MONTGOMERY COUNTY PLANNING DEPARTMENT
THE MARYLAND-NATIONAL CAPITAL PARK AND PLANNING COMMISSION

June 5, 2009

MEMORANDUM

TO: Montgomery County Planning Board

VIA: Glenn Kreger, Acting Chief, Vision Division

Sue Edwards, Team Leader, North Central Transit Corridor, Vision Division

FROM: Nancy Sturgeon, Planner Coordinator, Vision Division (301-495-1308)

SUBJECT: Public Hearing Draft Gaithersburg West Master Plan: Planning Board Worksession #5 – Economic Analysis and Staging

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STAFF RECOMMENDATION: Review Economic Analysis on Biotech and LSC Zone (BLTs) and Staging for the Life Sciences Center (LSC)

I. SCHEDULE FOR FUTURE WORKSESSIONS

Worksession #6	June 25	Wrap-up of Issues, if needed (Tentative)
Worksession #7	July 9	Draft Planning Board Draft for Review and Comment (Tentative)
Worksession #8	July 23	Final Planning Board Draft for Approval to Transmit (Tentative)

II. SUMMARY OF WORKSESSION #4: MAY 28, 2009

Issues covered at Worksession #4 on May 28 included specific properties in the LSC North District, the overall recommendations for the LSC West (PSTA) District, the LSC Zone, and the environmental analysis and recommendations. The Planning Board also discussed the building height of 143 feet currently recommended in the draft Master Plan and the Urban Design Guidelines. The Board directed staff to change all of the references of 143 feet to 150 feet. The revised LSC Zone also lists a maximum height of 143 feet, which will be changed to 150 feet given the Board's direction.

LSC North: Shady Grove Executive Center and Bureau of National Affairs

Planning Board Decision: The Planning Board supported the Planned Development (PD) zoning option for these two sites. With regard to the PD density, the Board decided that rather than the Plan identifying a specific (per acre dwelling unit) density, the Plan language should indicate that urban, high density housing would be appropriate in these locations. As a floating zone, the property owners will be required to initiate the rezoning by filing a Local Map Amendment for review and approval by the Planning Board and County Council. A Development Plan and Site Plan are required in the PD Zone.

The Board agreed with staff that language should be added to the Plan to encourage pedestrian-oriented local retail facilities that are compatible and provide convenience for the residents. The Board also noted that introducing a housing use in this area should focus on creating a neighborhood, a desirable place to live. Staff agrees and the draft Plan states: "To create a sense of community, the Plan encourages clustering any housing to create a residential neighborhood rather than isolated sites in scattered office parks." An application for PD zoning should also provide for community-serving amenities such as constructing part of the proposed LSC Loop trail to enhance connectivity. Pedestrian connections to future CCT stations (at DANAC as well as the Crown Farm) should also be provided.

LSC North: DANAC

Planning Board Decision: The Board agreed that the CCT station could be retained on the DANAC site on either the north or east side, pending the MTA's assessment of the existing and proposed CCT alignments. DANAC requested a rezoning from I-3 to a mixed use zone and an increase in density from 0.5 floor area ratio (FAR) in the existing zone to 1.2 FAR in a proposed new zone. The Board supported the property owner's request to rezone the site from I-3 to the new mixed-use (CR) Zone. The Board also supported the owner's request for increased density, up to 1.0 FAR.

LSC West

Planning Board Decision: The Planning Board supported the recommendations for the LSC West/Public Safety Training Academy (PSTA) District, as summarized below. The Board agreed with staff that the new mixed-use zone (CR) be applied to the majority of property in LSC West, rather than the TMX-2 Zone recommended in the Public Hearing Draft.

The Plan's recommendations for LSC West include:

- Relocate the PSTA and create a new residential community on this site.
- Rezone the PSTA (currently zoned R-90/TDR), the Innovation Center (currently zoned LSC) and the retail and office uses (at the corner of Darnestown Road and Key West Avenue, currently zoned C-3 and O-M) to the CR Zone.
- Change the proposed zoning map to reflect the recently approved rezoning of parcels on Darnestown Road from R-90/TDR to RT-8.
- Rezone the two parcels with special exception uses on Darnestown Road from R-90/TDR to C-T.
- Provide a CCT station on LSC West.

- Place the greatest densities and building heights at the transit station.
- Allow up to 2,000 dwelling units with supporting retail.
- Allow up to 150-foot building height near the transit station.
- Provide a site for a new fire station and a new public elementary school (if needed) with a park.

LSC Zone

The revised LSC Zone was presented and discussed at the worksessions on May 14 and May 28. The revised LSC Zone is a major zoning text amendment; it is not a new zone and it is not part of the ongoing Zoning Ordinance re-write. At the May 28 worksession, there was consensus on the Board to remove the language regarding special trip reduction guidelines (59-C-5.474) and to remove the language regarding green area (59-C-5.473(a)), but retain the public use space requirements. As mentioned above, the revised LSC Zone has a maximum height of 143 feet, which will be changed to 150 feet given the Board's direction. Staff will make these changes to the LSC Zone, as well as other minor modifications that were discussed, and bring the revised Zone to the Board on June 25. The Board will consider the proposed Building Lot Termination (BLT) and workforce housing requirements at that time.

III. ISSUES TO BE COVERED AT WORKSESSION #5: JUNE 11, 2009

Economic Analysis

Two consultant reports have been prepared – one group was hired by the Planning Department to address the market dynamics of biotech in the County and another group was hired by JHU and Percontee to address the economics of developing in the LSC Zone. Staff has analyzed these reports and prepared two memos summarizing the issues. Attachment A is the staff memo and consultant report, *Montgomery County Biotechnology Potentials*. Attachment B is the staff memo and JHU/Percontee consultant report, *Financial Feasibility Analysis of Planned Development in Life Sciences Mixed-Use Zone*. Staff will discuss these issues with the Board on June 11. The discussion of the latter may inform the Board's June 25 review of outstanding issues with the zoning text amendment for the LSC Zone.

Staging Plan

As stated in the draft Plan, staging governs the timing of development and the provision of public facilities, but not the total amount or type of development. One of the primary purposes of staging is to ensure that infrastructure is in place before development is allowed to move forward. In addition to a Master Plan's staging guidelines, when development applications are approved, there are mechanisms in place to regulate development and provide necessary facilities to support the new development. The Adequate Public Facilities Ordinance (APFO) is administered by the Planning Board at the time of subdivision (with review by other public agencies) and requires that public facilities (transportation, education, police, water, and sewer) are adequate to support proposed development.

Staging recommendations in the Gaithersburg West Public Hearing Draft are applied to the two districts where the greatest change is anticipated – LSC Central and LSC Belward. The overall land use concept of the draft Plan concentrated density at the three proposed CCT stations in the LSC while effectively maintaining existing zoning capacity elsewhere, i.e., in the LSC North and LSC South Districts. While the Planning Board supported the recommendations in the draft Plan for LSC South, the Board increased density in LSC North, particularly at the DANAC site (from 0.5 to 1.0 FAR). The Board also supported housing at two sites in LSC North, with potentially high residential densities. Given the Board's decisions to increase densities in LSC North, staff recommends that new development in this area be included in the staging plan.

Staging of Residential Development

The draft Plan did not recommend that residential development be subject to staging or sequencing because increasing housing in the LSC is encouraged to improve the jobs-housing balance and provide mixed uses. Residents concerned about school overcrowding stated that the residential development proposed by the Plan should be included in the staging element. The staff continues to believe that existing regulatory processes are adequate to stage residential development in Gaithersburg West.

Approximately half of the potential housing that could be built, based on maximum build out of allowable residential density, is in the LSC Central District. In this area, the Plan allows up to 30% of allowable FAR to be used for housing. If all property owners in LSC Central were to utilize this option, the total dwelling units would be 2,225. This maximum theoretical amount will not be achieved due to the existing built environment and, more importantly, due to the nature and business objectives of the property owners. For example, the largest property owner in LSC Central is Shady Grove Adventist HealthCare (AHC) and as stated in their consultant's letter dated May 18, 2009: "AHC considers housing to be an incompatible use on its medical center property, and although substantial retail is also considered to be an inappropriate use, AHC believes provision of a small amount of ancillary retail uses will improve functionality as well as the experience of working at and visiting the medical center."

Other major property owners in the LSC Central are private biotech companies that will not be likely to use their available land and development capacity for housing since their business is biotech. The Johns Hopkins University-Montgomery County Campus (JHU-MCC) site is the most likely location for some new housing in LSC Central in the future.

Outside of LSC Central, the location where housing is most likely to occur -- LSC West/PSTA -- is a County-owned site where the current uses must be relocated. The PSTA relocation is part of the County Executive's Smart Growth Initiative. Although not stated in the draft Plan, staff does not believe it is necessary to stage development of the future residential use in LSC West because the relocation of the PSTA and subsequent disposition of the site are an ongoing and lengthy process. One of the major concerns with regard to new housing on the PSTA is that the availability of new dwelling units be timed with additional job creation in the LSC. If the County can time the disposition of the PSTA with new development and new jobs in the LSC, this would increase the possibility that the new housing is occupied by those employed in the LSC.

With regard to school capacity, staff believes that this issue is better regulated through the growth management mechanisms that are part of the regulatory process than through a Master Plan's staging element. It is also worth noting that the LSC is in two school clusters, so the impacts of additional students that might be generated from new housing in the LSC will be disbursed. LSC North is part of the Gaithersburg High School cluster and LSC Central and the PSTA site are part of the Wootton High School cluster. In addition, a high school site has been dedicated on the Crown Farm property in the City of Gaithersburg, which, when built, will undoubtedly affect the current school boundaries.

Revised Staging Plan

Staff recommends that the staging plan in the Public Hearing Draft be revised and clarified. The staging requirements will apply to commercial development in the LSC North, Central, and Belward districts. Approved development that is in the "pipeline" is not subject to the Plan's staging requirements as long as a project's Preliminary Plan continues to be valid. The LSC South District is not subject to the staging plan because this area's density is limited to existing and approved development, with the exception of the Rickman property.

Staff recommends that the "Staging Requirements" section of the Public Hearing Draft on pages 62-63 be deleted and replaced with the following text.

Staging Requirements

The LSC today contains nearly 7 million square feet of commercial development. Approximately 3.7 million square feet of commercial (non-residential) development is approved and unbuilt in all five LSC Districts. The total existing and approved development in all five LSC Districts is 10.7 million square feet.

This Plan recommends that the staging plan and its requirements be applied to the LSC North, LSC Central, and LSC Belward districts. In these three districts, existing commercial development totals nearly 5.5 million square feet, with 2.7 million square feet in the pipeline, for a total of 8.2 million square feet. The pipeline increment of development, 2.7 million square feet, is not subject to the Plan's staging requirements as long as a project's Preliminary Plan continues to be valid.

In the three districts that are subject to staging, the Plan maintains today's level of density of 8.2 million commercial square feet (existing development and the approved pipeline), with an additional increment of 400,000 square feet in Stage 1. Development above 8.6 million commercial square feet cannot proceed until all the prerequisites for Stage 2 have been met, including funding of the CCT from Shady Grove to Belward.

Stage 1
Stage 1 allows a total of 400,000 square feet of commercial (non-residential) development in LSC North, Central, and Belward. Existing and approved development totals 8.2 million square feet and Stage 1 allows 400,000 additional square feet for a total of up to 8.6 million square feet.

5,500,000 existing development
2,700,000 approved development
400,000 additional new development
8,600,000 Total Stage 1 development

Stage 2
Stage 2 allows a total of 11.4 million square feet of commercial development. Of this total, 8.6 million will have been built in Stage 1. After all the prerequisites required before Stage 2 have been met, development above 8.6 million can proceed, including an additional 2.8 million square feet of new commercial development, up to a total of 11.4 million square feet.

8,600,000 Stage 1 development
2,800,000 Stage 2 additional new development
11,400,000 Total Stage 2 development at full build-out

Stage 3
Stage 3 allows a total of 13.2 million square feet of commercial development. Of this total, 11.4 million square feet will have been built in Stages 1 and 2. After all the prerequisites required before Stage 3 have been met, development above 11.4 million square feet can proceed, including an additional 1.8 million square feet of new development, up to a total of 13.2 million square feet.

11,400,000 Stage 2 development
1,800,000 Stage 3 additional new development
13,200,000 Total Stage 3 development at full build-out

Stage 4
Stage 4 allows a total of 17.7 million square feet of commercial development. Of this total, 13.2 million square feet will have been built in the previous stages. After all the prerequisites required before Stage 4 have been met, development above 13.2 million can proceed, including an additional 4.5 million square feet of new development, up to a total of 17.7 million square feet.

