Draft Report

Davis Innovation Centers Fiscal and Economic Impact Assumptions

The Economics of Land Use

Prepared for:

City of Davis

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Foreword

In May 2015, EPS prepared an Administrative Draft Report evaluating economic and fiscal assumptions and key success factors related to three proposed innovation center proposals in the City of Davis: the Mace Ranch Innovation Center (MRIC), the Davis Innovation Center (Davis IC), and the Nishi/Gateway project (Nishi). After finalizing the Administrative Draft Report, the applicants for Davis IC announced that their 208-acre project proposed near the Sutter Hospital complex was entering a holding status pending further internal discussion.

In consideration, this brief note highlights some possible economic implications of excluding the Davis IC from the group of proposed projects. Because the future of Davis IC is indeterminate, the structure and logic of the ensuing Phase I report has remained intact, providing a comprehensive discussion of Innovation Center trends and driving assumptions for the upcoming fiscal and economic analyses.

Should the Davis IC remain on hold as Phase II of the project is initiated, that analysis will evaluate only the economic and fiscal impacts of the MRIC, as well as the combined effects of the MRIC and Nishi.

The removal of the Davis IC from the cumulative scenario, presented in the March 2015 Economic Evaluation of Innovation Park Proposals by BAE, drops the total acreage by approximately 43 percent, total square footage by 56 percent, and total estimated employment by 59 percent. While this circumstance reduces the overall development footprint and employment outcome of the proposed Innovation Centers, the reduction should not be viewed as a complete net loss to the community because other opportunities ultimately could fill some of the void. For instance, the proposed Panattoni project could introduce up to 225,000 square feet of office/research and development (R&D) in the market that could be considered part of the Innovation Center ecosystem.

The Davis IC project description and applicant plans included many desirable attributes for an Innovation Center, including these:

- An orientation toward R&D, technology, and science- and engineering-based companies.
- Flexible space formats, including incubation spaces for small start-up firms, facilities for established mid-size or large-size companies, large floor-plate spaces for high-tech research and light manufacturing, and potential corporate headquarters facilities.
- Employee support services and retail with an active landscape for collaboration and innovation.

It will be important to ensure that these attributes remain in the mix of active proposed Innovation Centers, including MRIC, Nishi, and other opportunity projects.

Davis Innovation Centers Cumulative Buildout [1]

Item	With Davis IC	Without Davis IC
Total Acreage	484	276
Total Business Park Acreage [2]	442	234
Total Square Footage	7,125,956	3,125,956
Total Employment	18,390	7,548
Estimated Absorption (Years) [3]	21 to 51	9 to 27

project_adjust

Source: BAE Urban Economics

[1] Includes Mace Triangle as part of MRIC.
[2] Includes only the 13.5 acres of Nishi that would involve business park development and the 8.3 acres of Mace Triangle assumed to be developed as office/R&D/tech space.
[3] Assumes absorption rate range from BAE report of 8.6 acres per year (business park development only) to 350,000 square feet per year.

Anticipating questions and concerns regarding the practical implications of this change, the balance of this note addresses several likely implications of only one major project—the 212-acre MRIC development at the northeast quadrant of Interstate 80 (I-80) and Mace Boulevard—complimenting the planned Nishi site, which lies adjacent to Downtown Davis and the University of California (UC) Davis:

- *Continued viability of "innovation ecosystem"*—Overall, similar types of benefits likely are to occur in the remaining Innovation Centers, but the amounts of property taxes, sales and use taxes, and employment will be reduced. The Innovation Center concept remains compelling as an important next phase in the strengthening and diversification of Davis' economic base. With that said, it is possible that some loss of diversity could occur. Any reduction in the diversity of tenants potentially reduces the frequency and types of collaborations between and among firms and UC Davis interests, including the possibility of a reduced UC Davis off-campus presence throughout Davis.

- *Competition among development and site options*—One of the primary effects of realizing both MRIC and Davis IC was to establish a competitive environment where prospective users would compare and contrast development opportunities at each site. This arrangement typically would have the effect of reducing the average cost of land or leases applying to both sites. As discussed in the report, some targeted users in the region are price sensitive. As such, it follows that, all things being equal, lower leases and land prices would improve Davis' overall competitive position in the Northern California Region and increase absorption. Accordingly, any increase in prices will be accompanied by potential reduced annual absorption in Davis among price-sensitive uses. However, it is possible that opportunities now exist for one or more other projects to fill the void, such as the recently announced 15-acre Panatonni office/R&D center proposed south of I-80.

- *Concentrated versus dispersed development pattern*—Another key factor relates to the advantage of distributing trips to two sites rather than one, while meeting Davis' share of regional demand. The notion of simply doubling the MRIC absorption estimate is unrealistic in this case because of the potential for increased pressure on specific project infrastructure, namely freeway interchange, intersection, and road facilities. While this primarily is a concern of traffic engineering, it is highly likely that the need to invest in key facilities near MRIC will occur sooner without the Davis IC project available to "share the load."

Other possible outcomes of this recent decision include (1) reduced presence among firms seeking proximity to a working hospital complex, (2) reduced activity among specific groups in discussions with Davis IC project proponents, (3) less direct proximity to labor force and businesses located in Woodland near the State Route 113 corridor, and (4) less robust regional innovation ecosystem with appropriate space available for companies in viable clusters and aligned with research strengths.

Notwithstanding these initial comments addressing the potential loss or delay in the initiation of the Davis IC project, the following report maintains a robust discussion of all current proposals. As necessary and appropriate, the upcoming Phase II economic and fiscal analyses will reflect changed project circumstances.

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1. INTRODUCTION

The City of Davis (City), Yolo County, and the Greater Sacramento Region have the potential to see substantial benefits as a result of the successful implementation of the three proposed Innovation Centers in Davis. These benefits are both economic and financial in nature and could be generated from each Innovation Center individually, as well as through the combined effects of multiple Innovation Centers.

To provide information before potential 2016 ballot initiatives to annex the proposed Innovation Centers to the City, it is necessary to determine the likely economic implications of the three proposed Innovation Centers, including economic and community benefit contributions offered by these proposed projects, which stand to provide a variety of jobs in multiple market segments, as well as the fiscal impacts.

As a first step, this initial report describes key assumptions that may be used before the upcoming economic and fiscal impact analyses. In cases where these judgments are more involved and aided through the modeling process, EPS has provided interim discussion of key considerations and likely ranges, to be refined as the analytic process continues. This report is a technically oriented resource document prepared before and in support of these more detailed economic and fiscal studies that will commence in June and July 2015.

This "Phase I" effort identifies key assumptions, including analysis of land economics, select fiscal considerations, and preliminary industry analysis needed to understand key success factors and prepare Innovation Center development scenarios.

Key Issues

Property interests in Davis have acquired and held major, strategically located, aggregations of agricultural land just outside the City. Meanwhile, the City has been facing budget challenges stemming from issues such as limited diversity in the retail sales base, removal of property and equipment from tax rolls because of University of California (UC) Davis commercial leases, limited commercial land base, a heavily renter-oriented housing stock, and continued retail leakage. Drawing focus to the City's tepid tax receipts, the City's populace continues to demand high levels of service in line with the community's desirable quality of life.

At the same time, UC Davis has improved its standing as a major research university, creating rising expectations for a burgeoning high-tech and innovation concentration that contribute to the region's efforts to diversify the economic base.

The proposed Innovation Center projects signal the next phase in the development of a university town predicated on a major research presence: the advent of private investment leveraging a nationally significant public investment in the form of UC Davis. This is an opportunity to generate regional economic benefit, having local fiscal benefits through a strategy of university-related economic growth and diversification. The degree to which these anticipated benefits will occur greatly depends on the alignment between UC Davis and the local real estate market, as well as the ability to leverage regional strengths.

In March 2015, BAE Urban Economics (BAE) drafted the Economic Evaluation of Innovation Park Proposals document for the City to support the California Environmental Quality Act (CEQA) process. This study evaluated the demand generated by several development scenarios. EPS has been retained to evaluate the estimated development parameters focusing on how issues of market competition, feasibility, and other development opportunities and constraints affect the phasing, development typology, assessed values, and other attributes of the project.

Approach

This initial task consolidates information from BAE and other reports, establishes the local context, and builds scenarios and develops initial assumptions for consideration in the economic and fiscal impact analyses. Based on an evaluation of specific success factors, a range of growth and land use scenarios have been established for Mace Ranch Innovation Center (MRIC), Davis Innovation Center (Davis IC), and both innovation centers plus Nishi/Gateway (Nishi).[1] The chief goal is to identify and discuss major assumptions, as well as factors that affect them, for the economic impact and fiscal analyses (e.g., rate of development, likely industries, development prototypes, assessed values). Key objectives include these:

- Gain an understanding of industry sectors or clusters present and the mix of job types prevalent in similar innovation centers. Compare typical or desired sectors and clusters to local and regional economic development strategies (e.g., Next Economy Capital Region Prosperity Plan and Davis Innovation and Economic Vitality Work Program) and UC Davis research strengths (e.g., sustainability, agriculture, energy, health, engineering) to help inform the potential distribution of employment types in the proposed Innovation Centers.

- Evaluate competitive outlook for the proposed Innovation Centers, identifying economic opportunities, industry types and related labor force characteristics, real estate prototypes (e.g., Research and Development [R&D]/flex, manufacturing, office), probable capital investment based on feasibility considerations, assessed value considerations (e.g., property tax, sales tax), and alignment with economic development strategies. This is an iterative task with Phase II, as further information regarding probable industry clusters will be developed, which may inform and refine these descriptions.

- Consider the impact of strategic implementation actions on project performance. Examples of key issues include feasibility challenges for flex/office/R&D space that may require a judicious approach to the use of assessments or Community Facilities Districts (CFDs) to implement project infrastructure, for example.

[1] Scenarios include the high-end absorption estimate from the BAE study plus two additional scenarios for sensitivity testing. In addition, EPS has developed varying mixes of building types that have the potential to affect assessed values, taxable sales, and employment. MRIC includes the City-owned 25-acre parcel in the northwest corner of the project area.

The following specific work was conducted in developing this information:

1. Reviewed BAE study and other support materials to understand CEQA-related assumptions.
2. Conducted market research to understand definition and performance of development prototypes.
3. Evaluated economic feasibility potential and key issues, including ability to accommodate start-ups and to attract key industry clusters.
4. Built on case-study research to understand key drivers of innovation centers and how the Davis versions would contribute to the realization of an Innovation Ecosystem.
5. Considered a range of circumstances that may influence the type and rate of development, including UC Davis presence, cost structure, competitive influences, and other factors.
6. Initially identified key assumptions, expressed in ranges, and an approach to resolving outstanding questions and issues.

Background and Key Findings

An Innovation Park Task Force was established by the City Council in October 2010 for the purpose of exploring peripheral sites for future business park development to accommodate medium-scale businesses. Two City Council members were appointed to form a Task Force with two representatives selected by the Planning Commission and the Business and Economic Development Commission to return to the City Council with recommendations.

City Guiding Principles for Innovation Centers:

- Density
- Sustainability
- Transportation
- Work Environment
- Uses
- Timing and Project Phasing
- Fiscal Consideration and Net Community Benefit
- Facilitate Collaborative Partnerships

In addition, the City took action in several different areas in support of the innovation park concept:

- Joined i-GATE Innovation Hub in October 2011.
- Partnered with Davis Roots to form an entrepreneur accelerator in Downtown Davis in February 2012.
- Participated in Designing a Sustainable Innovative Davis Economy (DSIDE) workshop in September 2012.
- Approved a predevelopment agreement with Nishi property owners in November 2012.
- Established a Chief Innovation Officer position in March 2013.
- Created Office of Innovation & Economic Vitality as part of the City Manager's Office in June 2013.
- Produced Innovation & Economic Vitality Work Program and Action Plan in April 2014 that addressed creating an innovation ecosystem and knowledge-based economy.

These actions culminated in preparation of a Request for Expressions of Interest (RFEI) in an attempt to stimulate developer, landowner, and business community interest and support for creating "innovative business parks." In late May 2014, the RFEI was circulated soliciting responses by June 2014.

The City received proposals for two distinct sites, shown in **Map 1**: a 229-acre project called the Mace Ranch Innovation Center, by Oates/Ramos, on the eastern edge of Davis towards Sacramento; and a 208-acre project called the Davis Innovation Center, by SKK/Hines, in North/West Davis near Sutter Davis Hospital. In addition to these two sites, and separate from the RFEI process, a third 45-acre site known as the "Nishi Gateway" mixed use innovation district project is located adjacent to the UC Davis campus near the Mondavi Center but separated by the Union Pacific rail right-of-way and requiring a major new connection under the tracks. The latter proposal includes housing as a base-case scenario, even though earlier iterations did not include housing; the other two projects do not include housing. As shown in **Table 1**, combined, the proposals represent approximately 7.1 million square feet of new development. As discussed in **Chapter 6**, this development is projected to buildout over a 40- to 60-year time horizon.

BAE's "Economic Evaluation of the Innovation Centers" report suggests that combined absorption across the three Innovation Centers could be between 150,000 and 350,000 square feet per year. While prospects for Davis appear strong, the shift from current levels of net absorption to future levels, as identified by BAE, is significant at the upper end of the range. Therefore, near-term and longer term prospects, tied in with specific university and industry initiatives, should continue to be approached as a range of potential outcomes.

Numerous recent publications reinforce the notion that these projects work best when they are developed in intense, active urban centers with research strengths and a variety of cultural, civic, educational, and other supporting uses. While the two proposed peripheral Innovation Centers are geared toward providing many of these characteristics, they largely are proposed as greenfield sites that must create the necessary ambiance. To this end, it will be important to distinguish among the various opportunities most likely to arrive in Davis to determine the allocation of space to key locations by type of development. Proper determination of market segments and appropriate locations can bolster annual absorption and provide a defensible determination of how Downtown Davis, the Nishi site, and peripheral Innovation Centers can work together to contribute to a complete innovation district ecosystem. It could be possible to create the aggregated conditions for a successful distributed innovation center model through synergies reflected in the combination of the three proposed projects.

Map 1
Davis Innovation Centers

Table 1
Summary of Innovation Center Proposals

Item	Davis IC	MRIC [1]	Nishi [2]	Cumulative Scenario
Total Square Footage	**4,000,000**	**2,725,056**	**400,900 [3]**	**7,125,956** [3]
Research; Office; R&D		1,555,901	352,950 [3]	1,908,851
Tech Office; Lab	3,000,000			3,000,000
Manufacturing; Research		884,000		884,000
R&D; Assembly; Flex	680,000			680,000
Subtotal Professional Space	**3,680,000**	**2,439,901**	**352,950**	**6,472,851**
Ancillary Retail	120,000	125,155	47,950 [4]	293,105
Hotel/Conference	200,000	160,000	Unk [5]	360,000
Total Acres	208	229 [6]	47 [7]	484
Open Space	85	75	5	165
Residential (units	0	0	650	650
Location	Northwest area Covell Blvd/SR 113	East area Mace Blvd/I-80	South central area I-80/Richards Blvd/RR	

project_summary

Source: BAE Urban Economics.

[1] Includes Mace Triangle.
[2] Assumes 27,950 sq. ft. office and 27,950 sq. ft. of retail on West Olive Drive.
[3] Does not include square footage for residential portion of Nishi.
[4] Includes 20,000 sq. ft. of ancillary retail on Nishi Property and 27,950 sq. ft. of retail on West Olive Drive.
[5] Applicant may propose on-site hotel. Subject to separate review; not a part of the proposed project.
[6] Includes approximately 17 acres (3 parcels) for annexation/prezoning only (City - 3.4 ac, no development; Ikeda - 4.6 ac, 25,155 sq. ft. ag retail/restaurant; Bozorgchami - 8.3 ac, 45,901 sq. ft. office)
[7] Net developable acres 26.5 (13.5 ac business and 13.5 ac residential)

The Innovation Center Concept

Traditional single use business parks containing single land uses are not satisfying the needs of many tenants seeking proximity to centers of higher education, retail amenities, and services. Innovation Centers are an evolving form of business parks and research centers that bring improved vitality and interest through the creation of an improved sense of place, responding to user preferences for available indoor and outdoor meeting spaces; internal and external connections to community assets; and the inclusion of entertainment, civic, recreational, and even housing uses. Increasingly, these Centers are characterized by mixed use settings, including housing, which have the advantages of improving overall development economics through (1) working multiple market segments and (2) leveraging the above-referenced sense of place to effectively improve lease rates and land values.

Davis already is home to two districts that exhibit many characteristics of Innovation Centers. Interland University Research Park (Interland URP), shown in **Map 2**, is an office and R&D park located just south of I-80 and within a mile east of campus. It is owned and operated by Interland, LLC, a developer of offices and apartment complexes that moved their headquarters to the park from the Bay Area. The park is a mix of professional office, university, and ag/biotech companies. The largest employer, Marrone Bio Innovations, is an ag/bio company with more than 150 employees. Major tenants also include Novozymes, an enzyme manufacturer, as well as an engineering firm (West Yost Associates), a nonprofit organization (Freedom from Hunger), a computer software firm (Maintenance Connection), and a solar energy wholesaler (Blue Oak Energy).

The 2nd Street Corridor, shown in **Map 3**, is a former industrial center that has reinvented itself as a district for innovative companies. This reinvention has been largely organic, lacking the direction of a private facilitator as in the case of Interland URP. Major tenants include advanced manufacturers DMG Mori and FMC Schilling Robotics, Arcadia Biosciences, HM Clause, and Gold Standard Diagnostics. **Appendix C** provides data on the land use and building type mix in the two districts.

Emergence of an "Innovation Ecosystem"

The classic Innovation Center, insofar as typically defined as a dense urban project or a university-related project, is different from the projects being proposed in Davis. However, the combination of the proposed projects potentially contributes to the assembly of diverse opportunities and economic activities that can be described as an overall ecosystem. This is important to the notion of segmenting the market and providing as broad a range of activities as possible to foster meaningful economic development and diversification that will support the City's fiscal regime in the future. The following opportunities are associated with having diverse and eclectic options in this regard:

Map 2
Interland University Research Park

Interland (366,155 sf)

0 0.1 Mile

Source: City of Davis Geographic Information System

Map 3
2nd Street Corridor

Second Street (1,037,129 sf)

0 0.2 Mile

Source: City of Davis Geographic Information System

- Demand for infill projects created by relocation of space-limited users.
- Related to above, provide start-up opportunities for nascent firms.
- Contribute to demographic diversification of Davis, including retaining labor base trained at UC Davis as local or nearby residents.
- Support the downtown (essentially, the "fourth innovation center/district") through increased economic activity.
- Increased fiscal revenue from business-to-business (B2B) and point-of-sale transactions.
- Improve university access to industries aligned with research strengths and offering partnership potential.
- Provide opportunities for support businesses, including those in product or process chains.
- Attract prominent companies aligned with university and regional strengths.
- Enhance the regional innovation ecosystem and expand economic development opportunities.

The key to realizing rapid absorption is the inherent market segmentation embodied by such an ecosystem in Davis. This environment should strive to provide opportunity for companies at every stage of the firm life cycle to leverage the presence of UC Davis and allow mature industry to collaborate with and benefit UC Davis through research partnerships, similar to Seed Central and those being developed under the rubric of the World Food Center, and other university research institutes.

These are the expected types of benefits typically emanating from Innovation Centers:

- **Fiscal Benefits:** The fiscal and economic impact of land use projects can be analyzed as a means for understanding and comparing the implications of various public policy decisions. Costs and revenues to local jurisdictions, jobs and output, and the likely change in sales on both subject land uses and nearby businesses are all critical to sustaining service provision levels in Davis.
- **Economic Diversification:** Effectively segmenting the market is necessary to ensure projects are characterized and phased in such a manner as to ensure the projects can be developed feasibly and deliver fiscal and other community benefits, while protecting/bolstering downtown. The project has the ability to improve the local jobs/housing balance while making fiscal revenues available to fund key City services in support of continued economic innovation and the overall quality of life in Davis.

Key Issues and Concerns of Projects

- **Local Economic and Market Considerations:** The type, amount, and location of real estate development are linked to underlying economic and market forces. Product-specific performance measures, changes in demographics and employment, local and regional economic trends, consumer preferences, and business cycle considerations will all play a role

in the performance of the Innovation Centers in Davis based on identified market opportunities and constraints.

- **Financial Feasibility Issues:** In addition to land constraints, Davis has suffered from a lack of appropriate vertical product to offer growing companies. The financial feasibility of real estate development for the full spectrum of building types, including mixed-use, retail, office, housing, lodging, and entertainment projects, is sensitive to the cost of development in Davis. Based on tests of feasibility for a range of project prototypes, key policy assumptions for economic impact and fiscal impact analyses are made.

Summary of Initial BAE Findings

EPS initially conducted a detailed review of the BAE study with the understanding that the analysis provides key information to the CEQA process and, as such, assumptions are to be taken as "given" in at least one EPS scenario based on this foundational information. Key findings are detailed below:

- Development of all Innovations Centers may occur as quickly as 21 years, or take 51 or more years. The more aggressive buildout horizon is based on an assumed cumulative annual absorption of 350,000 square feet.
- The Innovation Centers have the potential to further develop symbiotic relationships with UC Davis and other institutions.
- Based on square feet per employee values ranging from 250 to 500, at buildout, the Innovation Centers are estimated to house nearly 18,400 employees. The possible types of industries supporting these employees have not been fully delineated.
- The innovation-related square footage is grouped into a general office/tech category with no further distinction of the mix of possible building types.
- The Innovation Centers are estimated to support about 400,600 square feet of retail space, which is predicated on an assumption that all employees will spend nearly $26 per work day in and around their place of work, based on a national survey of office workers.
- Each innovation center is capable of supporting its own hotel/conference center complex under certain conditions, with the possibility of multiple hotels in the MRIC and the Davis IC.
- The City will not be able to house all Innovation Center employees, and the overflow will replicate the current in-commute pattern in terms of the percentage breakdown among trip origins.

Key EPS Phase I Findings

The Innovation Centers have the potential to create benefits that generate economic value to the City and UC Davis alike. The proposed projects could support the goal of strengthening academic-industry partnerships in Davis and throughout the region, in support of the Next Economy initiative. In addition, the parks may help improve the jobs-housing balance and fiscal

resources, allowing Davis to maintain its reputation as one of the best quality-of-life experiences attained in the region. The proposed Innovation Centers have great potential to move forward simultaneously, if phased and developed in concert with evolving market forces:

1. ***The proposed Innovation Centers have the potential to generate benefits to the City, Yolo County, and the region.***

   Davis supports several competitive advantages that can be leveraged for economic vitality, including a technically skilled labor force, a major research university with renewed academic programs and research initiatives, and high quality of life for residents and businesses. Over the past few decades, the community has seen a notable amount of employment-oriented development in areas like the 2nd Street Corridor and Interland URP that has attracted several prominent tenants drawn to the community's competitive advantages such as DMG Mori, FMC Technologies, Marrone Bio Innovations, Arcadia Biosciences, HM Clause, Gold Standard Diagnostics, Expression Systems, Stratovan, Agrinos, Novozymes, and Blue Oak Energy.

   However, in recent years, local and regional economic development representatives have noted interest from several companies that have not been able to find suitable space in Davis and have located elsewhere in the region or to other competitive communities. At the same time, UC Davis has placed a renewed emphasis on technology transfer, aligned with a handful of local and regional entities focused on supporting startup and technology companies, as well as the Next Economy Capital Region Prosperity Plan goals of fostering a strong innovation environment and enhancing growth across core business clusters. The proposed Innovation Centers offer the opportunity to expand the amount of space that can house establishments interested in maintaining or establishing a presence in Davis. This integration of new employment-oriented development and enhanced economic activity has the potential to generate significant fiscal and economic benefits for the City, Yolo County (County), and the region.

2. ***The intersection of UC Davis research strengths and the regional innovation economy point to clusters and related types of industries and companies that are potential candidates for space in the proposed Innovation Centers.***

   The Innovation Center proposals show a total of roughly 6.5 million square feet of research and tech space, which ultimately could take the form of a mix of office, flex, and industrial space. These projects will be in a position to attract users that are aligned with industries that have gained traction in the regional economy, as well as activities that receive support from the university through strong research programs and efforts aimed at commercializing related research.

   The potential clusters and company type opportunities share several common attributes, including regional economic development focus reflected in Next Economy and Moving Solano Forward, regional innovation and investment activity (e.g., venture capital investment and patent generation), prominent UC Davis academic programs and research units, visible company presence in the local economy, and flex and industrial space requirements. A subset of five clusters that are targets for regional investment, as well as a group of four knowledge-intensive technical services that cut across all the clusters, represent potential areas of focus for the proposed Innovation Centers. n these various economic activities, the service-providing, administrative, design and prototyping, and technical-based manufacturing

functions could fit most closely with the local economic and labor force characteristics. Even among this concentration of activities, there is a wide range of types of companies that can be integrated into tenanting strategies for the Innovation Centers.

Clusters	Knowledge-Intensive Services
• Clean Energy Technology • Agriculture & Food Production • Life Sciences & Health Services • Information & Communications Technology • Advanced Manufacturing & Materials	• Scientific Research & Development Services • Management, Scientific, & Technical Services • Architectural, Engineering, & Related Services • Specialized Design Services

3. The inventory of office, flex, and industrial space in Davis accounts for less than 1 percent of space in the entire region, and the proposed Innovation Centers have the potential to add more than two times the amount of existing space, while fostering a stronger and more competitive innovation ecosystem.

Davis has more than 2.6 million square feet of office, flex, and industrial space, with more than two-thirds of the space falling in the office category. Regionally, there is almost 297 million square feet of space in these categories, with a tremendous amount of additional square feet planned for development in several competitive markets along I-80 and U.S. Highway 50. Focusing specifically at buildings 10,000 square feet or larger—a minimum space requirement for established companies—shows that Davis has 48 properties and fewer than 1.3 million square feet of total inventory, a negligible share of the regional market.

The constraints in the local market have led to volatility in market indicators with movement of large tenants, as well as generally lower vacancy rates and higher rents than in the rest of the region. The Innovation Centers could help Davis nurture a stronger competitive position in the region if the ultimate mix of space in the projects builds a stronger innovation ecosystem that offers opportunities for firms through key life cycle phases and provides for specialized uses and support services that are required by many innovative companies and which are in short supply in the region. The development of multiple projects also could help foster competition in the local market that facilitates lower lease rates and land values, thereby generating the ability to support a broad cross section of firms at different levels of maturity.

4. There are four primary development prototypes that support the types of targeted clusters and companies for the Innovation Centers and are present in the 2nd Street Corridor and Interland URP areas.

The clusters applicable for Davis demand a comparable mix of office, flex, and industrial space, with a few requiring specialized space such as clean rooms and wet labs. Examining the pertinent built space in the 2nd Street Corridor and Interland URP areas shows a roughly equal mix of Flex/Office R&D, Industrial, and Office building types. While this space primarily supports the types of targeted users being contemplated for the Innovation Centers, over the years, several commercial and sales-service entities also have become tenants. Based on the built space and tenants in these areas, four broad development prototypes are used as proxies for the types of space that could be built in the Innovation Centers: Office, Flex-R&D/Office, Manufacturing, and Industrial Commercial. These uses provide

opportunities for both ownership and leased space, the combination of which is critical to appealing to the widest range of users and to maximizing potential absorption rates.

The Flex-R&D/Office prototype likely is to be a critical component of the proposed Innovation Centers because of its alignment with targeted clusters and company types and its ability to generate high assessed values and sales tax. An illustrative pro forma for this prototype demonstrates that lease rates are too low to capitalize multi-tenant speculative construction of higher end products and too high for start-up and small companies to afford. If lease rate improvements do not effectively outpace cost escalations, then development is far more likely to consist of build-to-suit activity where owner-users commission purpose-built facilities predicated on a need to be in Davis for strategic business reasons. Some types of businesses are highly cost sensitive, while others are able to more equally weigh the value of proximity to the university and the quality of place in their site location criteria. Competitive communities in the region can offer existing attractive space for less than it could be built, which could be a factor that will limit absorption in Davis until the surplus of vacant space in the region is drawn down.[2] Considering these dynamics, absorption of space in the Innovation Centers likely is to be modest at first and improve over time.

5. ***It is possible the Innovation Centers could develop either faster or slower than the initial analysis suggests.***

   Many factors are discussed throughout this report that could result in much slower absorption rates than the upper end evaluated in the BAE report (about 350,000 square feet absorbed over a 20-year buildout). In summary, any factor that reduces revenue or increases the cost structure could drive absorption rates down. Based on the evaluation of local and regional market conditions in the City and other revenue and cost factors examined as part of this study, absorption could range between 128,000 and 175,000 building square feet annually in all Innovation Centers, consistent with the annual absorption estimated in the BAE study (about 150,000 square feet annually). This range of absorption, which reflects a much higher absorption than the City's historical annual average of about 33,000 square feet, would result in a buildout period of about 40 to 56 years.[3] It is possible that a faster development scenario could arise out of interest among one or more major campus users.

6. ***Numerous factors may affect the industry specializations and resulting mix of development in the Innovation Centers.***

   A range of success factors described in this report, such as the degree of UC Davis presence in the parks, may affect the industry specializations and resulting mix of development. A

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[2] Davis has an important competitive advantages in the region related to its strong university research programs and well-documented quality-of-life factors that may translate to lease rate improvements, particularly among established firms able to afford regional cost premiums, including firms seeking relief from Bay Area costs. As noted elsewhere in this document, Davis office lease rates are about 14 percent higher than the Sacramento Region on average but comprised only about 60 percent of average office lease rates in the Bay Area in the last quarter of 2014.

[3] Historical net absorption figure is based on annual averages for office, retail, flex, and industrial development in the City from 2000 through 2014 (office, flex, industrial) and 2006 through 2014 (retail), based on data collected from CoStar. It is important to note that this time frame includes the economic downturn occurring during "the Great Recession."

differing mix of development will, in turn, influence development feasibility, as well as the overall economic and fiscal impacts of the Innovation Centers, based on the key variables associated with each development type. Based on research conducted as part of this study, EPS is proposing to evaluate the overall economic and fiscal impacts of two alternative land use scenarios in each of the proposed Innovation Centers, subject to additional refinement as part of the next phase of analysis. Scenario 1 (2nd Street/Interland URP) will be based, in part, on development patterns in the City's existing innovation centers; and Scenario 2 (Build-to-Suit) will be based on the potential mix of development if the speculative market continues its tepid pace. These alternative land use scenarios in the proposed centers are discussed in detail in **Chapter 6**.

