July 2009

appendix

# gaithersburg west master plan

The Life Sciences Center







Montgomery County Planning Department The Maryland-National Capital Park and Planning Commission

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Appendix Gaithersburg West Master Plan The Life Sciences Center

Prepared by the Montgomery County Planning Department 8787 Georgia Avenue Silver Spring, MD 20910-3760

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### Introduction

The *Gaithersburg West Master Plan* supports transforming the Life Sciences Center (LSC) from today's isolated clusters into tomorrow's integrated, vibrant science and medical community that is connected by transit and trails and enlivened by a variety of uses. This Plan seeks to build upon the strong presence and collaborative relationships that exist among the institutions and businesses in the LSC. This Plan envisions a LSC where the physical, built environment is as dynamic and inspiring as the discoveries going on inside the labs, research centers, and universities.

Land use planning can help create the spaces and synergies that proactively generate collaboration across academic, government, and private industry sectors. The LSC is an appropriate location for future growth if it is phased with construction of major infrastructure improvements, primarily the Corridor Cities Transitway. This Plan provides the blueprint for the LSC of the 21st century to become an innovative, vibrant community that inspires advances in discovery and promotes translational science into practical applications that produce enhancements to healthcare delivery for residents and a thriving economy for the County and the region.

### Appendix 1: Background

Montgomery County has a long history of comprehensive planning. The County's General Plan has been a significant planning guide for the Gaithersburg West plan area since it designated the I-270 Corridor for major economic growth. This section:

- presents a brief history of Gaithersburg West master plans
- summarizes planning policies at the State and County level that influence local master plans
- summarizes annexations, which are inter-jurisdictional matters that require coordination between the municipalities and the County
- describes the area's development as a science center.

#### The General Plan

In 1964, the County's first General Plan, "...On Wedges and Corridors," A General Plan for the Physical Development of the Maryland-Washington Regional District in Montgomery and Prince George's Counties, recognized the District of Columbia as the region's geographic, economic, and cultural center and that the region depended on a healthy core. The General Plan originally envisioned six growth corridors radiating out from Washington, D.C. like spokes of a wheel that were separated by green wedges of open space, farmland, and lower density residential uses.

Along the I-270 Corridor, the General Plan envisioned a series of Corridor Cities—Rockville, Gaithersburg, Germantown,

and Clarksburg—that were linked with each other and Washington, D.C. via the Metrorail Red Line. The Corridor Cities were to have intensively developed downtowns located about four miles apart, with high rise buildings containing housing, offices, and a variety of shopping and cultural amenities. A ring of residential communities consisting of a variety of housing types and local shopping, recreational, and educational facilities were to surround the downtowns. Each of the Corridor Cities was planned to support a population of up to 100,000 people.

Montgomery County and Prince George's County were the only jurisdictions in the area to officially adopt the Wedges and Corridors concept to guide their development. Montgomery County contains the entire I-270 Corridor (hereinafter referred to as the "Corridor") while the I-95 Corridor is located to the east in Prince George's County. In addition to the corridors, the General Plan identified the developed areas of lower Montgomery County nearest Washington, D.C. as the "urban ring." The urban ring and the corridors were envisioned as appropriate locations for intense, compact, transit-serviceable growth and development while the wedges protected natural resources and agricultural lands and provided respite and recreational opportunities.



The 1993 *General Plan Refinement* reaffirmed the vision and concepts and identified the I-270 Corridor as the County's major radial transportation spine, along which much of its housing and employment growth has occurred during the past two decades. The General Plan Refinement stated: "This Corridor is a significant employment resource for the County and region, representing both the County's and State's economic future" (page 27). The General Plan Refinement placed great importance on containing Corridor and center development; continued dispersion, or sprawl, would put further strains on the environment, transportation systems, and the Wedges and Corridors concept itself.

#### **Gaithersburg Planning History**

While the County's General Plan provides overall guidance on land use and development, community master plans and sector plans provide more specific details and direction. Previous master and sector plans for the Gaithersburg area are summarized below.

The 1971 *Gaithersburg Vicinity Master Plan* was undertaken to address growth issues brought about by the extension of I-270. Development pressures increased for many growth centers within the Gaithersburg area. New employment centers were established along I-270, which generated new demand for housing. The Plan expanded the Corridor City concept and envisioned a complete range of community services, employment opportunities, and a variety of housing types. The Plan encouraged the creation of the Montgomery County Medical Center at Shady Grove Road (renamed the Shady Grove Life Sciences Center). The Plan also recommended the Outer Beltway (renamed the Intercounty Connector) and proposed a Metro station at Shady Grove to serve the transportation needs of this growing area.

The 1982 *Oakmont Special Study Plan* reflected the strong desire of the community to remain low-density and residential in character, while recognizing the need for some future transportation improvements. The Oakmont Plan was prepared as a separate study and preceded the 1985 Plan because it was not dependent on transportation studies. The primary recommendation of the Oakmont Plan was to reconfirm the existing R-200 zoning, rather than the R-90 zoning that had been recommended in the 1971 Gaithersburg Vicinity Master Plan.

The 1985 *Gaithersburg Vicinity Master Plan* focused on three study areas: Shady Grove West (which was the subject of a major master plan amendment in 1990), the Airpark, and Smokey Glen. For most of the land outside these areas, the Plan reconfirmed the recommendations of the 1971 Gaithersburg Vicinity Master Plan.

The 1990 *Shady Grove Study Area Master Plan* recommended a shift in land use on the west side of the Shady Grove Metro Station from industrial uses to a major employment and housing center. The Plan also recommended a mixed-use, transit-oriented, walkable neighborhood for the King Farm, which was annexed into the City of Rockville. West of I-270, the Plan designated the Life Sciences Center as a "Research and Development Village." The Plan's land use recommendations assumed that transit would be implemented. To emphasize the importance of transit, the Plan stated that the Sectional Map Amendment (which implements the Plan's zoning) should be deferred until actions had been taken toward providing transit. The SMA was approved in 1996 when an interim transit plan was approved by the County Council.

A 1996 amendment to the 1985 *Gaithersburg Vicinity Master Plan* and the 1990 *Shady Grove Study Area Master Plan* designated the alignment of the Corridor Cities Transitway (CCT) to connect the Shady Grove Metro Station with the Life Sciences Center to the west and to stops further north along the I-270 Corridor. The amendment also deleted a proposed transitway spur of the CCT through the Life Sciences Center as well as a southern transitway from Great Seneca Highway toward I-270.

#### **Planning Policies**

Master plans and sector plans must balance local land use issues with broader State and County policies. Following is an overview of significant State and County policies that affect land use planning in Montgomery County.

The 1992 Maryland Planning Act defined seven visions that are embraced and affirmed by this Plan: 1) development is concentrated in suitable areas, 2) sensitive areas are protected, 3) in rural areas, growth is directed to existing population centers and resources are protected, 4) stewardship of the Chesapeake Bay and the land is a universal ethic, 5) resource conservation is practiced, including a reduction in resource consumption, 6) economic growth is encouraged and regulatory mechanisms are streamlined to assure the achievement of one through five above, and 7) funding mechanisms are addressed to achieve these visions.

The 1997 Maryland Smart Growth Act supports growth in appropriate areas and limits development in agricultural and other resource areas by limiting State resources to existing communities and not subsidizing infrastructure in other areas. The Act encourages development principles designed to maximize existing infrastructure and focus investments in new infrastructure, including communities that are walkable and transit accessible. The policy's Priority Funding Areas concept includes criteria for counties to designate additional funding areas.

The 1993 Montgomery County *General Plan Refinement* updated the goals and objectives of the 1964 General Plan. As discussed above, the General Plan affirmed the Wedges and Corridors concept as a framework for development in the County. The Plan divides Montgomery County into four geographic components: the Urban Ring, the Corridor, the Suburban Communities, and the Wedge. Each component is defined in terms of appropriate land uses, scale, intensity, and function.

The 1998 *Park, Recreation, and Open Space Plan* explores future demand for recreational facilities within the County's 34,000-acre park system and determines which natural and historic areas should be preserved as open space.

The 1998 *Countywide Park Trails Plan* is a blueprint for creating a system of interconnected hard and natural surface trails in parkland.

The 1998 *Countywide Stream Protection Strategy* is a comprehensive review of stream quality and habitat that helps public agencies identify and provide funding for specific watershed-based resource protection initiatives.

The County's 2001 *Legacy Open Space Functional Master Plan* supports protection of natural and cultural resources through public acquisition and easements for properties that otherwise would not be protected through standard regulatory controls. The Plan identifies known resources and also defines a process for selecting sites, setting spending priorities, implementing the program and measuring its progress.

The County Council's 2002 *Transportation Policy Report* recommended a vision and principles for future land use and transportation plans and described a recommended transportation network that will be reflected through the Master Plan of Highways and appropriate master plans. It also included an alternate Land Use Plan that improved the jobs and housing balance throughout Montgomery County to increase opportunities to live near employment centers.

The County Council's 2003 Action Plan for Affordable Housing recommends using underdeveloped land near Metro stations for housing and encourages a full range of housing types to meet the diverse needs in the County.

#### Annexations

The cities of Gaithersburg and Rockville, which are adjacent to the Life Sciences Center, are directly affected by the Plan's recommendations. Two large, undeveloped parcels in Gaithersburg West are adjacent to the City of Gaithersburg—the JHU Belward Campus and the Metropolitan Grove/McGown property—and are within the City's maximum expansion limits. Maximum expansion limits (MEL) have been established by the municipalities as a guide to set a geographical boundary for potential future annexations of County land into the cities to allow for growth. Only land within the MEL can be considered for annexation and municipalities may only annex land that adjoins its boundaries.



# City of Gaithersburg Maximum Expansion Limits

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A municipality may initiate annexations or property owners may petition a municipality to annex unincorporated territory. A valid petition requesting annexation does not compel its enactment. The municipal governing body alone is authorized to introduce and approve an annexation resolution. Annexations occur for a number of reasons, but the most obvious is economics. The City benefits because of the increased tax revenue. Property owners may benefit from increased flexibility in the potential development of a parcel, an enhanced identity, or improved services.

The annotated Code of Maryland, Article 23A, Section 19, prescribes procedures for enlarging municipal boundaries in Maryland. The Code requires that municipalities produce a Municipal Growth Plan delineating the MEL. Municipalities may annex unincorporated land contiguous and adjoining the municipal boundaries if it is within the adopted MEL, but may not annex land within another municipality. An annexation cannot create an unincorporated enclave within the town or city that is surrounded on all sides by property within the municipality. According to state law, the Montgomery County Council must consent to any annexation where the land is placed by the City in a zone that allows a substantially different land use than that recommended by the current County master plan covering the property. The City may not place new zoning on annexed land that permits substantially different land uses from those specified in the County's zone for a period of five years after annexation, unless it has the consent of the Montgomery County Council.

In 1992, the City of Gaithersburg, the City of Rockville, and Montgomery County entered into a joint Memorandum of Understanding that established guidelines for land use and required community facilities, as well as the agreement by the jurisdictions to work cooperatively to develop procedural guidelines for annexation agreements that include staging components. The memorandum states "...it is essential that all jurisdictions support well-managed economic development and housing initiatives which will be mutually advantageous to all parties, and agree to the goals and principles of the General Plan."

Over the years, the City of Gaithersburg has envisioned a series of annexations that would create corporate limits following logically defined boundaries such as roads and highways, rather than private property lines. Since 1985, the City undertook a fairly aggressive annexation program that added over 1,100 acres to the municipality. Some of the larger annexed properties included IBM, the Washingtonian Center, Asbury Methodist Village, and National Geographic. The City of Gaithersburg currently covers 6,409 acres, or 10 square miles. The City's goal of logical and clear boundaries may never come to fruition since many of the areas that would have to be annexed to create well-defined corporate limits are developed with existing and established uses that do not offer the potential for substantially increasing city tax revenues.

A number of annexations have significantly altered boundaries adjacent to the municipalities. The following properties have been annexed into the City of Gaithersburg since the 1985 Master Plan: the Washingtonian Center, IBM, National Geographic Society, National Partnership, Washingtonian Industrial Park, Bechtel, Asbury Methodist Village, Teunis, Summit Hall Turf Farm, the Kramer property, the Carpenter property, and the Crown Farm. In addition, the Thomas Farm/Fallsgrove and King Farm were annexed into the City of Rockville. Several areas that were part of the 1985 and 1990 master plans are now covered by other plans, including the Shady Grove Metro Station area, which is the subject of the 2006 *Shady Grove Sector Plan*.

#### **Gaithersburg: The Science Capital of the United States**

Gaithersburg was primarily a farming community until the middle of the 20th century. With the opening of I-270 (originally 70S) in the 1950s, the mid-County landscape began to transform from agrarian to residential and business development. At the same time, during the Cold War years, the federal government began to look to surrounding suburban bedroom communities to find locations for agency expansions, based on concerns over nuclear attacks in the heart of Washington, D.C. Abundant land, easily accessible by I-270, made Gaithersburg an attractive location.

In 1957, the federal government purchased two farms adjacent to I-270 for the headquarters of the National Bureau of Standards, now known as the National Institute of Standards and Technology (NIST). When NIST opened in 1966, the City's Town Administrator, William Vose, predicted that Gaithersburg would become known as "The Science Capital of the United States." For many years, NIST was the largest employer in Gaithersburg. Other major corporations soon began to locate in the area, including IBM, National Geographic, and the Communication Satellite Corporation. To support the employment, housing developments and shopping centers, as well as schools and other services were built.

The origins of the Shady Grove Life Sciences Center are found in the 1971 Gaithersburg Vicinity Master Plan, which proposed a medical center complex near Shady Grove Road west of I-270. The medical center complex was intended to provide a variety of public and private institutional uses, including a teaching hospital, medical research facility, and a full complement of health services for the rapidly growing western suburbs. In 1979, Shady Grove Adventist Hospital opened among rolling pastures and farm fields. In 1976, land northwest of the hospital was conveyed to the State for the Regional Institute for Children and Adolescents (RICA) and the Noyes Institute.

In the early 1980s, Montgomery County government made a strategic decision to use public resources to enhance its competitive position to attract the biotechnology industry. With land and location as its principle benefits, and the presence of a strong federally supported scientific community, biotechnology was a natural focus for the County's economic development program. Created on nearly 300 acres of publicly-owned land, the LSC included three components—medical services in the center, educational institutions to the north and south, and surrounding land available to attract research and development companies. Medical services were clustered around Shady Grove Adventist Hospital. To bring academic institutions to the area, the County donated 35 acres north of the hospital to Johns Hopkins University (JHU-MCC) and 50 acres south of Darnestown Road to the University of Maryland (for the Universities at Shady Grove, USG).

#### Appendix 2: Demographic Profile

Analysis

Study Area Description Trends

Demographic Databook

Age Race and Hispanic Origin Educational Attainment Employment Commuting Alternatives Household and Family Type Household Mobility In-Mover Households Foreign Born Language Ability Household Income Housing Tenure Housing Tenure Housing Costs Car Ownership Computer Ownership

The Analysis section examines whether local population and household trends are consistent with a proposed science city development in Gaithersburg West. The Demographic Databook profiles Gaithersburg West's demographic trends and characteristics based on detailed statistics from the Research & Technology Center's 2005 *Census Update Survey and Round 7.1 COG Forecast*. Comparative data for the wider Gaithersburg area and for Montgomery County as a whole is included.

#### Analysis

#### **Study Area Description**

The Gaithersburg West Master Plan covers 6.82 square miles in eight unconnected clusters of unincorporated land between the City of Gaithersburg to the north and the City of Rockville to the south.

Encompassing the Shady Grove Life Sciences Center, the Belward Campus of Johns Hopkins University, the Universities at Shady Grove, and the Metropolitan Grove area, Gaithersburg West is a key activity center within the I 270 Technology Corridor and the greater Washington, D.C. region. The study area includes the National Institute of Standards & Technology (NIST) headquarters and is within a few miles of other major U.S. federal science and technology research agencies, including the National Institutes of Health, the Food and Drug Administration, and the Department of Energy.

The study area boundaries generally correspond to the following traffic zones: 166, 199, 200, 212, 213, 215, 216, 218-220, 225 and 231. Demographic data is limited to only those traffic zones with residential areas, i.e., 166, 200, 212, 213, 215 and 231. Gaithersburg West is mostly within the Gaithersburg Vicinity planning area (Planning Areas 20 and 21), except for traffic zone 166, which is part of the Travilah planning area.

#### Trends

**Gaithersburg West residents live in a comparatively high-density environment near major job, educational, and shopping centers.** The study area's existing population is housed in a mix of single-family and multifamily homes. Currently, 39 percent of area residents live in multifamily housing—well above the County wide average of 23 percent.

Higher density housing is clustered around the Life Sciences Center as well as new and existing retail centers. It also is relatively accessible to other major job centers along the I-270 Corridor and to downtown Washington via the Red Line at the nearby Shady Grove Metro Station. Several future Corridor Cities Transitway stops would provide a mass transit link to the Shady Grove Metro Station as well as communities to the north.

Multifamily housing growth is driving Gaithersburg West's expansion, accounting for most new housing units currently approved for development. As a result, residential densities are forecast to increase over time, with half of Gaithersburg West residents living in high rise or garden apartments by 2030.

Gaithersburg West is likely to be a focal point for population growth, with multifamily housing growth driving the expansion. In 2005, the study area had 11,585 residents in 5,140 households. Based on existing demographic patterns and development capacities, Gaithersburg West's population is forecast to increase 64 percent compared to 21 percent in Montgomery County as a whole from 2005 to 2030. Current forecasts anticipate that Gaithersburg West will have 19,700 residents in 9,155 households by 2030.

Residential densities are likely to increase over time, with multifamily units accounting for most new housing units currently approved for development. By 2030, half of Gaithersburg West residents will live in high rise or garden apartments.

**Gaithersburg West's existing demographic mix is consistent with its proximity to an internationally renowned science and technology industry cluster.** Residents in the study area are generally affluent and exceptionally well-educated. At \$79,341, Gaithersburg West's median household income is just 5 percent below the County wide median—which in turn is among the very highest in the U.S. As in Montgomery County as a whole, Gaithersburg West residents also rank among the best educated in the nation: an especially high share of area residents have earned master's, professional, or doctoral degrees—41 percent versus 35 percent County wide.

Compared to the County's workforce as a whole, employed residents are less likely to commute to Washington, D.C. (11 percent versus 22 percent County wide) and more likely to work within the County (75 percent versus 60 percent County wide). Gaithersburg West residents who commute by car have relatively shorter trips, averaging 25 minutes versus 29 minutes for residents in the wider Gaithersburg vicinity.

A relatively large proportion of Gaithersburg West households moved to Montgomery County within the past five years (29 percent, versus 21 percent County wide). Among these in-mover households, a very high proportion are new to the Washington, D.C. region (80 percent versus 59 percent County wide). The proportion of foreign-born households is slightly below the County wide average (33 percent versus 35 percent), suggesting that Gaithersburg West draws newcomers from other regions of the U.S. as well as from abroad.

Together, these factors—high levels of income and education, a locally-employed workforce and a large newcomer base—suggest that unique economic opportunities in the Life Sciences Center and the wider, technology-rich I-270 Corridor may draw many residents to Gaithersburg West.

Gaithersburg West's relatively large multifamily housing base may play an important role in drawing talent to the region—especially recent graduates, foreign-born, and other newcomers. Multifamily households generally have higher turnover rates, as residents marry, start families, purchase homes or move on to larger units. This churn means vacancies open up more frequently in multifamily housing, making it faster and easier for new residents—especially young adults, immigrants, and people moving in from elsewhere in the U.S.—to gain a foothold in the area.

This pattern is apparent in Gaithersburg West, where multifamily housing accommodates 86 percent of the area's residents moving from points outside the Washington, D.C. region within the past five years. Multifamily households have been in place an average of one year, compared to six years for single-family households in the study area.

Multifamily housing also accommodates an unusually high percentage of area residents who have advanced degrees (38 percent versus 20 percent County wide). At \$52,680, median household incomes for all multifamily households in Gaithersburg West are above the County wide median of \$46,660 for garden apartments and \$51,970 for high rise units.

At the same time, higher housing densities have kept Gaithersburg West accessible to a variety of incomes, ages, and backgrounds. Multifamily housing tends to attract young adults, seniors, lower-income households, newcomers, and other residents who need relatively affordable, quickly available, or easy to maintain housing.

The data show that Gaithersburg West's relatively large multifamily base accommodates these groups. Gaithersburg West is a diverse, mixed-income community that includes a wide range of ages—including children, young adults, and seniors.

Compared to the wider Gaithersburg vicinity and the County as a whole, the study area has more singles and young adults under 30. Most of these residents are housed in multifamily units—suggesting that higher density housing is financially accessible to one-income households and young workers just starting out in their careers.

The study area's senior population share is 20 percent larger compared to the wider Gaithersburg area. Most Gaithersburg West seniors (61 percent) live in multifamily housing. This suggests that higher residential densities have enabled the study area to supply a disproportionately large share of the senior housing needs of the up-County area.

Consistent with its relatively large multifamily base, Gaithersburg West has fewer children and youths under the age of 18 compared to the County as a whole. The average size of all households in Gaithersburg West is 2.25 persons versus 2.66 County wide, which also reflects the predominance of multifamily households, which tend to have more singles and fewer children. The current preference for single-family homes among families with children could change over time, especially if larger multifamily units close to jobs, recreation, and other amenities are built in the study area.

#### **Demographic Databook**

#### Average Household Size

#### **Demographic Overview**

**Population and Households (2005) Gaithersburg West has 11,585 residents living in 5,140 households.** The study area accounts for nine percent of the total Gaithersburg population and one percent of residents County wide.

Households tend to be smaller on average in Gaithersburg West. The average number of persons per household is comparatively low (2.25 versus 2.67 in Gaithersburg and 2.66 in Montgomery County).



#### Structure Types (2005)

**Most Gaithersburg West residents live in single-family homes.** Even so, the single-family share of the population is comparatively low (61 percent versus 70 percent in Gaithersburg and 77 percent in Montgomery County as a whole).

A majority of households are in multifamily units. Gaithersburg West has a relatively large base of multifamily households (51 percent versus 36 percent in Gaithersburg and 31 percent County wide).

A larger multifamily housing base accounts for smaller average household sizes. Multifamily households tend to be smaller than single-family households. This is the case in Gaithersburg West, where the average size of a multifamily household is 1.73 persons per household versus 2.78 for single-family households.

**Multifamily housing also accounts for smaller average household sizes.** With more singles and fewer children, multifamily households tend to be smaller than single-family households. This is the case in Gaithersburg West, where the average size of a multifamily household is 1.73 persons per household versus 2.78 for single-family households.

**Multifamily housing attracts singles to Gaithersburg West.** Most one-person households (74 percent) are concentrated in multifamily units.

**Multifamily housing is not limited to singles.** One third of Gaithersburg West's married couple families (34 percent) live in multifamily housing.

#### Growth Forecast (2005 to 2030)

**Gaithersburg West's residential base will grow markedly over the next 25 years.** According to COG Round 7.1 forecasts, the study area will add 7,655 new residents and 3,885 new households over the next 25 years. By 2030, Gaithersburg West will have 19,700 residents in 9,155 households.

**Gaithersburg West will attract an outsized share of population growth in the County.** The study area population will increase by 64 percent between 2005 and 2030—almost three times the forecast population growth for all of Montgomery County (21 percent), and twice the pace of growth forecast for the wider Gaithersburg area (35 percent).

**Households will grow at an even faster rate.** The number of households in Gaithersburg West is forecast to increase by 74 percent—well above the rate of household growth forecast for Montgomery County (27 percent) and the general Gaithersburg area (43 percent).

**Growth will accelerate after 2010.** After slightly lagging the County and the wider Gaithersburg vicinity through the rest of this decade, the pace of growth in the study area will begin to increase after 2010. Most of the area's total forecast population growth (80 percent) over the next 25 years will occur between 2015 and 2030.

**Multifamily housing development will drive future growth.** Nearly 69 percent of new residents in Gaithersburg West over the next 25 years will be housed in multifamily units. By 2030, half of Gaithersburg West's population will live in multifamily dwellings, up from 39 percent of residents today.

Households will get smaller on average. With more new households than residents, average household sizes are forecast to decline to 2.15 persons; this is in line with a general trend to smaller households in Montgomery County.

#### **Detailed Profile**

#### Age

Gaithersburg West has a relatively small population under the age of 18. Children and youths account for a relatively small share of the total household population (21 percent versus 26 percent County wide). This can be attributed to a larger base of multifamily households, which typically houses fewer children; 78 percent of the under 18 population is in single-family homes.



The multifamily housing base attracts more young working-age adults. Gaithersburg West's population of young adults (between the ages of 18 and

29) is 25 percent higher than in the County as a whole. The vast majority of young adults in the study area (71 percent) live in multifamily housing, which tends to be more accessible to singles and people in the early stages of their careers.

#### Age groups by structure type

Household Population Gaithersburg West



**Single-family housing attracts more adults in their prime child-bearing or income-earning years.** Adults between the ages of 30 and 64 account for 54 percent of Gaithersburg West's population versus 51 percent County wide. Sixty seven percent of adults over the age of 30 live in single-family housing.

**The senior population is large for the Gaithersburg vicinity.** The share of the population aged 65 and up is 20 percent higher in Gaithersburg West than in the surrounding area (10 percent versus 8 percent in Gaithersburg as a whole). Among Gaithersburg West seniors, 61 percent live in multifamily homes (including seniors-only complexes). This suggests that the multifamily housing stock in the study area provides an important source of senior housing in the up-County area.

#### **Race and Hispanic Origin**

Gaithersburg West has a somewhat smaller than average minority population. Minorities account for 40 percent of residents in the study area versus 52 percent in Gaithersburg and 44 percent in Montgomery County.

**Compared to other parts of Montgomery County, there are fewer Black/African American and Hispanic residents.** Gaithersburg West has a relatively small Black/ African American population (nine percent of the total population versus 18 percent in Gaithersburg as a whole and 17 percent County wide. The Hispanic population also is comparatively small (10 percent of residents, versus 19 percent in Gaithersburg and 14 percent County wide).

Gaithersburg West has relatively more Asian

**residents.** Asian/Pacific Islanders account for a somewhat larger share of the study area population (20 percent versus 15 percent in Gaithersburg as a whole and 13 percent County wide).

#### Minority share of the population









#### **Race & Ethnicity**

Source: 2005 Census Update Survey

			Gaithersburg West			
	Montgomery County	Gaithersburg	Total	Single Family	Multifamily	
Household Population	931,000	409,775	11,585	7,075	4,510	
White	64%	57%	66%	68%	62%	
African American/Black	17%	18%	9%	5%	16%	
Asian/Pacific Islander	13%	15%	20%	23%	15%	
Other	6%	10%	5%	4%	7%	
	100%	100%	100%	100%	100%	
Hispanic or Latino*	14%	19%	10%	6%	16%	

#### **Educational Attainment**

**Gaithersburg West residents are exceptionally well-educated.** A substantial percentage of adults age 25 and over in the study area has an advanced (graduate, professional or doctoral) degree (41 percent compared to 26 percent in Gaithersburg and 35 percent County wide).

Multifamily housing accommodates many of Gaithersburg West's most highly educated residents. Compared to their counterparts in other parts of Montgomery County, Gaithersburg West residents with advanced degrees are far more likely to live in multifamily housing (38 percent versus 20 percent County wide). Advanced degree holders account for 37 percent of all adults age 25 and over living in Gaithersburg West's multifamily housing units.



**Educational Attainment** Population age 25 and over

#### Not all residents are educationally advantaged. Six

percent of adults in Gaithersburg West lack a high school education. Among multifamily residents, the rate is even higher (nine percent).



#### Graduate, Professional or Doctoral Degrees

#### Educational Attainment Source: 2005 Census Update Survey

		_	Gaithersburg West			
	Montgomery County	Gaithersburg	Total	Single-Family	Multifamily	
Population 25 years and older	624,025	85,915	8,360	4,815	3,545	
Less than High School	8%	10%	6%	5%	9%	
High School	22%	27%	19%	16%	23%	
Associate or Trade School	6%	7%	4%	2%	5%	
Bachelor's Degree	29%	30%	30%	33%	26%	
Graduate, Professional or Doctoral Degree	35%	26%	41%	44%	37%	

#### Employment

#### Female labor force participation rates are relatively high.

Gaithersburg West has a relatively large population of working women (74 percent of female residents age 16 and over versus 68 percent County wide), with above-average female labor force participation rates among both single-family (72 percent) and multifamily (76 percent) residents.

Gaithersburg West supplies a disproportionate share of Montgomery County's labor force. Employed residents account for a relatively large share of the study area's total population (63 percent versus 57 percent County wide). This is consistent with a population that includes relatively fewer children and more working-age adults, singles, and working women.

Multifamily units house a comparatively large share of the resident labor force. A larger percentage of Gaithersburg West's employed residents live in multifamily units compared (43 percent versus 24 percent County wide).

Most Gaithersburg West workers commute to jobs in Montgomery County. Gaithersburg West residents are far more likely to work inside the County (75 percent of the labor force versus 60 percent County wide), half as likely to work in the District of Columbia (11 percent versus 22 percent County wide), and equally likely to commute to jobs in Virginia (seven percent versus eight percent County wide).

#### Female labor force participation rates









#### Work location of resident labor force



#### **Commute Alternatives**

People who live in Gaithersburg West are more likely to drive than take transit to work. Fewer area workers commute by public transit (13 percent versus 16 percent County wide). Those who do use transit face longer commute times (averaging 62 minutes versus 49 minutes for employed residents County wide). Low rates of transit use and long transit commutes reflect several factors, including the relatively smaller numbers of residents that work in the District, the study area's location near the end of the Red Line, and the relative dearth of direct rapid transit connections. Transit use is likely to increase once the Corridor Cities Transitway is built.

#### Residents of higher density housing are more likely to

**choose alternatives to one-car commutes.** Compared to workers living in single-family homes in the study area, multifamily residents in Gaithersburg West are more likely to commute by transit (16 percent versus 10 percent), carpool (seven percent versus four percent) or walk or bike to work (four percent versus less than 0.5 percent).

#### Single-family residents are more likely to work at home.

Telecommuting and other at-home employment is much higher among residents in single-family homes (seven percent of workers living in single-family homes versus one percent of workers in multifamily housing).

#### Household and Family Type

A smaller-than-average majority of Gaithersburg West households are married couple families. Married couples (with or without children) account for 57 percent of households in the study area, versus 62 percent County wide and 60 percent for Gaithersburg as a whole. Gaithersburg West also has relatively few single-parent families (six percent of households versus 11 percent in Gaithersburg and 10 percent County wide).

**Singles account for an above-average share of area households.** Gaithersburg West's housing mix accommodates an above-average number of one-person households (33 percent of households versus 25 percent in Gaithersburg and 24 percent County wide). Singles account for nearly half of multifamily households (48 percent).

#### Commute Alternatives Gaitherburg West



Average Commute Time to Work (in minutes)





**Families generally are smaller in Gaithersburg West.** The study area's population base includes more residents—seniors, singles and young adults—who tend to have few if any children living at home, with fewer minority residents

and average numbers of immigrant households—groups that tend to have larger families—to offset these smaller households. One third of Gaithersburg West households (33 percent) have three or more members, compared to nearly half of all households in Montgomery County (46 percent). This is reflected in the study area's smaller average household sizes (2.25 versus 2.66 County wide).

#### Families with 3 or more members by area



		Gaith	ersburg West	
Montgomery County	Gaithersburg	Total	Single-Family	Multifamily
350,000	48,820	5,140	2,540	2,600
62%	60%	57%	76%	38%
24%	25%	33%	18%	48%
10%	11%	6%	5%	6%
15%	15%	10%	7%	14%
2.66	2.67	2.25	2.78	1.73
	Montgomery County 350,000 62% 24% 10% 15% 2.66	Montgomery County Gaithersburg   350,000 48,820   62% 60%   24% 25%   10% 11%   15% 15%	Gaithersburg Gaithersburg   350,000 48,820 5,140   62% 60% 57%   24% 25% 33%   10% 11% 6%   15% 15% 10%   2.66 2.67 2.25	Gaithersburg Gaithersburg Gaithersburg   Montgomery County Gaithersburg Total Single-Family   350,000 48,820 5,140 2,540   62% 60% 57% 76%   24% 25% 33% 18%   10% 11% 6% 5%   15% 15% 10% 7%   2.66 2.67 2.25 2.78

#### **Household Mobility**

**Most Gaithersburg West households are newly-established.** Area residents have lived in their current homes for a median of three years—about half the median for Montgomery County as a whole (six years). Most Gaithersburg West households have been in place for less than five years (58 percent versus 49 percent in Gaithersburg and 42 percent County wide).

#### Mobility rates predictably are higher in multifamily households. Multifamily households generally have higher turnover rates, with residents moving on after marrying, starting families, or earning higher incomes. Even so, multifamily households in Gaithersburg West have been in their current homes for a substantially shorter period of time on average (one year versus a County wide average of three to four years for garden and high rise apartments, respectively).

### Average years households have been in place



**Higher turnover rates likely reflect relatively more recent expansion in multifamily units.** A relatively newer and more densely developed housing stock would boost the number of new residents and lower average years in place for the study area as a whole.

#### In-Mover Households

#### Many Gaithersburg West households are new to Montgomery

**County.** Households moving into the County within the past five years account for a greater than average share of Gaithersburg West households (29 percent, versus 19 percent in Gaithersburg and 21 percent County wide.)

The study area attracts an unusually large number of new residents from outside the region and abroad. The great majority of Gaithersburg West in-mover households arrived from places outside the Washington, D.C. metro area (80 percent versus 68 percent in Gaithersburg and 59 percent County wide). Conversely, the area attracts a below-average share of in-movers from Washington D.C. or Virginia (14 percent versus



20 percent in Gaithersburg and 19 percent County wide) and substantially fewer from other Maryland counties (six percent versus 13 percent in Gaithersburg and 22 percent County wide).

Most in-mover households—especially newcomers from outside the region—occupy multifamily housing. Multifamily housing accommodates 83 percent of inmover households. In-movers from elsewhere in the U.S. or abroad are especially likely to settle in multifamily housing (87 percent). A smaller majority of households arriving from surrounding counties (65 percent) occupy multifamily units. Overall, newcomers account for nearly half of all multifamily households (48 percent) compared to only one in 10 single-family households (11 percent).

#### **Foreign Born**

# Gaithersburg West—like the County as a whole—has a substantial foreign-born population. One in three



households in the study area (35 percent) has a foreign-born head of household—slightly fewer than in the Gaithersburg area (39 percent) and exactly in line with Montgomery County as a whole (35 **percent)**.

# Foreign Born Households in Gaithersburg West by structure type

n= 1,820



Foreign-born account for a substantial share of both single-family and multifamily households in the area. One third of Gaithersburg West's single-family households (33 percent) are headed by a foreign-born person. Foreign-born households occupy 38 percent of all multifamily units in the study area. Foreign-born households are more likely to live in multifamily housing. As discussed above, most households moving into Gaithersburg West from outside the metropolitan area (87 percent) tend to settle first in multifamily housing. A slight majority of foreign-born households in the study area live in multifamily housing (54 percent versus 46 percent in single-family homes), which is high by Montgomery County standards. Only one in three foreign-born households County wide (33 percent) currently lives in multifamily housing.

#### Language Ability

As in the rest of Montgomery County, many Gaithersburg West residents speak a language other than English at home. The rate of foreign language speakers in the Gaithersburg West population is identical to that of the wider Gaithersburg area, and somewhat above the rate for the County as a whole (39 percent of the population ages five and over versus 39 in Gaithersburg as a whole and 35 percent County wide).

Multifamily residents are more likely to be foreignlanguage speakers. Nearly half (48 percent) of multifamily residents in Gaithersburg West speak a language other than English at home, versus one-third (32 percent) of single-family residents. Most Spanishspeaking households are in multifamily housing units (69 percent).

**English proficiency rates are average among Gaithersburg West residents.** Among study area residents age five and over, 10 percent speak English less than "very well," versus 11 percent in Gaithersburg as a whole and 10 percent County wide.

Gaithersburg West has fewer Spanish-speaking households. Among study area households, 11 percent are Spanish-speaking, versus 16 percent in the wider Gaithersburg area and 13 percent County wide).

#### **Foreign-Born Households**

by area & housing type



#### Foreign Language Speakers by area & housing type



#### Spanish speaking households



#### Household Income (2004)

Gaithersburg West is relatively affluent, with household incomes close to the Montgomery County median. The study area's 2004 median household income (\$79,341) was 11 percent higher than the Gaithersburg area median (\$71,605) and five percent below the County wide median (\$83,880).

This relative affluence is somewhat unexpected in an area with a lot of multifamily housing. Multifamily households typically have lower income levels because they tend to include more singles and members not in their peak earning years (including newcomers, young, and elderly). Even so, Gaithersburg West's large multifamily household base (51 percent versus 31 percent of households County wide) has not transformed it into a low-income enclave.

Single-family households in Gaithersburg West have incomes considerably above the County wide and Gaithersburg area medians. Very high income levels among single-family households partly explain the area's relative affluence. Households living in single-family homes in Gaithersburg West had a 2004 median income of \$118,574, compared to a County wide median ranging from \$79,800 (townhomes) to \$115,870 (detached homes) and from \$77,500 (townhomes) to \$110,345 (detached homes) in Gaithersburg. Median Household Income (2004)





**Gaithersburg West's higher density housing also may attract comparatively affluent residents.** Multifamily households in Gaithersburg West had a 2004 median income of \$52,680—higher than median incomes for all categories of multifamily households in the County (\$46,660 for garden apartments and \$51,970 for high rise units) and Gaithersburg (\$44,295 for garden apartments and \$48,030 for high rise units).

**Even so, there is a large income gap between multifamily and single-family households.** Multifamily households in Gaithersburg West are far more likely to have annual incomes below \$50,000 (48 percent versus nine percent of single-family households), and far less likely to have incomes of \$100,000 or more (16 percent versus 63 percent of single-family households).

#### **Housing Tenure**

**Gaithersburg West homeownership rates are below average.** Most Gaithersburg West households own their homes (57 percent), but this is well below the County wide average of 74 percent.

#### Lower homeownership rates reflect a larger multifamily housing

**base.** As noted above, Gaithersburg West has a relatively high base of multifamily households (51 percent of area households versus 31 percent County wide). Multifamily households typically are more likely to rent rather than own their homes; this is especially true in Gaithersburg West where 78 percent of multifamily households are renters versus 70 percent County wide. In contrast, 92 percent of area single-family households are homeowners.

#### Homeownership Rate by area & housing type



#### **Housing Costs**

Homeownership costs are slightly above average for Montgomery County, but far higher than in Gaithersburg as a whole. In 2005, the average cost of owning a home in Gaithersburg West was \$1,755 per month—24 percent higher than average homeownership costs in the Gaithersburg area and five percent above the County wide average.

Despite paying slightly higher housing costs, area homeowners are in a slightly better position to absorb these costs. Housing costs consume more than 30 percent of monthly household income for only 15 percent of homeowners in the study area, versus 18 percent of Gaithersburg area homeowners and 17 percent of homeowners County wide.

**Rental costs are in line with the County and slightly higher than in the Gaithersburg vicinity.** The monthly cost of living in a Gaithersburg West rental unit (\$1,167)—is five percent higher than in Gaithersburg as a whole and identical to that of the County as a whole in 2005.

As in other parts of the County, housing costs consume a greater share of rental household incomes. In Gaithersburg West, 44 percent of renters spend more than 30 percent of their income on housing compared to 42 percent of Gaithersburg renters and 41 percent of renters County wide.

#### **Car Ownership**

A large multifamily housing base drives down car ownership rates in Gaithersburg West. Households in the study area own an average of 1.7 cars, versus 1.8 in Gaithersburg and 1.9 in Montgomery County. Single-family households in the study area, which generally are larger and more affluent (reflecting dualcommute families and more residents in their peak earning years), own an average of 2.2 cars. With more young, single-commute, elderly, and lower-income households, multifamily households own 1.3 cars on average.



Households spending +30% of income on housing



### Car Ownership

by area



#### **Computer Ownership**

Gaithersburg West households—especially multifamily households—have above-average rates of computer ownership. Ninety-two percent of Gaithersburg West households own at least one computer, compared to 89 percent of Montgomery County and Gaithersburg area households. The differences are more striking among multifamily households: County wide, only 79 percent of multifamily households owns a computer. In Gaithersburg West—with a slightly more affluent and significantly more educated population occupying its high-density housing—90 percent of multifamily households own a computer.

