

# INTERNET ALLEY

HIGH TECHNOLOGY IN TYSONS CORNER, 1945-2005

PAUL E. CERUZZI

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Years ago I heard a story, possibly a variant of Aesop's Fable "The Fly and the Draught-Mule," in which a fly sitting on the axle of a chariot exclaims to the mule who is pulling it down the road, "What a mighty cloud of dust we are kicking up!" The mule knows better. This study examines a chariot hurtling through northern Virginia, one whose economic vitality and dynamism are the envy of the world. The entire Washington, D.C., region has experienced this growth, but it has been concentrated across the Potomac in Fairfax County, Virginia, spilling over into neighboring Arlington and Loudoun counties and the city of Alexandria.

Who were this region's drivers as it became one of the biggest centers of employment and shopping on the East Coast, and the engine of the regional economy? In the following pages we will meet a number of individuals—real estate developers, scientists, engineers, business executives, federal and local government officials, as well as several Presidents—who all kicked up their share of dust. Yet it seems that the real driver has been, in the words of one critic, "Uncle Sam."<sup>1</sup> If that is the case, perhaps northern Virginia would have grown anyway simply because of the presence of the world's most powerful nation's (post-1945) seat of government, a government that has grown in power and complexity without pause for the past 60 years.

That explanation is only half right. After 1945, urban areas throughout the country grew, in some cases much more rapidly than in the Northeast. As was the case elsewhere, much of the growth happened in suburbs. Likewise, these suburbs displaced farms that had been supplying food to city dwellers. Yet what developed in northern Virginia was different. More precisely, something unique happened in a portion of Fairfax County, especially near a crossroads that, into the mid-1950s, was still characterized by dairy farms and

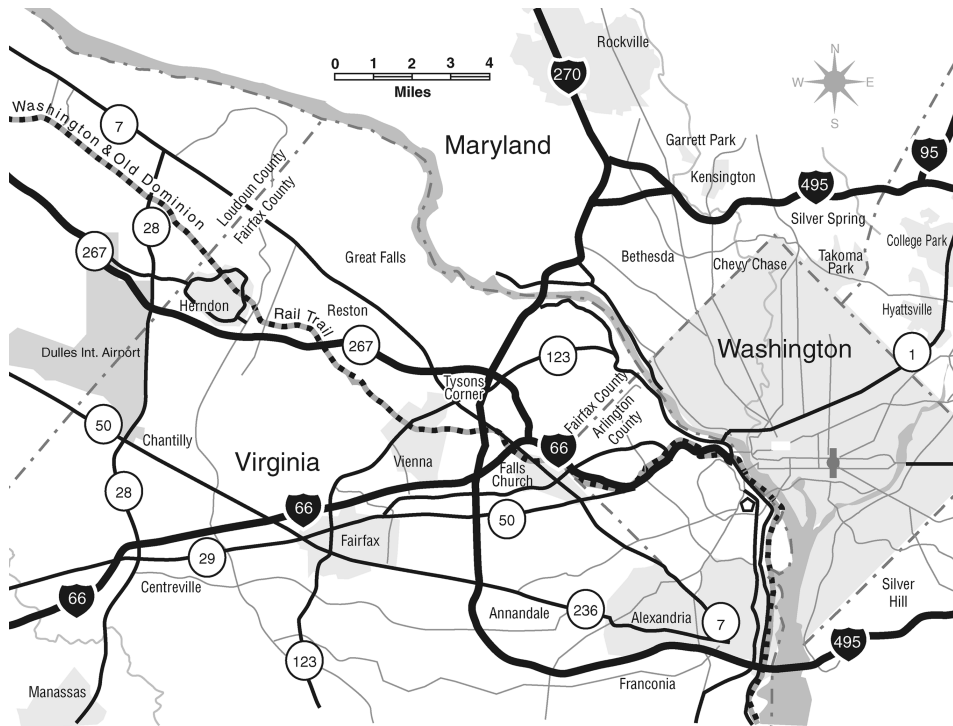


FIGURE 1.1

Washington, D.C. and the northern Virginia suburbs. The county of Arlington was the result of the 1846 retrocession of part of the District of Columbia back to Virginia. Tysons Corner lies just to the west, within Fairfax County. Fairfax, Falls Church, and Alexandria are independent cities with their own governments. Credit: ASAP Graphics, Inc.

gravel pits. That crossroads was called Tysons Corner, and its history is the focus of this study.

