormous impact on development and transportation decisions and patterns, so changes to regulations and investments are a key to implementing an alternative approach. Potential policies include:

- Reducing regulatory barriers to developments with a mixture of residential and commercial uses and to traditional neighborhoods.
- Promoting infill development, the revitalization of existing communities, and the redevelopment of declining or abandoned commercial areas.
- Planning and incentives to guide new development to designated growth areas and to protect rural and natural areas.
- Incentives and funding to advance greener building so that new and existing structures are healthier, cleaner, and more energy efficient.
- Providing greater transportation choices by redirecting investments at the state, regional, and local level to promote alternatives to driving.

There also are abundant opportunities on the ground to promote sustainable development. Under-utilized and declining corridors and neighborhoods in the city as well as the suburbs provide particularly attractive opportunities for infill and revitalization that are linked to existing infrastructure.

Some important policy changes, projects, and other significant steps have been taken in recent years in

the Greater Richmond Region—and more are under way—that advance a new approach to development. Much more is needed.

This report is organized into three sections. It examines the major trends spurring a new approach to development, the benefits of sustainable communities, and policy steps to advance more sustainable growth.

We have an important window of opportunity to work together to develop a coherent and compelling vision for how and where we want growth to occur in our region, and to begin to take the steps necessary to implement that vision. We must take the steps needed to advance sustainable development so that our communities and our region can thrive and prosper in the future.

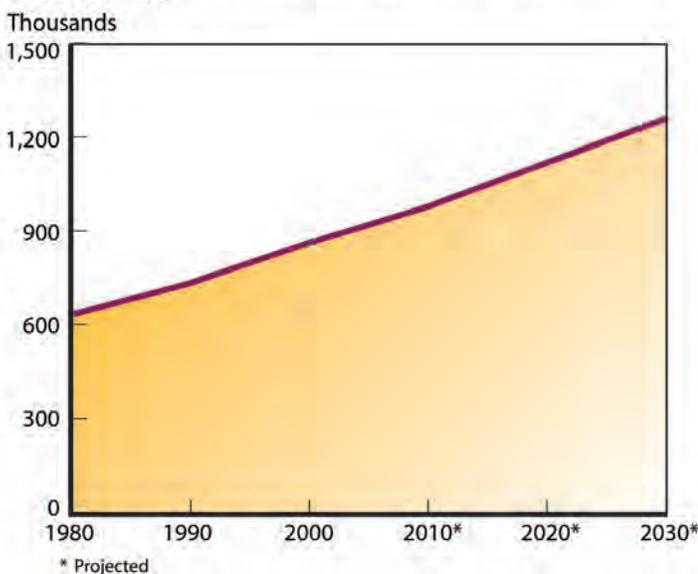
Momentum for a New Approach to Development

Key trends and changes are converging to spur support for more sustainable development among businesses, citizens, and localities in the Greater Richmond Region.¹ Growing awareness of the unintended consequences of current transportation and development patterns is also generating momentum for change. This section examines some of these significant shifts.

Changing Demographics

Population in the Greater Richmond Region has risen rapidly and is projected to continue to increase at a significant pace in coming decades.² The region's population rose by 126,206 people in the 1990s, a 17% increase that outpaced Virginia's growth rate of 14.4% and the national increase of 13.2%.³ Recent estimates show that over 116,000 more people were added between 2000 and 2009, bringing the total population to over 982,000.⁴ Looking forward, population in the region is projected to increase by about 12% each decade between 2010 and 2030, adding about 262,000 people to the region.⁵

Greater Richmond Region Population Growth (1980-2030)



Source: U.S. Census Bureau; Virginia Employment Commission

The number of households in the region has risen by an even higher percentage, since average household size has been declining. Even if average household sizes remain the same, the region would need over 150,000

new housing units between 2000 and 2030 to meet projected population growth in the Greater Richmond Region. Another estimate concluded that almost twice as many units will be needed by 2030 for the larger metropolitan area.⁶

This development cannot simply take the same form as in recent decades. For one thing, the composition of households is becoming more diverse. The share of households with married couples and married couples with children has declined, while family structures with no spouse present and non-family households (mainly people living alone) are rising. Moreover, the generational composition of the region is changing, and the fastest growing age groups for the next two decades will be young adults of the Generation Y or “echo boomer” generation (ages 20-34) and empty nesters and seniors (ages 55+) as the baby boomer generation gets older. The only major segment of the population that is declining is the middle age bracket (35-54), which was the fastest growing group in the past two decades and drove much of the housing demand.

Sprawling Development and Declining Areas

The dominant land development pattern in recent decades has been sprawling, low density growth, with residential and commercial activities segregated and increasingly located beyond existing communities. This pattern is a dramatic shift away from the pre-World War II patterns of relatively compact cities and towns with a variety of neighborhoods and greater mixing of land uses.

One consequence of this shift is that the Richmond region has had the highest rate of land conversion of any major metro area in Virginia. The U.S. Department of Agriculture estimates that 58,800 acres were developed in the region between 1992 and 1997—an area over 1.5 times the size of the City of Richmond—more land than was developed in either Northern Virginia or Hampton Roads.⁷ If land continues to be developed at that rate, more land would be developed in the next 20 years than in the previous 400 years.



Although population growth is a factor driving increased development, the rate of land conversion has increased much faster than population. The amount of land developed increased by over 30% between 1992 and 1997 in the Richmond region, although the region's population rose by just under 8% during that time.¹¹

Rapid, sprawling development has resulted in disinvestment in some existing areas, and is one of the factors that has led to the decline of a number of commercial and residential areas in the city, and increasingly, the inner-ring suburbs. For example, once vital shopping centers that benefitted from the initial decentralization of commercial activities in the region are now shuttered or ailing as development has moved farther out.

Land development has continued at a rapid rate since 1997, at least until the recent economic downturn. In Chesterfield alone, approximately 21,500 acres were developed between 2000 and 2008.⁸

Other analyses reflecting the rate of development in the region have focused on impervious surfaces—hard areas such as roads and rooftops. Impervious surfaces in Chesterfield County increased by over 90% between 1992 and 2001, and by 67% in Henrico during that period.⁹

Another indicator of the continued rapid growth in the region is the rate of farmland loss. The amount of land in farms in Powhatan County declined by 45% in just five years between 2002 and 2007, while the amount of farmland in Henrico dropped almost 30% during that time.¹⁰

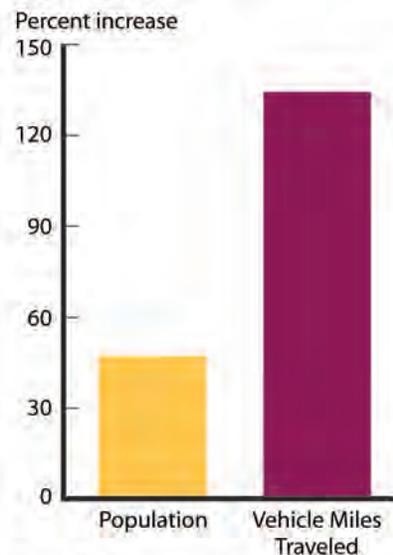
Driving and Alternatives

Since homes and businesses have spread farther apart and transportation tax dollars have been invested heavily in road projects, people in the Greater Richmond Region often are now left with little choice but to drive—and to drive longer distances—to get to work, to shop, or to engage in other activities.