# Computer Ownership by area



# Gaithersburg West Master Plan Area

Montgomery County, MD.

#### 2005 Census Update Survey

Traffic	Zones: 166,200,212,213,215, & 231	SINGLE- FAMILY	MULTI- FAMILY	ALL TYPES
	Household Population	7.075	4.510	11,585
	% Female	49.9%	57.8%	52.9%
	Age Distribution:			
	% 0-4 Years Old	7.4%	2.7%	5.6%
	% 5-17 Years Old	19.2%	8.8%	15.2%
Р	% 18-29 Years Old	7.1%	26.7%	14.7%
о	% 30-44 Years Old	23.0%	27.8%	24.9%
Р	% 45-64 Years Old	36.7%	18.2%	29.5%
υ	% 65-74 Years Old	4.1%	6.7%	5.1%
L	% Over 74 Years Old	2.4%	9.1%	5.0%
Α	Average Age (vears)	36.9	40.2	38.2
т	Race:			
1	% White	67.9%	62.4%	65.8%
o	% Black	5.3%	16.0%	9.4%
N	% Asian or Pacific Islander	22.9%	15.0%	19.9%
	% Other	3.9%	6.6%	4.9%
	Hispanic or Latino and Race			
	% Hispanic or Latino	6.1%	15.6%	9.8%
	% Not Hispanic White	64.2%	54.7%	60.5%
	Language Spoken at Home			
	Persons 5 Years and Older	6.550	4.390	10.940
	% Speak Language Other than English	32.0%	48.2%	39.0%
	% Speak English less than "Very Well"	9.7%	11.3%	10.4%
	Educational Attainment:			
	Persons 25 Years and Older	4.815	3.545	8.360
	% Less than High School Diploma	4.8%	8.7%	6.5%
	% High School Graduate	15.6%	22.8%	18.7%
	% Associate or Trade School	2.3%	5.0%	3.5%
	% Bachelor's Degree	32.9%	26.4%	30.1%
	% Grad, Professional or Doctoral	44.3%	37.1%	41.2%
	Number of Employed Residents 2	4,175	3,120	7,295
	% Females Who Are Employed <sup>2</sup>	71.9%	76.3%	74.0%
	Women with Children Under Age 6	535	90	625
L	% Employed <sup>2</sup>	*	*	66.1%
Α	Work Location:			
в	% Montgomery County	72.8%	78.4%	75.4%
ο	% Prince George's County	4.3%	2.0%	3.2%
R	% Elsewhere in Maryland	3.0%	2.1%	2.6%
	% Washington, D.C.	9.7%	13.0%	11.1%
	% Virginia	8.5%	4.6%	6.7%
F	% Outside MD-VA-DC	1.7%		0.9%
ο	Work Trip:			
R	% Driving	82.7%	79.7%	81.4%
С	% Alone	79.1%	72.7%	76.3%
Е	% Carpool	3.6%	7.0%	5.1%
	% Public Transit or Rail	10.4%	15.6%	12.7%
	% Walk/Bicycle/Other		3.8%	1.7%
	% Work at Home	6.9%	0.9%	4.3%
	Average Commuting Time to Work (minutes)			
	Overall	29.5	30.6	30.0
	By Car	25.2	25.4	25.3
	By Public Transit	62.7	60.8	61.7
	· · · · · · ·			

\* Insufficient data for reliable estimates.

1 Those of Hispanic origin may be of any race.

<sup>2</sup> Ages 16 and older and employed full- or part-time.

Source: 2005 Census Update Survey; Research & Technology Center, Montgomery County Planning Dept., M-NCPPC, Dec 2007v2.

# Gaithersburg West MP Area (cont.)

1

2005 Census Update Survey

		SINGLE-	MULTI-	ALL
Traffic	c Zones: 166,200,212,213,215, & 231	FAMILY	FAMILY	TYPES
	Households by Structure Type	2,540	2,600	5,140
	% Total Households by Structure Type	49.4%	50.6%	100.0%
	Average Household Size	2.78	1.73	2.25
	Tenure:			
	% Rental	7.5%	77.9%	43.3%
	Average Monthly Costs:			
	Homeowner	\$1,964	*	\$1,755
	Renter	*	\$1,159	\$1,167
	Residence in April 2000:			
	% in Same Home	65.6%	18.4%	41.8%
	% Elsewhere in County	23.8%	33.7%	28.8%
	% Elsewhere in Maryland		3.3%	1.7%
	% D.C or Northern Virginia	4.1%	4.1%	4.1%
	% Outside Metro Area	6.5%	40.6%	23.6%
	Median Years in Same Home	6	1	3
	Average Age of Household Head	50.5	45.4	47.9
н	% Households with Foreign Born Head			
0	or Spouse	33.0%	37.8%	35.4%
U	% Households Speaking Spanish	6.6%	14.6%	10.7%
S	Households by Type:	04 50/	40.00/	05.0%
	% Family Households	81.5%	48.8%	65.0%
N	% Married-Couple	75.7%	37.7%	56.5%
G	% Single-Parent	5.2%	6.0%	5.6%
	% Nontamily Households	18.5%	51.2%	35.0%
	% Householder Living Alone	17.5%	48.3%	33.1%
	Persons in Housenoids:	17 60/	40.00/	22.40/
	% 1 Person	17.5%	40.3%	33.1%
	% 2 Persons	30.0%	37.3% 7.1%	34.1% 15.4%
	% 4 Persons	25.9%	7.1/0	11.4%
	% 5+ Persons	12.5%	7.570	6.2%
	Average Number of Cars	22	13	0.270
	% of Households with Computers	94 7%	89.8%	92.1%
	% of these visiting M-NCPPC website	37.2%	20.1%	28.5%
		0	_0,0	
	2004 Household Income Distribution:			
	% Under \$15,000	0.6%	7.5%	4.1%
	% \$15,000 to \$29,999	1.4%	13.3%	7.4%
1	% \$30,000 to \$49,999	6.8%	27.1%	17.1%
N	% \$50,000 to \$69,999	9.8%	19.2%	14.6%
С	% \$70,000 to \$99,999	19.2%	17.2%	18.2%
0	% \$100,000 to 149,999	34.6%	13.9%	24.1%
м	% \$150,000 to 199,999	12.4%	1.1%	6.7%
E	% \$200,000+	15.2%	0.5%	7.8%
	2004 Median Household Income	\$118,574	\$52,680	\$79,341
	% of Households Spending More Than			
	30% of Income on Housing Costs:	40 50/	<u>.</u>	
	% Homeowners	16.5%	*	14.5%
	% Renters	*	45.2%	43.4%

\* Insufficient data for reliable estimates.

Source: 2005 Census Update Survey; Research & Technology Center, Montgomery County Planning Dept., M-NCPPC, Dec 2007v2.

### Appendix 3: School Capacity Analysis

#### **Gaithersburg West Master Plan: School Impact**

April 28, 2009

#### Summary

An elementary school site should be identified in the Gaithersburg West area to accommodate students that could be generated from the build-out of the proposed Master Plan. Middle school capacity is projected to be sufficient to accommodate development at most middle schools in the area. High school capacity is projected to be insufficient to accommodate future development, however, a high school site has been provided as part of the Crown Farm, should it be required in the future.

The *Gaithersburg West Master Plan* area overlaps portions of three Montgomery County Public Schools (MCPS) clusters: Gaithersburg, Quince Orchard, and Wootton. Following is a listing of MCPS cluster areas and the Gaithersburg West districts that fall within these clusters. In cases where a Master Plan area overlaps two school clusters, it has been placed in the cluster where future residential development is planned. A table is provided that shows the estimated number of students generated in each cluster based on the maximum potential build-out of the recommended Master Plan densities.

#### **Gaithersburg Cluster Properties**

LSC North:	Decoverly Residential, DANAC, Bureau of National Affairs (BNA), Shady Grove Executive Center
LSC Belward:	Johns Hopkins University - Belward property
Enclaves:	Londonderry, Rosemont, and Oakmont

#### **Quince Orchard Cluster Properties**

Quince Orchard neighborhoods and the McGown Property

#### **Wootton Cluster Properties**

LSC South:	Human Genome Sciences (HGS), Universities at Shady Grove (USG),
	Rickman, Traville/Avalon Bay Apartments
LSC Central:	Johns Hopkins University – Montgomery County Campus (JHU-MCC),
	Regional Institute for Children and Adolescents (RICA), Shady Grove
	Adventist Hospital

LSC West:	Public Service Training Academy site
Enclave:	Washingtonian Residential

In addition to potential residential development in the Gaithersburg West Master Plan, another large-scale development, the Aventiene community, is planned on the former Crown Farm property, located in the City of Gaithersburg. This property is in the Gaithersburg High School cluster. This mixed use community has been approved to include 2,250 residential units. As a condition of approval of this development, the City of Gaithersburg worked with MCPS and the property owner to obtain a future high school site. The estimated student generation from Aventiene is shown on the attached table for information purposes. School capacity in the three clusters that serve the Gaithersburg West Master Plan area is most limited at the elementary school level. Enrollment projections for elementary schools in these clusters indicate there will continue to be space shortages in the future. Because of these conditions, it is necessary to identify an elementary school site in the Master Plan area to serve future development. The previous Plan for this area, the 1990 Shady Grove Study Area Master Plan, recommended elementary schools on the Crown Farm and the Thomas Farm (now Fallsgrove, annexed into the City of Rockville). An elementary school site has been reserved in the Fallsgrove community.

This Plan recommends that the Public Safety Training Academy (LSC West District) be relocated and redeveloped as a residential community. The Plan recommends that an elementary school site be provided at LSC West, should it be needed in the future.

School capacity at the middle school level is projected to be adequate at most middle schools in the three clusters. Consequently, space will be available to serve middle school students generated by the Master Plan. At the high school level, Wootton High School is projected to remain over its capacity for the foreseeable future, while Gaithersburg and Quince Orchard high schools are projected to be at capacity in the future. If needed, a high school site is available in the Aventiene community.

# Gaithersburg West Master Plan Housing Student Generation in Clusters Recommended

Cluster		New Units by	/ Туре	Total New	Student Generation by Level			
	Single Detached	Townhouse	Low/Mid- Rise	High Rise	Units	K–5	6–8	9-12
Gaithersburg	0	0	325	150	475	20	19	16
Quince Orchard	0	0	375	375	750	32	29	25
Wootton	0	0	2,325	2,200	4,525	190	176	149
Totals	0	0	3,025	2,725	5,750	242	224	190

Notes:

• Low/mid rise units are high density with structured parking. Student generation rates for these units is the same as for high rise units.

• Student generation rates from Montgomery County Planning Department's 2005 Census Update Survey.

#### Crown Farm (Aventiene)

For Information Purposes – Not Part of Gaithersburg West Master Plan

Cluster		New Units by Type			Total New	Stud	ent Genera Level	tion by
Cluster	Single Detached	Townhouse	Low/ Mid-Rise	High Rise	Units	K—5	6–8	9-12
Gaithersburg	200	670	450	900	2,220	268	169	146
Total	200	670	450	900	2,220	268	169	146

Notes:

• Unit number and mix provided by Gary Unterberg, Rodgers Consulting. These estimates are subject to change.

• Low-rise units are high density with structured parking. Student generation rates for these units is the same as for high rise units.

• Student generation rates from Montgomery County Planning Department's 2005 Census Update Survey.

#### LSC: Districts



# Areas and Enclaves





#### Appendix 4: Parks and Open Space

Parks are essential components of community life. They provide for community gathering, foster a sense of place, and encourage environmental stewardship. In order to contribute to community character and quality of life, the location, size, amount, and type of parks should be carefully planned. Parks, open spaces, and trails should be designed as part of a comprehensive open space system that contributes to a sustainable community. To achieve this goal, an interconnected pedestrian and bike path system should link neighborhoods to parks and other destinations.

The Maryland-National Capital Park and Planning Commission made an early commitment to environmental stewardship and conservation when it was first formed in 1927 and began acquiring land surrounding the stream valley parks. This commitment provided the policy framework for the Wedges and Corridors concept in the 1964 General Plan (and subsequent 1993 *General Plan Refinement*) and has become an important principle that guides a wide range of planning and regulatory programs and projects.

County parks have been developed as a unified, interrelated system providing active and passive recreation as well as conserving resources throughout the County. Currently, the County's park system totals more than 34,000 acres, including 12,000 acres of stream valley parks that provide interconnected greenways. The challenge for the park system is to provide an adequate balance between the need for active recreation facilities for the County's expanding population while preserving and protecting our natural resources.

The Land Preservation, Parks, and Recreation Plan (LPPRP) is updated every five years. The document provides a comprehensive set of recommendations and policy guidelines for future park development. During the process of updating a master plan such as the Gaithersburg West Master Plan, park and natural resource issues are reviewed and recommendations are provided. Collaboration among the Environmental Planning, Park Planning, and the Urban Design sections provides comprehensive and sustainable solutions.

A master plan update assesses the adequacy of existing recreational facilities and whether new resources should be provided for existing and future users. As the County nears build out and vacant land becomes scarce, it is critical for plans to address an area's active and passive recreational needs and determine whether there are any available and appropriate sites for parkland acquisition to meet future needs. Implementation of park recommendations identified in the LPPRP and the master plans occurs through the subdivision process, the County's Capital Improvements Program, private dedication, or the State's Program Open Space plan. The private sector's role in providing some open space amenities is often critical to creating a complete and comprehensive open space system.

County wide parks include those with either a recreational focus, such as the large regional parks, or a conservation purpose, such as the stream valley parks. Community use parks are smaller open spaces located in residential neighborhoods for the convenience of residents and these include urban, neighborhood, and local parks. Additionally, several thousand acres of parkland are shared with public schools, providing children and adjacent residents with open space, playing fields, tennis and basketball courts, and playgrounds.
### Parkland in Gaithersburg West

The 2005 LPPRP identified the I-270 Corridor as one of three areas where population growth is highest, and where the corresponding need for additional recreation facilities will increase. Needs in the I-270 Corridor for rectangular fields were the highest in the County. The 1998 Park Recreation and Open Space Plan (PROS) also stated "Land use patterns along the I-270 Corridor are continuing to encourage new employment centers and the growth of technology-based enterprises in that area. As a result, more and more people are moving to the communities along the I-270 Corridor. Germantown and Gaithersburg in particular have experienced dramatic growth compared to the rest of the County." Increased population density and business development have significant impacts on the community's need for park and recreation facilities.

Within the boundaries of the Gaithersburg West Master Plan, there is currently one local park, two neighborhood parks, and a portion of the Great Seneca State Park. In addition, there are several parks nearby in Potomac. The cities of Gaithersburg and Rockville and Montgomery County Public Schools also provide park and recreation opportunities.

The following is a list of existing County parkland in and adjacent to the Plan area.

Park Name	Acres	Status	Facilities
Traville Local Park (LSC South)	13.7	Undeveloped	None
Great Seneca Extension Stream Valley Park	1,824 – State 846 –M-NCPPC	Developed	Trails
Orchard Neighborhood Park	12.3	Undeveloped	None
Quince Orchard Valley Neighborhood Park	89.2	Developed	1 Softball Field, 1 Playground, 1 Basketball Court, 1 Recreation Center, 2 Tennis Courts

### **Existing and Approved Gaithersburg West Area Parks**

# Parkland, Open Space, and Trails



#### **Existing Potomac Area Parks**

Park Name	Acres	Status	Facilities
Quince Orchard Knolls Local Park	24	Developed	1 softball/soccer overlay, 1 basketball, 1 playground, 2 tennis courts
Aberdeen Local Park	14	Developed	volleyball, basketball, 2 tennis courts, ball field, playground, shelter
Big Pines Local Park	11	Developed	basketball, 2 tennis courts, ball field, playground, covered picnic area
Dufief Local Park	15	Developed	2 soccer fields, 2 playgrounds, 3 tennis courts
Potomac Horse Center Special Park	41.6	Developed	1 horse center
Muddy Branch Stream Valley Park Unit #3	313	Developed	trails

### **Master Plan Vision**

Existing parks will continue to serve residents of Gaithersburg and North Potomac. In the Life Sciences Center (LSC), a more compact, higher density land use pattern and a greater mix of land uses is envisioned in the future. Additional parks and open spaces need to be created to provide recreation opportunities that support and enhance the vision for the LSC. The future open space system for the area should support a vibrant and sustainable work life community by creating open spaces that will be easily accessible by walking or transit, and provide a range of experiences for a variety of people.

To that end, the Plan proposes the following vision of open spaces:

- a green common at each of the proposed Corridor Cities Transitway stations, one of which will serve as the civic green for the LSC West District
- a shared park/school site at LSC West (PSTA)
- construction of the undeveloped Traville Local Park
- integrated green corridors between and through major blocks linked by the LSC Loop that connects destinations and integrates passive and active spaces
- an additional active use Local Park in the Quince Orchard area.

The proposed Public Safety Training Academy (PSTA/LSC West) relocation provides a unique opportunity to create centrally located and well designed publicly owned open spaces. The fact that the property is already in public ownership provides numerous location and financial advantages.

The key park planning recommendations that are addressed in this Plan are highlighted below:

RECOMMENDATIONS	BACKGROUND
Designate a new urban park to serve as the publicly owned civic green at LSC West.	A new urban park likened to a civic green is needed to serve as the central open space for the LSC West community (on the relocated PSTA site). The proposed civic green is adjacent to a CCT stop planned in the area of highest residential density. This green will be publically owned and design details are outlined below.
Designate a site for a park/ school at LSC West.	Due to increased residential development, an elementary school may be needed in the Master Plan area. It is desirable to combine the school with an active recreation park and some natural resource land into one combined site. The park site could provide a variety of experiences and functions including active recreation.
Designate two neighborhood greens at the CCT transit stops at LSC Belward and LSC Central.	These neighborhood greens should be privately owned and maintained for public use. The Belward neighborhood green includes the historic farm buildings and surrounding open spaces.
Develop the existing Traville Local Park in LSC South.	The Traville Local Park has been dedicated and rough graded to accommodate a small rectangular field, half court basketball, older children's playground, and a tot lot. This park should be scheduled for final facility planning in the next 2009-2014 Parks Capital Improvements Plan.
Provide a cohesive usable pattern of public parks and private open spaces in the LSC connected by the LSC Loop.	The Plan emphasizes green connectivity and corridors. Not all open space can or should be publicly owned and managed parkland. Public amenity spaces in new developments will provide needed recreation and open space. A key planning issue is how to integrate public amenity space with parkland to create a cohesive and logical pattern of open space that is connected by the LSC Loop.
Connect trails and bikeways.	The Muddy Branch Trail Corridor (on-road hard surface portion) and a Countywide bikeway (DB-24) must be completed on Muddy Branch Road along the western side of the Belward property. Trail interconnectivity and internal circulation in this location should be determined during the review of specific development plans
Identify a new Local Park site in the planning area.	The 1990 Shady Grove Study Area Master Plan recommended new local parks on the Crown Farm (annexed by the City of Gaithersburg) as well as the Banks Farm (Belward). This Plan recommends an alternate local park site, ideally with two rectangular fields and other active recreation facilities. The Plan recommends the possible purchase of the Johnson property in the Quince Orchard area if it becomes available from willing sellers at some time in the future. The Plan also recommends active recreation on the Belward property.
Promote environmental stewardship in all decision making.	Develop all parks and open space in an environmentally sensitive manner.

# Policy Guidance for Urban Open Space

*Parks for Tomorrow* (1998) indicates that areas such as Gaithersburg need several types of recreation including hiker/ biker paths and community connectors, neighborhood recreation for new residential areas, and urban recreation and open space for existing and proposed businesses and mixed-use development.

# **Planning and Design**

This Plan's recommendations recognize that compact, mixed-use areas present distinct challenges and opportunities to provide park and recreation resources and strive to incorporate and create those resources with redevelopment. The location, size, and type of open spaces appropriate to such a setting are unique. This Plan recommends a series of open spaces provided through a combination of public and private efforts.

Both residential and commercial development projects should provide a mixture of recreational facilities, open spaces, and trail connections that shape the public realm, help implement the Master Plan recommendations, and serve employees and residents. Consideration should be given to the following guidelines in location and development of parks and amenity open spaces.

- 1. They should be within a five to ten minute walk time for users.
- 2. They should include sitting areas, walkways, and landscaping.
- 3. Playground equipment and other small-scale active recreation facilities, such as multi-purpose courts, should be considered in areas serving a significant number of children.
- 4. Special consideration should be given to the needs of the elderly and people with disabilities.
- 5. Urban amenity open spaces located on the periphery of high-intensity non-residential areas should include facilities to serve nearby residents.
- 6. Design should provide crime prevention through environmental design by maximizing visibility and natural surveillance.
- 7. Amenity open spaces should be of a sufficient size to support appropriate use by residents or workers, and the public.
- 8. Consideration should be given to the appropriate amount of money necessary to support both the initial cost of the development and the long-term maintenance of the amenity space. As businesses are renovated or newly built in commercial and mixed-use developments, open spaces should be added to supplement public parks. Landscaping, seating areas, and public art can improve the area's appearance and improve the working environment.
- 9. Environmental features should be designed into parks, such as fountains in stormwater facilities that mask noise.

- 10. A key to providing adequate, close-to-home recreation is ensuring that opportunities are incorporated into plans for new development, which should provide private recreation areas for all age groups, as appropriate. Private redevelopment should include:level grass areas for leisure and informal play
  - adult recreation areas
  - walking and bicycling paths
  - playgrounds for young children
  - multi-use courts for children, teens, and young adults.

In multifamily housing developments, as well as higher density transit station areas, indoor recreation areas will be essential. Project development should explore innovative approaches to providing these facilities, including rooftops and indoor facilities such as playgrounds, gym, etc.

# **Appendix 5: Environmental Resources Analysis**

# Sustainability in Gaithersburg West

In the Gaithersburg West Plan, the overarching environmental goal is to "create a sustainable neighborhood that will attract nationwide interest for design and materials that minimize carbon emissions, maximize energy conservation, and preserve water and air quality." Sustainability is widely defined as meeting the needs of the present without compromising the ability of future generations to meet their own needs. The concept of sustainability integrates the broad categories of water quality, air quality, wildlife habitat and biological diversity, human health and quality of life, and climate protection.

Designing and constructing sustainable communities begins with an awareness of existing resources. Through careful and sensitive environmental site design, existing natural resources can be identified and incorporated into the planning phase of development. In this way, a development can preserve as many of the existing resources as possible, take advantage of the inherent benefits of the resources, protect the resources through clustering, sensitive road design and application of appropriate buffers, and enhance the resources where appropriate through forest planting and creative landscaping.

In many cases, recommendations intended to accomplish one environmental goal will also help accomplish other goals. This should only serve to underscore the importance of implementing recommendations that address multiple sustainability goals. Of particular importance are recommendations for energy conservation and renewable energy use. These recommendations are in response to recent County legislation requiring the County to reduce its carbon footprint substantially over the next 40 years. These recommendations include an endorsement of Smart Growth for development in Life Sciences Center portion of the Gaithersburg West Master Plan. The Smart Growth principles of creating compact, walkable communities with a mix of land uses, served by public transit, provide the planning framework necessary to enable the long-term behavior changes required to reduce carbon emissions.

Sustainable communities, based in Smart Growth principles, fit comfortably within their natural settings and have a compact development pattern that allows residents, workers, and visitors to accomplish daily activities via short commutes offering alternatives to a private car. While new development itself means adding to the carbon footprint, it can be achieved more sustainably than in the past. New development and redevelopment should use operational, technical, and physical means from design through construction and operation to improve the sustainability of both buildings and the communities.

# Watersheds

The Plan area is within the headwaters of several watersheds, all draining to the Chesapeake Bay. These watersheds are Great Seneca Creek, Muddy Branch, and Watts Branch (via Piney Branch), and a small area of Rock Creek. Local efforts are critical to improving the Bay's water quality.

All the Plan area's watersheds, except Rock Creek, empty into the Potomac River above the intake for the Potomac Water Treatment Plant that provides most of the County's drinking water. Development in Gaithersburg West must maintain and improve water quality to sustain our drinking water supply.

# Watersheds



# Water Quality

The Gaithersburg West study area includes parts of three watersheds: Watts Branch, Muddy Branch, and Great Seneca Creek. A small area of the Oakmont area drains to Rock Creek, but it is so small as to be inconsequential for purposes of the Plan. Because water quality responds to the unique combination of land use conditions in each watershed, each watershed will be addressed separately.

**Watts Branch** The southern portion of the Life Sciences Center area, largely south of Darnestown Road, drains to Watts Branch via the Piney Branch. Concern about development impacts to water quality in the Piney Branch led to the establishment of the Piney Branch Special Protection Area in 1995. The 1998 Countywide Stream Protection Strategy (CSPS)indicated good stream conditions in the Upper Piney Branch and fair stream conditions in the rest of the Piney Branch (Figure 1).

Since then, monitoring has documented declining stream conditions as development has proceeded in the Upper Piney Branch portion of the Special Protection Area. Over the past several years, the Upper Piney Branch streams were rated fair to poor. The decrease in water quality is due in part to the immediate impacts of construction and land use change. Development results in both short-term and long-term impacts to water quality. Vegetation removal and land disturbance through cut and fill activities to bring a parcel to grade results in delivery of sediment and altered runoff volumes to the streams. This affects hydrology, stream channel shape, water quality, and biological communities during the construction process. Forest loss, land use changes, and increased impervious surfaces continue the change in the hydrologic regime of the watershed over the long-term. It is unclear how much the biological community will recover once development is complete and stormwater management is in place.

**Muddy Branch** Most of the Life Sciences Center and other portions of Gaithersburg West drain to the Muddy Branch. Water quality in the upper Life Sciences Center drainage area varies between good and fair (Figure 1). Most of this area has been stable for a number of years, so construction impacts are limited. Plan proposals for this area anticipate significant new development in the Life Sciences Center. This development carries the same potential for short-term and long-term water quality impacts noted above.

The greatest damage will occur in headwater stream areas where groundwater hydrology will change through land disturbance and land use changes. Undisturbed land filters and stores groundwater for release over time through springs and seeps at a stream headwaters. If this ground is disturbed through cut and fill activities, stream flow from groundwater will be reduced and stormwater runoff into the headwater stream increases. Essentially the stream will have a less steady flow between storms and a flashier storm runoff rate. The Plan recommends reduction of long-term impacts through the use of Environmental Site Design (ESD), including techniques that maximize groundwater recharge and minimize runoff.

Water quality in the Oakmont and Rosemont enclaves has been in the poor range for the past couple of monitoring cycles. Streams in both of these areas have been substantially altered, including sections that have been channelized and piped. Some of these streams receive runoff from highly impervious commercial areas. The upper Muddy Branch mainstem here has been identified as a priority for stream restoration in the Great Seneca and Muddy Branch Watershed Study and any improvements resulting from redevelopment will aid the stream restoration process (Figure 2). In addition, the following stormwater facilities have been identified as priorities for retrofitting:

- Shady Grove Development Park Regional (east of I-270 and south of Gaither Road)
- Shady Branch #5 Regional (northeast corner of Banks farm, south of Great Seneca Highway)
- Shady Grove Life Sciences Center (east of Great Seneca Highway and south of Blackwell Road).

Figure 1 Gaithersburg West Water Quality



**Figure 2** Gaithersburg West Water Quality Considerations



**Great Seneca Creek** The northern portion of the NIST/Londonderry enclave has also demonstrated poor water quality in recent monitoring (Figure 1). The stream channel has been significantly altered with portions of the stream piped. Multifamily developments and light industrial and commercial areas drain to the stream. There is potential for some limited new development in the Londonderry area.

The Quince Orchard/McGown area benefits from having large areas of stable residential neighborhoods as well as substantial portions within the boundaries of Seneca Creek State Park. Stream conditions were good in the 1998 CSPS and evaluated as between fair and good in more recent studies. The McGown property occupies about 70 mostly wooded acres near Seneca Creek State Park. The topography here includes some significant steep slope areas. Large scale development in this area will have the high potential for significant negative impacts to stream conditions unless the development is carefully designed to maintain the natural topography, and the infiltration and runoff rate of the existing landscape. The Plan recommends that ESD techniques be employed to minimize any negative water quality impacts, but negative impacts will occur. The degree of recovery of the stream will depend on the extent to which ESD design is successfully applied to the area. Tributary streams draining the northern and southern portions of the McGown property and streams south of Great Seneca Highway east of the Seneca Creek mainstem in the Quince Orchard area are among those identified as priorities for stream restoration in the Great Seneca and Muddy Branch Watershed Study (Figure2). This study has also identified the stormwater management facility south of the end of Morning Light Terrace as a priority for retrofitting.

Two land use factors have been identified as having a major influence on stream water quality: imperviousness and forest cover.

### Imperviousness

Increasing levels of imperviousness have been linked to declines in water quality. Studies indicate that stream water quality indicators will begin to decline when watershed imperviousness exceeds about 10 percent. Watershed imperviousness levels above 25 percent are associated with severe levels of stream water quality degradation. Existing levels of imperviousness were analyzed within the boundaries of the Life Sciences Center and areas of the Gaithersburg West Master Plan (Table 1). In most of these areas, the Plan's projected growth projected is not expected to change impervious levels significantly. The exceptions are in the Life Sciences Center and on the McGown property.

### **Forest Cover**

Though not as strongly correlated with water quality as percent impervious cover, the amount of a watershed maintained in forest has also been shown to have a complimentary effect on stream water quality. In a study of Montgomery County, streams with excellent water quality typically had an average forest cover of greater than 50 percent, while poor water quality streams had an average forest cover of less than 30 percent (Goetz et al., 2003). Forest cover tends to decrease as imperviousness increases.

Most of the increase in imperviousness in the Life Sciences Center will occur in the areas of the Belward Campus of Johns Hopkins University and on the property currently occupied by the Public Safety Training Academy (PSTA). These two properties drain to two subwatersheds of the Muddy Branch. The McGown property drains to a subwatershed of the Great Seneca mainstem. The most critical consideration in these subwatersheds is the extent to which land use changes will increase the total imperviousness within the subwatersheds.

Table 1 shows existing forest cover and imperviousness, and projected changes in imperviousness for these subwatersheds. See Figure 3 for subwatershed locations and existing forest cover.

CSPS Subwatershed Station #	Current Imperviousness	Projected Imperviousness	Existing Forest Cover	CSPS Water Quality Rating
MBMB207	32%	45%	9%	Fair
MBMB305	31.5%	34.5%	7%	Fair
GSMS415	17.5%	25%	39%	Good

### Table 1. Imperviousness and Forest Cover in Key Gaithersburg West Subwatersheds

**<u>Figure 3</u>** Gaithersburg West Current Forest Coverage



New development is also anticipated for the Hoyle's Addition area of the Londonderry/NIST enclave. The area of new development is so small, however, that no discernable change in total watershed imperviousness is projected.

The above results highlight the need to incorporate all available ESD approaches for new and redevelopment in the Life Sciences Center and McGown areas of Gaithersburg West to prevent further degradation of water quality. Environmental Site Design

Environmental Site Design (ESD) is an approach to new development and redevelopment that incorporates a variety of practices that can be used to minimize adverse environmental impacts from development and increase overall sustainability. The purpose of ESD is to reduce the stormwater runoff generated by development, slow the delivery of runoff to stream systems, and reduce pollution and thermal impacts to receiving waterways. The basic principle behind ESD is to control stormwater runoff as close to its point of generation as possible rather than collecting, transporting, and concentrating it in large stormwater management (SWM) facilities. Use of ESD practices can ultimately reduce SWM costs by reducing the infrastructure necessary for collecting and transporting stormwater.

Environmental Site Design:

- incorporates SWM at the earliest stages of site design
- limits land disturbance and grading
- maximizes conservation of natural features
- minimizes impervious surfaces
- uses innovative and effective stormwater control and treatment and non-structural best management practices (BMPs) that minimize stormwater runoff, and maximize runoff treatment and infiltration.

Environmental Site Design BMPs include:

- bioretention facilities or rain gardens
- grass swales and channels
- vegetated rooftops
- rain barrels and cisterns
- vegetated filter strips
- permeable pavements
- pollution prevention.

The Maryland Stormwater Management Act of 2007 requires local jurisdictions to implement ESD to the maximum extent practicable and to amend their codes, regulations, and ordinances to remove impediments to implementing ESD.

Many of the natural features ESD is intended to conserve are contained within Montgomery County's regulated areas (Figure 2). Regulated areas include streams, wetlands and their buffers, as well as forest conservation easements.

### **Air Quality**

The Environmental Protection Agency has designated Montgomery County as failing to meet minimum air quality standards, recently downgrading air quality to severe air pollution. The Plan's land use and transportation recommendations are intended to encourage transit use and discourage automobile use.

### Green Infrastructure and Open Space System

Green infrastructure is a network of waterways, wetlands, woodlands, wildlife habitats, and other natural areas that supports native species and contributes to clean air and water. The green infrastructure network is formally identified and mapped at a County wide scale according to criteria established in the County's draft Green Infrastructure Functional Master Plan. As an interconnected system, green infrastructure enhances environmental viability, value, and function.

Portions of the green infrastructure network identified in the draft plan are incorporated into the proposed open space system for Gaithersburg West. The proposed open space system goes beyond the mapped green infrastructure network, seeking to extend the functions and connections of the network into and through the Gaithersburg West Plan area. The open space system also seeks to connect the area to the greater green infrastructure network beyond the Plan area.

The design of the open space system in Gaithersburg West attempts to incorporate as many functions as possible to achieve multiple objectives:

- intercepting, filtering, and infiltrating stormwater
- producing oxygen, filtering air, and sequestering carbon
- reducing energy consumption by reducing urban heat-island effect
- providing wildlife habitat
- providing transportation connections for bicyclists and pedestrians
- providing aesthetic, recreation, and health benefits to the community.

### **Carbon Emission Analysis**

Montgomery County Bill number 32-07 establishes a goal to stop increasing greenhouse gas emissions by the year 2010, and to reduce emissions to 20 percent of 2005 levels by the year 2050. Another Montgomery County law (Bill number 34-07) requires the Planning Board to estimate the carbon footprint of areas being master planned, and to make recommendations for carbon emissions reductions.

Our current greenhouse gas modeling effort uses a version of the spreadsheet model developed by King County, Washington. While many of the inputs are derived from national averages, wherever possible we have substituted Montgomery County data derived by the Planning Department's Research and Technology Division. While the model considers all greenhouse gas emissions, results are reported in terms of the equivalent effect of a given volume of carbon dioxide (carbon dioxide equivalents).

To project total emissions for an area, the spreadsheet model considers embodied energy emissions, building energy emissions, and transportation emissions. The model documentation defines embodied emissions as "emissions that are created through the extraction, processing, transportation, construction and disposal of building materials as well as emissions created through landscape disturbance" (by both soil disturbance and changes in above ground biomass). Building energy emissions are created in the normal operation of a building including lighting, heating cooling and ventilation, operation of computers and appliances, etc. Transportation emissions are released by the operation of cars, trucks, buses, motorcycles, etc.

Inputs for each planning area include the numbers and types of housing units and the square footage of different categories of retail, commercial, and public buildings. The model is run once using 2005 data to establish baseline results. The model is run again using housing units, and commercial and retail space projected to develop under the master plan to estimate future greenhouse gas emissions. The model estimates emissions over the life of the development, and results are given in metric tons of CO2 equivalents. This is different from the County Emissions Inventory prepared by the Montgomery County Department of Environmental Protection, which estimates annual emissions.

The model only deals with emissions; no calculations are included to estimate potential carbon offsets from best management practices. The estimates also assume "business as usual" when projecting emissions. As estimates of building energy consumption, vehicle fuel efficiency, vehicle miles travelled, and other input parameters change, it may be possible to re-run the model for projected emissions to see how improvements in technology and design affect projected outcomes. Many of these parameters are changing constantly, so input parameters are a moving target.

The results are also restricted to estimates for a specific master plan. Overall greenhouse gas emissions are projected to increase due to increased population and commercial development within a given master or sector plan area. As model results are evaluated, we must bear in mind that Montgomery County's greenhouse gas reduction targets are considered at a County wide scale.

Modeling results using these assumptions, along with sprawl scenario estimates are shown below. Results are given separately for the Life Sciences Center and for the rest of the Gaithersburg West Plan area outside of the Life Sciences Center, as well as a total for the entire Plan area.

The first grouping of outputs shows existing emissions based on 2005 data; these data are a baseline for comparison. The second grouping shows estimated emissions if the area built out completely under zoning that exists in the 1990 Master Plan. The third grouping presents estimated emissions assuming full buildout under the proposed Plan, including an estimate of the additional carbon that would be generated if the area built out in a sprawl scenario. Sprawl scenario estimates are made by assuming that growth beyond buildout of the 1990 Master Plan would have occurred in a sprawl pattern, causing the emission of 40 percent more carbon than if it were built in a Smart Growth pattern.

Estimated Baseline and Projected Carbon Emissions					
Year	Emissions				
	MTCO2e*				
2005 (Baseline) Life Sciences Center	16,000,000				
2005 (Baseline) Outside LSC	12,000,000				
2005 Total Gaithersburg West	28,000,000				
Buildout (current zoning) LSC	26,000,000				
Buildout (current zoning) Outside LSC	13,000,000				
Buildout Total Gaithersburg West	39,000,000				
2030 LSC	48,000,000				
2030 Outside LSC	14,000,000				
2030 Total Gaithersburg West	62,000,000				
2030 Total Gaithersburg West – Sprawl Scenario	71,000,000				

\*Metric Tons Carbon Dioxide Equivalents (over the life of the development)

In keeping with the Smart Growth approach to development recommended in this Plan, most of the growth projected to occur in Gaithersburg West is being concentrated in the area of the Life Sciences Center. Although per capita emissions should be reduced by creating compact, mixed-use, transit-served development, overall emissions will still increase due to the increase in population anticipated in the Life Sciences Center. Compared to the emissions that would result from more traditional sprawling, single-use land development patterns, the land use pattern in the Life Sciences Center will prevent the emission of approximately nine million metric tons over the lifetime of development. This reflects the physical savings of more compact building types and reduced vehicle miles traveled as compared to the sprawl scenarios. These results are also shown below. Alternative Energy

The Plan makes several recommendations intended to reduce carbon emissions, beginning with the recommendation to make the Life Sciences Center a model of Smart Growth. Some of the Smart Growth effects are modeled in the results above but it is

difficult to know the full range of behavior changes that the new Life Sciences Center will inspire. The vision is to create a compact community of mixed uses, enabling residents to live, work, and shop in a walkable area. The smart growth approach is enhanced by the provision of mass transit service (in the form of the Corridor Cities Transitway), further enabling people to run errands and to commute without a car.

There are many Plan recommendations that will promote reductions in carbon emissions (such as the open space recommendations, bicycle and pedestrian networks) and many programs outside the planning process that will result in substantial savings over time. Further reductions in carbon footprint will come from changes in building and site design, improvements in technology for vehicles and building energy conservation, as well as the behavioral changes enabled by a compact, livable urban environment.

### Water and Sewer

The Washington Suburban Sanitary Commission provides public water and sewer service to the Gaithersburg West Plan area. Public sewer and water capacity is adequate to cover projected growth through 2020 based on the latest forecasts, consistent with the planning and policies adopted in the Comprehensive Water Supply and Sewerage Systems Plan. Local sewer capacity will be addressed for each project as development proposals are submitted for review.

A high pressure water main traverses the area of the Life Sciences Center, entering the Plan area just southwest of the Human Genome Sciences complex south of Darnestown Road and bearing northeast, eventually exiting the planning area near the planned CCT station location on the Crown Farm. Along the way, the water main passes through the PSTA and under the RICA complex. Developments in this area may be asked to consider this line at time of development review. The location of this water main may affect road improvements or improvements to the main may need to be included in road or redevelopment projects.



# Gaithersburg West Potential Increase in Carbon Emissions

# **Other Plans and Initiatives**

A number of environmental plans and initiatives are underway in Montgomery County and their recommendations will supplement and may supersede this Plan's recommendations.

These plans and initiatives include:

- the Water Quality Functional Master Plan for Montgomery County
- the Green Infrastructure Functional Master Plan
- Revisions to the County's stormwater management regulations
- Revisions to the County's forest conservation regulations.
- •

### References

Goetz, S.J., R.K. Wright, A.J. Smith, E. Zinecker, and E. Schaub. 2003. IKONOS Imagery for Resource Management: Tree Cover, Impervious Surfaces, and Riparian Buffer Analyses in the Mid-Atlantic Region. Remote Sensing of Environment 88 (2003), p 195-208.