Tysons Corner is a compact area of intense commercial development, about four square miles in area, located ten miles west of the seat of the federal government in Washington. Fairfax County, in which it is located, is the first major Virginia county south of the Potomac (the smaller county of Arlington lies in between; its unique history will be discussed later). Tysons Corner is unincorporated, unlike nearby towns that have their own government, including Falls Church, Vienna, Fairfax City, and Alexandria. The activities characterizing Tysons Corner—namely, military contracting and systems engineering—take place throughout the region, including in the Maryland

suburbs and in the District of Columbia. Nevertheless, what emerged in Tysons Corner is different enough in character to deserve a closer look.

In the 1980s, the main activities of Tysons Corner outgrew the constraints of the four-square-mile area and began to spread westward, out to and beyond Dulles Airport. That development created a linear corridor, about forty miles long, that now begins in Arlington and ends just beyond the airport at the former farming town of Ashburn. A spur of this corridor extends south to the old crossroads of Chantilly, once recognized only by Civil War buffs. Businesses in the western part of this corridor list “Dulles” as their mailing address, and the press often refers to it as “the Dulles Corridor.” I use the term “Internet Alley” to distinguish it from Tysons Corner (this is discussed in more detail in chapter 7). When dealing with general issues of technology and suburban growth, one need not distinguish among these regions; hence the more general term “northern Virginia,” which refers to most of the Commonwealth situated north of the Rappahannock River. At other times the distinction is important, and that will be made clear in the context of what is being described. I have already hinted that one characteristic of this region is its concentration of government contractors whose work is of a scientific and technical nature, many of them for the Department of Defense and other federal agencies concerned with national security. Following chapters will examine the nature of this work in detail; they will also examine the question of what it is that these contractors do that is truly innovative, in both a technological and a managerial sense.

As I was carrying out this study, that work dramatically changed. The Cold War, whose funding drove Tysons Corner’s initial growth, ended, but the transformation of the landscape continued at an even greater pace. The development west of Tysons Corner out to Dulles repeated the established pattern of sleek office buildings housing high-tech tenants, but with a twist. Many of the tenants there were not defense-oriented, but part of the new Internet and telecommunications world. Partly by accident and partly by design, the Dulles Corridor became a world center for the management and operation of the Internet. Security was tight inside these buildings, too, but to protect economic assets, not military secrets.

Real estate developers did not worry about that distinction; they coined the term “Techtopia” to encompass the entire region where all high-technology activity, whether military or civilian, was going on.<sup>2</sup> They made no distinction between Tysons Corner, the Dulles Corridor, or the commercial districts in



FIGURE 1.2

Techtopia, 2004. The Northern Virginia Technology Council has been publishing these maps annually for a number of years.  
Source: Northern Virginia Technology Council.

Alexandria or other nearby towns. Tenants in the Dulles Corridor buildings, however, saw themselves differently: they were funded by venture capital, not by Pentagon contracts. They did not look to hire retired military officers with contacts inside the Pentagon, or care that their offices were physically located close to the Pentagon building in Arlington. These companies kept trade secrets but otherwise were not shy about telling the world what they were doing. The run-up of Internet stocks on the NASDAQ through the 1990s seemed to confirm their assertion that the “old economy,” symbolized by many Tysons Corner firms, was obsolete. Were these young entrepreneurs right? They seemed certain of that, although some of those who built the Tysons economy disagreed.

As this transformation to a venture capital-driven economy was under way, two critical events happened. In the spring of 2000, the Internet bubble burst. One local company, MicroStrategy, became a symbol of the bubble as its stock plummeted from \$227 to \$87 a share on a single day in March.<sup>3</sup> Other Internet and telecom start-ups followed MicroStrategy into trouble. Two telecom giants located along the Dulles Corridor, MCI-WorldCom and AOL-Time Warner, found themselves in financial difficulties as well, and those difficulties became the unwelcome subject of daily business reports.<sup>4</sup> The Internet-based “new economy” was not so robust after all.