The region has the highest driving rate in Virginia. People in the urbanized area drove an average of 28.2 miles per person per day in 2008, compared to



**Population and Miles Traveled:
Richmond Urbanized Area
(1987-2007)**



Source: Texas Transportation Institute

23.7 miles in Northern Virginia and 24 miles in Hampton Roads.¹² The total amount people drive in the Greater Richmond Region is over 30.4 million miles daily,¹³ which is the equivalent of traveling roughly the distance to the sun every three days.

The amount of driving has increased much faster than population. As shown in the chart on the previous page, between 1987 and 2007 the total number of vehicle miles traveled in the urban area increased by more than 134%, almost three times the rate population rose during that time.¹⁴

Given the increase in population, sprawl, and driving, it is not surprising that traffic congestion and time spent driving are rising as well. Over 10.2 million hours were lost to travel delay in 2007, a 277% increase since 1987.

Momentum for more sustainable development patterns is also coming from recent investment and interest in transportation alternatives. After years of decline, transit ridership in the Richmond area has increased recently, with the number of total passenger miles of travel on transit rising by 35% between 2000 and 2007.¹⁵ Funding cuts due to current budget pressures have led to proposed service reductions and fare increases that may temporarily reverse this trend despite increasing public demand. In contrast, funding has increased recently for passenger rail service, and there is growing interest in high-speed rail connecting the region to other metro areas.

Fiscal and Economic Impacts

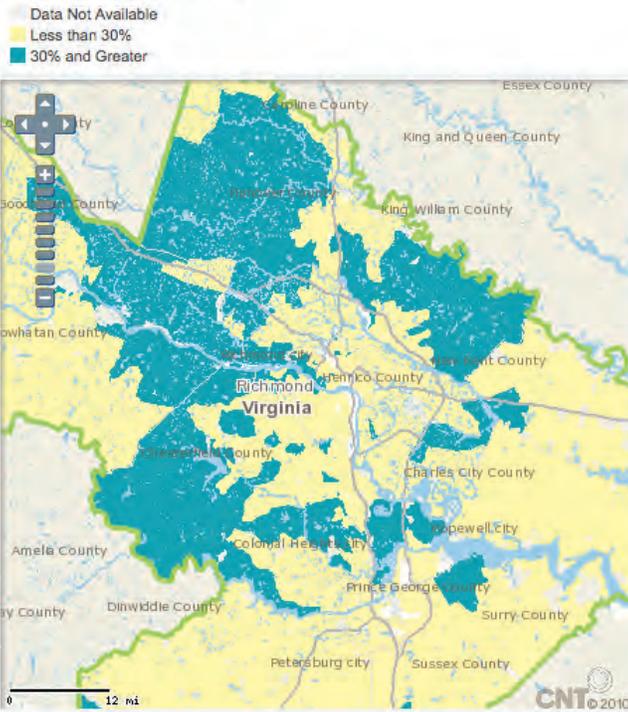
Localities have increasingly recognized that sprawl can be a significant drain on local budgets. For example, it has been estimated that it would cost \$5.7 billion to serve the new development allowed under Chesterfield County's comprehensive plan.¹⁶ Although proposed developments are often justified by promises of tax revenues they will generate, growth may not pay for itself and must be subsidized by higher tax rates, higher debt, or both. While new development does produce tax revenues, it often does not generate enough revenue to pay for water and sewer lines, roads, schools, and other infrastructure and services it requires. Sprawl costs taxpayers further since infrastructure taxpayers have already paid to build may be underused or abandoned as development moves farther out.



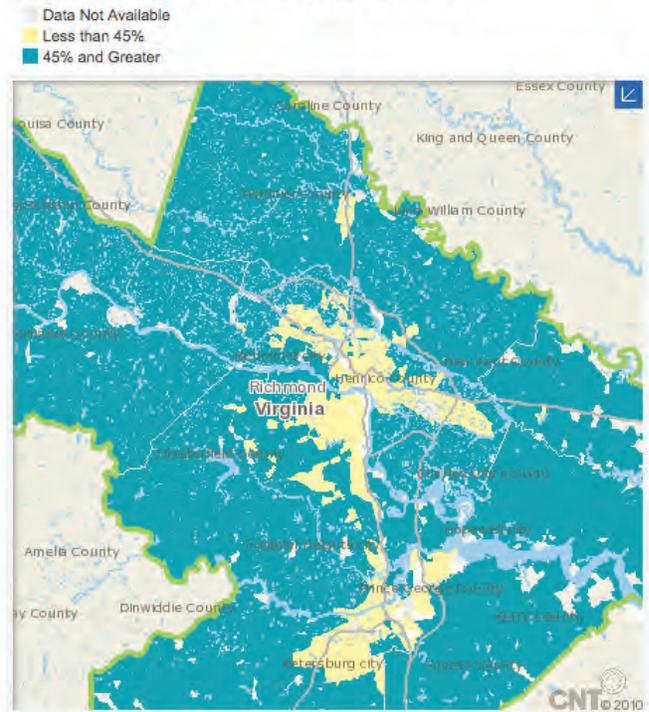
The financial impacts of current trends on individuals are also significant. A little over half of all spending by households in the South is for housing and transportation.¹⁷ In the Greater Richmond Region, there is a shortage of affordable housing. Although house prices have declined during the recent economic downturn, prices escalated much more rapidly through much of the past decade, incomes have not kept pace with rising house prices, and credit is tighter today. In 2000, approximately 36% of renters and 19% of owners had housing cost burdens that exceeded the amount typically deemed affordable, and it appears those figures have risen since then. Moving farther out to seek affordable housing often leads to higher transportation costs that eat up any savings on housing, and transportation costs tend to be higher in sprawling areas.¹⁸ (See maps on the next page.)