13,200,000 Stage 3 development
4,500,000 Stage 4 additional new development
17,700,000 Total Stage 4 development at full build-out

STAGES OF DEVELOPMENT AND REQUIREMENTS AT EACH STAGE
Before Stage 1 begins, all of the following must occur: • Approve and adopt the Sectional Map Amendment. • Fund and begin operating the Greater Shady Grove Transportation Management District (TMD). • Create a new LSC Policy Area with urban standards and characteristics. • Include the entirety of the Rickman property on Travilah Road in the new LSC Policy Area. • Document the baseline of non-driver mode share through monitoring and traffic counts.
Stage 1 New Commercial Development Allowed: 400,000 square feet
Before Stage 2 begins, all of the following must occur: • Fully fund construction of the CCT from the Shady Grove Metro Station to the Belward property in the County's six-year CIP or the State CTP. • Fully fund relocation of the Public Service Training Academy (PSTA) from LSC West to a new site. • Fund the LSC Loop trail in the County's six year CIP and/or through developer contributions as part of plan approvals. • Document a five percent increase over the baseline for the non-driver mode share.
Stage 2 New Commercial Development Allowed: 2.8 million square feet
Before Stage 3 begins, all of the following must occur: • Determine the need for an elementary school in LSC West (PSTA site) and program for construction. • Construct and open at least one public street (such as Medical Center Drive extended) across LSC West and Belward to provide a direct connection across major highways and between the Districts. • Fully fund construction of the following two interchanges, or other transportation project(s) providing equivalent mobility, in the County's six-year CIP or the State CTP: o Sam Eig Highway at Great Seneca Highway o Great Seneca Highway at Key West Avenue • Document a 10 percent increase over the baseline for the non-driver mode share.
Stage 3 New Commercial Development Allowed: 1.8 million square feet
Before Stage 4 begins, all of the following must occur: • Begin operating the CCT from the Shady Grove Metro Station to Clarksburg. • Fully-fund the widening of Key West Avenue, or other transportation projects providing equivalent mobility, in the County's six-year CIP or the State CTP. • Complete construction of the two highest priority interchanges identified as prerequisites to Stage 3. • Fully-fund construction of the following three interchanges, or other transportation project(s) providing equivalent mobility, in the County's six-year CIP or the State CTP: o Shady Grove Road at Key West Avenue o Sam Eig Highway at Diamondback Drive o Great Seneca Highway at Muddy Branch Road • Document a 15 percent increase over the baseline for the non-driver mode share.
Stage 4 New Commercial Development Allowed: 4.5 million square feet

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Attachment A – Memo from Jacob Sesker and report on *Montgomery County Biotechnology Potentials*
Attachment B – Memo from Jacob Sesker and report on the *Financial Feasibility Analysis of Planned Development in Life Sciences Mixed-Use Zone*

ATTACHMENT A

MONTGOMERY COUNTY PLANNING DEPARTMENT
THE MARYLAND-NATIONAL CAPITAL PARK AND PLANNING COMMISSION

June 4, 2009

MEMORANDUM

TO: Montgomery County Planning Board

VIA: Glenn Kreger, Acting Chief, Vision Division GK

FROM: Jacob Sesker, Planner Coordinator, Vision Division (301.650.5619) JS

SUBJECT: Cover Memo-Gaithersburg West/Montgomery County Biotechnology Potentials

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STAFF RECOMMENDATION: Discuss and provide direction to staff in the context of the Draft Plan and proposed Zoning Text Amendment (ZTA).

INTRODUCTION

This cover memo summarizes the findings of an attached report on the economics of the biotechnology industry and provides background for a discussion of economic issues related to the Gaithersburg West Master Plan. The attached report, *Montgomery County Biotechnology Potentials*, was prepared by Partners for Economic Solutions (PES) for the Montgomery County Planning Department. It evaluates trends in biotechnology and projects future growth in the biotechnology industry in Montgomery County in light of local, regional, and national market forces.

This cover memo does not include any staff recommendations, and staff will not be asking the Board to make any decisions during the presentation of this report. However, staff will be making recommendations with respect to economic issues in a separate memo (Attachment B) to be presented at this same work session.

KEY FINDINGS

The attached PES report contains eight key findings.

1. Four land-use related factors limit the growth potential of the biotech industry in Gaithersburg West:
    a. Limited transit service;
    b. Traffic congestion and internal circulation;
    c. Limited retail opportunities; and
    d. Sterility of the office park environment.

2. Locational decisions of firms are affected by factors including density and use mix.
3. Recent research park developments, including two biotech research parks in Maryland, have followed a more urban model.
4. Many jurisdictions in the mid-Atlantic offer economic development incentives to influence the locational decisions of biotechnology firms.
5. Economic development incentives usually include tax credits and often provide infusions of capital to biotechnology firms.
6. Biotechnology employment (does not include hospital or health care employment) in Montgomery County may increase from 12,000 today to 16,200 by 2025.
7. This Countywide biotechnology employment growth will result in an average annual demand for an additional 70,000 to 105,000 square feet of space, or demand for a total of 1.1 million to 1.5 million square feet of space by 2025.
8. Gaithersburg West's biotech employment base may increase from 4,000 today to between 4,700 and 7,600 by 2025.

DISCUSSION

The findings in the PES report support the principles of the Draft Plan. The Draft Plan recommends increases in density and increased flexibility of uses in order to address the market factors identified by PES as limiting growth potential of biotechnology. The Draft Plan addresses the need to improve transit service, reduce congestion and improve internal circulation, provide additional opportunities for retail, and create a more vibrant and diverse environment. By addressing these market factors in the Draft Plan, Montgomery County can maintain or improve its competitive position vis-à-vis other biotechnology clusters in Maryland and throughout the nation.

Other jurisdictions will be offering economic development incentives to influence location decisions. The report is silent on the question of whether relief from land use exactions is a particularly common or effective form of economic development incentive. While reducing land use exactions may, in some instances, be good public policy, it may not be a particularly effective tool in attracting or retaining biotechnology firms. Economic development incentives are generally most effective when they are narrowly tailored to benefit the intended beneficiary directly, rather than broadly targeted to benefit real estate development.

The Planning Department is at an information disadvantage in determining whether, or to what extent, relief from exactions is necessary. The information that staff does have addressing this specific topic was prepared by a consultant hired by affected property owners, and will be discussed in a separate staff memo. Staff does not know what incentive packages have been discussed with other County agencies, nor does staff know what incentive packages have been offered to other biotech projects in Maryland (such as the Science and Technology Park at Johns Hopkins University in Baltimore).

Recent research park developments have followed a more urban model. Examples include the University of Maryland Biotech Park ("BioPark"), which is located in Baltimore. In 2007, that park was awarded the "Emerging University Research Park of the Year" by the Association for University Research Parks. Similarly, Science + Technology Park at Johns Hopkins in East Baltimore will provide an urban location for biotech companies on a 31-acre site in Baltimore. The first 278,000 square foot building on that site was completed in 2008.

In order to compete with locations such as Baltimore, Montgomery County will need to be able to compete with the amenities offered by those locations. Use mix and density sufficient to support transit are two keys to competing with more urban locations.

The PES report projects that the number of biotech jobs in Montgomery County will increase from 12,000 today to 16,200 in 2025. Of the 4,200 new biotech jobs, between 700 and 3,600 will be located in Gaithersburg West. The high density and mixed-use vision for Gaithersburg West will be a factor in attracting and retaining jobs in that location, and thus will play a role in determining Gaithersburg West's share of Montgomery County's growth in the industry.

The job growth figures in the PES report were for biotech only, and do not include increases in employment at Shady Grove Adventist Hospital. Adventist Hospital already has roughly 3,000 employees. The Draft Plan recommends tripling the density and could expand to as many as 9,000 jobs. Increases of hospital employment would also qualify as life sciences employment. Expansion of the hospital would likely also result in new medical offices, further adding to the total life sciences employment within the Master Plan area.

Life science is a "basic" industry, i.e. an industry that exports nearly all of its output. Employment in "basic" industries generates employment in non-basic industries; this is often referred to as a multiplier effect. For purposes of this memorandum, staff assumes a multiplier of 2.4 for biotech jobs [1] and also for hospital and other medical jobs.[2] Applying this multiplier to Gaithersburg West, an additional 700 to 3,600 biotech jobs and 0 to 6,000 new hospital jobs could generate up to 23,040 jobs[3] (direct, indirect, and induced) by 2025. Staff expects that this 15-year time horizon reflects only partial buildout of the vision in the Draft Plan for the LSC. Full buildout—and the need for all infrastructure recommended in the Draft Plan—will take longer than 15 years.

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[1] A 2008 report by Battelle titled "Bioscience 08: Maryland" estimated the 2006 employment multiplier for "research, testing, and medical laboratories" to be 2.38. This means that every 1.0 biotech job generates an additional 1.38 indirect and induced jobs, for a total of 2.38. Other estimates of the biotech employment multiplier range from 2.0 to 2.9.

[2] Estimates of hospital employment multipliers also vary significantly—a brief survey shows a multiplier range from 1.6 to 2.6.

[3] Up to 3,000 biotech jobs and up to 6,000 new hospital jobs, times an employment multiplier of 2.4, equals 23,040 new direct, indirect, and induced jobs.

A challenge to infill development will be that rents in Gaithersburg West may prove inadequate to support the construction of structured parking. Additionally, biotech space is often ill-suited for redevelopment, because factors such as expensive equipment, highly specialized space, and security concerns increase the cost of redevelopment. These factors will serve as de facto limits on the supply of land available on which increased density is possible.

Growth in biotech is limited by the available sites for development. Growth in the industry will likely necessitate infill development and redevelopment of existing structures. The Belward site offers perhaps the most significant opportunity for new biotech space, while the PSTA offers a significant opportunity for mixed-use development in close proximity to new biotech-related development.

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Attachment: *Montgomery County Biotechnology Potentials*

cc: Nancy Sturgeon, Planner Coordinator, Vision Division

Montgomery County
Biotechnology Potentials

Prepared for:
Montgomery County Planning Department

June 3, 2009

PES
Partners for
Economic Solutions

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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 multi-story 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.

II. Biotechnology 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."[1] 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.[2] 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

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[1] Biotechnology Industry Organization, *"Guide to Biotechnology, 2008."* www.bio.org/speeches/pubs/er/

[2] Ernst & Young, *Beyond Borders: Global Biotechnology Report 2008,* www.ey.com/Publication/vwLUAssets/Industry_Biotechnology_Beyond_Borders_2008/$FILE/Biotechnology_Beyond_Borders_2008.pdf

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.[3]

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

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[3] PricewaterhouseCoopers and the National Venture Capital Association, *MoneyTree Report*, https://www.pwcmoneytree.com/MTPublic/ns/moneytree/filesource/exhibits/Moneytree%20Report%20Q1%202009.pdf

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[4] 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

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

- 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.

Table 1. Maryland Biotechnology Companies

	Biotech/ R&D Services		Biotech Therapeutics		Medical Technology		Professional Service/ Consulting		Supplier & Engineering		Other Biotech		
Location	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Total
Baltimore	18	11.6%	14	15.2%	5	13.2%	6	12.8%	6	11.1%	4	18.2%	53
Bethesda	1	0.6%	3	3.3%	2	5.3%	10	21.3%	3	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%	5	22.7%	32
Frederick	17	11.0%	4	4.3%	1	2.6%	2	4.3%	6	11.1%	2	9.1%	32
Gaithersburg	**21**	**13.5%**	**22**	**23.9%**	**2**	**5.3%**	**1**	**2.1%**	**8**	**14.8%**	**2**	**9.1%**	**56**
Germantown	8	5.2%	4	4.3%	1	2.6%	2	4.3%	0	0.0%	1	4.5%	16
Rockville	53	34.2%	31	33.7%	8	21.1%	14	29.8%	7	13.0%	1	4.5%	114
Silver Spring	0	0.0%	1	1.1%	1	2.6%	2	4.3%	1	1.9%	1	4.5%	6
Other Maryland Locations	23	14.8%	10	10.9%	15	39.5%	9	19.1%	15	27.8%	5	22.7%	77
	155		**92**		**38**		**47**		**54**		**22**		**408**
County													
Baltimore City	18	11.6%	14	15.2%	5	13.2%	6	15.8%	6	11.1%	4	18.2%	53
Baltimore	2	1.3%	2	2.2%	2	5.3%	2	5.3%	2	3.7%	2	9.1%	12
Frederick	17	11.0%	4	4.3%	1	2.6%	2	5.3%	6	11.1%	2	9.1%	32
Howard	14	9.0%	2	2.2%	3	7.9%	1	2.6%	7	13.0%	5	22.7%	32
Montgomery	**85**	**53.5%**	**63**	**66.3%**	**16**	**36.8%**	**31**	**81.6%**	**21**	**35.2%**	**7**	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 based on mailing address.

Source: USA Life Science Database; Partners for Economic Solutions, 2009.

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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[5] 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.[6] 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 Space	Square Feet Vacant	Percent Vacant	Percent of Vacant Space
A	4,000,214	12.7%	53.3%
B	2,904,381	10.7%	38.7%
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 one-half (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

[5] Increase in occupied space.

[6] 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.

Table 2: Office and R&D/Flex Space Trends, Montgomery County and the Washington Metropolitan Area, 2000-1st Quarter, 2009												
											2000-2008 Change	
	2000	2001	2002	2003	2004	2005	2006	2007	2008	1 Qtr, 2009	Amount	Percent
Montgomery County R&D Lab/Flex 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	(99,000)	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 Lab/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 Office 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 Office 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 Economic Solutions, 2009.

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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.

Table 3: Office and R&D/Flex Space Trends, Gaithersburg and Rockville, 2000-1st Quarter, 2009												
											2000-2008 Change	
	2000	2001	2002	2003	2004	2005	2006	2007	2008	1 Qtr, 2009	Amount	Percent
Shady Grove Life Sciences Center R&D Lab/FlexSpace												
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%
New Construction	0	0	0	0	0	289,912	0	0	0	0	NA	NA
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%
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%
Net Absorption	100	(3,500)	(6,550)	(31,463)	0	288,341	(89,545)	(26,156)	(4,483)	0	NA	NA
Average Rate (triple net)	NA	NA	NA	$29.48	$23.16	$30.58	$28.93	$29.11	$29.50	$29.50	NA	NA
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%
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%
Gaithersburg R&D Lab/FlexSpace												
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%
New Construction	169,585	0	0	0	0	0	0	0	0	0	NA	NA
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%
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%
Net Absorption	(33,800)	164,469	65,058	(192,674)	104,154	1,500	(11,718)	(4,730)	63,075	(10,255)	NA	NA
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%
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%
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%
Rockville R&D Lab/Flex Space												
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%
New Construction	0	0	0	0	0	0	0	0	0	0	NA	NA
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%
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%
Net Absorption	(4,347)	(1,673)	2,020	(2,020)	6,020	0	0	(64,014)	(23,007)	2,007	NA	NA
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 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%
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 Shady Grove Life Sciences Center Office Space												
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%
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
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 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%
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												
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%
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%
Net Absorption	85,474	164,394	32,038	214,367	(98,095)	123,641	1,386	(171,627)	(128,547)	(5,976)	NA	NA
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 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%
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												
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%
New Construction	86,484	541,057	255,029	0	440,836	36,000	0	89,218	382,881	0	NA	NA
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%
Occupancy Rate	94.0%	88.9%	89.2%	89.5%	90.2%	91.6%	94.3%	90.5%	87.3%	87.3%	-6.7%	-7.1%
Net Absorption	105,606	114,374	253,859	18,521	207,009	152,543	230,779	(243,879)	68,380	(8,203)	NA	NA
Average Rate (full service)	$29.76	$28.31	$28.69	$26.99	$26.39	$26.19	$28.85	$32.14	$31.59	$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%	5.5%
Share of County Occupied Space	12.9%	13.2%	13.5%	13.2%	13.5%	13.5%	13.6%	14.7%	13.4%	13.4%	0.5%	3.9%

Note: Gaithersburg and Rockville subarea boundaries conform roughly to the city limits.
Sources: CoStar; Partners for Economic Solutions, 2009.