Then, on the morning of September 11, 2001, terrorists hijacked four airplanes and used them to attack symbols of American power. One of the four planes crashed into the Pentagon, killing 125 people in the building and 59 on the plane.<sup>5</sup> The distinction between companies relying on military contracts and companies supplying commercial Internet and telecommunications services was no longer important. It was not the economy of northern Virginia but the security of the United States that was at stake. As the war against terrorism relied on timely information and intelligence, people recognized that the computer and telecommunications firms’ work was vital to national defense as well. The events of 2000 and 2001 did not alter the character of the region other than to accelerate the area’s already rapid growth. However, the question of how much the federal government was spending as compared to the venture capitalists is no longer an issue, as federal spending increased dramatically after September 11.

## GEOGRAPHY

Does it matter that this work happens to be located in a particular place in northern Virginia? What about the similar firms located in Maryland and the District of Columbia? Local residents often wax at length about the differences between Maryland and Virginia. Residents of one state declare that under no circumstances would they consider living in the other.<sup>6</sup> (For a long time both neglected the District of Columbia, which lies between them.) Residents of the Maryland suburbs, for example, think of northern Virginia as a foreign land, because, among other things, it is in the South. This belief, while common, cannot go unchallenged. That same belief asserts that Maryland is a solidly Democratic state, while Virginia, along with rest of the once-‘Solid South,’ broke away from the Democratic Party thirty years ago and is now Republican. The fact that recently Maryland has had a Republican governor while Virginia’s was a Democrat did not change this view, but is a sign that those differences are exaggerated. Both Maryland and Virginia are south of the Mason-Dixon line, both were slave states, and until recently, both grew tobacco as one of their major crops.<sup>7</sup>

Virginia seceded from the Union in April 1861, while Maryland did not. Some of the differences between the two states today are a product of decisions made by the Union and Confederate governments that year. The Potomac River was the border between the United and the Confederate States. However, the Union army occupied the town of Alexandria and adjacent land immediately across the Potomac for most of the Civil War.<sup>8</sup> The portion of Virginia between the Potomac and the Rappahannock was the setting of numerous skirmishes, raids, and battles, but the Confederate government in Richmond made the Rappahannock, not the Potomac, its line of defense against the Union armies. Virginia north of the Rappahannock, the location of present-day Techtopia, was in effect ceded from the Confederacy (although not completely, as shown by the two battles fought at Manassas in 1861 and 1862). Obviously much has changed since 1861, but the current focus of northern Virginia’s economy on things military began with that Union occupation of northern Virginia, however unwelcome it was at the time.

A few Civil War skirmishes deserve brief mention. A Confederate raid on a railroad train leaving Vienna on June 17, 1861 marked the beginning of armed conflict in northern Virginia.<sup>9</sup> A few days later, Thaddeus S. C. Lowe tested the concept of aerial reconnaissance for the Union army by ascending



in a balloon launched from Falls Church to see if he could spot the locations of Confederate troops. It was the first military use of aerial reconnaissance in the United States. Lowe's balloons flew over land where, today, one finds the headquarters of the Central Intelligence Agency, the National Reconnaissance Office, and the National Geospatial-Intelligence Agency.<sup>10</sup> Lowe's experiments were followed the next month by the First Battle of Manassas (Bull Run), where Confederate General Thomas J. Jackson stood "like a stone wall" against the Union troops. After that defeat, the Union Army retreated while the Confederates built defenses at Centreville to prevent a further incursion.<sup>11</sup> Loyalties among the residents of Fairfax County were divided, although in May 1862 the county government was reconstituted and professed its loyalty to the Union cause. The occupation was chaotic, especially after another defeat at Manassas in August 1862 left many residents of the county outside Union lines. Following that battle, on September 1, 1862, Stonewall Jackson's troops attacked the Union army as it was retreating back to Washington. The armies fought to a stalemate in a brief but violent battle at Ox Hill, west of the Fairfax Court House and about eighteen miles west of the White House.<sup>12</sup> Ox Hill, sometimes called the Battle of Chantilly, was the only major Civil War battle in Fairfax County. Rebel armies would never advance as close to Washington from the south again.<sup>13</sup> Mindful of the defenses around Washington, Robert E. Lee moved his troops to the northwest, crossing the Potomac thirty five miles upstream and engaging Union armies at Sharpsburg, Maryland, on the banks of Antietam Creek.<sup>14</sup> Back in Fairfax and Loudoun counties, periodic raids by Confederate Colonel John Singleton Mosby, the "Grey Ghost," made life miserable for those with Union sympathies. Today's U.S. Route 50, flanked by townhouses, defense contractors, and shopping malls, is named the John Mosby Highway in Loudoun and the Lee-Jackson Memorial Highway in Fairfax County to commemorate those days. In the 1990s, the Ox Hill battlefield was covered by townhouses and the Fairfax Towne Center shopping mall.<sup>15</sup>