The economic impacts of current development patterns are also significant. Sprawl, traffic, and a lack of

Housing Costs - % Income



Housing and Transportation Costs - % Income



The affordability of a location changes when transportation as well as housing costs are considered

affordable housing can harm the economic competitiveness of localities and the region as a whole by making it harder to attract and expand businesses and to attract and retain talented employees. The cost of congestion is estimated to be \$202 million a year.¹⁹ And as Jim Dunn, former president and CEO of the Greater Richmond Chamber of Commerce noted, “affordable housing is a business issue and a quality-of-life issue.”²⁰ One national report concluded that business leaders “are recognizing that quality of life directly affects economic prosperity, and that sprawl threatens the quality of life for many communities.”²¹

In addition, the rise in driving is accompanied by increasing energy consumption, which takes money out of the local economy and makes the economy and households vulnerable to rising and volatile fuel prices. The dominant pattern of motor vehicle-dependent, sprawling development emerged and expanded during a time of relatively inexpensive and readily-

available fossil fuels. Increasing fuel costs and questions about the availability of energy supplies in the future are making energy efficiency a greater factor in development, housing, and transportation decisions.

Environmental Impacts

The loss of forests, open space, and wildlife habitat from the rapid rise in land developed is just part of the substantial environmental damage caused by the region’s growth patterns. In fact, development and

transportation are a primary cause of virtually every pressing environmental problem in the region.

Water quality suffers as buildings, roads, and parking lots replace forests, farms, and wetlands that would otherwise filter water. The increase in pavement, rooftops, and other impervious surfaces can also increase erosion, flooding, and polluted stormwater

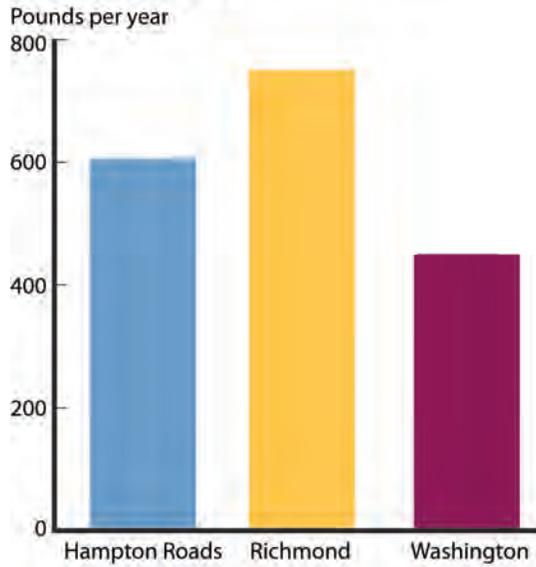


runoff. And land cleared for development and roads can increase sediment deposited in rivers and streams. In just one week in 2002, rainfall washed 1.4 million pounds of sediment and 400 pounds of phosphorous off of Route 288 construction sites into the Swift Creek Reservoir—a primary drinking water source for Chesterfield County.²²

Air pollution results from the rapid rise in driving and from power plants generating electricity to heat, cool, light, and operate our buildings. There were almost 200 violations of the ozone standard in the Richmond area between 2000 and 2008, an average of 24 violations each year.²³ One study found that transportation produces almost half of the emissions of six primary air pollutants—carbon monoxide, ozone, nitrogen dioxide, sulfur dioxide, particulate matter and lead—in the region.²⁴ These and other pollutants from vehicles and power plants contribute to smog, visibility impairment, acid rain, and other serious environmental problems. Spreading development and roadbuilding also exacerbate air quality problems by destroying tree cover that would otherwise help remove pollutants from the air.

Motor vehicles and power plants are also a primary source of carbon dioxide, contributing to global climate change. Virginia produces more carbon dioxide than some western industrial nations, and one study found that of the nation's largest 100 metro areas the Richmond region has the 15th highest carbon emissions per capita from transportation and residential energy use.²⁵ Spreading development also reduces agricultural and forest land that can offset carbon dioxide emissions, removing CO₂ from the air and storing carbon in trees and soils. Greenhouse gas emissions may contribute to increased storm intensity, coastal flooding, rising sea levels,

Air Pollution from Transportation Per Capita (1999)*



* Includes six criteria pollutants: carbon dioxide, ozone, nitrogen dioxide, sulfur dioxide, particulate matter, and lead. Source: Surface Transportation Policy Project

wetland loss, and species extinction as a result of altered temperature and moisture patterns.

Health Impacts

Polluted air from motor vehicles and power plants harms our health. Nitrogen oxides from burning fossil fuels, for example, are a major contributor to ground level ozone, which can cause pain when inhaling, shortness of breath, coughing, and headaches. It may also cause asthma attacks and even premature death. Long term exposure can result in more frequent and severe respiratory pain and possible lung tissue damage. As not-

ed, ozone levels exceeded the health standards almost 200 times in the region between 2000 and 2008, and the American Lung Association recently gave Chesterfield, Hanover, and Henrico a failing grade for their air quality due to the number of high ozone days.²⁶



Evidence is growing that current development and transportation patterns are also harming our health by reducing physical activity. Physical inactivity contributes to health problems such as obesity, diabetes, cardiovascular disease, certain forms of cancer, and depression. The decline in physical activity rates appears

to be linked in part to dispersed development, poor community design, and a lack of adequate and safe facilities that often makes walking and bicycling impractical or impossible.²⁷

Market Changes

The trends and impacts explored above are among the key factors spurring the growing demand for alternatives to residential and commercial sprawl. Younger households, for example, often seek to rent rather than to own—particularly in the current economic climate—and many prefer smaller, more affordable dwellings and a more urban lifestyle.²⁸ Many empty nesters are seeking a smaller residence that requires less upkeep and often has lower property taxes and energy bills. And an aging population has very different types of housing and transportation needs, sparking greater demand for walkable communities, transportation options that offer mobility to people no longer able to drive, and flexible housing options integrated into a community.

Other trends and impacts are contributing to changing market preferences. As a leading national real estate assessment noted, “Energy prices and road congestion accelerate the move back into metropolitan-area interiors as more people crave greater convenience in their lives. They want to live closer to work and shopping without the hassle of car dependence.”²⁹

Market surveys consistently show strong interest in more compact, walkable communities.³⁰ The shortage of such options has led to price premiums for houses in mixed use neighborhoods compared to those in single use subdivisions nearby.³¹ And the demand for mixed use and traditional neighborhoods is expected to grow with the demographic changes underway. Although it is difficult to predict future preferences, and some sprawl is likely to continue, a recent national real estate report concluded that “Next-generation projects will orient to infill, urbanizing suburbs, and transit-oriented development.”³²

There also are important shifts in the commercial market. Shopping habits are notoriously difficult to



predict, but a number of analysts have concluded that after years of moving farther out and increasing in scale, retail is overbuilt and that even after the economy recovers there will be fewer stores per capita. Infill and neighborhood shopping sites are projected to fare better. On the other hand, one forecast predicts that “many malls and strip centers will be bulldozed for new town center projects and mixed-use development.”³³ As for the market for office space, a leading national real estate assessment recently concluded there will be considerably less demand for single-use suburban office space, stating that, “Urban and infill areas should benefit from demographics changes and economic shifts working against many suburbs. The ‘move back in’ by echo boomers and empty nester baby boomers continues.... Rising car-related costs (gas, insurance, user fees, loans) and increased congestion don’t help the suburban office story, either.”³⁴

Sustainable Communities & Their Benefits

A more sustainable approach to development is emerging.