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

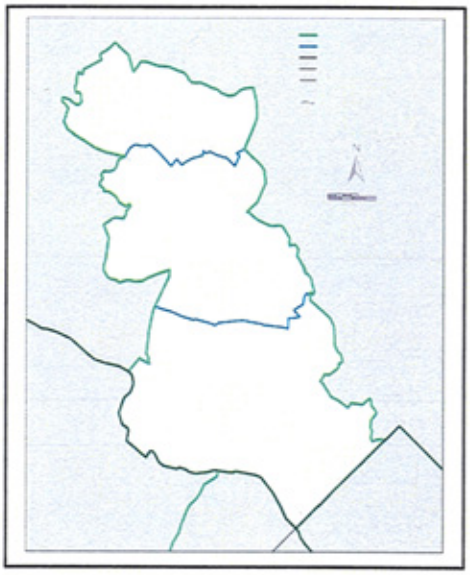
Table 4: Office and R&D/Flex Space Conditions, Shady Grove Life Sciences Center, Gaithersburg, Rockville, Montgomery County and the Washington Metropolitan Area, March 2009

	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 boundaries conform 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.[7] 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.

[7] U.S. Census Bureau, Census 2000 Public Use Microdata Sample files: 01002, 01003 and 01004.

Table 5. Biotechnology and Related Occupations by Jurisdiction						
	I-270 Corridor		Montgomery 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	-	0.00%	73	0.01%	0.01%	0.01%
Chemical Technicians	-	0.00%	-	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%
Operations Research Analysts	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 Economic Solutions, 2009.

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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 Economic Solutions, 2009.

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."[8]

- 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

[8] 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 lab-served 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 world-renowned 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 31-acre 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 square-foot 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. Competitive Biotechnology Clusters, 2009											
										Distance (miles) to	
Name/Location	Existing Companies	Related Federal Agencies	Research Institutions	Major Medical Center	Density	Highway Access	Transit Access	Available Laboratory Space	Presence of Incubator	Residential	Retail
Shady Grove Life Sciences Center, Gaithersburg		NIH	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.		NIH	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	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 Solutions, 2009.

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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."[9] 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[10], 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

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[9] Battelle Technology Partnership Practice, *BioMaryland 2020: Strategic Framework and Proposed Policy Actions*, May 2009, www.choosemaryland.org/businessinmd/biosciences/lsab/documentsandimages/BioMaryland%202020%20-%20Strategic%20Framework%20and%20Proposed%20Policy%20Actions.pdf

[10] Ibid, *Maryland Life Sciences Strategic Plan: the Current Competitive Position of Maryland,* May 2009, www.choosemaryland.org/businessinmd/biosciences/lsab/documentsandimages/Maryland%20Life%20Sciences%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[12] 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. Potential Growth in Bioscience Employment, Montgomery County and Gaithersburg West, 2007-2025

	Montgomery County		Gaithersburg West		
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

[11] Ernst & Young, *Beyond Borders: Global Biotechnology Report 2008,"* www.ey.com/Publication/vwLUAssets/Industry_Biotechnology_Beyond_Borders_2008/$FILE/Biotechnology_Beyond_Borders_2008.pdf and Biotechnology Industry Organization, *"Guide to Biotechnology, 2008."* www.bio.org/speeches/pubs/er/

[12] 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.

VI. Subarea Evaluations

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
    - Johns Hopkins University Montgomery County Center
    - University of Maryland Shady Grove Campus
    - 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 medically-related 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 auto-oriented 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.

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ATTACHMENT B

MONTGOMERY COUNTY PLANNING DEPARTMENT
THE MARYLAND-NATIONAL CAPITAL PARK AND PLANNING COMMISSION

June 4, 2009

MEMORANDUM

TO: Montgomery County Planning Board

VIA: Glenn Kreger, Acting Chief, Vision Division

FROM: Jacob Sesker, Planner Coordinator, Vision Division (301.650.5619)

SUBJECT: Economic Issues—LSC Zone

STAFF RECOMMENDATION: Discuss implications with regard to the LSC Zone and Gaithersburg West Master Plan and provide direction to staff.

PURPOSE OF THIS MEMO

This report provides context for the Planning Board's discussion of issues raised by the attached analysis of economic issues associated with the LSC Zone. *Financial Feasibility Analysis of Planned Development in Life Sciences Mixed-Use Zone*, was prepared by RCLCO for Johns Hopkins University and Percontee, Inc., two landowners who are potentially affected by the proposed revision to the LSC Zone.

INTRODUCTION

The RCLCO analysis addresses the economics of development under the proposed LSC zone. This staff memorandum analyzes and synthesizes the key issues raised by that analysis. Broadly speaking, the RCLCO analysis raises the following three issues:

- Density
- Use mix
- Cost of exactions

In addition to those three issues, staff has compiled a summary (Appendix A) of the layering of exactions on land values, using the same assumptions as the RCLCO analysis.

EXPLANATORY NOTE

The RCLCO memo uses a residual land value approach. In essence a residual land value analysis looks to see how much value the land has left after the costs of development and the "hurdle rate" (threshold level of financial returns) have been subtracted.

Because an underlying assumption of this analysis is that the hurdle rates have been met, comparatively low residual land value is not necessarily an indication that a development would not move forward; rather, it is an indication that it may be less attractive than other alternatives. For properties with existing uses producing income, the relevant comparison will be whether the residual land value of a given development program is greater than the value of the income stream produced either by the existing uses or other potential re-uses. For other properties, such as the Belward site, where there is substantial undeveloped land held with a very low "cost basis", a low residual land value may be less significant than pursuing the property owners' core purpose of promoting research and development.

ISSUE #1: DENSITY

RCLCO Finding

In summary, the RCLCO analysis argues that density itself does not increase the value of the land. The testimony assumes that increased density does not increase rents or reduce operating costs, but it does assume that density is a key factor in attracting or retaining employers and employees in the life sciences.

In the absence of exactions, additional density results in modest increases in land value. Land value increases with additional density more for residential uses than for non-residential uses. However, the increase in value is not proportional to the increase in density.

Table 1

Land value per acre w/no exactions , density scenarios by product type						
Density	R&D/Lab	Medical office	General office	Retail	Apartments	Condos
0.5 FAR	$1,034,550	$1,862,190	$1,742,400	$2,232,450	$1,230,570	$1,856,745
1.0 FAR	$1,067,220	$2,221,560	$1,916,640	$2,417,580	$2,330,460	$2,896,740
1.5 FAR	$1,143,450	$2,286,900	$1,960,200	$2,482,920	$2,809,620	$3,365,010
% Change	11%	23%	13%	11%	128%	81%

Source: RCLCO

According to RCLCO, an increase in density from 0.5 FAR to 1.5 FAR results in a modest 11% increase in land value for R&D/Lab space before exactions have been applied to the property; put differently, a 200% increase in density results in an 11% increase in land value. The disproportionately modest changes in land values that result from significant changes in density can be attributed to the cost of structured parking, as well as the more expensive construction materials and methods required to develop at higher densities.

While increases in non-residential density result in relatively modest increases in land value, residential land value increases more steeply with additional density. For example, tripling the density of residential apartments would more than double the value of the land (200% increase in density would result in 128% increase in land value). For all land uses, increases in density do not result in proportional increases in land value.

Table 2

Land value per acre with no exactions, cost of density from 0.5 FAR to 1.0 FAR, by product type						
Density	R&D/Lab	Medical office	General office	Retail	Apartments	Condos
0.5 FAR	$1,034,550	$1,862,190	$1,742,400	$2,232,450	$1,230,570	$1,856,745
2x 0.5 FAR	$2,069,100	$3,724,380	$3,484,800	$4,464,900	$2,461,140	$3,713,490
1.0 FAR	$1,067,220	$2,221,560	$1,916,640	$2,417,580	$2,330,460	$2,896,740
Density premium	-48%	-40%	-45%	-46%	-5%	-22%

Source: Montgomery County Planning Department, RCLCO

The table above illustrates that doubling the density does not result in a doubling of land values, instead resulting in modest increases in land value. This is because of the significant costs of moving to structured parking and the more expensive construction methods and materials required for higher density development. As an example, the land value for R&D/Lab space is 48% lower at 1.0 FAR than it would be if the doubling of density resulted in a doubling of value.

Table 3

Land value per acre with no exactions , cost of density from 0.5 FAR to 1.5 FAR, by product type						
Density	R&D/Lab	Medical office	General office	Retail	Apartments	Condos
0.5 FAR	$1,034,550	$1,862,190	$1,742,400	$2,232,450	$1,230,570	$1,856,745
3x 0.5 FAR	$3,103,650	$5,586,570	$5,227,200	$6,697,350	$3,691,710	$5,570,235
1.5 FAR	$1,143,450	$2,286,900	$1,960,200	$2,482,920	$2,809,620	$3,365,010
Density premium	-63%	-59%	-63%	-63%	-24%	-40%

Source: Montgomery County Planning Department, RCLCO

Re-iterating the point, tripling the density does not result in a tripling of the land value. The land value of R&D/Lab space at 1.5 FAR is 63% below what it would be if the land value at 0.5 FAR had been tripled.

Some exactions have a greater effect as density increases, whereas others have a relatively constant effect at varying levels of density. The issue of exactions, including the effect of exactions up and down the density scale, will be discussed in greater detail later in this memorandum.

Staff Response

- The costs of structured parking are not supported by the projected rents achievable in Gaithersburg West. Public sector funding for structured parking could provide valuable relief from the burdens of paying for public parking.

- Though the cost of structured parking may prevent much of the development from reaching the zoning envelope, other benefits of the proposed density are significant. Among those benefits are the following: the role of density in creating a vibrant mixed-use environment, the importance of being able to accommodate a large institutional tenant, and providing density sufficient to support transit in proximity to key institutions and employers.

- Staff does not have any reason to dispute the assumption that additional density in Gaithersburg West, in the absence of transit, is unlikely to lead to higher rents. However, there may be operational efficiencies that are not reflected in the testimony. For example, page 4 of that analysis states: "Density is critical not only as the foundation for a vibrant, urban place, which is an important draw for a transient and highly selective labor force, but it also allows for vital resources and expensive equipment to become more accessible to a broader population of workers." It may be that additional density could result in higher net operating incomes.

Recommendation

Retain the density as proposed in the ZTA and Draft Plan.

ISSUE #2: USE MIX

RCLCO Finding

The RCLCO analysis assumes that a mix of uses is necessary for attracting or retaining biotech employers and employees; it does not, however, assume any rent premium for R&D/Lab space associated with the urban research village model.

A significant aspect of the "value" of mixed-use is the internal subsidization of R&D/Lab development by other, more profitable uses.

Table 4

Hypothetical development at Belward, 4 scenarios, with existing and proposed exactions								
	Scenario 1		Scenario 2		Scenario 3		Scenario 4	
	0.5 FAR		1.0 FAR		1.0 FAR		1.0 FAR	
R&D/Lab	100%	$827,640	100%	$576,263	20%	$576,263	50%	$576,263
Medical office					20%	$1,385,644		
General office					50%	$1,003,586	40%	$1,003,586
Retail					10%	$1,504,526	10%	$1,504,526
Apartments								
Condos								
Total	100%	$827,640	100%	$576,263	100%	$1,044,627	100%	$840,019

Source: Montgomery County Planning Department, RCLCO

Staff developed the three scenarios above to illustrate the value of mixed-use, applying the RCLCO land values (including existing and proposed exactions) to each use.

- Scenario 1 vs. Scenario 2: Illustrates that doubling the built density for single use R&D/Lab space would actually result in lower land values.

- Scenario 1 vs. Scenario 3: Illustrates that a mix of uses can result in higher land values in spite of the marginal costs associated with a doubling of built density.

- Scenario 1 vs. Scenario 4: Illustrates that a development program containing a constant amount of R&D/Lab space (100% at FAR 0.5 is equal to 50% at 1.0 FAR) can achieve neutral or positive land value by adding density and a mix of uses.

- Scenario 2 vs. Scenario 3: Illustrates that a mix of uses can result in almost doubling the land value without a change to the density.

- Scenario 3 vs. Scenario 4: Illustrates that R&D/Lab space is a drag on land values in any mixed use scenario.

Staff Response

- Mix of uses is valuable for retaining and attracting biotech employers and employees. Mix of uses is also valuable in that it allows internal subsidization of the R&D/Lab use function.

- In certain situations, use mix can overcome the costs of building additional density. This is particularly true when the mix is dominated by non-residential development.

- Allowing a mix of uses increases the risk that much of the development within the master plan area will be uses other than R&D/Lab. However, the deed restriction on the Belward site, and other restrictions in the zone and master plan limit the development of certain uses. For example, while general office is allowed in the proposed LSC Zone, it is limited to not more than 50% of the gross floor area.[1] The purpose clause of the zone and the zone's requirement of master plan conformance will also serve to limit the extent to which more profitable uses can dominate the development.

Recommendation

Retain the flexibility of uses in the zone, the limit on general office use in the zone, and the master plan recommendations regarding use mix by district.

ISSUE #3: COST OF EXACTIONS

RCLCO Findings

RCLCO advocates for a reduction in the land use exactions. Specifically, RCLCO advocates for the removal of the proposed requirement that some non-residential development purchase BLTs for a portion of the optional method density.

In addition to the cost of structured parking and the higher costs of construction materials and methods necessary to achieve dense development, land use exactions also reduce the value of land. Some exactions apply only at density trigger points, whereas other exactions apply regardless of density.