# **Appendix 6: Historic Preservation Program**

# Objective

The intent of the County's preservation program is to provide a rational system for evaluating, protecting, and enhancing the County's historic and architectural heritage for the benefit of present and future generations. Historic sites and districts are essential elements of community identity and the unique character of the County and its communities.

The Master Plan for Historic Preservation and the Historic Preservation Ordinance, Chapter 24A of the Montgomery County Code, are designed to protect and preserve Montgomery County's historic and architectural heritage. Placement on the Master Plan officially designates a property as a historic site or historic district and subjects it to the procedural requirements of the Ordinance.

Any substantial changes to the exterior of a resource or its environmental setting must be reviewed by the Historic Preservation Commission (HPC) and a historic area work permit issued under the provisions of the Ordinance, Section 24A-6. In accordance with the *Master Plan for Historic Preservation* and unless otherwise specified in the amendment, the environmental setting for each site, as defined in Section 24A-2 of the Ordinance, is the entire parcel on which the resource is located as of the date it is designated on the Master Plan.

### **Historic Sites in Gaithersburg West**



The Gaithersburg West Master Plan includes historic sites that were designated in the 1985 Gaithersburg Vicinity Master Plan (Belward Farm, St. Rose of Lima) and the 1989 Germantown Master Plan (Clopper Mill Ruins). Immediately bordering the area are Maple Spring Barns and Pleasant View Church, designated in the 2002 Potomac Subregion Plan. One resource is identified on the Locational Atlas and Index of Historic Sites: the Humpback Bridge across the CSX tracks at East Deer Park Drive.

Area resources included in the National Register of Historic Places, described at the end of this section, are located in the City of Gaithersburg (Railroad Station, Belt Building, Thomas Company Cannery, and Observatory) and the Town of Washington Grove (Historic District).

Gaithersburg and Washington Grove have their own preservation programs and resources within these municipal boundaries, including locally designated historic sites, and are not subject to the County Preservation Ordinance.

The following historic sites in the Gaithersburg West Master Plan area are subject to the Preservation Ordinance, Chapter 24A of the County Code. The status indicates whether a property is designated on the Master Plan for Historic Preservation (Master Plan) or identified on the Locational Atlas and Index of Historic Sites (Atlas). The England-Crown Farm, described in the text that follows, was designated as a historic site in the 1985 Gaithersburg Vicinity Master Plan but was subsequently annexed by the City of Gaithersburg and is no longer subject to the Preservation Ordinance.

Historic Name	Date	Location	Status	Resource Number
Clopper Mill Ruins	c1795; 1834	Clopper Rd at Waring	Master Plan	19/21
		Station Rd		
Belward Farm	1891	9951 Key West Ave	Master Plan	20/21
		(10425 Darnestown		
		Road)		
St. Rose of Lima	1883	11715 Clopper Rd	Master Plan	20/28
Humpback Bridge	1945	East Deer Park Drive at	Atlas	21/220
		CSX Tracks		

### 19/21 Clopper Mill Ruins (c1795; 1834), Clopper Road at Waring Station Road

The Clopper Mill Ruins are significant as one of the few remaining distinguishable mills in the County, representing an industry once essential to economic development. The popularity of the mill led to a road network connecting it with farms and markets in the region. Nicholas Sibert built the original mill on this site in the 1770s. About 1795, Zachariah MacCubbin rebuilt the mill, constructing a two-level stone structure. Clopper renovated and expanded the mill in 1834, adding a third story of bricks made at a manufactory on this estate. A stone in the mill's gable read "FCC 1834." An undershot water wheel used water from the Great Seneca Creek to turn the millstone. Business at the mill declined after the steam-powered Bowman Brothers Mill opened in 1888 in Germantown. Clopper's Mill was heavily damaged by fire in 1947. The ruins consist of stone and brick walls with no roof. Local fieldstone on the basement and first floor levels has corner quoins and heavy stone lintels.

The mill is located within Seneca Creek State Park. This plan supports stabilization of the mill ruins and historical interpretation of this site, such as a plaque or historic marker.

The Clopper Mill Ruins are remnants of the extensive property of Francis C. Clopper, influential businessman in



Montgomery County in the mid-1800s. Clopper's mansion, known as Woodlands, was located near the visitors center at Seneca Creek State Park. A prosperous owner of a woolen factory and mills, Clopper was a principle backer of the Metropolitan Branch in the 1850s, and was instrumental in persuading the B&O to take over construction of the railroad branch after the original company failed. Francis Clopper donated land both for a nearby railroad station, named in his honor, and for St. Rose of Lima Catholic Church. **Belward House** Ignatius Beall Ward established the Belward Farm in the mid-1800s. Ward operated the Hunting Hill Post Office and Store, a community center located at the front of his farm, offering groceries and supplies for sale, mail delivery, wheelwrighting, and blacksmithing. The Belward



Farm complex includes a gambrel roof dairy barn, milk house and large frame cow barn. The



large, picturesque Belward House (c1891) is a significant example of late 19th century Victorian farmstead architecture with Queen Annestyle shingled gables, polygonal bay windows, and turned porch posts. In the second half of the 20th century, Ward's grand-daughter,

Elizabeth Beall Banks, continued the family tradition, residing here and farming the land. Ms. Banks died in 2002.



When the Belward Farm was designated a historic site, the setting was 108 acres. A Preliminary Plan was approved in 1996 subject to a condition specifying an environmental setting of 6.98 acres.

The development plan included provisions for open space on either side of the existing tree-lined driveway to maintain a view of the house from Darnestown Road, and open parking surrounding the designated setting, but was never built. A new proposal for development of the Belward Farm must include re-evaluating an appropriate setting for this historic resource.

Significant features of the setting include vistas of the farmstead from the south, east, and west along Key West Avenue/Darnestown Road; views of the farmstead from the north, east, and west along proposed CCT alignment; historic house, barns, and other historic outbuildings;

and mature trees in and around the farmstead. The modern house that Johns Hopkins University built for Elizabeth Beall Banks is not historic and may be substantially altered or demolished upon review by the Historic Preservation Commission. St. Rose of Lima is a fine example of a rural Carpenter Gothic chapel and is one of the earliest Catholic congregations in



the mid-County region. The wooden, front-gable church has a steeply pitched roof, pointed arch windows and door. Sheltering the door, on the main (south) façade, is a bracketed door hood with king-post truss. Above, a rose window lights the interior. On the north end, gabled wings flank a polygonal hipped roof apse.

Influential property-owner Francis Cassatt Clopper established the first Catholic Church in the Gaithersburg area in 1838. A Protestant, Clopper had married Ann Jane Bryant, a fervent Catholic, and their children were reared in the Catholic faith. When the Cloppers moved to the area in 1812, the closest Catholic churches were in Rockville and Barnesville. They donated land from their estate on Clopper Road, and a church was built in 1838 and dedicated by Bishop Eccleston in 1846.

Following extensive remodeling in 1880, the church was re-dedicated, but was destroyed by fire three years later. Plans for the present church were immediately designed. The cornerstone for the new St. Rose's Church was laid on July 4, 1883. The cost of construction, completed the same year, was about \$3000. The church grounds include a champion Douglas fir tree.

20/17 England-Crown Farm (c1880-1894), 9800 Fields Road



Designated on the Master Plan for Historic Preservation, subsequently annexed by City of Gaithersburg.

This farm includes a frame house built by 1894 and an earlier log house. The main block of the frame L-shaped dwelling is five bays wide and one room deep. The crossgable roof has wide unbracketed eaves and a cornice with deep side-gable returns. Gothic Revival influence is evident in the pointed-arch front-gable window and cutwork porch brackets, while heavy window cornices are typical of the Italianate style. First story windows extend down to the porch floor. Windows on side elevations have plain, flat window moldings. A log house, which may have been a tenant house, appears to date from the mid-1800s. The dwelling has a gable-end door, chimney in the opposite gable, and corner boxed staircase leading to a loft. Hattie England lived on this 76-acre farm by 1894.

#### 21/220 Humpback/Deer Park Bridge (1945), East Deer Park Drive at CSX Tracks

In 2005, the Planning Board added the Humpback Bridge to the Locational Atlas and Index of Historic Sites as a potential historic site. The Humpback Bridge spans the railroad tracks near the Washington Grove station site. Located



adjacent to the City of Gaithersburg and the Town of Washington Grove, the bridge represents the origin and development of Washington Grove, Oakmont and Gaithersburg. The Humpback Bridge is a local landmark that is a unique established and familiar visual feature. The form and profile of the bridge are reflective of bridge construction from 1945, the year that the structure was erected. A timber bridge has been in place at this location since the 1880s. The bridge, which is maintained by MCDOT, was rehabilitated in 1988 and 2000. MCDOT conducted a comprehensive structural test to examine the condition of the East Deer Park Drive Bridge over CSX Railroad and published their findings in November 2008. The study determined that timber supports were deteriorated and required replacement. MCDOT, working in cooperation with Planning Department staff, developed a rehabilitation program that provides for the replacement of existing timber bents with similar wooden bents in a compatible structural arrangement. Under Chapter 24A-10 of the County code, a determination that the project was a substantial alteration would have triggered an expedited review by the Historic Preservation Commission and the Planning Board to establish whether the bridge merited designation on the Master Plan for Historic Preservation. The in-kind replacement was found not to be a substantial alteration. The project is expected to take place in the summer of 2009.

# Potomac Subregion Master Plan Historic Sites Adjacent to Gaithersburg West

### 24/13 Pleasant View Methodist Episcopal Church (1914) and Quince Orchard School (c1875)11900 Darnestown Road

Pleasant View Church is representative of the post-Civil War era growth of the Methodist Church in general, and the Washington Negro Conference in particular. It is estimated that between 1870 and 1910, more than 66 percent of all new congregations in the County were Methodist. Reflective of the Gothic Revival tradition of church architecture, Pleasant View features lancet or pointed arch windows, and a three-part central entrance tower crowned with a crenellated turret. In 1950, a rear wing was built and the original church renovated to accommodate a pastor's study, choir room, and choir loft.



The Howard Brothers built the original church on the site in 1888. In 1914, that structure was in such poor condition that it was razed and rebuilt. The congregation was established about 1868, when the land was first acquired for a church. Early services were likely held in a nearby house until the church was built. In 1874, a school for black children was established in a Quince Orchard area house. After a fire destroyed the building in 1901, a school building, abandoned by the white population, was moved to the site. The latter, built about 1875, had been located on the opposite (north) side of Darnestown Road.

The Quince Orchard School is representative of the crowded and inadequate facilities that were the result of segregation in the late 1800s. In 1940, the school served 122 children in seven grades, making it the fifth largest

elementary school for blacks in the County. The following year the building was expanded with two additional rooms. Soon thereafter, the school consolidated with Tobytown and Seneca Colored Schools. After County wide integration of black students with white, the school building was used as a parish house for Pleasant View M.E. Church.

### 25/2 Maple Spring Barns (1942), 15021 Dufief Mill Rd

A prime example of an early 20th century, state of the art agricultural facility, Maple Spring Farm was once one of the State's leading dairy operations. The primary structure is the 19-bay long dairy barn (1942), with gambrel roof punctuated by four metal ventilators. The barn is highly visible on this section of well-traveled Darnestown Road in the densely populated Gaithersburg-Rockville area. The collection of outbuildings, built between c1918 and 1942, date from the heyday of specialized large-scale dairy farming.

Maple Spring Farm was recognized in the metropolitan region as a model dairy operation with its mechanized milking parlor, sanitary concrete interiors, and above average milk production. The 355-acre, 110-cow farm was owned and operated by Thomas Moore Garrett, a statewide agricultural leader who served as a director of the Farm Bureau, the Soil Conservation Board, and the Southern States Cooperative, and a charter member of the Maryland-Virginia Milk Producers Association, established in 1920. Other important agricultural structures include two terra cotta silos, a concrete block milk house, a two-story horse barn, one story wagon house/granary, and an equipment building. Still standing on an adjacent lot is the associated residence, located at the heart of a medical facility at 10810 Darnestown Road.



# **National Register Resources**

### 21/5 Washington Grove Historic District (1873), Municipality

Known as The Town within a Forest, Washington Grove is a community with Carpenter Gothic cottages, mature oak trees, pedestrian walkways, public parks, forest preserve, and independent, community-oriented residents. Washington Grove began as a summer camp meeting ground established in 1873 by Methodist clergy of Washington, D.C. Founders selected a wooded site along the newly opened Metropolitan Branch of the B&O Railroad as a retreat from hot, malarial, urban summers. Sunday meetings drew as many as 10,000 worshippers.

The campground was laid out with six walkway avenues radiating from a circle upon which founders built a wooden tabernacle. Campers erected 250 tents along the avenues in the first year, soon replaced by small wooden tents, and later by narrow Carpenter Gothic cottages. Though the tabernacle no longer stands, the Sacred Circle site has been preserved as a park. In contrast to the Tent Department, an area called the Cottage Department was platted between the circle and the railroad station. Lots and cottages in the Cottage Department were more spacious than in the Tent Department, reflecting the evolution of the community in its first decade from a two-week meeting to a season-long retreat, later year-round residence.

The early cottages are Carpenter Gothic in style, with steeply pitched, front gable roofs, full-width porches, and bargeboard trim. The style is derived from the form of the tents they replaced and succeeded, ecclesiastical associations, and the romantic, rural ideal popularized by Andrew Jackson Downing in the mid-1800s.

Unlike most communities built on a grid, cottages were built to face pedestrian avenues. Wagons and horses were restricted to roads that ran behind the houses. Grove Avenue served as the Town's Main Street, extending from the train station, and leading to the Assembly Hall, hotel, and tabernacle. A defining feature of Washington Grove is its mature tree canopy. Beginning in 1880, the Camp Meeting Association established rules to restrict the cutting of trees for construction of cottages or widening avenues. In 1972, the Town dedicated more than half of its 200 acres to parkland and forest preservation.



Washington Grove joined the Chautauqua Circuit and built the Assembly Hall in 1901. The octagonal building, measuring 20 feet on each side, had no plumbing, heat or electricity, but it provided shelter for lectures and shows as well as religious services. In 1937, the Camp Meeting Association dissolved and the Town of Washington Grove incorporated. Residents renamed the Assembly Hall McCathran Hall in 1957, in honor of retiring Mayor Irving Leroy McCathran. The hall, now with a restored cupola and new office addition, serves as the town hall as well as meeting place. The bell hung in the portico once announced camp meeting services and today calls residents to the Annual Town Meeting and rings in celebration of the Town's Independence Day festivities.

# 21/2 Gaithersburg B&O Railroad Station(1884),

5 Summit Avenue, City of Gaithersburg

The Gaithersburg Station is a well-preserved example of a high-style, small-scale train station. Designed by Ephraim Francis Baldwin, architect for the B&O, the station was built in 1884, replacing an 1873 station. The picturesque brick structure (21 feet 7 inches by 56 feet 3 inches) has a front-gable central tower, patterned brickwork walls, and gable-end wood stickwork. The east 12 feet were added 1905-7 to increase storage. In 1894, an early telephone switchboard was installed in the station, the first to serve County residents. A small brick freight house, also designed by Baldwin and built in the 1880s, stands further east. Both structures have overhanging shed roofs supported by oversize brackets that provide shelter for trackside passengers. The freight house currently holds a railroad museum.



**Gaithersburg Latitude Observatory** (1899) 100 DeSellum Drive, City of Gaithersburg

This structure is one of six observatories located in the United States, Russia, Japan, and Italy that are associated with an important and long-lived program of international scientific cooperation. In 1899, the International Geodetic Association established the International Polar Motion Service. This worldwide cooperative effort among scientists studied the nature of the Earth's wobble on its rotational axis. From its construction in 1899 until the obsolescence of manual telescopic observation forced its closing in 1982, the Gaithersburg Latitude Observatory played an integral role in this scientific endeavor. The frame, 13-foot square structure has a gable roof constructed of two sections that move apart on wheels to accommodate an elevated telescope.



J. A. Belt Building (1903), 227 E. Diamond Avenue, City of Gaithersburg

John A. Belt constructed this ornate Classical Revival building in 1903 to house his prosperous general store. A contemporary wrote that the "magnificent" Belt Building was "the largest mercantile house in Montgomery County and is filled to its utmost capacity with a choice stock of general merchandise." Prominently located at the corner of Diamond and Summit Avenues, in the center of Old Town Gaithersburg, the two-story brick store has paneled, rusticated pilasters and a paneled parapet which is inscribed "1903 J. A. Belt."



#### **Thomas and Company Cannery** (1917-8) W. Diamond and N. Frederick Avenues, City of Gaithersburg

The largest and longest-lived cannery in Montgomery County, the Thomas and Company Cannery operated from 1917 until 1962. While Baltimore had been the center of the canning industry in the 19th century, the outbreak of World War I created a need to regionalize. Frank and Clyde Thomas were leaders in the 20th century canning industry in Maryland. In 1917, the Thomas family opened a cannery in Gaithersburg, the first in Montgomery County. The factory was the focus of local industry and economy, providing an important market for farmers, and employment for local and migrant workers. Built along the B&O Railroad to facilitate shipping, the brick cannery had three main parts that are still extant: the central processing section, the shipping section (left), and boiler plant (right). In 1956, the cannery was expanded with a front concrete-block ell.



# **Appendix 7: Transportation Analysis**

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# 1. Purpose

The public hearing draft of the *Gaithersburg West Master Plan* proposes a conversion of the Life Sciences Center (LSC) area from auto-oriented suburbia to a transit-oriented, mixed-use, community. This Appendix provides the technical basis and details for the transportation system recommendations in the *Gaithersburg West Master Plan*.

The Plan proposes several innovative changes designed to promote the orderly implementation of a transit-oriented and sustainable center for the LSC, including:

- realigning the Corridor Cities Transitway (CCT) with line-haul service between the proposed LSC CCT stations
- accepting congestion levels that reflect the Planning staff and Planning Board approach to adequacy
- establishing a local street network that will create a finer grid than exists today and will improve vehicular and pedestrian connections between districts
- an implementation plan that relies on proportional participation by all developments and a staging plan to coordinate area wide transportation system implementation in lieu of assigning piecemeal transportation exaction requirements to individual development applications.

Since the early 1980s, the balance between land use and transportation system recommendations in master and sector plans has applied the procedures and general policies contained in the County's Growth Policy. The current Growth Policy applies an area wide mobility measure called Policy Area Mobility Review and a localized measure of congestion called Local Area Transportation Review. These measures, used to define adequacy for development review cases, are adapted for master plan analysis by applying the Department's TRAVEL/3 regional travel demand model and Local Area Model as described in detail in Chapter 3 of this Appendix.

The land use and transportation systems are balanced to promote end-state development that provides the density needed to redevelop the LSC area from an auto-oriented community to a transit-oriented community. The transportation system needed to accommodate these levels of development must achieve a 30 percent non-auto driver mode share (NADMS) for LSC employees, an objective that can be met through a combination of strategies, including:

- improved access to transit, including realigning the CCT through the LSC and improved transit circulator services in combination with the concentration of future development within walking distance of transit
- implementing a finer local street network with block lengths of 350 feet or less that promotes walking and bicycling
- managing the long-term parking supply by coordinating zoning requirements and public parking provisions
- commencing proactive travel demand management services through the establishment of the Greater Shady Grove Transportation Management District (TMD).

Establishing this balance between land use and transportation required an iterative review of alternative land use and transportation concepts, as described in this Appendix, which documents:

- the need to balance long-term land use and transportation systems to provide sufficient mobility in the developing LSC area and surrounding communities, using appropriate evaluation tools and measures of effectiveness
- the staging, implementation, and monitoring mechanisms that manage land use and transportation implementation details over two to three decades as the Plan is implemented.

The Appendix covers two areas.

- Chapter 2 describes the recommendations at a greater level of detail than described in the Plan.
- Chapter 3 demonstrates that the Plan's end-state conditions will result in an appropriate balance between land use and transportation.

# 2. Transportation Plan Recommendations

The *Gaithersburg West Master Plan* recommends a multimodal transportation system that recognizes the prior planning for the CCT system to create a transit-oriented community of walkable blocks with transportation options for residents, employees, and visitors.

Figure 1 shows the range of transportation system strategies examined in the Plan, including:

- travel demand management
- transit services
- local street network
- transportation system policies.

Figure 1 indicates the likelihood that the Plan would incorporate the different strategies based on analyses and coordination performed to date. The shaded cells indicate those strategies with high potential. In general, those strategies with high potential were incorporated into the Plan.

### **Figure 1: Transportation Management Strategies**

	Strategy	Opportunities	Constraints	Potential
and gement st	Reduce Single Occupant Vehicle mode share	Flexible, low capital Operational costs, cost monitoring		High
Dem Manag co	Increase parking charges	Reduce traffic, provide revenue	Establishing parking lot district, garage locations	Moderate
rvices	Construct CCT through LSC area	Serve planned development near LSC stations, reduce traffic congestion	Capital costs, operational costs	High
Transit Se	Express bus service using value-priced lanes from I-270 and ICC	Capture long-distance riders	Operating cost	Moderate
	Shuttle services	Low capital cost	Operating cost	Moderate
ork	Add local mid-block streets	Provide alternate routes, reduce walking distances	Capital costs, defining final alignment and implementation responsibilities	High
t Netwo	Left turn prohibitions	Reduce congestion	Circuitous trips (cars and buses), public acceptance	Moderate
al Stree	Add turn lanes	Reduce congestion	Increase pedestrian crossing distances, capital cost	High (for selected locations)
ΓΟ	Grade separated interchanges	Reduce congestion	Capital cost, attractiveness, inhibits pedestrian crossings, public acceptance	Moderate (for selected locations)

Policies	Strategy	Opportunities	Constraints	Potential
	CCT bridging over roadways	Reduce congestion	Capital cost, attractiveness, public acceptance	Moderate (for selected locations)
	Accept higher congestion levels	Consistent with urbanizing area, no capital cost	Operating costs, public acceptance	Moderate
	Increase residential uses	Create mixed use centers, provide housing near jobs, lower trip generation rates	Economic and market feasibility	Moderate
	Staging Plan	Provide services at time of development	None	High

# A. Travel Demand Management

Travel Demand Management (TDM) describes a wide range of programs and services designed to reduce the use of single-occupant vehicle trips. TDM is the set of public policy strategies to provide travel options that reduce and spread demand by travel destination, mode, route, and time of day to most efficiently use transportation system infrastructure and resources. TDM strategies can be implemented by both public and private sector activities and include:

- infrastructure such as high quality pedestrian environments, bus or high occupancy vehicle facilities or preferential treatments, telework centers, commuter information stores, car-sharing (i.e., Zipcar) and bike-sharing stations, and well-located transit stations or stops with real-time transit information
- services such as transit services, vanpools, ride-matching, Guaranteed Ride Home services, alternative commute
  option information (i.e., Greater Shady Grove Management District and the Metropolitan Washington Council of
  Government Commuter Connections)
- policies that affect the use of infrastructure and services, including parking supply management, preferential parking treatments for carpools/vanpools, transit subsidies, flexible work schedules, tax incentives, congestion pricing, and distance-based or Vehicle Miles of Travel pricing.

### **Montgomery County Travel Demand Management Applications**

Current TDM strategies include a variety of programs and services integrated between the private and public sectors. The Office of Legislative Oversight has summarized the County's existing TDM activities in their December 2008 report 2009-6, titled Transportation Demand Management Implementation, Funding, and Governance.

**Private sector** contributions include requirements of Planning Board conditions determined at the time of development review and approval (subdivision), often through a Traffic Mitigation Agreement (TMAg) to either provide a specified set of services or to achieve a specific performance objective. TMAgs are described in the Planning Board's Local Area Transportation Review/Policy Area Mobility Review (LATR/PAMR) Guidelines.

**Public sector** contributions include the activities of the area Transportation Management District (TMD). The proposed Greater Shady Grove TMD will provide services to employers and employees in the commercial areas of the LSC to promote adoption of commuter benefits programs by employers and to inform employees of alternative commuting options. The Greater Shady Grove TMD will also work to improve transit service in the area, to increase ridership, and to provide transit-friendly amenities.

In 2002, the County Council adopted Bill 32-02, an important link between the public and private sector TDM programs. This TDM law requires employers with more than 25 employees located in one of the County's four Transportation Management Districts to implement a Traffic Management Plan (TMP), participate in an annual commuter survey, and submit an annual report of TMP activities.

### **Target TDM Markets**

TDM strategies can be customized to target markets that consider land use (i.e., residential, commercial, or special event) and time of day (i.e., peak period, midday, or all day). Figure 2, from the Institute of Transportation Engineers Transportation Impact Analyses for Site Development an ITE Proposed Recommended Practice, summarizes the different types of TDM techniques commonly applied nationally to reduce vehicle traffic generation by their target market and trip reduction focus.

### Figure 2: Travel Demand Management Techniques and Target Markets

Techniqued	Types of Trips Affected						
rechniques	Office	Retail	Industrial	Residential	Lodging	Event	
Physical Actions							
Parking availability reduced below normal demand level or substantial increase in parking costs	T, P	-	T, P	T, P	T, P	T, P	
Quality pedestrian environment on-site (mixed-use developments only)	T, P, M	T, P, M	T, M	T, P, M	T, P, M	T, P, M	
Building amenities (bicycle lockers, showers, ATM, parking garage dimensions to accommodate vanpools, wiring for ease of telework)	T, P, M	-	T, P, M	T, P, M	-	-	
		Non-Phys	sical Actions				
Transit service to areas of trip origins	T, P	T, PM	T, P	T, P	T, P	T, P	
Carpool, vanpool programs (ridematching, preferential parking, subsidies, promotion)	T, P	T, PM	T, P	T, P	-	T, P	
Modified work schedules (4/40, staggered, flex)	Р	-	Р	Р	-	-	
Telecommute options	T, P	-	-	T, P	-	-	
Internal shuttle transportation to/within development site	T, M	T, M	-	T, M	T, P	-	
Transit subsidy	T, P	-	T, P	T, P	-	-	
On-site transportation coordinator or information center	T, P	T, P	T, P	T, P	T, P	T, P	

#### Table 7-11. Sample TDM Techniques With Potential to Reduce Site Traffic Generation

T = daily trips, P = peak hour trips, PM = p.m. peak hour trips, M = midday trips.

<sup>o</sup>Other techniques may be applicable either separately or in combination with others. To be effective, each measure must be designed to generate and sustain use of alternatives to the single-occupant automobile.

Many TDM techniques are effective in reducing auto travel at all times of day, others are targeted to peak period conditions. The Plan recommends a continued focus on weekday peak period modal shifts to optimize transportation system performance when congestion is greatest. As Montgomery County begins to consider climate change and energy requirements identified in the 2009 Climate Protection Plan the emphasis of travel demand management can be expected to shift somewhat from managing traffic congestion to reducing greenhouse gas emissions. The two objectives (peak period mobility versus daily or annual carbon footprint) are often, but not always, in sync. Shifting travel modes from auto to walking or biking will serve both objectives and TDM policies should make this shift the highest priority.

On the other hand, shifting an auto trip from the peak period to the off-peak period will serve the historic TDM objective of managing peak period performance, but has a smaller effect on greenhouse gas emissions (the difference between travel speeds and emissions during peak and off-peak periods).

The Plan's TDM strategies focus on commuters who work in the LSC area, for three reasons.

- Recurring vehicular travel demand is most constrained by traffic leaving the LSC area during the evening peak period.
- For the types of housing envisioned in the LSC (predominantly multifamily mid-rise units), the location and market provide high levels of transit use without the application of external TDM actions.
- TDM strategies applied at the workplace are often more effective than those applied at the residential level, due to both economies of scale and the fact that the employer/employee relationship can often be more productively applied than the residential owner/tenant relationship.

#### •

The staging plan for the LSC recommends that the mode share and transportation system performance be monitored periodically to track planned progress in targeted modal shifts and a reduction in per-unit vehicle trip generation rates. The implementation plan relies on a strong linkage between public and private TDM efforts so that the responsibility for success of the LSC trip reduction efforts are distributed across all plan area owners and tenants.

### LSC Employees

The Plan recommends a 30 percent non-auto driver mode share (NADMS) goal for the LSC. The current NADMS for this area is 16 percent. The NADMS measures the percentage of travelers who drive to and from work in the LSC as opposed to taking other modes.

The Local Area Modeling performed for the LSC analysis assumed that the 30 percent NADMS would be achieved over time for all commercial employees within the LSC located north of Darnestown Road. For monitoring purposes, the NADMS has been defined as:

- employees who normally arrive at their LSC workplace during the busiest two hours of the morning peak period from 7:00 a.m. to 9:00 a.m.
- auto drivers, including those in single-occupant vehicles (SOV) and those in carpools and vanpools.
- non-auto commuters, including transit riders, carpool/vanpool passengers, walkers, bicyclists, as well as those who have an LSC workplace but telecommute on the day of surveys.

The last master plan for the LSC area, the 1990 Shady Grove Study Area Master Plan estimated, on average, approximately 12 percent of the home-to-work trips originating outside the study area bound for Shady Grove would arrive at work via transit. As noted previously, the NADMS goal for this Plan in the LSC is 30 percent.

When comparing these two mode shares it should be noted that the land area in the 1990 Shady Grove Plan is roughly twice as large as the LSC and reflects a relatively dispersed land use pattern located both east and west of I-270. Also, the 30 percent NADMS goal for the LSC includes transit use, as well as other sub-mode shares such as ridesharing, walking, or biking. The Plan considers a 30 percent NADMS goal in the LSC area achievable for several reasons, including:

• the realignment of the CCT through the LSC

- the concentration of planned development within walking distance of the three proposed CCT stations in the LSC
- complementary feeder-bus service to the proposed CCT stations
- implementation of an active TDM program in the LSC (including employer-sponsored subsidized transit fares, parking management strategies, and staggered work hours).

### LSC Residents

The 1990 Shady Grove Study Area Master Plan identified a 75 percent auto-driver goal for the journey-to-work for study area residents. The 2005 Census Update Survey noted that this goal has very nearly been achieved in the R&D Village Policy Area, with a 73 percent auto-driver mode share reported for area residents.

### B. Corridor Cities Transitway (CCT) and Local Transit System

To serve the LSC area, this Plan recommends realigning the CCT with line-haul service between the proposed LSC CCT stations. To reduce delays for transit and vehicles, this realignment may require CCT grade separations at Key West Avenue (MD 28) and Great Seneca Highway (MD 119). Project planning for the CCT takes into account the potential need to reconfigure existing bus service to avoid duplication and ensure the most efficient allocation of vehicles and personnel. There are currently six Ride On routes from the Shady Grove Metro Station, three of which provide service to the LSC area, including Shady Grove Adventist Hospital and the Traville Transit Center. When the CCT is in place, these routes may need to be readjusted to ensure the most efficient service. This Plan also recommends developing express bus service using value-priced lanes from I-270 and the Intercounty Connector (ICC), as well as shuttle bus routes to serve the LSC area.

As LSC densities increase with zoning requirements and design guidelines that require buildings to be street-oriented rather than parking-lot oriented, the number of potential transit riders and the attractiveness of transit will also increase.

### **Corridor Cities Transitway**

### Background

The Corridor Cities Transitway (CCT) has been included in County master plans in one form or another for over 20 years. The CCT is envisioned as either a bus rapid transit (BRT) or light rail transit (LRT) system providing frequent (five to ten minute) service between the Shady Grove Metro Station and Clarksburg (i.e., the COMSAT site).<sup>1</sup>

### Purpose

The CCT's primary purpose is to provide improved mobility options within the corridor as well as improved access to the Metrorail system. The CCT is viewed as central to establishing active, pedestrian oriented, mixed-use centers along the entire corridor—not just in the Gaithersburg West area. As such, the visions for the centers and the CCT are codependent.



<sup>1</sup>While adopted master plans envision the CCT extending into Frederick County, the current Environment Assessment underway by the Maryland Transit Administration (MTA) includes only the segment between Shady Grove and the COMSAT site in Clarksburg. Any eventual first phase of actual construction of the CCT would likely involve a segment that began at the Shady Grove Metrorail Station and ended at some location south of the COMSAT site (e.g., Metropolitan Grove or Germantown).

### Figure 3: Current CCT alignment

### **Station Locations and Functions**

The activity centers served by the CCT stations include Shady Grove, King Farm, Crown Farm, Quince Orchard Park, Metropolitan Grove, Germantown and the southern edge of Clarksburg. One overriding objective in recent past (Shady Grove and Twinbrook) and current (Germantown and Gaithersburg West) planning efforts is to establish a vision for pedestrian oriented mixed-use communities with transit supportive densities within one-half mile of most station areas. Combining a mix of activities with high quality transit service will reduce the growth rate of single occupant auto trips—sometimes significantly. There are 14 planned station locations along the alignment between Shady Grove and COMSAT. The current plan is for seven of the 14 stations to have parking for transit riders, including the Washingtonian (Crown Farm) and Decoverly stations.

### **Current CCT Study**

The Maryland Transit Administration has completed an updated Alternatives Analysis/Environmental Assessment (AA/EA) of the CCT. The assessment updates information from the CCT's 2002 Environmental Impact Statement and guide the selection of a preferred mode (bus rapid transit or light rail).

# Alternative Alignment Recommended by the Gaithersburg West Master Plan

At its southern end, the CCT current master planned alignment (the blue line on Figure 4) goes over I-270 heading west after leaving King Farm and serves the Crown Farm development in the City of Gaithersburg before entering the Gaithersburg West study area along the south side of Decoverly Drive. The Plan proposes two stations, the DANAC station on Decoverly Drive just before the alignment goes over Great Seneca Highway and the Decoverly Station located on the west side of Great Seneca Highway.

The red line represents potential modifications to the CCT alignment. The modified alignment within Crown Farm is a result of the local review of the development carried out by the City of Gaithersburg and has been closely coordinated with the Maryland Transit Administration.

The Plan recommends the CCT alignment be extended south along Broschart Road to better serve the Shady Grove Life Sciences Center, the current Public Service Training Academy site, and the Johns Hopkins University (JHU) Belward Research Campus with stations at each of these locations. Commuter parking would likely be available at no more than two of the stations and more likely, just one of the three stations.

# **King Farm**



# Metropolitan Grove



Figure 4: Draft Plan CCT Alignment and Stations



Figure 1: Draft Plan CCT alignment and stations

The analysis of this proposed change to the alignment of the CCT is being carried out by the MTA using updated land use forecasts provided by the Planning Department.<sup>2</sup> The analysis is expected to be completed after the release of the Alternatives Analysis/Environmental Assessment in May 2009. It will inform the selection of a Locally Preferred Alternative scheduled to occur in Fall 2009.<sup>3</sup>

Staff believes the proposed alignment shift will better support the Plan's vision, complement the other planning efforts along the I-270 Corridor, and better fulfill the potential of the CCT. Accordingly, CCT planning should continue and should assume that shifting the alignment south better meets the Plan's vision, even if it requires additional environmental impact analysis.

It should also be noted that some communities near the proposed alignment have requested consideration of other modifications to the alignment on the Belward campus. While these additional modifications are not currently being studied by the MTA, staff feels that the dialogue should continue so as not to preclude further consideration at a later date.

### **CCT Staging Considerations**

It is possible the CCT will involve a staged or phased implementation—regardless of mode or alignment. Key factors to consider in the staging plan include:

- frequent service (ten minutes or less)
- average scheduled speed faster than conventional local bus service—a minimum of 15 mph.
- new, low floor, hybrid electric or other clean technology, and branded vehicles
- distinctive, well-lit station areas that are far enough apart to maintain an attractive average scheduled speed.

### **Existing Ride On Service**

Nine Ride On routes serve the Gaithersburg West Plan area with service that varies so the daily ridership shown in the table to the right includes passengers boarding outside the planning area.

#### **Ride On Strategic Plan**

The September 2008 Montgomery County Strategic Transit Plan indicates that Travilah is an underserved area of the County. Additional service in that area would likely result in additional service in the Gaithersburg West area.

### Potential Bus Service Changes in Response to Introduction of the CCT

Project planning for the CCT takes into account the need to reconfigure the existing bus service in order to avoid duplication and ensure the most efficient allocation of vehicles and personnel. Preliminary concept level planning of how a route network might evolve if the CCT were in place has been conducted by the MTA in consultation with the County's Ride On staff and with WMATA's Metrobus staff.

As of this writing, the operating plan for the bus service envisioned under the CCT's BRT alternative calls for improved service frequencies on the above routes and does change any route terminals. Under the LRT alternative, the Rockville routes and Route 43 would have improved service frequencies with no change in the routes' beginning or end points. The remaining routes (those more oriented to the LSC area) would be shorter, operate more frequently, and be designed as feeder routes for the CCT.

<sup>2</sup>The forecast provided by MTA includes updated estimates for Germantown, Twinbrook, and White Flint as well.

<sup>3</sup>Note that the analysis of the alternative alignment effectively expands the scope of the LPA decision to include alignment (master plan or new alignment through LSC area) as well as mode (bus rapidtransit or light rail). If the new alignment is chosen as part of the LPA, it is possible the Federal Transit Administration will require the MTA to conduct another supplemental environmental assessment, which could delay the project entering the FTA's New Start pipeline.
#### Figure 5: Ride On Routes and Average Ridership

Route No.	From	То	Peak Period Frequency	Average Weekday Ridership
43	Shady Grove Metrorail	Shady Grove Hospital	15	900
54	Rockville	Lake Forest	20	2,200
55	Rockville	Germantown Transit Center	15	6,900
56	Rockville	Lake Forest	20	2,500
66	Shady Grove Metrorail	Traville Transit Center	30	110
67	Shady Grove Metrorail	Traville Transit Center	30	130
74	Shady Grove Metrorail	Germantown Transit Center	30	750
76	Shady Grove Metrorail	Poolesville	30	600
78	Shady Grove Metrorail	Kingsview Park & Ride	30	230



#### Preliminary Ridership, Cost, and Cost-Effectiveness Estimates for the CCT

The MTA project team has released the following preliminary ridership (year 2030) estimates for the current CCT alignment using Round 6.4 demographic projections. The average weekday ridership is estimated to range from 21,000 to 30,000.

CCT Alternatives Preliminary Travel Demand Forecasts & Cost Estimates							
Transit Alternative	Travel Time Shady Grove to COMSAT (minutes)	Ridership (Daily Boardings)	Capital Cost (millions-2007\$)	Annual Operations and Maintenance Costs (millions-2007\$)			
Hwy 1 and Trans. TSM	60	6,000 - 7,000	\$86.9	\$14.8			
Hwy 1 and Light Rail	36	24,000 - 30,000	\$777.5	\$28.1			
Hwy 1 and Bus Rapid	38	21,000 - 27,000	\$449.9	\$26.8			
Hwy 2 and Light Rail	36	24,000 - 30,000	\$777.5	\$28.1			
Hwy 2 and Bus Rapid	38	21,000 - 27,000	\$449.9	\$26.8			

#### Figure 6: Round 6.4 Ridership for Existing CCT Alignment

Both Hw y 1 and Hw y 2 have four general purpose and two express toll lanes on F270 in each direction in Montgomery County north of F370 to the future interchange with New cut Road (between MD 121 and West Old Baltimore Road). Both have two general purpose lanes on F270 in each direction from the future New cut Road interchange to F70. Hw y 1 has two express toll lanes in this segment while Hw y 2 has one express toll lane.

MTA has also estimated the cost effectiveness of the alternatives under consideration (see Figure 7).

		А	В	С	D		
	Total Capital Costs (2007 dollars)	Annualized Capital Costs (2007 dollars)	Annual Operating Costs (2007 dollars)	Annual User Benefit (Hours)	Annualized Cost per Hour of User Benefit		
TSM	86,860,000	7,440,700	14,793,000	1,890,000	-		
Build Alternatives							
Alternative 6A (LRT)	777,530,000	62,202,400	28,129,000	3,960,000	\$32.90		
Alternative 6B (BRT)	449,920,000	36,443,500	26,859,000	4,110,000	\$18.50		
Alternative 7A (LRT)	777,530,000	62,202,400	28,129,000	3,990,000	\$32.43		
Alternative 7B (BRT)	449,920,000	36,443,500	26,859,000	4,140,000	\$18.25		

#### Figure 7: Cost Effectiveness of the Existing CCT Alignment

The Annualized Cost per Hour of User Benefit (column D) takes into account the annualized costs of the respective alternatives and the extent to which travel time benefits occur when compared to the TSM or <sup>4</sup>Transportation System Management alternative.<sup>4</sup> This variable is used by the Federal Transit Administration (FTA) to evaluate projects across the country competing for federal funds. Under the current FTA guidelines, the cost per hour for the Light Rail Transit (LRT) alternatives exceeds the amount that the FTA would consider competitive for funding. The BRT alternatives are well below the FY 2009 threshold cost of \$23.99 per hour, indicating greater funding potential for BRT. The cost estimates are not expected to change prior to the availability of the AA/EA document in May 2009 but are expected to change when the alignment through the Life Sciences Center area is examined by the MTA project team.