A cornerstone of sustainable growth is the creation of walkable communities that better integrate where we live, work, shop, play, and engage in other activities. Bringing development and various land uses closer together as in traditional neighborhoods and town centers can reduce sprawl, allow more trips to be taken without driving, and reduce the length of many of the vehicle trips we do take. Greater mixed use development can occur at a wide range of densities and proportions. Housing, shopping, offices, and amenities may be in a single building, in a group of buildings, or within easy reach of one another.



Sustainable communities entail more than just compact development or a mixture of land uses. Quality design that is also friendly to pedestrians is essential, as is providing a wider range of transportation alternatives. Such a community also typically includes components such as an interconnected grid of streets with short, walkable blocks and other steps to provide attractive, convenient options for walking, bicycling, and transit use.

Sustainable development also places a premium on location, guiding development to designated areas and encouraging infill, redevelopment, and revitalization in order to reduce pressure to develop rural and natural areas and to maximize the use of existing infrastructure. Complementary steps can also be adopted to directly protect farms, forests, and natural and historic resources.

This approach does not mean the end of suburbs. Compact, walkable development can be built in suburban or urban locations, although location is a critical factor in determining the overall impact of development. Moreover, plenty of single-family, large lot residential options and suburban retail and office parks would remain available even if the sustainable communities approach is widely adopted.

It also is important to offer a range of housing styles, sizes, and prices in order to meet the needs and preferences of individuals and households with different income levels and at different stages of life. Mixed use, mixed income communities can provide affordable options that serve a wide range of people, including families, singles, older adults, and the disabled.

In addition, green building techniques, measures, and practices can significantly reduce the environmental and health impacts of buildings, as well as energy bills. Green building includes steps to minimize the use of energy, water, and materials, to improve indoor environmental quality, and to reduce the adverse impacts of site design and development.

The Benefits of Sustainable Communities

Sustainable development is essential to addressing many of the key trends and challenges of growth. It offers multiple benefits, including:

- Lower infrastructure costs and fiscal stress on localities
- Thriving and diverse communities
- Enhanced economic competitiveness of localities and the region
- Shorter commutes
- Reduced energy consumption and bills
- Cleaner air and water
- Protected farms, forests, and natural and historic resources
- More active, healthier lifestyles
- Response to demographic changes and market demand
- A higher quality of life

A growing body of experience and analysis demonstrates these potential benefits and indicates that these benefits are largest when multiple elements of sustainable communities are present. The remainder of this section will highlight some of these benefits.

Budget and Taxpayer Relief

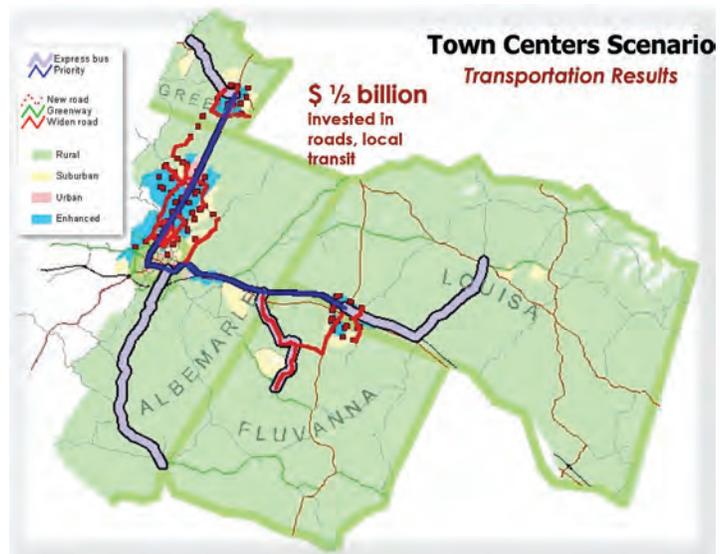
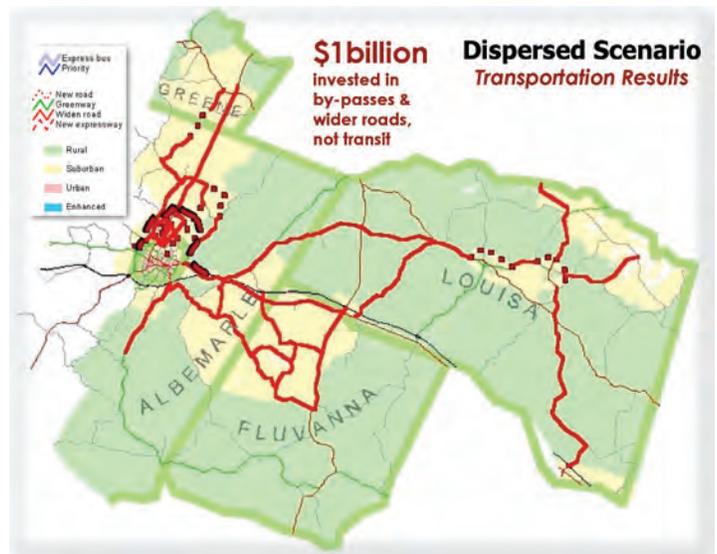
One of the most important potential advantages of more sustainable communities is that they can reduce the costs of serving growth by trimming the need for new infrastructure (such as roads, water, and sewer) and the cost of providing services (such as police and fire protection). This benefit is particularly valuable in a time of tight state and local budgets and limited public and political appetite for increased taxes.

There is substantial evidence that compact and contiguous development tends to be more fiscally efficient. Among other things,

- It typically is far cheaper to provide infrastructure to compact and contiguous—rather than scattered—development since serving sprawling growth requires more lane miles of roads and longer water and sewer lines to cover the distances between dispersed developments and between each business or residence.
- Costs per capita to provide services to dispersed development can be higher because of the additional time and expense to travel greater distances.
- The costs to operate and maintain the infrastructure that sprawl requires may be higher due to the larger amount of infrastructure needed; these costs are rising rapidly in many suburban areas as facilities age.
- Revitalizing communities and promoting infill development can reduce the burden on taxpayers by maximizing the use of infrastructure that is already in place and has already been paid for, although some updating may be needed.