[1] 59-C-5.211: "The following uses are permitted in the LSC Zone:(1) research, development and related activities; (2) private educational institutions;(3) health care services;(4) general offices limited to no more than 50% of the gross floor area;(5) conference centers;(6) hotels, motels, and inns;(7) dwellings and dormitories;(8) housing and related facilities for senior adults or persons with disabilities;(9) domiciliary care homes;(10) adult and child day care;(11) food services, excluding drive-in restaurants;(12) retail trade and personal services;(13) arts, entertainment, and recreation;(14) communications facilities or structures;(15) publicly owned or operated uses;(16) transportation facilities or structures;(17) utilities;(18) accessory buildings and uses; and(19) signs in accordance with the provisions of Article 59-F."

Table 5

Cost per FAR foot of existing exactions, by land use and density						
Density	R&D/Lab	Medical office	General office	Retail	Apartments	Condos
0.5 FAR	$9.50	$19.19	$19.19	$19.19	$28.06	$27.35
1.0 FAR	$9.50	$19.19	$19.19	$19.19	$31.31	$31.88
1.5 FAR	$9.50	$19.19	$19.19	$19.19	$35.88	$38.66

Source: RCLCO

The current exactions change very little as density increases. The cost of the MPDU requirement increases as density increases because MPDU pricing is tied to incomes, and does not change as the costs of development increase; consequently, as density increases the MPDU requirement becomes more of a burden on land value.

The proposed LSC Zone includes two exactions (BLT and Workforce Housing) that apply when density exceeds 0.5 FAR. Based on the structure of the zone, these exactions apply only to density above 0.5 FAR.

Sections 59-C-5.475 and 59-C-5.476 of the proposed ZTA address the proposed requirements that all non-residential development (except health care services[2]) purchase BLTs[3] in exchange for a portion of all density above FAR 0.5 and that any residential development of more than 100 units or a density of greater than 20 dwelling units per acre must provide workforce housing units[4] equal to at least 5% of the total number of market rate units.

Table 6

Cost per FAR foot of BLTs and Workforce Housing, by land use and density						
Density	R&D/Lab	Medical office	General office	Retail	Apartments	Condos
0.5 FAR	$0.00	$0.00	$0.00	$0.00	$0.00	$0.33
1.0 FAR	$1.77	$0.00	$1.77	$1.77	$0.00	$1.54
1.5 FAR	$2.36	$0.00	$2.36	$2.36	$1.02	$3.54

Source: RCLCO

[2] Health care services are defined in 59-A-2.1. "Health care services: Establishments providing health care by trained professionals. These establishments include hospitals, hospice care facilities, life care facilities, nursing homes, medical clinics, physical therapy facilities, and occupational therapy facilities."

[3] Under Section 59-C-5.475 of the proposed ZTA, all non-residential development (except health care services) is subject to a requirement to purchase Building Lot Terminations or make a payment to the Agricultural Land Preservation Fund. Developments subject to the requirement must purchase 12.5% of the floor area above FAR 0.5 at a rate of one buildable lot in the RDT (Rural Density Transfer) Zone per 7,500 square feet of subject non-residential space (put differently, one buildable lot must be extinguished for every 60,000 square feet above FAR 0.5). It is likely that most developments will end up making a payment to the Agricultural Land Preservation Fund (ALPF) rather than buy BLTs on the open market. Payments to the ALPF will be made in an amount to be established by Executive Regulation. Past research indicates that the value of a BLT is approximately $200,000 to $250,000. The RCLCO memo assumes a cost per BLT of $212,500.

[4] Under Section 59-C-5.476 of the proposed ZTA, a site plan containing residential units at a minimum density of 20 dwelling units per acre or containing a minimum of 100 dwelling units must include workforce housing units in an amount that is not less than 5% of the total number of proposed market rate units.

The proposed exactions become more burdensome as density increases. The BLT requirement increases from $0.00 per square foot at 0.5 FAR, to $1.77 per square foot at 1.0 FAR, to $2.36 per square foot at 1.5 FAR.

Table 7

Land value per acre, density scenarios by product type, no exactions, current exactions, and proposed exactions							
	Density	R&D/Lab	Med. office	Gen. office	Retail	Apartments	Condos
No County Exactions	0.5 FAR	$1,034,550	$1,862,190	$1,742,400	$2,232,450	$1,230,570	$1,856,745
	1.0 FAR	$1,067,220	$2,221,560	$1,916,640	$2,417,580	$2,330,460	$2,896,740
	1.5 FAR	$1,143,450	$2,286,900	$1,960,200	$2,482,920	$2,809,620	$3,365,010
Current County Exactions	0.5 FAR	$827,640	$1,444,232	$1,324,442	$1,814,492	$619,473	$1,261,061
	1.0 FAR	$653,400	$1,385,644	$1,080,724	$1,581,664	$966,783	$1,508,159
	1.5 FAR	$522,720	$1,033,025	$706,325	$1,229,045	$464,953	$839,029
Current & Proposed Exactions	0.5 FAR	$827,640	$1,444,232	$1,324,442	$1,814,492	$619,473	$1,253,901
	1.0 FAR	$576,263	$1,385,644	$1,003,586	$1,504,526	$966,783	$1,440,953
	1.5 FAR	$368,445	$1,033,025	$552,050	$1,074,770	$398,280	$607,649

Source: RCLCO

The aggregate effect of land use exactions on land values can be illustrated by comparing land values for any use or density level in the first grouping ("No County Exactions") in Table 7 above, with the corresponding cell in either of the other two groupings.

Staff Response

- Land use exactions reduce land values for all land uses and exactions increase as density increases. However, all residual land values are positive, which means that each land use can exceed a modest hurdle rate and still have "value left over." Whether there is enough residual value to justify redevelopment is a property-by-property analysis.

- The proposed exactions have a proportionally larger impact on R&D/Lab space than on other land uses, because R&D/Lab space is currently burdened with very few exactions when compared to other land uses. For example, transportation impact tax exemptions for life sciences result in substantial savings when compared to other industries or land uses.

- Relief from exactions is a clumsy form of economic development incentive, insofar as the benefit to tenants is often indirect. Early-stage research entities can often benefit more from infusions of cash than from modestly lower rents.

Recommendation

Retain the exactions in the proposed ZTA. To the extent that any relief from exactions is granted, that relief should be targeted to specific land uses which could benefit from economic development incentives. Other incentives, such as publicly financed structured parking, might be more effective as a means to achieve the vision in the Draft Plan.

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Attachments:
1. Appendix A: Layering of Burdens
2. Financial Feasibility Analysis of Planned Development in Life Sciences Mixed-Use Zone; Montgomery County, Maryland

cc: Nancy Sturgeon, Planner Coordinator, Vision Division
Greg Russ, Planner Coordinator, Build Division

ATTACHMENT 1

APPENDIX A: LAYERING OF BURDENS

Using the assumptions in the testimony, staff has compiled a visual summary of the so-called "parfait" for selected land uses allowed in the proposed LSC ZTA. Each of these visual summaries is intended to show the relative burdens imposed by the costs of density (e.g. structured parking) and current and proposed exactions.

Table A1

Regulatory burdens on land value at 0.5 FAR, per square foot						
Exaction	R&D/Lab	Medical office	General office	Retail	Apartments	Condos
School Impact Tax	$0.00	$0.00	$0.00	$0.00	$10.25	$8.11
Transportation Impact Tax	$0.00	$9.69	$9.69	$9.69	$5.99	$5.70
Sustainability/Green	$3.00	$3.00	$3.00	$3.00	$3.00	$3.00
Public Open Space/Amenities	$3.50	$3.50	$3.50	$3.50	$3.50	$3.50
Transportation Impact/Mitigation	$3.00	$3.00	$3.00	$3.00	$3.00	$3.00
MPDUs	$0.00	$0.00	$0.00	$0.00	$2.32	$4.04
Subtotal Current Exactions	*$9.50*	*$19.19*	*$19.19*	*$19.19*	*$28.06*	*$27.35*
BLTs	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Workforce Housing	$0.00	$0.00	$0.00	$0.00	$0.00	$0.33
Subtotal Proposed New Exactions	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.33*
Total Exactions	**$9.50**	**$19.19**	**$19.19**	**$19.19**	**$28.06**	**$27.68**

Source: RCLCO, Montgomery County Planning Department

Table A2

Regulatory burdens on land value at 1.0 FAR, per square foot						
Exaction	R&D/Lab	Medical office	General office	Retail	Apartments	Condos
School Impact Tax	$0.00	$0.00	$0.00	$0.00	$10.25	$8.11
Transportation Impact Tax	$0.00	$9.69	$9.69	$9.69	$5.99	$5.70
Sustainability/Green	$3.00	$3.00	$3.00	$3.00	$3.00	$3.00
Public Open Space/Amenities	$3.50	$3.50	$3.50	$3.50	$3.50	$3.50
Transportation Impact/Mitigation	$3.00	$3.00	$3.00	$3.00	$3.00	$3.00
MPDUs	$0.00	$0.00	$0.00	$0.00	$5.57	$8.56
Subtotal Current Exactions	*$9.50*	*$19.19*	*$19.19*	*$19.19*	*$31.31*	*$31.87*
BLTs	$1.77	$0.00	$1.77	$1.77	$0.00	$0.00
Workforce Housing	$0.00	$0.00	$0.00	$0.00	$0.00	$1.54
Subtotal Proposed New Exactions	*$1.77*	*$0.00*	*$1.77*	*$1.77*	*$0.00*	*$1.54*
Total Exactions	**$11.27**	**$19.19**	**$20.96**	**$20.96**	**$31.31**	**$33.41**

Source: RCLCO, Montgomery County Planning Department

Table A3

Regulatory burdens on land value at 1.5 FAR, per square foot						
Exaction	R&D/Lab	Medical office	General office	Retail	Apartments	Condos
School Impact Tax	$0.00	$0.00	$0.00	$0.00	$10.25	$8.11
Transportation Impact Tax	$0.00	$9.69	$9.69	$9.69	$5.99	$5.70
Sustainability/Green	$3.00	$3.00	$3.00	$3.00	$3.00	$3.00
Public Open Space/Amenities	$3.50	$3.50	$3.50	$3.50	$3.50	$3.50
Transportation Impact/Mitigation	$3.00	$3.00	$3.00	$3.00	$3.00	$3.00
MPDUs	$0.00	$0.00	$0.00	$0.00	$10.15	$15.35
Subtotal Current Exactions	*$9.50*	*$19.19*	*$19.19*	*$19.19*	*$35.89*	*$38.66*
BLTs	$2.36	$0.00	$2.36	$2.36	$0.00	$0.00
Workforce Housing	$0.00	$0.00	$0.00	$0.00	$1.02	$3.54
Subtotal Proposed New Exactions	*$2.36*	*$0.00*	*$2.36*	*$2.36*	*$1.02*	*$3.54*
Total Exactions	**$11.86**	**$19.19**	**$21.55**	**$21.55**	**$36.91**	**$42.20**

Source: RCLCO, Montgomery County Planning Department

Tables A4 through A9 are intended to illustrate how the cost of density (structured parking and more expensive construction materials and methods) and the various exactions under current zoning and proposed zoning affect residual land values. In those tables, each of the burdens on land value is shown as a negative number. The residual is what is left when each of those burdens has been subtracted, and is shown as a positive number.

Table A4

R&D/Lab Space: Reductions in land value, by burden/exaction, and residual			
	0.5 FAR	1.0 FAR	1.5 FAR
Cost of density	0%	-48%	-63%
School Impact Tax	0%	0%	0%
Transportation Impact Tax	0%	0%	0%
Sustainability/Green	-6%	-6%	-6%
Public Open Space/Amenities	-7%	-7%	-7%
Transportation Impact/Mitigation	-6%	-6%	-6%
MPDUs	0%	0%	0%
BLTs	0%	-4%	-5%
Workforce Housing	0%	0%	0%
Residual	**80%**	**28%**	**12%**

Source: Montgomery County Planning Department, RCLCO

Table A4 illustrates that the costs of density (structured parking, more expensive construction materials and methods) reduce land values for R&D/Lab by 48% at 1.0 FAR, and by 63% at 1.5 FAR. As used in Table A4 "cost of density" refers to the difference between the potential land value at a given density (assuming that land values at 0.5 FAR are proportionally increased with density) and the actual land values (after the costs of structured parking and higher construction costs have been taken into account). Current and proposed exactions further reduce land values—at 1.0 FAR, current exactions reduce the land value for R&D/Lab by 20% and BLTs by an additional 4%.

Tables A5 through A9 address the layering of burdens on medical office, general office, retail, apartments, and condos.

Table A5

Medical Office: Reductions in land value, by burden/exaction, and residual			
	0.5 FAR	1.0 FAR	1.5 FAR
Cost of density	0%	-40%	-59%
School Impact Tax	0%	0%	0%
Transportation Impact Tax	-11%	-11%	-11%
Sustainability/Green	-4%	-4%	-4%
Public Open Space/Amenities	-4%	-4%	-4%
Transportation Impact/Mitigation	-4%	-4%	-4%
MPDUs	0%	0%	0%
BLTs	0%	0%	0%
Workforce Housing	0%	0%	0%
Residual	**78%**	**37%**	**18%**

Source: Montgomery County Planning Department, RCLCO

Note that the language in the proposed LSC Zone appears to exempt medical office buildings from the BLT requirement, though staff understands that that was not the drafter's intent.