7. ***Key variables for the specific mix of development in each park will affect overall economic and fiscal impacts to the City and regional economy.***

   EPS examined key variables—including assessed values, taxable sales, and employment—to understand the potential range associated with key development types anticipated to be constructed in the Innovation Centers. Using myriad sources of information, including data from existing development in the 2nd Street Corridor and Interland URP, Urban Land Institute (ULI), and subscription-based data (e.g., CoStar, ESRI, and National Establishment Time Series [NETS]), EPS identified low to high ranges of assumptions and a resulting midpoint estimate for each key development type that will serve as a basis for further discussion and refinement before incorporating into the economic and fiscal impact analyses.

   EPS recommends using the following midpoint assumptions to inform total assessed value, taxable sales, and employment generated from the Innovation Centers. As shown, these midpoint assumptions vary by proposed innovation center based on the mix of land uses in each alternative land use scenario and their corresponding assessed value, taxable sales, and square feet per employee assumption. For example, the Davis IC is assumed to contain a greater percentage of public/nonprofit land uses relative to MRIC. This land use is assumed to be exempt from paying property and charging sales tax, thus lowering the average assessed value and taxable sales per square foot for Davis IC relative to MRIC. Details regarding the mix of land uses and key assumptions by land use for each proposed innovation center are presented in **Chapter 6**.

Summary of Key Economic and Fiscal Impact Assumptions

Area	Davis IC	MRIC	Nishi
Scenario 1: 2nd Street/Interland URP Mix			
Assessed Value/Sq. Ft.	$215	$230	$190
Taxable Sales/Sq. Ft.	$105	$125	$75
Sq. Ft./Employee	475	530	415
Scenario 2: Build-to-Suit Emphasis			
Assessed Value/Sq. Ft.	$230	$235	$210
Taxable Sales/Sq. Ft.	$125	$145	$85
Sq. Ft./Employee	510	555	420

Source: EPS.

8. There are several university-related, regional economy, market, and project implementation factors that could impact how successful the Innovation Centers ultimately will be in developing and generating fiscal and economic impacts.

Published research and case studies demonstrate that several common factors were present in successful research park developments built around the innovation ecosystem concept. While much of the evidence centers on parks with official university investment or commitment, many of the common factors also were present in spontaneous research centers that were driven by the private sector and supported by regional economic strengths.

Because the projects still are in the early stages, many of the market and project implementation factors will be important considerations moving forward in the process. These factors directly relate to the type of space that will be integrated, feasibility elements, the tenant mix, available amenities, connectivity, and related policies, most of which are under direct control of the City and the developers. On the other hand, the City and the Innovation Center developers have limited influence on the university-related and regional economy factors and, therefore, must prepare for any opportunities and threats that arise from these dynamics over the development period. **Chapter 6** discusses the success factors in relation to the proposed innovation centers.

University-Related	Regional Economy	Market	Project Implementation
• University proximity • University-tenant match • University investment or commitment	• Regional economic health • Regional cluster-innovation match • Regional entrepreneurial support and tech transfer • Regional access to capital	• University as a tenant • Ability to accommodate tech companies and "gazelles" • Ability to accommodate start-ups • Real estate feasibility • Developer investment horizon • Public-private approach to value creation	• Diversity of space and tenants • Neighborhood amenities • Connectivity • On-site start-up support infrastructure • Supportive policy environment • Project development and management expertise • Private development opportunities

Organization of the Report

The study analysis is provided in the next 5 report chapters. **Chapter 2** identifies focus areas that will be explored in the economic and fiscal impact analyses. **Chapter 3** discusses the trends and best practices of the Innovation Center concept as a basis for which to benchmark the Davis Center proposals. **Chapter 4** identifies the clusters and company types that can support Innovation Centers in Davis based on the presence of growth opportunities in UC Davis and the surrounding region. **Chapter 5** surveys the market indicators and trends in the City and the region that will affect absorption of the Innovation Centers, including examinations of macroeconomic factors, trends in commercial real estate and performance by product type, feasibility considerations and market dynamics, and key development types supported by the targeted clusters and companies. **Chapter 6** provides multiple scenarios that will be explored for the purposes of fiscal and economic analysis, based on the presence of various success factors that will influence assessed values, taxable sales, and employment densities.

The report also contains 6 appendices. **Appendix A** suggests further reading on the Innovation Center concept and regional economic development, **Appendix B** provides an analysis of commercial market trends, **Appendix C** presents land use and building data for existing innovation districts in Davis, **Appendix D** compares infrastructure cost burdens in the region, **Appendix E** compares electricity costs in the region, and **Appendix F** lists entities participating in interviews for this study.

2. KEY FOCUS AREAS FOR ECONOMIC AND FISCAL IMPACT ANALYSIS

Despite elevated expectations for a dynamic and innovative expansion of the university-related tech economy in Davis, the local real estate market has been relatively quiet. Recent discussion has revolved around the loss of notable tenants to other cities because of a lack of larger space availabilities. Yet, rents have been slow to increase, absorption rates have been relatively uneven, and the speculative real estate market has been tepid.

Buildout of the Innovation Centers consistent with BAE's more aggressive projections would require a greater level of absorption than the City historically has experienced. Yet the City and location of the proposed Innovation Centers offers a setting that may be able to accommodate the full swath of demand if the Innovation Centers are well positioned relative to one another and phased effectively over time.

EPS's evaluation of the estimated development parameters is focused on how issues of market competition, feasibility, and other development opportunities and constraints affect the development typology, assessed values, employment density, and other attributes of the project. The economic and fiscal impact analyses will focus on these key topics, in addition to other analysis-specific topics, as described below. These focus areas are explored in this report and will continue to be refined as EPS develops the economic and fiscal impact analyses:

- **Innovation Center land uses at buildout.** The economic and fiscal impact analyses will evaluate the maximum allowable land uses at buildout, as detailed in BAE's analysis and the Environmental Impact Report (EIR). However, a range of factors, including existing and projected market competition, the degree of UC Davis presence, and financial feasibility, will influence the actual mix of land uses at buildout. And, given differing assumptions related to assessed value, sales tax generation, and employment density, the actual mix of land uses has a direct influence on economic impacts flowing to the City and regional economy, including net fiscal impacts to the City's General Fund. EPS intends to evaluate alternative land use scenarios that will explore differing land use mixes, providing a range of potential economic and fiscal impacts resulting from buildout of the Innovation Centers. These land use scenarios are described in greater detail in **Chapter 6** of this report.

- **Assessed value.** Property tax revenues, based on the secured and unsecured assessed value of development, will be one of the largest sources of revenues for the City. Average assessed values per building square feet can vary widely based on the type, character, and density of land uses developed in the Innovation Centers. For example, under the "Research; Office; R&D" land use category, the assessed value per square foot for a Class A suburban office building may vary significantly from the assessed value per square foot of an R&D user with a substantial amount of assessed value attributable to business fixtures and property (i.e., research equipment). Further, the proportion of UC Davis or other property tax-exempt users will play a significant role in determining the total secured and unsecured assessed value and resulting total property tax revenue impacts of development in the Innovation Centers. Finally, the City may enter into a property tax-sharing agreement with

the County upon approval of annexation into the City. Because an agreement is not in place indicating the City's share of property tax revenue, the fiscal impact analysis will address a range of potential assumptions, thereby affecting the amount of property tax revenue generated by new development and the overall net fiscal impacts to the City's General Fund.

- **Taxable sales and TOT.** Sales and use tax revenue stemming from development in the Innovation Centers will be generated by three sources: (1) business-to-business (B2B) taxable sales generated on site from non-retail businesses, (2) taxable sales generated by on-site industrial commercial and ancillary retail businesses, and (3) taxable retail expenditures citywide from new Innovation Center employees. There likely will be substantial overlap between the second and third sources of taxable sales, which will be accounted for in the fiscal impact analysis. Initial observations of market conditions in the City indicate the potential for a reduced amount of retail development in the Innovation Centers. However, recognition that retail would be phased over time to correspond with commensurate market demand will mitigate any concerns in this regard. In addition to sales tax revenue generated by the Innovation Centers, development of the proposed hotels will generate transient-occupancy tax (TOT) revenue for the City. As part of the economic and fiscal impact analyses, EPS may conduct a sensitivity analysis assuming the exclusion of hotel development to determine the relative impacts of the Innovation Centers if market demand for new hotel development is insufficient.

- **Estimated employment.** The magnitude of ongoing economic and fiscal impacts depends on the types of establishments located in the Innovation Centers and their respective employment densities. For the economic impact analysis, multiplier effects for each industry vary based on the estimated demand on suppliers of goods and services, employee compensation that drives household spending, amount of demand that can be supported by existing suppliers, and leakage across household spending categories. It will be necessary to approximate the distribution of assumed employment across industries to estimate the multiplier effects and associated economic impacts. For the fiscal impact analysis, employment estimates will impact sales tax revenue and other City General Fund revenue and expenditure estimates. EPS will model base employment densities, as provided in the BAE analysis and EIR, as well as adjusted employment densities based on current employment in the City's 2nd Street Corridor and Interland URP and supplemental data collected from subscription-based databases (Costar; ESRI).

- **Building construction costs.** An integral assumption of the economic impact analysis, the Innovation Centers will generate one-time economic impacts as a result of building construction activity. Building construction costs can vary significantly based on the type of facility being constructed (i.e., industrial, flex, office, hotel, retail) and any associated specialized space (e.g., wet lab, clean room, server hosting). Construction cost estimates will need to be derived for the assumed building type mix to estimate the one-time economic impacts. EPS will use information from the applicants, as well as industry-standard values from published sources, to derive the construction costs associated with the assumed building type mix in each scenario.

- **Service facility and equipment requirements.** For most General Fund-funded services, the fiscal impact analysis will estimate City General Fund expenditures based on the current citywide level of municipal services to serve development at buildout of the Innovation

Centers. For the provision of fire services to the Innovation Centers, the fiscal impact analysis will assume the Davis Fire Department will be the service provider, which includes the proposed detachment from the Springlake Fire Protection District and annexation to the Davis Fire Department for the Davis IC. Studies may be required to determine the exact fire facilities and equipment required to meet response time goals for all development in the Innovation Centers. In the interim, EPS will work with City staff to determine fire provision expenditures, assuming high- and low-cost scenarios. In addition, EPS will work with City staff to determine appropriate police service levels to serve the type of development envisioned in the Innovation Centers.

- **Ongoing maintenance assumptions.** The fiscal impact analysis will take into account current assumptions regarding the ownership and maintenance of public facilities in the Innovation Centers. The City has provided EPS with a matrix of facilities (e.g., landscaping, road maintenance) and a preliminary approach to ownership and maintenance funding responsibilities. EPS will work with City staff to refine this set of assumptions, to the extent that maintenance of these facilities typically is funded through General Fund revenues. EPS will conduct sensitivity analyses assuming private versus public ownership and maintenance funding responsibility for specific General Fund-funded operation and maintenance items.

3. KEY ELEMENTS OF THE INNOVATION CENTER CONCEPT

The "Innovation Center" concept is described well by the Brookings Report, "The Rise of Innovation Districts." Key aspects of this report follow an introductory discussion of how universities impact innovation economies, along with supporting information from, "Driving Regional Innovation and Growth," a report of survey results from 108 North American University Research Parks (URPs), issued by Battelle Technology Partnership Practice for the Association of University Research Parks (AURP), as well as the Innovation Center Study issued by UC Davis' Studio 30, and others.[4] This chapter looks at case studies that illustrate the importance of different Innovation Center criteria, and comments on how Davis responds to these criteria and the significance in terms of how development expectations are affected. The chapter goes on to benchmark Davis against a typical research park as defined through the AURP survey. While individual elements of the Davis proposals do not fully align with best practices and benchmarks, when assessed collectively, the innovation network in Davis is quite strong.

The University and the Innovation Economy

To understand the impacts of Innovation Centers that largely are inspired by the proximity to UC Davis, it is important to recognize more broadly the impacts universities have on innovation economies. A university's presence can spur significant economic activity in terms of generating spin-off firms and startups, as well as real estate demand for innovative businesses and ancillary services.

As a fundamental part of the shift to a "knowledge economy," academia increasingly has emerged as a major "anchor industry," driving economic growth and generating employment opportunities and other benefits.

Technology Transfer and Business Incubation

One of the primary ways universities improve local economies is through development and commercialization of new technologies, otherwise known as technology transfer. There is growing awareness that innovation in technology is crucial for regional economies to remain competitive.[5] The Milken Institute found that high technology industries accounted for 65 percent of the difference in regional economic success in the United States from 1975 to 1998.[6]

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[4] Suggestions for further reading on the Innovation Center concept are provided in **Appendix A**.

[5] "Rising above the Gathering Storm, Revisited: Rapidly Approaching Category 5," National Academy of Sciences, September 2010.

[6] Milken Institute, America's High-Tech Economy: Growth, Development and Risks for Metropolitan Areas, 1999.

Universities facilitate technology transfer in many ways. Universities lead to the creation of R&D-related start-ups or spin-off firms, as well as clusters of ancillary and support-related businesses and services, all of which catalyze additional local job generation.[7]

Universities also play a very active role in creating new businesses through the operation of business incubators. There are hundreds of incubators affiliated with colleges and universities across the country, which catalyze the commercialization of research and assist in the formation of start-ups created by faculty. In interviews, founders of UC San Francisco-incubated firms highlighted the importance of having "micro" spaces available for rent, allowing firms to pay for what they need and expand as necessary. In addition, sharing space with other start-ups fosters a creative atmosphere conducive to networking, and simply having an address in university space provides firm founders exposure to venture capitalists looking for new investment opportunities.[8] Shared access to expensive resources, such as laboratory equipment, is another key to success, and part of what has made North Carolina's Research Triangle Park the largest research park in North America.

A university's impact on real estate extends to the businesses it directly helps create. The UCSF Mission Bay Campus, for example, has created a demand for building space for biotech that has been estimated to range from 840,000 to 3.6 million square feet over a 10- to 20-year period, as well as generating demand to support between 73,000 and 106,000 square feet of retail space.[9] This ratio of retail demand relative to office demand is roughly equivalent to the proposed Innovation Centers in Davis. Operating space for technology businesses is an essential element of university research parks, which are by their nature real estate developments, but when surveyed, their lowest ranked goal was to "generate income for university and developer." Instead, research parks stated their main priority was to "create an environment that encourages innovation and entrepreneurship," which serves broader, regional economic development goals.[10] In the case of Davis, this finding is germane, as one of the overt goals for creating innovation centers in Davis is to rectify the City's structural fiscal deficit. It will be important to balance the larger objective of fostering innovation with the goal of generating revenue.

Innovation Center Assets

Innovation districts, as defined by Brookings, are areas where forward-thinking anchor institutions and companies cluster together and connect with start-ups, business incubators, and accelerators. They also are characterized as mixed-use, physically compact areas that are transit-accessible and technically wired. The proposed projects in Davis align well with Brookings' definition when taken as a whole, particularly given Davis' commitment to integrating place-based amenities and a mix of uses with multi-modal connections to key entertainment, civic, and cultural assets throughout the City.

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[7] "The University of California's Economic Contribution to the State of California," EPS, 2011.

[8] "A Study of the Economic and Fiscal Impact of UCSF," EPS, 2010.

[9] "Commercial Land Use Impacts: UCSF Mission Bay Campus and Hospital," EPS, 2007.

[10] "Driving Regional Innovation and Growth." Battelle Technology Partnership Practice, August 2013.

Brookings defines three classes of assets necessary to make an innovation district a true innovation ecosystem, where a synergistic relationship between people, firms, and the physical geography of a district can facilitate idea generation and accelerate commercialization. The three assets classes, economic, physical, and networking, are presented in **Table 2**.

Economic Assets

University Connection

Davis has several economic assets present, including the connection to a university, as research has shown long-term employment and worker income to rise in industries related to the innovative strengths of local universities. In Battelle's report, the highest rated attribute for success was commitment of university leadership, and another very important success criterion was a good match between the core competency of the university and research park tenants.

The nearby presence of UC Davis is a significant factor for the Davis Innovation Center proposals, though UC Davis has not committed to any official partnership with any of the developers making proposals for private research parks. While university commitment in the planning stages of a research park is desired, it does not preclude a successful future marriage of a university and a research park (see sidebar).

Innovation Centers Developed without University Leadership:

- Cummings Research Park in Alabama benefits from the key anchor tenant of the University of Alabama in Huntsville (UAH); however, the park itself originally was developed by an engineering company. The park was built in the 1960s adjacent to land that had been acquired by UAH to develop a new campus, but the development was led by Brown Engineering Company. It is now the second largest research park in the country.
- The University of Arizona Tech Park (UA Tech Park) in Tucson is now owned by the university, but originally it was built by IBM and sold to UA in 1994. It has since grown from one company employing 750 people to 40 companies employing 6,500 people. UA Tech Park is discussed later in this chapter as it bears other similarities to the Davis Innovation Centers.

Davis also can learn from the example of Spontaneous Research Districts that have formed in the Bay Area.[11] These districts have strong ties to local research universities, but unlike traditional URPs, these districts have self-organized and developed organically, driven by regional economic and institutional preconditions. In Emeryville, significant R&D development occurred in the 1980s, with firms locating in old industrial and warehouse space zoned appropriately for conversion, leading to the rise of bio-tech and software giants Chiron and Sybase. At the same time, Alameda began attracting tenants to two business parks, including Marina Village, which now has more than 1 million square feet and approaches 100 percent occupancy. Both Alameda and Emeryville attracted UC Berkeley spinoffs, as well as other small high-tech firms seeking UC proximity, because of their pro-business city governments, mixed-use, amenity-rich environments, and

[11] "Spontaneous Research Districts: Universities in Local Economic Development," EPS, 1997.

Table 2
Innovation District Assets

Economic	Physical	Networking
Innovation Drivers	**Public Realm**	**Strong Tie Builders (within Similar Fields)**
Industry Composition	Encourage Interaction	Tech Regulars
R&D	Digital Access	Workshops
Creative Fields (Design, Media, etc.)	Design And Programming	Training Sessions
Boutique Manufacturing	Concerts	Cluster-Specific Meetings
University Connection	Innovation Expositions	Industry-Specific Conferences and Meetings
Cultivation of Entrepreneurs	Eateries	Industry-Specific Blogs
Mixing of Large and Small Firms		
	Private realm	**Weak Tie Builders (across Fields)**
Innovation Cultivators	Mixed-Income Housing	Networking Breakfasts
Incubators	Neighborhood-Serving Retail	Hack-a-thons
Accelerators	Research and Office Complexes	Tech-jam Startup Classes
Proof-of-Concept Centers	Flex Work Spaces	Open Space Designed for "Collision Points"
Tech Transfer Offices	Lab Spaces	
Shared Working Spaces	Startup Space (Small and Affordable)	
Local High Schools	Micro-Housing	
Job Training Firms		
Community Colleges	**Connectivity**	
Legal Counsel	Internal (within District)	
Patent Attorneys	Link Anchor Institutions to District	
Venture Capital Firms	Remove Barriers (Fences, Walls, etc.)	
	Bicycle and Pedestrian Infrastructure	
Neighborhood-Building Amenities	External (District to Broader Metro)	
Medical Offices	Broadband	
Grocery Stores	Transit	
Restaurants	Bicycle and Pedestrian Infrastructure	
Coffee Bars		
Small Hotels		
Local Retail		

assets

Source: Brookings Institution; EPS.

flexible building types. UC Berkeley provided employees and technology innovation, serving as a de-facto, absentee anchor tenant, even though the university administration took no active role in these districts, as they were largely disinterested in tech transfer and relationships with private enterprise.

The Torrey Pines Mesa surrounding UC San Diego benefits from a similar dynamic. While UC San Diego now hosts its own research park, the biotech firms in the area have long benefitted from university proximity without any formal relationship.

Davis also is home to a mix of innovative industries, including R&D-intensive firms, as well as creative firms in design and media, that Brookings posits can help drive innovation. Brookings suggests that innovation districts should have spaces that support a mix of large and small companies, as well as a mix of industries. To this end, research and office complexes should have flex work spaces, lab spaces, and smaller, more affordable areas for start-ups and spinoffs that can support larger firms. Centers also should make sure to accommodate clusters that are strengths of the region.

While the existing innovation ecosystem in Davis, when taken as a whole, possesses many important economic assets, it remains to be seen to what extent these assets will be available in the Innovation Centers themselves. For instance, UC Davis formally has not committed to having a tangible presence in the Innovation Centers that would solidify the university connection. Innovation cultivators such as incubators and tech transfer offices already exist in UC Davis (discussed in **Chapter 4**), but the presence of these types of facilities in the Innovation Centers themselves can help create the conditions necessary to support a full spectrum of businesses. Downtown Davis has many of the neighborhood-building amenities that can activate an innovation district, but will the new Innovation Centers provide adequate access to these amenities or offer them on site?

Physical Assets

The physical assets listed by Brookings can serve as a guide for the physical development of Innovation Centers in Davis. Connectivity is regarded as particularly important, especially as a broadening group of companies and firms are valuing collaborative environments, including such science- and technology-heavy fields as chemicals, biotechnology, telecommunications, and semiconductors. Collaborative environments can take the form of "hackable buildings," with open floor plans that can be reconfigured

Value of Connectivity and Collaboration

- UC San Diego's Science Research Park (UCSD SRP) is still in its infancy, with only one building built out of a planned five. However, for the first two tenants, the nonprofit La Jolla Institute for Allergy and Immunology and a biopharmaceutical company that translates the Institute's research into treatments, the collaborative environment afforded by close connection to the university has been very fruitful. It has resulted in many joint research efforts and collaborations. "We currently have active research collaborations with 20 UC San Diego faculty members and have published 17 joint publications since 2005," said Dr. Mitchell Kronenberg, the president of the La Jolla Institute. "Our location here has definitely been a catalyst for cooperative scientific innovation."[1]

- Iowa State University's Research Park (ISU RP), recognizing the importance of connectivity, is in the process of creating "Hub Square" as a social and professional gathering space for the park, which includes plans for restaurants, coffee shops, daycare, and fitness facilities.[1]

for dense, collaborative spaces. The Innovation Centers must ensure that not only internal barriers to relationship-building are removed, but also that connections are made to the rest of Davis and the region so the Centers do not become islands unto themselves. This can be addressed through infrastructure investments such as transit, bike and pedestrian paths, and even broadband.

In addition to the physical assets presented by Brookings, AURP reports several other trends of note in the physical development of URPs, including these:

- Mix of multitenant and single tenant commercial space supportive of R&D activities.
- New types of enhancements for R&D-oriented buildings, such as increased air handling systems, higher floor heights and loading capacity, chilling and wastewater pretreatment systems, and increased and redundant electrical power systems.
- Specialized and dedicated laboratory facilities, often associated with a specific university research center.
- Instructional facilities, many targeting continuing education, also are becoming more widespread.
- More basic hospitality services such as restaurants, and even hotel and conference centers.
- The growing importance of mixed-use live-work-play environments, even in more traditional, suburban research parks such as Research Triangle Park.

Studio 30's report emphasizes green and sustainable design as a success factor for Innovation Centers, which fits well with community values in Davis. Green design attributes can be useful in marketing to the kind of cutting-edge businesses the Innovation Centers will seek.

While the responsibility of providing these physical assets for new Innovation Centers largely will rest on the developers themselves, the City's existing infrastructure works to connect the Center sites to surrounding resources. In addition to transit options, the bike path network connects the Center sites to Downtown and the campus. A new tunnel also will serve to connect the Nishi site to the campus. The extent to which the other physical assets are present will be determined by how the Centers are developed and what elements are prioritized.

Networking Assets

The networking assets detailed by Brookings provide guidelines for encouraging the kind of network building, both in and across fields, that has made the Silicon Valley such a hub for innovative activity. Most of the assets included are programming-related (networking breakfasts, workshops), and their presence in the new Innovation Centers will depend on strong, engaged leadership. Brookings also points to the example of St. Louis, which is designing the open spaces between five clustered innovation centers to generate "collision points" or design-based interactions between innovative people across industries and companies. These design possibilities, which increase the connectivity assets described earlier, should be considered for the Innovation Centers.

Innovation District Model: The Urbanized Science Park

The assets described earlier combine to create innovation districts, where businesses and educational institutions work together in cutting-edge R&D pursuits. Brookings describes three models of innovation districts. The first two models, Anchor-Plus (districts centered on anchor institutions, such as the growth of Kendall Square around MIT and nearby hospitals) and Re-Imagined Urban Areas (industrial or warehouse areas transformed into innovation districts, such as Boston's South Waterfront and San Francisco's Mission Bay), concern existing urban districts. The third model, the Urbanized Science Park, describes innovation districts in suburban or exurban areas where mixed-use, dense environments are coming online to house innovation activities that traditionally have been isolated and sprawling. This model, which is quite applicable to the Davis case, has examples in North Carolina's Research Triangle Park, University Research Park at the University of Wisconsin-Madison (Madison URP), the University of Virginia Research Park in Charlottesville, and UA Tech Park.

Typical Innovation Center Attributes: Comparison to Davis Context

The Battelle report of survey results can serve in many ways as a benchmark for a typical innovation center, a helpful resource for the proposed Innovation Centers in Davis in the planning stages. The typical North American research park, based on responses from the survey, is about 120 acres in size, containing about 250,000 building square feet that is 90-percent occupied. It should be noted that the research park concept the City is pursuing differs from a traditional URP in that the sites considered mostly are disconnected by a few miles from the university itself, and UC Davis has not committed to any official partnership with any Innovation Center proposals.

Urbanized Science Parks: Madison URP and UA Tech Park

While most case studies of successful university research parks either are in or adjacent to a university campus, Madison URP and UA Tech Park, two of the Urbanized Science Parks cited by Brookings, are located 3 miles and 16 miles away from their respective universities. Despite this distance, Madison URP and UA Tech Park have total economic impacts (state and local) of $825 million and $2.3 billion, respectively, as shown in **Table 3**. Madison URP is able to operate without any local or state funding, and UA Tech Park has been named the top university research park in years past by AURP. These case studies show that innovation districts that are removed from their associated universities can be quite successful, though it should be noted that unlike the proposed Innovation Centers in Davis that are removed by some distance from UC Davis, both Madison URP and UA Tech Park have strong formal ties to their respective universities and are part of the largest metropolitan areas in their respective states.

Table 3
Urbanized Science Park Examples

Item	University of Madison [1]	University of Arizona [2]
Year Started	1984	1994
Miles to Campus	3	16
Size		
Acres	255	1,345
Square Feet	1.8 million	2 million
Tenants		
Companies	126	40
Employees	3,419	6,500
Average Annual Earnings	$64,310	91,145
Economic Impact		
Annual State and Local Tax Revenues	$43 million	$157 million
Total Annual Economic Impact (State and Local)	$825 million	$2.3 billion

urb_science

Source: NorthStar Economics; VP Research and Consulting; EPS.

[1] "The Economic Contribution of the University Research Park", NorthStar Economics, 2010.
[2] “The Economic Impact of the UA Tech Park”, VP Research and Consulting, 2015.

Challenges

The biggest challenge to developing university research parks, according to survey respondents, includes financing, primarily in finding capital for park development and renovations. This will be a primary concern of the Innovation Centers going forward. In order of importance, these are the key challenges for URPs, all relevant for the City:

- Capital for park development and renovations.
- Identifying, growing, and supporting a sufficient tenant base.
- Equity capital for tenants.
- Financing for wet-lab space.
- Financing for multi-tenant space.
- Competition from other sources.
- Decreasing demand for office space as companies move to operate virtually.
- Insufficient customer use to expand retail/commercial components of the park.
- Loss of developer interest in partnering with research parks.
- Limitations on the use of tax-exempt financing for buildings in the park.

Employment

The typical URP contains 26 establishments (64 percent of which are for-profit companies) and employs 850 people. Technology-related private-sector jobs accounted for 79 percent of total park employment. On average, about 78 percent of the technology-related employment is focused on R&D activities, demonstrating the concentration of innovation among firms and workers in the URP environment. Around 19 percent of the employment in the typical URP is supported by universities and governmental entities. Although the proportion of R&D activities was not measured for these entities, case-study examples suggest these primarily are engaged in research-oriented activities. The remaining 2 percent of employment is captured by workplace support activities like retail and personal services.[12]

Facilities

The existing and planned facilities for URPs are detailed in **Table 4**. The most common current facilities are specialized labs and university instructional facilities, followed by food/restaurants and conference centers. Few parks currently have hotels, but ¼ plan to add them in the next 5 years.

[12] The share of park support activities in the typical URP is less than the amount of retail being proposed in the Innovation Centers. However, it is important to note that these data represent an average of the existing parks surveyed by AURP. Each park operates in a unique market and occupies a different position in the surrounding community. As a result, the integration of retail in the parks versus proximate centers can vary substantially based on local market conditions.

Table 4
Research Park Facilities: Existing and Planned

Industry	Currently in Park	Planned within 5 Years
Specialized laboratory facilities	74%	45%
University instructional facilities	45%	27%
Food/Restaurants	40%	41%
Conference center	26%	22%
Other education facilities	19%	13%
Hotel	13%	25%
Other retail shops	12%	30%
Student housing	8%	11%
Other residential	7%	21%

facility_plan

Source: Battelle, Driving Regional Innovation and Growth, 2013.

Startup Support

The availability of a formal business incubator within park boundaries was rated as a very important success criterion in the park survey; the typical research park was shown to have about 25,000 square feet of incubator space. Respondents collectively indicated that 963 new businesses graduated from their incubators or related start-up space in 5 years. Of the graduates, only 12 percent left the region, and 81 percent were still in business after 5 years, an impressive statistic in light of the fact that nationally over half of start-ups fail within that time.

While the City is home to multiple incubators (see **Chapter 4**), the experience of existing research parks teaches that an on-site incubator provides significantly more benefit than one that is off site. On the other hand, some experience has shown there is a danger in over-providing incubator facilities. According to Ylva Williams of the Stockholm Science City Foundation, quoted in the Brookings report, "Too many incubators run the risk of spoon-feeding entrepreneurs too much. They need to work hard at achieving success."

URPs also provide access to a variety of business and commercialization services (business planning, marketing and sales). Over half of parks surveyed have a university tech transfer/commercialization office, which the City also should consider as a possible on-site resource.

Seventy-two percent of URPs link to or provide sources of capital, and URPs rated access to equity capital sources as very important to the success of a park. Brookings suggests innovation districts consider a districtwide integrated financing strategy (buildings, utilities, transportation, and incubators) as opposed to scattershot efforts, which can influence capital sources to better value the innovation district model as a whole.

Madison URP, as successful as it has been in the state as a concentration of innovative healthcare companies, suffers from a dearth of nearby sources of capital and consequently has seen many start-ups leave for the Bay Area and elsewhere. While Davis has several local venture capital firms and is within 200 miles of Silicon Valley, the Valley still is distant and concentrated enough that it will continue to be a threat to steal start-ups from Davis.