A number of factors can influence the overall fiscal impact of development, such as the type of land use (residential, commercial, mixed use), the density of development, and the proximity to other land uses and to existing facilities and services.³⁵ However, as the Congressional Office of Technology Assessment concluded: “Though there is a good deal of disagree-

ment on the assumptions and calculations for such estimations, there is general agreement that decreased density leads to increasing public and private development costs.”³⁶



The amount and cost of needed infrastructure can vary significantly under alternative land use scenarios

Decades of studies across the U.S. have examined the fiscal impacts of alternative development patterns at the state, metro region, and local levels, as well as for individual developments. These studies have almost uniformly shown potential savings from compact and contiguous growth, offering savings on infrastructure costs of 10 to 20 percent or more and reduced cost of service as well.³⁷ For example, as the maps above show, a study of alternative growth scenarios in a region that included parts of Albemarle and Greene and all of Fluvanna and Louisa Counties assumed the same increase

in jobs and population, but different development patterns; when compared to a dispersed, business as usual scenario, the walkable, village scaled development alternative was projected to cut the cost of transportation improvements needed in half, saving an estimated \$500 million over 50 years.³⁸ In addition, a recent study by VDOT in the Fredericksburg area concluded that more concentrated development in the next 25 years could reduce driving enough to maintain current levels of mobility on Route 17 and Route 3 rather than have both drop to a failing level of service, triggering the need for costly transportation investments.³⁹

Economic Development, Thriving Communities, and Market Trends

There is increasing evidence that more sustainable development can improve the economic competitiveness of a locality or region by helping to attract and expand businesses and to attract and retain talented employees. It thus can aid local budgets and taxpayers not only by reducing the cost to serve growth, but by increasing the tax base. For example, a number of experts contend that features such as mixed use and walkable communities foster economic growth since they offer qualities that appeal to mobile workers in an information age who have a choice of places to live and can in turn impact the ability to attract talent and certain types of jobs.⁴⁰



In addition, promoting more sustainable communities, particularly if linked with an efficient transportation system offering attractive alternatives to driving, can help to reduce congestion costs to businesses and individuals and to improve environmental quality. These benefits in turn improve the quality of life for residents and can make the entire region more competitive. In contrast, as noted in the section on momentum for a new development approach, sprawl, traffic, and a lack

of affordable housing can reduce economic competitiveness by making it harder to attract and retain a growing number of businesses, jobs, and employees.

Sustainable development can also capture the shifting market trends discussed in the previous section. Market surveys consistently show strong interest in alternatives to sprawl. In one survey, for example, 61% of prospective homebuyers preferred a neighborhood that offered a shorter commute and shopping, restaurants, and public transportation within walking distance over a dispersed neighborhood with a larger lot but also a longer commute and limited options for walking.⁴¹ There also is evidence that the limited availability of alternatives has led to price premiums for houses in mixed use neighborhoods compared to those in single use subdivisions nearby.⁴² In addition, a study of home sales in fifteen markets found that more walkable neighborhoods tended to have higher sales prices.⁴³ And the demand for walkable, mixed use, and traditional neighborhoods is expected to grow with the demographic changes underway in the region.

Although it is difficult to predict future preferences, and some sprawl is likely to continue, a recent national real estate report concluded that “Next-generation projects will orient to infill, urbanizing suburbs, and transit-oriented development.”⁴⁴ These types of projects offer some of the most important opportunities to create value, build vibrant communities, revitalize existing areas, and improve our quality of life.

Promoting mixed use, walkable communities with access to transit can be a particularly effective way to strengthen the local economy and raise real estate values, especially when linked with efforts to promote revitalization and infill. Arlington County has been a national leader in promoting mixed use, transit-oriented development, working for decades to create pedestrian-friendly development within easy walking distance (typically up to 1/4 mile) of transit stations. Today, virtually all office space and about two-thirds of the retail space in the county is within walking distance of transit, and retail, offices, and housing have all expanded substantially.⁴⁵ Charlotte’s light rail is another success story. The first line tracks a former rail corridor, bordered by a number of vacant or underutilized industrial sites. It opened in November 2007 and has sparked a number of development projects, generating over \$1.5 billion in investment.⁴⁶

Less Energy Use and Lower Costs

Sustainable communities require fewer and shorter vehicle trips, reducing fuel consumption and reducing energy bills. Although it is difficult to predict accurately the impact of the built environment on travel behavior, studies conducted at the regional, neighborhood, and household level have indicated the potential for alternative development patterns to curb driving and fuel consumption.

A national study of 83 metro areas found that driving rates tended to be about 25% less in more compact areas than in more sprawling regions.⁴⁷ Other studies have similarly found considerably reduced driving—and thus lower fuel consumption—in walkable areas. The potential for reduced driving in new developments can be even larger. An EPA study of scenarios for projects proposed in three metropolitan areas found that compact development patterns could cut the number of miles traveled by about 50% or more.⁴⁸

Projecting the impact of different development patterns over a broader area is harder and depends upon a number of variables. The analysis of alternative patterns in an area of Albemarle, Fluvanna, Greene and Louisa Counties noted above concluded that more concentrated development would cut the total number of miles driven by a third and the amount of gas consumed by a little over 40%.⁴⁹

Part of the reduction in driving due to alternative development patterns is due to the larger number of trips that can be taken by walking. This is the case even in areas lacking quality transit service.⁵⁰ Driving and energy consumption can be reduced further if development is guided to areas served by transit and other alternatives to driving, and if transit service is improved and expanded. In a recent Chesterfield scenario study, over three times as much housing would be located near existing transit under a more compact development scenario than under current trends, and the percentage of housing near transit jumps with expanded service.⁵¹

Energy consumption can also be markedly reduced through steps to improve the energy efficiency of buildings. Interest in green building has exploded, and efforts have multiplied to produce more efficient, healthier, environmentally-friendly buildings. Enormous opportunities exist in new construction and in retrofitting existing residential, commercial, and industrial buildings to cut energy use through steps such as installing efficient lighting, heating, and cooling, and

improving insulation. A recent statewide study concluded that Virginia could cut electricity consumption by almost 20% by 2025 using cost-effective efficiency steps.⁵²