Table A6

General Office: Reductions in land value, by burden/exaction, and residual			
	0.5 FAR	1.0 FAR	1.5 FAR
Cost of density	0%	-45%	-63%
School Impact Tax	0%	0%	0%
Transportation Impact Tax	-12%	-12%	-12%
Sustainability/Green	-4%	-4%	-4%
Public Open Space/Amenities	-4%	-4%	-4%
Transportation Impact/Mitigation	-4%	-4%	-4%
MPDUs	0%	0%	0%
BLTs	0%	-2%	-3%
Workforce Housing	0%	0%	0%
Residual	**76%**	**29%**	**11%**

Source: Montgomery County Planning Department, RCLCO

Table A7

Retail: Reductions in land value, by burden/exaction, and residual			
	0.5 FAR	1.0 FAR	1.5 FAR
Cost of density	0%	-46%	-63%
School Impact Tax	0%	0%	0%
Transportation Impact Tax	-9%	-9%	-9%
Sustainability/Green	-3%	-3%	-3%
Public Open Space/Amenities	-3%	-3%	-3%
Transportation Impact/Mitigation	-3%	-3%	-3%
MPDUs	0%	0%	0%
BLTs	0%	-2%	-2%
Workforce Housing	0%	0%	0%
Residual	**81%**	**34%**	**16%**

Source: Montgomery County Planning Department, RCLCO

Table A8

Apartments: Reductions in land value, by burden/exaction, and residual			
	0.5 FAR	1.0 FAR	1.5 FAR
Cost of density	0%	-5%	-24%
School Impact Tax	-18%	-18%	-18%
Transportation Impact Tax	-11%	-11%	-11%
Sustainability/Green	-5%	-5%	-5%
Public Open Space/Amenities	-6%	-6%	-6%
Transportation Impact/Mitigation	-5%	-5%	-5%
MPDUs	-4%	-10%	-18%
BLTs	0%	0%	0%
Workforce Housing	0%	0%	-2%
Residual	**50%**	**39%**	**11%**

Source: Montgomery County Planning Department, RCLCO

Table A9

Condos: Reductions in land value, by burden/exaction, and residual			
	0.5 FAR	1.0 FAR	1.5 FAR
Cost of density	0%	-22%	-40%
School Impact Tax	-10%	-10%	-10%
Transportation Impact Tax	-7%	-7%	-7%
Sustainability/Green	-4%	-4%	-4%
Public Open Space/Amenities	-4%	-4%	-4%
Transportation Impact/Mitigation	-4%	-4%	-4%
MPDUs	-5%	-10%	-18%
BLTs	0%	0%	0%
Workforce Housing	0%	-2%	-4%
Residual	**68%**	**39%**	**11%**

ATTACHMENT 2

MEMORANDUM

DATE: May 21, 2009

TO: Jonathan Genn, Percontee, Incorporated
David McDonough, Johns Hopkins Real Estate

FROM: Len Bogorad, Managing Director
Marc McCauley, Senior Principal
Ann Glendon, Senor Consultant

SUBJECT: Financial Feasibility Analysis of Planned Development in Life Sciences Mixed-Use Zone; Montgomery County, Maryland

Executive Summary

From our investigation of the unique economic forces that distinctively impact life sciences, mixed-use communities --- which are contemplated by both Johns Hopkins University (JHU) for the Shady Grove area and by Percontee, Inc. (Percontee) for the White Oak area of Montgomery County --- we conclude that the financial feasibility of these prospective life-sciences communities is severely jeopardized with the set of existing and proposed exactions imposed by Montgomery County, including those that relate to any proposed Building Lot Termination (BLT) payments. Accordingly, the vision shared by JHU and Percontee to create internationally renowned epicenters for the advancement of the life sciences and applied technologies in the 21st Century and beyond --- and the valuable opportunities they represent to Montgomery County and the State of Maryland --- will likely not be realized if Montgomery County were to elect to treat these unique life sciences, mixed use communities in the same fashion as other more conventional, mixed-use developments. In all likelihood, the creation of these unique land use concepts and economic development engines will require the County to review the appropriateness of not only proposed exactions, but also the existing exactions.

We have assumed as part of this analysis that the County has accepted the following general propositions: 1) the life sciences sector plays a critical role in the County's economy now and into the foreseeable future as a primary driver of economic activity, and offers the County significant positive fiscal and economic impact; 2) there is strong competition regionally and nationally (as well as globally) to retain and attract major life science clusters, and this strong competition will lead to aggressive public and public-private ventures in other places in order to cultivate this critical economic engine; and, 3) in order to retain and attract a sustainable life sciences economy, competitive jurisdictions (and Montgomery County) must create vibrant, mixed-use places that are now required by innovative institutions and companies, and perhaps more critically, their "creative class" workforce.

The economic and market forces affecting the life sciences and applied technologies sector --- and the supporting land use concepts and amenities necessary to create a vibrant live-work-play life sciences community --- create significant financial burdens on real estate development activity. Urban research villages are necessary to effectively compete, but are at least "triple-burdened" by: 1) substantially higher construction costs of specialized laboratory space, which can cost five times or more the cost of general office space; 2) substantially lower rent or sale price constraints due to hyper-competition (often against projects in jurisdictions offering significant subsidies) and real occupancy cost ceilings of major catalytic tenants (governmental and institutional) and private-sector start-up businesses; and, 3) substantially higher construction costs associated with higher-density, mixed-use environments, particularly more expensive building construction costs and the increased costs of structured or below-grade parking.

The increased costs associated with the urban research village concept combined with the inability to "pass onto" tenants or buyers these high costs creates significant pressures on the financial feasibility of

the real estate development. There is even less ability to effectively pass onto tenants or buyers additional costs associated with the County-imposed exactions. Furthermore, due to the interdependence of the various amenities that are needed to support a 21st Century life sciences and applied technologies mixed-use community (e.g., medical offices, hotels and conference centers, restaurants, retail, residences, general offices for affiliated businesses, etc.), these other uses are also adversely affected by the same underlying economic constraints the characterize the life sciences and applied technology uses, which are the anchors that "brand" and must exist first in these communities.

Although the current distressed state of the economy would likely forestall development on either property in the near future, we believe a longer-term perspective on economic feasibility is appropriate given the sheer size of the parcels, the millions of square feet of development capacity in question, and the potential economic benefit these planned life science clusters will have on the County – and the lost economic benefits that would result from missed opportunities to retain and grow this critical sector. This analysis evaluates financial returns and underlying land economics under improved economic conditions using market assumptions which we consider stable and reasonable. Even within this context, we have found that the type of higher-density, mixed-use development that would be required to create a highly-competitive, economically-sustainable life sciences urban research village results in lower land value per FAR square foot than conventional, low-density suburban development for all types of real estate development. This is primarily due to the increase in construction costs – most notably more expensive building types and the cost of moving from surface to structured parking – relative to any market premiums on rents.

When County exactions are applied to challenging building development and land economics these exactions create another financial obstacle that significantly degrades land value to the point that higher-density development offers less land value per acre than conventional, low-density suburban development. The inability of increased density to result in higher per-acre land values in our analysis is due to the increased cost of building density combined with the inflexible exactions placed on development – as land value per FAR square foot falls as density increases, exactions per FAR square foot stay constant. A life sciences urban research village is further constrained by land uses – most notably specialized laboratory space – that naturally result in a lower land value given higher building costs and revenue constraints.

Given the likely development and land value economic challenges associated with creating a denser, mixed-use urban research village at the two proposed life sciences urban research village locations, existing and proposed exactions will place a particularly prohibitive burden on the proposed projects. We have found that a reduction in existing and proposed exactions of between 25% and 50% (as shown in Table 11 on page 12) will be required to remove the strong financial disincentives to creating the type of environment that can compete effectively in the national and global marketplace for life sciences uses, particularly the government and institutional users that will catalyze broader economic growth. In that the goal of a life sciences urban research village is to create a vibrant mix of uses, any reduction in exactions should be applied across land use types; targeted incentives to specific land uses would create a strong economic incentive for the private-sector to only deliver those land use types, thus not resulting in a vibrant, mixed-use environment that can effectively compete a world-class life sciences cluster.

Background and Objectives

RCLCO was retained by Percontee Incorporated (Percontee) and Johns Hopkins Real Estate (JHU) to conduct a financial feasibility analysis of mixed-use development within Life Sciences Center (LSC) zones in Montgomery County. Percontee owns approximately 185 acres of land adjacent to the new Food and Drug Administration (FDA) headquarters in White Oak, and JHU controls about 107 acres within the Shady Grove Life Sciences Center adjacent to its Montgomery County campus. Percontee and

JHU are jointly pursuing a zoning text amendment that would allow for a mix of uses and higher densities within the LSC zone that would allow for truly world class research villages.

The analysis is intended to address the financial impacts of Montgomery County's existing and proposed exactions on new development within LSC zones under the zoning text amendment. Existing exactions include impact taxes for transportation and schools, Moderately Priced Dwelling Units (MPDUs), measures for traffic mitigation, provisions for open space, and green building features. Proposed new exactions would also require that developers make Building Lot Termination (BLT) payments and provide workforce housing in mixed-use LSC zones.

Discussion of the Analysis

Economic Forces Facing the Life Sciences Sector

We have assumed as part of this analysis that the County has accepted the following general propositions: 1) the life sciences sector plays a critical role in the County's economy now and into the foreseeable future as a primary driver of economic activity, and offers the County significant positive fiscal and economic impact; 2) there is strong competition regionally and nationally (as well as globally) to retain and attract major life science clusters, and this strong competition will lead to aggressive public and public-private ventures in other places in order to cultivate this critical economic engine; and, 3) in order to retain and attract a sustainable life sciences economy, competitive jurisdictions (and Montgomery County) must create vibrant, mixed-use places that are now required by innovative institutions and companies, and perhaps more critically, their "creative class" workforce. Specifically, we propose that:

- The life sciences sector is widely held as a key economic driver globally and nationally for the next 20 years and beyond.
- The fiscal and economic benefit of the proposed life sciences projects as proposed by JHU and Percontee have been shown to be significant. With regard to fiscal benefit, JHU's project will result in a $10.7 million net fiscal benefit annually at build out and Percontee's project will result in a net fiscal benefit of $471.5 million over a 30-year period[1].
- The key to maintaining and growing a sustainable, world-class life sciences economy is retaining and attracting key life sciences economic catalysts – most notably larger-scale government and/or institutional entities.
- The larger-scale life sciences catalysts are limited in number and often have significant constraints on occupancy costs.
- There is very strong competition regionally and nationally to attract and retain the limited number of life sciences catalysts and their spin-off activity.
- This strong competition for a limited number of prospective catalysts, along with constraints on occupancy costs of these types of tenants, will place tremendous strain on real estate development financials, primarily by pushing down achievable rents and pushing up development costs (specifically related to higher tenant build out).
- The strong motivation to create and bolster life sciences clusters and the financial strain on development that will result from strong competition will likely result in many jurisdictions offering significant incentives/reduction of development burdens.

[1] Based upon previously completed studies: JHU impacts were analyzed in a June 2008 report by Sage Policy Group, Inc.,; Percontee impacts were analyzed in a March 2008 report by RCLCO.

- The ability to attract and retain a high-quality workforce – the members of which are often very selective about where they choose to work and live -- is especially important to the sustainability of a life sciences cluster.
- Life sciences catalysts and the related private sector economic activity will strongly prefer to locate in vibrant, mixed-use, high-density cores – the urban research village concept --- in great part because of the attractiveness of this concept to high-quality, creative workers.
- The urban research village concept creates an environment where people can more easily interact and innovations can be more easily shared; creativity can flourish; research institutions can work more closely with businesses large and small (including the array of support businesses that are key to the effective commercialization of research ideas); and time-sensitive, lifestyle-focused workers have the flexibility to more efficiently blend work and leisure time.
- Density of development is critical not only as the foundation for a vibrant, urban place, but it also allows for vital resources and expensive equipment to become more accessible to a broader population of workers.

The Urban Research Village Concept

The life sciences sector is a key component of the current and future economic health of Montgomery County. The County is now, and will be for the foreseeable future, competing for growth opportunities within this sector within a highly competitive global marketplace. It is critical, in this highly competitive global context, that the County provide the physical places that can retain and attract life sciences employers and employees, especially within the world-class research institutions that are catalysts of innovation and engines of future employment growth.

The existing LSC zone in Montgomery County is based upon a largely outdated model that permits single-use buildings at relatively low densities in primarily single-use commercial developments. The life sciences clusters of the future will flourish within urban research villages -- dense, 18-hour, mixed-use environments that provide creative class workers not only the places to do their work, but also close proximity to a variety of housing options, shopping, dining, entertainment, culture, recreation, and public transit. Density is critical not only as the foundation for a vibrant, urban place, which is an important draw for a transient and highly selective labor force, but it also allows for vital resources and expensive equipment to become more accessible to a broader population of workers. Unlike the single-use business park model of the past (as typified by the County's current LSC zone), which physically separated uses and activities from one another, the urban research village concept creates an environment where people can more easily interact and innovations can be more easily shared; creativity can flourish; research institutions can work more closely with businesses large and small (including the array of support businesses that are key to the effective commercialization of research ideas); and time-sensitive, lifestyle-focused workers have the flexibility to more efficiently blend work and leisure time.

Previous studies have shown the significant positive fiscal and economic impacts that the urban research village concept will have on the County. As a foundation of this analysis, we have assumed that the County has embraced the goal of retaining and growing its life science economy, and that the urban research village has been accepted as a key component of this goal.

Assumptions

In order to determine the impacts of existing and proposed exactions, we analyzed the land residual values associated with the development of a variety of product types under various scenarios of density and level of County exactions. Residual land value was determined utilizing market assumptions on

revenue and development costs, and static financial return hurdle rates (9.0% return on costs for commercial, 7.0% return on costs for rental apartments, and 25% profit rate for for-sale condominiums. These assumptions were derived based upon RCLCO experience and in-house knowledge, as well as consultation with our clients.

We have tested the residual land values for a variety of density scenarios – 0.5 FAR (the base zoning), 1.0 FAR, and 1.5 FAR. Residual land value is a useful measure, once consistent return hurdle rates for the vertical development are assumed, in that it shows the underlying land economics of viable development projects and allows for an apples-to-apples comparison across scenarios. The underlying land economics will drive, in great part, the decision of developers to seek higher densities. The use of residual land value by acre allows for a comparison across density scenarios, but the residual land value per FAR square foot is also a useful and important measure to track, as will be discussed more below.