Governance/Leadership

Most URPs work with private developers to finance and construct buildings but not to play a role in governance. **Table 5** shows the breakdown of URPs by governance structure, which places the proposed Innovation Centers in Davis in the clear minority. Only 5 percent of parks are governed by private developers, which points to the Davis proposals as falling somewhat outside the typical URP model. Consequently, it will be very important to ensure the new parks are managed to achieve goals of economic development and diversification aligned with the university. The parks should consider coordination services managed by a nonprofit entity in Davis to maintain focus and make progress on the stated mission.

Table 5
Park Governance Structure

Park is Governed by	Park Management
University-affiliated non-profit	31%
Affiliated university	19%
Government agency, quasi-public corporation or public authority	18%
Independent, private non-profit	17%
Formal joint venture among diverse organizational types	6%
For-profit developer	5%
Other	5%

governance

Source: Battelle, Driving Regional Innovation and Growth, 2013.

Innovation centers need strong leadership, preferably with a diverse group of leaders from key institutions, to stay on mission. Brookings presents three models of leadership that have proven beneficial in developing innovation districts, which often can overlap:

- **Triple Helix:** Structured interactions between industry, research universities, and government have been important for long-range vision planning in St. Louis and several cities in Europe.
- **Facilitator:** One person, or a team or entity, can help as a catalyst, integrator, or a facilitator through the process. In Seattle, Vulcan Real Estate has organized discussions with local community groups about housing, infrastructure, and amenities.
- **Local Government:** Mayors are playing a growing role in forming innovation districts. Former Boston Mayor Tom Menino was instrumental in designating the South Boston Waterfront as an innovation district.

The Innovation Park of Tallahassee is a cautionary tale of what can happen without strong leadership. After much internal in-fighting that made news headlines, the county authority that owns and manages the park commissioned a review by outsiders that revealed significant financial problems and a lack of direction, as the park was largely managing property instead of focusing on its mission to promote R&D activities and further economic development in the county.[13] The review resulted in a park restructuring to establish a better focus on the mission.

The success of Spontaneous Research Districts in Emeryville and Alameda, which developed organically without any structured leadership, serve as a counterpoint to such evidence. Davis certainly shares some of the economic and institutional preconditions that helped those districts thrive, though if the City wants to ensure the Innovation Centers meet the goals of the City, it is preferable to have some established guidance present rather than assume spontaneous development will meet every need.

Key Factors

The best practices, trends, and case studies of innovation centers inform a series of success factors that are used to evaluate the development scenarios discussed in **Chapter 6**. The lack of university commitment in any of the Innovation Center proposals places them well outside the norm, and they may be better evaluated as possible Spontaneous Research Districts. Even so, the City still has many of the necessary economic assets for a successful innovation district, as commonly defined, as well as some physical assets that can connect the Centers to other resources in the area. Great opportunities therefore are available for the Centers to capitalize on these existing assets through thoughtful and careful planning and development.

[13] "Innovation Park Takes A Different, Unique Path", Tallahassee Reports, 2014. http://tallahasseereports.com/2014/03/02/innovation-park-takes-a-different-unique-path/

When the projects are evaluated collectively, as part of the larger innovation ecosystem that includes UC Davis and Downtown Davis, the outlook for the individual pieces as part of this umbrella network has the potential to enhance the existing innovation ecosystem. Other community objectives to facilitate redevelopment of underutilized sites in the Downtown could provide further support. There are synergies that could arise from the combination of the three proposed projects, where many of the key factors are present across the Innovation Centers, including university proximity, a mix of business facilities, and housing. The fact that Davis is a relatively compact city with strong bicycle and transit connections is an important quality-of-life factor, which is supportive of the proposed Innovation Centers.

4. INNOVATION CENTER CLUSTERS AND COMPANY TYPES

The success of the Innovation Centers rests in part on the opportunities for innovative business growth present in UC Davis and the surrounding region, and this chapter focuses on identifying those opportunities to isolate industry clusters and company types that can support the Innovation Center projects in Davis. This chapter first describes the regional opportunities for innovative growth that already have been recognized from the work of regional planning efforts. This is followed by an analysis of the regional innovation environment, including venture capital, patent, licensing, and startup activity, which sheds further light on regional opportunities like Biotechnology and Clean Tech, two clusters found to attract high volumes of regional venture capital investment attributed almost entirely to Davis.

The second section looks at opportunities present in UC Davis, beginning with a discussion of local and regional goal-setting efforts, and followed by an analysis of innovation activity in UC Davis. While UC Davis historically has supported a low amount of measured innovation activity relative to its size in the UC system, UC Davis Chancellor Linda Katehi, as well as the Sacramento Region's Next Economy Capital Region Prosperity Plan (Next Economy), have outlined several goals and initiatives that will push forward tech transfer and innovative activity in UC Davis and consequently the region.

The opportunities present both in UC Davis and the larger region then are compared to arrive at a set of industry clusters and business types that are most appropriate to attract to the future Innovation Centers.

Regional Opportunities

Planning Efforts

Recent planning efforts to improve the economy in the Davis Region have focused on the work of two initiatives: Moving SOLANO Forward (MSF) in Solano County, and the Next Economy. These efforts provide lessons specifically to identify industry clusters where strengths already exist, as well as opportunities for growth.

Moving SOLANO Forward

Funded by the Department of Defense's Office of Economic Adjustment, MSF is an effort to diversify the economic base of Solano County to grow the local economy. MSF outlined three main goals in its Final Report, issued in September 2014, as well four viable clusters for growth based on historical and forecasted performance, detailed in **Table 6**.

Table 6
Goals and Target Clusters of Regional Planning Initiatives

Item	Next Economy	Moving Solano Forward
Goals		
	Foster a strong innovation environment. Amplify the Region's global market transactions. Diversify the economy through growth and support of core business clusters. Grow and maintain a world-class talent base. Improve the regional business climate for economic growth.	Enhance countywide development capacity. Strengthen regional economic development and workforce development programs and services. Improve the quality of life for county residents and businesses.
Target Clusters		
	Advanced Manufacturing – covers industries that depend on cutting edge materials and emerging technologies to manufacture existing products as well as new products enabled by advanced technologies. *Agriculture & Food* – covers the growing of crops, the raising of animals, food processing, and related manufacturing, wholesaling, and retailing. *Clean Energy Technology* – covers four segments of clean energy, energy efficiency, clean transportation, and green building. *Education & Knowledge Creation* – covers educational institutions ranging from elementary schools to trade schools and universities, as well as educational support services and publishing. *Information & Communications Technology* – covers industries that assist in accessing, transmitting, storing, and accessing information; also includes activities in telecommunications, software, storage, and audio-visual systems. *Life Sciences & Health Services* – includes industries that apply biological scientific knowledge to the development of products and technologies, as well as healthcare services and support.	*Energy* – covers electric power and natural gas, utility systems, and petroleum and coal products, as well as clean energy components, core components, and other support sectors. *Food Chain* – covers agriculture, food and beverage production, equipment manufacturing, warehousing, wholesale and retail, and related services. *Medical & Life Sciences* – covers medical services, medical devices, and supporting activities like machinery, equipment, and business services. *Advanced Materials* – covers high-tech engineered materials, components, and systems, as well as the commodities, products, processes, and instruments to make and monitor the materials.

NE_MSF

Source: Next Economy, Capital Region Prosperity Plan; Moving Solano Forward, Solano County Economic Diversification Study; EPS.

Next Economy's Capital Region Prosperity Plan

Next Economy, funded by a mix of private interests, organized labor, foundations, and several local governments, is an effort to build a diverse, stable, and robust economy in the Sacramento Region.[14] The Next Economy's 2013-2017 plan was released in March 2013, and Davis has since adopted a Resolution of Support for the plan. The plan laid out five goals to bring about new opportunities for job creation, innovation, and investment, as well as identified six clusters that presented the best opportunities for growth, described in **Table 6**. These two regional planning initiatives have clear areas of overlap, though while MSF set out rather broad goals to further economic development, Next Economy has a focus on spurring innovation activity, and therefore is more applicable to assess opportunities for the Innovation Centers.

Regional Innovation Environment

Several metrics of regional innovation, including venture capital, patent, licensing, and start-up activity, were evaluated in the area surrounding Davis to identify industries and clusters with the most growth opportunity, such as Biotechnology and Clean Tech.

Venture Capital

Industries that attract venture capital investment have been recognized by investors to be solid growth opportunities. **Table 7** shows there has been just more than $270 million in venture capital in Davis from 2003 to 2014, and almost $1.3 billion in the Davis Region, here defined as the Sacramento Metropolitan Statistical Area (MSA) plus Solano County. While there is no discernable trend in the trajectory of venture capital investment in the region, patterns in activity by industry are apparent. Almost half of the regional investment total is attributed to two specialized industries that fall under Information Technology. Biotechnology and Clean Tech rank third and fourth in terms of regional investment over time, and Davis accounts for 82 percent and 100 percent of that investment, respectively. Davis also accounts for 24 percent of the regional investment in Software, another branch of Information Technology, as well as all of the regional investment in Agriculture and Medical Devices & Instruments.

The Davis Region is home to several venture capital firms, though the level of activity pales in comparison to the Bay Area and Silicon Valley, both areas that threaten to poach the region's best innovators with their seemingly unlimited access to capital. Some, like Foothills Angels and Velocity Venture Capital, focus on companies in the Sacramento area, while others focus on Northern California or the western U.S. more broadly. Most fund a variety of firms across industries, though there is some industry specialization. Newcastle Capital focuses on Financial Services firms, while Foothills Angels focuses on Clean Tech, Life Sciences, and Information Technology. The portfolios of venture capital firms that do not possess industry requirements are nonetheless weighted heavily towards technology companies.

[14] Next Economy covers El Dorado, Placer, Sacramento, Sutter, Yolo, and Yuba Counties. It was launched by the Sacramento Metro Chamber, the Sacramento Area Commerce and Trade Organization (SACTO), the Sacramento Regional Technology Alliance (SARTA), and Valley Vision.

Table 7
Regional Venture Capital Investment 2003-2014 (Sacramento MSA and Vallejo MSA) [1]

Industry	Description	Davis	Sacramento Region	Davis as Share of Region
Total		**$270,033,252**	**$1,263,550,763**	**21%**
Components	Computer components	$0	$312,000,000	0%
Infrastructure	Internet infrastructure	$0	$230,000,000	0%
Biotechnology	Biotechnology drug development firms, diagnostics	$129,643,200	$158,455,200	82%
Clean Tech	Water purification, engine efficiency technologies	$111,889,100	$111,889,100	100%
IT	Enterprise information technologies, software and services	$0	$100,000,000	0%
Internet	Consumer and enterprise Internet services; social networking	$0	$57,565,000	0%
Healthcare Services	Healthcare ecosystem services	$0	$54,750,000	0%
Networking	Optical networking equipment and services	$0	$49,484,599	0%
Software	Enterprise and consumer software	$10,700,000	$44,345,658	24%
Wireless	Wireless equipment and service providers	$0	$43,001,871	0%
Financial Services	Enterprise and consumer financial services, ex- ECommerce	$1,791,473	$29,790,373	6%
Alternative Energy	Solar, wind and other non-fossil fuel energy technologies	$0	$28,395,634	0%
Agriculture	Agricultural technologies	$15,000,000	$15,000,000	100%
Environmental	Environmental remediation	$0	$10,150,000	0%
Electronics	Consumer electronics; MEMS	$0	$7,254,900	0%
Semiconductors	Semiconductors - fab and fabless	$0	$3,007,000	0%
Digital Media	Digital advertising networks and game developers	$0	$3,000,000	0%
Security	Security software - enterprise and consumer	$0	$2,521,000	0%
Mobile	Mobile applications, payments and networks	$0	$1,530,949	0%
Medical Devices & Instruments	Medical & surgical devices, diagnostics	$1,009,479	$1,009,479	100%
Transportation	Vehicle manufacturers	$0	$400,000	0%
ECommerce	ECommerce and electronic payment systems, ex-Mobile	Undisclosed	Undisclosed	N/A
Healthcare	Healthcare management services or technologies	$0	Undisclosed	N/A

vc_region

Source: 2015 Venture Deal; EPS.

[1] Transactions from 2003-2014 include Venture Equity, Crowdfunder, M&A, Debt, and IPO. Investor types include Venture Capital, Corporate, Private Equity, Accelerator, Crowdfunder, Angel Group, Lender, Hedge Fund, and Family Office.

Patents

Patents are clear indicators of innovative activity and discovery, and the disciplines with high volumes of patent issuance hint at industries where innovative people are driving progress.

The Sacramento MSA ranks within the top 10 percent of metropolitan areas nationwide for utility patents issued from 2000 to 2013.[15] More than 7,100 utility patents were issued to patent holders in the Sacramento MSA and Solano County in this time frame, as shown in **Table 8**, and patent issuance has been trending upwards since 2009. The top 20 technology classes in terms of patent activity represent a mix of disciplines that includes computers/software, telecommunications, biotechnology, medicine, energy, and advanced manufacturing. Ground-breaking individuals in the Davis Region are working in these industries and would be ideal tenants for the Innovation Centers.

Technology Companies

Technology companies are one of the driving forces in an innovation economy, and the existing mix of technology companies indicates which industries can be hotbeds for the successful technology pioneers of the future. SARTA lists a total of 49 technology companies in the City, strongly weighted towards Medical and Agriculture & Food Production, as shown in **Table 9**. The type of space demanded by technology companies will vary depending on the industry supported. A standard Internet-based company may require as little as 100 to 300 square feet, though other industries will require significantly more employees and specialized equipment.

High-growth companies, otherwise known as "gazelles," have been shown to provide major contributions to employment growth and are the focus of many business retention and expansion efforts. Gazelles are defined for the purpose of this report as private establishments with more than 20 percent employment growth over a period of 5 years, in this case from 2007 to 2012. Gazelles also must meet a minimum threshold of $500,000 in their latest year of business.

Examples of Davis Tech Companies

- Novozymes
- Marrone Bio Innovations
- Blue Oak Energy
- Gold Standard Diagnostics
- Arcadia Biosciences
- Expression Systems

Davis was home to 51 gazelles in 2012, as shown in **Table 10**, most of which were standalone firms (77 percent) with fewer than 50 employees (86 percent). There were multiple high-growth firms in industries such as Engineering and Scientific R&D. These firms and industries will demand more space if they continue their pace of rapid growth.

[15] According to the United States Patent and Trademark Office (USPTO), utility patents represent about 90 percent of patents issued in the past several years. These patents, often referred to as "patents for invention," are issued for the invention of a new and useful process, machine, manufacture, or composition of matter, or a new and useful improvement thereof.

Table 8
Patents by Technology Class in Davis Region 2000-2013 (Sacramento MSA and Vallejo MSA)

Technology Class	Patents Issued 2000-2013 #	%
Total	**7,117**	**100.0%**
Memory (Electrical Computers and Digital Processing Systems)	340	4.8%
Chemistry: Molecular Biology and Microbiology	327	4.6%
Support (Electrical Computers and Digital Processing Systems)	281	3.9%
Multiplex Communications	277	3.9%
Input/Output (Electrical Computers and Digital Data Processing Systems)	258	3.6%
Multicellular Living Organisms and Unmodified Parts Thereof and Related Processes	229	3.2%
Multicomputer Data Transferring (Electrical Computers and Digital Processing Systems)	220	3.1%
Error Detection/Correction and Fault Detection/Recovery	204	2.9%
Electricity: Electrical Systems and Devices	198	2.8%
Static Information Storage and Retrieval	196	2.8%
Computer Graphics Processing and Selective Visual Display Systems	186	2.6%
Drug, Bio-Affecting and Body Treating Compositions (includes Class 514)	175	2.5%
Surgery (includes Class 600)	125	1.8%
Pulse or Digital Communications	121	1.7%
Communications: Electrical	95	1.3%
Telecommunications	94	1.3%
DP: Database and File Management or Data Structures (Data Processing)	84	1.2%
Miscellaneous Active Electrical Nonlinear Devices, Circuits, and Systems	79	1.1%
DP: Measuring, Calibrating, or Testing (Data Processing)	76	1.1%
Semiconductor Device Manufacturing: Process	69	1.0%

patent_tech

Source: U.S. Patent and Trademark Office; EPS.

Table 9
Davis Tech Companies

Industry Group	Tech Companies	
	Total	Share
Total	**49**	**100.0%**
Med Tech	17	34.7%
Ag Tech	13	26.5%
Clean Tech	9	18.4%
Software/Apps	6	12.2%
Ag/Food Tech	1	2.0%
Components/Materials	1	2.0%
Machinery & Equipment	1	2.0%
Robotics	1	2.0%

tech

Source: 2014 SARTA; EPS.

Table 10
Characteristics of High Growth Establishments in Davis, 2012

Characteristics of High Growth Establishments [1]	Establishments	Share of Total
Total High Growth Establishments	**51**	**100.0%**
Employment Size		
Small (less than 50 employees)	44	86.3%
Medium (50-199 employees)	6	11.8%
Large (200-plus employees)	1	2.0%
Establishment Category		
Headquarters	1	2.0%
Branch	11	21.6%
Standalone	39	76.5%
Company Type		
Tech	8	15.7%
Other	43	84.3%

gazelle

Source: National Establishment Time-Series (NETS) Database, Walls & Associates, 2012; EPS.

[1] High growth companies, often referred to as gazelles, are here defined as private establishments with over 20 percent employment growth from 2007 to 2012. Gazelles must also meet a minimum threshold of $500,000 in sales in the latest year.

Innovation at UC Davis

UC Davis has long been one of the largest driving forces in the region's innovation economy and has been taking steps recently to further its leadership role in this regard. This section examines the university's research strengths, entrepreneurial programs, and start-up activity to illuminate opportunities that UC Davis can generate for local Innovation Centers.

Chancellor Katehi's Vision 2020 Initiative calls for a mix of university incentives, funding mechanisms, and training programs to encourage innovative collaborations, self-sustaining initiatives, next-generation technologies, and entrepreneurial activity. The early results of this initiative are discussed later in this section.

In the Next Economy planning efforts, UC Davis has been designated the coordinating champion for the region's objective to bolster university technology transfer and commercialization. These are the strategies outlined to achieve this objective:

1. Embed regional research, university technology transfer, and entrepreneurship programs in the region.
2. Identify regional industry needs and align university research capacity for new discoveries or adapting emerging technologies.
3. Develop strong relationships between regional research universities and small business, financing, and incubator and accelerator programs and services on a regionwide basis.
4. Encourage linkages between researchers making discoveries and entrepreneurs and companies able to commercialize and deploy.
5. Explore opportunities for developing university-industry research centers around regional research strengths and core business clusters.

The innovation economy stands to benefit greatly if UC Davis truly embraces this role as coordinating champion of tech transfer, given the plethora of research strengths the university can help commercialize.

Research Strengths

UC Davis brings in more than $700 million in research grants annually, more than UC Berkeley, MIT, or Harvard. It is a leading academic partner for innovative research in agriculture, biotechnology, clean energy, medicine, information technology, and engineering.

UC Davis research programs routinely are ranked among the highest in the nation, including these areas of specialty:[16]

- Agriculture and forestry—#1 in the world for teaching and research
- Food science and nutrition—#1 in faculty papers
- Ecology and the environment—#1 in faculty papers

[16] UC Davis Web site, QS World University Rankings.

- Entomology—#1 in faculty papers
- Plant and animal sciences—#1 in faculty papers
- Among the nation's best hospitals in 10 adult medical specialties
- Veterinary medicine—#1 school

Table 11 provides an expanded list of research specialties and centers.

Tech Transfer and Entrepreneurial Support

Technology transfer in UC Davis has garnered increased attention from the leadership of Chancellor Katehi, who was trained as an electrical engineer and circuit designer and holds 19 patents herself. The Chancellor created a blue ribbon committee to evaluate tech transfer in UC Davis and has helped grow the Office of Research. The university now operates several programs benefitting entrepreneurs:[17]

- **Venture Catalyst** is a series of programs facilitating tech transfer and assisting UC Davis start-ups, partly modeled on QB3's "startup in a box" program.

- **Science Translation and Innovative Research (STAIR)** provides proof-of-concept grants of $25,000 to $50,000 for faculty to show their ideas are commercially feasible.

- **Smart Toolkit of Accelerated Research Translation (START)** provides a series of tools to entrepreneurs, including deferment of patent expenses, company incorporation and legal support, connection to business and technology mentors, grant writing workshops, and access to contract service providers.

- **The Child Family Institute for Innovation and Entrepreneurship (CFI)**, established in 2011 and housed under the Graduate School of Management, helps entrepreneurially minded faculty, staff, and students determine if they have viable business ideas, using the expert resources of VCs, lawyers, and other professionals. CFI also hosts Big Bang, a business plan competition, as well as an Entrepreneurship Academy series, held three times a year, for 40 to 50 participants. Each academy series has a different focus, like biomedical innovation or cleantech. The Academy has enrolled more than 1,000 participants, who have gone on to start more than 50 companies.

- **The Engineering Translational Technology Center (ETTC)**, housed in the School of Engineering, is the one incubator hosted on campus. It assists university professors who want to commercialize their ideas by providing incubator space, business coaching, and help in obtaining seed financing. It has spun off two companies so far: headphone maker Dysonics and network management provider Ennetix.

[17] A resource not listed is Davis Roots, a nonprofit business accelerator. While not technically a university facility, it was founded by CFI's director and commonly assists the same start-ups at different points of their life cycle with the goal of retaining them in Davis.

Table 11
UC Davis Research Specialties and Centers

Engineering	Agricultural and Environmental Sciences	Medicine and Veterinary Medicine	Interdisciplinary Centers
Biological and Agricultural Engineering	Food security	Cancer Biology	Cancer Center
Biomedical Engineering	Clean energy, air and water	Vascular Biology	Center for Mind and Brain
Chemical Engineering	Agricultural sustainability	Genetic Diseases and Functional Genomics	Genome Center
Materials Science	Food systems	Health Services	Center for Neuroscience
Civil and Environmental Engineering	Climate change	Infectious Diseases	M.I.N.D. Institute
Computer Science	Biodiversity	Neuroscience	Center for Comparative Medicine
Electrical and Computer Engineering	Disease prevention	Nutrition	Center for Tissue Regeneration and Repair
Mechanical and Aerospace Engineering		Telemedicine	Institute for Transportation Studies
		Vision Science	California Lighting Technology Center
		Biodefense	Energy Efficiency Center
		Equine Health	Energy Institute
		Wildlife Health	World Food Center
		Companion Animal Health	Seed Central
		Aquatic Health	Institute of Food and Agricultural Research
		Children's Health	

research_dept

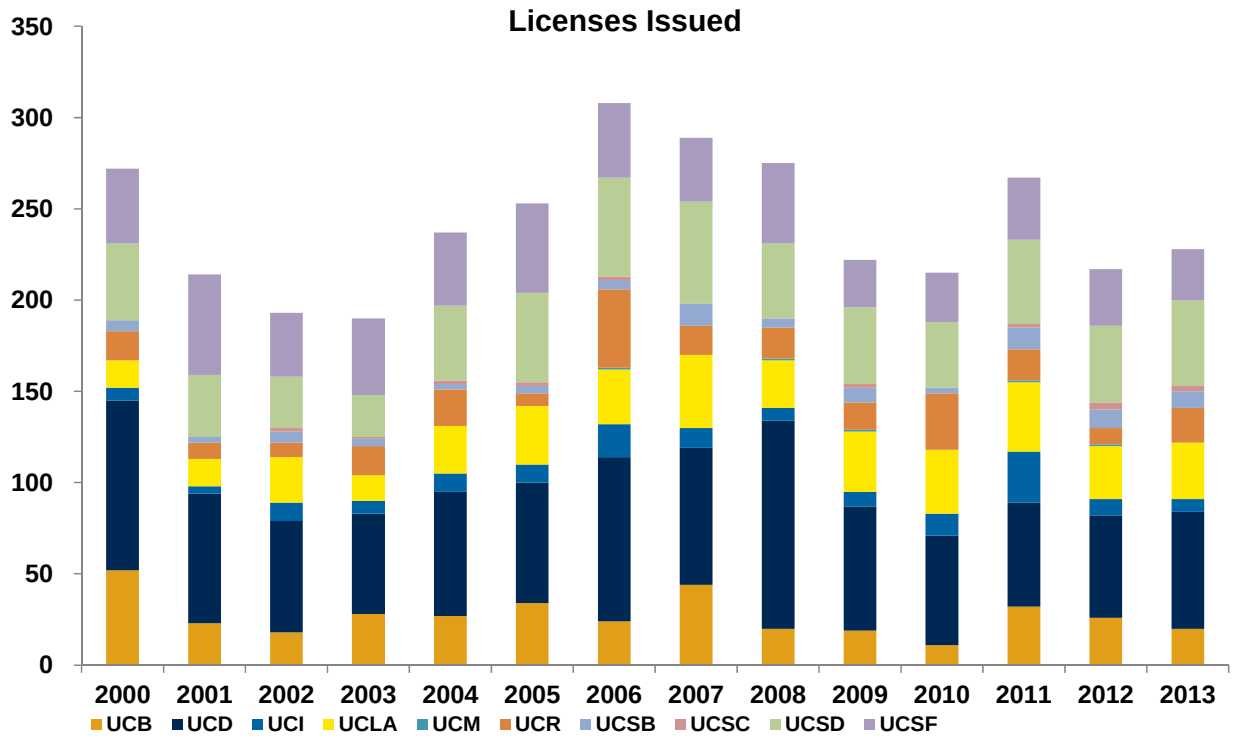
Source: UC Davis; EPS.

- **Sustainable AgTech Innovation Center (SATIC)** supports the commercialization of clean ag technologies by identifying and accelerating new ventures that promote sustainability in the agricultural field, supported by the UC Davis Center for Entrepreneurship and SARTA.
- **Translating Engineering Advances to Medicine (TEAM).** Design, Prototyping, and Fabrication Facilities were created under the Biomedical Engineering Department to speed up the adoption and commercialization of freshly developed technologies through design aid and inexpensive rapid prototyping techniques. The Design and Prototyping Space features many of the industry's most advanced technologies in the fields of 3D printing, 3D scanning, printed circuit board manufacturing, laser machining, and software. The TEAM Metalworking Fabrication Shop features an advanced CNC mill, lathe, and other basic metalworking equipment. The TEAM Molecular Prototyping and BioInnovation Lab is a multi-use wet laboratory equipped to facilitate projects in molecular engineering.
- **The UC Davis-HM.CLAUSE Innovation Center**, managed by Venture Catalyst, provides UC Davis start-ups with shared access to 3,100 square feet of office and lab space for biochemistry, molecular biology, and chemistry, as well as 1,800 square feet of greenhouse facilities.
- **The Distributed Research, Incubation, and Venture Engine (DRIVE)** is a project overseen by Dushyant Pathak, Associate Vice Chancellor for Technology Management and Corporate Relations. It aims to take the ETTC concept and apply it campuswide across all academic departments. DRIVE will provide UC Davis start-ups access to affordable, mixed office/lab business incubation spaces in Davis and Sacramento, as well as funnel start-ups to resources provided by other incubators.
- **The Office of Corporate Relations** helps companies engage with campus research activity.
- **Seed Central** is a joint initiative of UC Davis's Seed Biotechnology Center and SeedQuest that hosts networking and educational meetings for the seed industry. According to HM Clause, Seed Central is helping to attract new firms to the area.
- **The World Food Center**, just recently announced, will create a large campus to tackle the agricultural, technological, and political aspects of feeding the world's growing population. The Center will house the Innovation Institute for Food and Health, which will help create start-ups and research.

Licensing Activity

The volume of licensing activity can be used to evaluate the effectiveness of tech transfer at UC Davis. **Figure 1** shows licenses issued across the UC system from 2000 to 2013, demonstrating that UC Davis has issued more licenses (utility and plant) than any other UC in every year,

Figure 1
UC and UC Davis Licenses Issued, 2000–2013



Source: University of California Office of the President, Technology Transfer Annual Reports; EPS.

despite being only the third largest campus in terms of student enrollment.[19] UC Davis accounted for 30 percent of all UC licenses in that time, including an amazing 80 percent of all plant licenses, a result of the university's strength in Agriculture & Food Production.

Despite issuing the largest share of UC licenses, UC Davis' income from royalties and fees is relatively small at under $10 million annually from 2000 to 2013, as shown in **Figure 2**. UC San Francisco, by contrast, averaged more than $50 million in the same time frame. While licensing income generated by UC Davis may not be as high as the top earners in the UC system, the steady volume of new licenses issued, especially for plants, shows that a lot of forward-thinking work consistently takes place in agricultural research, and people will continue to need space in which to perform this work.

UC Davis Start-ups

The City's mix of technology companies closely reflects the composition of UC Davis start-ups, as shown in **Figure 3**. Biotechnology & Medical companies lead the way, though UC Davis start-ups are weighted more towards Information Technology and less towards Agriculture & Food Science than the rest of Davis's tech companies. In terms of real estate demand, start-ups use very limited space. In addition, they are very cost sensitive, which will price them out of newer commercial space; they need additional support services; and many of them do not survive after a few years. For these reasons, start-ups are not a primary target for the Innovation Centers.

UC Davis supports a low level of start-up activity relative to its size in the UC system, as shown in **Figure 4**. Only 8 percent of the UC start-ups formed from 2009 to 2013 originated at UC Davis. It is important to note that this data only includes businesses that have a formal UC Davis relationship and does not account for other businesses that were independently formed by UC Davis affiliates.