After Lee's surrender at Appomattox in 1865, the Civil War became the "Lost Cause," and for many Virginians history itself came to an end, perhaps to reawaken at some unspecified time in the future.<sup>16</sup> A professor at Virginia Tech, seeking to document the history of digital computer usage at a navy yard at Dahlgren, was told by the Virginia State Antiquities Commission that "anything postdating 1865 is not considered historical."<sup>17</sup> During the war,

residents of the Loudoun County village of Waterford had been unsupportive of secession; after 1865 and well into the twentieth century they found themselves snubbed by the Virginia legislature when it came to appropriations for roads and public works. That had the unintended but fortuitous consequence of stopping material progress in the village, thus rendering it now one of the most desirable places to live among wealthy refugees escaping the hectic pace of Washington life.

Included in the area that remained under Union control was a crossroads called Peach Grove, just east of the site of the June 1861 raid. Later it became known as Tysons Crossroads, then Tysons Corner, after William Tyson, a Marylander who purchased property there in 1852.<sup>18</sup> Some of the earliest written records of the Tysons Corner economy come from farmers who petitioned the government for money to compensate for livestock, grain, and lumber that Union armies took before the battles at Manassas.<sup>19</sup> Peach Grove became an important source of firewood and lumber, which left the area stripped of trees. At an elevation of 500 feet above sea level, it was one of the highest points in the county and to this day affords spectacular views of the Blue Ridge to the west and the Washington Monument to the east. The Union army erected a 60-foot signal tower there, using timber taken from a nearby farm. Using a system of signal flags, Union troops moving to the west could communicate with troops stationed in the forts surrounding and defending Washington. Ninety years later, at the beginning of the Cold War, a U.S. Army radio tower was erected on the same spot. It used radio technology instead of flags, but for the same purpose: to communicate between Washington and outlying military posts. For a time it fell into disuse but lately it has been refurbished and is being used again.

Time flows in a steady, linear march, but to residents of Tysons Corner the tumult of 1861–1865 was followed by a long succession of days in which life went on at a slow pace. This time dilation persisted until October 1957, when the faint beep of the Soviet Sputnik suddenly made everyone's clocks run faster. A famous photograph of Tysons Corner taken in 1956 shows a pickup truck parked outside the Crossroads Market.<sup>20</sup> The truck's door is ajar. One can imagine the driver—perhaps someone who worked on a local dairy farm—taking his time as he conversed with the store's owner or other customers. The farms had become mechanized, but otherwise the conversations might have been familiar to residents of the area a century earlier. But that era was rapidly passing. A few years after Sputnik, the crossroads was



FIGURE 1.3

Tysons Corner, 1956. The Crossroads Market stood on the southwest corner of the intersection of Routes 7 and 123 until the intersection was reconstructed in 1963. Thirty years later, the headquarters of America Online (AOL) and the Internet switch MAE-East were located a few hundred yards to the south of this store. Courtesy of Fairfax County Library, Photographic Archive

replaced by an overpass and the stores at the old corner were torn down. Today, those who park in the lots nearby are careful to lock their car doors.