The increase in density from one scenario to another requires a change in assumption with regard to the built form and the cost of vertical development – specifically the cost of construction of the building and the cost of parking serving that use. Specifically, we have assumed:

- In the 0.5 FAR scenario all uses can and will be delivered in lower-cost, wood-frame product with surface parking.
- In the 1.0 FAR scenario all buildings will still be wood-frame, but structured parking will replace the surface parking (at an average cost of $15,000 per space, as compared to $3,000 per space for surface parking).
- In the 1.5 FAR scenario we have assumed a higher-cost mid-rise product will be required, which will result in an increase in vertical construction costs, but all parking will still be served in structured parking decks (we have not assumed any underground parking).
- We have not assumed any changes to parking ratios across any of the scenarios.
- Site development costs are assumed at $150,000 per acre across all scenarios, so the higher-density scenarios have a resulting lower site development cost per FAR SF.

More information on the inputs into this analysis can be found in the more detailed financial analysis at the end of this memorandum.

As shown in Table 1, the proposed exactions will have a significant impact on land values, especially at the higher-density (1.5 FAR) scenario. The proposed exactions are as follows:

- Density above the base FAR of 0.5 will be required to purchase Building Lot Termination (BLT) easements, equal to 12.5% of the additional FAR square feet. Health care services are exempt from this requirement. We have assumed each BLT easement of 7,500 square feet will cost $212,500.
- Workforce housing, defined broadly as housing that serves households with incomes between 60% and 120% of the area median income (AMI), will be required for residential projects at densities at or above 20 units per acre or containing at least 100 dwelling units. For the purposes of this analysis we have assumed that these units will target households between 60% and 100%; in most cases, market-rate multifamily development already serves households over 100% of AMI. We have assumed that workforce housing units will be part of a density bonus program, and thus merely need to reach market-rate return hurdles and support a neutral land value.

Table 1. Summary of Proposed Exactions per FAR SF and Their Impacts on Land Value

Scenario	Land Use					
	R&D/Lab Space	Medical Office	General Office	Retail	Apartments	Condos
0.5 FAR						
Proposed Exactions per FAR SF	$0.00	$0.00	$0.00	$0.00	$0.00	$0.33
Building Lot Termination	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Workforce Housing	$0.00	$0.00	$0.00	$0.00	$0.00	$0.33
Impact on Value Per Acre	$0	$0	$0	$0	$0	$7,160
1.0 FAR						
Proposed Exactions per FAR SF	$1.77	$0.00	$1.77	$1.77	$0.00	$1.54
Building Lot Termination	$1.77	$0.00	$1.77	$1.77	$0.00	$0.00
Workforce Housing	$0.00	$0.00	$0.00	$0.00	$0.00	$1.54
Impact on Value Per Acre	$77,138	$0	$77,138	$77,138	$0	$67,206
1.5 FAR						
Proposed Exactions per FAR SF	$2.36	$0.00	$2.36	$2.36	$1.02	$3.54
Building Lot Termination	$2.36	$0.00	$2.36	$2.36	$0.00	$0.00
Workforce Housing	$0.00	$0.00	$0.00	$0.00	$1.02	$3.54
Impact on Value Per Acre	$154,275	$0	$154,275	$154,275	$66,673	$231,380

Table 2 provides the existing exactions for the three density scenarios. These exactions generally stay constant per FAR square foot, with the exception of the MPDU requirement. The cost of the MPDU exactions was calculated by assuming a market-rate return hurdle for these units at rents and prices targeting incomes at or below 60% of AMI, and then determining if a negative land value resulted; the cost of this negative land value was then distributed across the entire program. We have assumed that MPDU units will be part of a density bonus program, and thus merely need to reach market-rate return hurdles and support a neutral land value.

Table 2. Summary of Existing Exactions per FAR SF and Their Impacts on Land Value

Scenario	Land Use					
	R&D/Lab Space	Medical Office	General Office	Retail	Apartments	Condos
0.5 FAR						
Existing Exactions per FAR SF	$9.50	$19.19	$19.19	$19.19	$28.06	$27.35
School Impact Tax	$0.00	$0.00	$0.00	$0.00	$10.25	$8.11
Transportation Impact Tax	$0.00	$9.69	$9.69	$9.69	$5.99	$5.70
Sustainability/Green	$3.00	$3.00	$3.00	$3.00	$3.00	$3.00
Public Open Space/Amenities	$3.50	$3.50	$3.50	$3.50	$3.50	$3.50
Transportation Impact/Mitigation	$3.00	$3.00	$3.00	$3.00	$3.00	$3.00
MPDUs	$0.00	$0.00	$0.00	$0.00	$2.32	$4.04
Impact on Value Per Acre	$206,910	$417,958	$417,958	$417,958	$611,097	$595,684
1.0 FAR						
Existing Exactions per FAR SF	$9.50	$19.19	$19.19	$19.19	$31.31	$31.88
School Impact Tax	$0.00	$0.00	$0.00	$0.00	$10.25	$8.11
Transportation Impact Tax	$0.00	$9.69	$9.69	$9.69	$5.99	$5.70
Sustainability/Green	$3.00	$3.00	$3.00	$3.00	$3.00	$3.00
Public Open Space/Amenities	$3.50	$3.50	$3.50	$3.50	$3.50	$3.50
Transportation Impact/Mitigation	$3.00	$3.00	$3.00	$3.00	$3.00	$3.00
MPDUs	$0.00	$0.00	$0.00	$0.00	$5.57	$8.56
Impact on Value Per Acre	$413,820	$835,916	$835,916	$835,916	$1,363,677	$1,388,581
1.5 FAR						
Existing Exactions per FAR SF	$9.50	$19.19	$19.19	$19.19	$35.88	$38.66
School Impact Tax	$0.00	$0.00	$0.00	$0.00	$10.25	$8.11
Transportation Impact Tax	$0.00	$9.69	$9.69	$9.69	$5.99	$5.70
Sustainability/Green	$3.00	$3.00	$3.00	$3.00	$3.00	$3.00
Public Open Space/Amenities	$3.50	$3.50	$3.50	$3.50	$3.50	$3.50
Transportation Impact/Mitigation	$3.00	$3.00	$3.00	$3.00	$3.00	$3.00
MPDUs	$0.00	$0.00	$0.00	$0.00	$10.15	$15.35
Impact on Value Per Acre	$620,730	$1,253,875	$1,253,875	$1,253,875	$2,344,667	$2,525,981

We have assumed a constant rate per FAR square foot for exactions which tend to be more variable and negotiable – Sustainability/Green, Public Space/Amenities, and Transportation Impact Mitigation – based upon our experience working with similar projects in the County. In reality these exactions are often

negotiated, and thus a rate of total exactions of these types over the $9.50 peer FAR square foot would have an even greater impact on financial feasibility of projects. For those exactions with set rates – School Impact Tax and Transportation Impact Tax – we have used the current rates, with the understanding that these rates are set to increase next year.

The existing exactions have a considerably greater impact on land values than the proposed exactions, although the proposed exactions still represent a significant increase. As shown in Table 3, R&D/Lab buildings experience the greatest percentage increase in exactions under the 1.0 and 1.5 FAR scenarios (which include proposed exactions); the higher percentage increase is due to the exemption of R&D/Lab space from Transportation Impact Fees under existing exactions, and thus proposed exactions for this space are calculated off a lower base than other commercial products. Total exactions for R&D/Lab space under the 1.0 and 1.5 FAR scenarios still are significantly lower – approximately 40% to 45% -- than other commercial products.

Residential product has a significantly higher burden of exactions than commercial product, particularly because of the addition of school impact taxes and MPDU requirements, but the percentage increase imposed by proposed exactions on multifamily residential products is lower than on commercial products. This is because the workforce housing requirement is less onerous than the BLT due to the fact that workforce housing rents/prices (even assuming targeting incomes between 60% and 100%) are relatively close to market-rate rents/prices. The degree of burden exacted by the workforce housing requirement is dependent on the cost of construction, and thus higher-density scenarios where more expensive parking and building types are utilized impose a greater burden. The workforce housing requirement for rental apartments does not create a burden until the highest density scenario, as market-rate rents fit within workforce income ranges up to the most expensive construction type.

Table 3. Comparison of Existing and Proposed Exactions

Scenario	Land Use					
	R&D/Lab Space	Medical Office	General Office	Retail	Apartments	Condos
0.5 FAR						
Existing Exactions per FAR SF	$9.50	$19.19	$19.19	$19.19	$28.06	$27.35
Proposed Exactions per FAR SF	$0.00	$0.00	$0.00	$0.00	$0.00	$0.33
% Additional from Proposed Exactions	0.0%	0.0%	0.0%	0.0%	0.0%	1.2%
1.0 FAR						
Existing Exactions per FAR SF	$9.50	$19.19	$19.19	$19.19	$31.31	$31.88
Proposed Exactions per FAR SF	$1.77	$0.00	$1.77	$1.77	$0.00	$1.54
% Additional from Proposed Exactions	18.6%	0.0%	9.2%	9.2%	0.0%	4.8%
1.5 FAR						
Existing Exactions per FAR SF	$9.50	$19.19	$19.19	$19.19	$35.88	$38.66
Proposed Exactions per FAR SF	$2.36	$0.00	$2.36	$2.36	$1.02	$3.54
% Additional from Proposed Exactions	24.9%	0.0%	12.3%	12.3%	2.8%	9.2%

Financial Analysis Findings

The land value economics of development are significantly affected by existing and proposed exactions, but are impacted to an even greater degree by the cost of density and the resulting impact on land values per FAR square foot. As shown in Table 4, if land value per FAR square foot was held constant, there will still be significant value loss, but overall increases in land value per acre would almost certainly incentivize higher-density development.

Table 4. Summary of Land Values Assuming Constant Land Value per SF

Scenario	Land Use					
	R&D/Lab Space	Medical Office	General Office	Retail	Apartments	Condos
0.5 FAR						
Base Land Value per FAR SF Without Exactions	$47.50	$85.50	$80.00	$102.50	$56.50	$85.25
Base Land Value per FAR SF With Existing Exactions	$38.00	$66.31	$60.81	$83.31	$28.44	$57.57
Base Land Value per Acre With Existing Exactions	$827,640	$1,444,232	$1,324,442	$1,814,492	$619,473	$1,253,901
1.0 FAR						
Land Valuer per FAR SF With All Exactions	$36.23	$66.31	$59.04	$81.54	$25.19	$51.83
Land Value per Acre	$1,578,143	$2,888,464	$2,571,746	$3,551,846	$1,097,463	$2,257,703
% Increase from Base Value (With Existing Exactions)	91%	100%	94%	96%	77%	80%
Land Value Without Existing Exactions Remaining Constant	$1,655,280	$2,888,464	$2,648,884	$3,628,984	$1,238,945	$2,507,801
Impacted Land Value	-$77,137	$0	-$77,138	-$77,138	-$141,483	-$250,098
1.5 FAR						
Land Valuer per FAR SF With All Exactions	$35.64	$66.31	$58.45	$80.95	$19.60	$43.05
Land Value per Acre	$2,328,645	$4,332,695	$3,819,050	$5,289,200	$1,280,370	$2,812,874
% Increase from Base Value (With Existing Exactions)	181%	200%	188%	191%	107%	124%
Land Value Without Existing Exactions Remaining Constant	$2,482,920.00	$4,332,695.40	$3,973,325.40	$5,443,475.40	$1,858,418.16	$3,761,701.97
Impacted Land Value	-$154,275	$0	-$154,275	-$154,275	-$578,048	-$948,828

However, the increased cost of density – first moving to structured parking and then to a more expensive building type – has a downward effect on land values per FAR SF. As shown in Table 5, land values per FAR square foot, without accounting for any exactions, drop approximately 40% to 50% for commercial uses and 5% to 20% for residential uses from 0.5 FAR to 1.0 FAR, and an additional 30% for commercial and 20% for residential when moving from 1.0 FAR to 1.5 FAR. While rents and prices also increase through these scenarios, with the assumption that a well-executed urban environment could achieve a market premium, the increase in revenues is expected to be outpaced by the increase in costs.

Table 5. Land Values per FAR SF of Selected Scenarios by Product Type

Scenarios/ Included Exactions	R&D/Lab Space	Medical Office	General Office	Retail	Apartments	Condos
No County Exactions						
0.5 FAR	$47.50	$85.50	$80.00	$102.50	$56.50	$85.25
1.0 FAR	$24.50	$51.00	$44.00	$55.50	$53.50	$66.50
1.5 FAR	$17.50	$35.00	$30.00	$38.00	$43.00	$51.50
Existing County Exactions						
0.5 FAR	$38.00	$66.31	$60.81	$83.31	$28.44	$57.90
1.0 FAR	$15.00	$31.81	$24.81	$36.31	$22.19	$34.62
1.5 FAR	$8.00	$15.81	$10.81	$18.81	$7.12	$12.84
Existing & Proposed Exactions						
0.5 FAR	$38.00	$66.31	$60.81	$83.31	$28.44	$57.57
1.0 FAR	$13.23	$31.81	$23.04	$34.54	$22.19	$33.08
1.5 FAR	$5.64	$15.81	$8.45	$16.45	$6.10	$9.30

As residual land values per FAR square foot decline as densities increase, existing and proposed exactions per FAR SF hold constant or increase, and thus have a greater impact on overall land values. The impact of the inflexible exactions is best shown in the comparison of land values per acre with and without exactions. While land value per FAR square foot does decline as densities increase, the land value per acre without any exactions does increase. This is because the reduction in per square foot value is still at a lower rate than the increase in total square footage. However, the combination of the increased costs of densities, the effect of those increased costs on land value per FAR SF, and the inflexible exactions do result in very significant value loss.

As shown in Table 6, after accounting for all existing and proposed exactions, the lowest-density option (0.5 FAR) results in the highest per-acre land value for all the commercial uses. The multifamily

residential uses do see an increase in land value per acre moving from 0.5 FAR to 1.0 FAR, but the per-acre values for these uses drop to their lowest point when moving to 1.5 FAR. This trend suggests a strong disincentive for landowners/developers to seek additional density under current market and entitlement conditions – especially for developments with a high percentage of commercial uses.