Common Attributes of Potential Cluster and Company Type Opportunities:

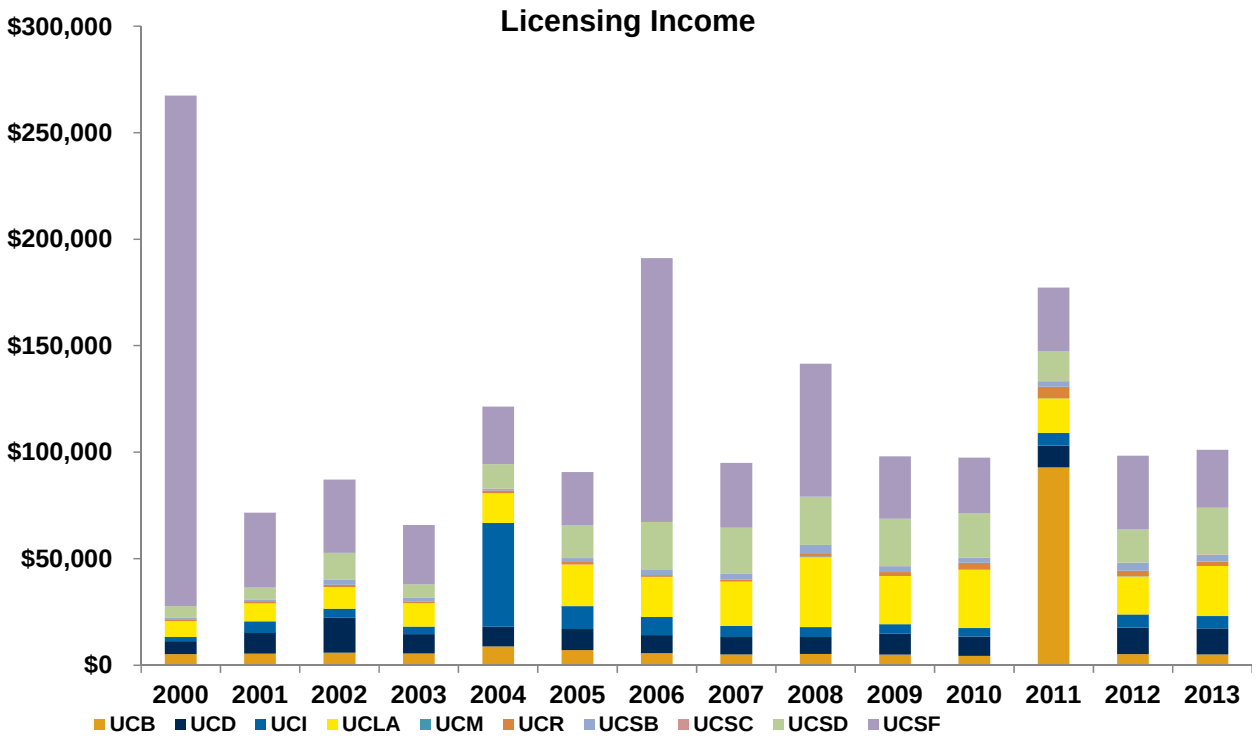
- Regional economic development focus (e.g., Next Economy and MSF)
- Innovation and investment activity (e.g., patents and venture capital)
- UC Davis research strength (e.g., academic and research units)
- Prominent company presence
- Flex and industrial space demand

Selection of Clusters/Company Types

Significant overlap exists between the innovative growth areas in UC Davis and the larger region, which is understandable, given the role that UC Davis plays in shaping the regional innovation economy. While UC Davis has certain strengths relative to the larger region and vice versa, the areas of overlap indicate the clusters and related types of industries and companies that are potential candidates for space in the

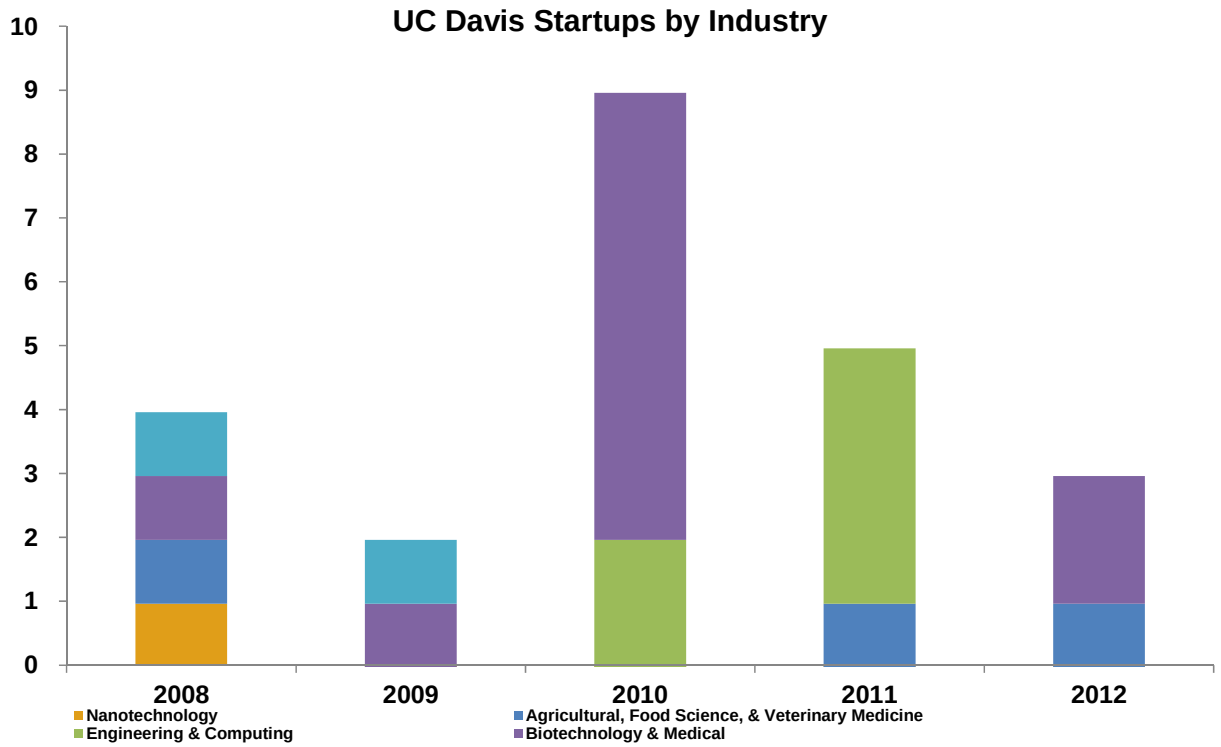
[19] General Campus and Health Sciences FTE Student Enrollment, 2011-2012, taken from 2013-2014 UC Budget.

Figure 2
UC and UC Davis Licensing Income, 2000–2013



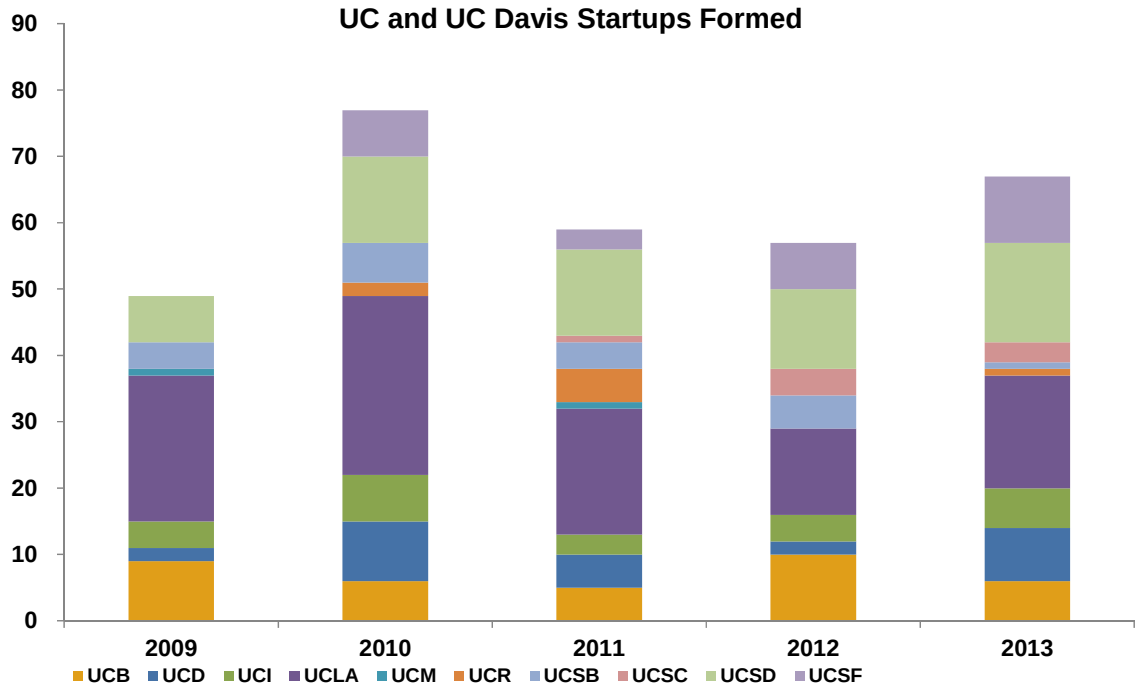
Source: University of California Office of the President, Technology Transfer Annual Reports; EPS.

Figure 3
UC Davis Startup Companies by Industry



Source: Source: UC Davis Office of Research Annual Report, 2011-2012.

Figure 4
UC and UC Davis Startups Formed, 2008–2012



Source: University of California Office of the President, Technology Transfer Annual Reports; EPS.

proposed Innovation Centers. These are the clusters that not only have gained traction in the regional economy, but also receive support from the university through strong research programs that bring industry activity forward, as well as resources to commercialize that research. Several prominent companies representing most of these clusters already have a presence in Davis.

A subset of five clusters that are targets for regional investment in the Next Economy and MSF economic development initiatives exemplify the overlap of innovative growth areas. All display a set of common attributes and represent a mix of manufacturing elements and supporting activities. In addition, two of these clusters were identified in the BAE report as possible areas of emphasis for the Innovation Centers. These are the five clusters:

- Clean Energy Technology
- Agriculture & Food Production
- Life Sciences & Health Services
- Information & Communications Technology
- Advanced Manufacturing & Materials

The Next Economy initiative also emphasized that a set of knowledge-intensive technical services cut across all identified clusters and represent another area of focus for regional economic development. Growth across these types of services is necessary to enhance performance in each of the clusters. Companies providing these types of services in and across the five clusters also represent strong candidates for space in the Innovation Centers, particularly in the following areas (many of which were highlighted in the Business Park Land Strategy):

- Scientific R&D Services
- Management, Scientific, and Technical Consulting Services
- Architectural, Engineering, and Related Services
- Specialized Design Services

It is important to note that the clusters and related knowledge-intensive services represent opportunities for the entire region. Each local area presents different conditions that can support a specific subset of the numerous types of economic activities included as part of the clusters. Evidence from existing development in Davis and the characteristics of the local workforce signal the general types of activities in the clusters that might display a stronger fit for the community and the Innovation Center space.

The local labor force is highly concentrated (more than two times the statewide average) in three occupational categories, including Computer, Engineering, & Science; Educational, Legal, Community Service, Arts, & Media; and Healthcare Practitioners & Technical Support. Local labor force concentration in nearly every other occupational category is well below the statewide average, including Production, Transportation, & Material Moving, which is important for manufacturing-based activities. This demonstrates that the labor force strengths align most closely with the knowledge-intensive services, as well as the administrative functions and design and prototyping components of the clusters.

Possible Concentration of Economic Activities:

- Knowledge-Intensive Services
- Administrative Functions
- Design and Prototyping
- Technical-Based Manufacturing

Establishment-based data for the 2nd Street and Interland URP areas in Davis reveal that about one-third of the nonretail or local service employment falls in the Professional, Scientific, & Technical Services industry. This provides further evidence that the knowledge-intensive services could represent a notable share of the opportunities for the Innovation Centers. Another one-third of the nonretail or local service employment in the 2nd Street and Interland URP areas is captured in the Manufacturing industry. These types of activities could be supported by the Innovation Centers with a continued draw from the regional production labor force and an orientation toward more technical-based manufacturing that is reinforced by the local labor force strengths.

Clean Energy Technology Cluster

Characteristics
• Description—producing goods and providing services related to clean or renewable energy, energy efficiency, clean transportation, and green building • Predominant Core Regional Activities—clean energy and clean transportation • Prominent Local Companies—Blue Oak Energy, Octus Energy, Marrone Bio Innovations
Research & Innovation Activity
• Academic Research Strengths—clean energy and engineering • Venture Capital—$100 million in Davis in past 11 years, representing all regional activity • Local Tech Companies—9 on SARTA list and 1 gazelle
Support Ecosystem
• Regional Programs—SARTA CleanStart and Green Capital Alliance • Key University Programs—Institute for Transportation Studies, California Lighting Technology Center, Energy Efficiency Center, Energy Institute, Plug-in Hybrid/Electric Vehicle Research Center
Real Estate Demand
• General Categories—utility-scale land, heavy and light industrial, and flex • Specialized Space—clean room space and demonstration or prototype testing facilities
Other Indicators
• Utility renewable energy portfolio standards

Agriculture & Food Production Cluster

Characteristics
• Description—growing crops, raising animals, food processing, and related manufacturing, wholesaling, and retailing • Predominant Core Regional Activities—agriculture and food and beverage manufacturing • Prominent Local Companies—Marrone Bio Innovations, HM Clause, Arcadia Biosciences, Novozymes, Agrinos
Research & Innovation Activity
• Academic Research Strengths—agriculture and biotechnology • Venture Capital—$15 million in Davis in past 11 years, representing all regional activity • Local Tech Companies—14 on SARTA list, 3 UC Davis startups, and 3 gazelles, including 2 with IPOs
Support Ecosystem
• Regional Programs—"America's Farm-to-Fork Capital" campaign, Rural-Urban Connections Strategy (RUCS), and SARTA AgStart • Key University Programs—Seed Central, World Food Center, Institute of Food & Agricultural Research
Real Estate Demand
• General Categories—agricultural land, heavy and light industrial, and flex • Specialized Space—wet lab space and greenhouses
Other Indicators
• Recent land acquisitions from Marrone Bio Innovations and Monsanto • Stated desire of Bayer Cropscience to stay in Davis that was unfulfilled because of lack of appropriate space

Life Science & Health Services Cluster

Characteristics
• Description—production and research activities related to pharmaceuticals and medical devices, as well as the provision of healthcare and all its related services • Predominant Core Regional Activities—health care and medical equipment and devices • Prominent Local Companies—Novozymes, Gold Standard Diagnostics, Expression Systems, Antibodies Inc., D3g Inc., Davis Sequencing, Inc., Stratovan, Cedaron
Research & Innovation Activity
• Academic Research Strengths—medicine and biotechnology • Venture Capital—$130 million for Biotechnology in Davis in past 11 years, representing 82 percent of regional activity • Regional Patents—More than 850 patents in past 13 years • Local Tech Companies—17 on SARTA list, 11 UC Davis startups, and 12 gazelles, representing greatest share of activity
Support Ecosystem
• Regional Programs—SARTA MedStart • Key University Programs—Cancer Center, Center for Mind and Brain, Center for Neuroscience, Genome Center, M.I.N.D. Institute
Real Estate Demand
• General Categories—light industrial, flex, and medical office • Specialized Space—wet lab space and clean room space
Other Indicators
• Connection to UC Davis Health System

Information & Communications Technology Cluster

Characteristics
• Description—production of electronic products, computers, software, and telecommunications equipment, as well as the provision of communications, data processing and hosting, and system design services • Predominant Core Regional Activities—system design and computer, electrical, and electronic component manufacturing • Prominent Local Companies—Maintenance Connection
Research & Innovation Activity
• Academic Research Strengths—information technology and engineering • Venture Capital—More than $800 million in region in past 11 years • Regional Patents—More than 2,500 patents in past 13 years • Local Tech Companies—6 on SARTA list, 7 UC Davis startups, and 3 gazelles
Support Ecosystem
• Key University Programs—Engineering Translational Technology Center
Real Estate Demand
• General Categories—heavy and light industrial, flex, and office • Specialized Space—clean room space
Other Indicators
• Application across Clean Energy Technology, Agriculture & Food, and Life Sciences & Health Services clusters

Advanced Manufacturing & Materials Cluster

Characteristics
• Description—production of new and existing products using advanced technologies plus high-tech engineered materials, components, and systems, as well as the commodities, products, processes, and instruments used to make and monitor the materials • Predominant Core Regional Activities—aerospace products and structural metal manufacturing • Prominent Local Companies—DMG Mori and FMC Schilling Robotics
Research & Innovation Activity
• Academic Research Strengths—engineering • Local Tech Companies—3 on SARTA list
Support Ecosystem
• Key University Programs—Engineering Translational Technology Center, Translating Engineering Advances to Medicine Facilities, UC Davis Center for Integrated Computing and STEM Education (C-STEM)
Real Estate Demand
• General Categories—heavy and light industrial and flex • Specialized Space—controlled environments and clean room space
Other Indicators
• FMC Schilling Robotics stated need for expansion space • Application across a wide range of production activities and new products

5. REGIONAL MARKET INDICATORS AND TRENDS

Domestic macroeconomic indicators are very strong, with the U.S. emerging as the most stable growing economy in the world. While national average commercial construction somewhat is below prerecession levels, activity levels in key markets, such as San Francisco, are well above historic peaks. This growth largely is being driven by technology users. Along with the energy sector, tech growth is contributing to more than half of the 60 million square feet of space precommitted for occupancy through 2017 in new office developments in the United States. The dominance of tech-driven office demand is expected to continue.[20]

In the regional context, Davis finds itself in the midst of several dynamic regional confluences. To the west, the Bay Area represents one of the most vital innovation ecosystems in existence. The dual effect of UC Berkeley and Stanford, accompanied by several additional universities, has emerged as the center of tech innovation across a myriad of industries, anchored by information technology and life sciences industries. According to the DTZ Bay Area Investment Snapshot (Q1 2015) the Bay Area economy entered 2015 with arguably the strongest economy in the nation, adding more than 580,000 jobs since 2010. Capital flows are very strong, with venture capital (VC) trending near "dotcom" levels, receiving 50 percent of all venture capital activity.

In the Bay Area Region, the East Bay, which has been the source of some relocation activity to Solano County and the Sacramento Region, represents the second largest submarket in terms of total market size but is by far the lowest (relative to the North Bay, San Francisco, the Peninsula, and Silicon Valley) in terms of sales volume (DTZ). In the East Bay, the strongest tech submarket has been Emeryville, which experienced just more than 150,000 square feet of positive net absorption. Emeryville has emerged over the past 2 decades as a de-facto UC Berkeley-related Innovation Center, as investment until recently has skipped over West Berkeley because of prohibitive zoning constraints. Overall, the Interstate 880/I-80 corridors are receiving interest from firms seeking lease rate relief not needing locations in more expensive submarkets such as San Francisco. These firms often still have access to the desirable attributes in the Bay Area such as labor force, high quality-of-life communities, agglomeration of firms in clusters, and an established innovation ecosystem. However, the chain reaction can continue with some East Bay firms looking further east for economic relief as the market catches up with the balance of the Bay Area.

However, in Solano County on the I-80 corridor, growth has been slow to catch on. The 2014 MSF economic diversification strategy targeted the need to retrofit Solano County's myriad business parks to create an enhanced sense of place overall and more dynamic environments. This recommendation is consistent with the successful efforts in various parts of the East Bay to retrofit and improve the performance of single-use business parks such as Hacienda in Pleasanton. Bishop Ranch in San Ramon is taking plans forward to add a commercial/mixed-

[20] CBRE, "Why New Office Construction in the U.S. is not "Low," Volume 16, Number 16, April 23, 2015.

use component to improve its regional competitive position. Davis, with its heralded quality of life and university presence, has emerged as a very competitive market to receive this growth potential, should the land supply be made available.

To the east, the Sacramento office marketplace consists of roughly 87 million square feet in approximately 1,866 properties. Davis as a subset of the Sacramento marketplace office and flex/R&D market consists of approximately 1.75 million square feet. When one considers the data for buildings 10,000 square feet and larger, Davis has 48 buildings and fewer than 1.24 million square feet of total inventory, or less than 1.5 percent of the regional total, while there is an immense supply of planned development exceeding 65 million square feet throughout the region. Further, oversupply (combined with lack of demand) for suburban office product has resulted in sales of premium LEED-certified buildings in submarkets such as Natomas for well under $100 per square foot.[21] This is less than half of what a viable new office building would cost to construct in Davis.

Despite what appears to be a regional oversupply of land and general office space, general expectations are that Davis has an opportunity to enhance its market share because of the desire of many companies to be located near the university in a vital and safe community with high-quality schools. Improving regional dynamics may help reduce the price differences between Davis and its nearby competitors and improve Davis' capture of sought-after tenants. It is important to note that some types of businesses are highly cost sensitive, while others are able to more equally weigh the value of proximity to the university and the quality of place in their site location criteria.

Davis Commercial Trends

Overview

Commercial market analysis for the Innovation Centers Study Area (Study Area) focuses on three primary employment land uses—office, flex,[22] and industrial[23]—serving a variety of users seeking both ownership and leasing opportunities. This section presents data and findings regarding each land uses' competitive position in the City and the County and how these employment sectors compare to the Greater Sacramento Region[24] and the San Francisco Bay Area[25] markets.

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[21] Personal communication with Jim Gray, DTZ, April 30, 2015.

[22] Includes the following CoStar industry subcategories: Flex telecom & data hosting, industrial telecom & data hosting, light distribution, light manufacturing, and R&D.

[23] Includes the following CoStar industry subcategories: Airplane hangar, airport, auto salvage facility, cement/gravel plant, chemical/oil refinery, contractor storage yard, distribution, flex showroom, food processing, industrial showroom, landfill, lumberyard, manufacturing railroad yard, refrigeration/cold storage, self-storage, shipyard, truck terminal, utility substation, warehouses, and water treatment facility.

[24] Includes the Counties of El Dorado, Placer, Sacramento, Solano, Sutter, Yolo, and Yuba.

[25] Includes the Counties of Alameda, Contra Costa, San Francisco, San Mateo, and Santa Clara.

Overall, according to DTZ, Davis is on the cusp of substantial fundamental market improvements. For example, rents are expected to increase between 3 and 4 percent in the coming year for commercial space in Davis. Openings caused by relocations have been backfilled quickly in the life sciences and ag biotech sectors. Indicators point to possible speculative development in the future, beyond that planned to come on-line at the Cannery.

UC Davis is on a growth trajectory with the planned addition of 5,000 undergraduates and related staff/faculty, as well as the planned World Food Center. UC Davis historically has used off-site lands as part of its facilities-development approach, with facility capital funding potentially oriented to $1.3 billion worth of on-campus deferred maintenance needs. However, this trend cannot be assured in the future because there is a very real possibility UC Davis may elect to refocus future expansion activities on its own land. If there is a strong policy established in this regard, it does not necessarily imply that UC Davis will not be a part of the future use mix among the proposed Innovation Centers, but its presence could be less than current trends would otherwise indicate, and the practical result could be slower overall absorption.

As discussed in the following section, Davis has struggled to demonstrate consistent demand. According to local commercial brokers, this is a direct result of a lack of available product, especially among larger floor plate properties. The most limiting factor has been an absence of larger floor plate space available to users.

Nationally, there are a small number of major corporate relocations or expansions that occur annually with a large number of communities competing for the opportunities. Recent research from Area Development indicates there is a downward pattern in the number of planned expansions or new facilities as companies are integrating efficiencies in existing facilities rather than realizing the large capital outlay required for a relocation project.[26] Groups like the California Manufacturers and Technology Association suggest that California receives less than its fair share of these decreasing expansions and new facilities.[27] Nevertheless, the Greater Sacramento Area Economic Council (formerly the Sacramento Area Commerce & Trade Organization) maintains an active prospect roster of hundreds of companies exploring the Sacramento Region for new or expanded sites.

Data indicate that over the past decade, on average, there has been one deal per year that directly expressed interest in a Davis location, but in most cases was not able to find suitable available space. Each of these deals required between 100,000 and 150,000 square feet of space.[28] In many instances, these deals had some unique tie to UC Davis either through research or alumni relationships. While this prospective activity demonstrates steady interest in Davis, the history of large completed projects in the community and general corporate site location trends suggest that additional economic development attention on established small and medium enterprises will be necessary to generate a notable uptick in the demand for space.

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[26] Area Development, *Annual Consultant Survey* and *Annual Survey of Corporate Executives*.

[27] California Manufacturers and Technology Association, *California Manufacturing Economy Watch*.

[28] Interview with Bob Burris from the Greater Sacramento Area Economic Council, March 27, 2015.

In addition to the initial location—which could range from 10,000 to 40,000 square feet—the growth trajectory of many successful small and medium enterprises could lead to consistent incremental demand for space as they expand.[29]

Performance by Product Type

Table 12 shows a regional summary of the performance by product type, with more detail on each product type available in **Appendix B**.

Office

The office sector in the City has and continues to be a strong employment sector. Over the past 15 years, the office market has grown from 1.2 million square feet to nearly 1.8 million square feet, adding more than 538,000 square feet over the period at an average annual growth rate of 2.6 percent. During that same time period, the vacancy rate has averaged just 8.2 percent, the lowest of the three employment sectors analyzed. While vacancy rates have been low, average annual office lease rates from 2000 to 2014 in the City have been approximately $0.20 higher than the Greater Sacramento Region, yet $0.45 lower than the Bay Area. Thus, the office market should be attractive for prospective clients who seek a competitive market, yet with significantly lower lease rates compared to the Bay Area.

At this time, lease rates are approaching levels that could justify new construction, though some appreciation may be necessary. One challenge pertains to accommodating start-ups, which often have difficulty paying market rents in Davis. While there is no question that Davis has many attractive factors, such as university proximity, quality of life, and regional connections to Bay Area and Sacramento assets, certain cost-sensitive users will be forced to consider other options in Sacramento and Solano Counties to the extent that affordable start-up space is limited in Davis.

Table B-1 shows the leasable office space inventory in the City. As shown, the City's 1.8 million square feet of office space comprises about 35 percent of all leasable office space in the County. Its 500,000+ square feet of leasable office space growth since 2000 translates to an average annual increase of 2.6 percent—a relatively strong growth rate given the Great Recession and limited local land available for development. In comparison, the balance of the County added approximately 1.3 million square feet of office space in the same timeframe.

As of the fourth quarter 2014, the vacancy rate of office space in the City is 9.2 percent. As shown in **Table B-2**, the office vacancy rate in the City reached its lowest in 2006, 1 year before the Great Recession[30] and peaked in 2009 at the end of the Great Recession. Since, office

[29] Interviews with Bob Burris from the Greater Sacramento Area Economic Council, March 27, 2015, Scott Ragsdale from Davis Roots, April 28, 2015, and Kirk Uhler from the Sacramento Regional Area Technology Alliance, April 8, 2015.

[30] According to the National Bureau of Economic Research, the Great Recession officially began in December 2007 and ended in June 2009.

Table 12
Regional Commercial Market Analysis
Summary Table

Item	City of Davis	Yolo County	Greater Sacramento Region [1]	Bay Area [2]
Office [3]				
2014 Q4 Leasable Sq. Ft.	1,768,684	5,093,950	110,890,440	380,481,032
Annual Avg. Change in Sq. Ft.	35,900	89,904	2,014,362	2,932,446
Annual Avg. Vacancy	8.2%	11.1%	12.9%	10.8%
Annual Avg. Absorption	34,382	87,523	1,124,964	2,072,610
2014 Q4 Lease Rate	$1.87	$1.61	$1.64	$2.83
Annual Avg. Change in Lease Rt.	0.95%	0.75%	0.24%	(2.53%)
Annual Avg. Sq. Ft. Constructed	43,076	98,361	1,782,183	4,562,441
Retail [4]				
2014 Q4 Leasable Sq. Ft.	2,185,004	8,358,312	130,265,476	281,415,520
Annual Avg. Change in Sq. Ft.	28,316	119,080	833,446	546,863
Annual Avg. Vacancy	4.9%	6.6%	8.8%	4.3%
Annual Avg. Absorption	22,596	103,917	764,689	1,175,551
2014 Q4 Lease Rate	$1.69	$1.29	$1.34	$2.16
Annual Avg. Change in Lease Rt.	4.31%	(0.93%)	(3.95%)	(1.56%)
Annual Avg. Sq. Ft. Constructed	31,246	161,615	1,480,516	1,761,088
Flex [3] [5]				
2014 Q4 Leasable Sq. Ft.	358,757	943,430	7,595,457	153,639,896
Annual Avg. Change in Sq. Ft.	7,322	6,822	158,220	334,246
Annual Avg. Vacancy	17.3%	12.0%	20.5%	14.6%
Annual Avg. Absorption	2,960	(181)	17,156	166,164
2014 Q4 Lease Rate	$1.04	$0.89	$0.73	$1.38
Annual Avg. Change in Lease Rt.	0.78%	3.31%	0.88%	(2.36%)
Annual Avg. Sq. Ft. Constructed	7,322	7,322	87,391	1,320,417
Industrial [3] [6]				
2014 Q4 Leasable Sq. Ft.	457,628	30,775,466	178,504,224	337,949,388
Annual Avg. Change in Sq. Ft.	(24,954)	113,516	3,148,549	(1,054,179)
Annual Avg. Vacancy	9.1%	10.9%	11.3%	6.2%
Annual Avg. Absorption	(27,309)	166,628	911,447	(1,192,152)
2014 Q4 Lease Rate	$1.25	$0.35	$0.36	$0.67
Annual Avg. Change in Lease Rt.	N/A	1.08%	0.25%	(1.40%)
Annual Avg. Sq. Ft. Constructed	14,507	295,883	1,360,088	1,069,270

market sum

Source: CoStar; EPS.

[1] Includes counties of El Dorado, Placer, Sacramento, Solano, Sutter, Yolo, and Yuba.
[2] Includes counties of Alameda, Contra Costa, San Francisco, San Mateo, and Santa Clara.
[3] Annual average items analyzed from 2000-2014.
[4] Annual average items analyzed from 2006-2014.
[5] Includes the following CoStar industry sub-categories: Flex telecom & data hosting, industrial telecom & data hosting, light distribution, light manufacturing, R&D.
[6] Includes the following CoStar industry sub-categories: Airplane hangar, airport, auto salvage facility, cement/gravel plant, chemical/oil refinery, contractor storage yard, distribution, flex showroom, food processing, industrial showroom, landfill, lumberyard, manufacturing, railroad yard, refrigeration/cold storage, self-storage, shipyard, truck terminal, utility sub-station, warehouses, and water treatment facility.

vacancy rates have averaged between 9 and 10 percent, reaching a low of 7.1 percent in the fourth quarter 2013, similar to office performance elsewhere in the County and better than the Sacramento Region as a whole.

Table B-3 provides net absorption trends for the City and the County. As shown, the City incurred positive net absorption totaling approximately 516,000 square feet (an average of 34,000 square feet annually) since 2000. Office absorption generally remained positive through the Great Recession and generally has continued to be positive post-Great Recession.

Compared to the County and the Greater Sacramento Region and Solano County, the City's office average lease rates significantly are high, as shown in **Table B-4**. However, office lease rates in the Bay Area average approximately $1.00 per square foot per month higher than average lease rates in Davis, the County, and the Greater Sacramento Region.

Office average lease rates in the City have decreased since the Great Recession but are beginning to increase. The average office lease rate in the City peaked in 2008, the middle of the Great Recession, at $2.34 per square foot. During the recovery, lease rates dipped to $1.81 per square foot in 2012 and 2013, but have risen to $1.87 per square foot in fourth quarter 2014. Expectations are that office rents in Davis will increase by nearly 4 percent in the coming year.[31] It will be necessary to see continued growth in these rates to capitalize new construction.