#### **Transit Supportive Density Considerations**

The Planning Department has reviewed the considerable amount of existing and evolving research on station area densities, pedestrian accessibility and connectivity, transit mode share, and other issues related to transit oriented development. The following examples represent the issues and options.

The FTA-sponsored report by Reconnecting America, Station Area Planning: How to Make Great Transit-Oriented Place, identifies different types of activity centers in the context of function, density, and level of transit service as shown in the following tables.

0		•		
	DISTRICTS		CORRIDOR	QUESTIONS ARE POSED in this table to help all
Urban Neighborhood	Transit Neighborhood	Special Use/ Employment District	Mixed-Use Corridor	the station area planning partners identify the areas they are planning within the
Predominantly residential district with good access to regional and subregional centers	Predominantly residential district organized around transit station	Local focus of economic and community activity without distinct center	Local focus of economic and community activity without distinct center	place typology. The place types in the typology are generalized so as to highlight similarities and differences
Heavy rail, LRT/streetcar, BRT, commuter rail, local bus	LRT/streetcar, BRT, commuter rail, local bus	LRT/streetcar, BRT, potentially heavy rail	LRT/streetcar, BRT, local bus	as well as the parameters that tend to define their land use mix, housing densities, and transit service. Because of this a particular place
5-15 minutes	15-30 minutes	15-30 minutes	5-15 minutes	may not fit exactly into one of these types. All of the characteristics that are identified, defined and
Moderate- to high-density residential uses with supporting commercial and employment uses	Low- to moderate-density residential uses with supporting commercial and employment uses	Concentrations of commercial, employment and civic/cultural uses, potentially with some residential	Moderate-density mix of residential, commercial, employment and civic/cultural uses	quantified are intended to be descriptive and not prescriptive, in the recognition that all places
Primarily local-serving retail opportunity; need for some community-serving retail	Primarily local-serving retail opportunity	Potential for community- and regional-serving retail but need to balance demands for access	Primarily local-serving retail opportunity; need for some community- serving retail	are unique.
Expanding local-serving retail opportunities and increasing high-density housing	Integrating moderate- density housing and supporting local-serving retail	Creating sustainable off-peak uses and accommodating peak travel demand	Expanding local-serving retail opportunities and high-density housing opportunities	Note: The term "station area" typically refers to the half-mile radius around the station, about 500 acres in size. The term "primary transit mode" refers to
Fruitvale in Oakland, Greenwich Village in New York City, the Pearl District in Portland, University City in Philadelphia	Ohlone-Chynoweth outside San Jose; Plano, Texas; Barrio Logan in San Diego; Capitol Hill in Washington D.C.	South of Market in San Francisco, Camden Station in Baltimore, South Waterfront in Portland	International Boulevard in Oakland, Washington Street in Boston, University Avenue in St. Paul, Minnesota	une curinst: types that typically support the place type.

#### **Figure 8: Characteristics of Transit-Oriented Development**

Source: Station Area Planning, Reconnecting America and the Center for Transit-Oriented Development, February 2008, page 8.

Some representative or general TOD residential categories include the following:

# Figure 9: Characteristics of Residential Transit Oriented Development

	CENTERS				
	Regional Center	Urban Center	Suburban Center	Transit Town Center	
Housing Mix (New Development)	High-rise and mid-rise apartments and condos	Mid-rise, low-rise, some high-rise and townhomes	Mid-rise, low-rise, some high-rise and townhomes	Mid-rise, low-rise, townhomes, small-lot single family	
Station Area Total Units Target	8,000-30,000	5,000-15,000	2,500-10,000	3,000-7,500	
Net Project Density (New Housing)	75-300 du/acre	50-150 du/acre	35-100 du/acre	20-75 du/acre	
Station Area Total Jobs Target	40,000-150,000	5,000-30,000	7,500-50,000	2,000-7,500	
Minimum FAR (New Employment Development)	AR ent 5.0 FAR 2.5 FAR nt)		4.0 FAR	2.0 FAR	
	ONCE THE PLAN identified an ap to guide plannir station area, the can be used to t characteristics o want to create. should be discus	NING partners have propriate place type og in a particular ese guidelines hink through the f the places they The following criteria esed:	• Housing mix: the range of housing types will vary depending on local conditions and the community vision. These types refer to new, not existing, housing.	• Station area total units target: The range will vary according to local conditions.	

Source: *Station Area Planning*, Reconnecting America and the Center for Transit-Oriented Development, February 2008, page 12.

An example of s similar typology for mixed use sites is presented below.

#### Figure 10: Characteristics of Mixed-Use Transit-Oriented Development

		Net Density	Characteristics	Construction Type	Parking Configuration	
Mid-Rise Residential Over Commercial	SE TYPES	40-90 du/acre	3-6 stories with apartments, single- or double-loaded corridors with lobby entrance, off-street parking in structure or below grade	Type I/III (max 6 stories with building code modification/65 feet)	Groundfloor podium/ subgrade or elevated structure	Contraction of the second
High-Rise Residential Over Commercial	MIXED US	60+ du/acre	7+ stories, usually with base and point tower, single- or double-loaded corridors with lobby entrance, off-street parking in structure or below grade	Type I/II (max 12 stories/120 feet/no limits on Type 1)	Off-street parking in structure or below grade	
Low-Rise Office/Commercial		0.5-2.5 FAR	1-3 stories with lobby entrance to upper floors; retail, office or mixed-use with mix of tenant types, including limited large-footprint retail uses; parking in surface lots or structures	Type III/IV/V (max 4 stories/65 feet)	Off-street parking in groundfloor podium or surface	
Mid-Rise Office/Commercial	NT TYPE	2.0-5.0 FAR	3-7 stories, with lobby entrance to upper floors, office with potential groundfloor retail, parking in structure or below grade	Type I/II (max 12 stories/160 feet)	Off-street parking in structure or below grade	
High-Rise Office/Commercial	MPLOYME	4.0+ FAR	6+ stories with lobby entrance to upper floors sometimes with point tower over base, office with potential groundfloor retail, parking in structure or below grade	Type 1 (no limits)	Off-street parking in structure or below grade	
Institutional/Other Employment		varies	schools, civic uses, stadiums, hospitals, other entertainment uses; range of densities and sizes; parking often in structures or below grade	Varies	Parking often in structures or below grade	

Source: Station Area Planning, Reconnecting America and the Center for Transit-Oriented Development, February 2008, page 13.

#### Non-Auto Mode Share

The available research indicates that the percent of work trips by residents in a Transit Oriented Development made by transit, walking, or bicycle varies but in general, is much higher than for the region overall. This is especially the case in maturing regions with heavy rail systems as noted in the tables below from the Transit *Cooperative Research Program (TCRP) Report 128: Effects of TOD on Housing, Parking, and Travel.* 

					%
	Transit	Transit	Transit	Transit	Change
	Share	Share	Share	Share	1970-
Region	1970 (%)	1980 (%)	1990 (%)	2000 (%)	2000 (%)
Older and	Redevelop	ing Region	s		
Chicago TOD Average (n=8)	24.0	21.7	18.7	16.7	-30.0
Chicago MSA Average	22.1	16.6	13.7	11.5	-48.0
NY/NJ TOD Average (n=26)	15.7	13.1	13.6	16.4	4.0
NY/NJ MSA Average	35.5	26.7	25.4	24.9	-30.0
TOD Average	19.8	17.4	16.1	16.5	-17.0
MSA Average	28.8	21.6	19.5	18.2	-37.0
Maturing	- Heavy Ra	ail Regions			
Atlanta TOD Average (n=4)	20.9	22.5	24.9	19.3	-8.0
Atlanta MSA Average	9.2	7.7	4.6	3.7	-60.0
Miami TOD Average (n=2)	0.5	2.7	5.4	6.5	1094.0
Miami MSA Average	7.1	5.0	4.4	3.9	-45.0
San Francisco TOD Average (n=18)	17.8	22.3	20.1	21.0	18.0
San Francicsco MSA Average	11.6	11.4	9.6	9.5	-18.0
Washington DC TOD Average (n=16)	19.0	27.4	32.5	30.0	58.0
Washington DC MSA Average	15.4	13.1	11.3	9.4	-39.0
TOD Average	14.6	18.8	20.7	19.2	32.0
MSA Average	10.8	9.3	7.5	6.6	-39.0
New Star	rt - Light Ra	ail Regions			
Portland TOD Average (n=5)	9.2	13.4	11.8	14.6	58.0
Portland MSA Average	5.5	7.6	5.0	5.7	3.0
San Diego TOD Average (n=6)	8.3	11.2	6.5	6.7	-19.0
San Diego MSA Average	3.7	3.4	3.5	3.4	-7.0
Los Angeles TOD Average (n=6)	6.2	11.5	10.2	8.4	37.0
Los Angeles MSA Average	4.2	5.2	4.7	4.7	11.0
Dallas TOD Average (n=6)	14.5	9.1	9.2	3.2	-78.0
Dallas MSA Average	5.2	3.5	2.3	1.8	-66.0
Denver TOD Average (n=2)	9.4	8.6	8.4	7.5	-20.0
Denver MSA Average	4.3	6.0	4.2	4.3	0.0
Salt Lake City TOD Average (n=4)	2.4	5.8	3.2	5.0	108.0
Salt Lake City MSA Average	2.2	5.0	3.1	3.0	36.0
TOD Average	8.3	9.9	8.2	7.6	-9.0
MSA Average	4.2	5.1	3.8	3.8	-9.0
Total TOD Average (n=103)	15.1	17.0	16.9	16.7	11.0
Total MSA Average (n=12)	19.0	14.1	12.0	7.1	-63.0

# Figure 11: Transit Trends for Journey to Work Trips for Selected TODs

Source: Renne, 2005

Source: Transit Cooperative Research Program Report 128, Transportation Research Board, 2008, page 9.

# Figure 12: Walk/Bike Trends for Journey to Work Trips for Selected TODs

					%				
	Walk		Walk/Bike		Change				
	Share	Walk/Bike	Share	Walk/Bike	1970-				
Region	1970 (%)	Share 1980 (%)	1990 (%)	Share 2000 (%)	2000 (%)				
Old	Older and Redeveloping Regions								
Chicago TOD Average (n=8)	13.6	14.1	9.8	8.9	-34.0				
Chicago MSA Average	9.6	7.9	5.7	3.4	-64.0				
NY/NJ TOD Average (n=26)	16.9	14.3	8.6	8.2	-51.0				
NY/NJ MSA Average	10.0	10.2	7.3	5.8	-42.0				
TOD Average	15.2	14.2	9.2	8.6	-44.0				
MSA Average	9.8	9.0	6.5	4.6	-53.0				
M	aturing - H	eavy Rail Region	s						
Atlanta TOD Average (n=4)	13.1	16.1	7.9	7.4	-43.0				
Atlanta MSA Average	4.4	3.2	3.1	1.4	-68.0				
Miami TOD Average (n=2)	3.3	3.6	3.0	2.8	-15.0				
Miami MSA Average	7.3	5.5	4.1	2.2	-70.0				
San Francisco TOD Average (n=18)	19.8	19.1	14.9	16.1	-19.0				
San Francicsco MSA Average	8.6	9.1	6.4	4.4	-49.0				
Washington DC TOD Average (n=16)	17.3	18.3	14.9	14.2	-18.0				
Washington DC MSA Average	8.4	7.0	5.4	3.2	-62.0				
TOD Average	13.4	14.3	10.2	10.1	-24.0				
MSA Average	7.2	6.2	4.8	2.8	-61.0				
N	ew Start - L	ight Rail Region	s						
Portland TOD Average (n=5)	23.2	23.4	19.5	20.4	-12.0				
Portland MSA Average	7.8	7.4	5.4	3.7	-52.0				
San Diego TOD Average (n=6)	13.2	22.6	9.4	7.7	-42.0				
San Diego MSA Average	9.5	9.1	6.1	4.0	-58.0				
Los Angeles TOD Average (n=6)	15.2	13.5	10.7	9.5	-37.0				
Los Angeles MSA Average	7.7	7.6	5.1	3.2	-58.0				
Dallas TOD Average (n=6)	31.9	9.4	26.1	11.2	-65.0				
Dallas MSA Average	5.8	3.4	3.2	1.6	-72.0				
Denver TOD Average (n=2)	13.4	6.3	7.9	5.5	-59.0				
Denver MSA Average	7.8	6.4	4.9	3.1	-60.0				
Salt Lake City TOD Average (n=4)	12.9	8.0	6.9	7.1	-45.0				
Salt Lake City MSA Average	6.5	5.7	4.5	2.3	-65.0				
TOD Average	18.3	13.9	13.4	10.2	-44.0				
MSA Average	7.5	6.6	4.8	3.0	-60.0				
Total TOD Average (n=103)	17.4	15.8	12.3	11.2	-36.0				
Total MSA Average (n=12)	7.8	6.9	5.1	3.2	-59.0				

Source: Renne, 2005

Source: Transit Cooperative Research Program Report 128, Transportation Research Board, 2008, page 10.

# **TOD Density Thresholds and the CCT**

In general, minimum job densities that are transit-supportive for fixed-guideway line-haul services, i.e., that establish a ridership base for peak period service that is frequent and reasonably competitive with an auto trip ranges from 25 to 50 jobs/acre. The corresponding minimum number for residential development ranges from 10 to 35 dwelling units/acre. The ranges and mix can vary by station but these are the minimum densities to support transit. The density threshold is typically applied within one-half mile of the station with the higher densities within ¼ mile of the station.

Staff has examined the station area densities along the CCT alignment using the COG Round 6.4 land use forecasts, for all stations except the LSC area. The Round 6.4 forecasts were developed in 2003 as the Planning Department began analyzing the I-270 Corridor master plans. In the LSC area, jobs and housing were estimated for year 2030 and were provided to the MTA for their evaluation of the proposed alignment in August 2008. A summary of the estimate of jobs and housing in the August 2008 forecasts used by MTA is presented below:

PROGRAM /TAZ/VARIABLE	SGLSC CLUSTER	PSTA CLUSTER	BELWARD CLUSTER	TOTAL/AVERAGE
Research/Office/Lab SF	2,105,750	89,750	1,250,500	3,446,000
Residential SF & DU's	1,980,000	1,607,000	352,000	3,939,000
Retail SF	37,600	156,000	23,600	217,200
Industrial	760,950	56,700	1,678,950	2,496,600
Other (Cultural/Rec) SF	2,218,500	11,500	750,000	2,980,000
Subtotal	7,102,800	1,920,950	4,055,050	13,078,800
Land Area	9,458,223	2,223,447	6,941,704	18,623,374
FAR	0.75	0.86	0.58	0.70
HH/Acre	9.12	31.48	2.21	9.21
Jobs /Acre	67.45	17.59	64.58	60.43
Jobs Per DU	7.40	0.56	29.24	6.56
Total Jobs	14,645	898	10,292	25,835
Total Residents	3,445	3,551	778	7,775
Total DU's	1,980	1,607	352	3,939
Non Residential SF				9,139,800
Residential SF				3,939,000
Total				13,078,800

#### Figure 13: Staff's August 2008 Forecast for 2030 Development

Figure 14 shows how these densities compare with other station area densities—both along the CCT and along Metrorail. The estimates reflect densities with an approximate radius of half mile station areas since that is the approximate size of the sub-zones used in the analysis.

# Figure 14: Round 6.4 Forecast for 2030 Development Comparisons

CCT Stations - Sub Zones Are Round 6.4	2030 HH/Acre	2030 Jobs/Acre
	Within First Half Mile	Within First Half Mile
Clarksburg Town Center	3	6
Shawnee Lane	2	13
COMSAT	4	15
Dorsey Mill	3	14
Manekin	4	21
Cloverleaf	3	14
Germantown Transit Center	6	13
Middlebrook Road	2	10
Metropolitan Grove	5	10
First Field	4	19
NIST	3	9
Quince Orchard	4	5
Decoverly	6	7
DANAC	4	15
Crown Farm	4	33
West Gaither	2	35
East Gaither	11	2
Shady Grove	10	22
Metrorail Stations - Round 7.0		
Shady Grove	13	15
Rockville	7	33
Twinbrook	8	31
White Flint	16	63
Grosvenor	14	11
Medical Center	1	41
Bethesda Metro	34	110
Friendship Heights	27	73

Other Activity Centers - Round 7.0					
Milestone Center	2	2			
Lakeforest Mall	7	6			
Rock Spring Park	2	21			
Washingtonian Center	6	11			
Life Science 2030 Using CCT Round 7.2 Forecast					
SGLSC Cluster	9	67			
PSTA Cluster	31	18			
Belward Cluster	2	65			
Life Science 2030 Average	9	60			
Density Threshold Minimums From Literature					
Heavy Rail	12	50			
Light Rail	9	25-50			
BRT	5-15	25-50			
Express Bus	3-15	10			
Local Bus	3-8	5-10			
			SGLSC	PSTA	BELWARD
TOD Guidelines - Station Area Planning	Urban Center	Suburban Center	CLUSTER	CLUSTER	CLUSTER
Peak Transit Frequency	5-15	5-15	6	6	6
Station Area Total Housing Units Target	5,000 - 15,000	2,000 - 10,000	1,980	1,607	352
New Housing Density	50-150 du/acre	35-100 du/acre	9	31	2
Station Area Total Jobs Target	5,000-30,000	7,500 - 50,000	14,645	898	10,292
Minimum FAR - New Employment Development	2.5	4.0	N/A	N/A	N/A

The examination of the station area densities indicates that the initial 2030 land use forwarded to the MTA exceeds the generally accepted minimum densities for TOD station areas and is approximately double the station area job density planned for Crown Farm and the west side of King Farm. In general, the station area densities along the CCT at some other stations (excluding the more recently planned station areas in Germantown, Shady Grove, Crown Farm, King Farm) are below the <sup>6</sup>minimum densities.

In summary, the staff analysis of station area densities in Round 6.4 led to the conclusion that additional density should be concentrated at selected CCT stations where redevelopment potential is highest to more closely reflect TOD level densities and therefore, also to improve CCT competitiveness for federal funding.

# **C. Street Network**

The Plan's street network includes major highways, arterials, and master-planned business streets. These streets are required elements of the Plan and associated development, and should be built according to County design standards to accommodate both regional (for major highways and arterials) and local (for business streets) travel needs.

Section 49-31 of the County Code defines the functional classification system for roadways.

- A Major Highway is meant nearly exclusively for through movement of vehicles at a moderate speed. Access must be primarily from grade-separated interchanges and at-grade intersections with public roads, although driveway access is acceptable in urban and denser suburban settings.
- An Arterial is meant primarily for through movement of vehicles at a moderate speed, although some access to abutting property is expected.
- A Business District Street is meant for circulation in commercial and mixed-use zones.
- A Primary Residential Street is meant primarily for circulation in residential zones, although some through traffic is expected.
- •

The Gaithersburg West Master Plan takes into consideration the County's Road Code (Chapter 49) developed in 2006 and design standards (Executive Regulation 31-08) developed in 2007 and 2008. Executive Regulation 31-08 stresses the need to develop context-sensitive solutions with street designs that reflect and emphasize the planned adjacent land uses. The design guidance reflects that while the County formally has rural, suburban, and urban areas, a continuum exists both across and within those three designations.

Figures 15 and 17 present the proposed overall street network for the Plan area and a closer view of the LSC district. The proposed road network has the following elements:

- A network of traffic-carrying, master-planned, business district streets (shown as fuchsia lines for major highways and blue lines for arterials in both figures) designed to reflect the County's new Road Code emphasis on multimodal access and stormwater management.
- •
- A secondary network of business district streets will provide internal site accessibility to the LSC with a focus on enhancing pedestrian connectivity by reducing block size.

#### Figure 15: Gaithersburg West Street Network



Specific streets are described in the Plan and this Appendix.

#### Sam Eig Highway

To support proposed development levels while maintaining a suburban level of mobility for automobile users, this Plan sees the need to reconstruct Sam Eig Highway as a grade-separated boulevard treatment within a 250-foot wide right-of-way with three through lanes in each direction; shoulders suitable for peak-period, peak-direction use by BRT; and two-lane, one-way, frontage roads providing connections to Fields Road and Diamondback Drive with a flyover ramp connection from eastbound Great Seneca Highway to northbound Sam Eig Highway. The concept plan (Figure 16) illustrates how this would function, and the minimum right-of-way expansion needed to accommodate improvements.

Figure 16: Illustrative Concept of Sam Eig as a Controlled Major Highway



#### Key West Avenue (MD 28)

This Plan shows the need to accommodate build-out levels of development on an expanded roadway network. The predominant east-west vehicle movement in the Plan area is accommodated on Key West Avenue, a major highway, following construction efforts to expand that roadway and reroute through traffic to it, as evidenced by its designation as MD Route 28.

If the area develops at build-out levels, the Plan's staging would ultimately require reconstructing Key West Avenue within a 200-foot wide right-of-way between Great Seneca Highway and Shady Grove Road to provide a consistent design treatment that includes a wide landscaped median, four through travel lanes in each direction, and a separate curb lane that can provide multiple functions. (During peak periods, the curb lane should serve as a through lane for transit vehicles only and a right turn lane for other vehicles.)

The Plan's staging recommendations require a decision on the ultimate configuration for Key West Avenue prior to Stage 3 of development (build-out). The recommended 200-foot wide right-of-way would facilitate the development of urban-diamond interchanges at Great Seneca Highway and Shady Grove Road with Key West Avenue elevated above the cross streets. The roadway would need to be reconstructed as an urban boulevard between the two interchanges, and the distance between existing building faces would accommodate the wider right-of-way.

#### Longdraft Road (A-33)

Longdraft Road forms the boundary between the City of Gaithersburg and the Plan area. The east side of Longdraft Road is in the City of Gaithersburg and the west side is part of this master plan. The 1985 master plan classified Longdraft Road from Pheasant Run Drive (in the City of Gaithersburg) to the railroad as an arterial (A-33). That plan also identified sections of Longdraft Road and Watkins Mill Road as an arterial route (A-17) that would extend from Quince Orchard Road to Great Seneca Creek with a recommended right-of-way of 80 feet and four travel lanes. This proposed route assumed that Watkins Mill Road would be extended from its current terminus at Route 355, across I-270. At Clopper Road, Pheasant Run Drive would connect Watkins Mill Road with Longdraft Road.

At the request of the City of Gaithersburg, the County Department of Transportation (DOT) studied this route and recommended using Clopper Road, rather that Pheasant Run Drive, as a link between Watkins Mill Road extended and Longdraft Road. This Plan recommends that Longdraft Road and Watkins Mill Road be classified separately as A-33 and A-17, respectively. This Plan recommends that the arterial designation for the northernmost portion of Longdraft Road, from Clopper Road to the railroad, be removed.

In 2004, DOT initiated a facility planning study for Longdraft Road from Quince Orchard Road to Clopper Road. The study examined whether this two-lane, 1 1/2 mile section of Longdraft Road should be widened to accommodate existing and future traffic projections. In addition to potential road way improvements, the study examined bicycle and pedestrian enhancements.

In July 2008 the County Council's Transportation and Environment Committee determined the Longdraft Road facility planning study should not proceed to Phase II, referring the elements recommended by the Planning Board and resident coalition to other programs within DOT's capital and operating budgets to move forward. By doing so these elements likely will be implemented sooner than if they remained within a project planning study.

- Renumber Longdraft Road as A-33 (from A-17) from Quince Orchard Road to Clopper Road (excluding the section from Longdraft Court to Golden Post Lane, which is completely within the City of Gaithersburg).
- Remove the arterial designation of Longdraft Road north of Clopper Road to the railroad.

#### Watkins Mill Road (A-17)

As discussed above, Watkins Mill Road and Longdraft Road were recommended in the 1985 master plan as an arterial route (A-17) from Quince Orchard Road on the south to Great Seneca Creek on the north.

This Plan recommends that the two roads continue to be designated as arterials, but considered as separate routes with individual numbers. A portion of Watkins Mill Road (from Route 355 to just north of Windbrooke Drive) is in the City of Gaithersburg and is designated as an arterial. The City of Gaithersburg has planned an extension of Watkins Mill Road south of Route 355 to Clopper Road, with a new interchange at I-270. The extension of Watkins Mill Road and the new I-270 interchange are funded for planning and engineering in the State's 2004 Comprehensive Transportation Program. This Plan supports the City's efforts to complete this connection.

Watkins Mill Road from Windbrooke Drive to Great Seneca Creek is in Montgomery Village and is not within the Plan's boundaries. There are four public schools along this section of Watkins Mill Road and the community has raised concerns about traffic safety. The 2004 CIP included a traffic calming project to analyze options to reduce travel speed and improve safety on this road. This project is required by the County Council before construction of a new interchange at I-270 and Watkins Mill Road extended.

- Classify Watkins Mill Road (A-17) from Great Seneca Creek to 400 feet north of Windbrooke Drive as an arterial with an 80-foot right-of-way and four lanes.
- List the right-of-way requirements for Watkins Mill Road from Clopper Road to 400 feet north of Windbrooke Drive as "not applicable," since this section is in the City of Gaithersburg.
- Support further study to address traffic safety and the potential for traffic calming measures along Watkins Mill Road in Montgomery Village.
- Support the extension of Watkins Mill Road from Route 355 to Clopper Road in the City of Gaithersburg.

The Plan recommendations also include:

- removing the proposed grade-separated interchange between Darnestown Road and Shady Grove Road, since the intersection is forecast to operate near capacity with an at-grade solution. Land use and travel demand distribution will focus east-west travel along Key West Avenue (MD 28), requiring a higher infrastructure investment at plan build-out, including a grade-separated interchange at Key West Avenue junction with Shady Grove Road
- retaining Darnestown Road as a four-lane arterial, recognizing adjacent community interest in a downclassification of the roadway but also the need for four lanes of capacity and an arterial function
- retaining Game Preserve Road as an unclassified master plan roadway, recognizing adjacent community and Rustic Road Advisory Committee interest in a rustic road classification. Analysis performed during plan development indicates that the roadway currently has safety concerns that do not support rustic road classification. The interest in reclassification is prompted in part by concerns regarding through traffic that will be reduced by the completion of the parallel arterial Watkins Mill Road between MD 355 and MD 117
- reducing the number of through travel lanes on Oakmont Avenue from four lanes to two lanes, but retaining a reconstructed Deer Park Bridge over the CSX tracks, recognizing the need to retain a grade-separated arterial roadway function for the adjacent commercial area and neighboring communities.

#### **Master Planned Business Streets**

The business street system is intended to be a slow-speed environment, with both the public and private realms designed to emphasize a 30 mile per hour target speed.



# **Secondary Grid of Local Streets**

Figure 17 describes a secondary street system that will be developed to nest within the Major Highway and Arterial street system. These streets are designed to facilitate site access (particularly for the larger development sites) and enhance pedestrian and bicycle mobility by improving the network's permeability.

In addition to pedestrian connectivity, the tighter street grid can extend operational flexibility options such as left turn restrictions at major congested intersections and access management along major roads. These business streets are predominantly two lanes, with parking on one (60-foot wide right-of-way) or both sides (70- or 100-foot wide right-of-way). They should include curb extensions at crosswalks to further reduce pedestrian exposure to vehicle traffic.

The locations of roads where development is in place provide an opportunity to thread between existing buildings and environmental constraints while still providing a grid network for pedestrians and vehicles. Details on final alignments will be subject to further engineering evaluation at the time of new development or redevelopment.

Notable new roads include:

- B-1, Blackwell Road should be extended on to the PSTA site to Medical Center Drive Extended (A-261d), or if possible, to Darnestown Road to provide a business district road parallel to Key West Avenue specific to the LSC.
- B-2, a new road connection of the Decoverly development access road to Research Boulevard.
- B-3 and B-4, new roads connecting the LSC Belward District to the highway network. Connection to the existing signalized intersection with Darnestown Road helps preserve mobility for pedestrians as well as vehicles.
- B-8, a new road connecting the LSC Central District to Key West Avenue. The section south of Blackwell is shown as split into two one-way pairs with a green, walkable space between to take advantage of the space between existing hospital buildings.
- B-16, a new road connection from Medical Center Drive to Travilah Gateway Drive. This connection, also
  constructed as a local business district street, would provide a direct pedestrian connection across Darnestown
  Road between the LSC Central District CCT stop, the Universities at Shady Grove (USG) site and the Traville
  development. It may also be necessary to realign the current USG entrance of Travilah Gateway Drive to better
  match a new road opposite Darnestown Road.
- B-18, would be a new road extending Great Seneca Highway south of Darnestown Road to connect to Travilah Gateway Drive. The connection, constructed as a local business district street, would also provide a direct pedestrian connection across Darnestown Road into LSC South along the most direct path for persons walking from a future CCT stop on the PSTA site. This connection would provide an additional access point at an already signalized location.

# **D. Bicycle and Pedestrian System**

The Plan's bicycle and pedestrian system will be implemented through a combination of land use and zoning policies, local street network implementation, and pedestrian access and safety improvements.

#### **Bikeway Network**

The Plan proposes a bikeway system with three key elements.

- An off-road, shared-use path system connecting Gaithersburg West to other areas of the County via bikeways adopted in the *Countywide Bikeways Functional Master Plan* (2005).
- Shared-use paths along major highways and arterial roadways, separating cyclists from higher speed vehicles.
- An emphasis on slower, signed-shared bikeways on new roadways within the LSC. These roads would use a 30 mile per hour target speed to facilitate shared space, rather than separated modal facilities and the Road Code emphasis on bike accommodation on all streets.

Off-road shared use paths and on-road bicycle accommodations serve different users; a majority of the avid cycling community is interested in quality on-road bike accommodation. However, the Plan's higher speed highways and arterials encourage separating cyclists from vehicles. The Plan's large number of off-road paths complement the adopted paths in the *Countywide Bikeways Functional Master Plan*.

In September 2007, the Planning Board supported the Road Code requirement that generally marked bike lanes should be provided as a matter of course on roads with daily traffic volumes of more than 20,000 vehicles per day or a posted speed of 45 miles per hour or greater.

# **County Wide Bikeways**

The *Countywide Bikeways Functional Master Plan* was updated and adopted in 2005. County wide bikeway classifications follow.

• Shared use paths (formerly Class I)

An off-road asphalt or concrete path (optimally 8'-12' wide) that is separated from motorized traffic by either a minimum five-foot landscape panel or by a physical barrier such as a wall or fence. The path may be adjacent and parallel to a road or may be completely separate from a road in its own right-of-way. The path is designed and intended to be shared by multiple users—bicyclists, walkers, joggers, skaters, etc. Shared use paths are generally more appropriate in areas where there are fewer conflicts with driveways and intersecting streets and where separation from motor vehicles is highly desirable.

• Bike lanes (formerly Class II)

A portion of a roadway that has been designated by striping, signing, and pavement markings for the preferential or exclusive use of bicyclists. The bike lane is four to six feet wide and is available in both directions adjacent to the curb, with the cyclist traveling in the same direction as the motor vehicles. Bike lanes are more appropriate along major travel corridors with higher speeds and volumes and where a defined space for bicyclists is desired.

• Signed shared roadway (formerly Class III)

A roadway that has been designated as a preferred route for bicycle use, but there is no separation or striping that delineates the bike travel area from travel area for motor vehicles. Shared roadways feature a wide curb lane (closed section roads), paved shoulders (open section roads), or low traffic volumes and speeds (neighborhood streets). Shared roadways are appropriate where vehicle speeds and volumes are lower, where inadequate right-of-way makes bike lanes or a shared use path infeasible or in rural areas where there may be room to bike on the shoulder of the road.

In certain situations, a roadway may be recommended for dual bikeways—two types of bike facilities. Some roadways can accommodate both on-road and off-road bicycle facilities, in which case the route may be recommended for both a shared use path and a bike lane or a shared use path and shared roadway. This is called a dual bikeway. The State Highway Administration is now providing wider (up to 16-feet) outside travel lanes on all reconstructed roads to accommodate bikes. When these areas are less than three feet, and do not qualify as bike lanes, they are considered to be bicycle areas.

County wide bikeways provide direct or indirect connections to municipalities, as well as existing and proposed transit stations, activity centers, employment centers, and residential neighborhoods. They also provide connections between major activity centers and regional recreational park destinations and connect communities located outside the County's growth areas to the County wide bikeway network. The 2005 Countywide Bikeways Functional Master Plan attempts to strike a balance between recommended improvements for both off-road (shared use paths) and on-road bikeways (bike lanes, shared roadways). It identifies a network of bikeways that will support those who wish to travel by bicycle and accommodate varying skill levels and abilities.

The County wide bikeway network is integrated with other facilities, including local bikeways, sidewalks, and park trails. In most residential neighborhoods, it is not possible or feasible to provide both a sidewalk and a bike path. Therefore, the neighborhood sidewalk often accommodates both pedestrians and bicyclists. By law, bicyclists are permitted on sidewalks in Montgomery County.

# Pedestrian and Cyclist Access and Safety

Pedestrian and bicyclist access and safety will be pursued through several initiatives, including:

- design standards to implement the County's Road Code
- design guidelines for private sector development in the Plan area
- zoning requirements for bicycle parking and other amenities
- engineering, education, and enforcement programs under the County Executive's Pedestrian Safety Initiative.

In 2007, the County Council adopted several amendments to Chapter 49 of the County Code concerning streets and roads to improve pedestrian and bicycle accommodation, stormwater management, and context-sensitive design. In December 2008, the Council approved Executive Regulation 31-08 AM, Context Sensitive Road Design Standards, which specify certain design standards and processes for implementing the revised road construction code, most notably the typical cross-section standards for many types of roads and streets, the required stormwater management criteria for capturing runoff within the right-of-way, and considerations for establishing target speeds and street tree placement. Continued effort is needed to complete the range of street design standards and intersection design standards that will be needed to promote pedestrian and bicyclist access and safety in new or reconstructed roadway design.

The Planning Board will adopt urban design guidelines for the LSC that will provide guidance for the pedestrian realm to improve access, comfort, and safety, including:

- building orientation to maximize pedestrian accessibility
- street tree planting
- design treatments for sidewalks and driveways
- street lighting
- signing and marking.

The Plan proposes the LSC Zone for much of the LSC area. This zone is designed to facilitate pedestrian access and safety through several means:

- pedestrian-oriented activity at street level with uses such as storefront retail and restaurants
- safety-oriented environmental design including clearly marked sidewalks and crosswalks
- street trees providing canopy and landscaping on all streets, including street furniture such as benches, trash receptacles, and planters

• continuous, direct, and convenient connections to transit stations for pedestrians and bicyclists.

As both public and private sector projects are implemented, all agencies need to elevate pedestrian and bicycle access and safety considerations in their review of design and operational elements, including:

- maximum 30-foot curb radii
- signal timing, including pedestrian countdown signals that provide the ability to complete roadway crossing at a speed of 2.5 feet per second or slower, and at least five seconds of startup time (and greater time where pedestrian volumes result in platooning)
- maximum crosswalk lengths of 60 feet between pedestrian refuges
- accessible bus stop locations at or near marked crosswalks
- signing and marking per the *Manual on Uniform Traffic Control Devices*, including marked crosswalks on all approaches to signalized intersections and elimination of lane markings across intersections
- street lighting designed to improve the visibility of pedestrians at levels specified by the Illuminating Engineering Society of North America
- designing mixed-use streets, pedestrian walkways, and alleys using Crime Prevention Through Environmental Design criteria.

# 3. Transportation and Land Use Balance

The *Gaithersburg West Master Plan* transportation analyses reflect the procedural guidance established by the County Council's Growth Policy, applied through the LATR and PAMR processes described below, followed by a description of regional transportation and land use assumptions and a brief summary of the alternative local land use scenarios analyzed.

This Plan establishes a new LSC Policy Area for the LSC Central, LSC West and LSC Belward transit station areas, with policy attributes the same as for the Germantown Town Center Policy Area. The current LATR standard for local intersection congestion in the LSC is 1475 CLV. The Plan would increase this standard to 1600 CLV.

Figure 20 shows the Plan's proposed level and mix of development in the LSC Policy Area.

Area	Acres	Existing		Future	
		Jobs	НН	Jobs	НН
LSC Central, West, Belward	567	9,200	0	44,600	4,525

#### Figure 19: LSC Policy Area Land Use

#### A. Measures of Effectiveness

Alternative development scenarios with varying amounts of commercial and residential development were analyzed for three levels of transportation impacts.

- An area wide mobility analysis indicates the degree to which the alternative local land use and transportation scenarios provide an appropriate balance between land use and transportation per current County policies.
- An intersection congestion analysis indicates the degree to which alternative land use or transportation changes affect congestion hot-spots within the LSC area.
- A cordon line analysis demonstrates the effects of vehicles generated by local land use scenarios as compared to through travel.

The first two measures are elements of the County's Growth Policy, called Policy Area Mobility Review (PAMR) and Local Area Transportation Review (LATR). Both PAMR and LATR are summarized below and detailed background information is available on the Department's website, <u>www.montgomeryplanning.org</u>.

# B. Policy Area Mobility Review (PAMR)

PAMR measures transportation system adequacy considering Relative Transit Mobility and Relative Arterial Mobility for each of the County's 21 policy areas. PAMR is used in the implementation of the Adequate Public Facilities Ordinance (APFO) to forecast conditions considering the County's pipeline of approved development and near-term transportation system improvements for which funding is committed during the next four years.

Since the early 1980s, every master plan has considered the balance between land use and transportation using an assessment of area wide conditions forecast for end-state conditions for the plan. PAMR is the current measure of area wide transportation adequacy, introduced into the County Growth Policy in 2007. It is similar to the Policy Area Transportation Review measure that was an element of the Growth Policy from 1982 to 2003.

PAMR continues a long-standing County policy that higher levels of roadway congestion are appropriate in areas with higher quality transit service. This policy provides multimodal equity across the County and facilitates the development of pedestrian-oriented, rather than auto-oriented, improvements in Metro Station Policy Areas. Through PAMR, the County Council has established transit and arterial level of service (LOS) standards for each policy area by considering area wide adequacy on two scales: relative transit mobility and relative arterial mobility.

Relative transit mobility, defined as the relative speed by which journey to work trips can be made by transit as opposed to by auto, is based on the Transit/Auto Travel Time level of service concept in the 2003 Transit Capacity and Quality of Service Manual published by the Transportation Research Board. It is defined as the relative speed by which journey to work trips can be made by transit, as opposed to by auto. This concept assigns letter grades to various levels of transit service, so that LOS A conditions exist for transit when a trip can be made more quickly by transit (including walk-access/drive-access and wait times) than by single-occupant auto. This LOS A condition exists in the Washington region for certain rail transit trips with short walk times at both ends of the trip and some bus trips in HOV corridors. LOS F conditions exist when a transit trip takes more than an hour longer than single-occupant auto trip.

Relative arterial mobility is a measure of congestion on the County's arterial roadway network, defined as the relative speed by which auto trips move during peak congestion periods as compared to the free-flow speed. It is based on the urban street delay level of service in the 2000 Highway Capacity Manual, published by the Transportation Research Board. This concept measures congestion by comparing modeled (congested) speeds to free-flow speeds on arterial roadways. It then assigns letter grades to the various levels of roadway congestion, from A to F. For a trip along an urban street that has a free-flow speed (generally akin to posted speed) of 40 miles per hour, LOS A conditions exist when the actual travel speed is at least 34 miles per hour, including delays experienced at traffic signals. At the other end of the spectrum, LOS F conditions exist when the actual travel speed is below 10 miles per hour.

In addition to its APFO utility, PAMR is also used in the development of master plans to determine whether or not a plan's end-state land use and transportation recommendations are in balance. Master plan study areas typically address roadway capacity needs by intersection improvements rather than roadway widening. Therefore, the AGP process has evaluated master plan study areas in conjunction with the master plan and policy area surrounding these areas.

The LSC Policy Area is located within and comprises a major portion of the R&D Village Policy Area. Figure 21 shows the forecast PAMR conditions for all policy areas in the County for 2030 assuming the Gaithersburg West Master Plan "high" scenario with a 32.5 percent NADMS. Figure 22 summarizes the supporting travel data, including vehicle miles of travel (VMT) and vehicle hours of travel (VHT) for both free-flow and congested conditions. Given the high scenario's assumptions, the R&D Village Policy Area is forecast to operate at:

- Relative Transit Mobility of 63 percent (LOS D between 60 and 75 percent)
- Relative Arterial Mobility of 40 percent (LOS D between 40 and 55 percent).