Table 6. Land Values per Acre of Selected Scenarios by Product Type

Scenarios/ Included Exactions	R&D/Lab Space	Medical Office	General Office	Retail	Apartments	Condos
No County Exactions						
0.5 FAR	$1,034,550	$1,862,190	$1,742,400	$2,232,450	$1,230,570	$1,856,745
1.0 FAR	$1,067,220	$2,221,560	$1,916,640	$2,417,580	$2,330,460	$2,896,740
1.5 FAR	$1,143,450	$2,286,900	$1,960,200	$2,482,920	$2,809,620	$3,365,010
Existing County Exactions						
0.5 FAR	$827,640	$1,444,232	$1,324,442	$1,814,492	$619,473	$1,261,061
1.0 FAR	$653,400	$1,385,644	$1,080,724	$1,581,664	$966,783	$1,508,159
1.5 FAR	$522,720	$1,033,025	$706,325	$1,229,045	$464,953	$839,029
Existing & Proposed Exactions						
0.5 FAR	$827,640	$1,444,232	$1,324,442	$1,814,492	$619,473	$1,253,901
1.0 FAR	$576,263	$1,385,644	$1,003,586	$1,504,526	$966,783	$1,440,953
1.5 FAR	$368,445	$1,033,025	$552,050	$1,074,770	$398,280	$607,649

R&D/Lab space provides lower land value than other commercial development. R&D space is uniformly more expensive to build than office space, particularly with regard to the build-out of the space and the purchase of expensive equipment. In our analysis, we have assumed typical fit out costs, but the actual costs vary widely depending on intended use of the facility. Some tenants require fairly conventional laboratory space, while some of the most cutting edge research requires much more sophisticated equipment and construction features. Moreover, while R&D/Lab space generally achieves higher rents than conventional office space, given the specialty nature of the use and the more expensive construction costs, many tenants have constraints on absolute occupancy costs, particularly government and institutional users that are often the key catalysts for research and innovation that drive private sector employment growth.

It is also important to note that competition for major life science R&D catalysts will be fierce nationally and globally, and many jurisdictions will likely aggressively offer incentives to attract these types of users. Aggressive incentives will allow developers in competitive locations to provide lower rents and/or a greater share of expensive space fit out. As a result, a world-class research and technology project is often very difficult to justify economically without some form of subsidy, and the land values calculated within this analysis may actually be overly aggressive. Within a mixed-use setting, profits from development of other complementary commercial or residential uses are often not sufficient to internally subsidize R&D space with lower financial returns and/or land values.

In order to incentivize higher-density development, we assume that landowners will require at least a neutral land value proposition, and most likely require a significant increase (20%-25%) in land value to justify cost of pursuing entitlements (in this case, the efforts of landowners to create a new LSC zone) and increased development risk. Even landowners motivated to provide a world-class urban research village will likely not do so in the face of severe economic disincentives.

In Table 7, we have provided the average land value per acre for hypothetical developments – a conventional business park model at a 0.5 FAR, and the mixed-use urban research village concept at 1.0 and 1.5 FARs. The higher-density mixed-use concepts have significantly lower average land values per acre; the mixture of uses does not effectively subsidize uses that may be desirable targets for reduction in exactions – most notably R&D/Lab uses. If the goal was to make the urban research village concept an

economically neutral proposition, the reduction in value per FAR square foot would need to be addressed – potentially through a reduction in exactions or other forms of subsidy. Under the 1.0 FAR SF scenario, the value reduction equates to $6.24 per FAR square foot (roughly 28% of total exactions); under the 1.5 FAR SF scenario, the value reduction increases to $10.99 per square foot (approximately 45% of total exactions).

Table 7. Comparison of Land Values by Hypothetical Development Program

	Conventional Development 0.5 FAR		Urban Research Village 1.0 FAR		Urban Research Village 1.5 FAR	
Land Use	% of Uses	Land Value per Acre	% of Uses	Land Value per Acre	% of Uses	Land Value per Acre
R&D/Lab Space	15.0%	$827,640	25.0%	$576,263	25.0%	$368,445
Medical Office	30.0%	$1,444,232	20.0%	$1,308,506	20.0%	$878,750
General Office	54.0%	$1,324,442	20.0%	$1,003,586	20.0%	$552,050
Retail	1.0%	$1,814,492	5.0%	$1,504,526	5.0%	$1,074,770
Apartments	0.0%	$619,473	20.0%	$966,783	20.0%	$398,280
Condos	0.0%	$1,253,901	10.0%	$1,440,953	10.0%	$607,649
TOTAL/AVG.	**100.0%**	**$1,290,759**	**100.0%**	**$1,019,162**	**100.0%**	**$572,431**
Value Reduction (Neutral Land Value)				**-$271,597**		**-$718,328**
per FAR SF				**-$6.24**		**-$10.99**
Total Exactions per FAR SF		**$17.74**		**$22.56**		**$24.26**
% of Total Exactions				**27.6%**		**45.3%**

Strong competition nationally could further diminish the land value directed with R&D/Lab space, particularly for key anchor tenants that will be required to support a world-class urban research village concept. This competition could result in lower rents (often government and institutional have occupancy cost caps) and higher development costs (specifically the percentage of fit out that the developer pays covers). If competition for the R&D/Lab component becomes particularly fierce, it is quite possible that the residual land value for this space is reduced to zero. As shown in Table 8, if the residual land value for R&D/Lab space is reduced to zero, then the value reduction per FAR square foot increases to $9.54 for the 1.0 FAR square foot scenario and $12.40 for the 1.5 FAR square foot scenario. This is a possible scenario that would require further mitigation of exactions – an increase in value reduction to 42% and 51% of exactions for each of the density scenarios.

Table 8. Comparison of Land Values by Hypothetical Development Program - R&D Land Value at $0

	Conventional Development 0.5 FAR		Urban Research Village 1.0 FAR		Urban Research Village 1.5 FAR	
Land Use	% of Uses	Land Value per Acre	% of Uses	Land Value per Acre	% of Uses	Land Value per Acre
R&D/Lab Space	15.0%	$827,640	25.0%	$0	25.0%	$0
Medical Office	30.0%	$1,444,232	20.0%	$1,308,506	20.0%	$878,750
General Office	54.0%	$1,324,442	20.0%	$1,003,586	20.0%	$552,050
Retail	1.0%	$1,814,492	5.0%	$1,504,526	5.0%	$1,074,770
Apartments	0.0%	$619,473	20.0%	$966,783	20.0%	$398,280
Condos	0.0%	$1,253,901	10.0%	$1,440,953	10.0%	$607,649
TOTAL/AVG.	**100.0%**	**$1,290,759**	**100.0%**	**$875,097**	**100.0%**	**$480,320**
Value Reduction (Neutral Land Value)				**-$415,662**		**-$810,439**
per FAR SF				**-$9.54**		**-$12.40**
Total Exactions per FAR SF		**$17.74**		**$22.56**		**$24.26**
% of Total Exactions				**42.3%**		**51.1%**

Table 9. Comparison of Land Values by Hypothetical Development Program - Without BLT

Land Use	Conventional Development 0.5 FAR % of Uses	Land Value per Acre	Urban Research Village 1.0 FAR % of Uses	Land Value per Acre	Urban Research Village 1.5 FAR % of Uses	Land Value per Acre
R&D/Lab Space	15.0%	$827,640	25.0%	$653,400	25.0%	$522,720
Medical Office	30.0%	$1,444,232	20.0%	$1,385,644	20.0%	$1,033,025
General Office	54.0%	$1,324,442	20.0%	$1,080,724	20.0%	$706,325
Retail	1.0%	$1,814,492	5.0%	$1,581,664	5.0%	$1,229,045
Apartments	0.0%	$619,473	20.0%	$966,783	20.0%	$398,280
Condos	0.0%	$1,253,901	10.0%	$1,440,953	10.0%	$607,649
TOTAL/AVG.	**100.0%**	**$1,290,759**	**100.0%**	**$1,073,158**	**100.0%**	**$680,423**
Value Reduction (Neutral Land Value)				**-$217,601**		**-$610,336**
per FAR SF				**-$5.00**		**-$9.34**
Total Exactions per FAR SF		**$17.74**		**$22.56**		**$24.26**
% of Total Exactions				**22.1%**		**38.5%**

We also ran the hypothetical development programs (with and without R&D/Lab space showing a residual land value), but without BLTs. Table 9 shows the analysis without BLTs assuming a land for R&D/Lab space, and under this scenario the value gap is reduced significantly, but a value gap still exists – 22% of exactions under the 1.0 FAR scenario, and 39% under the 1.5 FAR scenario. The exemption of BLTs does not fully mitigate the value gap. Exemption from the workforce housing requirement has a much less significant impact on value. As shown in Table 10, if R&D/Lab space land values are once again assumed to be at zero under the urban research village concepts but BLTs are removed, the resulting value reduction is still very significant.

Table 10. Comparison of Land Values by Hypothetical Development Program - R&D Ind Value at $0, Without BLT

Land Use	Conventional Development 0.5 FAR % of Uses	Land Value per Acre	Urban Research Village 1.0 FAR % of Uses	Land Value per Acre	Urban Research Village 1.5 FAR % of Uses	Land Value per Acre
R&D/Lab Space	15.0%	$827,640	25.0%	$0	25.0%	$0
Medical Office	30.0%	$1,444,232	20.0%	$1,385,644	20.0%	$1,033,025
General Office	54.0%	$1,324,442	20.0%	$1,080,724	20.0%	$706,325
Retail	1.0%	$1,814,492	5.0%	$1,581,664	5.0%	$1,229,045
Apartments	0.0%	$619,473	20.0%	$966,783	20.0%	$398,280
Condos	0.0%	$1,253,901	10.0%	$1,440,953	10.0%	$607,649
TOTAL/AVG.	**100.0%**	**$1,290,759**	**100.0%**	**$909,808**	**100.0%**	**$549,743**
Value Reduction (Neutral Land Value)				**-$380,951**		**-$741,016**
per FAR SF				**-$8.75**		**-$11.34**
Total Exactions per FAR SF		**$17.74**		**$22.56**		**$24.26**
% of Total Exactions				**38.8%**		**46.7%**

Table 11 summarizes the necessary value reductions – displayed as a percent of County exactions – for each of the scenarios discussed above.

Table 11. Comparison of Reduction in Exactions Driven By Value Reduction Analysis

Scenario	Urban Research Village, 1.0 FAR	Urban Research Village, 1.5 FAR
Residual Land Value for R&D/Lab Space		
Hypothetical Development Program	27.6%	45.3%
No BLTs	22.1%	38.5%
No Residual Land Value for R&D/Lab Space		
Hypothetical Development Program	42.3%	51.1%
No BLTs	38.8%	46.7%

This analysis does not take into account the significant value creation that would likely result from the arrival of accessible mass transit – specifically rail, such as the planned Corridor Cities Transitway (CCT). Value creation from transit comes primarily in three forms: 1) increase in rents and prices due to a transit premium, 2) reduction in costs due to decreased parking requirements; and 3) reduction in transportation impact fees (these fees are cut in half in Metro-accessible areas). The affect of value creation through the delivery of transit will need to be studied further, particularly as it relates to this study, but also as it relates to the need of any value creation to help pay for the transit infrastructure..

This analysis also does not take into account the reality that the two different life science clusters – Shady Grove and White Oak – are in different submarkets that have different market contexts. The rents assumed in our analysis are generally at the top of the non-transit suburban market, and therefore more reflective of the Shady Grove situation than of White Oak's. A world-class urban research village – specifically for major governmental and institutional R&D entities -- is competing on a national or global stage, and therefore is not as affected by local market conditions. Still, it is likely that the Percontee-White Oak site will be able to achieve rents and prices below the JHU-Shady Grove area, and thus an additional land value reduction may result. This could require additional relaxation of exactions.

In 2010 the current impact fees related to schools and transportation are expected to increase, on average by approximately 7%. Clearly additional exaction burdens will only exacerbate the challenging land economics.