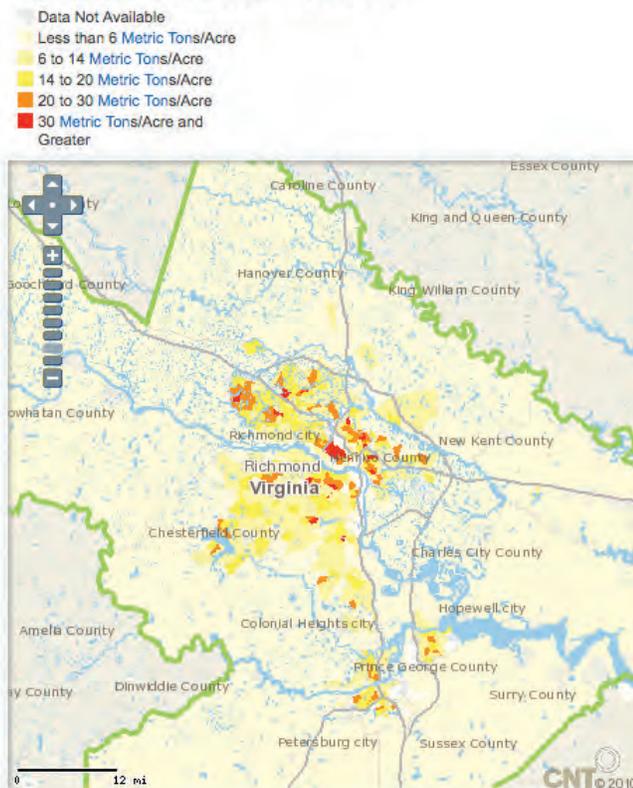
Reduced transportation and building energy consumption offer a range of benefits, including lower energy bills for businesses and households, reduced risk from volatile fuel supply and prices, less dependence on foreign oil, and increased affordability of housing and communities. The benefits to low income households are particularly significant, since these households typically pay a substantially higher proportion of their income on energy. The average American household spends roughly 5% of its income on energy, while low income households spend 16%,⁵³ in part because low income housing tends to be less energy efficient. Increased efficiency reduces bills and makes housing more affordable. Although results vary widely, one national estimate is that “simple” efficiency upgrades “can cut energy costs by over 40% in most affordable housing.”⁵⁴

Cleaner Air and Water, Saving Farmland and Open Space

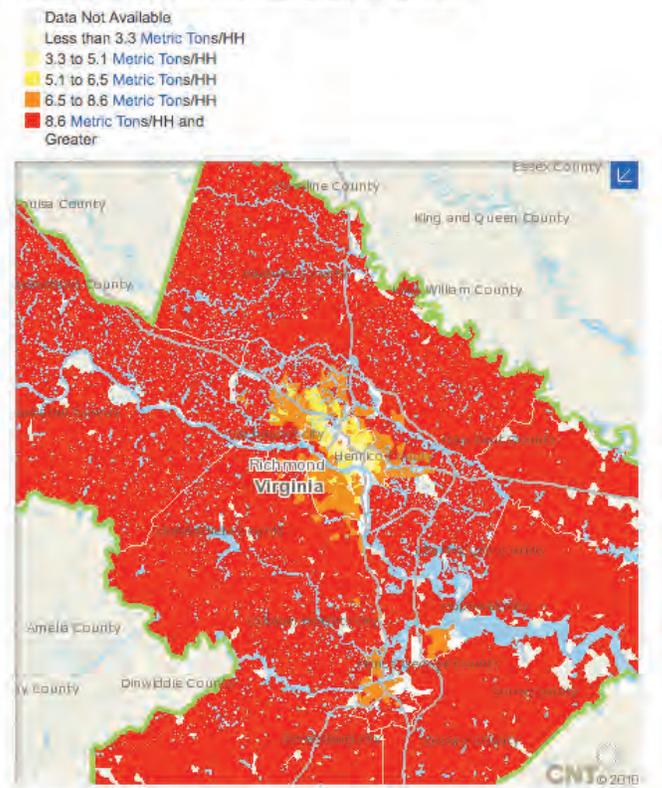
The potential for alternative development patterns to reduce energy consumption for transportation and buildings also translates into important environmental and health benefits, since energy production and consumption is a leading source of a range of harmful pollutants.

A study of a more compact, infill site option and a lower density, suburban option for each of three proposed projects found the infill sites for the most part generated only about half as many pollutants such as nitrogen oxides (NO_x contributes to smog and is linked to respiratory problems) and carbon dioxide (CO₂ contributes to global climate change).⁵⁵ Another study that examined the emissions that would result from locating a new development in Atlanta on an infill site or three suburban sites concluded that the suburban sites would result in 37-81% higher NO_x emissions and 277-316% higher emissions of volatile organic compounds (VOCs also contribute to smog).⁵⁶ And a more comprehensive, broader study of the Atlanta region concluded that residents in the most walkable neighborhoods produce 8% less NO_x, 10% less VOCs, and 20% less CO₂.⁵⁷ When combined with other features such as the location within the region and proximity to jobs, the emissions reductions for walkable communities were even greater.

CO2 per Acre From Household Auto Use



CO2 per Household From Household Auto Use



Perceptions of vehicle emissions change dramatically when viewed on a per household rather than a per acre basis, illustrating the impact of development patterns on transportation and emissions.

In addition, a recent study examined the validity of perceptions that urban areas produce more pollution, finding that although cities do in fact “generate more carbon dioxide per acre than less dense suburban and exurban communities, their compact, mixed use urban neighborhoods generate nearly 70% less greenhouse gases per household for travel than their suburban and exurban counterparts.”⁵⁸

Despite suggestive results such as these, it is difficult to quantify precisely the emissions benefits of various land use and transportation measures. Most forecasting models are inadequate, although efforts have been made to better capture potential pollution reduction from different measures.⁵⁹ And there are a range of possible factors and assumptions impacting findings and projections.⁶⁰ Nonetheless, the bottom line is that more sustainable communities offer important potential emissions reductions, particularly when multiple measures are adopted.

The reduced air emissions from more sustainable development can improve water quality as well. Excessive nitrogen pollution is one of the top threats to bodies of water such as the James River,⁶¹ and much of this excess nitrogen comes from vehicle exhaust and power plant emissions of nitrogen oxides that ultimately are

deposited in water bodies. More efficient transportation and buildings can thus improve water quality since, as noted above, they can cut these emissions.