After 1865, the main activity of the northern Virginia economy was once again farming. Cotton and tobacco had never been the principal crops; this was an area for raising dairy and beef cattle, for growing grain and fruit, and for lumber. Fairfax County's dairy farms grew to meet the needs of nearby Washington, D.C. By the early twentieth century, no Virginia county produced more dairy products than Fairfax. The Alexandria, Loudoun and Hampshire Railroad, the target of the 1861 Vienna raid, was rebuilt to serve the growing economy and was renamed the Washington and Old Dominion Railroad. It was often in financial trouble but remained important to the region's farming economy. The alignment of the W&OD railroad is now paralleled by four limited-access highways that define the Dulles Corridor: Interstate 66, the Dulles Airport Access Road, the Dulles Toll Road, and the

Dulles Greenway.<sup>21</sup> The railroad never pierced the Blue Ridge or reached the coal fields of West Virginia, but it did survive long enough to deliver loads of construction material for Dulles Airport, completed in 1962. The line was abandoned in 1968, its right of way converted to a linear park that is now among the most popular rails-to-trails paths in the country.<sup>22</sup>

One other change to Fairfax County after 1865 needs to be mentioned. That was the end of the custom of locating political power in the county court. Many of the court's roles were assumed by a board of supervisors, consisting of elected officials from newly divided sections of the county.<sup>23</sup> This form of government would play an important role in the commercial and residential development of Tysons Corner in the modern era.

#### THE BEGINNINGS OF SUBURBANIZATION

Northern Virginia farmers did well after the Civil War. Despite the image of predatory northern carpetbaggers, the region benefited from an influx of northerners, some of them Union veterans who remembered the lands they had crossed. They brought with them much-needed capital, which they used to buy land, make improvements, and establish prosperous farms and accompanying mills. The proximity to Washington was a crucial factor in establishing successful farms and businesses. Because Fairfax County was still far removed from Washington, the roads were of poor quality, and the river crossings were few, suburbanization could not yet take hold. The W&OD Railroad and the Leesburg Pike (present-day Route 7) were both good transportation routes, but they terminated in Alexandria and did not lead directly to Washington. An old road from Fairfax led through Vienna east to the river, crossing the Potomac at Chain Bridge. It crossed the Leesburg Pike at Tysons Corner and is now known as Route 123. But it went over difficult terrain, and the river crossing at Chain Bridge was still a fair distance from downtown Washington.<sup>24</sup> A group of speculators purchased land along the W&OD near Vienna around 1887 and began selling residential lots, but their attempt to establish the community of Dunn-Loring (named after two of the group) was premature.<sup>25</sup>

Commuting became more practical at the turn of the twentieth century, when a number of electric streetcar lines were built. These were specifically intended to create suburbs from farmland and to serve commuters. Rather than head for Alexandria, these lines aimed at Washington, D.C. and crossed

the Potomac farther upstream. Lines from Alexandria and Mount Vernon crossed the river and reached the District over a bridge near the present-day Jefferson Memorial. Lines from Fairfax, Vienna, and the western parts of Arlington converged at Rosslyn, just across the river from Georgetown. Rosslyn became a busy terminus; from there, commuters would cross the river to a de facto Union Station (still standing) at 36<sup>th</sup> and M Streets in Georgetown. There they could transfer to lines into downtown Washington. At the initiative of Senator Steven B. Elkins of West Virginia, a line was laid out from Rosslyn to the Great Falls of the Potomac, the region's most spectacular natural feature. Excursion trains to the falls began running in 1906, while closer in, the line established the suburb of McLean.<sup>26</sup> Portions of the W&OD were electrified in 1912, and a branch that diverged to Rosslyn began to serve commuters as well as freight customers. The village of Clarendon and the towns of Falls Church and Fairfax all had electric rail connections to Washington by 1904.

The lines did not last long but they had a profound effect. They began the transformation of Northern Virginia from a farming region to a bedroom suburb. After a method for state financing of road building was established, it became practical to commute by automobile as well, and the combination of automobiles and publicly-financed roads doomed the streetcar. The line from Mount Vernon was abandoned in 1932, the Great Falls line in 1934, and the Fairfax in 1939.<sup>27</sup> The Washington & Old Dominion dropped electric-powered passenger service in 1941 and reverted back to a freight line, its trains pulled by diesel locomotives.<sup>28</sup> But while automobiles drove the electric streetcar lines into bankruptcy and abandonment, the streetcars set the pattern of suburbanization, with its subdivisions of farms into residential lots. In many instances the roads took over the railroad's right of way; for example, Old Dominion Drive through McLean.<sup>29</sup> Nearly all other traces of the streetcar lines have vanished except for a few street names that reflect their passage, such as Electric Avenue in Vienna, or Railroad Avenue in downtown Fairfax.