Flex/R&D

Flex uses in the Study Area, the County, and the Greater Sacramento Region generally are less prevalent and have incurred modest growth relative to the Bay Area. **Table B-6** depicts a stark contrast in this regard, with the Bay Area possessing more than 23 times the amount of flex space than the Greater Sacramento Region. Considering the modest amount of flex space in the City and County, any loss of significant tenants in the flex market dramatically affects the sector vacancy rate. In addition, average annual lease rates for flex space are much more affordable in other areas of the Greater Sacramento Region, which may pose competing markets in the region to be more attractive to incubator users and small, cost-sensitive companies.

Table B-6 depicts the inventory of flex space in the City and the County. The County contains approximately 940,000 square feet, with the City containing about 38 percent of flex (approximately 360,000 square feet). The City has added approximately 110,000 square feet of flex use since 2000, dominating this type of development in the County.

The vacancy rates for flex in the City and the County are about 24 percent and 16 percent, respectively, as shown in **Table B-7**. Vacancy rates in the City constantly have fluctuated before, during, and after the Great Recession. Much of the vacant space reportedly is substandard construction quality or located in the second floors of structures. In the latter case, such spaces are less appealing to users because of increased cost and inconvenience, with such users often looking for ground floor options in the market. In contrast, flex vacancy rates in the County were relatively low (between 6 to 9 percent) from 2000 to 2004, showing user demand for space in communities surrounding Davis. Flex vacancy rates increased in 2005, hovered

[31] Davis Office and Commercial Real Estate Report, 2014 Year in Review, DTZ.

consistently between 12 to 15 percent from 2006 through 2012, and increased in 2013 and 2014.

Table B-8 illustrates historical net absorption trends in the City and the County for flex uses. As shown, the City incurred positive absorption of approximately 3,000 square feet per year since 2000, with a majority of this positive absorption occurring from 2004 to 2010. Absorption has been negative each year from 2011 to 2014. The County has seen negative absorption from 2000 to 2014.

Flex lease rates in the City and the County reflect the trends seen in the greater region. Lease rates generally increased from 2000 to mid-Great Recession, then sharply declined in the following couple of years. Lease rates post-Great Recession have increased and are nearing similar rates as just before the Great Recession, as shown in **Table B-9**.

Industrial

As used in this section, "Industrial" pertains to heavy manufacturing and other industrial activities not occurring in offices and R&D settings. The industrial sector in Davis is very different than the balance of the County, with DMG Mori's manufacturing building being a signature example, in contrast to other industrial operations throughout the County that tend to be more oriented to food processing, warehouse/distribution, assembly, and other such space-intensive and cost-sensitive activities. In Davis, the anticipation is that advanced manufacturing will be a key element of the innovation ecosystem, capitalizing on a growing critical mass of local tech operations and ties to UC Davis Engineering schools.

Table B-11 provides the amount of leasable square feet for each analyzed market. At approximately 460,000 square feet of space, the City only assumes about 1.5 percent of the industrial market in the County. Although the Davis industrial sector has reduced in size, it has realized gains in terms of tenant profiles and specialization in higher value innovation sectors over the past 15 years. In the case of the Innovation Centers, this likely is to take the form of build-to-suit operations, with new locations predicated on specific business factors rather than related to speculative commercial development. With these operations, real estate costs are but one of many critical factors influencing location, with factors such as large-scale parcels, labor force, proximity to buyers and suppliers, and other criteria being of equal or greater importance to land costs. Nevertheless, these operations are highly sought after and usually evaluate multiple sites and multiple regions and therefore can be sensitive to CFD special taxes and other policies that may increase operational costs. These opportunities tend to come to the region on a limited basis, but when they do arrive, there usually is a strong preference for large-scale and well-proportioned "shovel-ready" land with excellent infrastructure and a clean and expeditious entitlement process.

Real Estate Feasibility Outlook: Fostering an Innovation Ecosystem in Davis

One critical challenge in fostering "innovation ecosystems" is facilitating conditions that foster start-ups, growth, and move-up opportunities as firms move through key life cycle phases. In the initial stage of a firm's life cycle, extreme cost sensitivity is common as revenue essentially does not exist, with firms clamoring for angel or venture capital to get operations off the ground. In the life sciences and agricultural biotech industries, companies face long lead times related to

regulatory approvals before entering the second phase of growth, innovation, and revenue production, becoming truly viable candidates for leasing office, flex, and other space types.

As relating to start-up opportunities, this creates a dilemma in that minimum lease revenues are necessary to capitalize vertical construction; if lease rates are insufficient, firms are more likely to pursue existing space that can be purchased for less than replacement cost. Davis is lacking in such product, especially for medium floor plate users needing 10,000 to 20,000 square feet.[32] As the applicants of the proposed Innovation Centers must demonstrate a return on investment commensurate with market expectations and project risks, it is not reasonable to expect them to accept below-market leases from nascent start-ups looking for space in Davis. Therefore, it may be necessary to "intervene" in the marketplace to ensure that this critical source of future Innovation Center absorption is in place, allowing the Innovation Centers to support a wide range of innovative companies, from small start-ups to large established entities. This intervention may be done through a 501(c)(3) organization, possibly in affiliation with UC Davis or independently structured. Many traditional URPs are managed by nonprofits, including successful parks such as Madison URP and ISU RP.[33]

In addition to offsetting occupancy costs through direct intervention, it is helpful to encourage the development of multiple parks to foster competition. The development entity overseeing the MRIC in particular has a long legacy of metering out speculative space on the 2nd Street Corridor and is a likely candidate to move in front of the market. In this manner, the successful development of initial phases of the three proposed Innovation Centers in Davis can help creating an atmosphere of "competitive collaboration," whereby provision of three options for development facilitates lower lease rates and land values, supporting a broad cross section of firms at different levels of maturity, which are interwoven with other local firms, as well as UC Davis or other institutions.

However, the other two parks also hold promise in responding to early-stage demand. Research indicates that firms that are more mature are less dependent on immediate university proximity.[34] In keeping with this idea, nascent firms in need of incubation and acceleration may be more natural candidates for the Nishi site. Nishi will be an early bellwether for interest among industries seeking expanded access and affiliation with UC Davis researchers.

The Innovation Centers proposal heavily is predicated on up-front research carried out by the development team. Materials provided by the applicant indicate substantial due diligence in investigating departmental sources of future demand at UC Davis. For example, a technology incubator called the Engineering Translational Technology Center has been in discussions with the ownership group, as this center reportedly is looking for more space.

Thus, all three parks are doing their part to create the essential elements of an "Innovation Ecosystem" with potential synergies across the projects appealing to firms seeking ownership and leasing opportunities. The ability to use a flexible approach in selling land, constructing

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[32] Interview with Jim Gray and Nahz Anvary from DTZ, April 21, 2015.

[33] It is possible that City-owned land integrated with the MRIC may be appropriate for this purpose.

[34] "A Study of the Economic and Fiscal Impact of UCSF," EPS, 2010.

build-to-suit structures for end users, and making space available on a speculative basis would lead to accommodation of a wide range of users and will help to maximize annual absorption rates.

Davis Market Dynamics

The following key market dynamics, as provided to EPS by DTZ, illustrate key trends and dynamics from 2014 (unless otherwise specified), providing evidence of a robust and promising overall development outlook:

- Recently, in the fourth quarter 2014, two AgBio Tech companies, AgraQuest and Nunhems, became consolidated operating units of Bayer CropScience and relocated into ±160,000 square feet in West Sacramento. Bayer first did a Request for Qualifications (RFQ) and sought space in Davis, and when they were unable to find a timely, available, and affordable alternative, they acquired and rehabbed a property in the neighboring city of West Sacramento, spending more than $60 million in tenant improvements and equipment.

- Marrone Bio Innovations in the fourth quarter 2014 immediately backfilled and released ±55,000 square feet previously occupied by Bayer CropScience units. As Bayer continues their exodus, additional AgBio Science Companies are moving into the space, such as Agrinos.

- FMC Shilling Robotics, a robotic engineering and underwater oil services firm, announced they have outgrown their ±100,000 feet of space in Davis (50-percent leased and 50-percent owned). Schilling/FMC is reported to be planning on obtaining a ±40-acre parcel to build their own facility.

- In 2010, DMG Mori, a Japanese global manufacturing and engineering company, selects a site in Davis, acquires ±17 acres, and builds an initial ±240,000-square-foot building, which they own and from which they operate their manufacturing business. Additional land for expansion and future facilities already is owned. This large manufacturing facility follows DMG Mori earlier R&D facility in which Digital Technology Labs, a spin-off from the structural engineering department at UC Davis, with the financial backing of DMG Mori, negotiates a build-to-suit facility of ±71,173 square feet.

- In 2011, Expression Systems, a bio-tech company that cultivates and manufactures cell culture media, obtains approval to construct a 27,484-square-foot, 2-story building for laboratory, manufacturing, and office uses on a 1.24-acre vacant parcel located at the northwest corner of Second Street and Cantrill Drive. The approval enabled the company to relocate from Woodland, California, and achieve its goal to be closer to UC Davis.

- In 2012, Monsanto, one of the world's largest agricultural companies, builds a ±90,000-square-foot R&D lab in Woodland as an addition to their now ±200,000 square feet for their seed company, on a 112-acre farm they acquired as a part of acquiring the Seminis Seed Company and now are moving R&D, Field Trials, and Production to one site. UC Davis until recently was in escrow to acquire the former Monsanto/Calgene property in Davis for labs, but there were complications and costs that made that transaction terminate. There

likely is to be interest from other firms, though the building and its improvements are old and likely will require significant improvements and upgrades. The ability to expand and properly park at the subject property is problematic.

- UC Division of Agriculture and Natural Resource enters into a contract to convert a ±33,000-square-foot industrial/sports building, adds a ±9,600-square-foot second story, and acquires a ±42,600-square-foot office building for its 125-person operating unit. UC takes possession and closes escrow in the fourth quarter 2013.

- In 2012, UC Davis makes the decision to create a Shared Services space at 260 Cousteau to enhance efficiencies and save costs by consolidating varied administrative services, including payroll, human resources, and accounts payable in a single operating unit, and leases ±25,000 square feet from Buzz Oates (initially occupied ±15,000 square feet with an obligation to take an additional ±10,000 more square feet and has subsequently done so). Also, a division of UC Davis is reported to have finalized a ±10,000-square-foot lease, so there will be no further vacancy in this building. The Buzz Oates properties in the 2nd Street Corridor and Interland URP always have been seen as the "overflow" for UC Davis, and there is very limited available supply with little if any remaining large floor plate spaces available.

- In 2012, HM Clause, part of Limagrain, now the 4th largest seed company in the world, purchases Campbell Soup Company's Vegetable Seed Operations, located on Mace Boulevard in Davis. These operations include the company's research facility for vegetable breeding and seed development and sale of seeds to farmers and growers around the world. The 19 full-time employees join HM Clause. The new HM Clause/UC Davis start-up incubator, opening in 2015, is hosted in the old Campbell's Soup facility.

- In 2013, HM Clause expands from a 4,000-square-foot space on Mace Boulevard into an 11,000-square-foot space on Cousteau Place. The Davis location hosts an administrative support and research center for the company. Stephen Tomasello, external communication manager for Harris Moran in the Americas, said that having a research center in the same town as UC Davis was no accident. The proximity to UC Davis, a renowned agricultural research university, was key to the location decision. He noted that "several other seed companies are also setting down roots in Davis for the same reason… it's like a Silicon Valley for seed companies."[35]

- In 2014, Stratovan, a company started by a UC Davis PhD graduate, moved back to Davis. Stratovan specializes in next-generation interactive, visual analysis software and software toolkits for 3D imaging, diagnostics, surgical planning, life science applications, and airport security. The company's core product line includes a range of novel, next-generation visual analysis applications, including 3D image viewing station

Built Space Square Footage in Davis Innovation Ecosystem:

2nd Street Corridor

- Industrial = 23.9%
- Flex/Office R&D = 37.6%
- Office = 30.9%
- General Commercial = 7.1%
- Educational = 0.5%

Interland URP

- Flex/Office R&D = 36.3%
- Office = 63.7%

[35] "Seed company Harris Moran grows into bigger space," Sacramento Business Journal, May 2013.

software, airport screening simulation software, and system solutions that include Automated Threat Recognition (ATR), DICOM, and DICOS (Digital Imaging and Communications in Medicine/Security) -based toolsets. In addition, its innovative 3D surgical planning and diagnostic tools are used in areas such as orthopedics, craniofacial surgery, neuroimaging, oncology, ophthalmology, otolaryngology, anthropology, and veterinary medicine. In February 2014, Stratovan was awarded two contracts with the U.S. Transportation Security Administration for up to $6.2 million to develop technology to detect explosives for baggage screening systems.

- In 2015, Cedaron, a local, growing medical technology company started in 1990 by serial entrepreneurs, purchased property at Da Vinci Court and obtained approval for site and building modifications, enabling the company to expand in Davis.

Overview of Key Development Types

The industry clusters applicable for Davis (described in **Chapter 4**) require a comparable mix of industrial, office, and retail space; life science and agricultural biotech firms often have very specialized buildings.

In looking at development prototypes in Davis, there are four primary building types that show up in the City's existing tech clusters located on the 2nd Street Corridor and at Interland URP (see **Maps 2** and **3**). These are the four broad classes:

- **Office.** This use has the highest employment density, typically ranging from 175 to 350 square feet per employee. It can be configured as multistory or single-story space.
- **Flex—R&D/Office.** Schilling Robotics' main facility in the 2nd Street Corridor and the DMG Mori Innovation Lab are classic examples, showing some similarities to office but having larger workstations, more internal equipment, and often roll-up doors to facilitate equipment and materials delivery. Because of the nature of activity involving larger work stations and laboratory facilities, employment density usually is lower than office uses. In many cases, these operations generate substantial B2B transactions resulting in sales and use tax receipts for their host jurisdictions. This is a key prototype for Davis, arguably the "workhorse" of the Innovation Center concept as it applies to Davis, and the subject of the pro forma example discussed in the next section. Depending on specific industry niche, the following specialized needs are associated with this prototype:
  - **Wet laboratories** are ventilated spaces designed for the handling of chemicals and biological materials. They are a necessity for Life Sciences & Health Services, even though this type of space is in very short supply in Davis and the region.
  - **High-load capacity** is a concern for many innovative companies that need to power advanced equipment. Bruce White, director of ETTC, a UC Davis incubator, said one of his former graduate students was forced to relocate her company to Fairfield and then to San Francisco because she could not find any commercially available space with enough power for her needs.
  - **High-speed broadband** is a necessity for Information & Communications Technology companies and many other technology-related companies.

- **Industrial Commercial.** Similar in appearance to low-density versions of the above two prototypes, this usually is configured as a basic single-story shell without HVAC and other high performance core building infrastructure needed to accommodate specialized operations. These facilities may be used for a very broad array of tenants, ranging from office to sales-service. Examples in Davis include the Strelitzia Flower Company and Hoffman Automotive. The sales-service aspect is capable of generating considerable sales tax; therefore, it is important to track this product as a possible generator of fiscal revenue to the City.

- **Manufacturing.** As discussed in the preceding discussion, advanced manufacturing is a strong candidate for future development. These are specialized facilities for specific tenants and, while the overall "shell" may be a very basic tilt-up, the foundations, power, specialized HVAC, and specialized manufacturing equipment can lead to very high assessed values, partially from the unsecured property tax roll. These facilities often have the following characteristics:

  - **Clean rooms** are enclosed spaces that control levels of airborne particulates and contaminants. They particularly are useful for Advanced Manufacturers creating circuits and other electronic hardware.

  - **High-load capacity** is a concern for many innovative companies that need to power advanced equipment.[36]

  - **Floor drains and commercial grade kitchens** are necessary for food-related R&D and testing operations.

  - **High ceilings** are important for many manufacturers; large buildings of this kind in Davis are almost nonexistent beyond DMG Mori.[37]

The images on the following pages provide examples of these prototypes.

[36] Interview with Bruce White, director of ETTC, April 20, 2015.

[37] Interview with Jim Gray and Nahz Anvary from DTZ, April 21, 2015.

Office


260
COUSTEAU
OFFICE PLAZA
260
FMC Technologies Schilling Robotics
HM•CLAUSE
UC DAVIS Shared Services Center


2851
2851

Flex Office / R&D


University of California
Agriculture and Natural Resources


279
Suite
200
NO PARKING FIRE

Industrial Commercial

Manufacturing

Horizontal and Vertical Feasibility Considerations

As discussed earlier, the flex-office/R&D building type likely is to be a critical component of the proposed Innovation Centers. The most notable examples of this prototype are Schilling Robotics and the DMG Mori Innovation Lab. These are facility types that are critically important as they house mature industries related to research strengths of UC Davis, which generate very high assessed values and sales tax. Other prototypes, such as pure office and sales-service are being developed in the market, with some recently built space still awaiting occupancy on the 2nd Street corridor near the Target Center. Manufacturing, as described earlier, is almost always developed by owner-users, but the region has seen strong interest in existing facilities. Demand is driven by a multitude of non-real estate factors beyond the basic need for large sites, fast entitlements, and an absence of onerous costs of occupation (e.g., CFD special taxes making the area more expensive than other competitive areas).

EPS has prepared an illustrative development pro forma (see **Table 13**) providing a residual land value analysis to illustrate key market dynamics related to the Innovation Centers and to inform future consideration of project infrastructure, mitigation measures, and other issues critical to project delivery. Assumptions for this pro forma are gleaned from a variety of sources, including in-house data, market data from Co-Star and DTZ, and cost information from project applicants. The project is modeled based on an actual confidential project that has not been built, and approaches a level of quality sought by multi-tenant users interested in the Davis market.

Scenario 1 represents a baseline analysis where a 109,000-square-foot project is constructed at an "all-in" cost of $266 per square foot. This cost figure includes tenant improvement (TI) costs of $60 per square foot, which is a reliable but modest assumption, recognizing that TIs for tech users can range much higher.[38] In all cases, there will be a negotiation between the developer/landlord and the end user regarding the amount of TIs covered by the landlord and offset by lease payments, versus specialized and user-specific TIs funded by the tenant. Based on current lease rates and other variables, the value of the building is estimated to be less than the estimated cost, indicating the project is not feasible in the current market.

Scenarios 2 and 3 provide for relatively modest market improvements. As discussed earlier, DTZ forecasts a year-over-year lease rate appreciation between 3 and 4 percent. Scenario 2 provides for a 3.3-percent lease rate improvement and a slight reduction in the "capitalization rate," a metric based on the relation between annual lease rates and sale values.[39] Both of these scenarios also assume the TIs paid by the developer/landlord are limited to $30 per square

[38] Tenant improvement costs for this type of space can range from $30 to $80 per square foot, depending on the need for specialized equipment in line with requirements such as clean rooms or wet labs. Although many of the types of targeted tenants for the Innovation Centers will require these specialized uses, these improvements likely will not be present in a large share of built space. This topic will be explored further in the economic and fiscal impact analyses in Phase II.

[39] A lower capitalization rate indicates a bullish perspective among buyers, who are willing to pay more for a given projected cash flow, with the expectation that market conditions will improve. When cap rates increase, it is reflective of reduced expectation of future cash flows.

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Table 13
Residual Land Value Analysis
Office/R&D Hybrid - Speculative Multi-Tenant Pro Forma

Item	Scenario 1: Office/R&D Hybrid Baseline	Scenario 2: Lower TIs (2), Modest Market Improvement	Scenario 3: Lower TI's, Substantial Market Improvement
DEVELOPMENT PROGRAM ASSUMPTIONS			
Site Acres	5.0	5.0	5.0
Floor Area Ratio	0.40	0.40	0.40
Gross Leasable Area (Square Feet)	82,764	82,764	82,764
Efficiency Ratio	95%	95%	95%
Gross Building Area (Square Feet)	87,120	87,120	87,120
Parking Ratio (Spaces/1,000Sq. Ft. GLA)	4.00	4.00	4.00
Total Parking Spaces	331	331	331
REVENUE ASSUMPTIONS			
Avg. Lease Rate/SF/Year (modified gross) (1)	$30.00	$31.00	$32.00
Gross Potential Income/Year	$2,482,920	$2,565,684	$2,648,448
Less Vacancy%	7.5%	7.5%	7.5%
less Operating Expenses ($/SF/Year or % of GPI)	25.0%	25.0%	25.0%
less Leasing Commissions (% of GPI)	6.0%	6.0%	6.0%
less Capital Reserves ($/SF/Year)	$1.75	$1.75	$1.75
less CFD ($/SF/Year)	$0.40	$0.40	$0.40
less additional CFD surcharge ($/SF/Year)	$0.00	$0.00	$0.00
Total Operating Expenses Subtotal			
Net Operating Income	**$1,395,608**	**$1,448,060**	**$1,500,511**
Value/Gross Square Foot	***$16.02***	***$16.62***	***$17.22***
Capitalization Rate	6.80%	6.70%	6.60%
Total Building Value	**$20,523,646**	**$21,612,830**	**$22,735,020**
Value/Gross Square Foot	***$235.58***	***$248.08***	***$260.96***
COST ASSUMPTIONS			
Direct Building Construction Costs/Gross Building SF (shell)	$140.00	$140.00	$140.00
Total Direct Building Construction Costs	$12,196,800	$12,196,800	$12,196,800
Direct Parking Construction Costs/Space	$1,800	$1,800	$1,800
Total Direct Parking Construction Costs	$595,901	$595,901	$595,901
Direct Site Improvement and Intract Costs/Gross Building SF	$10.00	$10.00	$10.00
Total Direct Site Improvement Costs	$871,200	$871,200	$871,200
Soft Costs as % of Direct Costs	25.0%	25.0%	25.0%
Total Soft Costs	$3,415,975	$3,415,975	$3,415,975
Tenant Improvement Costs/GLA SF	$60.00	$30.00	$30.00
Total Tenant Improvement Costs	$4,965,840	$2,482,920	$2,482,920
Builder Fee as % of All Costs Excluding Land	5.0%	5.0%	5.0%
Builder Profit/Unit	$1,102,286	$978,140	$978,140
Total Costs	**$23,148,002**	**$20,540,936**	**$20,540,936**
Cost/Gross Square Foot	***$265.70***	***$235.78***	***$235.78***
RESIDUAL LAND VALUE CALCULATION			
Finished Land Value	**($2,624,355)**	**$1,071,895**	**$2,194,084**
Per Gross Building Square Foot	*($30.12)*	*$12.30*	*$25.18*
Per Acre	*($524,871)*	*$214,379*	*$438,817*
Per SF	*($12.05)*	*$4.92*	*$10.07*

pro_forma

Source: Interviews with local real estate professionals; EPS.

[1] Tenant pays separately metered utilities.
[2] Assumes developer installs $30/SF in TIs, tenant funds balance as business expense.

foot, with the tenant willing to pick up the balance of the cost. In both cases, values exceed development costs to produce a positive land value. However, only in Scenario 3, where lease rates are increased over Scenario 2 by an additional 3 percent, does the value exceed $10 per square foot, which is considered a reasonable expectation for a well-located and entitled finished pad in Davis.

This illustration and the preceding discussion of market trends result in the following observations:

1. Lease rates may be too low to capitalize multi-tenant speculative construction of higher end flex office/R&D space and too high for many start-ups to afford.

2. There has been little if any appreciation in the past decade, but improvement of lease rates is expected. The question is whether lease escalations effectively can outpace cost inflation, such that net value accrues to the land and encourages speculative development.

3. If conditions do not improve as described above, the result is that development in Davis is far more likely to consist of build-to-suit activity, where owner-users commission purpose-built facilities predicated on a need to be in Davis for strategic business reasons. Often, this results in very uneven absorption, and less absorption overall.

4. Competitive cities in the region can offer built space below replacement cost, offering state-of-the-art structures for less than they could be built. In addition, competitive cities (e.g., Vacaville, Roseville, Folsom) have lower combined impact fee/CFD burdens (see **Appendix A**). These will continue to be factors limiting absorption in Davis.

5. As continued market recovery draws down the surplus of vacant buildings in the region, lease rates will climb and the differential between Davis and its competitors will diminish, improving absorption over time.

6. Overall absorption in Davis, provided quality land is made available, likely is to be modest at first and improve over time because of above-referenced dynamics. This dynamic could change if one or more new speculative multi-tenant projects come on line in the short term and succeed, demonstrating risk is manageable and market fundamentals are in place.

7. It will be important to carefully weigh the costs and benefits of any project requirements such as mitigation measures as to facilitate project feasibility. Similarly, it will be important to ensure that project entitlement processes are clear and straight forward, reducing time to market to the extent possible.

8. The ability to implement economic development solutions that improve prospects for start-ups and other early-stage companies will strengthen demand and absorption for all the planned Innovation Centers.

6. OUTLOOK: DAVIS INNOVATION CENTERS

Summary of Key Factors and Effects on the Innovation Centers

To develop scenarios for the impacts of the Innovation Centers, a group of success factors was identified on which to measure the proposals. These success factors were distilled through analysis of key concepts and trends of innovation districts, benchmarking information for URPs, and stakeholder interviews. Descriptions of the success factors are provided below.

University-Related Factors

***University Proximity*:** In addition to a university's presence as an anchor tenant in the park, close access to the larger university campus is important to facilitate collaborations and resource sharing. UC Davis brings in more than $700 million in research grants annually, more than UC Berkeley, MIT, or Harvard. It is a leading academic partner for innovative research in agriculture, biotechnology, clean energy, medicine, information technology, and engineering.

***University-Tenant Match*:** The research strengths of the university should align with the types of businesses the park targets, in terms of the space and resources provided, as well as the outreach campaigns devised. The cross section of industries prevalent in existing Davis tech concentrations are indicative of representative industries.

***University Investment/Commitment*:** Universities can serve as important catalysts of research parks that provide direction and leadership, as well as on-site services (incubators, accelerators) that otherwise would not be provided by the private market. The investment and commitment that universities demonstrate in the planning stages of a research park help determine the future role and presence they will have.

Regional Economy Factors

Regional Economic Health: Key regional dynamics include continued rent growth and draw down of surplus real estate in adjacent markets, as discussed in **Chapter 5**.

***Regional Clusters-Innovation Match*:** The Innovation Centers should provide space and resources for, as well as market to, businesses in innovative clusters that are strong points for the regional economy because there is substantial cross-over between regional and UC Davis strengths. Growth prospects likely are to be a blend of companies focused on Davis with ties to the university or other tenants, as well as regional companies attracted by the perceived and real upside of being located in Davis because of the university presence and other positive attributes. Therefore demand likely is to stem from a subset of five regional clusters discussed in the body of the report:

- Clean Energy Technology
- Agriculture & Food Production

- Life Sciences & Health Services
- Information & Communications Technology
- Advanced Manufacturing & Materials

The clusters use the following services:

- Scientific R&D Services
- Management, Scientific, and Technical Consulting Services
- Architectural, Engineering, and Related Services
- Specialized Design Services

Establishment-based data for the 2nd Street and Interland URP areas in Davis reveal that about one-third of the non-retail or local service employment falls in the Professional, Scientific, & Technical Services industry. This provides further evidence that the knowledge-intensive services could represent a notable share of the opportunities for the Innovation Centers.

Another one-third of the non-retail or local service employment in the 2nd Street and Interland URP areas is captured in the Manufacturing industry. These types of activities could be supported by the Innovation Centers with a continued draw from the regional production labor force and an orientation toward more technical-based manufacturing that is reinforced by the local labor force strengths.

***Regional Entrepreneurial Support / Tech Transfer*:** While certain start-up supports should be offered within park boundaries, the availability of area resources that foster collaboration and assist in the commercialization of research will be attractive to many prospective tenants.

***Regional Access to Capital*:** The growth of many innovative companies in their early stages depends on their ability to obtain sources of capital. Venture capital firms often are very reticent to fund companies outside their immediate vicinity, and consequently innovative firms move to areas where capital concentrates. Leading prospects for local VC funding may be strongest for Biotechnology and Clean Tech, which rank third and fourth in terms of regional investment over time, with Davis accounting for 82 percent and 100 percent of that investment, respectively. Davis also accounts for 24 percent of the regional investment in Software, another branch of Information Technology, as well as all of the regional investment in Agriculture and Medical Devices & Instruments. The scale of venture capital investment is dwarfed, however, by the Bay Area and Silicon Valley, which will continue to pull innovative companies in need of funding to move through the product life cycle away from the Davis region despite real estate cost differentials.

Local Market Factors

University as a Tenant (anchor or otherwise): UC Davis is a strong historic source of real estate demand in the City. A change in policy reducing this support could be a factor limiting the amount of absorption. Overall, the relatively high assessed values associated with innovative companies and research activities in innovation centers partly are based on university proximity and interactions that are absent in more generic settings.

Ability to Accommodate Tech Companies and Gazelles: These fast-growing and innovative companies are a key focus area in terms of tracking near-term demand for buildings and land. Davis houses innovative companies such as Novozymes, Marrone Bio Innovations, Blue Oak Energy, CACE Technologies (enterprise network tools), Gold Standard Diagnostics (laboratory services), and Syntech Research (R&D services for agribusiness). These firms and industries will demand more space if they continue their pace of rapid growth.

Ability to Accommodate Start-ups: The composition of start-ups favors medical technology, agricultural technology, clean tech, and software applications. Space needs for these companies likely are to include both flex/lab and basic multi-tenant spec office. Both are tenuous propositions in today's market, as discussed below.

Real Estate Feasibility: A mix of small and large firms is an important driver of innovation.

- **Office likely is a short-term prospect**, which may emerge with successful prototypes in the market at both the high and low ends of development (e.g., density, office building class).

- **Flex space oriented to technology users may be challenged** because of user cost sensitivity. Market conditions may support certain projects oriented towards established companies in the next 2 years. However, there is little market incentive to speculatively build flex work spaces, labs, or other space oriented towards start-ups. This may shift near-term absorption toward reliance on owner-users.

- **Housing would be a powerful mechanism for improving returns**, as well as creating a basis for funding infrastructure. This topic will be further explored, in a concise, qualitative, discussion, as part of Phase II of this study.

- **A competitive environment is healthy.** In addition to offsetting occupancy costs through direct intervention, it is helpful to encourage the development of multiple parks to foster competition and provide choices to prospective tenants and owner-users.

- **Nascent firms in need of incubation and acceleration may be more natural candidates for the Nishi site.** Nishi will be an early bellwether for interest among industries seeking expanded access and affiliation with UC Davis researchers.

- **Space for large and specialized users** will be necessary to attract larger firms, including manufacturers like DMG Mori and FMC Schilling Robotics. Land needs to be available in the form of shovel-ready pads with appropriate entitlements in place. A rapid response to these market opportunities is critical.