The current Growth Policy requires that all Policy Areas have a Relative Arterial Mobility of at least 40 percent, or LOS D conditions, regardless of the level of transit service provided. The PAMR results derived from the analysis of the scenario described above just meets this threshold.

The PAMR analysis performed thus far has evaluated a range of scenarios. The demographics and development intensity of the high scenario reflect the upper bound of the scenarios tested and result in the highest travel demand. The Plan recommends a less intense development level than the high scenario. Therefore, staff is confident that the Plan-recommended scenario will balance land use and transportation.



#### Figure 20: Policy Area Mobility Review Chart-2030

#### Figure 21: Policy Area Mobility Review Table-2030

#### Derivation of Year 2030 PAMR Results by Policy Area - Gaithersburg West Master Plan "High" LU Scenario w/TDM Mode Shares)

Relative Transit Mobility

Policy Area	VMT	VHT	VHT	Free-Flow	Congested	Relative Arterial	Average Arterial	Average Transit	Relative Transit
		(free-flow)	(congested)	Speeds	Speeds	Mobility	Travel Time	Travel Time	Mobility
Aspen Hill	189,868	5,783	12,626	32.8	15.0	46%	40.9	51.8	79%
Bethesda/Chevy Chase	396,854	15,574	38,863	25.5	10.2	40%	31.1	37.2	84%
Clarksburg	108,964	3,628	6,267	30.0	17.4	58%	38.1	59.9	64%
Cloverly	95,462	2,356	3,570	40.5	26.7	66%	44.0	58.8	75%
Damascus	90,837	2,255	4,009	40.3	22.7	56%	48.4	82.1	59%
Derwood/Shady Grove	140,087	4,982	11,055	28.1	12.7	45%	37.5	43.3	87%
Fairland/White Oak	384,192	10,126	28,073	37.9	13.7	36%	40.0	57.8	69%
Gaithersburg City	243,110	8,667	20,190	28.1	12.0	43%	34.5	45.4	76%
Germantown East	105,604	3,565	5,632	29.6	18.8	63%	36.5	54.8	67%
Germantown West	154,896	5,060	7,123	30.6	21.7	71%	36.5	50.2	73%
Kensington/Wheaton	465,588	14,581	33,389	31.9	13.9	44%	37.0	43.3	85%
Montgomery Village/Airpark	142,629	4,726	6,942	30.2	20.5	68%	41.3	56.3	73%
North Bethesda	237,712	9,980	25,052	23.8	9.5	40%	30.3	37.5	81%
North Potomac	66,824	2,391	4,119	27.9	16.2	58%	39.2	51.6	76%
Olney	168,213	4,749	9,777	35.4	17.2	49%	47.1	59.9	79%
Potomac	203,448	6,118	15,804	33.3	12.9	39%	38.1	54.7	70%
R & D Village	80,760	3,583	8,994	22.5	9.0	40%	26.6	42.0	63%
Rockville City	277,965	12,036	30,617	23.1	9.1	39%	31.5	41.5	76%
Silver Spring/Takoma Park	273,044	10,429	24,351	26.2	11.2	43%	33.4	39.6	84%
Rural East	608,504	15,513	33,414	39.2	18.2	46%	47.1	60.8	77%
Rural West	241,519	6,573	9,621	36.7	25.1	68%	46.5	63.4	73%
Montgomery County Total	4,676,080	152,675	339,488	30.6	13.8	45%	37.5	46.0	82%

Relative Arterial Mobility measures total PM Peak Period vehicular travel on arterial roadways within each policy area

Relative Transit Mobility measures AM Peak Period travel times for journey-to-work trips originating within each policy area VMT = Vehicle Miles of Travel

VHT = Vehicle Hours of Travel

The areas highlighted in blue in Figures 21 and 22 are those most likely to be affected by redevelopment in the Plan area. The assessment of the policy area conditions reflect the upper bound of the demographic scenarios tested for the LSC in combination with Round 7.1 demographic forecasts for all other areas in the Washington metropolitan region. Therefore, while the exhibits are appropriately labeled with a horizon year of 2030, staff does not expect that the full master plan yield for any of the Policy Areas will be achieved by the year 2030. Figure 23 provides a summary of year 2005 PAMR conditions by policy area for comparison purposes.

#### Figure 22: Policy Area Transportation Review Table - 2005

#### Derivation of Year 2005 PAMR Results by Policy Area

	Relative Arterial Mobility					Relative Transit Mobility				
Policy Area	VMT	VHT (free-flow)	VHT (congested)	Free-Flow Speeds	Congested	Relative Arterial Mobility	Average Arterial Travel Time	Average Transit Travel Time	Relative Transit Mobility	
Aspen Hill	166.975	4,992	11.141	33.4	15.0	45%	36.4	54.5	67%	
Bethesda/Chevy Chase	370,936	14.148	31,264	26.2	11.9	45%	25.8	36.9	70%	
Clarksburg	48,985	1.341	2.038	36.5	24.0	66%	38.6	69.9	55%	
Cloverly	80.280	1.954	3.398	41.1	23.6	58%	39.8	59.6	67%	
Damascus	57.419	1.350	1,749	42.5	32.8	77%	43.5	95.7	45%	
Derwood/Shady Grove	128,774	4.337	8.851	29.7	14.5	49%	34.4	50.8	68%	
Fairland/White Oak	332,420	9,478	18,794	35.1	17.7	50%	35.4	60.9	58%	
Gaithersburg City	187,111	6,483	12,132	28.9	15.4	53%	31.5	56.4	56%	
Germantown East	83,578	2,421	4,388	34.5	19.0	55%	35.4	65.6	54%	
Germantown West	111,574	3,299	4,525	33.8	24.7	73%	35.7	61.5	58%	
Kensington/Wheaton	410,368	12,896	26,052	31.8	15.8	50%	31.7	45.3	70%	
Montgomery Village/Airpark	92,853	3,086	5,928	30.1	15.7	52%	38.3	64.9	59%	
North Bethesda	194,168	7,893	17,069	24.6	11.4	46%	27.0	39.1	69%	
North Potomac	53,299	1,811	2,989	29.4	17.8	61%	36.7	60.6	61%	
Olney	136,864	3,972	7,727	34.5	17.7	51%	43.9	72.2	61%	
Potomac	180,868	5,290	11,631	34.2	15.6	45%	33.7	54.5	62%	
R & D Village	47,322	1,980	2,853	23.9	16.6	69%	30.7	52.2	59%	
Rockville City	255,979	10,016	20,932	25.6	12.2	48%	29.1	47.3	62%	
Silver Spring/Takoma Park	230,410	8,782	17,926	26.2	12.9	49%	27.7	40.2	69%	
Rural East	449,002	11,427	20,928	39.3	21.5	55%	42.9	70.2	61%	
Rural West	171,011	4,596	6,411	37.2	26.7	72%	42.7	75.6	56%	
Montgomery County Total	3,790,196	121,552	238,726	31.2	15.9	51%	34.2	50.7	67%	

Relative Arterial Mobility measures total PM Peak Period vehicular travel on arterial roadways within each policy area

Relative Transit Mobility measures AM Peak Period travel times for journey-to-work trips originating within each policy area

VMT = Vehicle Miles of Travel VHT = Vehicle Hours of Travel

# C. Local Area Transportation Review (LATR)

The *Gaithersburg West Master Plan* supports redevelopment toward a transit-oriented community with an emphasis on pedestrian accessibility, connectivity, and safety.

The intersection analysis applies the Critical Lane Volume (CLV) methodology from the Department's LATR guidelines. The CLV values are converted to a volume-to-capacity, or v/c ratio, by dividing the current or forecasted CLV values by the applicable congestion standard.

As shown in Figure 24, the County's Growth Policy establishes acceptable levels of congestion for different policy areas based whether alternative modes of transportation are available. In rural policy areas, where few auto alternatives exist, the congestion standard is 1350 CLV (which equates to the middle range of LOS D). In Metro Station Policy Areas, where multiple alternatives to auto transport are provided, the congestion standard is 1800.

The Public Hearing Draft Plan recommends creating a Town Center policy area to encompass the entire LSC district, so that intersections within the district and served by the CCT would have a congestion standard of 1600 CLV. Currently, intersections in the LSC area have a congestion standard of 1450 CLV. Intersections along Shady Grove Road in the Plan area have a congestion standard of 1500 CLV where the Rockville Policy Area overlaps.

Figure 23: Intersection Congestion Standards by Policy Area



Figure 24 summarizes the congested intersections for existing conditions and the high land use scenario. However, the draft Plan recommends one million square feet less commercial use than tested in the high land use scenario. As indicated in Figure 24:

- Currently, all but three of the tested signalized intersections pass the congestion test. Shady Grove Road at Key West Avenue (MD 28), Great Seneca Highway at Muddy Branch Road, and Darnestown Road (MD 28) at Muddy Branch Road exceed either the 1450 or 1600 CLV congestion standards at full buildout of the high scenario.
- Nine intersections tested under the high land use scenario would exceed the 1600 CLV standard. At four of these locations, forecast CLVs over 2000 (a v/c ratio of 1.25) warrant planning for grade-separated interchanges. The draft Plan also retains the recommendation for an eastbound left flyover ramp from Great Seneca Highway to Sam Eig Highway to keep the intersection within the congestion standard.
- Five of the at-grade intersections tested under the high land use scenario are forecast to exceed the 1600 CLV congestion standard at Plan buildout during either the morning or evening peak hour: Shady Grove Road at Corporate Boulevard, Key West Avenue and Broschart Road, Darnestown Road and Muddy Branch, Key West Avenue and Omega Drive/Medical Center Drive, and Key West Avenue and Darnestown Road. At these locations, the forecast CLVs range from 1668 to 1721, indicative of delays associated with Metro Station Policy Area development. Grade-separated interchanges are not warranted at this level of forecast congestion, but at-grade improvements will be required as development occurs.

• Analysis of the draft Plan's recommended land use on intersection congestion remains in progress. To date, the draft Plan's recommended land use generates about 10 percent fewer vehicle trips than the high land use scenario represented in Figure 25. Considering the effect of through traffic, staff expects the CLVs for the Plan recommendations to generally be about five percent lower than those shown in Figure 25.

#### Figure 24: Intersection Analysis

# Gaithersburg West Master Plan

Intersection Analyses Critical Lane Volume and Volume/Capacity Ratios "High" Land Use Scenario

		Existing Co	nditions		High Land	d Use Sce	nario Tes	ted
Interse	ction	AM	PM	Max V/C	AM	PM	Max	⟨V/C
84	Shady Grove @ Corporate	1096	1467	0.92	138	8 1	668	1.04
85	Shady Grove @ Research	1074	1089	0.68	141	.8 1	.515	0.95
86	Shady Grove@ Key West	1391	1640	1.03	Replaced	by Interc	hange	
87	Shady Grove@ Medical Center Way	744	868	0.54	102	3 1	.086	0.68
88	Shady Grove@ Darnestown	1098	794	0.69	138	2 1	592	1.00
134	Darnestown @ Travilah	907	974	0.61	107	6 1	460	0.91
368	Great Seneca @ Darnestown	1028	1009	0.64	154	8 1	447	0.97
369	Great Seneca (MD 119) @ Key West (MD 28)	1227	1114	0.77	156	8 1	449	0.98
370	Great Seneca @ Muddy Branch	1654	2179	1.36	Replaced	by Interc	hange	
415	Key West (MD28) @ Broschart/Diamondback	1563	1195	0.98	130	6 1	.694	1.06
446	Darnestown @ Muddy Branch	1697	1250	1.06	172	1 1	431	1.08
466	Key West (MD28) @ Omega/Med Center	1313	1359	0.85	159	1 1	.679	1.05
479	Key West (MD28) @ Darnestown	1085	1058	0.68	152	1 1	718	1.07
518	West Montgomery (MD 28) @ Hurley	830	998	0.62	83	0	998	0.62
519	West Montgomery (MD 28) @ Research	941	1307	0.82	132	6 1	.514	0.95
567	Fields @ Washingtonian	455	747	0.47	48	2 1	168	0.73
568	Fields @ Rio	440	1029	0.64	81	.0 1	476	0.92
569	Sam Eig @ Fields	1456	1297	0.91	Replaced	by Interc	change	
570	Sam Eig @ Diamondback	933	1217	0.76	Replaced	by Interc	change	
572	Great Seneca (MD 119) @ Sam Eig	1240	1348	0.84	122	8 1	189	0.77 *
700	West Montgomery (MD 28) @ Key West (MD 28)	942	1304	0.82	119	6 1	596	1.00
798	Darnestowne @ Gudelsky				112	0	931	0.70
901	Great Seneca (MD 119) @ Decoverly				116	8 1	.518	0.95
902	Key West (MD 28) @ JHU				127	4 1	.489	0.93
903	Great Seneca (MD 119) @ Med Center				120	1 1	.451	0.91
904	Shady Grove @ Blackwell				126	2 1	.537	0.96
905	PSTA road @ Key West Avenue				151	.0 1	.489	0.94
906	Diamondback @ Decoverly				114	5 1	.361	0.85
907	Muddy Branch @ JHU New				99	7 1	.501	0.94
908	Great Seneca (MD 119) @ Blackwell				129	6 1	.548	0.97
909	Research Blvd @ W Gude				158	2 1	.550	0.99

\* Reflects planned flyover ramp for east bound left turns

#### **D. Cordon Line Analysis**

A cordon line analysis is a general tool to quickly compare total traffic volumes entering or leaving the *Gaithersburg West Master Plan* area. In developing the master plan, a subregional cordon line was established, as indicated in Figure 18, to consider flows into and out of the area surrounding but including the LSC. This cordon line reflects the boundary between analysis that applied the TRAVEL/3 system level model and analysis that applied the Local Area Model. The cordon line is used two ways. First, to assess forecast traffic volumes based on trip generation and second, to establish a constant level of through traffic for quick-response sensitivity tests to land use alternatives with a conceptual cordon line volume. These conceptual cordon line volumes are reflected in the bar chart comparisons of land use volumes and may differ slightly from the volumes shown on traffic assignments.

# **Vehicular Traffic Volumes**

Figure 26 compares existing and forecast traffic volumes at the studied cordon line. In general, the cordon line serves as the boundary between the LSC area, where land uses are proposed to change as a result of this plan, and the area outside of the cordon, which is subject to other plans or is otherwise not forecast to change development densities. As a result, traffic volumes at these locations are substantially higher than in the interior of the master plan area.

At the cordon line, the total traffic volume will increase by about 43 percent, from 392,000 vehicles per day to 561,000 vehicles per day. The heaviest volumes will occur on the major highways where they meet I-270, Sam Eig Highway and Shady Grove, with between 79,900 and 88,000 vehicles per day.

Traffic volumes and volume growth will be slightly lower within the LSC area due to the expanded roadway network. In general, traffic volumes along Key West Avenue today in the Plan area are 52,000 vehicles per day and are forecast to grow to between 56,000 and 65,000 vehicles per day.

# Figure 25: Sector Plan Cordon Line Traffic Volumes

#### Gaithersburg West Plan Study Area Cordon Line

#### 2007 Conditions - Observed Peak Hour Totals

			AM Peak Hour			r PN		/IPeak Hour	
	Location	ADT	Inbound	Outbound	Total	Inbound	Outbound	Total	
10	DIAMONDBACK DR	15100	1000	330	1330	440	800	1240	
12	TRAVILAH RD	10700	460	350	810	440	570	1010	
13	MUDDY BRANCH/ Darnestown	18200	1230	270	1490	660	940	1600	
15	DARNESTOWN RD (MD 28)	35900	2590	580	3170	940	1980	2930	
16	GLEN MILL RD	17000	370	1120	1500	840	560	1400	
17	MUDDY BRANCH/ Great Seneca	20600	850	670	1520	950	1030	1980	
18	WEST MONTGOMERY AVE (MD 28)	52000	2110	2090	4200	2460	2190	4650	
20	Shady Grove Road/270 + slip ramp	58700	3470	1520	4990	2010	2990	5000	
21	Sam Eig Highway	66600	2160	2890	5040	2840	3440	6280	
23	W Gude Drive	32500	1440	1220	2660	1190	1670	2860	
24	Shady Grove Road/Traville	11900	610	450	1060	540	430	970	
25	GREAT SENECA HWY (MD 119)	53100	3160	1070	4220	1650	3160	4810	
	TOTAL	392300	19440	12550	31990	14960	19750	34720	

#### Modeled Draft Plan (High Scenario) Conditions

			AM Peak Hour			ur PM		Peak Hour	
	Location	ADT	Inbound	Outbound	Total	Inbound	Outbound	Total	
10	DIAMONDBACK DR	18400	1210	380	1590	560	980	1540	
12	2 TRAVILAH RD	16300	770	510	1280	640	860	1500	
13	MUDDY BRANCH/ Darnestown	26300	1580	550	2130	1040	1310	2350	
15	DARNESTOWN RD (MD 28)	46900	2910	970	3880	1580	2510	4090	
16	GLEN MILL RD	25000	690	1320	2000	1300	940	2240	
17	MUDDY BRANCH/ Great Seneca	35200	1570	1080	2650	1690	1650	3340	
18	WEST MONTGOMERY AVE (MD 28)	76800	3240	2870	6110	3140	3820	6950	
20	) Shady Grove Road/270 + slip ramp	79900	4230	2630	6870	2660	4050	6710	
21	Sam Eig Highway	88000	3570	2890	6460	4190	4310	8500	
23	W Gude Drive	49300	2280	1680	3960	1980	2450	4430	
24	Shady Grove Road/Traville	31000	1210	1160	2370	1460	1450	2910	
25	GREAT SENECA HWY (MD 119)	68000	3620	1780	5400	2380	3790	6170	
	TOTAL	561100	26860	17830	44690	22610	28110	50720	

The Plan's recommendations for transportation infrastructure and staging are based on a high land use scenario, even though the Plan's selected recommendations are at a slightly lower density. Figure 27 compares the scenario and the Plan's recommended trip generation characteristics.

- existing land uses within the cordon generate about 31,700 vehicle trips in the morning peak hour and 34,900 trips in the evening peak hour.
- The high scenario generates 44,700 vehicle trips in the morning peak hour and 50,800 trips in the evening peak hour.



Figure 26: Draft Plan Trip Generation Comparison

• Comparatively, the Plan recommendations generate 40,600 vehicle trips in the morning peak hour and 41,700 in the evening peak hour, a difference of about 10 percent between the two land use scenarios.

The Plan also recommends a slightly lower non-auto driver mode split (NADMS) of 30 percent, compared to the high scenario NADMS of 32.5 percent, resulting in slightly higher per-square foot trip rates per square foot of use modeled.

# E. Travel Demand Forecasting Process and Assumptions

The travel demand forecasting process includes three levels of analysis: TRAVEL/3, TRAVEL/3 post processing, and CLV intersection analysis.

The Department's regional travel demand forecasting model, TRAVEL/3, is used to develop forecast travel demand results for weekday travel and PM peak periods. TRAVEL/3 is a four-step model, consisting of:

- trip generation: person trips generated by land use type and density within each TAZ
- trip distribution: person trips generated in each TAZ that travel to each of the other TAZs within the metropolitan area
- mode split: travel mode of the person trips, including single-occupant auto, multiple-occupant auto, transit, or a non-motorized mode such as walking or bicycling
- traffic assignment: roadways used for vehicular travel between TAZs.

The TRAVEL/3 model incorporates land use and transportation assumptions for the Metropolitan Washington region, using the same algorithms applied by the Metropolitan Washington Council of Governments (MWCOG) for air quality conformity analysis. Figure 28 shows the relationship of Montgomery County to the regional travel demand network, featuring the coding of street network characteristics to reflect the general level of adjacent development density.



Figure 27: Travel/3 Model Network Typology



The TRAVEL/3 provides system-level results that are used directly to obtain the Policy Area Mobility Review forecasts for the County's Policy Area Transportation Review. The system-level results are also used as inputs to the finer grain analytic tools described below.

The second level of analysis consists of post processing techniques applied to the TRAVEL/3 forecasts, as described in NCHRP Report 255. These techniques include refinement of the AM and PM peak hour forecasts to reflect a finer grain of land use and network assumptions than included in the regional model, such as the location of local streets and localized travel demand management assumptions. The NCHRP 255 analyses are used to produce the cordon line analyses.

The third level of analysis includes intersection congestion, using the Critical Lane Volume (CLV) methodology described in the Department's Policy Area Mobility Review/Local Area Transportation Review Guidelines.

# **Travel/3 Forecasting Assumptions**

The Gaithersburg West Master Plan forecasts assumed the following parameters:

- A 2030 horizon year, the most distant horizon year for which forecast land use and transportation system development is available.
- Regional growth per the MWCOG Cooperative Forecasting Process. The most current round of Cooperative Forecasts was used.
- For the Washington region, the Round 7.1 forecasts include an increase from 3.0 million jobs and 1.9 million households in 2005 to 4.2 million jobs and 2.5 million households in 2030.
- For Montgomery County, the Round 7.1 forecasts include an increase from 500,000 employees and 347,000 households in 2005 to 670,000 employees and 441,300 households in 2030.
- For the LSC area, the Round 7.1 forecasts include an increase from 6.9M square feet of development and 3,300 households in 2005 to 12.9M square feet of development and 8,000 households in 2030.
- Transportation improvements in the region's Constrained Long Range Plan (CLRP), a fiscally constrained transportation network. Notable projects assumed to be in place for the buildout of the LSC area include:
- elimination of the WMATA turnback at Grosvenor
- the Corridor Cities Transitway (realigned through the LSC) from Shady Grove to Clarksburg
- the Purple Line between Bethesda and Silver Spring
- the Montrose Parkway, including an interchange at Rockville Pike
- the Intercounty Connector
- express toll lanes on I-270 from I-370 to the city of Frederick.

#### F. Local Area Modeling Process and Assumptions

The Department's Local Area Modeling (LAM) process uses NCHRP Report 255 techniques to convert the TRAVEL/3 system level forecasts to intersection-level forecasts. The LAM process is then used as a pivot-point technique to reflect changes to the localized land use or transportation network, providing both cordon line and network analysis results.

The TRAVEL/3 model represents the R&D Village Policy Area as six TAZs. The LSC LAM disaggregates these six TAZs into twenty three (23) subzones as indicated in Figure 28.





The LAM process uses trip generation rates that are customized to reflect both existing conditions and future changes, considering both the land use types and changes in travel behavior. Figure 29 shows the trip generation rates used in the LAM.

Land Use	Units	AM	PM
Office (at 30% NADMS)	1000 Square Feet	1.30	1.20
Retail (at 30% NADMS)	1000 Square Feet	1.00	3.00
Industrial (at 30% NADMS)	1000 Square Feet	1.00	1.00
Other Commercial (at 30% NADMS)	1000 Square Feet	1.00	1.00
Multifamily residential (garden apartment)	Dwelling unit	0.48	0.83
Multifamily residential (highrise)	Dwelling unit	0.44	0.48

• •
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These trip generation rates reflect a combination of varied land uses and their Local Area Transportation Review rates for typical development in Metro Station Policy Areas such as White Flint and were calibrated to match the observed traffic counts, considering the amount of through traffic in the roadway network so that the LAM volumes at the network cordon line are within 2 percent of observed count data for both morning and evening peak hours.

The trip generation rates shown in Figure 29 are generally lower than those found in the Institute of Transportation Engineers (ITE) Trip Generation Report, particularly for commercial land uses. These trip generation rates reflect the fact that ITE rates for most commercial locations do not have Gaithersburg West's transit availability and use potential of the CCT. The difference for residential uses is not quite as high because ITE trip generation rates for multifamily housing do reflect the fact that most multifamily housing units have, almost by definition, sufficient density to support transit service. Finally, the retail trip generation rates in the LSC zone also incorporate a discount for pass-by and diverted-link trips.

#### Land Use Alternatives Tested

Figure 30 shows the LSC Policy Area land use alternatives considered for the LAM in the development of the Gaithersburg West Master Plan.

Scenario	commercial square feet	dwelling units
Existing	3.5m	0
1990 Plan – Low Scenario	7.2m	500
Medium Scenario	12.4m	4,800
High Scenario	16.1m	9,700
Recommended Scenario	15.2m	4,525

#### Figure 30: LSC Policy Area Land Use Scenarios Considered in Plan Development (TAZs 218, 219, and 220)

Concerning: Life Sciences Center Zone Draft No. & Date: 7/16/09 Introduced: Public Hearing: Adopted: Effective: Ordinance No:

# COUNTY COUNCIL FOR MONTGOMERY COUNTY, MARYLAND SITTING AS THE DISTRICT COUNCIL FOR THAT PORTION OF THE MARYLAND-WASHINGTON REGIONAL DISTRICT WITHIN MONTGOMERY COUNTY, MARYLAND

By: Councilmember

AN AMENDMENT to the Montgomery County Zoning Ordinance to:

- modify the Life Sciences Center (LSC) Zone to permit mixed-use development under certain circumstances in order to promote the growth and advancement of life sciences and applied technologies; to establish the use of building lot termination development rights in the LSC Zone; and to generally amend the provisions of the LSC Zone.

By amending the definitions of the following terms in the Montgomery County Zoning Ordinance, Chapter 59 of the Montgomery County Code:

DIVISION 59-A-2. DEFINITIONS AND INTERPRETATION. Section 59-A-2.1. Definitions. Research, development and related activities;

By amending the following sections to the Montgomery County Zoning Ordinance, Chapter 59 of the Montgomery County Code:

DIVISION 59-C-5. INDUSTRIAL ZONES. Section 59-C-5.21. Allowable uses. Section 59-C-5.23. Retail sales and personal services. Section 59-C-5.3. Development standards. Section 59-C-5.47. Special regulations LSC zone.

Add New Section 59-C-5.478. Definitions

Cultural, entertainment, and recreation; Communication facilities or structures Food services; Health care services; Personal services; Retail trade; Transportation facilities or structures; and Utilities.

EXPLANATION:	Boldface indicates a heading or a defined term.
	<u>Underlining</u> indicates text that is added to existing laws by
	the original text amendment.
	[Single boldface brackets] indicate text that is deleted from
	existing law by the original text amendment.
	<u>Double underlining</u> indicates text that is added to the text
	amendment by amendment.
	[[Double boldface brackets]] indicate text that is deleted
	from the text amendment by amendment.
	* * * indicates existing law unaffected by the text
	amendment.

# ORDINANCE

The County Council for Montgomery County, Maryland, sitting as the District Council for that portion of the Maryland-Washington Regional District in Montgomery County, Maryland, approves the following ordinance:

1	Sec. 1.	<b>DIVISION 59-A-2.</b>	is amended as follows:

# 2 Sec. 59-A-2.1. Definitions.

- In this Chapter, the following words and phrases have the meanings indicated:
  \*\*\*
- 5 Research, development and related activities: Study, research, and experimentation in 6 one or more scientific fields such as life sciences or biomedical research, 7 communications, chemistry, computer science, electronics, medicine and physics. 8 Research and development also includes the development of prototypes and the 9 marketing of resultant products. Related activities include the manufacturing, mixing, 10 fermentation, treatment, assembly, packaging and servicing of products. Supporting 11 services such as administrative offices, educational facilities, libraries, and data services 12 are other examples of related activities. \* \* \* 13 14 Sec. 2. DIVISION 59-C-5. is amended as follows:
- 15 Sec. 59-C-5.2. Land uses.
- 16 \*\*\*
- 17 **59-C-5.21.** Allowable uses.
- 18 \*\*\*
- 19

	I-1	I-2	I-3	I-4	R&D	LSC <u>*</u>
(a) Residential.						
Dwellings.	SE		SE	SE		
Dwellings, for caretakers or watchkeepers and their families or for bona fide agricultural operations.	Р	Р	Р	Р	Р	
Hotel or motel. <sup>1</sup>	SE		SE			
(b) Manufacturing and industrial.						
	I-1	I-2	I-3	I-4	R&D	LSC <u>*</u>
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I. Uses of a light industrial nature.						
Bakery.	Р	Р		Р		
Blacksmith shops, welding shops, ornamental iron works, and machinery shops, excluding drop hammers and punch presses over 20 tons rated capacity	P	P	P	P	P	
Bottling plants	т Р	I D	1	т Р	1	
Confectionery production	T D	T D		T D		
Contractors storage words	T D	T D		1		
Dry cleaning and laundry plant	I D	I D		D		
Electroplating and manufacturing of small parts such as coils, condensers, transformers, and crystal holders.	P	P	Р	P	Р	
Food production, packaging, packing and canning of.	Р	Р		Р		
Fuel storage yards.	Р	Р				
Ice manufacturing and storage.	Р	Р		Р		
Manufacturing of light sheet metal products.	Р	Р	Р	Р	Р	
Manufacturing, compounding, assembling or treatment of articles from the following previously prepared materials: bone, cellophane, plastic, canvas, cloth, cork, feathers, felt, fiber, fur, hair, horn, leather, textiles, yarns, glass, precious or semi-precious metals or stones, and tobacco.	Р	Р		Р		
Manufacturing, compounding, processing or packaging of cosmetics, drugs, perfumes, pharmaceuticals, toiletries and products resulting from biotechnical and biogenetic research and development.	Р		Р	Р	Р	[P]
Manufacturing, fabrication and/or subassembly of aircraft or satellite parts, components, and equipment.	Р		Р	Р	Р	
Manufacturing of musical instruments, toys, novelties, and rubber and metal stamps.	Р		Р	Р		
Manufacturing of paint not employing a boiling or rendering process.	Р	Р		Р		
Manufacturing of pottery and figurines or other products using previously pulverized clay and kilns fired only by electricity or gas.	Р	Р		Р		
Manufacturing and assembly of electronic components, instruments and devices.	Р		Р	Р	Р	
Manufacturing and assembly of machine parts, components and equipment.	Р	Р		Р		
Manufacturing and assembly of medical, scientific or technical instruments, devices and equipment.	Р		Р	Р	Р	[P]

	I-1	I-2	I-3	I-4	R&D	LSC <u>*</u>
Manufacturing and assembly of mobile, modular and manufactured homes.	Р	Р		Р		
Manufacturing and assembly of semi-conductors microchips, circuits and circuit boards.	Р		Р	Р	Р	
Manufacturing of yeasts, molds, and other natural products necessary for medical and biotechnical research and	D		D	D	D	[D]
Demos producto monufacturing	r D	D	P	r D	r	
Paper products manufacturing.	r D	P	D	r D	D	
Printing and publishing.	P		P	P	P	[D]
Research, development and related activities.	P		Р	P	Р	[P]
Sawmills.	Р	P				
Sign making shop.	Р	Р		Р		
Stoneworks.	Р	Р				
Tinsmith and roofing services.	Р	Р		Р		
Wood products manufacturing.	Р	Р		Р		
II. Uses of a heavy industrial nature.						
Alcoholic beverage manufacturing.	SE	Р				
Automobile recycling facility		Р				
Distillation of coal, tar, or wood		Р				
Central mixing plants for asphalt, concrete or other paving materials.		Р				
Chemicals, except sulfuric, nitric, hydrochloric acid or other corrosive or offensive chemicals.		Р				
Dye works.		Р				
Fertilizer mixing plants.		SE				
Foundries or metal fabrication plants.		Р				
Incinerators. <sup>6</sup>		SE <sup>27</sup>				
Manufacturing of brick, clay, terra cotta and tile.		Р				
Manufacturing of cinder blocks.		Р				
Manufacturing of printing inks.		Р				
Manufacturing of synthetic fabrics such as rayon.		Р				
Manufacturing of cloth made from shoddy or other similar material.		Р				
Off-loading and transfer sites for storage of sand, gravel or rocks.	Р7	Р		р7		

	I-1	I-2	I-3	I-4	R&D	LSC <u>*</u>
Recycling facility.	P30	Р		P30		
Rock crusher, washing and screening plants.		Р				
Sanitary landfills. <sup>6</sup>		SE <sup>27</sup>				
Starch, glucose and dextrin.		Р				
Steam power plants.		Р				
Stove polish.		Р				
Sugar refineries.		Р				
(c) Transportation, communication and utilities.						
Amateur radio facility.	р35/ SE	P <sup>35</sup> / SE	P <sup>35</sup> / SE	р35/ SE	P <sup>35</sup> / SE	[P <sup>35</sup> / SE]
Cable communications system. <sup>5</sup>	SE	SE	SE	SE	SE	[SE]
Electric power transmission and distribution lines, overhead, carrying more than 69,000 volts.	Р	Р	SE	SE	SE	[P]
Electric power transmission and distribution lines, overhead, carrying 69,000 volts or less.	Р	Р	Р	Р		
Electric power transmission and distribution lines, underground.	Р	Р	Р	Р	Р	[P]
Heliports.	SE	SE	SE	SE	SE	[SE]
Helistops.	SE	SE	SE	SE	SE	[SE]
Parking of motor vehicle, off-street, in connection with any use permitted.	P2	p <sup>3</sup>	Р	Р	Р	[P]
Parking of motor vehicle, off-street, in connection with any use permitted in a commercial zone.	SE					
Pipelines, aboveground.	Р	Р	SE	SE	SE	[SE]
Pipelines, underground.	Р	Р	Р	Р	Р	[P]
Public utility buildings and structures.	SE	SE	SE	SE	SE	[SE]
Radio and television broadcasting stations and towers.	P <sup>33</sup> / SE	Р	P <sup>33</sup> / SE	P <sup>33</sup> / SE	P <sup>33</sup> / SE	[P <sup>33</sup> / SE]
Railroad tracks.	Р	Р	Р	Р	Р	[P]
Railroad yards or roundhouses.		Р				
Rooftop mounted antennas and related unmanned equipment building, equipment cabinets, or equipment room. <sup>26</sup>	Р	Р	Р	Р	Р	[P]
Solid waste transfer station, private. <sup>6</sup>		SE <sup>27</sup>				

	I-1	I-2	I-3	I-4	R&D	LSC <u>*</u>
Telecommunications facility. <sup>4</sup>	Р	Р	Р	Р	Р	[P]
Telephone and telegraph lines.	Р	Р	Р	Р	Р	[P]
Telephone offices, communication and telecommunication centers.	Р		Р	Р	Р	[P]
Trucking terminals.	Р			Р		
(d) Commercial.						
Adult entertainment business. <sup>22</sup>	Р	Р				
Aircraft parts, sales and services, including the sale of fuel for aircraft only.	Р			Р		
Animal research service facilities.						[P]
Automobile parts, sales and services, including but not limited to tire sales and transmission services, but excluding automobile filling stations.	Р			Р		
Automobile repair and services.	Р			Р		
Automobile sales, indoors and outdoors.	Р8			Р8		
Building material and supply, wholesale and retail. <sup>20</sup>	Р	Р		Р	Р37	
Cafeteria, dining room, snack bar, or other such facilities as an accessory use in connection with the operation and primarily for employees of the zone in which the use is located. <sup>9</sup>	Р	Р	Р	Р	Р	[P <sup>29</sup> ]
Consignment store		P31			-	
Eating and drinking establishments. <sup>9,10</sup>	SE		SE	SE	SE	[SE]
Lumberyards.	Р	Р		Р		
Retail sales and personal services, dealing primarily with employees in the zone, in accordance with section 59-C-5.23.	Р		Р	Р	Р	[P <sup>29]</sup>
Transitory use. <sup>25</sup>	P/SE	P/SE	P/SE	P/SE	P/SE	[P/SE]
Wholesale trades limited to sale or rental of products intended for industrial or commercial users.	Р		р36	Р		
(e) Services.						
Ambulance or rescue squads, publicly supported.	Р		Р	Р	Р	[P]
Animal boarding places. <sup>11</sup>	Р			Р		
Automobile filling stations. <sup>21</sup>	SE	SE14		SE		
Automobile repair and services.	Р			Р		
Automobile, truck and trailer rentals, outdoor.	Р			Р		

	I-1	I-2	I-3	I-4	R&D	LSC <u>*</u>
Chancery.	SE		P24			
Child day care facility. <sup>28</sup>						
-Family day care home.	Р		Р	Р	Р	[P]
-Group day care home.	Р		Р	Р	Р	[P]
-Child day care center.	Р		Р	Р	Р	[P]
Clinics, medical or dental.	Р		Р	Р	Р	[P]
Computer programming and software services including data banks and data retrieval.	Р		Р	Р	Р	
Conference centers:						
-With lodging facilities.			SE		SE	
-Without lodging facilities.			Р		Р	[P]
Corporate, administrative or business offices for companies principally engaged in health services, research and development or high technology industrial activities.					Р	[P]
Day care facility for senior adults and persons with disabilities	Р		Р	Р	Р	[P]
Duplicating service.	Р		Р	Р	Р	[P <sup>29</sup> ]
Educational institution, private	р34					
Fire stations, publicly supported.	Р		Р	Р	Р	[P]
General offices.	Р	P12	Р	SE	P13	[P <sup>13</sup> ]
Highway fuel and food service.	SE					
Hospitals.	SE		SE	SE	SE	[P]
Hospitals, veterinary, when in a soundproof building.	Р			Р		
International organization, public.	SE		P <sup>24</sup>		P24	[P]
Laboratories.	Р		Р	Р	Р	[P]
Landscape contractor.	Р					
Meeting centers.	SE					
Nursing and care homes.						[P]
Place of religious worship.	Р		Р	Р	Р	[P]
Physical therapy facilities.						[P]
Publicly owned or publicly operated uses.	Р	Р	Р	Р	Р	[P]
Storage, outdoor. <sup>15</sup>	Р	Р		Р		
Trade, artistic or technical schools.	Р		P19	Р	P <sup>19</sup>	[P <sup>19]</sup>

	I-1	I-2	I-3	I-4	R&D	LSC <u>*</u>
Universities and colleges providing teaching and research facilities.	P32		Р		Р	[P]
Warehousing and storage services:						
-Industrial and commercial users.	Р	Р	P16	Р		
-Self-storage facilities.	Р			Р		
(f) Cultural, entertainment and recreational.						
Art or cultural centers.			SE		SE	[SE]
Health clubs.	Р		Р	Р	Р	[P]
Libraries, scientific or technical.	Р		Р	Р	Р	[P]
Private clubs. <sup>17</sup>	SE		SE	SE	SE	
Recreational facilities primarily for the use of employees. <sup>17</sup>	Р	Р	Р	Р	Р	[P <sup>29</sup> ]
Recreational or entertainment establishments, commercial.	SE	SE		SE		
Rifle or pistol ranges, indoor.	SE	SE		SE		
Service organizations.	SE			SE		
Swimming pools, private.			P18			
(g) Resource production and extraction.						
Agricultural uses.	Р	Р		Р		
Dairy products processing.	Р			Р		
Rock or stone quarries.		Р				
Sand gravel or clay pits.		Р				
Stockyards.	SE	SE				
(h) Miscellaneous uses.						
Accessory buildings and uses.	Р	Р	Р	Р	Р	[P]
Signs, in accordance with the provisions of article 59-F.	Р	Р	Р	Р	Р	[P]

### 21 <u>\* See Section 59-C-5.211 for allowable uses in the LSC Zone.</u>

22

### 23 <u>59-C-5.211. Allowable uses in the LSC Zone.</u>

24 <u>The following uses are permitted in the LSC Zone:</u>

25	(1) health care services;
26	(2) domiciliary care homes;
27	(3) research, development and related activities;
28 29 30	(4) Corporate, administrative or business offices for companies principally engaged in health services, research and development or high technology industrial activities.
31 32 33	(5) general offices limited to no more than 50% of the gross floor area of the buildings on a lot or group of contiguous lots in common ownership and control at the time of subdivision approval;
34	(6) private educational institutions:
35	
36	(7) conference centers;
37	(8) hotels, motels, and inns;
38	(9) dwellings and dormitories;
39 40	(10) housing and related facilities for senior adults or persons with disabilities;
41	(11) adult and child day care;
42	(12) food services, excluding drive-in restaurants;
43	(13) retail trade and personal services;
44	(14)cultural, entertainment, and recreation;
45	(15) communications facilities or structures;
46	(16) publicly owned or operated uses;
47	(17) transportation facilities or structures;
48	(18) utilities;
49	(19) accessory buildings and uses; and
50	(20) signs in accordance with the provisions of Article 59-F.