In 1846 Virginia petitioned the federal government to take back the part of the District of Columbia that lay on the Virginia side of the Potomac. Retrocession of what was then farms and a few small villages took effect the following year, and the area was incorporated into Alexandria County. In 1920, with suburbanization underway, the thirty three-square-mile parcel was incorporated and named Arlington County, after the name of Robert E. Lee's home before the Civil War. The 1846 decision was based on the

perception that too much land had been taken for the new capital; the 1920 incorporation of Arlington County served as notice that the original 1846 decision, however flawed, would not be reversed. By 1920, thanks to new river crossings and streetcar lines, Arlington County was a fast-growing suburb and home to many federal workers. Old farming or streetcar commuter villages like Clarendon lost their individual identities and merged into a continuous spread of housing developments, served by roads leading to bridges across the Potomac. Arlington thus acquired the unique character of being physically a part of Virginia yet perceived—correctly—as being culturally, politically, and economically more a part of Washington.<sup>30</sup> It retains its uniqueness to this day: neither a city (like its neighbor Alexandria) nor a county in the traditional sense. Since about 1980, dense urban development has begun to crowd out some of the inner suburbs, although large areas of Arlington County retain a bedroom community flavor. It retains a system of county government.

#### THE SECOND WORLD WAR AND REGIONS OF HIGH TECHNOLOGY

The preceding discussion of the Civil War, Reconstruction, and the region's economy brings us back to the original question of what qualities, if any, distinguish northern Virginia from similar areas in suburban Maryland or the District of Columbia. The pundits who write for the op-ed page of the *Washington Post* and who populate the Sunday morning talk shows insist that there is a big difference from their vantage point. Northern Virginia has many qualities that are the true reasons for the mix of military and civilian technology firms, residences, and retail shopping now located there. The cultural differences between North and South, though present, are not among them, but they are worth some examination.

To Virginians who study the early history of their state, the phrase “the War” means one thing: the conflict with the North between 1861 and 1865. In the course of researching this study, I interviewed executives, real estate developers, scientists, and engineers whose work gives the region its identity today. These men and women also spoke of the enormous effect of “the War,” except they meant the Second World War, fought between 1939 and 1945, not the Civil War. World War II affected all regions of the United States, but it affected the South perhaps more than others. And within the South, it affected northern Virginia most of all. World War II changed the relationship

among the military, armaments manufacturers, and contractors. It changed the role of the scientist in society and the role of universities. It helped create what President Eisenhower called, in his 1961 farewell address, the “military-industrial complex.”<sup>31</sup> There were differences of orders of magnitude between the Union signal tower at Peach Grove and the microwave tower that replaced it in the 1950s, or between Thaddeus Lowe’s balloons and the reconnaissance satellites of the 1960s.

During the Civil War and Reconstruction, Virginians saw the federal Army as pillagers, who helped themselves to livestock, grain, and wood as they needed it, burning the rest. After World War II, northern Virginians saw the U.S. military establishment as a source of both pride and employment, as it established numerous army and naval bases in the state. In 1942 the War Department moved its headquarters from Washington to Arlington, to a five-sided building called simply the Pentagon. That move was not seen as an occupation this time.

Students of southern history often say that “the South” really begins at the Rappahannock, the next major river south of the Potomac, thirty miles from the Maryland-Virginia border. That was the *de facto* border during the Civil War, and it has persisted as a boundary into the twenty first century. As late as the 1980s, drivers entering Virginia from the north on Interstate 95 first saw a “Welcome to Virginia” sign at the Rappahannock, not the Potomac River bridge.<sup>32</sup> Students of geography have other tests for whether a place is in the South or not: they go into a restaurant and see if grits are on the menu. My own test is similar: if diners sitting in the next booth mention “the Yankees,” are they discussing Lincoln’s armies or the baseball team from the Bronx? By these criteria, Tysons Corner and the Dulles Corridor are not in the South.<sup>33</sup>

The other types of differences are those that primarily led to the concentration of certain types of firms in the Dulles Corridor, while other types developed in the Maryland suburbs. One must avoid the historian’s fallacy of saying that because such a concentration *did* develop in Virginia, it *had* to have developed there. In hindsight it is easy to pick out the factors that led to the asymmetry, but anticipating those factors is hard. That does not prevent city planners and politicians from around the world from visiting northern Virginia, hoping to find the key to its concentration of wealth and high-paying jobs and take it back to their countries or regions.<sup>34</sup> These visitors typically have lunch at the Tower Club in Tysons Corner, visit office



buildings in Reston and Herndon where major Internet work is done, visit the offices of America Online in Dulles, and schedule interviews with local entrepreneurs, real estate developers, and executives, who are all happy to tell them the “secret” to the region’s success.