- **Quality-of-life** factors can play an important role in company site location decisions. Business executives might consider the value of living and doing business in high quality-of-life communities, which can balance out competitive cost differentials seen in markets like Davis.

- **Overall absorption in Davis, provided quality land is made available, likely is to be modest at first and improve over time, and will be uneven.** Perhaps the most valuable thing that could occur in Davis in the short term would be to have one or more new speculative multi-tenant projects come on line and succeed, demonstrating that risk is manageable and the market fundamentals are in place.

- **Competitive position relative to the region and the Bay Area may improve with the availability of viable supply in Davis.** Davis currently competes with communities throughout Northern California for business location and expansion projects. Depending on the industry, users interested in sites in the immediate region have several competitive options along the I-80, Interstate 5, and U.S. Highway 50 corridors, including in proximate communities like West Sacramento, Woodland, and Vacaville. In addition to available land and sites, many of these options offer cost advantages over Davis in the form of fees and utilities. Further, there are several planned projects that will support a considerable amount of new square footage in the market over the coming decades that could compete with the Innovation Centers for specific users. More broadly, the region in general and Davis specifically have been subject to the pull of the greater Bay Area, which attracts users in the innovation economy as a result of strong cluster agglomeration, a fully developed innovation support ecosystem, and a technical workforce.

  The Innovation Centers offer Davis the opportunity to improve its competitive position as a leader in the innovation economy in the region, potentially mitigate some of the pull of the Bay Area, and enhance the region's standing in Northern California. As discussed throughout this report, Davis has several quality-of-life attributes (e.g., internal and external connections, exemplary schools, walkable downtown, recreation/civic/cultural assets) that are very attractive to the industries discussed in this report, providing a strong foundation for the innovation ecosystem concept in Davis.

Public-Private Approach to Improving Feasibility: The proposed Innovation Centers will require a patient approach. The development community has carefully thought through phasing of the proposed projects. The ability to match individual phases of development to market opportunities will be important in terms of avoiding extraordinary up-front costs and keeping lease rates at competitive levels. On the public side, it will be important to maintain a competitive stance with other communities in terms of overall cost burdens.

Project Implementation Factors

***Diversity of Space/Tenants*:** Innovation Centers should have spaces that support a mix of large and small companies, as well as a mix of industries. Every effort should be made to ensure that start-ups have options in Davis, either through new development or adaptive reuse of buildings vacated over time. However, to maximize the economic output over the long run, each Innovation Center should have a cross section in this regard.

***Neighborhood Amenities*:** Successful innovation centers need a mix of services that activate public areas, encourage social interaction, and attract the knowledge professionals that work in cutting-edge industries. It is important to make the value proposition as powerful as possible through the provision of meaningful amenities and high-quality public spaces.

***Connectivity*:** Innovation centers must be designed to link institutions and people together both within park boundaries and to the rest of the metropolitan area. The following connection types are critical in Davis:

- **Vehicular connections.** Connections to UC Davis and Downtown are critical. The Innovation Centers enjoy excellent proximity to regional freeways. It will be important to ensure goods movement and commute routes are not in conflict. To the extent that major capacity improvements are sought, a multi-faceted funding strategy likely is to be needed to the extent the improvements have regional benefit.

- **Bike / pedestrian / transit connections.** The Innovation Centers can access a network of existing facilities for bicycles, pedestrians, and transit to connect to other areas, though the connections to these networks deserve careful attention.

- **Broadband / data and other utilities.** It is critical that all Innovation Centers have state-of-the-art high bandwidth connections, including to key UC Davis collaborators. It may be necessary to review prospects for the Davis IC specifically in this regard. Electricity can be a major component of the cost of doing business for many of the types of large users that are envisioned as possible tenants for space in the proposed Innovation Centers. Pacific Gas & Electric Company (PG&E) provides electricity for residential and nonresidential properties in the City, and PG&E's average retail electricity price is higher across all categories compared to the prices of other providers in the region: Sacramento Municipal Utility District (SMUD) and Roseville Electric.[40]

- **Labor force and housing.** Employees of the new Innovations Centers will need access to appropriate housing options, both locally and regionally.

On-Site Start-up Support Infrastructure: While substantial technology transfer and entrepreneurial resources may be available in the City, the availability of an incubator and other supports for start-ups within park boundaries serves as a key differentiator between a typical research park and an innovation center.

***Supportive Policy Environment—Entitlement and Public Finance*:** The combination of market forces, impact fees, and local regulations, both park-specific and areawide, will determine whether the business community will embrace the opportunities presented by the Innovation Centers or turn to more attractive options elsewhere. Because the user base can be cost sensitive, it is important to understand how the City compares to regional competition. In this regard, any design requirements or restrictions of uses should be carefully vetted with the development community to ensure no unintended consequences (i.e., reduced revenue to the public and private sectors) arise out of these policies. A comparison of the 2nd Street Corridor of Davis to key areas of regional competition indicates that combined impact fees, special taxes, and assessments are very comparable to the City of West Sacramento, but 35 percent to 100 percent higher than key areas in the cities of Folsom, Roseville, and Vacaville.[41]

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[40] See **Appendix E** for more detail on electricity costs.

[41] See **Appendix D** for a comparison of infrastructure cost burdens.

Further, the City has indicated the need to address sewer capacity for the Davis IC, potentially resulting in sewer improvements not currently anticipated. As such, it will be important to be mindful of total cost burdens as public financing options are weighed for the Innovation Centers, as not to suffer a competitive disadvantage that could affect local capture of market share.

Project Development and Management Expertise: Both Davis IC and MRIC are experienced property developers and managers and are highly motivated to accommodate the broadest swath of users feasible.

Private Development Opportunities: A major upside of privately developed innovation centers is the complexities of being located on public university land (sharing of royalties) are avoided. If current models of university absorption of spec space hold up, a positive outcome might arise from the university/private-sector proximity without the potential disadvantages of public land ownership. The potential to explore the ability to augment these capabilities with the services of an economic development entity charged with attracting, retaining, and growing a network of tech industries in Davis should be explored. This type of entity could improve overall absorption rates over time through implementation of an active system of economic development featuring incubation, acceleration, and ultimately placement of industry in long-term space in Davis.

Local Leadership: Strong leadership is necessary, preferably from a variety of vital, local institutions, to provide direction and ensure the park's activities match the goals outlined for the project. The Innovation Centers will benefit from the continued involvement of the City, the Chamber, and UC Davis throughout the planning and development process.

Absorption Outlook

Alternative Absorption Scenarios

Many factors have been discussed throughout this report that could result in much slower absorption rates than the high end presented in the BAE analysis (about 350,000 square feet absorbed over a 20-year buildout). In particular, any factor that reduces revenue or increases the cost structure could drive absorption rates down.

Based on the evaluation of local and regional market conditions in the City and other revenue and cost factors examined as part of this study, absorption could range between 128,000 and 175,000 building square feet annually in all Innovation Centers, consistent with the more conservative cumulative annual absorption estimated in the BAE study (about 150,000 square feet annually). Consistent with the findings of BAE, EPS finds that fundamental changes in market activity are necessary to realize this level of development, and to date, the lack of available land has precluded the ability to test the limits of the market. However, review of multiple research park case studies, consideration of expanding market share from the larger Northern California Region, and the continued success of UC Davis as a growing R&D node in the U.S. all provide EPS with a solid basis to agree and work with the order-of-magnitude of the

foundational projections initially made by BAE.[42] [43] This level of absorption would result in a buildout period of about 40 to 56 years.[44] The absorption rate can be expected to be somewhat higher with additional sites made available, as the added geographic and product diversity implied by expanded development sites will attract a broader cross section of market segments. In general, achieving the higher end of the range coincides with strong ratings across the success factors described in the following section.

A faster development scenario could arise out of interest among one or more major corporate campus users. According to DTZ, typical expressions of interest in this regard point to projects involving the acquisition or development of buildings or land typically involving up to 1 million square feet for their own use. These types of projects are capable of stimulating additional activity among symbiotic firms. Some market analysts have indicated there may be a 10- to 20-percent chance of landing a company of this caliber in Davis in any given year, though data from the Greater Sacramento Area Economic Council show solid interest in Davis sites from at least one major business location or expansion prospect per year. However, much discussion has centered on the "reshoring" of American industry, the emergence of advanced industries in the Sacramento Region, and, to the extent such industry is attracted by university-related factors including the labor force and local quality of life, Davis becomes a very competitive locale for such activity should adequate land be made available. Major corporate campus projects can range from 50 to 100 acres or more. Successful capture of such projects could have the effect of accelerating development in Davis.

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[42] It has been suggested that Hacienda Business Park in Pleasanton and Bishop Ranch in San Ramon offer examples of potential absorption rates and development types that may be instructive. However, both of these Tri-Valley projects developed under vastly different circumstances relative to those present in Davis, including (1) proximity to multiple major employment centers; (2) larger labor force; and (3) positioning as "back office" centers intending to take advantage of the latent underemployed labor force to serve call centers and other back office functions related to a variety of telecommunications, finance, insurance, and real estate-related industries. Hacienda Business Park in particular struggled with very poor financial performance, eventually selling holdings to an institutional entity (Prudential Insurance) that worked quickly to rezone major portions to housing and big box retail to achieve targeted absorption. While these centers are not good proxies for the Innovation Centers, recent initiatives announced to retrofit Bishop Ranch with a mixed-use "Main Street" feature are indicative of recent trends toward improving business park amenities and creating more compelling places for employment.

[43] It has been suggested that simply totaling the prospective projects that ended up developing elsewhere, as well as relocations from Davis to other communities, would be a reliable approach to identifying potential net absorption. These cases are all instructive in their own right. Each case has had a specific outcome related to very specific factors such as lease rates, need for specific facilities, locational preferences, and other factors, all of which are discussed in detail in this report. Nevertheless, the overall patterns of activity are noted and are part of the base of evidence indicating strong potential to achieve the identified ranges in this report.

[44] Historical net absorption figure is based on annual averages for office, retail, flex, and industrial development in the City from 2000 through 2014 (office, flex, industrial) and from 2006 through 2014 (retail). Based on data collected from CoStar.

Key Driving Variables of Economic and Fiscal Impact Analyses

As discussed previously, any factor that reduces revenue or increases costs could have an impact on overall absorption of development in the Innovation Centers. For example, price-sensitive users may struggle to get a foothold in the Davis market without some type of overt intervention. These factors also will drive the overall economic and fiscal impacts to the City and regional economy. Examples of major variables that will affect the fiscal outcomes include B2B sales transaction levels, the amount of specialized equipment (manufacturing, R&D) resulting in higher assessed values, and employment density. EPS examined key variables—including assessed values, taxable sales, and employment—to understand the potential range associated with key development types discussed in the previous chapter. Using myriad sources of information, including data from existing development in the 2nd Street Corridor and Interland URP, Urban Land Institute (ULI), and subscription-based data (e.g., CoStar, ESRI, Hoovers, National Establishment Time Series [NETS]), EPS identified low to high ranges of assumptions and a resulting midpoint estimate for each key development type that will serve as a basis for further discussion and refinement before incorporating into the economic and fiscal impact analyses in Phase II. These assumptions are illustrated in **Table 14**.

Mix of Innovation Centers Development Types: Land Use Scenarios

The range of success factors described above, such as the degree of UC Davis presence in the parks, may affect the industry specializations and resulting land use mix of development in each innovation center. A differing mix of development will, in turn, influence development feasibility, as well as the overall economic and fiscal impacts of the Innovation Centers based on the key variables associated with each development type.

The following scenarios are to be explored for the purpose of the economic and fiscal impact analyses:[45]

1. **Scenario 1: 2nd Street / Interland URP Mix.** Scenario 1 is based, in part, on development patterns in the City's existing innovation centers: the 2nd Street Corridor and Interland URP. EPS reviewed existing data for development in the City's existing innovation centers. The data revealed that 47 percent of total development is categorized as office, while nearly 40 percent is categorized as Flex/Office/R&D, about 10 percent is categorized as industrial, and the remainder (6 percent) is categorized as general commercial. To arrive at the mix of development in this scenario, EPS adjusted this percentage breakdown based on information collected as part of this study, including each park's proximity to UC Davis, existing development and transportation infrastructure, and other City assets.

[45] Hotels will be modeled independently.

Table 14
Key Fiscal and Economic Assumptions by Land Use: Low and High Impacts [1]

Item	Public/ Non-Profit	Office	Flex: R&D/Office	Industrial: Manufacturing	Industrial Commercial	Ancillary Retail
Low Impact Estimate						
Assessed Value/Sq. Ft. [2]	$0	$200	$175	$200	$200	$200
Taxable Sales/Sq. Ft.	$0	$20	$60	$150	$185	$185
Sq. Ft./Employee	400	350	500	1,000	600	600
Midpoint Estimate						
Assessed Value/Sq. Ft. [2]	$0	$225	$245	$250	$225	$225
Taxable Sales/Sq. Ft.	$0	$45	$80	$225	$205	$205
Sq. Ft./Employee	350	290	450	800	500	500
High Impact Estimate						
Assessed Value/Sq. Ft. [2]	$0	$250	$310	$300	$250	$250
Taxable Sales/Sq. Ft.	$0	$70	$100	$300	$225	$225
Sq. Ft./Employee	300	225	400	600	400	400

assump

Source: EPS.

[1] Excludes residential and hotel land uses. These will be handled separately, accommodated within retail footprint.
[2] Includes secured and unsecured assessed value.

2. **Scenario 2: Build-to-Suit.** If the speculative market continues its tepid pace, or is affected by potential interest-rate increases possibly in the offing, there will be less small-scale space in the flex category offered. This scenario reflects this notion, recognizing there also would be less University occupancy if less space is available.[46]

These scenarios will be evaluated further and may be modified as part of the economic and fiscal impact analyses.

Table 15 provides information regarding the relative percentage of development, by land use type by innovation center, for both land use scenarios. The relative percentage of development by land use type for each innovation center was based on each center's geographic location, including its proximity to UC Davis, major transportation corridors, and other City amenities, and the type and character of adjacent land uses. In addition, applicant development experience and possible tenanting strategies were considered. In particular, the following observations are noted based on available evidence, as well as industry knowledge and experience:

- **Nishi**, with immediate proximity to the UC Davis campus and adjacency to housing and downtown amenities, will be a natural preference among firms seeking immediate university proximity. These likely are to be both large and small firms, but space limitations preclude major operations at the site. Because of campus proximity, Nishi would be in a strong position to accommodate any UC Davis off-campus space needs if available space can be provided. More university space implies possible lower average assessed values because of public ownership; however, the value of this university presence extends far beyond mere property tax, as the catalytic effect toward attracting specific targeted users is very important to the overall economic development of Davis.

- **MRIC** effectively would serve as an extension of the east-west axis that encompasses the 2nd Street area. This area has been studied carefully and provides an excellent basis for further testing of assessed values, taxable sales, and employment density occurring in such a district. The MRIC proponents are steeped heavily in industrial development in Davis and other parts of the Sacramento Region and understand the development of major manufacturing and office/R&D facilities across a broad swath of industries. Reflecting this, ensuing fiscal and economic testing will consider an emphasis in advanced manufacturing and other appropriate larger scale office and R&D uses similar to those reflected by the 2nd Street Corridor.

[46] One distinct possibility that offers potential for economic testing is the continued difficulty in financing higher end speculative development that would be attractive to medium-sized and smaller firms requiring high levels of sophisticated building equipment. If such space cannot be provided by the market, development will be composed of relatively higher percentages of owner-user facilities constructed on a "build-to-suit" (BTS) basis. In such cases, the mix of development may be proportionately higher among office and manufacturing facilities built for such end users, with somewhat less speculative flex product developed in the next 10 years, and therefore representing a lower buildout of such uses should BTS development at least partly fill the void.

Table 15
Development Scenarios: Percentage Mix [1]

Area	Innovation Center Land Uses: Public/ Non-Profit	Office	Flex: R&D/Office	Industrial: Manufacturing	Industrial Commercial	Ancillary Retail	Total
Scenario 1: 2nd Street/Interland URP Mix [2]							
Davis IC	10%	33%	28%	25%	2%	2%	100%
MRIC	5%	33%	20%	38%	2%	2%	100%
Nishi	20%	43%	18%	15%	2%	2%	100%
Scenario 2: Build-to-Suit Emphasis							
Davis IC	4%	42%	10%	37%	3%	4%	100%
MRIC	2%	36%	9%	46%	3%	4%	100%
Nishi	10%	52%	14%	17%	3%	4%	100%

scenarios

Source: EPS.

[1] Potential development scenarios based on interviews and research conducted by EPS in April 2015.
[2] Scenario 1 assumes a reduced amount of industrial commercial space relative to the current mix in the 2nd Street Corridor and Interland URP.

- The **Davis IC** project has been presented as a potentially denser project, possibly including a higher percentage of office and R&D facilities. The proponents have deep experience building and operating office and mixed-use development throughout the region and nation and have worked intensively with several distinct groups on campus to build prospects for future development. However, it also has been made clear that this group is capable of serving and interested in other sectors such as advanced manufacturing.

Table 16 summarizes the influence of the specific development mix for each land use scenario on the key economic and fiscal impact analysis variables. The resulting low, medium, and high assumptions shown for each key variable represents the weighted average of key variable assumptions (see **Table 14**) and the associated proportion of development types for each scenario (see **Table 15**). The following figures illustrate the comparison of weighted average assumptions by innovation center by scenario. All of these assumptions will continue to be tested during the upcoming second phase of fiscal and economic analysis.

Key Issues for Ongoing Consideration

- Maximize market segments served. Speculative construction remains a risky proposition in the short term throughout the region. Need to find a way to facilitate start-ups not addressed by market.
- Be mindful of overall cost burden incidence and timing. Design and high value uses are critical, yet restrictions and guidelines, if too onerous, can be a major disincentive.
- Consider housing. This use may help reduce trips, lower burden on infrastructure, and provide a more complete innovation environment.
- Pursue "use by right" philosophy in the entitlement and permitting process to reduce risk and improve project economics.
- Consider implications of imposing fiscal impact analysis mitigations. Given financial feasibility concerns, additional burdens on development, including annual special taxes, assessments, or other financing mechanism to cover potential net fiscal deficits or ongoing maintenance and operations requirements, may affect project feasibility.

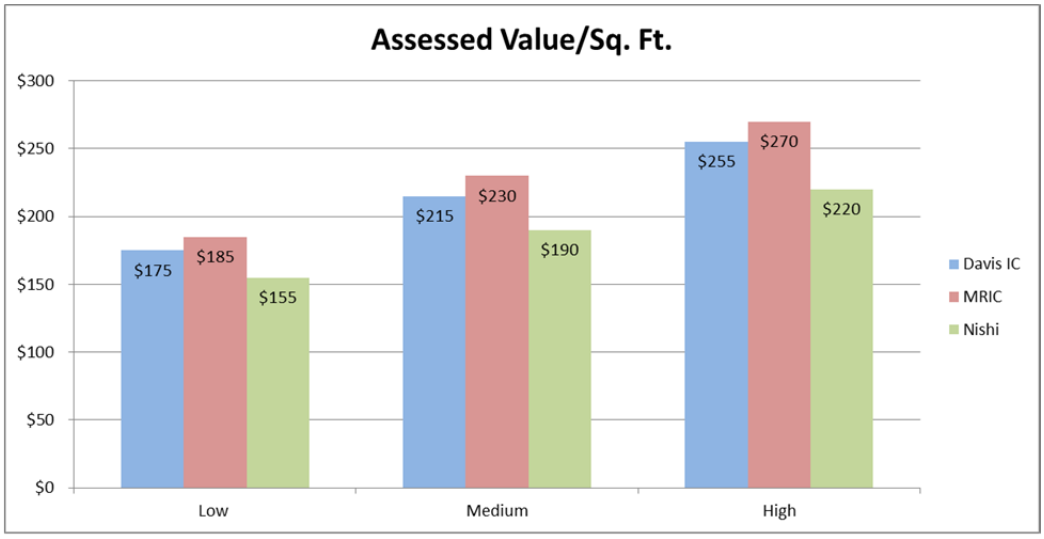
Table 16
Summary of Key Economic and Fiscal Impact Assumptions

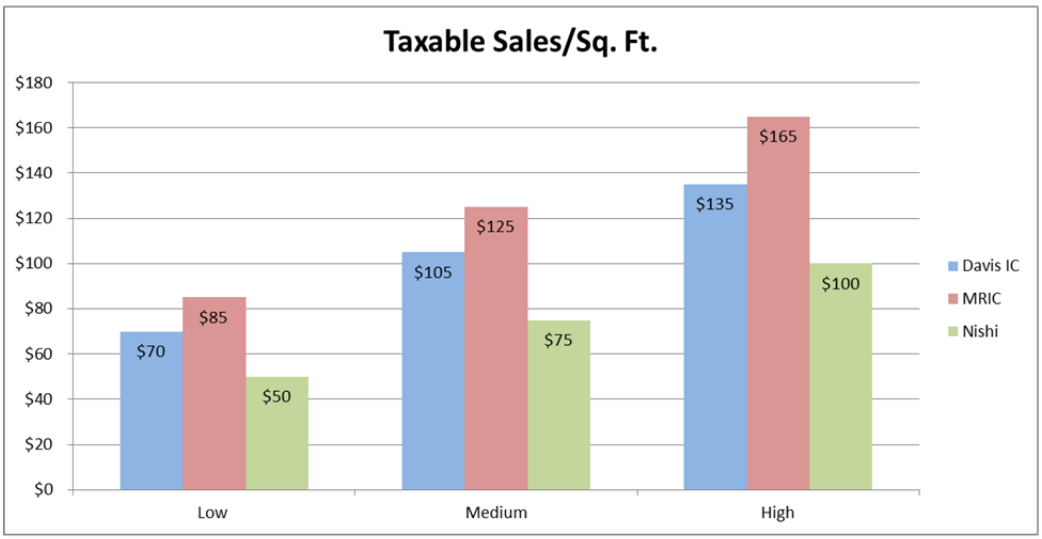
Area	Davis IC			MRIC			Nishi		
	Low	Medium	High	Low	Medium	High	Low	Medium	High
Scenario 1: 2nd Street/Interland URP Mix									
Assessed Value/Sq. Ft.	$175	$215	$255	$185	$230	$270	$155	$190	$220
Taxable Sales/Sq. Ft.	$70	$105	$135	$85	$125	$165	$50	$75	$100
Sq. Ft./Employee	570	475	380	640	530	415	495	415	335
Scenario 2: Build-to-Suit Emphasis									
Assessed Value/Sq. Ft.	$190	$230	$265	$195	$235	$275	$175	$210	$240
Taxable Sales/Sq. Ft.	$85	$125	$165	$95	$145	$190	$55	$85	$115
Sq. Ft./Employee	625	510	395	680	555	425	505	420	335

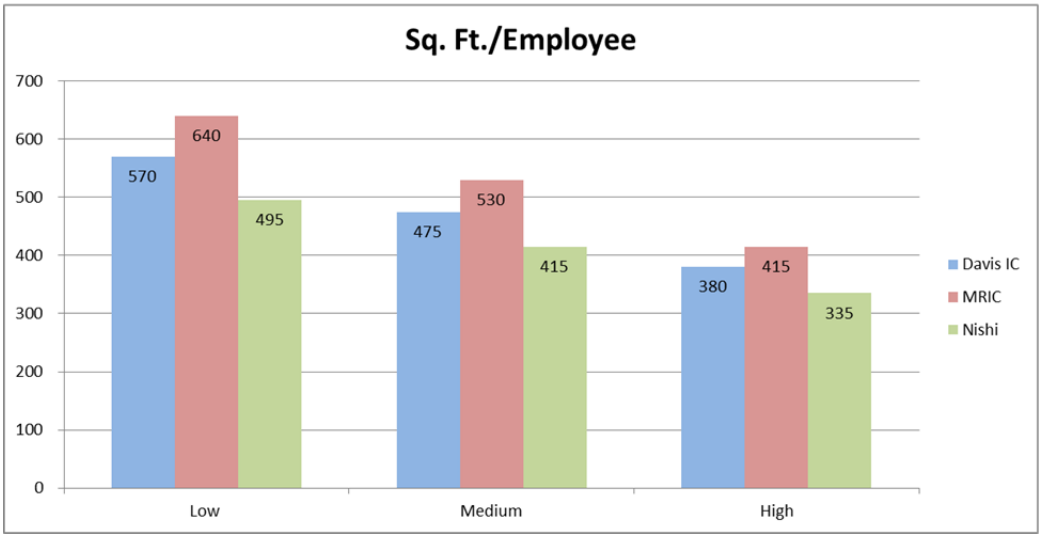
summary

Source: EPS.

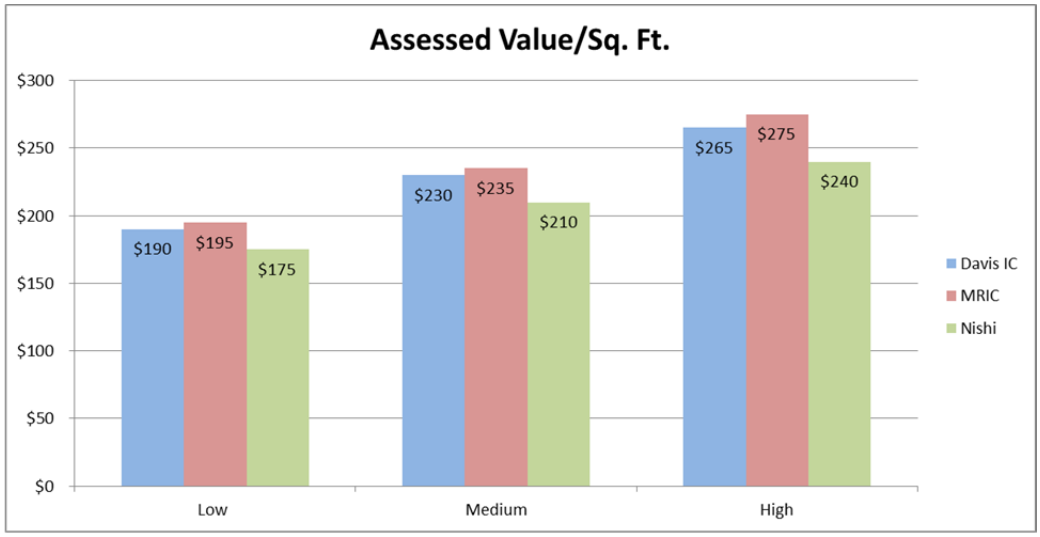
Scenario 1: 2nd Street / Interland URP Mix
Key Economic and Fiscal Impact Assumptions by Innovation Center

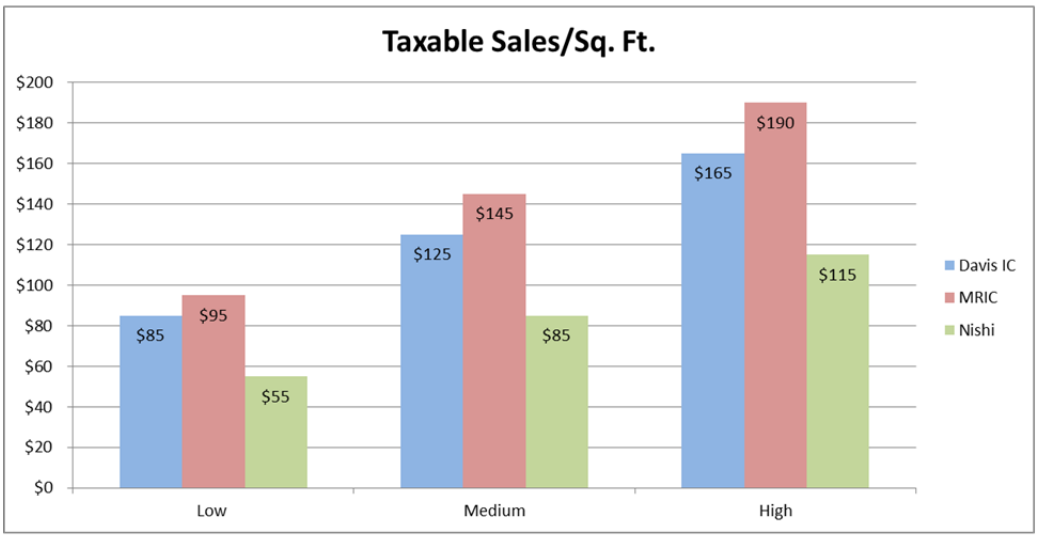


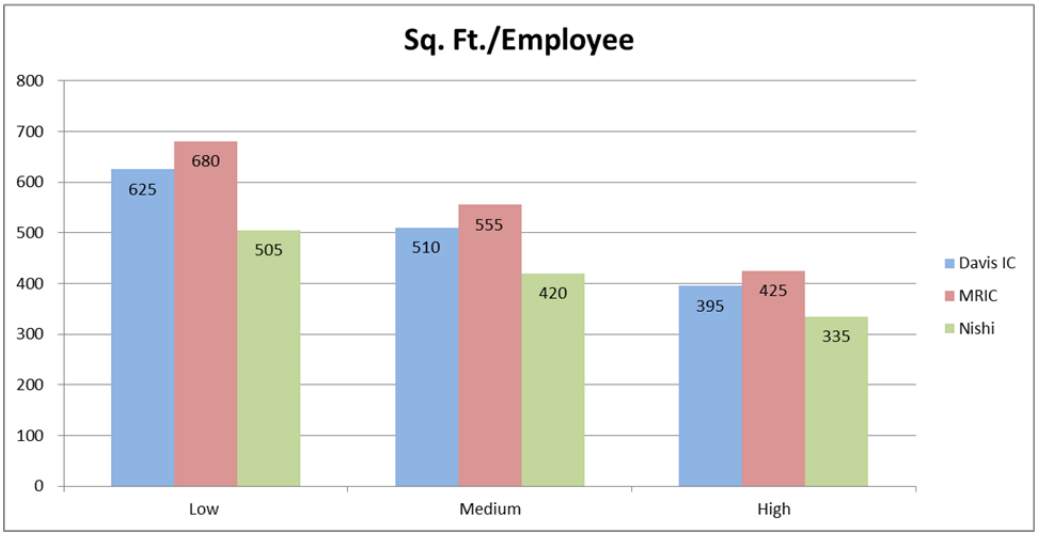




Scenario 2: Build-to-Suit Emphasis
Key Economic and Fiscal Impact Assumptions by Innovation Center







APPENDICES:

Appendix A: Further Reading on Innovation Center Concept and Regional Economic Development

Appendix B: Davis Commercial Market Analysis

Appendix C: Davis Innovation Districts Land Use and Building Types

Appendix D: Infrastructure Burden Comparison

Appendix E: Electricity Cost Comparison

Appendix F: Expert Interviews

APPENDIX A:

Further Reading on Innovation Center Concept and Regional Economic Development

FURTHER READING ON INNOVATION CENTER CONCEPT AND REGIONAL ECONOMIC DEVELOPMENT

"Driving Regional Innovation and Growth", Battelle Technology Partnership Practice, 2013. https://aurp.memberclicks.net/assets/documents/aurp_batelllestudy2012-final.pdf

"The Rise of Innovation Districts", Brookings Institution, Bruce Katz and Julie Wagner, 2014. http://www.brookings.edu/~/media/Programs/metro/Images/Innovation/InnovationDistricts1.pdf

"City of Davis Innovation Center Study", UC Davis' Studio 30, 2012. http://city-council.cityofdavis.org/media/default/documents/pdf/citycouncil/innovation-park-task-force-committee/documents/davis-innovation-center-study-studio30-final-sept-2012.pdf

"Capital Region Prosperity Plan 2013-2017", Next Economy, 2013. http://www.nexteconomycapitalregion.org/uploads/Next_Economy_2013_Annual_Report_Final.pdf

"Economic Diversification Study", Moving Solano Forward, 2014. http://www.movingsolanoforward.com/news/moving-solano-forward-economic-diversification-study-final-report/

"The 2020 Initiative", UC Davis Chancellor Linda Katehi. http://chancellor.ucdavis.edu/initiatives/2020_Initiative

APPENDIX B:

Davis Commercial Market Analysis

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Table B-1
Davis Commercial Market Analysis
Office Market Inventory: Leasable Square Feet

Office Inventory: Leasable Sq. Ft.