51			
52	59-C-5	5.23. Re	tail sales and personal services.
53	In the ]	<u>I-1, I-2,</u>	I-3, I-4, and R&D zones, [R]retail sales and personal services
54	operati	ing prin	narily for the convenience of employees [of Industrial zones] are
55	permit	ted uses	subject to the following limitations:
56	(a)	Such u	se must not be located in an industrially zoned area containing less
57		than te	n contiguous acres of land classified in industrial zones.
58	(b)	Such u	se must not occupy more than 5 percent of the total floor area of the
59		buildin	gs on a lot or group of contiguous lots in common ownership and
60		control	at the time of subdivision approval.
61	(c)	Such u	se must not front on or abut any street with a right-of-way of 70
62		feet or	more unless the street is internal to the industrially zoned area.
63		Such u	se, however, must not front on or abut any street with an existing or
64		master	planned right-of-way of 100 feet or more. All access to such use
65		must b	e from interior streets within the industrially zoned area.
66	(d)	The di	splay of a sign must comply with the requirements established in
67		Article	59-F of this chapter.
68	(e)	In the l	-3 and R&D zones, such use may be located within any building as
69		[a] <u>an i</u>	incidental use [in accordance with] under the following
70		require	ements:
71		(1)	Such incidental use must not be located above the first floor;
72		(2)	Such incidental use must satisfy the requirements of subsections
73			(a), (b) and (d), above.

74		The provisions of this section shall not apply to any land or building
75		lawfully existing, under construction, or for which a building permit has
76		been issued [prior to] before August 19, 1987.
77	* * *	

# 79 Sec. 59-C-5.3. Development standards.

	I-1	I-2	I-3	I-4	R&D	LSC
59-C-5.31 Building height.						
No building shall exceed the following height limits:						
(a) Normally:						
-In stories	3	5		3		
-In feet	42	70	100	42	50	[100] 150 <sup>*</sup>
(b) In the I-1 zone this height may be increased in accordance with the requirements of section 59-C-5.41.						
<b>59-C-5.32. Coverage limitations.</b> (Percent of gross tract area)						
-Green area shall be provided for not less than	10	10	35	20	30	[25]
<u>-In the LSC Zone the minimum public use space is as follows but</u> may be provided in part or entirely off-site on a separate lot or parcel classified under the LSC Zone. A payment instead of all or some of the required public use space may be made at the time of site plan review if approved under the applicable provisions of Section 59-D- 2.31.						20
-Off-street parking is not allowed to occupy more than			45 <sup>1</sup>			
<b>59-C-5.321. Maximum density of development.</b> <sup>2</sup> The maximum density of development must not exceed the following floor area ratio which is to be based on and may be averaged over the gross tract area.					0.30	

	I-1	I-2	I-3	I-4	R&D	LSC
In the I-3 and LSC zones, the maximum density of development must not exceed the following floor area ratio, based on gross tract area, which may be averaged over 2 or more lots created by the same subdivision plan if the density is recorded by covenant in the land records for all affected lots. When averaging is used for previously approved subdivision plans the total development density must not exceed the density for which Facility approval was previously granted, unless a new Adequate Public Facility test is applied. In such situations, the shift of density must be recorded in the land records for all affected lots. [Adequate Public Facility approval was previously granted, unless a new Adequate Public Facility test is applied. In such situations, the shift of density must be recorded in the land records for all affected lots. [Adequate Public Facility test is applied. In such situations, the shift of density must be recorded in the land records for all affected lots.] In the LSC Zone, if the property is under common ownership or control, the floor area ratio in one portion of the gross tract area of the property may exceed the maximum floor area ratio of the zone only if it is balanced by a lower floor area ratio elsewhere on the property so that the overall floor area ratio for the property does not exceed the maximum floor area ratio of the zone. The densities for all portions of the property must be shown in a covenant that is recorded in the land records and that covers the total tract area of the property. The Planning Board must determine compliance with the densities shown in the covenant at the time of site plan approval In the LSC zone, 12.5% of any density above a floor area ratio of 0.50 must be supported through the purchase of a BLT easement in accordance with Section 59-C-5.473.			0.50			[0.30] <u>2.0**</u>
In the I-3 zone, the maximum density may be increased up to a maximum floor area ratio of 0.60 provided that the applicant for development obtains approval of a traffic mitigation agreement at the time of site plan review, that will result in traffic generation equal to or less than a project with a floor area ratio of 0.50.						
[ In the LSC zone, the maximum density may be increased to a maximum floor area ratio of 0.50 provided the applicant for development obtains approval of a traffic mitigation agreement in accordance with Section 59-C-5.475.] 59-C-5.322. Requirement for landscape plan. In the R&D zone						
the preliminary plan of subdivision must include a landscape plan and a plan for the preservation of natural features.						

- 81 1 In unusual circumstances, may be waived by the [planning board] <u>Planning Board</u> at the time of

site plan approval upon a finding that a more compatible arrangement of uses would result.

83	2	An entire floor or story or a portion of a floor or story used exclusively for mechanical equipment
84		is excluded from the maximum density of development calculation, and no portion of any floor or
85		story excluded from the maximum density calculation that exceeds the Floor Area Ratio of the
86		zone may be used for any other purpose. The aggregate area of any partial floors or stories
87		excluded from the maximum density of development calculation must not exceed the gross floor
88		area of any full floor of the building.
89	*	In approving height limits, the Planning Board must consider factors such as: the size of the lot or
90		parcel; the relationship of existing and proposed buildings and structures to surrounding uses; and
91		the need to preserve light and air for the occupants of the development and occupants of
92		surrounding properties.
93	**	In approving the densities, the Planning Board must consider the size of the parcel and the
94		relationship of the existing and proposed buildings and structures to surrounding uses.
95		
96	* * *	
97	Sec. 5	9-C-5.4. Special regulations.
98	* * *	
99	59-C-:	5.47. Special Regulations LSC zone.
100		59-C-5.471. Purpose. The primary purpose of the Life Sciences Center (LSC)
101		Zone is to promote research, academic, and clinical facilities that advance the life
102		sciences, health care services and applied technologies. It is also the purpose of
103		the LSC Zone to provide opportunity for the development of uses that support a
104		Life Science Center, while retaining an environment conducive to high
105		technology research, development, and production.

106	[A life	science	es center (LSC) is a major research and development park for		
107	faciliti	facilities of companies specializing in the life sciences and related fields, at a			
108	locatio	n as rec	ommended in a master sector plan.		
109	(a)	The go	als of an LSC are:		
110		(1)	To provide a unique reinforcing focus for the life sciences industry		
111			to promote the successful expansion of the industry in		
112			Montgomery County;		
113		(2)	To expand the educational and research resources available for		
114			Montgomery County residents, employers and work force; and		
115		(3)	A life sciences center may serve the health care needs of the		
116			region.		
117	(b)	It is the	e intent that LSC's be developed in a manner which makes a		
118		positiv	e contribution to the quality of life in the County. The facilities,		
119		landsca	aping and open space will create an attractive setting and		
120		enviro	nment conducive to high technology research, development,		
121		produc	tion and related uses. The purposes of the life sciences center zone		
122		are as f	follows:		
123		(1)	To promote the development of life science research parks which		
124			reflect the highest architectural and environmental standards; to		
125			preserve the confidence of corporate users and the surrounding		
126			community that future development will be of consistently high		
127			quality and to protect and enhance the economic and		
128			environmental values of the life sciences center.		

129		(2)	To assure that all buildings are compatible with each other and
130			with their surroundings in terms of exterior design, massing and
131			scale, and type and quality of construction.
132		(3)	To promote clustering of buildings to encourage and facilitate
133			pedestrian use of open space and common areas and shared
134			facilities.
135		(4)	To assure the provision of green areas and promote the use of
136			green areas to enhance the appearance of the facilities and the
137			quality of the work environment.]
138	59-C-	5.472.	Where applicable. No land may be classified in the LSC zone
139	unless	the lan	d is within an area for which there is an approved and adopted
140	master	r plan w	hich recommends life sciences center development for the land
141	which	is subje	ect to the application of the zone. <u>Development under the LSC zone</u>
142	<u>must l</u>	be substa	antially consistent with the recommendations of the applicable
143	master	r or sect	or plan.
144	[59-C	-5.473.	Development standards.
145	(a)	Buildi	ng setbacks.
146		(1)	Building setback from the rights-of-way of interior roads is 25 feet
147			Building setback from the rights-of-way of perimeter roads is 50
148			feet.
149		(2)	Building setback from the right-of-way line at entry gateways is 50
150			feet.
151		(3)	Building setback from an interior lot line is 20 feet.]

152	[(b)	Building height. Maximum building height is 100 feet, except 125 feet in
153		the health services core of the Shady Grove Life Sciences Center as
154		defined in the 1986 Shady Grove Life Sciences Center Development Plan,
155		as amended.
156	(c)	Building coverage. Maximum building coverage is 25 percent of the lot
157		area except that increased coverage up to 50 percent may be approved
158		when the applicant proposes to construct structured or underground
159		parking.
160	(d)	Floor area ratio. The maximum floor area ratio may be increased to 0.50
161		if special trip reduction is implemented in accordance with the guidelines
162		in Section 59-C-5.475.
163	(e) Gi	een area. The minimum green area on the site is 25 percent of the lot area.
164		Roofs or below grade parking may be counted as green space if developed
165		for passive or recreational use.
166	(f)	Parking setbacks.
167		(1) Parking setback from rights-of-way is 50 feet.
168		(2) Parking setback from an interior lot line is 15 feet. Where internal
169		connection between adjacent parking lots is planned, total
170		combined setback is eight (8) feet.
171		(3) In the Shady Grove Life Sciences Center, parking setback from the
172		right-of-way line of Blackwell Road and the curb line of access
173		roadways and cul-de-sacs is 25 feet.
174	(g)	Parking design standards. ]

175		[(1)	All parking areas must be effectively screened from adjacent
176			roadways and adjoining lots, through the use of berms, plantings,
177			or the depression of parking areas below surrounding grades.
178		(2)	Parking areas should be broken up into lots of no more than 150
179			cars, the lots to be separated by landscaped islands.
180		(3)	The number of parking spaces provided, and the overall design and
181			layout of parking lots must be in accordance with Article 59-E.
182		(4)	No access to any lot is allowed directly from perimeter roads.
183	(h)	Site de	esign standards.
184		(1)	Buildings should be sited to provide primary visual orientation to
185			the internal road network. Care must be taken so that exposure to
186			roads surrounding the life sciences center do not detract from the
187			overall appearance of the facility or the life sciences center.
188		(2)	Buildings should appear to be integrated into the natural terrain,
189			avoiding unnatural looking grading.
190		(3)	Service areas should not detract from the design of the facility. All
191			service areas should be effectively screened from adjoining lots,
192			pedestrian areas, and parking lots by incorporating them into the
193			building or by the use of walls, berms, level changes and
194			landscaping.
195		(4)	In the Shady Grove Life Sciences Center, pedestrian paths or
196			sidewalks must be provided in accordance with the 1986 Shady
197			Grove Life Sciences Center Development Plan, as amended.]

198	[(i)	Build	ing des	ign standards.
199		(1)	All sic	des of the building are to be built with finish materials.
200		(2)	Recor	nmended finish materials include:
201			(A)	Architectural masonry units (excluding standard concrete
202				and cinder block);
203			(B)	Natural stone;
204			(C)	Precast concrete
205			(D)	Aluminum and architectural metals
206			(E)	Porcelain covered metal panels; and
207			(F)	Glass
208		(3)	Mecha	anical equipment should be located within the building or
209			within	a mechanical equipment penthouse. If mechanical
210			equip	ment is located on the roof or is free-standing on the site, it
211			must l	be effectively screened from view by means fully compatible
212			with t	he architecture. Mechanical equipment must be screened
213			from	view from all roads and immediately adjacent structures
214			(existi	ng or future) four stories in height or less. Required flues or
215			vents	must be compatible in design with the architecture and
216			prefer	ably incorporated into that design.
217		(4)	Outdo	or storage must not be permitted except when effectively
218			screen	ed within a court or a wall made of substantial materials
219			compa	atible with those of the building skin.

220		(5)	All trash containers, transformers, meters, telephone junction
221			boxes etc., must be integrated architecturally or effectively
222			screened with screen walls and/or landscaping materials.
223			Locations must be compatible with building and site design.
224		(6)	No temporary structures may be constructed or trailers located
225			within the LSC except for those approved by the Director to
226			service a construction project and only for the duration of the
227			construction. ]
228	[(j)	Site lig	ghting standards.
229		(1)	Site lighting must be provided to maintain a minimum level of
230			illumination within the parking areas (ft. candle minimum
231			maintained).
232		(2)	Maximum pole heights for drives and parking lots must be
233			approximately 24 feet with "cut off" type luminaries. Poles and
234			luminaries must be compatible with established lighting in the
235			existing core area.
236		(3)	Lighting bollards must be used adjacent to pedestrian walk areas.
237			The design must be compatible with architectural materials.]
238	[ <b>59-</b> C-	-5.474.	Landscaping guidelines.
239	(a)	Landso	caping should be an integral part of the building design and should
240		provid	e effective screening and shade.
241	(b)	Every	effort should be made to avoid formality in plantings except as it
242		may be	e integral to an architectural concept. Emphasis should be placed on

243		the natural grouping of groves of trees and every opportunity should be
244		taken to emphasize or take advantage of natural terrain features.
245	(c)	Plants should be restricted to those with low maintenance requirements
246		and which have already proven themselves hardy and easily cared for in
247		this area.
248	(d)	To ensure year-round interest and beauty, a skeletal planting of evergreen
249		trees and major shrubs of seasonal interest should be used in each project
250		so that the design does not disintegrate at leaf-fall.
251	(e)	Native flowering trees should be planted in groves placed near areas of
252		pedestrian use. Whenever possible, larger specimens should be selected in
253		order to create an immediate effect at major points in the design. Smaller
254		plantings may be used in peripheral areas.]
255	[ <b>59-</b> C	2-5.475. Special trip reduction guidelines. Where the approved
256	subdi	vision plan of the life sciences center allows a development density
257	excee	ding 0.3 FAR, it is the intent of the special trip reduction guidelines to
258	achie	ve as a goal a reduction in auto trips for projects of 10 percent below the
259	peak	hour trip generation rates adopted by the Planning Board for the
260	admir	nistration of the Adequate Public Facilities Ordinance. To help achieve the
261	trip re	eduction goal, design measures should be incorporated in the project to meet
262	trip re	eduction objectives established in this section, as well as non-design
263	measu	ares for the purpose of reducing dependence on single-occupant
264	auton	nobiles. The Planning Board may establish a schedule for achieving the goal
265	and ti	me periods during which the trip reduction measures will be in effect. Any

266	or all c	of the fo	llowing trip reduction guidelines or other measures proposed by an	
267	applicant are to be considered as appropriate on a case-by-case basis taking into			
268	consid	eration	specific circumstances of the project.]	
269	[(a)	Design	ı guidelines.	
270		(1)	Buildings clustered near internal streets to minimize walking	
271			distance to available transit and to promote an attractive, active and	
272			safe pedestrian-oriented streetscape, to accommodate bus service,	
273			carpooling and vanpooling within a project.	
274		(2)	An uninterrupted pedestrian circulation system linking the various	
275			uses within a project. The pedestrian system should provide	
276			convenient connections to transit service and employee	
277			convenience services to reduce dependence on single-occupant	
278			automobiles and to promote an active streetscape.	
279		(3)	If convenience services are provided, space on the ground floor of	
280			a building for such services to reduce the need for private vehicle	
281			trips during the day.]	
282	[(b)	Non-d	esign guidelines.	
283		(1)	Trip reduction programs such as limiting off-street parking after	
284			consideration of market demand, flex time, the provision of or	
285			participation in share-a-ride programs, transit/vanpool fare	
286			discounts, bus shelters, emergency ride-home programs, reserved	
287			HOV spaces, or other acceptable measures that may be proposed;	
288			provided that a limitation on off-street parking below the	

289			applicable standards of Article 59-E shall not be required in order
290			to achieve trip reduction goals.
291		(2)	Development phased in accordance with public or private transit
292			availability.]
293	[(c)	Imple	mentation.
294		(1)	The Planning Board may establish a schedule for achieving the
295			requirements and time periods during which the trip reduction
296			measures will be in effect. The Planning Board may also require
297			the applicant to enter into an agreement providing for the
298			monitoring, enforcement, and other terms of the trip reduction
299			program. Provision must be made in the agreement to allow for
300			the inclusion of a maximum cost for the implementation of
301			substitute components of the trip reduction measures in the event
302			initial components do not achieve the requirements.
303		(2) Re	sults of on-site trip reduction programs implemented by the
304		apj	plicant to satisfy other traffic mitigation conditions of development
305		apj	provals may be credited toward achieving the trip reduction
306		rec	quirement. All traffic mitigation requirements otherwise applicable
307		rer	nain in effect. The Planning Board may phase implementation of
308		SOI	me or all of the trip reduction in accordance with the build-out of the
309		pro	oject and/or availability of transmit so that the measures are feasible
310		an	d effective, except the Planning Board must not defer such

311	implementation for more than 10 years from the issuance of any use-
312	and-occupancy permit for a building in the project.]
313	
314	59-C-5.473. Special regulations for use of a Building Lot Termination (BLT)
315	Development Right.
316	Except for residential development subject to the requirement of workforce
317	housing under Section 59-C-5.474(b) and except for health care services:
318	(a) 12.5 percent of any floor area above 0.50 must be supported through the
319	purchase by the applicant of a BLT easement or through a contribution to the
320	Agricultural Land Preservation Fund under Chapter 2B, for purchase of a
321	BLT easement on real property to preserve agricultural land in the County.
322	One buildable RDT zoned lot must be extinguished for each 9,000 square
323	feet of residential space, or for each 7,500 square feet of non-residential
324	space.
325	(b) If the applicant for development under the LSC zone cannot purchase an
326	easement, or if the amount of density to be attributed to BLT easement is a
327	fraction of the applicable floor area equivalent, the Planning Board must
328	require the applicant to pay the Agricultural Land Preservation Fund an
329	amount set annually by Executive Regulation.
330	
331	59-C-5.474 MPDUs and Workforce Housing.
332	(a) Moderately Priced Dwelling Units. If residential uses are included in a

333 development, Moderately Priced Dwelling Units must be provided under Chapter

334	25A. The maximum residential FAR may be increased in proportion to any
335	MPDU density bonus units provided on-site.
336	
337	(b) Workforce Housing.
338	(1) Notwithstanding Section 59-A-6.18 and Chapter 25B, this zone
339	requires that any site plan containing residential units at a density of 20
340	dwelling units per acre or higher or containing 100 dwelling units or
341	more, include an amount of workforce housing units that is not less
342	than 5 percent of the total number of proposed market rate dwellings,
343	not including any MPDUs or resulting bonus density units, or dwelling
344	units excluded under Chapter 25B.
345	(2) To allow the construction of all workforce housing units on site, the
346	Planning Board must permit:
347	
348	(A) any residential density or residential FAR limit of the applicable
349	zone to be exceeded to the extent required for the number of
350	workforce housing units that are constructed, but not by more than
351	<u>5 percent;</u>
352	
353	(B) any residential density or residential FAR limit established in a
354	master or sector plan to be exceeded to the extent required for the
355	number of workforce housing units that are constructed, but not

356	more than the maximum density and FAR of the zone, except as
357	provided in paragraph (2)(A), and
358	
359	(C) any building height limit established in a master or sector plan to
360	be exceeded to the extent required for the number of workforce
361	housing units that are constructed, but not more than the maximum
362	height of the zone.
363	
364	
365	<b>59-C-5.475</b> Parking. Off-street parking must satisfy Article 59-E.
366	
367	59-C-5.476. Procedure for application and approval.
368	(a) [The procedure for site plan approval in the LSC zone is set forth in] <u>Site</u>
369	plan approval in the LSC Zone must satisfy Division 59-D-3. The site plan must
370	be substantially consistent with the recommendations of the applicable master or
371	sector plan. In addition to the site plan submission requirements, the applicant
372	must submit for approval comprehensive design standards that address building
373	types, facades, and architecture except when the site plan is proposed for
374	amendment through a limited plan amendment, a consent agenda amendment or a
375	Director level amendment. Site plans also must be substantially consistent with
376	general design principles recommended by the applicable master or sector plan
377	and design guidelines adopted by the Planning Board to implement the applicable
378	master or sector plan.

380	(b)	<u>For site</u>	e plan o	r subdivision plan approvals before (ZTA Effective Date),
381			<u>,</u> [T] <u>t</u> h	e following regulations apply [in the LSC zone]:
382		(1)	In the S	Shady Grove Life Sciences Center except as provided
383			below,	an applicant for site plan or subdivision plan approval must
384			comply	with the requirements of the Amended and Restated
385			Declara	ation of Covenants and Easements dated March 9, 1990 and
386			recorde	ed May 25, 1990 in Liber 9332 at folio 591, or as the
387			Declara	ation may be later amended, that governs the development
388			of the S	Shady Grove Life Sciences Center. Any project that
389			receive	s site plan or subdivision plan approval on property
390			identifi	ed as University Sites in the 1995 Shady Grove Life
391			Science	es Center Development Plan is not required to comply with
392			the Dec	claration.
393		(2)	Propert	ties within the Shady Grove Life Sciences Center except as
394			provide	ed below are subject to the provisions of:
395			A.	an approved subdivision plan which may restrict the
396				maximum density allowed, and
397			B.	the 1986 Shady Grove Life Sciences Center Development
398				Plan, as amended. This subparagraph does not apply to any
399				project on the property identified as the University Sites in
400				the 1995 Shady Grove Life Sciences Development Plan.
401				Any application of the 1986 Shady Grove Life Sciences

- 402Center Development Plan to such University Sites arises by403private agreement only.404(3)Any proposed development shown on a site plan or plan of405development approved prior to June 11, 1996 may be constructed406in accordance with the approved plan regardless of whether said407development is built in one or more phases. Such development is
- 408not subject to the provisions of Section 59-G-.1 and 59-G-4.25,409and may be continued, repaired, reconstructed, or structurally410altered in accordance with the approved site plan or plan of411development. In cases where detailed review of subsequent phases412of an approved plan is anticipated, such reviews will continue to be413required under the provisions of Division 59-D-3.

#### 414 **59-C-5.477.** Existing approved buildings, building permits, or uses.

415 (a) Any existing building or structure for which a lawful building permit was 416 issued, and any lawful use which was instituted on property within the 417 Shady Grove Life Sciences Center and subject to the provisions of the 418 1986 Shady Grove Life Sciences Center Development Plan, as amended, 419 prior to a sectional zoning map amendment approved on June 11, 1996, 420 where such lot was rezoned to the life sciences center zone by sectional or 421 local map amendment, will not be regarded as a non-conforming use. 422 Such building or use may be structurally altered, replaced or repaired, or 423 may be changed in conformance with the requirements of the previous 424 lease agreement or memorandum of understanding with the County

425		entered into prior to June 30, 1984, so long as it remains an otherwise
426		lawful use. Properties which are subject to a lease agreement or
427		memorandum of understanding with the County entered into prior to June
428		30, 1984 may be developed [in accordance with] under agreements and
429		procedures applicable prior to June 11, 1996. Any lawful uses or
430		development which were approved in a plan of development approved by
431		the District Council may be instituted on the Shady Grove Life Sciences
432		Center properties.
433	(b)	Construction underway in the Shady Grove Life Sciences Center pursuant
434		to a building permit validly issued and existing at the time of
435		reclassification to the life sciences center zone shall be permitted, and
436		buildings and structures so constructed shall not be considered
437		nonconforming.
438	<u>(c)</u>	Any lawful structure, building, or use that existed for which a building
439		permit was issued before the date the LSC zone was applied to the
440		property is a conforming structure or use and may be continued,
441		structurally altered, repaired, renovated, or enlarged up to 10 percent of
442		the gross building floor area. However, any enlargement of the building
443		that is more than 10 percent of the gross floor area, or construction of a
444		new building must comply with the new standards of the LSC zone.
445	<u>(d)</u>	Any preliminary plan or site plan approved before the date the LSC zone
446		was applied to the property remains valid, and construction may proceed
447		subject to applicable approvals. A preliminary plan approved before the

448	date the LSC zone was applied to the property may be amended under the
449	standards of the previous zone or under the LSC zone standards.
450	
451	59-C-5.478. Definitions.
452	In the Life Sciences Center Zone, the following words and phrases have the meanings
453	indicated:
454	Cultural, entertainment, and recreation: Establishments that operate facilities or
455	provide services to meet cultural, entertainment, and recreational interests of their
456	patrons. Such establishments include art/cultural centers, health clubs, libraries, private
457	clubs, and theaters.
458	Communications facilities or structures: Facilities or structures that support or
459	facilitate communications by radio, television, or telephone. Such facilities or structures
460	include amateur radio facility, cable communications system, radio and television
461	broadcasting studio, radio and television stations, telephone office or communications
462	center, and rooftop mounted antennas and related equipment.
463	Food services: Establishments that prepare meals, snacks, and beverages for human
464	consumption. Such establishments include restaurants, cafes, and coffee shops.
465	Health care services: Establishments providing health care by trained professionals.
466	These establishments include hospitals, hospice care facilities, life care facilities, nursing
467	homes, medical clinics, physical therapy facilities, and occupational therapy facilities.
468	Personal services: Establishments that provide services to individuals, households, and
469	businesses. These establishments include self-service laundromats, dry cleaning and
470	laundry establishments of no more than 3,000 square feet of gross floor area, dry cleaning
	31

- 471 and laundry pick-up stations, beauty and barber shops, shoe repair, photo studios and
- 472 photo finishing services, data services, appliance repair shops, duplicating services, tailor
- 473 or dress making shops, and pet grooming services.
- 474 **Retail trade**: Establishments engaged in selling merchandise to the general public and
- 475 services incidental to the sale of merchandise. These establishments include grocery
- 476 stores, pharmacies, automobile filling stations, electronic and appliance stores, office
- 477 supply stores, computer and software stores, hardware stores, and clothing stores.
- 478 **Transportation facilities or structures:** Facilities or structures that support or facilitate
- 479 transportation of people. Such facilities or structures include bus terminals, bus stops,
- 480 transit stations, transit stops, taxi stands, heliports, helistops and off-street parking of
- 481 motor vehicles, in connection with any use permitted.
- 482 <u>Utilities: Buildings and structures that provide services such as telephone, electric power,</u>
- 483 <u>natural gas, water, and sewage removal.</u>
- 484
- 485 Sec. 3. Effective date. This ordinance becomes effective 20 days after the date of
  486 Council adoption.
- 487
- 488 This is a correct copy of Council action.
- 489
- 490 Linda Lauer, Clerk of the Council
- 491

Appendix 9: Montgomery County Biotechnology Potentials

Montgomery County Biotechnology Potentials

Prepared for: Montgomery County Planning Department

June 3, 2009



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## **Executive Summary**

The draft Master Plan for Gaithersburg West calls for a shift from a Life Sciences Center zoning focused on single uses – office, flex industrial, laboratory and educational uses – to a mixed-use concept that also allows significant retail and residential development. The goal is to achieve a better jobs/housing balance while creating attractive mixed-use environments that allow people to live, work, shop and recreate in a walkable community that reduces dependence on single-passenger automobile travel. As input to the plan, the Montgomery County Planning Department asked Partners for Economic Solutions (PES) to evaluate the potentials for additional biosciences development and to evaluate the county's ability to compete for biotech companies.

#### **Biotechnology Industry Clusters**

As defined by the U.S. Department of Commerce and the Biotechnology Industry Association, biotechnology is the "application of molecular and cellular processes to solve problems, conduct research, and create goods and services." It takes many forms, focusing alternatively on medical applications ("red"), agricultural applications ("green") or industrial applications ("white"). Maryland and Montgomery County have excelled in the "red" segment of medically-related biotech, R&D, therapeutics, tools and diagnostics.

Though the biotechnology industry is expanding around the world, it has shown great propensity for clustering in a select set of geographic locations. This clustering is driven largely by the need for specialized labor pool, advanced science, industry experience and financing. Human capital is the most critical resource; it is important to be in a location that can attract the talent, offering a good quality of life, good employment opportunities among other similar firms, continuing education opportunities and other amenities.

A Brookings Institution study in 2002 identified nine key clusters of biotech activity in the United States that represent three-quarters of both large and new biotech companies:

- Boston
- San Francisco
- New York
- Philadelphia
- San Diego
- Seattle
- Raleigh/Durham
- Washington/Baltimore
- Los Angeles

Financing patterns reinforce the competitive strength of existing biotech clusters. Biotech investors, who are largely focused in Boston, New York and San Francisco, favor investing in companies within a reasonable drive time so that they can stay actively involved in managing and guiding the companies.

Though the industry is dominated by U.S. companies with 77 percent of industry revenues in 2007, biotechnology is continually globalizing as other countries capitalize on their

science, industry and investments. Europe represented 15 percent of global industry revenues in 2007; Asia-Pacific generated 5 percent; and Canada provided 3 percent of industry revenues. The largest European clusters are currently focused in Cambridge, the Medicon Valley at the border between Sweden and Denmark, Switzerland and Paris. Other emerging clusters exist in Sydney, Melbourne, Tokyo, Hong Kong, Singapore, Shanghai, Beijing, Brazil, and India's "Genome Valley." The developing nations tend to focus on manufacturing operations but are seeking to expand into R&D as well.

#### Montgomery County's Competitive Advantages and Disadvantages

Montgomery County has a total of 223 bioscience companies located across the county, but concentrated in the I-270 Corridor. The county's biotech industry stands out in R&D and biotech therapeutics with a particular niche of in vitro diagnostics.

Montgomery County competes with several other regional locations, most significantly, Frederick County and Baltimore. Frederick County benefits from its I-270 Corridor location and expansion from Montgomery County. Its greater availability of land at lower prices has attracted MedImmune and others to establish production facilities there. Baltimore is now home to two new university-affiliated bioscience research parks. The University of Maryland BioPark is a highly urban development park on 10 acres adjacent to downtown Baltimore. In East Baltimore, Forest City Corporation is developing a 31-acre Science + Technology Park at Johns Hopkins in cooperation with the State, the City of Baltimore and Johns Hopkins University. Its initial development has accommodated major Johns Hopkins centers and private biotech companies.

Montgomery County and Gaithersburg West, in particular, excel in many of the key locational criteria for early-stage, second-stage and mature companies other than production facilities, again largely focused on "red" biotech of human medicine.

- Research universities and institutes 50 Federal life science research-intensive institutions, Johns Hopkins University, and the National Institute of Standards and Technology (NIST).
- Regulatory agencies Access to the FDA.
- Educated and experienced workforce.
- Experienced entrepreneurs A slowly developing cadre of experienced biotechnology entrepreneurs; however, the county still lags in comparison to other regions with a longer history of life science companies and an entrepreneurial environment.
- Specialized business support Specialized services to biotech companies.
- Access to capital –Washington/Baltimore has a growing venture capital community capable of supporting some of Montgomery County's biotech companies. However, these firms have invested less locally than have those in comparable regions, possibly due to the county's limited supply of experienced entrepreneurs with industry expertise.
- Specialized facilities Laboratory and incubator space available for lease.

Some of the factors that may be inhibiting the industry's growth in Gaithersburg West include:

- Limited transit service –Most workers must drive to work, drive to eat out and drive to meet with other companies.
- Traffic congestion and internal circulation.
- Limited retail opportunities Limited choice of nearby restaurants, though the selection has improved in the last few years.
- Sterility of the office park environment Some companies, such as United Therapeutics in Silver Spring, choose to locate in more urban environments with greater levels of diverse activity and the opportunity to walk to restaurants, retail, entertainment, Metro and nearby housing.

### **Future Demand and Opportunities**

Growth projections are fraught with difficulty in a young industry with such diversity of company types and maturity levels. Based on industry growth trends in Maryland, PES projects that the industry could grow from the 2007 level of 12,000 private industry employees in Montgomery County to 16,200 employees by 2025. Within Gaithersburg West, the employee base is projected to shift from 33 percent of the county total (4,000 employees) in 2007 to 29 to 47 percent of the county total depending on the introduction of transit and mixed-use development as well as competitive development elsewhere in the county (Bethesda, Rockville, Germantown, Silver Spring and White Oak). That share would translate into 4,700 to 7,600 bioscience employees in Gaithersburg West by 2025.

Gaithersburg West will continue to compete well in the bioscience field, but each year the competition will increase from regional, other domestic and international clusters. Gaithersburg West's greatest strength will be internally generated growth from its existing base of companies. The ability to capitalize on that potential requires access to financial capital, appropriate facilities, mentoring, technical support, a favorable regulatory environment and incentives to help developing companies.

Critical to the competition for biotech growth is the ability to attract talent – both scientific and entrepreneurial. The county's high quality of life is important in attracting new workers and in retaining existing researchers and scientists when they decide to start a company. Also important is a supportive and appealing work environment. The pattern of single-use development works against 1) walkable environments where retail and other support uses are close enough to access on foot or on bicycle rather than being forced to drive and 2) the density of employees and residents needed to support a vibrant business base.

The vision for Gaithersburg West as a higher density village could be quite effective in helping the county attract and retain knowledge workers – the key to long-term prosperity in the evolving knowledge economy.

The transition to the new paradigm of mixed-use, walkable development will take time, however. The sector is relatively built out in that most of the available land parcels have been developed. However, the scale and density of that development leave open the opportunity for selective infill to replace parking lots with parking garages and new multistory buildings. Some redevelopment will be possible, though laboratory improvements are too expensive to demolish in great numbers. More likely will be new development in environments in which density and transit are designed from the beginning – the Belward campus and the redevelopment of the Public Safety Training Academy.

As biotech evolves to include a higher percentage of office space, it will be easier to accommodate in higher-density developments. Laboratory space can be effectively accommodated in multi-story buildings designed for that use; however, such buildings come with a higher price tag and are more complex to adapt. Most tenants and developers have favored one- and two-story buildings due to their cost and flexibility for reconfiguration. In the near- and mid-term, bioscience lab buildings are likely to remain at primarily two stories. Going forward, the demand is likely to break down 40 to 45 percent in flex space and 55 to 60 percent in office space.

It will also take time to change due to the relatively slow pace of development for the biotech industry. Employment projections presented above suggest an average annual increase in demand of 70,000 to 105,000 square feet. In the first few years, that will be absorbed largely by the existing vacant space in the market. Also, land economics require a high land value in order to justify construction of structured parking rather than less expensive surface parking lots. That value calculation may postpone intensive infill for some years. Introduction of the Corridor Cities Transitway will help to ease that transition by increasing demand and allowing a reduction in the number of parking spaces required.

The long-term future of Gaithersburg West will be best served by concentrating a mix of land uses at the new transit stations so as to create a knowledge community with places to live, work, eat and interact, while facilitating pedestrian and bicycle movements and reducing dependence on the private automobile.

# I. Introduction

The Montgomery County Planning Department has prepared a draft Master Plan for Gaithersburg West – the core of the I-270 Corridor. The plan calls for a shift from a Life Sciences Center zoning focused on single uses – office, flex industrial, laboratory and educational uses – to a mixed-use concept that also allows significant retail and residential development. The goal is to achieve a better jobs/housing balance while creating attractive mixed-use environments that allow people to live, work, shop and recreate in a walkable community that reduces dependence on single-passenger automobile travel. The new proposed zoning would allow an increase in maximum density from the current 12.9 million square feet to 20 million square feet.

In considering this major shift in land use policy, the Planning Board has asked what are the potentials for additional biosciences development and what portion of the new development is likely to be used for bioscience operations. This resulting report is organized as follows:

- Section II profiles the biotechnology industry, the life cycles of typical biotech companies and their locational patterns, and key biotech clusters around the world.
- Section III focuses on Montgomery County, its base of biotech companies, related real estate trends and its competitive advantages and disadvantages.
- Section IV evaluates the regional competition.
- Section V projects future demand for biotech-related development.
- Section VI evaluates the five Gaithersburg West subareas and their potentials for future biotech development.

This analysis relies largely on secondary data with selected interviews with individuals and organizations involved in the local and regional life sciences industry.
# **Biotechnology Industry**

As defined by the U.S. Department of Commerce and the Biotechnology Industry Association, biotechnology is the "application of molecular and cellular processes to solve problems, conduct research, and create goods and services."<sup>1</sup> Experts often talk about biotechnology sectors as "red", "green" and "white" where "red" refers to medically-related biotechnology focused on understanding and treating diseases. "Green" includes agricultural biotechnology oriented to plants and animals. "White" refers to applications for industrial purposes, including creating and modifying enzymes for bioremediation and the efficient production of biofuels. Historically, Montgomery County's activity has focused on the "red" segment of medically-related biotech, R&D, therapeutics, tools and diagnostics.

Globally, the industry now includes an estimated 4,414 companies. Of that total, 798 are publicly held companies with total revenues of \$84.8 billion in 2007, \$31.8 billion in research & development expenditures and a net loss of \$2.7 billion.<sup>2</sup> Still in its early stages, the industry has failed to generate consistent profits due largely to the high costs and long lead time required to bring products to market. The United States dominates the market with 77 percent of the total revenues, 81 percent of the global R&D expenditures and 10 percent of the net losses. Though large, the industry is dwarfed by size of pharmaceutical industry.

## **Business Life Cycle**

Biotechnology companies focused on therapeutics and human medical applications typically progress through several life cycle stages:

- Research
- Discovery of a promising gene or technology
- Proof of concept
- Scale-up manufacturing
- Clinical trials
- Approval by the U.S. Food & Drug Administration
- Production

<sup>&</sup>lt;sup>1</sup> Biotechnology Industry Organization, *"Guide to Biotechnology, 2008."* www.bio.org/speeches/pubs/er/

<sup>&</sup>lt;sup>2</sup> Ernst & Young, *Beyond Borders: Global Biotechnology Report 2008,* <u>www.ey.com/Publication/vwLUAssets/Industry\_Biotechnology\_Beyond\_Borders\_2008/\$FILE/Biotechnology\_Beyond\_Borders\_2008.pdf</u>

That progression typically requires 10 years or more from the initial discovery given the lengthy testing and review process required before a drug can be brought to market. Only one in thousands of discoveries ever reach production.

The scale of money is astounding, involving \$100 million or more to bring a drug to market. So the availability of financing for high-risk ventures is critical to company success. Currently, the national and international financing crisis is impacting biotech companies, many of which are finding it much more difficult to secure financing to expand their R&D and product development. The failure of the industry to live up to the lofty expectations of high profits in a short timeframe also has restricted the flow of necessary funds. In the first quarter of 2009, venture capital investment in the life sciences sector (biotech and medical devices) dropped 40 percent in amount from the fourth quarter of 2008.<sup>3</sup>

Funding options for early-stage companies during the research stage are relatively limited – typically involving federal Small Business Innovation Research (SBIR) grants, personal savings, and investment by family and friends. Once a discovery is made, it is subjected to a proof of concept study to demonstrate clinical efficacy with a small number of patients. This study seeks to test quickly for clinical efficacy and toxicity and provide information for a potential go/no go decision. Proof of concept funding is often the most difficult funding to attract at this very early stage of product development.

Once a promising innovation or discovery is achieved and the concept proven, the company is better able to compete for investment, reaching out to "angel" investors, that is, individual high-wealth investors who often have personal knowledge of the industry and an ability to assess the potential value of the innovation. Major pharmaceutical companies are increasingly entering into strategic alliances with smaller biotechnology firms to take advantage of their innovation and research skills. They may fund the firms' research and clinical trials. These trials subject the new compound to rigorous analysis on a much larger scale to determine efficacy, appropriate dosage and treatment protocols, toxicity and specific populations that will benefit. These trials and the review process by the U.S. Food and Drug Administration (FDA) take several years to complete with no assurance of a positive outcome. Recently, the Merck, Eli Lilly, Pfizer, and Johnson & Johnson pharmaceutical firms created a new venture fund to search for innovative ways to test drugs without human trials so as to reduce the huge cost of bringing a drug to market.

Venture capital firms have been major sources of capital funding for the industry, but they are most interested in companies likely to attract major investors within five years – i.e., companies that are likely to be ready for acquisition by a major pharmaceutical firm or for going public through an Initial Public Offering. More often, companies are acquired by

<sup>&</sup>lt;sup>3</sup> PricewaterhouseCoopers and the National Venture Capital Association, *MoneyTree Report*, <u>https://www.pwcmoneytree.com/MTPublic/ns/moneytree/filesource/exhibits/Moneytree%20Report%2</u> <u>0Q1%202009.pdf</u>

major pharmaceutical firms that need the research capabilities, innovation and discoveries of small biotech companies to fill their pipeline of new drugs.