Before they come to Virginia, these visitors often go first to California, where a concentration of semiconductor, computer, and software firms arose in a compact area on the peninsula between Palo Alto and San Jose. Around 1970, a local journalist gave that area the name “Silicon Valley,” a term that has come to symbolize prosperity based on information technology. Like Tysons Corner and the Dulles Corridor, Silicon Valley is not an incorporated town. There is no post office with that name, nor is there a mayor or city council that governs it. Unlike northern Virginia, it has been the subject of numerous academic studies, yielding shelves full of books and reports on its origins, growth, vitality, and future. Returning to their home regions, people set out to create a local version, which the local press dubs “Silicon X,” where X stands for Glen, Gulch, Plains, Forest, Beach, and so on.<sup>35</sup> From these studies one can distill a consensus on what factors are critical for success:

1. The presence of a nearby highly ranked research university with strengths in computer science, electrical engineering, and the physical sciences
2. An entrepreneurial climate including the presence of venture capital and forward-thinking banks
3. An infrastructure of cooperative local zoning boards, real estate developers, lawyers, marketing people, and the like who can help a company get established quickly without red tape
4. Suitable places for engineers and their families to live, with good schools, roads, and parks
5. The presence of a military or other federal research facility to pump in government money

This last criterion apparently contradicts the second, which implies that private sources of capital are better engines of growth than government money, since the former is more flexible, more attuned to market needs, and less influenced by unseemly political pressures. As we study those factors in relation to Tysons Corner and the Dulles Corridor, we need to keep that difference in mind. Robert Noyce, the coinventor of the silicon chip and one who helped give Silicon Valley its reputation, remarked that military-supported projects



were “a waste of the asset. The direction of the research was being determined by people less competent in seeing where it ought to go, and a lot of time of the researchers themselves was being spent communicating with military people through progress reports or visits or whatever.”<sup>36</sup> In the culture of Silicon Valley, it is always the engineer, the programmer, even the computer hacker, who ranks at the top, even if he or she may not be the CEO of the company or necessarily have gotten rich from his or her efforts.<sup>37</sup>

It is worth stating that northern Virginia easily qualifies as a technology center, with a concentration of high-paying jobs. Northern Virginia’s economy is dynamic and fast-changing, and it is impossible to cite exact figures. But a survey of technology employment conducted in 2000, the year the Internet bubble burst, listed the Washington region as having 426,000 tech jobs, third behind Silicon Valley (629,000) and Boston (526,000). It had nearly twice as many as the next place on the list, Seattle (234,000).<sup>38</sup> That survey looked at the entire Washington area, but other surveys have shown that about two-thirds of that work is done in the Virginia suburbs—overwhelmingly in the Tysons-Dulles axis, with the rest in Maryland and only a small amount in the District.<sup>39</sup> Thus northern Virginia would remain third-ranked in the 2000 survey. Other surveys have measured variations of the local economy taken before, during, and after the Internet run-up; they all present similar conclusions. Within the Commonwealth of Virginia, the region near Washington is without question the economic engine. As early as 1989, then-Governor Gerald L. Baliles noted that Virginia income tax receipts from Fairfax County alone exceeded revenues from the cities of Richmond, Norfolk, Virginia Beach, Roanoke, Winchester, and Bristol, plus the counties of Albermarle, Botecourt, Chesterfield, Halifax, Rockbridge, Tazewell, and Westmoreland *combined*.<sup>40</sup> Other informal surveys of the Washington region state that from 40 percent to 60 percent of Virginia’s tax revenues come from an area less than fifteen miles from the Washington Monument. If this region is less dynamic and prosperous than Silicon Valley, it cannot be far behind.