0.5 FAR Development	R&D/Lab Space	Medical Office	General Office	Retail	Apartments	Condos
FAR	0.50	0.50	0.50	0.50	0.50	0.50
Building Efficiency	85%	85%	85%	92%	88%	88%
Parking Ratio (per 1,000 SF)	4.0	4.0	4.0	5.0	1.7	1.7
Parking Type	Surface	Surface	Surface	Surface	Surface	Surface
Revenue						
Rent per NSF (Annual)/Sales per NSF	$34.00	$27.00	$26.00	$30.00	$22.80	$375.00
Stabilized Occupancy	94%	92%	92%	92%	95%	
Annual Rent Revenue per GSF	$27.17	$24.84	$23.92	$27.60	$19.06	
Additional Revenue					4% of Net Rent	
Total Rent Revenue/Total Sales per GSF	$27.17	$24.84	$23.92	$27.60	$19.82	$330.00
Leasing Costs	4% of Net Rent	4% of Net Rent	4% of Net Rent	4% of Net Rent		6% of Sales Revenue
Leasing Costs per GSF	-$1.09	-$0.99	-$0.96	-$1.20		-$19.80
Annual Operating Expenses per Unit					-$6,000	
Annual Operating Expenses per GSF					-$6.32	
Net Operating Income/Total Revenue per GSF	$26.08	$23.85	$22.96	$26.50	$13.51	$310.20
Development Costs						
Site Development Costs per Acre	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000
Site Development Costs per GSF	$6.89	$6.89	$6.89	$6.89	$6.89	$6.89
Product Type	Stick Built	Stick Built	Stick Built	Stick Built	Stick Built	Stick Built
Hard Costs per GSF	$100.00	$90.00	$90.00	$90.00	$90.00	$105.00
Soft Costs (as a % of Hard)	25%	25%	25%	25%	25%	30%
Soft Costs per GSF	$25.00	$22.50	$22.50	$22.50	$22.50	$31.50
Total Costs per GSF	$125.00	$112.50	$112.50	$112.50	$112.50	$136.50
Tenant Improvement Costs per NSF	$300.00	$100.00	$60.00	$80.00		
% Paid by Developer	33%	40%	60%	60%		
TI Costs per NSF to Developer	$99.00	$40.00	$36.00	$48.00		
TI Costs per GSF to Developer	$84.15	$34.00	$30.60	$44.16		
Parking Costs per Space	$3,000	$3,000	$3,000	$3,000	$3,000	$3,000
Parking Costs per GSF	$12.00	$12.00	$12.00	$15.00	$5.05	$5.00
Financing Rate	6.5%	6.5%	6.5%	6.5%	6.5%	6.5%
Interest Carry per GSF	$14.03	$12.81	$12.81	$13.10	$12.13	$14.47
Total Development Costs per GSF	$289.57	$263.70	$254.80	$294.15	$193.07	$248.10
Target Return on Costs/Profit	9.006%	9.043%	9.012%	9.008%	6.996%	25.028%
Residual Land Value per GSF	$47.50	$85.50	$80.00	$102.50	$56.50	$85.25
Residual Land Value per Acre	**$1,034,550**	**$1,862,190**	**$1,742,400**	**$2,232,450**	**$1,230,570**	**$1,856,745**
County Exactions per GSF						
Existing Exactions						
School Impact Tax	$0.00	$0.00	$0.00	$0.00	$10.25	$8.11
Transportation Impact Tax	$0.00	$9.69	$9.69	$9.69	$5.99	$5.70
Sustainability/Green	$3.00	$3.00	$3.00	$3.00	$3.00	$3.00
Public Open Space/Amenities	$3.50	$3.50	$3.50	$3.50	$3.50	$3.50
Transportation Impact/Mitigation	$3.00	$3.00	$3.00	$3.00	$3.00	$3.00
MPDUs	$0.00	$0.00	$0.00	$0.00	$2.32	$4.04
Total Existing Exactions	$9.50	$19.19	$19.19	$19.19	$28.06	$27.35
Total Development Costs w/Exactions	$289.57	$263.70	$254.80	$294.15	$193.07	$248.10
Target Return on Costs/Profit	9.006%	9.043%	9.012%	9.008%	6.996%	25.028%
Residual Land Value per GSF	$38.00	$66.31	$60.81	$83.31	$28.44	$57.90
Residual Land Value per Acre	**$827,640**	**$1,444,232**	**$1,324,442**	**$1,814,492**	**$619,473**	**$1,261,061**
Reduced Value per Acre	($206,910)	($417,958)	($417,958)	($417,958)	($611,097)	($595,684)
Proposed Exactions						
Bulding Lot Termination	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Workforce Housing	$0.00	$0.00	$0.00	$0.00	$0.00	$0.33
Total Proposed Exactions	$0.00	$0.00	$0.00	$0.00	$0.00	$0.33
Total Existing & Proposed Exactions	$9.50	$19.19	$19.19	$19.19	$28.06	$27.68
Total Development Costs w/Exactions	$289.57	$263.70	$254.80	$294.15	$193.07	$248.10
Target Return on Costs/Profit	9.006%	9.043%	9.012%	9.008%	6.996%	25.028%
Residual Land Value per GSF	$38.00	$66.31	$60.81	$83.31	$28.44	$57.57
Residual Land Value per Acre	**$827,640**	**$1,444,232**	**$1,324,442**	**$1,814,492**	**$619,473**	**$1,253,901**
Reduced Value per Acre	($206,910)	($417,958)	($417,958)	($417,958)	($611,097)	($602,844)

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1.0 FAR Development	R&D/Lab Space	Medical Office	General Office	Retail	Apartments	Condos
FAR	1.00	1.00	1.00	1.00	1.00	1.00
Building Efficiency	85%	85%	85%	92%	88%	88%
Parking Ratio (per 1,000 SF)	4.0	4.0	4.0	5.0	1.7	1.7
Parking Type	Structured	Structured	Structured	Structured	Structured	Structured
Revenue						
Rent per NSF (Annual)/Sales per NSF	$37.00	$28.35	$27.30	$31.50	$24.60	$385.00
Stabilized Occupancy	94%	92%	92%	92%	95%	
Annual Rent Revenue per GSF	$29.56	$26.08	$25.12	$28.98	$20.57	
Additional Revenue					4% of Net Rent	
Total Rent Revenue/Total Sales per GSF	$29.56	$26.08	$25.12	$28.98	$21.39	$338.80
Leasing Costs	4% of Net Rent	4% of Net Rent	4% of Net Rent	4% of Net Rent		6% of Sales Revenue
Leasing Costs per GSF	-$1.18	-$1.04	-$1.00	-$1.26		-$20.33
Annual Operating Expenses per Unit					-$6,000	
Annual Operating Expenses per GSF					-$6.32	
Net Operating Income/Total Revenue per GSF	$28.38	$25.04	$24.11	$27.82	$15.07	$318.47
Development Costs						
Site Development Costs per Acre	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000
Site Development Costs per GSF	$3.44	$3.44	$3.44	$3.44	$3.44	$3.44
Product Type	Mid-Rise	Stick Built	Stick Built	Stick Built	Stick Built	Stick Built
Hard Costs per GSF	$100.00	$90.00	$90.00	$90.00	$95.00	$110.00
Soft Costs (as a % of Hard)	25%	25%	25%	25%	25%	30%
Soft Costs per GSF	$25.00	$22.50	$22.50	$22.50	$23.75	$33.00
Total Costs per GSF	$125.00	$112.50	$112.50	$112.50	$118.75	$143.00
Tenant Improvement Costs per NSF	$300.00	$100.00	$60.00	$80.00		
% Paid by Developer	33%	40%	60%	60%		
TI Costs per NSF to Developer	$99.00	$40.00	$36.00	$48.00		
TI Costs per GSF to Developer	$84.15	$34.00	$30.60	$44.16		
Parking Costs per Space	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000
Parking Costs per GSF	$60.00	$60.00	$60.00	$75.00	$25.26	$25.00
Financing Rate	6.5%	6.5%	6.5%	6.5%	6.5%	6.5%
Interest Carry per GSF	$18.37	$17.15	$17.15	$18.62	$14.38	$16.72
Total Development Costs per GSF	$315.47	$278.10	$267.70	$309.22	$215.33	$254.66
Target Return on Costs/Profit	8.996%	9.004%	9.007%	8.997%	7.000%	25.058%
Residual Land Value per GSF	$24.50	$51.00	$44.00	$55.50	$53.50	$66.50
Residual Land Value per Acre	**$1,067,220**	**$2,221,560**	**$1,916,640**	**$2,417,580**	**$2,330,460**	**$2,896,740**
County Exactions per GSF						
Existing Exactions						
School Impact Tax	$0.00	$0.00	$0.00	$0.00	$10.25	$8.11
Transportation Impact Tax	$0.00	$9.69	$9.69	$9.69	$5.99	$5.70
Sustainability/Green	$3.00	$3.00	$3.00	$3.00	$3.00	$3.00
Public Open Space/Amenities	$3.50	$3.50	$3.50	$3.50	$3.50	$3.50
Transportation Impact/Mitigation	$3.00	$3.00	$3.00	$3.00	$3.00	$3.00
MPDUs	$0.00	$0.00	$0.00	$0.00	$5.57	$8.56
Total Existing Exactions	$9.50	$19.19	$19.19	$19.19	$31.31	$31.88
Total Development Costs w/Exactions	$315.47	$278.10	$267.70	$309.22	$215.33	$254.66
Target Return on Costs/Profit	8.996%	9.004%	9.007%	8.997%	7.000%	25.058%
Residual Land Value per GSF	$15.00	$31.81	$24.81	$36.31	$22.19	$34.62
Residual Land Value per Acre	**$653,400**	**$1,385,644**	**$1,080,724**	**$1,581,664**	**$966,783**	**$1,508,159**
Reduced Value per Acre	($413,820)	($835,916)	($835,916)	($835,916)	($1,363,677)	($1,388,581)
Proposed Exactions						
Bulding Lot Termination	$1.77	$0.00	$1.77	$1.77	$0.00	$0.00
Workforce Housing	$0.00	$0.00	$0.00	$0.00	$0.00	$1.54
Total Proposed Exactions	$1.77	$0.00	$1.77	$1.77	$0.00	$1.54
Total Existing & Proposed Exactions	$11.27	$19.19	$20.96	$20.96	$31.31	$33.42
Total Development Costs w/Exactions	$315.47	$278.10	$267.70	$309.22	$215.33	$254.66
Target Return on Costs/Profit	8.996%	9.004%	9.007%	8.997%	7.000%	25.058%
Residual Land Value per GSF	$13.23	$31.81	$23.04	$34.54	$22.19	$33.08
Residual Land Value per Acre	**$576,263**	**$1,385,644**	**$1,003,586**	**$1,504,526**	**$966,783**	**$1,440,953**
Reduced Value per Acre	($490,958)	($835,916)	($913,054)	($913,054)	($1,363,677)	($1,455,787)

1.5 FAR Development	R&D/Lab Space	Medical Office	General Office	Retail	Apartments	Condos
FAR	1.50	1.50	1.50	1.50	1.50	1.50
Building Efficiency	85%	85%	85%	92%	88%	88%
Parking Ratio (per 1,000 SF)	4.0	4.0	4.0	5.0	1.7	1.7
Parking Type	Structured	Structured	Structured	Structured	Structured	Structured
Revenue						
Rent per NSF (Annual)/Sales per NSF	$45.50	$35.00	$34.00	$38.00	$27.60	$425.00
Stabilized Occupancy	94%	92%	92%	92%	95%	
Annual Rent Revenue per GSF	$36.35	$32.20	$31.28	$34.96	$23.07	
Additional Revenue					4% of Net Rent	
Total Rent Revenue/Total Sales per GSF	$36.35	$32.20	$31.28	$34.96	$24.00	$374.00
Leasing Costs	4% of Net Rent	4% of Net Rent	4% of Net Rent	4% of Net Rent		6% of Sales Revenue
Leasing Costs per GSF	-$1.45	-$1.29	-$1.25	-$1.52		-$22.44
Annual Operating Expenses per Unit					-$6,500	
Annual Operating Expenses per GSF					-$6.84	
Net Operating Income/Total Revenue per GSF	$34.90	$30.91	$30.03	$33.56	$17.15	$351.56
Development Costs						
Site Development Costs per Acre	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000
Site Development Costs per GSF	$2.30	$2.30	$2.30	$2.30	$2.30	$2.30
Product Type	Mid-Rise	Mid-Rise	Mid-Rise	Mid-Rise	Mid-Rise	Mid-Rise
Hard Costs per GSF	$150.00	$150.00	$150.00	$150.00	$125.00	$140.00
Soft Costs (as a % of Hard)	33%	25%	25%	25%	25%	30%
Soft Costs per GSF	$49.50	$37.50	$37.50	$37.50	$31.25	$42.00
Total Costs per GSF	$199.50	$187.50	$187.50	$187.50	$156.25	$182.00
Tenant Improvement Costs per NSF	$300.00	$100.00	$60.00	$80.00		
% Paid by Developer	33%	40%	60%	60%		
TI Costs per NSF to Developer	$99.00	$40.00	$36.00	$48.00		
TI Costs per GSF to Developer	$84.15	$34.00	$30.60	$44.16		
Parking Costs per Space	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000
Parking Costs per GSF	$60.00	$60.00	$60.00	$75.00	$25.26	$25.00
Financing Rate	6.5%	6.5%	6.5%	6.5%	6.5%	6.5%
Interest Carry per GSF	$24.36	$24.36	$24.36	$25.82	$17.92	$20.41
Total Development Costs per GSF	$387.80	$343.15	$334.75	$372.77	$244.73	$281.20
Target Return on Costs/Profit	9.000%	9.008%	8.970%	9.003%	7.010%	25.020%
Residual Land Value per GSF	$17.50	$35.00	$30.00	$38.00	$43.00	$51.50
Residual Land Value per Acre	**$1,143,450**	**$2,286,900**	**$1,960,200**	**$2,482,920**	**$2,809,620**	**$3,365,010**
County Exactions per GSF						
Existing Exactions						
School Impact Tax	$0.00	$0.00	$0.00	$0.00	$10.25	$8.11
Transportation Impact Tax	$0.00	$9.69	$9.69	$9.69	$5.99	$5.70
Sustainability/Green	$3.00	$3.00	$3.00	$3.00	$3.00	$3.00
Public Open Space/Amenities	$3.50	$3.50	$3.50	$3.50	$3.50	$3.50
Transportation Impact/Mitigation	$3.00	$3.00	$3.00	$3.00	$3.00	$3.00
MPDUs	$0.00	$0.00	$0.00	$0.00	$10.15	$15.35
Total Existing Exactions	$9.50	$19.19	$19.19	$19.19	$35.88	$38.66
Total Development Costs w/Exactions	$387.80	$343.15	$334.75	$372.77	$244.73	$281.20
Target Return on Costs/Profit	9.000%	9.008%	8.970%	9.003%	7.010%	25.020%
Residual Land Value per GSF	$8.00	$15.81	$10.81	$18.81	$7.12	$12.84
Residual Land Value per Acre	**$522,720**	**$1,033,025**	**$706,325**	**$1,229,045**	**$464,953**	**$839,029**
Reduced Value per Acre	($620,730)	($1,253,875)	($1,253,875)	($1,253,875)	($2,344,667)	($2,525,981)
Proposed Exactions						
Bulding Lot Termination	$2.36	$0.00	$2.36	$2.36	$0.00	$0.00
Workforce Housing	$0.00	$0.00	$0.00	$0.00	$1.02	$3.54
Total Proposed Exactions	$2.36	$0.00	$2.36	$2.36	$1.02	$3.54
Total Existing & Proposed Exactions	$11.86	$19.19	$21.55	$21.55	$36.90	$42.20
Total Development Costs w/Exactions	$387.80	$343.15	$334.75	$372.77	$244.73	$281.20
Target Return on Costs/Profit	9.000%	9.008%	8.970%	9.003%	7.010%	25.020%
Residual Land Value per GSF	$5.64	$15.81	$8.45	$16.45	$6.10	$9.30
Residual Land Value per Acre	**$368,445**	**$1,033,025**	**$552,050**	**$1,074,770**	**$398,280**	**$607,649**
Reduced Value per Acre	($775,005)	($1,253,875)	($1,408,150)	($1,408,150)	($2,411,340)	($2,757,361)