Market	Formula	Office Inventory: Leasable Sq. Ft. [1]															Difference 2000-2014	Average Annual % Change	Average Annual Inventory
		2000 Q4	2001 Q4	2002 Q4	2003 Q4	2004 Q4	2005 Q4	2006 Q4	2007 Q4	2008 Q4	2009 Q4	2010 Q4	2011 Q4	2012 Q4	2013 Q4	2014 Q4			
Davis	a	1,230,182	1,234,882	1,321,603	1,419,918	1,447,473	1,471,447	1,503,914	1,524,164	1,666,900	1,699,200	1,699,200	1,699,200	1,726,684	1,768,684	1,768,684	**538,502**	**2.6%**	**1,545,476**
Yolo County	b	3,745,389	3,875,998	3,989,310	4,201,633	4,360,988	4,384,962	4,438,680	4,458,930	4,601,666	5,042,966	5,042,966	5,024,466	5,051,950	5,093,950	5,093,950	**1,348,561**	**2.2%**	**4,560,520**
Greater Sacramento Region (GSR)	c	80,675,003	84,005,323	86,968,557	89,921,218	91,470,826	94,792,611	104,041,824	106,049,694	108,282,215	110,358,976	110,829,795	111,020,786	110,699,259	110,816,876	110,890,440	**30,215,437**	**2.3%**	**100,721,560**
Bay Area		336,494,341	354,004,788	362,632,084	367,649,254	368,129,841	370,283,686	371,667,900	373,166,240	377,260,186	378,778,397	379,874,365	377,326,996	377,986,704	379,480,870	380,481,032	**43,986,691**	**0.9%**	**370,347,779**
Davis as a Percentage of Yolo Co.	**a/b**	**32.8%**	**31.9%**	**33.1%**	**33.8%**	**33.2%**	**33.6%**	**33.9%**	**34.2%**	**36.2%**	**33.7%**	**33.7%**	**33.8%**	**34.2%**	**34.7%**	**34.7%**	**39.9%**	**0.4%**	**33.9%**
Yolo Co. as a Percentage of GSR	**b/c**	**4.6%**	**4.6%**	**4.6%**	**4.7%**	**4.8%**	**4.6%**	**4.3%**	**4.2%**	**4.2%**	**4.6%**	**4.6%**	**4.5%**	**4.6%**	**4.6%**	**4.6%**	**4.5%**	**(0.1%)**	**4.5%**

office inv

Source: CoStar; EPS.

[1] Reflects data as of the fourth quarter of each year.

Table B-2
Davis Commercial Market Analysis
Historical Office Market Vacancy (2000-2014) [1]

Historical Market Vacancy - Office

Market	2000 Q4		2001 Q4		2002 Q4		2003 Q4		2004 Q4		2005 Q4		2006 Q4		2007 Q4	
	Sq. Ft.	%	Sq. Ft.	%	Sq. Ft.	%	Sq. Ft.	%	Sq. Ft.	%	Sq. Ft.	%	Sq. Ft.	%	Sq. Ft.	%
Davis	134,400	10.9%	105,507	8.5%	139,933	10.6%	107,444	7.6%	86,791	6.0%	68,112	4.6%	66,943	4.5%	81,610	5.4%
Yolo County	603,075	16.1%	265,018	6.8%	384,489	9.6%	553,787	13.2%	599,624	13.7%	582,911	13.3%	442,660	10.0%	549,977	12.3%
Greater Sacramento Region (GSR)	6,644,446	8.2%	7,861,906	9.4%	8,904,377	10.2%	10,364,622	11.5%	10,878,495	11.9%	9,802,827	10.3%	12,003,092	11.5%	13,190,374	12.4%
Bay Area	10,547,398	3.1%	39,879,732	11.3%	49,804,626	13.7%	53,377,881	14.5%	47,026,850	12.8%	39,441,338	10.7%	39,188,781	10.5%	36,401,882	9.8%
Davis as a Percentage of Yolo Co.	**-**	**22.3%**	**-**	**39.8%**	**-**	**36.4%**	**-**	**19.4%**	**-**	**14.5%**	**-**	**11.7%**	**-**	**15.1%**	**-**	**14.8%**
Yolo Co. as a Percentage of GSR	**-**	**9.1%**	**-**	**3.4%**	**-**	**4.3%**	**-**	**5.3%**	**-**	**5.5%**	**-**	**5.9%**	**-**	**3.7%**	**-**	**4.2%**

Source: CoStar; EPS.

[1] Data reflects the vacancy as of fourth quarter of each year.

Table B-2
Davis Commercial Market Analysis
Historical Office Market Vacancy (2000-2014) [1]

Historical Market Vacancy - Office

Market	2008 Q4		2009 Q4		2010 Q4		2011 Q4		2012 Q4		2013 Q4		2014 Q4		Average	
	Sq. Ft.	%	Sq. Ft.	%	Sq. Ft.	%	Sq. Ft.	%	Sq. Ft.	%	Sq. Ft.	%	Sq. Ft.	%	Sq. Ft.	%
Davis	129,237	7.8%	196,540	**11.6%**	169,758	10.0%	161,689	9.5%	157,306	9.1%	126,149	7.1%	162,920	9.2%	**126,289**	**8.2%**
Yolo County	553,009	12.0%	682,851	13.5%	491,955	9.8%	478,654	9.5%	520,216	10.3%	467,525	9.2%	409,549	8.0%	**505,687**	**11.1%**
Greater Sacramento Region (GSR)	14,625,212	13.5%	17,157,954	15.5%	17,921,358	16.2%	18,174,923	16.4%	16,685,270	15.1%	16,114,316	14.5%	15,041,550	13.6%	**13,024,715**	**12.9%**
Bay Area	41,721,100	11.1%	51,589,520	13.6%	50,909,636	13.4%	41,479,761	11.0%	36,327,479	9.6%	32,549,148	8.6%	28,970,885	7.6%	**39,947,734**	**10.8%**
Davis as a Percentage of Yolo Co.	**-**	**23.4%**	**-**	**28.8%**	**-**	**34.5%**	**-**	**33.8%**	**-**	**30.2%**	**-**	**27.0%**	**-**	**39.8%**	**-**	**25.0%**
Yolo Co. as a Percentage of GSR	**-**	**3.8%**	**-**	**4.0%**	**-**	**2.7%**	**-**	**2.6%**	**-**	**3.1%**	**-**	**2.9%**	**-**	**2.7%**	**-**	**3.9%**

office vacancy

Source: CoStar; EPS.

[1] Data reflects the vacancy as of fourth quarter of each year.

Table B-3
Davis Commercial Market Analysis
Historical Office Year-to-Date Net Absorption -- Sq. Ft. (2000-2014)

Annual Net Absorption - Office

Market	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total Absorption (2000-2014)	Annual Average (2000-2014)
Davis	13,902	33,593	(28,514)	211,613	48,208	42,653	33,636	3,626	69,115	(13,052)	32,782	8,069	31,867	73,157	(44,929)	**515,726**	**34,382**
Yolo County	(206,957)	487,353	(87,132)	109,325	77,633	81,445	202,628	(87,883)	64,891	380,628	198,496	(5,199)	(16,478)	87,036	27,059	**1,312,845**	**87,523**
Greater Sacramento Region	1,397,942	2,332,385	1,224,578	1,960,314	819,730	4,382,878	1,089,710	974,206	402,505	27,203	(578,094)	745	800,637	946,257	1,093,463	**16,874,459**	**1,124,964**
Bay Area	11,451,826	(13,177,453)	(2,258,408)	1,216,771	6,140,093	9,073,173	2,447,154	4,700,940	253,582	(8,566,546)	(355,667)	4,511,997	5,278,377	6,220,654	4,152,663	**31,089,156**	**2,072,610**

office absorp

Source: CoStar; EPS.

Table B-4
Davis Commercial Market Analysis
Historical Office Market Average Asking Lease Rates (2000-2014)

Average Lease Rates - Office

Market	Lease Type	2000 Q4	2001 Q4	2002 Q4	2003 Q4	2004 Q4	2005 Q4	2006 Q4	2007 Q4	2008 Q4	2009 Q4	2010 Q4	2011 Q4	2012 Q4	2013 Q4	2014 Q4	Average Annual % Change (2000-2014)	Difference (2000-2014)	Average
Davis	Full Service	$1.64	$1.69	$1.82	$2.33	$1.82	$1.97	$2.08	$2.17	$2.34	$2.16	$2.03	$1.94	$1.81	$1.81	$1.87	**0.95%**	**$0.23**	**$1.97**
Yolo County	Full Service	$1.45	$1.50	$1.37	$1.49	$1.50	$1.57	$1.59	$1.79	$1.77	$1.78	$1.75	$1.68	$1.64	$1.64	$1.61	**0.75%**	**$0.16**	**$1.61**
Greater Sacramento Region (GSR)	Full Service	$1.59	$1.67	$1.70	$1.75	$1.77	$1.88	$1.90	$2.03	$1.96	$1.85	$1.76	$1.67	$1.63	$1.61	$1.64	**0.24%**	**$0.05**	**$1.76**
Bay Area	Full Service	$4.05	$2.86	$2.25	$1.95	$1.89	$1.91	$1.98	$2.36	$2.47	$2.13	$2.14	$2.30	$2.48	$2.61	$2.83	**-2.53%**	**($1.22)**	**$2.41**
Davis as a Percentage of Yolo Co.		**13.5%**	**12.7%**	**33.2%**	**55.7%**	**21.1%**	**25.5%**	**30.9%**	**21.0%**	**31.9%**	**21.3%**	**16.0%**	**15.3%**	**10.5%**	**10.6%**	**16.7%**	**-**	**-**	**-**
Yolo Co. as a Percentage of GSR		**(9.0%)**	**(10.3%)**	**(19.5%)**	**(14.9%)**	**(14.9%)**	**(16.6%)**	**(16.4%)**	**(11.8%)**	**(9.7%)**	**(3.7%)**	**(0.8%)**	**0.6%**	**0.9%**	**1.7%**	**(2.2%)**	**-**	**-**	**-**

office lease rt

Source: CoStar; EPS.

Table B-5
Davis Commercial Market Analysis
Office Market Annual RBA Delivered

Annual Square Feet Constructed - Office

Market	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total Bldg. Sq. Ft. Constructed	Average Annual (2000-2014)
Davis	105,000	4,700	86,721	98,315	27,555	23,974	35,107	20,250	142,736	32,300	0	0	27,484	42,000	0	**646,142**	**43,076**
Yolo County	116,964	130,609	113,312	212,323	159,355	23,974	45,107	20,250	142,736	441,300	0	0	27,484	42,000	0	**1,475,414**	**98,361**
Greater Sacramento Region (GSR)	2,017,323	3,334,416	2,964,226	2,958,538	1,658,636	3,466,785	1,713,802	2,197,915	2,374,612	2,335,906	600,678	240,195	359,559	273,931	236,221	**26,732,743**	**1,782,183**
Bay Area	11,681,183	17,830,731	9,010,314	5,251,949	833,981	2,705,892	1,576,910	2,115,539	5,717,026	2,528,997	1,704,968	160,176	1,928,392	2,840,342	2,550,211	**68,436,611**	**4,562,441**
Davis as a Percentage of Yolo Co.	**89.8%**	**3.6%**	**76.5%**	**46.3%**	**17.3%**	**100.0%**	**77.8%**	**100.0%**	**100.0%**	**7.3%**	**0.0%**	**0.0%**	**100.0%**	**100.0%**	**0.0%**	**43.8%**	**43.8%**
Yolo Co. as a Percentage of GSR	**5.8%**	**3.9%**	**3.8%**	**7.2%**	**9.6%**	**0.7%**	**2.6%**	**0.9%**	**6.0%**	**18.9%**	**0.0%**	**0.0%**	**7.6%**	**15.3%**	**0.0%**	**5.5%**	**5.5%**

office deliv

Source: CoStar; EPS.

DRAFT

Table B-6
Davis Commercial Market Analysis
Flex Market Inventory: Leasable Square Feet

Flex Inventory:
Leasable Sq. Ft.

Market	Flex Inventory: Leasable Sq. Ft. [1]															Difference 2000-2014	Average Annual % Change	Average Annual Inventory
	2000 Q4	2001 Q4	2002 Q4	2003 Q4	2004 Q4	2005 Q4	2006 Q4	2007 Q4	2008 Q4	2009 Q4	2010 Q4	2011 Q4	2012 Q4	2013 Q4	2014 Q4			
Davis	248,933	266,533	266,533	266,533	266,533	287,582	287,582	287,582	287,582	358,757	358,757	358,757	358,757	358,757	358,757	**109,824**	**2.6%**	**307,862**
Yolo County	841,106	858,706	858,706	858,706	858,706	879,755	879,755	879,755	879,755	950,930	943,430	943,430	943,430	943,430	943,430	**102,324**	**0.8%**	**897,535**
Greater Sacramento Region (GSR)	5,222,156	5,400,316	5,708,330	5,749,850	5,829,006	5,925,230	7,384,674	7,448,396	7,512,440	7,587,215	7,579,715	7,579,715	7,579,715	7,570,215	7,595,457	**2,373,301**	**2.7%**	**6,778,162**
Bay Area	148,626,205	157,049,389	158,588,722	159,075,959	159,734,977	160,098,766	160,962,263	161,258,086	161,531,114	160,761,087	160,397,827	159,060,683	157,014,935	155,268,414	153,639,896	**5,013,691**	**0.2%**	**158,204,555**
Davis as a Percentage of Yolo County	**29.6%**	**31.0%**	**31.0%**	**31.0%**	**31.0%**	**32.7%**	**32.7%**	**32.7%**	**32.7%**	**37.7%**	**38.0%**	**38.0%**	**38.0%**	**38.0%**	**38.0%**	**107.3%**	**1.8%**	**34.3%**
Yolo County as a Percentage of GSR	**16.1%**	**15.9%**	**15.0%**	**14.9%**	**14.7%**	**14.8%**	**11.9%**	**11.8%**	**11.7%**	**12.5%**	**12.4%**	**12.4%**	**12.4%**	**12.5%**	**12.4%**	**4.3%**	**(1.8%)**	**13.2%**

flex inv

Source: CoStar; EPS.

Table B-7
Davis Commercial Market Analysis
Historical Flex Market Vacancy (2000-2014) [1]

Historical Market Vacancy - Flex

Market	2000 Q4		2001 Q4		2002 Q4		2003 Q4		2004 Q4		2005 Q4		2006 Q4		2007 Q4	
	Sq. Ft.	%	Sq. Ft.	%	Sq. Ft.	%	Sq. Ft.	%	Sq. Ft.	%	Sq. Ft.	%	Sq. Ft.	%	Sq. Ft.	%
Davis	25,243	10.1%	24,510	9.2%	34,205	12.8%	52,534	19.7%	48,525	18.2%	93,776	32.6%	63,157	22.0%	52,193	18.1%
Yolo County	50,098	6.0%	57,130	6.7%	61,366	7.1%	85,121	9.9%	62,014	7.2%	129,946	14.8%	112,492	12.8%	109,573	12.5%
Greater Sacramento Region (GSR)	204,214	3.9%	959,721	17.8%	1,139,655	20.0%	1,092,964	19.0%	1,180,007	20.2%	1,098,559	18.5%	1,451,131	19.7%	1,527,247	20.5%
Bay Area	4,708,231	3.2%	19,683,437	12.5%	28,228,848	17.8%	33,113,539	20.8%	30,051,533	18.8%	27,313,830	17.1%	27,337,636	17.0%	22,674,032	14.1%
Davis as a Percentage of Yolo Co.	**-**	**50.4%**	**-**	**42.9%**	**-**	**55.7%**	**-**	**61.7%**	**-**	**78.2%**	**-**	**72.2%**	**-**	**56.1%**	**-**	**47.6%**
Yolo Co. as a Percentage of GSR	**-**	**24.5%**	**-**	**6.0%**	**-**	**5.4%**	**-**	**7.8%**	**-**	**5.3%**	**-**	**11.8%**	**-**	**7.8%**	**-**	**7.2%**

Source: CoStar; EPS.

[1] Data reflects the vacancy as of fourth quarter of each year.

Table B-7
Davis Commercial Market Analysis
Historical Flex Market Vacancy (2000-2014) [1]

Historical Market Vacancy - Flex

Market	2008 Q4		2009 Q4		2010 Q4		2011 Q4		2012 Q4		2013 Q4		2014 Q4		Average	
	Sq. Ft.	%	Sq. Ft.	%	Sq. Ft.	%	Sq. Ft.	%	Sq. Ft.	%	Sq. Ft.	%	Sq. Ft.	%	Sq. Ft.	%
Davis	43,002	15.0%	42,300	11.8%	36,657	10.2%	42,600	11.9%	76,385	21.3%	76,943	21.4%	86,408	24.1%	**53,229**	**17.3%**
Yolo County	88,834	10.1%	101,306	10.7%	123,031	13.0%	138,010	14.6%	146,817	15.6%	191,027	20.2%	155,022	16.4%	**107,452**	**12.0%**
Greater Sacramento Region (GSR)	1,761,253	23.4%	1,765,012	23.3%	1,874,930	24.7%	1,748,917	23.1%	1,668,054	22.0%	1,614,399	21.3%	1,714,483	22.6%	**1,386,703**	**20.5%**
Bay Area	22,448,574	13.9%	26,279,045	16.3%	26,329,263	16.4%	23,017,675	14.5%	20,688,008	13.2%	18,807,109	12.1%	16,011,703	10.4%	**23,112,831**	**14.6%**
Davis as a Percentage of Yolo Co.	**-**	**48.4%**	**-**	**41.8%**	**-**	**29.8%**	**-**	**30.9%**	**-**	**52.0%**	**-**	**40.3%**	**-**	**55.7%**	**-**	**49.5%**
Yolo Co. as a Percentage of GSR	**-**	**5.0%**	**-**	**5.7%**	**-**	**6.6%**	**-**	**7.9%**	**-**	**8.8%**	**-**	**11.8%**	**-**	**9.0%**	**-**	**7.7%**

flex vacancy

Source: CoStar; EPS.

[1] Data reflects the vacancy as of fourth quarter of each year.

Table B-8
Davis Commercial Market Analysis
Historical Flex Year-to-Date Net Absorption -- Sq. Ft. (2000-2014)

Annual Net Absorption - Flex

Market	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total Absorption (2000-2014)	Annual Average (2000-2014)
Davis	(8,707)	22,788	(18,744)	(18,329)	13,058	(24,202)	20,619	20,964	9,191	71,877	5,643	(5,943)	(33,785)	(558)	(9,465)	**44,407**	**2,960**
Yolo County	(29,476)	45,023	(13,285)	(30,705)	21,306	(29,083)	7,454	12,919	139	79,303	(29,225)	(21,179)	(8,807)	(43,054)	35,953	**(2,717)**	**(181)**
Greater Sacramento Region (GSR)	436,065	(558,366)	95,752	34,420	3,091	157,921	68,186	35,451	(149,110)	101,265	(111,917)	101,667	103,169	18,123	(78,377)	**257,340**	**17,156**
Bay Area	9,854,886	(6,487,351)	(7,371,091)	(4,256,190)	2,761,051	2,868,156	1,406,107	4,255,134	1,609,581	(4,159,327)	(1,113,353)	1,094,663	950,313	(1,122,769)	2,202,656	**2,492,466**	**166,164**

flex absorp

Source: CoStar; EPS.

Table B-9
Davis Commercial Market Analysis
Historical Flex Market Average Asking Lease Rates (2000-2014)

Average Lease Rates - Flex

Market	Lease Type	2000 Q4	2001 Q4	2002 Q4	2003 Q4	2004 Q4	2005 Q4	2006 Q4	2007 Q4	2008 Q4	2009 Q4	2010 Q4	2011 Q4	2012 Q4	2013 Q4	2014 Q4	Average Annual % Change (2000-2014)	Difference (2000-2014)	Average
Davis	NNN	$0.93	$0.70	$0.75	$0.84	$0.86	$1.08	$1.25	$1.33	$1.03	$0.75	$0.72	$0.76	$0.92	$0.97	$1.04	**0.78%**	**$0.11**	**$0.93**
Yolo County	NNN	$0.57	$0.60	$0.70	$0.69	$0.78	$0.79	$0.81	$0.82	$0.86	$0.74	$0.76	$0.78	$0.83	$0.84	$0.89	**3.31%**	**$0.33**	**$0.76**
Greater Sacramento Region (GSR)	NNN	$0.65	$0.68	$0.82	$0.66	$0.77	$0.89	$0.95	$0.99	$0.98	$0.83	$0.80	$0.76	$0.78	$0.75	$0.73	**0.88%**	**$0.09**	**$0.80**
Bay Area	NNN	$1.93	$2.05	$1.25	$0.95	$0.86	$0.87	$0.96	$1.22	$1.32	$1.09	$1.04	$1.10	$1.18	$1.29	$1.38	**-2.36%**	**($0.55)**	**$1.23**
Davis as a Percentage of Yolo Co.		**64.9%**	**17.0%**	**7.0%**	**22.3%**	**10.4%**	**37.4%**	**53.5%**	**62.2%**	**19.3%**	**1.7%**	**(5.5%)**	**(2.7%)**	**11.7%**	**15.2%**	**16.5%**	**-**	**-**	**-**
Yolo Co. as a Percentage of GSR		**(12.7%)**	**(11.1%)**	**(14.3%)**	**3.5%**	**0.4%**	**(11.1%)**	**(13.9%)**	**(17.4%)**	**(12.4%)**	**(11.4%)**	**(5.2%)**	**1.5%**	**6.0%**	**12.5%**	**21.8%**	**-**	**-**	**-**

flex lease rt

Source: CoStar; EPS.

Table B-10
Davis Commercial Market Analysis
Flex Market Annual RBA Delivered

Annual Square Feet Constructed - Flex

Market	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total Bldg. Sq. Ft. Constructed	Average Annual (2000-2014)
Davis	0	17,600	0	0	0	21,049	0	0	0	71,175	0	0	0	0	0	**109,824**	**7,322**
Yolo County	0	17,600	0	0	0	21,049	0	0	0	71,175	0	0	0	0	0	**109,824**	**7,322**
Greater Sacramento Region (GSR)	123,478	178,160	308,014	41,520	79,156	96,224	226,402	63,722	94,178	74,775	0	0	0	0	25,242	**1,310,871**	**87,391**
Bay Area	4,029,975	8,423,184	1,539,333	487,237	715,065	363,789	1,092,645	486,637	939,772	358,182	315,120	611,000	221,710	107,000	115,600	**19,806,249**	**1,320,417**
Davis as a Percentage of Yolo Co.	**0.0%**	**100.0%**	**0.0%**	**0.0%**	**0.0%**	**100.0%**	**0.0%**	**0.0%**	**0.0%**	**100.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**100.0%**	**100.0%**
Yolo Co. as a Percentage of GSR	**0.0%**	**9.9%**	**0.0%**	**0.0%**	**0.0%**	**21.9%**	**0.0%**	**0.0%**	**0.0%**	**95.2%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**8.4%**	**8.4%**

flex deliv

Source: CoStar; EPS.

Table B-11
Davis Commercial Market Analysis
Industrial Market Inventory: Leasable Square Feet

Industrial Inventory: Leasable Sq. Ft.

Market	Industrial Inventory: Leasable Sq. Ft. [1]															Difference 2000-2014	Average Annual % Change	Average Annual Inventory
	2000 Q4	2001 Q4	2002 Q4	2003 Q4	2004 Q4	2005 Q4	2006 Q4	2007 Q4	2008 Q4	2009 Q4	2010 Q4	2011 Q4	2012 Q4	2013 Q4	2014 Q4			
Davis	831,934	849,534	849,534	849,534	849,534	849,534	849,534	849,534	290,534	290,534	290,534	290,534	490,534	457,628	457,628	**(374,306)**	**-4.2%**	**623,107**
Yolo County	29,072,727	29,527,163	30,472,978	30,692,935	30,750,455	31,050,399	31,184,195	31,184,195	30,925,195	30,905,195	30,861,205	30,118,821	30,318,821	30,465,466	30,775,466	**1,702,739**	**0.4%**	**30,553,681**
Greater Sacramento Region (GSR)	131,275,987	133,563,089	136,280,641	137,348,242	139,367,357	141,600,595	177,389,484	179,142,593	179,092,530	178,967,329	177,975,786	177,484,872	177,677,392	177,803,579	178,504,224	**47,228,237**	**2.2%**	**161,564,913**
Bay Area	353,762,068	355,667,726	355,601,985	356,051,497	356,779,126	356,135,573	355,268,036	354,452,993	353,695,179	351,366,746	350,180,238	346,811,039	342,122,405	338,879,997	337,949,388	**(15,812,680)**	**-0.3%**	**350,981,600**
Davis as a Percentage of Yolo County	**2.9%**	**2.9%**	**2.8%**	**2.8%**	**2.8%**	**2.7%**	**2.7%**	**2.7%**	**0.9%**	**0.9%**	**0.9%**	**1.0%**	**1.6%**	**1.5%**	**1.5%**	**(22.0%)**	**(4.6%)**	**2.0%**
Yolo County as a Percentage of GSR	**22.1%**	**22.1%**	**22.4%**	**22.3%**	**22.1%**	**21.9%**	**17.6%**	**17.4%**	**17.3%**	**17.3%**	**17.3%**	**17.0%**	**17.1%**	**17.1%**	**17.2%**	**3.6%**	**(1.8%)**	**18.9%**

ind inv

Source: CoStar; EPS.

Table B-12
Davis Commercial Market Analysis
Historical Industrial Market Vacancy (2000-2014) [1]

Historical Market Vacancy - Industrial

Market	2000 Q4		2001 Q4		2002 Q4		2003 Q4		2004 Q4		2005 Q4		2006 Q4		2007 Q4	
	Sq. Ft.	%	Sq. Ft.	%	Sq. Ft.	%	Sq. Ft.	%	Sq. Ft.	%	Sq. Ft.	%	Sq. Ft.	%	Sq. Ft.	%
Davis	11,200	1.3%	14,100	1.7%	22,070	2.6%	17,200	2.0%	552,300	65.0%	14,200	1.7%	9,300	1.1%	7,500	0.9%
Yolo County	2,289,675	7.9%	3,516,784	11.9%	4,420,709	14.5%	3,708,799	12.1%	4,621,488	15.0%	3,990,407	12.9%	3,167,242	10.2%	2,932,675	9.4%
Greater Sacramento Region (GSR)	10,279,492	7.8%	15,474,401	11.6%	16,804,280	12.3%	15,660,704	11.4%	17,421,816	12.5%	15,430,270	10.9%	19,636,917	11.1%	18,628,724	10.4%
Bay Area	8,610,589	2.4%	23,527,838	6.6%	27,964,522	7.9%	31,151,957	8.7%	24,354,262	6.8%	22,826,550	6.4%	21,564,578	6.1%	18,411,485	5.2%
Davis as a Percentage of Yolo Co.	-	**0.5%**	-	**0.4%**	-	**0.5%**	-	**0.5%**	-	**12.0%**	-	**0.4%**	-	**0.3%**	-	**0.3%**
Yolo Co. as a Percentage of GSR	-	**22.3%**	-	**22.7%**	-	**26.3%**	-	**23.7%**	-	**26.5%**	-	**25.9%**	-	**16.1%**	-	**15.7%**

Source: CoStar; EPS.

[1] Data reflects the vacancy as of fourth quarter of each year.

Table B-12
Davis Commercial Market Analysis
Historical Industrial Market Vacancy (2000-2014) [1]

Historical Market Vacancy - Industrial

Market	2008 Q4		2009 Q4		2010 Q4		2011 Q4		2012 Q4		2013 Q4		2014 Q4		Average	
	Sq. Ft.	%	Sq. Ft.	%	Sq. Ft.	%	Sq. Ft.	%	Sq. Ft.	%	Sq. Ft.	%	Sq. Ft.	%	Sq. Ft.	%
Davis	11,200	3.9%	13,696	4.7%	8,606	3.0%	36,216	12.5%	58,596	11.9%	34,700	7.6%	41,027	9.0%	**56,794**	**9.1%**
Yolo County	2,557,519	8.3%	2,907,348	9.4%	3,802,959	12.3%	3,281,018	10.9%	3,800,450	12.5%	3,166,495	10.4%	1,941,243	6.3%	**3,340,321**	**10.9%**
Greater Sacramento Region (GSR)	18,540,459	10.4%	21,729,017	12.1%	24,249,683	13.6%	22,669,855	12.8%	21,231,095	11.9%	19,899,285	11.2%	16,704,181	9.4%	**18,290,679**	**11.3%**
Bay Area	17,715,637	5.0%	24,063,860	6.8%	26,965,305	7.7%	25,605,823	7.4%	22,628,666	6.6%	17,126,316	5.1%	14,056,118	4.2%	**21,771,567**	**6.2%**
Davis as a Percentage of Yolo Co.	**-**	**0.4%**	**-**	**0.5%**	**-**	**0.2%**	**-**	**1.1%**	**-**	**1.5%**	**-**	**1.1%**	**-**	**2.1%**	**-**	**1.7%**
Yolo Co. as a Percentage of GSR	**-**	**13.8%**	**-**	**13.4%**	**-**	**15.7%**	**-**	**14.5%**	**-**	**17.9%**	**-**	**15.9%**	**-**	**11.6%**	**-**	**18.3%**

ind vacancy

Source: CoStar; EPS.