Of the factors listed earlier for Silicon Valley, some are present in this region, but others are conspicuously absent. The Washington, D.C. area is blessed with a number of high-quality universities and colleges, but the one that is best known for computer science and electrical engineering is the University of Maryland, on the other side of the Beltway in College Park. Virginia’s technical university, Virginia Tech, is highly-ranked but is in

Blacksburg, 250 miles away. George Mason University in Fairfax has built up comparable strengths in these subjects, but that university was created in response to demand from local firms—it is an effect, not a cause, of the booming economy. Nearby universities in the District of Columbia, including Georgetown, George Washington, and Howard, are top-ranked but are better known for their strengths in medicine, law, and politics than for computer science, physics, or electrical engineering.

Among the other factors, northern Virginia fares well: it has a pleasant climate, access to recreation, and good schools. The local governments and business community have been supportive, although not without frequent rear-guard fights from local residents' associations. Like Silicon Valley, it has a good infrastructure of roads, airports, water, sewer, and electric utilities. (Also like Silicon Valley, these highways can no longer handle the traffic.) Northern Virginia's telecommunications infrastructure may be the best in the world, although that, like George Mason University, is more an effect than a cause of economic development in the region.

Federal facilities in northern Virginia, however, are nothing like what one finds in Silicon Valley, and indeed nothing like any other region of the country. Assessing their role requires a careful and detailed analysis, and that will be a major focus of subsequent chapters. The difference is one both of degree and of kind. Military and federal research laboratories of all sizes and types are scattered throughout the District and around the Washington area. (In the immediate suburbs, more of these laboratories are located in Maryland than in Virginia.) The region is also home to institutions serving the management of research, engineering, and military activities. These are not unique to this region, but they are not found in such a concentration anywhere else. And whereas one can find military bases and government laboratories in Virginia, Maryland, and the District, these entities dealing with management are heavily concentrated in Virginia, where their presence gives Tysons Corner its unique character.

The critical role of the Defense Department in northern Virginia affects the other criterion for high technology economies: the requirement that a region have risk-taking bankers and venture capitalists, with their preference for lean and flexible organizations that keep stifling bureaucracy at bay. Robert Noyce's comments suggest that Silicon Valley would not exist were it not for such risk-takers. How does that translate to northern Virginia? After all, the Pentagon may look like a fortification with its five sides, but it

is really just a large office building, housing one of the largest bureaucracies in the world. The military's weapons are built and tested elsewhere; the Pentagon's principal product is paper (or its modern equivalent, PowerPoint slides). Can one base a dynamic, technology-driven local economy on contracts from government bureaucrats? Subsequent chapters will show that the answer is yes. The government's presence, however, has made the nature of the Virginia economy different from that of Silicon Valley, Boston's Route 128, the Dallas-Fort Worth Metroplex, or other similar regions. Venture capital can be raised in northern Virginia, but activities funded by it may never grow out of the shadow of those receiving government monies. This implies that the Dulles Corridor will never achieve the kind of dynamism found in Silicon Valley. Perhaps the nation needs only one such place anyway. The role of government funding, especially Pentagon funding, versus venture capital and Wall Street funding will also come into play as we examine the difference between what drove the growth of Tysons Corner and what grew up along the Dulles Toll Road.

Beginning in the next chapter, we will leave our discussion of the Civil War and Reconstruction, which many Virginians feel is the true subject of Commonwealth history. But it will be worth remembering that the post-World War II development of government contracting, consulting, systems integration, and telecommunications all happened on specific pieces of land. But how does one connect the present to the past in a meaningful way? The townhouses and office towers one finds there today look the same as structures found almost anywhere else in the eastern United States. The shopping malls are filled with chain stores and restaurants using the same logos and fixtures, selling the same clothes, and offering the same menus as anywhere else. Does it make any difference that Stonewall Jackson led his men over what is now the site of the Fairfax Towne Center?<sup>41</sup> It is a nice conceit to compare Thaddeus Lowe's balloons at Falls Church to the National Reconnaissance Office's activities in Chantilly, or the "Quaker guns" (logs painted to look like cannons) deployed at Centreville to the CIA-manufactured deceptions produced in its labs at CIA Headquarters in Langley.<sup>42</sup> But is there anything of more substance to that comparison? We shall return to that question in the following narrative.