A sustainable approach to development can also improve water quality by reducing the amount of land cleared for development and roads, thus reducing the amount of sediment washed into rivers and streams. Moreover, it can reduce impervious surfaces such as buildings, roads, and parking lots that increase erosion, flooding, and the volume of runoff of pollutants (including toxic chemicals, nitrogen, and phosphorus). An EPA study, for example, found that eight houses on one acre lots generated over 3.5 times the runoff of eight houses on quarter acre lots, and noted that runoff can be reduced further through infill development and redevelopment of properties such as a former shopping center.⁶²

By developing less land, sustainable communities also help preserve farms, forests, wildlife habitat, and environmentally sensitive areas. Studies at the state, regional, local, and site level have all demonstrated the more efficient use of land that better development approaches can provide. For example, a New Jersey study found that planned, concentrated growth could cut loss of open space by 43% and loss of environmentally

fragile lands by 80%.⁶³ The growth scenarios studied in Albemarle, Fluvanna, Greene, and Louisa found that the walkable, less dispersed development scenario reduced the amount of land developed in the area from 45% to 35%.⁶⁴ And the recent Chesterfield scenario analysis shows reduction in the amount of vacant land developed from 40% to 27%.⁶⁵ Although these analyses depend on a number of assumptions, and it

is difficult to precisely quantify the land conservation benefits of different development patterns, it is clear that the potential benefits of more mixed use, walkable development are significant and that these benefits are greatest when more compact development is located with a greater emphasis on infill and redevelopment. If widely adopted, a robust sustainable communities approach offers dramatic environmental benefits.



Getting There: Promoting Sustainable Communities

Activities to promote more sustainable communities have increased significantly in the Greater Richmond Region. These steps are an important beginning and may mark a major change. There is enormous potential—and much more to be done—to advance sustainable development.

Recent Steps

Localities in the region have increasingly recognized the benefits of promoting mixed use, walkable development. The comprehensive plan Henrico County adopted in 2009 to guide its future development, for example, notes that “A well-designed, mixed-use development typically reduces automobile trips, incorporates and preserves unique environmental features, promotes the efficient use of land, provides access to amenities at a local level, creates regional draws for commerce and provides the ability to create unique communities in the county.”⁶⁶ Chesterfield County’s vision adopted in February 2010 to guide the update of its comprehensive plan calls for “a mix of uses in centers and corridors.”⁶⁷ And the Richmond Downtown Plan adopted in October 2008 stresses mixed use, mixed income, walkable development throughout downtown.⁶⁸

More rural localities have begun to recognize the benefits of mixed use developments for certain areas as well. Goochland County’s comprehensive plan adopted in 2009

envisions more heavily populated “major villages” that would “include a desirable mixture of uses combining commercial services with residential development” and that would be “pedestrian-friendly.”⁶⁹ Powhatan’s 2010 draft comprehensive plan outlines a vision for future growth where the County’s “dominant rural character will be supplemented by mixed residential and business uses situated at defined locations.”⁷⁰ And New Kent County adopted a zoning ordinance in 2009 to create a development district around New Kent Courthouse that provides for “a mixed-use, mixed-income community where people can live, work, play,



Before and after: potential transformation of East Broad Street

and worship within a compact area developed on a pedestrian scale.”⁷¹

Localities have also taken steps to foster infill, redevelopment, and revitalization. The City of Richmond has adopted the most extensive measures, including a real estate tax abatement program for rehabilitation projects that has been a successful catalyst for renovation and the Neighborhoods in Bloom program, a program that focuses public and nonprofit resources to revitalize targeted areas and has attracted private investment.⁷² The City also has begun to embrace an innovative zoning tool, with the Downtown Plan and two recent rezonings in Manchester endorsing a form based code approach that promotes mixed use development by focusing on buildings and their relationship to each other and to the street rather than basing regulation on the uses of particular lots and buildings. Efforts to revitalize communities have spread beyond the City. Henrico County’s new comprehensive plan recognizes the need to “Encourage compatible infill, redevelopment and development in proximity to existing development and services when appropriate to avoid ‘leap frog’ growth patterns which may result in higher service costs.”⁷³ Chesterfield’s vision includes a call for “Emphasis on infill, revitalization and redevelopment.”⁷⁴ Both counties are actively working to help encourage redevelopment of older suburban areas, sites, and corridors.

Further, localities have widely recognized the need to guide growth to certain areas. Every county in the region has taken at least some steps to target growth and to protect rural and natural places. Hanover County’s comprehensive plan, for example, stresses compact and contiguous development in designated areas to allow more efficient service and help protect rural areas.⁷⁵

In addition to these and other steps by localities, numerous development projects have been completed or approved in the region with at least some sustainable aspects. Widespread renovation and adaptive reuse efforts in the City have included a number of mixed use projects, for example, and

there has been significant investment in areas such as Shockoe Bottom, Church Hill, Jackson Ward, Monroe Ward, and Manchester. As a result, the City’s population has risen in recent years, reversing a decades-long decline.⁷⁶ More sustainable development projects outside the City have increased as well, including a number of walkable, mixed use projects built or planned in Henrico and Chesterfield and one underway in New Kent County.

There also has been a rise in green building projects, reflecting a national trend. The Better Housing Coalition has built each of the more than 40 homes and 240 rental units it has constructed since 2006 to meet the sustainable standards for EarthCraft homes, a residential green building program that reduces energy and water usage and lowers bills while improving indoor air quality.⁷⁷

These are all positive steps, and some of them represent a fundamental change in direction in the policies of localities and in the focus of development projects. However, much more is needed to make sustainability a priority and to address the trends and challenges facing the region. Many recent policy steps, for example, have yet to be implemented while others are somewhat vague and limited. And the projects developed thus far are still a relatively small percentage of the built environment and often exhibit only a few of the elements





of sustainable communities. Meanwhile, many existing policies need to be overhauled and destructive proposals continue to move forward.

Opportunities for Change

There are abundant opportunities to promote sustainable communities in the Greater Richmond Region.

Government funding, policies, and decisions have an enormous impact on housing, development, and transportation patterns, and have tended to promote sprawling, auto-dependent development. For example, taxpayers often subsidize the cost of providing roads, schools, water, and sewer facilities to new development. In addition, zoning provisions requiring large lots, minimum house sizes, and the separation of residential and commercial uses prohibit traditional neighborhood development and in effect require dispersed growth while raising the cost of housing, transportation, and providing public services. Transportation decisions that earmark the bulk of taxpayer funds to road projects and that slight other travel modes can subsidize sprawl and offer few realistic alternatives to driving. As a result, government policies present some of the most promising opportunities for growing more wisely.

Solutions and strategies to promote more sustainable communities include the following steps:

Guide Growth to Targeted Areas. Localities in the region have sought—to varying degrees—to steer development to designated areas. The track record of these efforts, however, is mixed. Further steps are needed to provide incentives to guide new development to designated areas, to promote or require more compact projects within targeted areas, and to limit growth outside certain areas. In addition, localities—and the state—should give priority to existing communities and designated growth areas when allocating transportation



funds and making other public investments to help ensure that taxpayers do not subsidize sprawl.

Encourage Infill, Renovation, and Redevelopment.

Infill development, renovation of existing buildings, and the redevelopment of declining or abandoned commercial areas are all cornerstones of community revitalization and central to sustainable development. The range of strategies to foster such activities include offering incentives (such as loans, rehabilitation tax credits, technical assistance, and expedited approval processes), revamping zoning and building code requirements that prohibit or impede desirable projects, and investing a greater share of infrastructure spending in older areas (such as repairing and upgrading existing roads and schools).