Upon completion of clinical trials and receipt of FDA approval, biotech companies that are still independent are most likely to license their innovation to a major pharmaceutical firm. Some pursue an Initial Public Offering (IPO) and go public to raise capital, but few biotech companies have the financial strength, manufacturing expertise and distribution network that will allow them to be fully integrated vertically. Most prefer to focus on their particular strengths of research and development, leaving production, marketing and distribution to other entities.

These life cycles apply most directly to health-related biotech companies. Companies focused on industrial applications of biotechnology are less constrained by the FDA approval process and follow somewhat different paths. To date, very few Maryland biotech firms have focused on this segment of the industry; however, the State has targeted bioagriculture, biofuels and nanotechnology for future growth.

#### **Locational Patterns**

The industry's locational patterns often reflect these life cycle stages. In the initial stages of development, the company's efforts typically focus on research. Their staffing is relatively small and heavily oriented to research scientists. At this stage, proximity to universities, institutes, major governmental entities (e.g., National Institutes of Health) and major research hospitals is highly valued. Many of the company founders come from major research institutions or universities and maintain their ties while developing new innovations with potential commercial value. For them, proximity to their institutional laboratory provides major time savings while also providing access to a valuable workforce of highly trained graduate students. Access to expensive equipment is also important to start-ups that cannot afford to buy their own. Facilities are smaller and company requirements change quickly. Incubator facilities which offer inexpensive, flexible space and business support services can be very important to companies at this stage.

Cambridge has developed an impressive concentration of biotech companies on the strength of access to Massachusetts Institute of Technology (MIT), Harvard and other scientists and graduate student workers. While Amgen and some other companies have retained their Cambridge location as they matured into major international corporations, second-stage companies involved in the clinical trials stage often elect to move to suburban locations along Route 128 with lower-cost and larger facilities, room for growth and easier commutes for the companies' managers and the full range of employees (not just the graduate students).

At maturity, most are acquired by large pharmaceutical companies. Acquisition by a major pharmaceutical company does not necessarily mean that the biotech company leaves its original location. The importance of retaining the scientific talent in an environment that encourages further innovation leads many companies to remain in place after acquisition rather than being absorbed into the major corporation and a corporate environment that may stultify innovation and entrepreneurial thinking.

However, the pattern of company acquisition or licensing of proven drugs to major pharmaceutical companies does mean that production operations are often separated physically from the biotech company's headquarters and R&D facilities. Pharmaceutical manufacturing has shifted through the recent decades to favor lower-cost areas such as the Research Triangle or international sites. Some Maryland firms have retained production facilities in the state, particularly pilot-scale production.

Site selection for a biotechnology company mirrors that of any industry because it is based on the comparative advantages of one location over another. While most biotechnology companies seek close proximity to world-class research institutions, a pool of skilled workers, and access to local capital, offering incentives can promote one location over another.

#### Incentives

Incentives offered to biotechnology companies typically feature several components of economic development programs created by most state and local governments in the past decade. Throughout this region many jurisdictions offer a mix of tax incentives, low-cost financing and creative financing. The tax incentives focus on research and development, job training, capital purchases (equipment, machines, etc.) and property or sales tax exemptions. The low-cost and creative financing mechanisms are more directed toward product development and construction financing. While each incentive package reflects the needs of a specific company and its location, most packages include some form of tax credits.

Many of the early stage companies need cash in hand more than a promise of tax credits. These types of biotech companies do not have high tax burdens and need incentives that more effectively meet their needs. A few jurisdictions – including New Jersey and Pennsylvania but not Maryland – allow such companies to cash in tax credits or trade the credits to other companies for cash. In all instances, these companies receive less than the full value, typically 65 percent of the credit value as cash in hand. These incentives make a difference in the survival of new biotechnology firms. While Maryland does not allow jurisdictions to cash in tax credits, both the Challenge Investment and Enterprise Investment programs help establish emerging biotechnology companies and those established businesses ready for the next stage of development.

In Maryland, the state's Biotechnology Investment Tax Credit, launched in 2006 provides small Maryland-headquartered biotechnology companies a 50-percent credit against State income taxes. The credit targets younger biotechnology companies in business for less than 12 years. The challenges in the venture capital market means that many biotech companies rely on this type of investment incentive to keep their operation running. On average each year the State receives 200 applications for the Biotechnology Investment Incentive Tax Credit. The program has attracted \$36 million in total capital investment for the first three years.

Recently increasing incentives for biotechnology companies reflect the promise of the industry and the belief of local governments that such jobs will create a spin-off impact on local and state economies. Several states now provide more flexible low-cost financing options with performance-based incentives. Such incentives may be used as a source of liquidity when companies operate at a loss in their first three to five years of operations. These incentives provide firms some of the flexibility and patience often needed to achieve ultimate success in a new venture.

#### **Industry Clusters**

Though the biotechnology industry is expanding around the world, it has shown great propensity for clustering in a select set of geographic locations. This clustering is driven largely by the need for specialized labor pool, advanced science, industry experience and financing. Human capital is the most critical resource; companies want to be able to reach out to a local market of skilled and experienced workers without having to recruit nationally and pay for relocation. Where recruitment is likely, it is important to be in a location that can attract the talent – regions with a good quality of life, good employment opportunities among other similar firms, continuing education opportunities and other amenities.

An in-depth analysis by the Brookings Institution<sup>4</sup> in 2002 identified nine key clusters of biotech activity in the United States that represent three-quarters of both large and new biotech companies. The majority of the industry's activity is focused in four metropolitan areas:

- Boston
- San Francisco
- New York
- Philadelphia

Building on the strength of MIT, Harvard, University of California-San Francisco and other major research institutions, Boston and San Francisco were early leaders in the development of the biotech industry. The New York and Philadelphia areas excel due to their long history of major pharmaceutical company headquarters and the availability of financial capital.

Emerging clusters of growing importance include:

• San Diego

<sup>&</sup>lt;sup>4</sup> The Brookings Institution Center on Urban & Metropolitan Policy, *Signs of Life: The Growth of Biotechnology Centers in the U.S.*, 2002, <u>www.brookings.edu/ES/urban/publications/biotech.pdf</u>

- Seattle
- Raleigh/Durham

These areas also have benefited from major research institutions, good quality of life and a strong technical workforce.

Rounding out the list are:

- Washington/Baltimore
- Los Angeles

The Washington/Baltimore area ranked eighth in 2002 by virtue of the mass of biotech companies that have spun out of and/or seek proximity to the National Institutes of Health (NIH), the FDA and other governmental institutions, including the Walter Reed Army Institute of Research, the United States Army Medical Research and Materiel Command and the National Cancer Institute at Fort Detrick, and the Uniformed University of Health Sciences. Also important are the research capabilities of Johns Hopkins University as well as several other well-respected medical and graduate science universities. Los Angeles' ranking is due primarily to the presence of Amgen, the world's largest biotech company.

Financing patterns further reinforce the competitive strength of existing biotech clusters. Biotech investors, who are largely focused in Boston, New York and San Francisco, favor investing in companies within a reasonable drive time so that they can stay actively involved in managing and guiding the companies.

Brookings reported that the growth of the late 1990s was most significant in the Boston, San Francisco, San Diego, Seattle and Raleigh/Durham metropolitan areas. These five areas accounted for 56 percent of new biotech companies and 75 percent of new venture capital invested in biopharmaceuticals from 1996 to 2001. That trend also is reflected in more recent data from Ernst & Young. In 2007, the San Francisco Bay Area had 77 public biotech companies – 20 percent of the nation's total. Another 16 percent were concentrated in New England with 11 percent in San Diego, 8 percent in New Jersey, 7 percent in New York state and 6 percent in the Mid-Atlantic (Maryland, DC and Virginia).

Internationally, biotechnology is continually globalizing as other countries capitalize on their science, industry and investments. Europe represented 15 percent of global industry revenues in 2007 with 40 percent of the publicly traded companies. Asia-Pacific generated 5 percent with 17 percent of public companies, and Canada provided 3 percent of industry revenues with 9 percent of public companies. The largest European clusters are currently focused in Cambridge, the Medicon Valley at the border between Sweden and Denmark, Switzerland and Paris. In Canada, the three finance centers – Montreal, Toronto and Vancouver – dominate the industry. Singapore has been very aggressive in pursuing and funding international experts to open regional facilities in its Biopolis development. Other emerging clusters exist in Sydney, Melbourne, Tokyo, Hong Kong, Shanghai, Beijing, Brazil, and India's "Genome Valley." The developing nations tend to focus on manufacturing operations but are seeking to expand into R&D as well. Most focus on "red" biotechnology. However, Finland, Denmark and Japan stand out in "white" applications of biotechnology to industrial uses. "Green" biotechnology has largely focused around major companies, such as Monsanto and DuPont. India and China are also involved in agribio applications, which are largely banned in Europe.

# **III. Montgomery County Conditions**

Montgomery County has a total of 223 bioscience companies located across the county, but concentrated in the I-270 Corridor. Table 1 on the following page shows the number of companies by type and location. The county's biotech industry stands out in R&D and biotech therapeutics with a particular niche of in vitro diagnostics. Local businesses and institutions led the mapping of the human genome, providing a surge of activity in the early part of the decade and an invaluable research resource. That resource base positions Montgomery County to benefit from the evolution toward personalized medicine, where treatments are tailored based on the patient's individual genetic makeup.

The county has an estimated inventory of 6.65 million square feet of space for biotech companies with the following approximate breakdown of space by building type:

Flex	49%
Office	45%
Industrial	6%

With the growing field of bioinformatics, more of the biotech activity is shifting from the laboratory to computers, allowing for a greater utilization of office space rather than flex buildings outfitted for laboratories.

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	Serv	rices	Therap	eutics	Medical To	echnology	Service/ C	onsulting	Engine	ering	Other B	liotech	
Location	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Total
Baltimore	18	11.6%	14	15.2%	ŋ	13.2%	9	12.8%	9	11.1%	4	18.2%	53
Bethesda	1	0.6%	с,	3.3%	2	5.3%	10	21.3%	ŝ	5.6%	•	0.0%	19
College Park	0	0.0%	1	1.1%	0	0.0%	0	0.0%	1	1.9%	1	4.5%	3
Columbia	14	9.0%	2	2.2%	3	7.9%	1	2.1%	7	13.0%	2	22.7%	32
Frederick	17	11.0%	4	4.3%	1	2.6%	7	4.3%	9	11.1%	5	9.1%	32
Gaithersburg	21	13.5%	22	23.9%	2	5.3%	1	2.1%	80	14.8%	5	9.1%	56
Germantown	8	5.2%	4	4.3%	1	2.6%	7	4.3%	0	0.0%	1	4.5%	16
Rockville	53	34.2%	31	33.7%	80	21.1%	14	29.8%	7	13.0%	1	4.5%	114
Silver Spring	0	0.0%	1	1.1%	1	2.6%	7	4.3%	1	1.9%	1	4.5%	9
<b>Other Maryland Locations</b>	23	14.8%	10	10.9%	15	39.5%	6	19.1%	15	27.8%	ы С	22.7%	77
	155		92		38		47		54		22		408
County													
Baltimore City	18	11.6%	14	15.2%	5	13.2%	9	15.8%	9	11.1%	4	18.2%	53
Baltimore	2	1.3%	7	2.2%	2	5.3%	7	5.3%	7	3.7%	7	9.1%	12
Frederick	17	11.0%	4	4.3%	1	2.6%	7	5.3%	9	11.1%	7	9.1%	32
Howard	14	9.0%	7	2.2%	ĉ	7.9%	1	2.6%	2	13.0%	ю	22.7%	32
Montgomery	85	53.5%	63	66.3%	16	36.8%	31	81.6%	21	35.2%	2	31.8%	223
Prince George's	0	0.0%	1	1.1%	0	0.0%	0	0.0%	1	1.9%	1	4.5%	3
Other Maryland Counties	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	-
	155		92		38		47		54		22		408
Note: Locations coded base	d on mailir	ng address.											
Source: USA Life Science I	<u>Jatabase; F</u>	artners for	Economic	Solutions.	2009.								

# Office and R&D Development Trends

CoStar tracks the inventory and performance of office and industrial buildings in the region, the county and key subareas. It characterizes lab buildings within its category of R&D/flex space.

#### **Montgomery County**

The history of office development and absorption trends since 2000 show a significant slowing in new development since 2004 and in absorption over the last two years. Table 2 shows both R&D/lab space in flex industrial buildings and total office space for the county and the metropolitan area as a whole. Since 2000, Montgomery County's total office space inventory has grown by 9.9 million square feet or 17.9 percent to a 2008 total of 65.3 million square feet. The county's office development lagged the metropolitan area, which grew by 21.8 percent from 2000 through 2008. New construction averaged 1,255,000 square feet annually – ranging from 3.3 to 30.4 percent of the region's annual office construction. During this decade, the county's share of the region's office inventory has declined from 15.8 to 15.2 percent with the expansion of markets in Northern Virginia and other jurisdictions.

In terms of demand, absorption<sup>5</sup> of Montgomery County office space totaled 7.1 million square feet from 2000 through 2008, an average of 786,000 square feet annually. With absorption running slower than new construction, occupancy rates in the county's office space fell from 94.4 percent in 2000 to 89.0 percent in 2008 and continued to fall to 88.5 percent in the first quarter of 2009 with an additional 325,000 of occupied space vacated.<sup>6</sup> The metropolitan area suffered a similar fate as new construction outran demand. The County now has 7.5 million square feet of vacant office space. That vacant space has the following breakdown by class of space:

Class of	Square Feet	Percent	Percent of
Space	Vacant	Vacant	Vacant Space
А	4,000,214	12.7%	53.3%
В	2,904,381	10.7%	38.7%
$\mathbf{C}$	594,619	8.6%	7.9%

For R&D/lab space in flex industrial buildings, county development trends have been constrained by a lack of available sites and competition from other land uses that return a higher value to the property owner. The county's inventory of 2.79 million square feet of space has grown by 11.1 percent or 310,000 square feet since 2000. Somewhat under onehalf (44.5 percent) of the region's total supply of R&D/lab space is located in Montgomery County. Over the same period, occupied space grew by only 6.1 percent. From 2000

<sup>&</sup>lt;sup>5</sup> Increase in occupied space.

<sup>&</sup>lt;sup>6</sup> Typically, a healthy office market will have occupancies close to 95 percent.

through the first quarter of 2009, the county captured only one-quarter of the total regional net absorption.

The county's market absorbed 208,000 square feet of R&D/lab space while developers built an additional 605,000 square feet of lab space in flex buildings. R&D/lab space occupancy fell from 85.5 percent in 2000 to 80.5 percent in the first quarter of 2009.

Tal	ole 2: Office ar	nd R&D/Flex	Space Trend	ls, Montgome	ery County a	nd the Washi	ngton Metrop	olitan Area,	2000-1st Qu	arter, 2009		
							,				2000-2008	Change
	2000	2001	2002	2003	2004	2005	2006	2007	2008	1 Qtr, 2009	Amount	Percent
Montgomery County R&D Lab/F	rlex Space											
Total Square Feet (4th Quarter)	2,477,476	2,497,676	2,497,676	2,497,676	2,497,676	2,787,588	2,787,588	2,787,588	2,787,588	2,787,588	310, 112	12.5%
New Construction	294, 397	20,200	0	0	0	289,912	0	0	0	0	NA	NA
Total Occupied Square Feet	2,118,569	2,019,569	2,195,873	2,010,800	2,137,965	2,468,762	2,399,535	2,302,224	2,256,517	2,243,269	137,948	6.5%
Occupancy Rate	85.5%	80.9%	87.9%	80.5%	85.6%	88.6%	86.1%	82.6%	80.9%	80.5%	-4.6%	-5.3%
Net Absorption	83,420	(000,66)	176,304	(185,073)	127,165	330,797	(69, 227)	(97, 311)	(45,707)	(13, 248)	NA	NA
Average Rate (triple net)	\$15.64	\$26.42	\$19.43	\$18.62	\$18.65	\$24.97	\$24.81	\$24.61	\$24.04	\$24.03	\$8.40	53.7%
Share of Total Office Inventory	4.3%	4.2%	4.0%	3.9%	3.8%	4.2%	4.2%	4.1%	4.1%	4.1%	0	-4.4%
Share of Occupied Office Space	3.9%	3.7%	4.0%	3.6%	3.7%	4.1%	4.0%	4.2%	3.7%	3.7%	-0.2%	-4.1%
Share of Total New Office Space	17.8%	0.9%	0.0%	0.0%	0.0%	49.5%	0.0%	0.0%	0.0%	#DIV/0!	NA	NA
Share of Metro R&D Space	47.8%	47.0%	47.0%	46.8%	46.3%	48.6%	47.9%	47.5%	44.7%	44.5%	-3.1%	-6.4%
Share of Metro Occupied R&D	47.7%	48.2%	49.3%	47.2%	45.7%	49.8%	45.8%	46.4%	43.4%	43.5%	-4.3%	-9.1%
Washington Metro Area R&D L	ab/Flex Space											
Total Square Feet (4th Quarter)	5,184,987	5,308,953	5,308,953	5,334,352	5,393,295	5,737,105	5,820,329	5,871,448	6,234,620	6,258,870	1,049,633	20.2%
New Construction	362,095	123,966	0	77,057	58,943	343,810	83,224	51,119	363, 172	24,250	NA	NA
Total Occupied Square Feet	4,439,548	4,192,034	4,456,688	4,257,009	4,679,997	4,960,775	5,235,932	4,956,647	5, 199, 229	5,154,248	759,681	17.1%
Occupancy Rate	85.6%	79.0%	83.9%	79.8%	86.8%	86.5%	90.0%	84.4%	83.4%	82.4%	-2.2%	-2.6%
Net Absorption	109,367	(247, 514)	264,654	(199, 679)	422,988	280,778	275,157	(279, 285)	242,582	(44, 981)	NA	NA
Average Rate (triple net)	\$12.03	\$19.91	\$14.44	\$13.90	\$16.05	\$20.25	\$20.56	\$19.79	\$19.57	\$19.09	\$7.54	62.7%
Share of Total Office Inventory	1.5%	1.4%	1.4%	1.4%	1.4%	1.4%	1.4%	1.4%	1.4%	1.4%	0.0%	-1.2%
Share of Occupied Office Space	1.3%	1.3%	1.3%	1.2%	1.3%	1.4%	1.4%	1.3%	1.4%	1.3%	0.0%	2.3%
Share of Total New Office Space	4.6%	0.9%	0.0%	1.3%	0.8%	4.7%	0.7%	0.6%	3.7%	3.0%	NA	NA
Total Montgomery County Offic	e Space											
Total Square Feet	55, 351, 536	57, 647, 409	59,412,188	61,202,932	62,702,320	62,998,558	63,409,557	64,401,375	65, 285, 880	65, 285, 880	9,934,344	17.9%
New Construction	1,359,868	2,295,873	1,764,779	1,790,744	1,499,388	296, 238	410,999	991,818	884,505	0	NA	NA
Total Occupied Square Feet	52, 255, 050	51,918,533	52, 423, 356	54,069,957	56,028,549	57, 308, 076	58, 252, 465	52, 359, 369	58,107,562	57,782,714	5,852,512	11.2%
Occupancy Rate	94.4%	90.1%	88.2%	88.3%	89.4%	91.0%	91.9%	81.3%	89.0%	88.5%	-5.4%	-5.7%
Net Absorption	1,404,917	(336, 517)	499,544	1,474,060	1,952,592	1,279,527	944, 389	106,904	(251, 807)	(324, 848)	NA	NA
Average Rate (full service)	\$28.35	\$28.13	\$27.42	\$26.28	\$25.62	\$25.70	\$27.32	\$28.97	\$29.16	\$28.89	\$0.81	2.9%
Share of Metro Space	15.8%	15.8%	15.8%	16.0%	16.1%	15.9%	15.5%	15.4%	15.3%	15.2%	-0.5%	-3.1%
Share of Metro Occupied Space	15.8%	15.8%	15.9%	16.0%	16.1%	15.8%	15.7%	13.9%	15.4%	15.3%	-0.5%	-2.9%
Share of Metro New Space	18.2%	16.3%	15.1%	30.4%	21.5%	4.2%	3.3%	11.1%	9.5%	0.0%	NA	NA
Total Washington Metro Area O	ffice Space											
Total Square Feet	351, 189, 580	365, 286, 140	377,002,656	382,889,104	389, 853, 314	396,847,400	409, 298, 610	418, 236, 694	427, 579, 866	428, 365, 996	76, 390, 286	21.8%
New Construction	7,452,421	14,096,560	11,716,516	5,886,448	6,967,710	6,990,586	12,451,210	8,932,874	9, 333, 172	786, 130	1,880,751	25.2%
Total Occupied Square Feet	330, 361, 469	328,004,694	330,096,366	338, 162, 265	348,862,865	362, 292, 778	371, 413, 529	377,073,656	378, 222, 264	377,601,679	47,860,795	14.5%
Occupancy Rate	94.1%	89.8%	87.6%	88.3%	89.5%	91.3%	90.7%	90.2%	88.5%	88.1%	-5.6%	-6.0%
Net Absorption	10, 147, 104	(2, 360, 445)	2,086,393	7,913,062	10,700,600	13,429,159	9,124,257	5,660,127	1,148,608	(620, 585)	NA	NA
Average Rate (full service)	\$30.59	\$29.78	\$28.69	\$28.31	\$29.56	\$30.46	\$32.08	\$33.34	\$33.25	\$32.86	\$2.66	8.7%
Sources: CoStar; Partners for Econc	mic Solutions, 20	009.										

**Shady Grove Life Sciences Center, Gaithersburg and Rockville Submarkets** The Shady Grove Life Sciences Center, which dominates the Gaithersburg West business district, has a total of 3.9 million square feet in office buildings – a growth of 3.9 million square feet of 1.6 million square feet or 69 percent since 2000. Tenants occupy 3.3 million or 86.2 percent of that space. The occupancy rate has fallen from 92.9 percent in the fourth quarter of 2000 due to the extensive construction from 2002 to 2004. Also relevant to the analysis are trends in Gaithersburg and Rockville which border the Life Sciences Center.

The Gaithersburg and Rockville submarkets' office inventories have grown significantly since 2000 while their R&D/lab space inventory has remained static. Gaithersburg and Rockville have 6.0 million and 8.9 million square feet of office space, respectively. (See Table 3.) That represents 23 percent of the county's total office supply. New construction added 2.85 million square feet of office space from 2000 through 2008. Over the same time period, the market absorbed only 1.1 million square feet. Occupancy rates dropped almost 10 percentage points to 83.1 percent in Gaithersburg in 2009 and 7 percentage points to 87.3 percent in Rockville. Since the end of 2006, net absorption has been negative with Gaithersburg losing 306,000 square feet of occupied space and Rockville losing 184,000 square feet.

The Shady Grove Life Sciences Center also has an inventory of 746,000 square feet of R&D/lab space in flex buildings – 26.8 percent of the county's total. Occupancy increased from 453,000 square feet in 2000 to 700,000 square feet in 2005 before declining to 580,000 square feet in the first quarter of 2009. Because almost 290,000 square feet of space was added to the inventory in 2005, the occupancy rate fell from 99.4 percent in 2000 to 77.8 percent in 2009. Gaithersburg has a total inventory of 1.18 million square feet of R&D/lab space in flex industrial buildings as compared with Rockville's inventory of 258,000 square feet. Occupancy of Gaithersburg space increased significantly in the face of no increase in supply, growing from 71.6 percent in 2000 to 86.7 percent in the first quarter of 2009. Rockville's occupancy fell from 98.3 percent to 67.1 percent over the same time period with the movement of several FDA operations to White Oak. Together, these three subareas represent more than three-quarters of the county's total inventory of R&D/lab space in flex buildings.

Model         Model <th< th=""><th></th><th></th><th>Table 3: Offic</th><th>e and R&amp;D/I</th><th>lex Space Tr</th><th>rends, Gaithe</th><th>rsburg and R</th><th>ockville, 200</th><th>0-1st Quarte</th><th>ır, 2009</th><th></th><th></th><th></th></th<>			Table 3: Offic	e and R&D/I	lex Space Tr	rends, Gaithe	rsburg and R	ockville, 200	0-1st Quarte	ır, 2009			
Total Constraint         C		0000	1000	6006	6006	FOOG	3006	9006	2006	0000	1 0th	2000-2008 C	hange Desert
Tent control         Contro         Control         Control	Shady Grove Life Sciences Cente	er R&D Lab/F	lexSpace	7007	2002	2004	2000	20002	1007	0007	T 4002	armounter	recent
Construction: <ul> <li>Construction:         <ul> <li>Construction:             <ul> <li>Construction:                 <ul> <li>Construction:                     <ul> <li>Construction:                     <ul> <li>Construction:                     <ul> <li>Construction:                     <ul> <li>Construction:                     <ul> <li>Construction:                        <ul> <li>Construction:                               <li>Construction:</li></li></ul></li></ul></li></ul></li></ul></li></ul></li></ul></li></ul></li></ul></li></ul></li></ul>	Total Square Feet (4th Quarter)	455,929	455,929	455,929	455,929	455,929	745,841	745,841	745,841	745,841	745,841	289,912	63.6%
Tead         Tead <th< td=""><td>New Construction</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>289,912</td><td>0</td><td>0</td><td>0</td><td>0</td><td>NA</td><td>NA</td></th<>	New Construction	0	0	0	0	0	289,912	0	0	0	0	NA	NA
Contractional and the proper contractional and the proper contraction	Total Occupied Square Feet	453,329	449,929	443,379	411,916	411,916	700,257	610,712	584,556	580,073	580,073	126,744	28.0%
Matchellic         Matchel	Occupancy Rate	99.4%	98.7%	97.2%	90.3%	90.3%	93.9%	81.9%	78.4%	77.8%	77.8%	-21.7%	-21.8%
Marcy for the part of the part	Net Absorption	100	(3,500)	(6,550)	(31, 463)	0	288,341	(89,545)	(26, 156)	(4, 483)	0	NA	NA
The effective for the former of the fo	Average Rate (triple net)	NA	NA	NA	\$29.48	\$23.16	\$30.58	\$28.93	\$29.11	\$29.50	\$29.50	NA	NA
Interfactor         2.3.14         2.3.44 <th2.3.44< th=""> <th2.3.44< th=""> <th2.3.4< td=""><td>Share of County R&amp;D Space</td><td>18.4%</td><td>18.3%</td><td>18.3%</td><td>18.3%</td><td>18.3%</td><td>26.8%</td><td>26.8%</td><td>26.8%</td><td>26.8%</td><td>26.8%</td><td>8.4%</td><td>45.4%</td></th2.3.4<></th2.3.44<></th2.3.44<>	Share of County R&D Space	18.4%	18.3%	18.3%	18.3%	18.3%	26.8%	26.8%	26.8%	26.8%	26.8%	8.4%	45.4%
Teacher in the fully barries         1 \$ \$ 1.0	Share of County Occupied R&D	21.4%	22.3%	20.2%	20.5%	19.3%	28.4%	25.5%	25.4%	25.7%	25.9%	4.3%	20.1%
Tick start before         1134/361 <td>Gaithersburg R&amp;D Lab/FlexSpa</td> <td>ee</td> <td></td>	Gaithersburg R&D Lab/FlexSpa	ee											
Constraint in the constr	Total Square Feet (4th Quarter)	1,184,086	1,184,086	1,184,086	1,184,086	1,184,086	1,184,086	1,184,086	1,184,086	1,184,086	1,184,086	0	0.0%
Ted former         Signed         Sig	New Construction	169,585	0	0	0	0	0	0	0	0	0	NA	NA
Currentine         111         Stand	Total Occupied Square Feet	847,556	1,012,025	1,077,083	884,409	988,563	990,063	978,345	973,615	1,036,690	1,026,435	189,134	22.3%
Net Absertion         Bible of Component         Bible of Com	Occupancy Rate	71.6%	85.5%	91.0%	74.7%	83.5%	83.6%	82.6%	82.2%	87.6%	86.7%	16.0%	22.3%
Amery Relay (equal)         31.03         S1.03         S1.04         S1.04 <td>Net Absorption</td> <td>(33,806)</td> <td>164,469</td> <td>65,058</td> <td>(192, 674)</td> <td>104,154</td> <td>1,500</td> <td>(11, 718)</td> <td>(4, 730)</td> <td>63,075</td> <td>(10, 255)</td> <td>NA</td> <td>NA</td>	Net Absorption	(33,806)	164,469	65,058	(192, 674)	104,154	1,500	(11, 718)	(4, 730)	63,075	(10, 255)	NA	NA
Share of Councy Regione         (T)	Average Rate (triple net)	\$16.29	\$16.25	\$16.23	\$17.20	\$19.43	\$20.49	\$19.83	\$19.29	\$21.62	\$21.49	\$5.33	32.7%
Section Resch         00%         201%         01%         201%         01%         201%         01%         201%	Share of County R&D Space	47.8%	47.4%	47.4%	47.4%	47.4%	42.5%	42.5%	42.5%	42.5%	42.5%	-5.3%	-11.1%
Description         Sec.12         Se	Share of County Occupied R&D	40.0%	50.1%	49.1%	44.0%	46.2%	40.1%	40.8%	42.3%	45.9%	45.8%	5.9%	14.8%
Tred bilar be (14) quarter)         26/12         56/12	Rockville R&D Lab/Flex Space												
New Concentration         No         0	Total Square Feet (4th Quarter)	258,122	258,122	258,122	258,122	258,122	258,122	258,122	258,122	258,122	258,122	0	0.0%
Thend         Comparing Name         Constrained Name	New Construction	0	0	0	0	0	0	0	0	0	0	NA	NA
Occupancy Telesis         0.933         0.733         0.733         0.000         1.0004         1.0004         0.6336         65.34         0.736 </td <td>Total Occupied Square Feet</td> <td>253,775</td> <td>252,102</td> <td>254,122</td> <td>252,102</td> <td>258,122</td> <td>258,122</td> <td>258,122</td> <td>194.108</td> <td>171.101</td> <td>173,108</td> <td>-82.674</td> <td>-32.6%</td>	Total Occupied Square Feet	253,775	252,102	254,122	252,102	258,122	258,122	258,122	194.108	171.101	173,108	-82.674	-32.6%
Net Absorption         (4.10) <th< td=""><td>Occupancy Rate</td><td>98.3%</td><td>97.7%</td><td>98.5%</td><td>97.7%</td><td>100.0%</td><td>100.0%</td><td>100.0%</td><td>75.2%</td><td>66.3%</td><td>67.1%</td><td>-32.0%</td><td>-32.6%</td></th<>	Occupancy Rate	98.3%	97.7%	98.5%	97.7%	100.0%	100.0%	100.0%	75.2%	66.3%	67.1%	-32.0%	-32.6%
Arrene fine trapie muth         81.01         91.01          81.20         81.01	Net Absorption	(4.347)	(1.673)	2.020	(2,020)	6.020	0	0	(64.014)	(23,007)	2,007	NA	NA
Share of County Station         10.6         10.36	Average Rate (triple net)	\$14.50	\$10.50	\$16.75	\$11.00	•	•	\$12.00	\$28.84	\$25.41	\$25.41	\$10.91	75.2%
Share of Counsi/ Couns	Share of County R&D Space	10.4%	10.3%	10.3%	10.3%	10.3%	9.3%	9.3%	9.3%	9.3%	9.3%	-1.2%	-11.1%
Total Shady Group (Shady Group (Shady Shady Group (Shady Shady Group (Shady Group (Shady Group (Shady Group (Shady Group (Shad))) $3.87.357$ $3.87.357$ $3.87.357$ $3.87.357$ $3.87.357$ $3.87.357$ $3.87.357$ $3.87.357$ $3.87.357$ $3.87.357$ $3.87.357$ $3.87.357$ $3.87.357$ $3.87.357$ $3.87.357$ $3.87.357$ $3.87.367$ <th< td=""><td>Share of County Occupied R&amp;D</td><td>12.0%</td><td>12.5%</td><td>11.6%</td><td>12.5%</td><td>12.1%</td><td>10.5%</td><td>10.8%</td><td>8.4%</td><td>7.6%</td><td>7.7%</td><td>-4.4%</td><td>-36.7%</td></th<>	Share of County Occupied R&D	12.0%	12.5%	11.6%	12.5%	12.1%	10.5%	10.8%	8.4%	7.6%	7.7%	-4.4%	-36.7%
Total Square fret $2,260,566$ $2,461,513$ $2,766,101$ $3,01,163$ $3,723,57$ $3,873,377$ $3,873,377$ $3,873,377$ $1,576,601$ $00,116$ New Construction $10,610$ $10,610$ $3,61,163$ $3,72,010$ $3,636,163$ $3,326,166$ $3,326,166$ $1,01,220$ $0,01,22$ New Abseryction $10,610$ $8,61,61$ $8,61,61$ $3,77,010$ $3,376,201$ $3,361,633$ $3,326,160$ $1,101,220$ $0,103$ New Abseryction $10,012$ $8,61,01$ $2,760,101$ $8,73,11$ $2,760,101$ $3,378,201$ $3,378,101$ $1,143$ New Abseryction $8,71,21$ $8,70,11$ $2,80,03$ $8,26,30$ $8,26,30$ $8,26,30$ $8,26,30$ $8,27,10$ $2,01,20$ New Abseryction $8,71,21$ $8,70,11$ $2,760,10$ $3,779,11$ $3,759,11$ $3,759,11$ $3,759,11$ $3,759,11$ $3,759,11$ New Abseryction $8,71,11$ $8,170$ $4,750$ $8,26,30$ $8,26,30$ $8,26,30$ $8,26,30$ $8,26,30$ $8,26,30$ $8,26,30$ New Abseryction $2,31,11$ $11,18,30$ $5,37,11$ $5,77,11$ $5,77,11$ $5,77,11$ $5,77,11$ $2,90,90$ $2,90,90$ New Construction $2,34,311$ $6,10,6,90,70$ $8,34,17$ $6,90,70,90$ $8,36,40$ $1,10,80$ $2,90,100$ New Construction $2,34,311$ $1,11,80$ $2,91,90$ $2,91,90$ $2,91,90$ $2,91,90$ $2,91,90$ New Construction $2,34,111$ $1,11,80$ $2,11,11,11,11,11,$	Total Shady Grove Life Sciences	Center Office	Space										
New Construction         (43)         (13) <td>Total Square Feet</td> <td>2.280.866</td> <td>2,431,513</td> <td>2.766.104</td> <td>3,401,162</td> <td>3,639,453</td> <td>3,693,453</td> <td>3,723,689</td> <td>3,785,357</td> <td>3,857,357</td> <td>3,857,357</td> <td>1.576.491</td> <td>69.1%</td>	Total Square Feet	2.280.866	2,431,513	2.766.104	3,401,162	3,639,453	3,693,453	3,723,689	3,785,357	3,857,357	3,857,357	1.576.491	69.1%
	New Construction	435,190	150,647	334,591	635,058	238,291	54,000	30,236	61,668	72,000	0	NA	NA
	Total Occupied Square Feet	2,190,342	2,274,903	2,560,994	3,111,606	3,378,239	3,326,013	3,156,206	3,361,653	3,281,601	3,326,095	1,091,259	49.8%
Net All         440.120         64.0120         64.061         286.083         37.9071         286.633         57.907         64.043         NA         NA           Share of County Offer Spice $37.30$ $37.90$ $37.90$ $55.96$ $57.96$ $55.96$ $57.96$ $55.96$ $57.96$ $55.96$ $57.96$ $55.96$ $57.96$ $55.96$ $57.96$ $55.96$ $57.96$ $55.96$ $57.96$ $55.96$ $57.96$ $55.96$ $57.96$ $55.96$ $57.96$ $55.96$ $57.96$ $55.96$ $57.96$	Occupancy Rate	96.0%	93.6%	92.6%	91.5%	92.8%	90.1%	84.8%	88.8%	85.1%	86.2%	-11.0%	-11.4%
	Net Absorption	460,129	84,561	286,089	379,071	266,633	(52,226)	(169, 807)	205,447	(80,052)	44,494	NA	NA
Share of Courty Office Space $4.1\%$ $4.7\%$ $5.\%$ $5.\%$ $5.9\%$ <td>Average Rate (full service)</td> <td>\$27.22</td> <td>\$27.90</td> <td>\$28.35</td> <td>\$26.28</td> <td>\$26.68</td> <td>\$25.97</td> <td>\$27.74</td> <td>\$26.99</td> <td>\$26.63</td> <td>\$27.01</td> <td>-\$0.59</td> <td>-2.2%</td>	Average Rate (full service)	\$27.22	\$27.90	\$28.35	\$26.28	\$26.68	\$25.97	\$27.74	\$26.99	\$26.63	\$27.01	-\$0.59	-2.2%
Share of County Occupied Space $4.3\%$ $4.4\%$ $4.9\%$ $5.8\%$ $6.4\%$ $5.6\%$ $5.6\%$ $1.5\%$	Share of County Office Space	4.1%	4.2%	4.7%	5.6%	5.8%	5.9%	5.9%	5.9%	5.9%	5.9%	1.8%	43.4%
Total Gaine Space           Total Space         5.233,935         5.786,035         5.791,133         5.786,035         5.791,133         5.786,035         5.731,131         5.786,033         5.791,133         5.786,033         5.791,133         5.786,033         5.791,133         5.786,330         5.786,330         5.791,1331         5.786,330         5.791,1331         5.786,330         5.791         5.786,330         5.716,101         7.716,101         7.776,170         7.776,170         7.776           Vectopment Square Feet         9.326, 9.92%         9.326, 9.32,18         8.513,21,795         5.293,017         6.010,579         6.010,579         7.716           Vectopment Square Feet         9.326         8.323,181         6.017.631         7.716	Share of County Occupied Space	4.2%	4.4%	4.9%	5.8%	6.0%	5.8%	5.4%	6.4%	5.6%	5.8%	1.5%	34.7%
	Total Gaithersburg Office Space												
New Construction $234,311$ $111,835$ $161,337$ $238,932$ $25,436$ $0$ $42,940$ $200,000$ $6,000$ $0$ $0$ NATotal Occupied Square Feet $4,80,017$ $5,041,656$ $5,041,656$ $5,041,567$ $5,032,007$ $5,017,011$ $114,2866$ $2.9786$ Total Occupied Square Feet $85,474$ $92.96$ $91.966$ $5,015,821$ $5,041,567$ $5,032,167$ $5,032,007$ $5,017,011$ $114,2869$ $2.9786$ Net Absorption $85,474$ $82.326$ $32.038$ $21.966$ $82.266$ $82.2461$ $82.347$ $82.347$ $83.326$ $9.376$ $9.376$ $9.786$ $10.567$ Net Absorption $85,474$ $82.32,90$ $82.366$ $9.2266$ $92.266$ $92.367$ <t< td=""><td>Total Square Feet</td><td>5,253,899</td><td>5,365,734</td><td>5,527,071</td><td>5,766,003</td><td>5,791,439</td><td>5,791,439</td><td>5,834,379</td><td>6,034,379</td><td>6,040,379</td><td>6,040,379</td><td>786,480</td><td>15.0%</td></t<>	Total Square Feet	5,253,899	5,365,734	5,527,071	5,766,003	5,791,439	5,791,439	5,834,379	6,034,379	6,040,379	6,040,379	786,480	15.0%
	New Construction	234,311	111,835	161,337	238,932	25,436	0	42,940	200,000	6,000	0	NA	NA
	Total Occupied Square Feet	4,880,171	5,044,565	5,081,882	5,296,249	5,198,154	5,321,795	5,323,181	5,151,554	5,023,007	5,017,031	142,836	2.9%
Net Abserption $85,774$ $164,334$ $22,038$ $21,436$ $11,657$ $(5,976)$ $NA$ </td <td>Occupancy Rate</td> <td>92.9%</td> <td>94.0%</td> <td>91.9%</td> <td>91.9%</td> <td>89.8%</td> <td>91.9%</td> <td>91.2%</td> <td>85.4%</td> <td>83.2%</td> <td>83.1%</td> <td>-9.7%</td> <td>-10.5%</td>	Occupancy Rate	92.9%	94.0%	91.9%	91.9%	89.8%	91.9%	91.2%	85.4%	83.2%	83.1%	-9.7%	-10.5%
Average Rate (full service) $$24.74$ $$22.36$ $$22.66$ $$22.66$ $$22.66$ $$22.66$ $$23.67$ $$23.67$ $$23.32$ $$23.20$ $$51.32$ $$5.33.67$ Share of Courdy Office Space $9.5\%$ $9.7\%$ $9.7\%$ $9.2\%$ $9.2\%$ $9.2\%$ $9.2\%$ $9.3\%$ $9.3\%$ $9.3\%$ $9.7\%$ $7.5\%$ Share of Courdy Office Space $9.5\%$ $9.7\%$ $9.7\%$ $9.3\%$ $9.3\%$ $9.3\%$ $9.3\%$ $9.3\%$ $9.7\%$ $7.5\%$ Total Rock-Tile Office Space $7.165.101$ $7.697.187$ $7.952.187$ $7.932.187$ $7.932.187$ $7.932.187$ $7.932.187$ $7.936.187$ $7.966.138$ $7.766.333$ $1.746.021$ $2.74\%$ Total Square Feet $7.166.101$ $7.697.187$ $7.952.187$ $7.932.187$ $7.192.187$ $8.90.1.122$ $8.901.122$ $1.746.021$ $2.4\%$ Vetal Rock-Tile Office Space $7.166.101$ $7.697.187$ $7.952.187$ $7.192.187$ $7.192.167$ $7.714.567$ $7.766.333$ $1.046.138$ $1.6\%$ Vetal Rock-Tile Office Space $7.66.738$ $7.719.216$ $7.766.333$ $1.046.138$ $1.6\%$ Vetal Rock-Tile Office Space $1.3.6\%$ $1.3.2\%$ $8.92.69$ $8.26.90$ $8.26.90$ $8.26.19$ $8.90.1.122$ $1.746.021$ $2.746$ Vetal Rock-Tile Office Space $1.3.6\%$ $1.3.2\%$ $8.92.16$ $9.2\%$ $9.2\%$ $9.2\%$ $9.2\%$ $9.2\%$ $9.2\%$ $9.2\%$ $9.2\%$ $9.2\%$ $9.2\%$ $9.2\%$ $9.2\%$ $9.2\%$ $9.2\%$ <td>Net Absorption</td> <td>85,474</td> <td>164,394</td> <td>32,038</td> <td>214,367</td> <td>(38,095)</td> <td>123,641</td> <td>1,386</td> <td>(171,627)</td> <td>(128,547)</td> <td>(5,976)</td> <td>NA</td> <td>NA</td>	Net Absorption	85,474	164,394	32,038	214,367	(38,095)	123,641	1,386	(171,627)	(128,547)	(5,976)	NA	NA
Share of County Office Space         9 3%	Average Rate (full service)	\$24.74	\$23.29	\$23.64	\$22.39	\$22.60	\$21.26	\$23.67	\$23.61	\$23.42	\$23.20	-\$1.32	-5.3%
Share of County Occupied Space $9.3\%$ $9.7\%$	Share of County Office Space	9.5%	9.3%	9.3%	9.4%	9.2%	9.2%	9.2%	9.4%	9.3%	9.3%	-0.2%	-2.5%
Total Rocrville Office Space           Toral Rocrville Office Space $7,166,101$ $7,697,138$ $7,952,187$ $7,952,187$ $7,952,187$ $7,952,187$ $7,952,187$ $7,952,187$ $7,952,187$ $7,962,187$ $7,962,188$ $8,429,023$ $8,419,012$ $8,901,122$ $1,745,021$	Share of County Occupied Space	9.3%	9.7%	9.7%	9.8%	9.3%	9.3%	9.1%	9.8%	8.6%	8.7%	-0.7%	-7.4%
	Total Rockville Office Space												
New Construction $8444$ $641,057$ $255,029$ $0$ $440,836$ $36,000$ $0$ $89,218$ $382,881$ $0$ $NA$ $NA$ Total Occupied Square Feet $6,728,038$ $6,813,113$ $7,114,792$ $7,719,276$ $7,96,055$ $7,766,353$ $1,046,518$ $15,68$ Total Occupied Square Feet $6,728,038$ $89,28,6$ $90,23,6$ $7,96,055$ $7,766,353$ $1,046,518$ $15,68$ Net Absorption $105,606$ $114,374$ $253,859$ $85,211$ $207,09$ $83,73,6$ $87,36$ $87,36$ $87,736$ $7,766,353$ $1,046,518$ $7,166,518$ $7,166,518$ $7,166,518$ $7,166,518$ $7,166,518$ $7,166,518$ $7,166,738$ $7,766,359$ $1,046,518$ $7,166,738$ $7,718,56$ $7,766,353$ $1,046,518$ $7,716$ $7,776,766,738$ $7,716,766,738$ $7,716,778$ $7,716,778$ $7,716,778$ $7,716,778$ $7,716,778$ $7,716,778$ $7,716,778$ $7,716,778$ $7,716,778$ $7,716,778$ $7,716,778$ $7,716,778$	Total Square Feet	7,156,101	7,697,158	7,952,187	7,952,187	8,393,023	8,429,023	8,429,023	8,518,241	8,901,122	8,901,122	1,745,021	24.4%
Total Occupied Square Feet         6.728.038         6.842.412         7.096.271         7.114.732         7.566         7.719.276         7.775.56         7.765.333         1.046.518         15.6%           Viet Moorthyin         105.606         89.2%         89.2%         99.2%         91.3%         7.719         7.6%         7.1%           Net Moorthyin         105.606         114.374         25.8.89         85.2%         90.2%         81.3%         9.6%         97.3%         7.71%         7.665.333         1.046.518         15.6%           Net Moorthyin         105.606         114.374         258.589         18.25.1         20.779         2.33.779         87.3%         87.3%         9.71%         NA         NA           Average Rate full service)         \$29.76         \$28.819         \$28.619         \$28.639         \$28.619         \$23.14         \$31.59         \$1.3.6%         7.71%           Share of County Office Space         12.9%         13.4%         13.4%         13.4%         13.4%         13.4%         53.649         \$5.7%           Share of County Office Space         12.9%         13.3.5%         13.3.5%         13.3.5%         13.4%         13.4%         5.5%	New Construction	86,484	541,057	255,029	0	440,836	36,000	0	89,218	382,881	0	NA	NA
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Total Occupied Square Feet	6,728,038	6,842,412	7,096,271	7,,114,792	7,566,733	7,719,276	7,950,055	7,706,176	7,774,556	7,766,353	1,046,518	15.6%
Nertage Rate (null service) 12.9% 11.4.7.4 20.509 15.021 20.109 11.5.7.19 05.509 05.509 05.509 11.4.7 05.509 05.50	Uccupancy Kate	94.0%	88.9%	89.2%	89.9%	90.2%	%9.T6	94.3%	90.06 %0.06	87.3%	81.3%	-0.1%	%T./-
Average fate (util service)         \$25.10         \$25.59         \$26.19         \$25.55         \$23.14         \$31.09 <td>Net Absorption</td> <td>105,606</td> <td>114,3/4</td> <td>253,859</td> <td>18,521</td> <td>2011,009</td> <td>152,543</td> <td>230,779</td> <td>(243,879)</td> <td>68,380</td> <td>(8,203)</td> <td>NA 22.20</td> <td>NA</td>	Net Absorption	105,606	114,3/4	253,859	18,521	2011,009	152,543	230,779	(243,879)	68,380	(8,203)	NA 22.20	NA
Starr of County Office Space         12.4%         13.4%         13.4%         13.4%         13.4%         13.4%         13.4%         13.4%         13.4%         13.4%         13.4%         13.4%         13.4%         13.4%         13.4%         13.4%         13.4%         13.4%         13.4%         13.5% <th< td=""><td>Average Kate (tull service)</td><td>\$29.76</td><td>\$28.31</td><td>\$28.69</td><td>\$26.99</td><td>\$26.39</td><td>\$26.19</td><td>\$28.85</td><td>\$32.14</td><td>\$31.99</td><td>\$31.09</td><td>\$1.83</td><td>6.1%</td></th<>	Average Kate (tull service)	\$29.76	\$28.31	\$28.69	\$26.99	\$26.39	\$26.19	\$28.85	\$32.14	\$31.99	\$31.09	\$1.83	6.1%
	Share of County Office Space	12.9%	13.4%	13.4%	13.0%	13.4%	13.4%	13.3%	13.2%	13.6%	13.6%	0.7%	0.0%0
	Share of County Occupied Space	12.9%	13.2%	13.0%	13.2%	13.0%	13.0%	13.6%	14.7%	13.4%	13.4%	0.9%	3.9%
	Sources: CoStar; Partners for Econo.	mic Solutions, 2	2009.										