[1] Data reflects the vacancy as of fourth quarter of each year.

Table B-13
Davis Commercial Market Analysis
Historical Industrial Year-to-Date Net Absorption -- Sq. Ft. (2000-2014)

Annual Net Absorption - Industrial

Market	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total Absorption (2000-2014)	Annual Average (2000-2014)
Davis	(5,500)	14,700	(7,970)	4,870	(535,100)	538,100	4,900	(557,200)	(3,700)	(2,496)	5,090	(27,610)	177,620	(9,010)	(6,327)	**(409,633)**	**(27,309)**
Yolo County	452,753	(746,155)	(196,170)	580,073	(325,658)	924,163	816,080	(74,935)	701,011	(355,836)	(1,038,385)	(162,548)	(428,348)	668,814	1,684,560	**2,499,419**	**166,628**
Greater Sacramento Region (GSR)	1,363,001	(4,860,281)	2,975,631	737,338	2,140,760	3,714,979	3,357,358	2,907,771	490,235	(4,069,226)	(2,648,937)	322,042	1,321,369	2,107,715	3,811,957	**13,671,712**	**911,447**
Bay Area	2,868,681	(12,708,503)	(3,148,896)	(3,013,563)	5,917,463	1,646,350	(388,809)	3,935,679	(296,004)	(9,071,038)	(5,331,359)	(2,228,862)	(2,293,576)	1,748,576	4,481,579	**(17,882,282)**	**(1,192,152)**

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Source: CoStar; EPS.

Table B-14
Davis Commercial Market Analysis
Historical Industrial Market Average Asking Lease Rates (2000-2014)

Average Lease Rates - Office

Market	Lease Type	2000 Q4	2001 Q4	2002 Q4	2003 Q4	2004 Q4	2005 Q4	2006 Q4	2007 Q4	2008 Q4	2009 Q4	2010 Q4	2011 Q4	2012 Q4	2013 Q4	2014 Q4	Average Annual % Change (2000-2014)	Difference (2000-2014)	Average
Davis	NNN	-	-	-	-	$0.20	$0.20	-	-	-	-	-	$0.85	$0.85	$1.25	$1.25	**N/A**	**N/A**	**$0.77**
Yolo County	NNN	$0.30	$0.30	$0.31	$0.29	$0.29	$0.31	$0.32	$0.38	$0.34	$0.34	$0.31	$0.31	$0.33	$0.32	$0.35	**1.08%**	**$0.05**	**$0.32**
Greater Sacramento Region (GSR)	NNN	$0.35	$0.33	$0.33	$0.36	$0.38	$0.40	$0.44	$0.49	$0.43	$0.40	$0.38	$0.36	$0.37	$0.36	$0.36	**0.25%**	**$0.01**	**$0.38**
Bay Area	NNN	$0.82	$0.78	$0.60	$0.53	$0.51	$0.51	$0.54	$0.59	$0.60	$0.55	$0.51	$0.53	$0.55	$0.60	$0.67	**-1.40%**	**($0.15)**	**$0.59**
Davis as a Percentage of Yolo Co.		**n/a**	**n/a**	**n/a**	**n/a**	**(31.0%)**	**(35.7%)**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**172.0%**	**156.9%**	**289.6%**	**261.4%**	**-**	**-**	**-**
Yolo Co. as a Percentage of GSR		**(14.4%)**	**(9.6%)**	**(7.3%)**	**(18.5%)**	**(23.2%)**	**(22.9%)**	**(27.0%)**	**(22.0%)**	**(20.8%)**	**(15.3%)**	**(19.0%)**	**(13.4%)**	**(11.4%)**	**(10.7%)**	**(3.9%)**	**-**	**-**	**-**

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Source: CoStar; EPS.

Table B-15
Davis Commercial Market Analysis
Industrial Market Annual RBA Delivered

Annual Square Feet Constructed - Industrial

Market	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total Bldg. Sq. Ft. Constructed	Average Annual (2000-2014)
Davis	0	17,600	0	0	0	0	0	0	0	0	0	0	200,000	0	0	**217,600**	**14,507**
Yolo County	1,279,184	454,436	945,815	219,957	93,905	299,944	133,796	0	300,000	0	0	0	200,000	201,211	310,000	**4,438,248**	**295,883**
Greater Sacramento Region (GSR)	2,949,712	2,415,102	2,823,852	1,124,072	2,055,500	2,233,238	1,767,876	2,037,109	682,231	136,892	75,666	343,820	242,000	532,363	981,880	**20,401,313**	**1,360,088**
Bay Area	2,639,007	2,995,143	1,879,277	944,234	779,129	562,493	1,163,120	788,939	574,083	640,427	776,688	27,200	218,390	217,555	1,833,364	**16,039,049**	**1,069,270**
Davis as a Percentage of Yolo Co.	**0.0%**	**3.9%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**100.0%**	**0.0%**	**0.0%**	**4.9%**	**4.9%**
Yolo Co. as a Percentage of GSR	**43.4%**	**18.8%**	**33.5%**	**19.6%**	**4.6%**	**13.4%**	**7.6%**	**0.0%**	**44.0%**	**0.0%**	**0.0%**	**0.0%**	**82.6%**	**37.8%**	**31.6%**	**21.8%**	**21.8%**

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Source: CoStar; EPS.

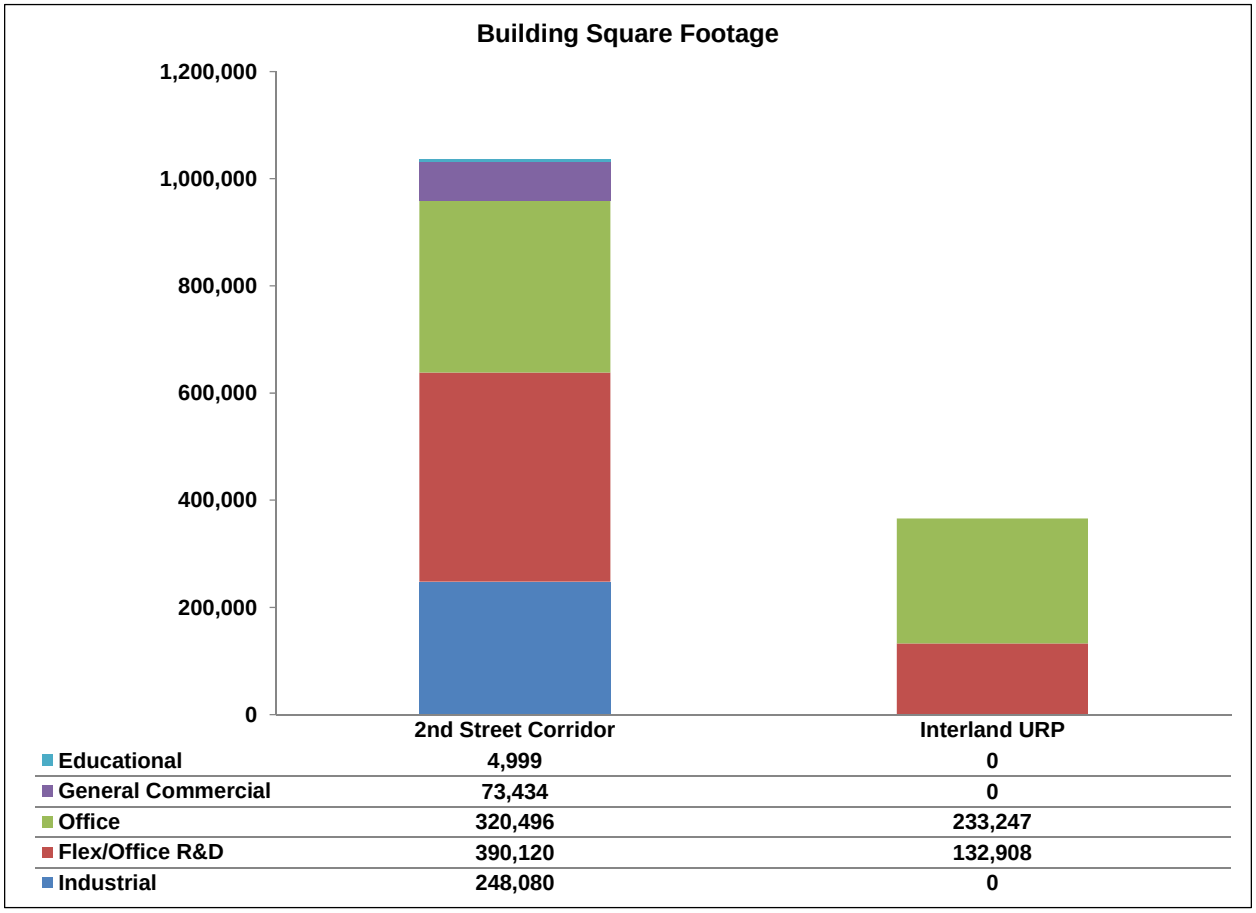
APPENDIX C:

Davis Innovation Districts
Land Use and Building Types

DAVIS INNOVATION DISTRICTS LAND USE AND BUILDING TYPES

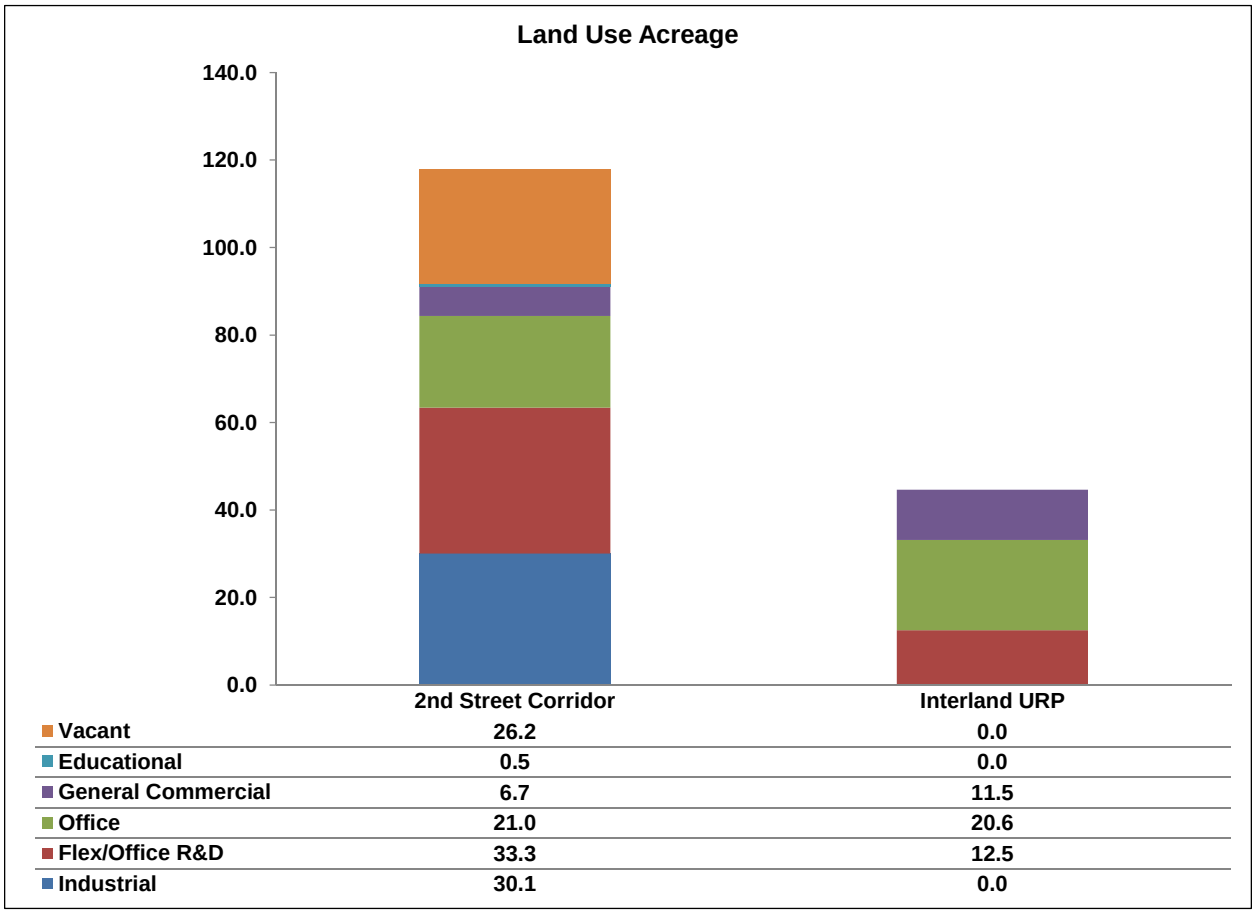
The City of Davis provided land use data for the two existing innovation districts in the community, the 2nd Street Corridor and Interland University Research Park. **Figures C-1** and **C-2** summarize the building square footage and area acreage by land use building type category based on the City's data.

Figure C-1
Existing Davis Innovation Districts Building Square Footage



	2nd Street Corridor	Interland URP
Educational	4,999	0
General Commercial	73,434	0
Office	320,496	233,247
Flex/Office R&D	390,120	132,908
Industrial	248,080	0

Figure C-2
Existing Davis Innovation Districts Acreage



	2nd Street Corridor	Interland URP
Vacant	26.2	0.0
Educational	0.5	0.0
General Commercial	6.7	11.5
Office	21.0	20.6
Flex/Office R&D	33.3	12.5
Industrial	30.1	0.0

APPENDIX D:

Infrastructure Burden Comparison

INFRASTRUCTURE BURDEN COMPARISON

One method of evaluating the financial feasibility of development projects is to compare backbone infrastructure and public facility costs to competitive projects in the region. The City projects include development in East Davis/Mace, South Davis, and the general Davis area not located in any infrastructure Mello-Roos Community Facility Districts (CFDs). The most likely competitive projects include development in West Sacramento, Vacaville, Roseville, and Folsom. The infrastructure burden comparison is based on city and county fees, special districts fees, school fees, plan area fees, and special taxes and assessments for infrastructure for the following land uses:

- Light Industrial Development
- Office/Business Park Development

Caution should be exercised in using these comparisons because the infrastructure items paid for by these fees may be different for the various projects. Moreover, these costs represent estimates only meant to be used for general planning and comparison purposes. Actual fees are likely to be different for specific parcels.

As shown on **Table D-1** and **Table D-2**, the city/county fees for Davis are slightly higher in the area without a CFD, but the infrastructure CFDs increase the total infrastructure burden for East Davis/Mace Ranch and South Davis. East Davis/Mace Ranch is also located in two school CFDs, while the other areas are only located in one. The 1991-2 East Davis/Mace Ranch CFD has been reduced to 65-percent of the maximum assessment and the South Davis CFD has been reduced to 40-percent of the maximum assessment for the current fiscal year.

Light Industrial Comparison

Table D-1 shows the infrastructure cost burden for light industrial development. The light industrial prototype is a 350,000 square-foot project on a 20 acre site. As shown on **Table D-1**, the infrastructure burden for light industrial development in Davis is comparable to other competitive projects in the region. The infrastructure burden for general Davis (no infrastructure CFDs) and South Davis is lower than all of the other competitive projects except VacaValley Industrial Park in Vacaville. East Davis/Mace Ranch is lower than both projects located in West Sacramento, which is the closest area to Davis geographically.

Office/Business Park Comparison

Table D-2 shows the infrastructure cost burden for office/business park development. The office/business park prototype is a 75,000 square-foot project on a 5 acre site. As shown on **Table D-2**, the infrastructure burden for office/business park development in Davis is comparable to other competitive projects in the region. The infrastructure burden for general Davis (no infrastructure CFDs) and South Davis is lower than all of the other competitive projects except VacaValley Industrial Park in Vacaville and Folsom Broadstone Unit III. East Davis/Mace Ranch is lower than Southport and very close to the infrastructure burden for Riverside Centre

Business Park, both of which are located in West Sacramento, which is the closest area to Davis geographically.

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Table D-1
Light Industrial Development Infrastructure Burden Comparison

Item	Davis			West Sacramento		Folsom	Roseville	Vacaville
	Base (no CFD)	South (Interland)	Mace (2nd Street)	Riverside Centre Business Park	Southport	Broadstone Unit III	Westpark (Phase 4)	VacaValley Industrial Park
Assumptions								
Building Valuation	*$22,554,000*	*$22,554,000*	*$22,554,000*	*$22,554,000*	*$22,554,000*	*$22,554,000*	*$22,554,000*	*$22,554,000*
Building Square Feet	350,000	350,000	350,000	350,000	350,000	350,000	350,000	350,000
Acres	20	20	20	20	20	20	20	20
Floor Area Ratio	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40
City/County Fees per Sq. Ft.								
Processing Fees per Sq. Ft. [1]								
Building Permit	$0.41	$0.41	$0.41	$0.30	$0.30	$0.33	$0.14	$0.17
Plan Check	$0.27	$0.27	$0.27	$0.24	$0.24	$0.33	$0.15	$0.15
Energy	-	-	-	$0.00	$0.00	-	-	$0.04
Technology Surcharge	-	-	-	$0.04	$0.04	-	$0.01	-
Seismic/Strong Motion	$0.02	$0.02	$0.02	$0.02	$0.02	$0.02	$0.02	$0.02
California Building Standards Commission Fee	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Fire Review Fee	$0.07	$0.07	$0.07	$0.00	$0.00	-	-	$0.03
Long Range Planning Fee	$0.13	$0.13	$0.13	-	-	-	-	-
Construction Tax	$3.10	$3.10	$3.10	-	-	-	-	-
CAL Green Fee	$0.03	$0.03	$0.03	-	-	-	-	-
Commercial Plan Check	-	-	-	-	-	$0.03	-	-
General Plan Update Fee	-	-	-	-	-	$0.02	-	-
Landscape Plan Fee	-	-	-	-	-	-	-	$0.08
Total Processing Fees per Sq. Ft.	**$4.03**	**$4.03**	**$4.03**	**$0.61**	**$0.61**	**$0.72**	**$0.32**	**$0.49**
Development Impact Fees per Sq. Ft.								
Sewer	$0.77	$0.77	$0.77	$0.49	$0.67	$0.53	$2.46	$0.77
Water [2]	$0.85	$0.85	$0.85	$0.72	$0.72	$0.52	$0.83	$1.74
Traffic/Roadways/Transportation (Local and Regional)	$0.48	$0.41	$0.41	$11.27	$15.17	$4.77	$4.30	$2.76
Drainage	$0.12	$0.12	$0.12	-	$2.53	$0.32	$0.32	$0.48
School	$0.47	$0.47	$0.47	$0.54	$0.54	$0.54	$0.50	$0.33
Parks/Open Space	$0.22	$0.22	$0.22	$0.88	$0.88	$0.36	-	-
Fire/Police	$0.28	$0.27	$0.26	$0.92	$0.92	$1.04	$0.32	$0.27
In-Lieu Flood Protection Fees	-	-	-	$1.32	$1.32	-	-	-
Housing Trust Fund	-	-	-	-	-	$1.35	-	-
Habitat/Greenbelt Preservation	$0.49	$0.49	$0.49	-	-	-	-	-
Capital Improvements/Public Facilities	$0.24	$0.24	$0.23	-	-	$0.45	$0.42	$0.21
Other General Fees/One-Time Taxes [3]	-	-	-	$0.78	$0.78	$0.02	$1.48	-
Countywide Fee	$0.40	$0.40	$0.40	-	-	-	$0.25	$0.60
Total Development Impact Fees per Sq. Ft.	**$4.33**	**$4.25**	**$4.23**	**$16.91**	**$23.52**	**$9.90**	**$10.88**	**$7.17**
Total City/County Fees	**$8.36**	**$8.28**	**$8.26**	**$17.52**	**$24.13**	**$10.62**	**$11.19**	**$7.66**

Table D-1
Light Industrial Development Infrastructure Burden Comparison

Item	Davis			West Sacramento		Folsom	Roseville	Vacaville
	Base (no CFD)	South (Interland)	Mace (2nd Street)	Riverside Centre Business Park	Southport	Broadstone Unit III	Westpark (Phase 4)	VacaValley Industrial Park
Assumptions								
Building Valuation	*$22,554,000*	*$22,554,000*	*$22,554,000*	*$22,554,000*	*$22,554,000*	*$22,554,000*	*$22,554,000*	*$22,554,000*
Building Square Feet	350,000	350,000	350,000	350,000	350,000	350,000	350,000	350,000
Acres	20	20	20	20	20	20	20	20
Floor Area Ratio	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40
Plan Area Fees [4]	-	-	-	-	$0.02	-	$0.03	$0.00
Annual Special Taxes and Assessments								
Infrastructure CFD	-	$0.86	$6.75	-	$3.58	$2.15	$2.68	-
Infrastructure Assessment District	-	-	-	$0.16	-		-	$0.11
School CFD	$1.13	$1.13	$2.10	-	-	-	-	-
West Sacramento Area Flood Control	-	-	-	$0.72	$0.72	-	-	-
Total Annual Special Taxes and Assessments	**$1.13**	**$1.99**	**$8.84**	**$0.88**	**$4.30**	**$2.15**	**$2.68**	**$0.11**
Total Fees per Sq. Ft.	**$9.49**	**$10.27**	**$17.10**	**$18.40**	**$28.45**	**$12.77**	**$13.90**	**$7.77**
Fees per Acre	$166,097	$179,742	$299,332	$321,987	$497,851	$223,463	$243,272	$135,982

ind fees

Source: City of Davis; City of Roseville; City of West Sacramento; Yolo County; EPS.

[1] Processing fees exclude mechanical, electrical, plumbing and other similar review fees.
[2] Assumes two 4-inch water meters.
[3] Roseville: Includes the electric installation fee and solid waste fee. West Sacramento: Includes the corp yard, city hall, and childcare impact fees.
Folsom: Includes solid waste capital fee, school impact mitigation fee, and business license fee.
[4] Westpark: West Roseville Specific Plan air quality program fee. Southport: Southport framework plan area fee.

Table D-2
Office/Business Park Development Infrastructure Burden Comparison

Item	Davis			West Sacramento		Folsom	Roseville	Vacaville
	Base (no CFD)	South (Interland)	Mace (2nd Street)	Riverside Centre Business Park	Southport	Broadstone Unit III	North Central	VacaValley Business Park
Assumptions								
Building Valuation	*$9,282,000*	*$9,282,000*	*$9,282,000*	*$9,282,000*	*$9,282,000*	*$9,282,000*	*$9,282,000*	*$9,282,000*
Building Square Feet	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000
Acres	5	5	5	5	5	5	5	5
Floor Area Ratio	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34
City/County Fees per Sq. Ft.								
Processing Fees per Sq. Ft. [1]								
Building Permit	$0.83	$0.83	$0.83	$0.59	$0.59	$0.63	$0.28	$0.34
Plan Check	$0.54	$0.54	$0.54	$0.49	$0.49	$0.63	$0.31	$0.31
Energy	-	-	-	$0.00	$0.00	-	-	$0.04
Technology Surcharge	-	-	-	$0.09	$0.09	-	$0.02	-
Seismic/Strong Motion	$0.03	$0.03	$0.03	$0.03	$0.03	$0.03	$0.03	$0.03
California Building Standards Commission Fee	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Fire Review Fee	$0.13	$0.13	$0.13	$0.00	$0.00	-	-	$0.05
Long Range Planning Fee	$0.25	$0.25	$0.25	-	-	-	-	-
Construction Tax	$3.10	$3.10	$3.10	-	-	-	-	-
CAL Green Fee	$0.07	$0.07	$0.07	-	-	-	-	-
Commercial Plan Check	-	-	-	-	-	$0.06	-	-
General Plan Update Fee	-	-	-	-	-	$0.04	-	-
Landscape Plan Fee	-	-	-	-	-	-	-	$0.08
Total Processing Fees per Sq. Ft.	**$4.96**	**$4.96**	**$4.96**	**$1.21**	**$1.21**	**$1.41**	**$0.65**	**$0.86**
Development Impact Fees per Sq. Ft.								
Sewer	$1.53	$1.53	$1.53	$1.30	$1.66	$1.03	$2.46	$2.32
Water [2]	$1.28	$1.28	$1.28	$1.08	$1.08	$0.76	$1.02	$3.00
Traffic/Roadways/Transportation (Local and Regional)	$5.19	$4.48	$4.38	$10.76	$14.49	$5.22	$7.51	$3.77
Drainage [3]	$0.12	$0.12	$0.12	-	$3.11	$0.38	$0.37	$0.13
School	$0.47	$0.47	$0.47	$0.54	$0.54	$0.54	$0.50	$0.33
Parks/Open Space	$0.86	$0.86	$0.86	$2.04	$2.04	$0.36	-	-
Fire/Police	$1.08	$0.93	$0.82	$2.29	$2.29	$1.48	$0.62	$0.79
In-Lieu Flood Protection Fees	-	-	-	$2.75	$2.75	-	-	-
Housing Trust Fund	-	-	-	-	-	$1.50	-	-
Habitat/Greenbelt Preservation	$0.58	$0.58	$0.58	-	-	-	-	-
Capital Improvements/Public Facilities	$0.93	$0.86	$0.82	-	-	$0.45	$0.83	$0.31
Other General Fees/One-Time Taxes [4]	-	-	-	$2.08	$2.08	$0.10	$1.17	-
Countywide Fee	$0.72	$0.72	$0.72	-	-	-	$0.50	$1.43
Total Development Impact Fees per Sq. Ft.	**$12.76**	**$11.83**	**$11.58**	**$22.85**	**$30.04**	**$11.83**	**$14.98**	**$12.07**
Total City/County Fees	**$17.72**	**$16.79**	**$16.54**	**$24.06**	**$31.25**	**$13.24**	**$15.63**	**$12.93**

Table D-2
Office/Business Park Development Infrastructure Burden Comparison

Item	Davis			West Sacramento		Folsom	Roseville	Vacaville
	Base (no CFD)	South (Interland)	Mace (2nd Street)	Riverside Centre Business Park	Southport	Broadstone Unit III	North Central	VacaValley Business Park
Assumptions								
Building Valuation	*$9,282,000*	*$9,282,000*	*$9,282,000*	*$9,282,000*	*$9,282,000*	*$9,282,000*	*$9,282,000*	*$9,282,000*
Building Square Feet	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000
Acres	5	5	5	5	5	5	5	5
Floor Area Ratio	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34
Plan Area Fees [5]	-	-	-	-	$0.03	-	-	-
Annual Special Taxes and Assessments								
Infrastructure CFD	-	$0.86	$8.14	-	$5.75	$2.15	$4.05	-
Infrastructure Assessment District	-	-	-	$0.19	-		-	$0.10
School CFD	$1.21	$1.21	$2.18	-	-	-	-	-
West Sacramento Area Flood Control	-	-	-	$0.86	$0.86	-	-	-
Total Annual Special Taxes and Assessments	**$1.21**	**$2.07**	**$10.32**	**$1.05**	**$6.61**	**$2.15**	**$4.05**	**$0.10**
Total Fees per Sq. Ft.	**$18.93**	**$18.87**	**$26.86**	**$25.11**	**$37.89**	**$15.39**	**$19.68**	**$13.04**
Fees per Acre	$284,001	$282,976	$402,965	$376,591	$568,310	$230,826	$295,140	$195,588

of fees

Source: City of Davis; City of Roseville; City of West Sacramento; Yolo County; EPS.

[1] Processing fees exclude mechanical, electrical, plumbing and other similar review fees.
[2] Assumes two 2-inch water meters.
[3] Vacaville: Assumes development occurs in drainage detention Zone 1A, which does not pay a drainage detention zone fee.
[4] Roseville: Includes the electric installation fee and solid waste fee. West Sacramento: Includes the corp yard, city hall, and childcare impact fees.
Folsom: Includes solid waste capital fee, school impact mitigation fee, and business license fee.
[5] Southport: Southport framework plan area fee.

APPENDIX E:

Electricity Cost Comparison

ELECTRICITY COST COMPARISON

Electricity can be a major component of the cost of doing business for many of the types of large users that are envisioned as possible tenants for space in the proposed Innovation Centers. Pacific Gas & Electric Company (PG&E) provides electricity for residential and non-residential properties in the City of Davis. **Table E-1** shows that PG&E's average retail electricity price is higher across all categories compared to the prices of other providers in the region, the Sacramento Municipal Utility District (SMUD) and Roseville Electric. PG&E average prices also tend to be higher than other major providers in the state with the exception of San Diego Gas & Electric. At 14 cents per kilowatt-hour, PG&E's industrial prices are notably above those for the same customer class at SMUD and Roseville Electric. For some users, this electricity cost differential could put the innovation parks at a competitive disadvantage when suitable sites are available in other areas of the region and state. It is important to note, however, that PG&E offers economic development programs that could reduce overall electricity costs for major users. For example, for eligible projects requiring loads of at least 200 kilowatts that are considering competitive site options in other states, PG&E can provide a 12 percent reduction in electric rates for a period of 5 years through its Economic Development Rate program. For certain economically distressed communities in its service territory, including a handful of competitive areas the region (e.g. West Sacramento, Woodland, and Lincoln), PG&E offers an Enhanced Economic Development Rate program with a 30 percent reduction. This moderates the advantage for communities like Davis when competitive sites are available in areas offering the enhanced rate.

Table E-1
Average Electricity Retail Price Per Kilowatt Hour

Customer Class	Pacific Gas & Electric	Roseville Electric	Sacramento Municipal Utility District	Southern California Edison	San Diego Gas & Electric	Los Angeles Department of Water & Power
Residential	0.16	0.14	0.12	0.17	0.19	0.14
Commercial	0.16	0.11	0.12	0.14	0.17	0.14
Industrial	0.14	0.10	0.11	0.13	0.15	0.12
Agricultural [1]	0.19	-	0.13	0.16	0.20	0.13
System Average	0.17	0.12	0.13	0.16	0.18	0.14

"electricity"

Source: Center for Strategic Economic Research, 2014 Placer County Profile; California Energy Commission; EPS

[1] Price for small general service user at 2000 kilowatts.

APPENDIX F:

Expert Interviews

EXPERT INTERVIEWS

In addition to the project applicants, EPS interviewed representatives from the following entities to inform its analysis of the proposed Innovation Centers.

- Association of University Research Parks
- Battelle
- Brookings Institution
- Cushman & Wakefield
- Davis Roots
- DTZ Commercial Real Estate Services
- Greater Sacramento Area Economic Council (formerly Sacramento Area Commerce & Trade Organization)
- Sacramento Area Council of Governments
- Sacramento Area Regional Technology Alliance
- UC Davis Engineering Translational Technology Center
- UC Davis Office of Research