Foster More Compact, Traditional New Development.

There are a host of steps most localities could take to reduce regulatory barriers to building more compact, walkable new communities and areas with a mixture of residential and commercial uses. These steps include amending zoning provisions such as minimum lot and house size, setback, and parking requirements that inadvertently encourage sprawl and limit housing choices. Local ordinances also should be amended to reduce or eliminate the strict separation of land uses and to permit mixed use developments, multistory retail and commercial buildings, additional density where appropriate, and a broader range of housing types.



Advance Transit-Oriented Development. Another useful tool is to guide a larger share of growth to areas within walking distance of transit stops, through steps such as increasing permissible density and allowing a mixture of uses in these areas, providing faster permitting for such projects, and offering technical assistance. The state and localities need to target transportation funding and planning resources to encourage transit-oriented development and expanding transit service. In addition, a portion of the federal transportation funds the region's metropolitan planning organization allocates could be used to create a fund to pay for technical assistance to localities interested in amending zoning provisions and crafting plans for transit-oriented development.

Address Housing Affordability. Many of the steps to promote sustainable communities will help to promote affordable housing if properly crafted. Zoning changes can also help foster mixed income development, such as allowing accessory dwelling units, multi-family housing, and live-work units. And there are various options for greater inclusion of affordable units in new development, such as providing density bonuses or other incentives for adding affordable units to projects or encouraging projects above a certain size to include

a share of affordable units or to contribute to a housing affordability fund to help obtain approval.⁷⁸

Provide Incentives for Greener Buildings. A variety of potential steps can advance greener building so that new and existing structures are healthier and more energy and resource efficient. These steps include providing information and technical assistance programs, grants and loans, streamlined permitting, tax incentives, and requiring public structures to meet certain standards for high-performance buildings.

Reduce Stormwater Runoff. Polluted runoff from development can be significantly reduced by changes to local policies and programs.⁷⁹ For example, localities can reduce impervious surfaces by lowering minimum parking and minimum street and driveway width require-

ments. They also can take steps to limit erosion from construction sites and require or encourage preservation of stream buffers. And they can require or provide incentives to developers to adopt low impact development measures to manage and filter stormwater onsite, such as limiting disturbance of the natural landscape, providing or retaining greater tree coverage, increasing landscaping in parking lots and designing the landscaped areas to absorb runoff, and using permeable pavement.

Protect Rural and Natural Areas. Steps such as targeted growth areas and promoting more compact development can help relieve pressure to develop rural and natural areas. There also are a number of policies localities can adopt to protect and restore these resources, including adopting zoning classifications recognizing the value of rural and natural resources rather than viewing them as areas awaiting future development, offering tax credits to landowners who place a conservation easement on their property, funding a program to purchase development rights from willing sellers, providing funding for parks as well as greenways and trails that connect various areas, and facilitating agricultural vitality programs such as efforts to connect retiring and beginning farmers.



If we focus on moving people rather than cars, existing streets often have plenty of capacity, especially when people use alternatives to driving. The photos above show the same amount of people and the different space they take up depending on their mode of transportation. Top left photo—cars; top right photo—space needed for cars; bottom left photo—space if riding a bus; bottom right photo— space required for cyclists and pedestrians.

Provide More Transportation Choices. Mobility choices can be significantly increased by reorienting policies and spending at the state, regional, and local level to promote alternatives to driving. Localities and the region as a whole lack a balanced transportation system, lagging behind many comparable areas. There needs to be a move away from costly, sprawl-inducing projects to build and expand highways and other roads. Instead, transportation policies, planning, and investments should focus on building a network of multiple travel options that improve connections within localities, across the region, and to other regions. This will require greater focus on these and other alternatives:

- Complete road networks that better link areas, provide drivers many choices of routes, and provide more options for pedestrians and cyclists
- More extensive, safe, and convenient pedestrian and bicycle infrastructure
- Improved and expanded bus service, including service to major job centers in the counties and bus rapid transit in key corridors
- Light rail connecting areas such as downtown and the Airport
- Expanded passenger rail service to connect areas such as Richmond and Norfolk and to provide additional service to Washington, D.C.

- High speed rail service connecting Richmond to Washington and the Northeast corridor, to Hampton Roads, and to Raleigh, Charlotte, and Atlanta.

Reduce Adverse Impacts of Roads. Poorly-planned roads can harm the character of a community, increase speeding and accidents, and discourage pedestrians and bicyclists. Too often, road design and decisions have focused on moving as many cars as possible through a place, largely ignoring the impacts to the surrounding area. We should design for people, rather than cars. Communities can be strengthened and transportation choices improved by adopting a flexible, context-sensitive approach to road planning, design, and construction, as well as steps such as narrowing certain roads, widening sidewalks, and extending curbs at intersections to improve conditions for pedestrians and to reduce traffic speed.

Increase Regional Cooperation. Promoting sustainable communities requires a comprehensive vision of the future and a commitment to forge an integrated approach to land use, community design, transportation, and environmental quality. Although steps need to be taken at the local, state, and federal level, efforts to promote sustainable communities are perhaps needed the most at the regional level since many of the challenges do not correspond to local boundaries and can most effectively be addressed through regional cooperation and partnerships. Other regions are far ahead of ours in setting common goals, jointly committing to pursue more compact, mixed use development, and building a regional transit system.

These and other strategies and steps are most effective when multiple measures are adopted and when coordinated as part of a broader effort in a locality or region.

In addition to the substantial room for policy improvements in the Greater Richmond Region, there is tremendous potential on the ground to promote sustainable communities. The declining vitality of certain corridors, neighborhoods, and commercial areas such as dead or dying malls provide prime opportunities for retrofitting already developed areas to handle future growth. These areas usually have the transportation access and other infrastructure to be promising locations for walkable, mixed use development.

Conclusion

The Greater Richmond Region faces challenges—but also significant opportunities. Our current development patterns are not sustainable. We must adopt a new vision using the growing support for sustainable communities among citizens, businesses, and government officials, and take the steps needed to translate that vision into quality results.

Sustainable development would benefit the entire region, bringing multiple economic, health, and environmental benefits. We must promote better ways to grow as we build the future of our region.



Before and after: potential transformation of Hull Street

Endnotes

- ¹ The Richmond region is defined differently in various contexts and for various data sources. This report focuses on the City of Richmond and the Counties of Charles City, Chesterfield, Goochland, Hanover, Henrico, New Kent, and Powhatan and it uses the term the Greater Richmond Region to refer to these localities.
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