Table 4 summarizes and compares current conditions across the Gaithersburg, Rockville, Montgomery County and metropolitan area markets.

Table 4: Office and R&D/Flex Space Conditions, Shady Grove Life Sciences Center, Gaithersburg, Rockville, Montgomery County and the Washington Metropolitan Area, March 2009

	Number of Buildings	Total Space	Vacant Space	Percent Vacant
Shady Grove Life Sciences Center				
Total Office Space	47	3,857,357	526,757	13.7%
R&D Lab/Flex Space	8	745,841	164,042	22.0%
R&D as Share of Total Space	14.5%	16.2%	23.7%	NA
Share of Total County Office Space	3.5%	5.9%	7.0%	NA
Share of Total County R&D Space	19.5%	26.8%	29.6%	NA
Gaithersburg				
Total Office Space	200	6,040,379	953,180	15.8%
R&D Lab/Flex Space	19	1,184,086	149,644	12.6%
R&D as Share of Total Space	8.7%	16.4%	13.6%	NA
Share of Total County Office Space	14.7%	9.2%	12.7%	NA
Share of Total County R&D Space	46.3%	42.5%	27.0%	NA
Rockville				
Total Office Space	186	8,901,122	1,186,189	13.3%
R&D Lab/Flex Space	5	258,122	85,014	32.9%
R&D as Share of Total Space	2.6%	2.8%	6.7%	NA
Share of Total County Office Space	13.7%	13.6%	15.8%	NA
Share of Total County R&D Space	12.2%	9.3%	15.3%	NA
Montgomery County				
Total Office Space	1,359	65,451,647	7,499,214	11.5%
R&D Lab/Flex Space	41	2,787,588	554,986	19.9%
R&D as Share of Total Space	2.9%	4.1%	6.9%	NA
Share of Total Metro Area Office Space	15.8%	15.2%	14.6%	NA
Share of Total Metro Area R&D Space	46.6%	44.5%	49.8%	NA
Washington Metro Area				
Total Office Space	8,580	430,120,773	$51,\!425,\!872$	12.0%
R&D Lab/Flex Space	88	6,258,870	1,115,124	17.8%
R&D as Share of Total Space	1.0%	1.4%	2.1%	NA
Note: Gaithersburg and Rockville subarea	ı boundaries con	form roughly to	the city limits.	

Sources: CoStar; Partners for Economic Solutions, 2009.

# **Biotech Jobs**

One of the reasons that Montgomery County is so competitive for biotech companies is its outstanding labor force of highly trained scientists and technicians. Obviously, the concentration of biotech workers also reflects the concentration of biotech companies in the county. The U.S. Census provides detailed information about the characteristics of individuals or units (households) with sample data from specific geographies. Unlike standard census tracts, these areas must contain a large enough sample size of persons to keep information confidential and reduce the margin of error when extrapolating trends. The I-270 corridor consists of three Public Use Microdata Areas (PUMAs) contained within the Super-PUMA 24102.<sup>7</sup> The map shows the boundaries for this area.



Montgomery County had 9,800 persons in traditional biotechnology occupations in 2000. Of that total, 65 percent live within the I-270 Corridor.

The biotechnology industry creates new jobs with the creation of a new company. The creation of new companies correlates closely with the availability of capturing venture capital dollars and the existing knowledge based infrastructure or spinoff from world-class research institutions. In 2005, authors Junfu Zhang and Nikesh Patel found that "more than half of the employment growth in biotech is attributable to new firms". In the State of Maryland, we've seen a small but steady amount of growth in the number of biotechnology firms from 360 in 2002 to 370, as reported in June of 2008.

<sup>&</sup>lt;sup>7</sup> U.S. Census Bureau, Census 2000 Public Use Microdata Sample files: 01002, 01003 and 01004.

Table 5. Biotechnolog	y and Relate	ad Occupati	ons by Juri	sdiction		
	I-270 Cc	orridor	Montgome	iry County	Maryland	U.S.
Biotechnology and Related Occupations	Number	Percent	Number	Percent	Percent	Percent
Biotechnology and Related Occupations						
Medical and Health Services Managers	1,841	0.61%	2,935	0.49%	0.39%	0.12%
Natural Sciences Managers	254	0.08%	254	0.04%	0.03%	0.00%
Biomedical and Agricultural Engineers		0.00%	'	0.00%	0.01%	0.00%
Chemical Engineers	108	0.04%	108	0.02%	0.02%	0.01%
Biological Engineers	1,275	0.42%	2,099	0.35%	0.10%	0.03%
Medical Scientists	2,404	0.80%	3,499	0.58%	0.20%	0.02%
Chemist and Materials Scientists	477	0.16%	791	0.13%	0.09%	0.02%
Biological Technicians	ı	0.00%	73	0.01%	0.01%	0.01%
Chemical Technicians	ı	0.00%	ı	0.00%	0.03%	0.03%
Total Biotechnology & Related Employees	6,359	2.11%	9,759	1.62%	0.88%	0.25%
Computer and Related Occupations						
Computer Scientists and Systems Analysts	4,295	1.42%	7,353	1.22%	0.95%	0.19%
Computer Programmers	3,918	1.30%	5,065	0.84%	0.42%	0.13%
Computer Software Engineers	6,207	2.06%	9,721	1.61%	0.92%	0.15%
Computer Support Specialists	875	0.29%	2,360	0.39%	0.40%	0.16%
Database Administrators	804	0.27%	1,595	0.26%	0.13%	0.02%
Network and Computer Systems Administrators	1,855	0.61%	2,612	0.43%	0.40%	0.06%
Network Systems and Data Communications	1,856	0.61%	3,782	0.63%	0.41%	0.10%
<b>Operations Research Analysts</b>	1,154	0.38%	2,071	0.34%	0.27%	0.19%
Miscellaneous Mathematical Science Occupations	737	0.24%	1,397	0.23%	0.10%	0.00%
Total Computer & Related Employees	21,701	7.19%	35,956	6.0%	4.0%	1.0%
Source: Public Use Microdata Sample; Partners for Ecc	onomic Solutic	ons, 2009.				

Biotechnology and related fields provide much higher wages than other occupations in the US and locally. This higher wage reflects the highly educated workers required by the industry. Within the US personal incomes average \$27,050 as compared to the I-270 corridor in Montgomery County in which the average income for all occupations averages \$32,467. As can be seen in the following table, biotech occupations pay significantly higher wages.

Table 6. Occupation by Income for	I-270 Corridor	
Biotechnology and Related Occupations	I-270 Corridor	U.S.
Medical and Health Services Managers	\$124,144	\$71,173
Natural Sciences Managers	\$345,996	\$100,049
Biomedical and Agricultural Engineers	n/a	\$85,731
Chemical Engineers	\$80,000	\$77,360
Biological Engineers	\$71,534	\$52,694
Medical Scientists	\$98,610	\$76,720
Chemist and Materials Scientists	\$122,468	\$66,653
Biological Technicians	n/a	\$39,202
Chemical Technicians	n/a	\$44,814
Computer Scientists and Systems Analysts	\$78,923	\$66,784
Computer Programmers	\$56,974	\$83,345
Computer Software Engineers	\$79,527	\$47,605
Computer Support Specialists	\$44,560	\$70,499
Database Administrators	\$83,621	\$62,940
Network and Computer Systems Administrators	\$76,064	\$56,294
Network Systems and Data Communications	\$74,291	\$67,551
Operations Research Analysts	\$74,164	\$72,120
Miscellaneous Mathematical Science Occupations	\$140,224	\$74,486
Income for All Occupations	\$32,467	\$27,050
Source: Public Use Microdata Sample; Partners for Ecor	nomic Solutions, 20	09.

# Montgomery County's Competitive Position

Montgomery County and Gaithersburg West, in particular, excel in many of the key locational criteria for early-stage, second-stage and mature companies other than production facilities, again largely focused on "red" biotech of human medicine.

• Research universities and institutes – The presence of 50 Federal life science research-intensive institutions, Johns Hopkins University and the University of Maryland provide an important base of cutting-edge science and world-class researchers. The Center for Advanced Research in Biotechnology (CARB) located in Gaithersburg West is a joint effort of the University of Maryland and the National Institute of Standards and Technology (NIST).

- Regulatory agencies Access to the FDA is an important factor for many companies.
- Educated and experienced workforce Montgomery County's highly educated workforce is quite attractive, particularly its concentration of life scientists and others with specialized skills and experience in the biotechnology industry. The concentration of private and public employment opportunities and the national reputation of local schools and other quality of life factors make it easy to attract and retain key workers.
- Experienced entrepreneurs The county is slowly developing a cadre of experienced biotechnology entrepreneurs; however, it still lags in comparison to other regions with a longer history of life science companies and an entrepreneurial environment. The biggest deficiency identified by the County's Biosciences Task Force is the limited number of experienced entrepreneurs and managers that can lead a firm to profitable operations. The extensive base of private companies helps to train executives and scientists, who then seek to start their own companies. Researchers from the Johns Hopkins Institute for Policy Studies tracked the history of founders of Maryland bioscience and medical instrument companies and found that fewer than half "launched their start-ups after leaving a position in another company. Overwhelmingly, bio company founders came from federal laboratories and universities, primarily NIH."<sup>8</sup>
- Specialized business support The cluster of life science firms has helped to generate a corps of specialists that provide support services particular to the biotech industry, e.g., Intellectual Property attorneys.
- Access to capital While the venture capital industry is most heavily concentrated in New York, San Francisco and Boston, Washington/Baltimore has a growing venture capital community capable of supporting some of Montgomery County's biotech companies. However, these firms have invested less locally than have those in comparable regions. This record may relate to the county's limited supply of experienced entrepreneurs with industry expertise.
- Specialized facilities Most biotech companies choose to focus their resources and energies on the science and business rather than on real estate, so most seek to rent space, particularly in the early stages. Few developers build the types of laboratory space needed by biotech companies on a speculative basis due to the high cost. In recent years, the development industry has come to realize that the investment in lab space is not as risky as it was once thought and has begun building speculative

<sup>&</sup>lt;sup>8</sup> Marsha R.B. Schachtel and Scott R. Heacock, Johns Hopkins Institute for Policy Studies, "Founders of Maryland Bioscience and Medical Instrument Companies," 2002, www.marylandtedco.org/ media/pdf/publications/BioGenealogyStudy.pdf

lab space in certain limited locations that have a critical mass of life sciences companies. Montgomery County is well equipped with a large inventory of labserved buildings. Also important is lower-cost incubator space with flexible leases and supportive services. The Shady Grove Innovation Center offers 60,000 square feet of space for early-stage companies. Other incubators elsewhere in Maryland often generate companies that move to Montgomery County once they leave the incubator.

Some of the factors that may be inhibiting the industry's growth in Gaithersburg West include:

- Limited transit service The Shady Grove Metro station provides good regional transit access for Gaithersburg West, but it must be accessed by feeder bus. Not all segments of the area are well served with frequent and convenient bus service. Most workers must drive to work, drive to eat out and drive to meet with other companies.
- Traffic congestion and internal circulation The I-270 Corridor is impacted by traffic congestion on its major arteries. Within Shady Grove Life Sciences Center, area workers report frustration with traffic congestion at lunch time that prevents them from being able to go out to eat.
- Limited retail opportunities The limited choice of nearby restaurants has been a long standing complaint in the Life Sciences Center, though the selection has improved in the last few years. Again, the requirement that almost everyone must drive to lunch constrains employees' ability to take advantage of some of the offerings.
- Sterility of the office park environment The single-use development pattern of isolated office and lab buildings surrounded by parking and open land is appealing to many companies and workers, but not to all. Some companies, such as United Therapeutics in Silver Spring, choose to locate in more urban environments with greater levels of diverse activity and the opportunity to walk to restaurants, retail, entertainment, Metro and nearby housing.

# **IV. Regional Competition**

The regional competition for biotechnology and related industries includes a growing number of viable locations. Beyond Montgomery County's life science clusters there are several other prominent research institutions attempting to capture their in-house scientific knowledge base and grow new biotech firms.

# **Competitive Environment**

Within the State of Maryland, Montgomery County is the predominant location for biotechnology companies. Approximately 60 percent of the state's biotechnology firms are located in Montgomery County. The other competitive locations for biotechnology firms in the region include: Baltimore, Beltsville, Columbia, College Park, Germantown, Frederick, and Northern Virginia.

Those smaller submarkets close-in to the existing I-270 cluster, such as Germantown, will likely gather some of the biotechnology activity with the creation of desirable incubator space. The Germantown Innovation Center, on the upper county campus of Montgomery College, plans to attract an estimated 10 to 15 new biotechnology start-ups.

The nature of biotechnology development in Beltsville, Columbia and other smaller submarkets represents only a fraction of the actual biotechnology activity in the State of Maryland. These areas do not have a strong world-class research institution and typify site selection likely unrelated to standard factors but rather an executive preference for a specific location. While these areas may continue to house the same biotechnology firms located there today, their ability to compete is limited.

For this reason, this analysis focused on four primary regionally competitive locations for biotechnology and related companies. These included Frederick, Baltimore, College Park, and Northern Virginia in order of potential to attract biotechnology. As previously mentioned, these areas may be competing for the same biotechnology firms or for the creation of an independent cluster based on existing local resources.

Frederick County benefits from its location in the I-270 Corridor and expansion from Montgomery County. Its greater availability of land at lower prices has attracted MedImmune and others to establish production facilities in the county. Fort Detrick, the largest employer in Frederick County, is home to the United States Army Medical Research and Material Command with the National Cancer Institute (NCI- Frederick), National Interagency Confederation for Biological Research and National Interagency Biodefense Campus. This military command's mission envelopes biomedical research and development, attracting many private biotechnology firms to nearby locations. Baltimore's biotechnology industry consists of two biotechnology parks centered on its major research universities. In 2007, UM Biotech Park received acknowledgement from the biotech community as the "Emerging University Research Park of the Year according to the Association for University Research Parks (AURP). The BioPark includes a 10- acre campus planned for more than 1.8 million square feet of lab and office space in 12 buildings with structured parking. Currently the BioPark has more than 12 tenants including high profile biotechnology firms like Gliknik Inc, and Alba Therapeutics Corporation.

Johns Hopkins University is the nation's leading recipient of NIH funding with worldrenowned researchers and facilities. The University has entered into a partnership with the City of Baltimore, the State of Maryland and Forest City Corporation to develop the 31acre Science + Technology Park at Johns Hopkins in East Baltimore adjacent to its Medical Campus. The bioscience-focused research park will provide facilities for the University, private bioscience businesses and nonprofit research institutions. The first 278,000 squarefoot building, opened in 2008, houses the Johns Hopkins Institute for Basic Biomedical Sciences, the Johns Hopkins Brain Sciences Institute, the Howard Hughes Medical Institute, Cangen Biotechnologies, BioMarker Strategies, IATRICa and Champions Biotechnology.

The University of Maryland's M Square Research Park is attracting companies working with the University and Federal government agencies. It has the advantage of access to the College Park Metro and MARC stations. When fully built out, the 130-acre park will host 2 million square feet of space for research and technology companies. It is anchored by the National Oceanic and Atmospheric Administration as well as the American Center for Physics and the Center for Advanced Study of Language. To date, the park has focused on homeland and national security, environmental and earth sciences, weather prediction and global climate change; and food safety and security rather than biotechnology. However, the University's Technology Advancement Program incubator system has supported the start-up of several biotechnology firms.

The Northern Virginia biotechnology market is dispersed among several locations, primarily in the Dulles Toll Road corridor. A new research park is being developed in Manassas with George Mason University. The Howard Hughes Medical Institute moved its headquarters from Bethesda to Loudoun County. However, Northern Virginia has nothing approaching the concentration of biotech firms found in Montgomery County.

The following matrix provides basic features and elements within each of the competitive regional life science clusters.

			Table 7. C	ompetitive Biot	schnology Cl	usters, 2009					
		Related						Available		Distance (	miles) to
Name/Location	Existing Companies	Federal Agencies	<b>Research</b> Institutions	Major Medical Center	Density	Highway Access	Transit Access	Laboratory Space	Presence of Incubator	Residential	Retail
Shady Grove Life Sciences Center. Gaithersburg		HIN	Johns Hopkins Univ. of MD	Shady Grove Adventist	<0.5 FAR	Excellent	Good	Yes	Yes	<1 mile	<1 mile
Rockville/Twinbrook		FDA, NIH			0.5- $1.5$ FAR	Good	Excellent	Yes	Yes	<1 mile	<1 mile
White Oak		FDA			<0.5 FAR	Excellent	Fair	No	No	<1 mile	<1 mile
Science + Technology Park at Johns Hopkins, E. Balto.		HIN	Johns Hopkins Kennedy Krieger Howard Hughes	Johns Hopkins Hospital	0.5-1.5 FAR	Fair	Excellent	Yes	Yes	Included	Included
University of Maryland BioPark, Baltimore	10 to 15		Univ. of MD Medicine MD Biotech Institute	Univ. of MD Medical Center VA Hospital	>1.5 FAR	Good	Excellent	Yes	No	<1 mile	<1 mile
M Square, University of Maryland Research Park, College Park	less than 5		Univ. of MD		<0.5 FAR	Good	Good	No	Yes	1-5 miles	1-5 miles
Frederick County	30 to 40	Fort Detrick			<0.5 FAR	Excellent	Fair	$\mathbf{Yes}$	No	1-5 miles	1-5 miles
Columbia / Howard County	30 to 40		Johns Hopkins Applied Physics Lab	Howard County General Hospital	<0.5 FAR	Excellent	Fair	Little	No	<1 mile	1-5 miles
bwtech@UMBC, University of Maryland-Balto. Co., Catonsville	10 to 20		Univ. of MD Balto. Co.		<0.5 FAR	Excellent	Good	No	Yes	<1 mile	>5 miles
George Mason Research Park, Manassas, VA	Less than 10		George Mason Univ.	Prince William Hospital	<0.5 FAR	Good	Fair	No	No	1-5 miles	1-5 miles
Dulles Toll Road Area, Fairfax County, VA	Less than 10			Reston Hospital Center	<0.5 FAR	Excellent	Good	Yes	No	1-5 miles	1-5 miles
Source: Partners for Economic Solu	utions, 2009.										

# **V. Demand Projections**

Growth projections are fraught with difficulty in a young industry with such diversity of company types and maturity levels. A single successful company can lead to demand for 600,000 square feet or more in a relatively short time. Or a promising molecular compound may fail to prove its clinical efficacy or it may demonstrate toxic side effects that stop or significantly delay its development. Other unknown factors could impact development, such as the long-term potential for a new NIH campus.

Many factors impact the industry's health and growth – most notably the availability of financial support. The current credit crunch is impacting biotech severely, potentially inhibiting a generation of start-up companies that may not survive due to lack of funding when needed. Maryland's new bioscience initiative includes several steps to accelerate business development, actions that may accelerate the industry's growth.

The Battelle Technology Partnership Practice studies prepared for the Maryland Life Sciences Board highlights the state's strengths as "one of the world's leading bioscience research environments and one of the largest and fastest-growing bioscience clusters in the country." They further observe that "what remains striking about Maryland is its still enormous untapped potential in the biosciences."<sup>9</sup> The extent of future growth in the biotechnology industry in Maryland and Montgomery County will depend on tapping that potential and attracting additional experienced entrepreneurs to develop successful companies to exploit that research.

Few definitive forecasts of future biotech industry growth exist for the U.S., and none are available for submarkets, such as Maryland and the I-270 Corridor. Recent history can provide some guidance, with the caveat that history is not always a good predictor of the future, particularly in a rapidly developing industry.

From 2001 to 2006, Battelle reports that Maryland employment in the industry grew 14.5 percent<sup>10</sup>, adding 3,200 jobs to reach more than 25,000 jobs. At the same time, U.S. industry grew 5.7 percent. Ernst & Young has tracked the biotech industry for more than

<sup>&</sup>lt;sup>9</sup> Battelle Technology Partnership Practice, *BioMaryland 2020: Strategic Framework and Proposed Policy Actions*, May 2009,

www.choosemaryland.org/businessinmd/biosciences/lsab/documentsandimages/BioMaryland%20202 0%20-%20Strategic%20Framework%20and%20Proposed%20Policy%20Actions.pdf

<sup>&</sup>lt;sup>10</sup> Ibid, Maryland Life Sciences Strategic Plan: the Current Competitive Position of Maryland, May 2009,

www.choosemaryland.org/businessinmd/biosciences/lsab/documentsandimages/Maryland%20Life%2 0Sciences%20%20-%20%20Current%20Competitive%20Position%20(Battelle).pdf

20 years. They show that the number of companies (public and private) in the industry has increased 13.9 percent from 2000 to 2007 and 14.6 percent from 1994 to  $2007.^{11}$ 

The Maryland bioscience employment growth rate equates to 2.75 percent per year. An annual growth rate that high is hard to maintain over time as the base of companies grows. Montgomery County serves as the epicenter of the state's biotech cluster and can be expected to develop at a pace commensurate with the state's growth rate, though there is emerging competition from new locations in Baltimore, Frederick and other parts of the state. Given these factors, we estimate that the 12,000 life science private industry workers in Montgomery County in 2007<sup>12</sup> could grow 1.0 percent annually from 2008 to 2010 with the economic slow-down and financial crunch, 2.0 percent annually from 2011 to 2015, and 1.8 percent per year from 2016 to 2020 and 1.6 percent annually from 2021 to 2025. Shown in the following table, these growth rates suggest the county could add 4,200 new bioscience jobs by 2025, a growth of 35 percent from the 2007 level.

Table 8. Po	tential Grow	th in Bioscienc Gaithersburg V	e Employme Vest, 2007-2	nt, Montgomery 025	County and
	Montgom	ery County		Gaithersburg We	st
Year	Employees	Annual Growth Rate	Share of County Total	Employees	Annual Growth Rate
2007-2010		1.0%			0.6% - 2.3%
2011 - 2015		2.0%			1.7% - 3.4%
2016-2020		1.8%			1.3% - 3.4%
2021 - 2025		1.6%			1.2% - 2.9%
2007	12,000		33% - 33%	4,000 - 4,000	
2010	12,400		32% - 36%	4,000 - 4,500	
2015	13,700		31% - 39%	4,200 - 5,300	
2020	15,000		30% - 43%	4,500 - 6,500	
2025	16,200		29% - 47%	4,700 - 7,600	

Source: Montgomery County Department of Economic Development; Partners for Economic Solutions, 2009.

Gaithersburg West (the Shady Grove Life Sciences Center) has an estimated 4,000 bioscience jobs, based on its share of the county's R&D/Lab space as well as major single-tenant buildings (e.g., Human Genome Sciences). The area's future share of county bioscience jobs will depend, in part, on adoption of the proposed plan and the resulting change in environment and density increases. It will also be impacted by competitive

<sup>11</sup> Ernst & Young, *Beyond Borders: Global Biotechnology Report 2008,*"

www.ey.com/Publication/vwLUAssets/Industry Biotechnology Beyond Borders 2008/\$FILE/Biotech nology Beyond Borders 2008.pdf and Biotechnology Industry Organization, "Guide to Biotechnology, 2008." www.bio.org/speeches/pubs/er/

<sup>&</sup>lt;sup>12</sup> Montgomery County Department of Economic Development, October 2008, www.montgomerycountymd.gov/apps/News/press/PR\_details.asp?PrID=4931

developments elsewhere in the county, including Rockville, Bethesda, Germantown and Silver Spring. PES projects that the share of county bioscience jobs located in the Gaithersburg West sector will range between 29 and 47 percent by 2025. By 2025, Gaithersburg West could develop a base of 4,700 to 7,600 bioscience jobs.

Gaithersburg West will continue to compete well in the bioscience field, but each year the competition will increase from regional, other domestic and international clusters. Gaithersburg West will benefit from self-sustaining growth within its existing base of companies. This strength has already been proven through the spin-outs from NIH and from a few early industry leaders. The ability to capitalize on that potential requires access to financial capital, appropriate facilities, mentoring, technical support, a favorable regulatory environment and incentives to help companies offset some of the high costs of real estate during their early stages.

Critical to the competition for biotech growth is the ability to attract talent – both scientific and entrepreneurial. The county's high quality of life is important in attracting new workers and in retaining existing researchers and scientists when they decide to start a company.

It is also important to provide a supportive and appealing work environment. While many people value and appreciate the business park model that has dominated the Shady Grove Life Sciences Center development historically, it has some fundamental weaknesses noted earlier. Chief among those is the isolation of uses and the need to drive to work, to lunch and to meetings. The low-density business park model inhibits the potential for effective transit connections. The pattern of single-use development works against walkable environments where retail and other support uses are close enough to access on foot or on bicycle rather than being forced to drive. The quality, quantity and success of the supporting retail depends on being able to draw a sufficient mass of customers, which typically requires both daytime and nighttime/weekend patronage. Therein lies some of the strength of mixed-use development – the aggregation of sufficient numbers of employees and residents to support a vibrant business base and a pedestrian environment that frees people from the constant need to depend on private automobiles.

The vision for Gaithersburg West as a higher density village could be quite effective in helping the county attract and retain knowledge workers – the key to long-term prosperity in the evolving knowledge economy.

The transition to the new paradigm of mixed-use, walkable development will take time. The sector is relatively built out in that most of the available land parcels have been developed. However, the scale and density of that development leave open the opportunity for selective infill to replace parking lots with parking garages and new multi-story buildings. Some redevelopment may be possible, though laboratory improvements are too expensive to demolish in great numbers. More likely will be new development in environments in which density and transit are designed from the beginning – the Belward campus and the redevelopment of the Public Safety Training Academy.

As biotech evolves to include a higher percentage of office space, it will be easier to accommodate in higher-density developments. Laboratory space can be effectively accommodated in multi-story buildings designed for that use. Examples abound in Cambridge, San Francisco, New York City and at research university campus around the world. However, such buildings come with a higher price tag and are more complex to adapt. Given the tenant companies' desire to maintain their flexibility to reconfigure lab space and building uses over time as their businesses evolve and grow, most tenants and developers have favored one- and two-story buildings. Experienced brokers and developers report some market resistance to even three-story lab buildings in the I-270 Corridor's recent development. In the near- and mid-term, bioscience lab buildings are likely to remain at primarily two stories. Going forward, the demand is likely to break down 40 to 45 percent in flex space and 55 to 60 percent in office space.

It will also take time to change due to the relatively slow pace of development for the biotech industry. Employment projections presented above suggest an average annual increase in demand of 70,000 to 105,000 square feet. In the first few years, that will be absorbed largely by the existing vacant space in the market. Also, land economics require a high land value in order to justify construction of structured parking rather than less expensive surface parking lots. That value calculation may postpone intensive infill for some years. Introduction of the Corridor Cities Transitway will help to ease that transition by increasing demand and allowing a reduction in the number of parking spaces required.

The Gaithersburg West Master Plan breaks the area into five key subareas:

- North encompassing the north side of Key West Avenue from Shady Grove Road to Great Seneca Highway, which includes the Decoverly and DANAC developments and the Shady Grove Executive Center;
- Core bounded by Key West Avenue, Shady Grove Road, Darnestown Road and Great Seneca Highway, which includes the Shady Grove Adventist Hospital, the Johns Hopkins Montgomery County Campus, the J. Craig Venter Institute, BioReliance and several social service providers;
- South extending south from Darnestown Road between Travilah Road and Shady Grove Road, which is anchored on the east by the Universities at Shady Grove and on the west by the Human Genome Sciences headquarters;
- West bounded by Key West Avenue, Great Seneca Highway and Darnestown Road, including Montgomery County's Public Safety Training Academy (PSTA), which the Plan recommends be relocated; and
- Belward bounded by Darnestown Road, Key West Avenue, Great Seneca Highway and Muddy Branch Road, a former farm owned by the Johns Hopkins University and proposed for mixed-use development dominated by research and development uses.

The evaluation of each of these areas for future development considers the

- concentration of biotech activity;
- availability of underutilized land;
- highway access;
- transit access;
- pedestrian amenities;
- quality of the environs; and
- proximity to
  - o Johns Hopkins University Montgomery County Center
  - University of Maryland Shady Grove Campus
  - $\circ$  retail and restaurants
  - multi-family housing.

## Subarea Evaluations

#### LSC North

The LSC North subarea has the advantages of I-270 access from both Shady Grove Road and Sam Eig Highway (I-370). The current and proposed Corridor Cities Transitway (CCT) alignments show a station to the north of this subarea but not providing immediate access. Recent development includes three- to five-story office buildings with structured parking – a higher density than in most of the rest of the study area. Avalon Decoverly provides rental housing with easy access to office uses. This subarea lacks restaurants and retail space but benefits from the amenities of the Washingtonian Center, a mixed-use development to the north at the I-270/I-370 interchange separated by the Crown Farm to the north. The quality of the environment is high though the area is not well developed for pedestrians.

#### LSC Central

The LSC Central subarea is dominated by Shady Grove Adventist Hospital and other medical institutions with their major parking lots. Several major office buildings, including the J. Craig Venter Institute, line Shady Grove Road. The area benefits from proximity to Fallsgrove Village – a major retail and office center east of Shady Grove Road in the City of Rockville as well as a new hotel. I-270 access is provided primarily by Shady Grove Road with additional access from the West Montgomery Avenue interchange. The proposed CCT alignment includes a stop near Shady Grove Adventist Hospital. Johns Hopkins Montgomery County Campus has three buildings in the Central subarea along with major parking lots. The environment is somewhat more dominated by parking and auto-oriented uses. The parking lots and aging buildings in some parts of the subarea may present redevelopment opportunities. The Central subarea has the highest employee density of the five subareas, providing better support for transit and mixed uses, particularly medicallyrelated office space.

#### LSC South

The LSC South subarea extends south from Darnestown Road to residential developments and is anchored by the Universities at Shady Grove campus on the east and the substantial Human Genome Sciences (HGS) headquarters on the west. I-270 can be accessed from West Montgomery Avenue or Shady Grove Road. No CCT station is proposed. The Travilah Square Shopping Center provides retail and restaurant amenities in an autooriented environment. The Avalon at Traville development south on Shady Grove Road offers proximate rental housing. Major executive housing neighborhoods also line the subarea's edges. HGS sits on a major independent landscaped campus with a relatively low density. Some other land remains undeveloped.

#### LSC West (PSTA)

The West subarea is dominated by the County's PSTA, which is recommended for relocation to another part of the county. That relocation will make available a major land assemblage. Also within the subarea is the Shady Grove Medical Village with physicians' offices and extensive parking. The Shady Grove Innovation Center (formerly the Maryland Technology Development Center) occupies a 60,000 square-foot building with wet labs and office facilities for 40 to 50 companies. A CCT station is proposed for the center of the subarea, providing links to both the Core and Belward subareas. The West subarea sits somewhat further from I-270 but enjoys good regional accessibility. The Travilah Square Shopping Center is immediately south across Darnestown Road, providing nearby retail and restaurants, though lacking good pedestrian connections.

## LSC Belward

The LSC Belward subarea is a partially developed former farm owned by Johns Hopkins University and proposed for development as a research campus. It enjoys good access via Great Seneca Highway and Key West Avenue to the Sam Eig Highway and Shady Grove Road interchanges on I-270. A CCT station is proposed central to the property. Residential development lines its northern edge and the west side of Muddy Branch Road. Currently, Belward is removed from most of the area's retail amenities, though clusters on Shady Grove Road and Darnestown Road can be accessed by car.

# **Implications for Future Development**

The different natures of these subareas have implications for their ability to attract biotech and other tenants. Most of the near-term opportunities for new development in the Core are gone except for reuse of parking lots. The presence of nearby retail, restaurants and hotel make possible some synergies but require much better pedestrian and bicycle connections. Belward offers a largely blank slate for new development with the opportunity for true integration of mixed-use and transit-oriented development to create a sense of place. A similar opportunity is created by redevelopment of the PSTA site, which is unencumbered by multiple owners and existing buildings planned for retention.

The long-term future of the area will be best served by concentrating a mix of land uses at the new transit stations so as to create a knowledge community with places to live, work, eat and interact, while facilitating pedestrian and bicycle movements and reducing dependence on the private automobile.

349 Cedar Street, NW Washington, DC 20012 www.PESconsult.com

appendix

# gaithersburg west master plan

The Life Sciences Center



Montgomery County Planning Department The Maryland-National Capital Park and Planning Commission

MontgomeryPlanning.org



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