



# Los Angeles County Bioscience Industry Cluster Development Implementation Plan

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**WONDROS**

## SPECIAL ACKNOWLEDGEMENTS

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The Los Angeles County Bioscience Industry Cluster Development: Five-Year (2017-2021) Implementation Plan ("Bioscience Implementation Plan") is a true public-private partnership to build a stronger, more diverse and sustainable bioscience industry here in Los Angeles County. This transactional roadmap, with its action items and precise implementation steps, provides private, public, education, economic development and other bioscience stakeholders with a list of prioritized actions that, if taken, will better align and deploy the county's bioscience-related assets and fill existing gaps that are critical ingredients to developing a world-leading bioscience industry cluster here in L.A. County.

The Bioscience Implementation Plan also represents a prototype for how to operationalize Los Angeles County's recent motion to develop a Countywide Industry Sector Development Strategy<sup>1</sup> as a way to build further capacity and advance high growth potential economic drivers – and thus spur more and higher-paying jobs – in the county's regionally concentrated export-oriented industries, such as: aerospace; international trade; and entertainment. This plan is the first of these county-initiated industry cluster development efforts and targets L.A. County's bioscience industry cluster.

## I. First Steps: Activating Battelle's Strategic Priorities for L.A. County Bioscience Success

Building on the August 2014 bioscience industry cluster feasibility assessment prepared for the county by Battelle Technology Partnership Practice (TPP), titled: "Feasibility Assessment and Master Plan for Advancing the Bioscience Industry Cluster in Los Angeles County" ("Battelle Report"), the Bioscience Implementation Plan contains 40 detailed action items ("Action Item/s") to activate the Battelle Report, along with a description of each

Action Item's purpose and the specific steps to implement it ("Implementation Steps").<sup>2</sup> As five (5) major strategic priorities have been identified by Battelle TPP to address the most pressing weaknesses and to exploit the foremost opportunities needed to sustain, strengthen and grow L.A. County's bioscience industry, directly below is a brief summary of the initial or first Implementation Steps ("First Step/s"), which are prioritized as essential, highly recommended and valuable. Of these First Steps, the items requiring immediate attention upon adoption of the Bioscience Implementation Plan by the L.A. County Board of Supervisors are denoted as "Day One" in the timeline found in Executive Summary section V.

1. Engage private sector participation and leadership in advancing sustainable public private partnerships to help L.A. County take its place among the leading U.S. bioscience regions:
  - Essential Priority: L.A. County Board of Supervisors to pass a motion to provide "seed" funding and appoint county representatives to serve on the "L.A. County Bioscience Partnership." (Action Item 1, First Implementation Step, page 28)
  - Highly Recommended: L.A. County Board of Supervisors to pass motion directing the L.A. County CEO to report back on the viability of piloting an Industry Cluster Advocate Program. (Action Item 5, First Implementation Step, page 38)

1) Los Angeles Community Development Commission, "Report on the Establishment of a Countywide Economic Development Trust Fund and Related Action Items (Item Nos. 1-D and 7, Agenda of October 20, 2015)," dated: January 26, 2016.

2) For a comprehensive list of Action Items and Implementation Steps, please see the individual chapters.

- Highly Recommended: Bioscience Partnership to identify a small group of county-based organizations focused exclusively on global trade, and investment programs and strategies to form an advisory group for export-readiness initiatives. (Action Item 7a, First Implementation Step, page 44)
  - Highly Recommended: Bioscience Partnership to catalog the core bioscience competencies of the 10 largest foreign direct investment source nations. (Action Item 7b, First Implementation Step, page 46)
  - Valuable: Los Angeles County Board of Supervisors to request Office of the L.A. County Treasurer to report back on fiscal implications of different sales and use tax credit program scenarios. (Action Item 6a-1, First Implementation Step, page 42)
2. Raise the brand and recognition of L.A. County's bioscience industry cluster and assets:
- Essential Priority: Bioscience Partnership will extend the agreement with current database contractor to finish developing the internal database, mapping critical data points and broadening the "visual" understanding of the dynamics of the regional bioscience network. (Action Item 2a, First Implementation Step, page 30)
  - Essential Priority: Bioscience Partnership to acquire licenses for database management platform and program, as well as to secure domain name for website ([www.LALifeSciences.com](http://www.LALifeSciences.com)). (Action Item 2b, First Implementation Step, page 31)
  - Highly Recommended: Bioscience Partnership to retain a PR/Marketing firm to oversee and execute the marketing and communications campaign. (Action Item 3, First Implementation Step, page 32)
  - Highly Recommended: Bioscience Partnership to begin to craft and test key messages, talking points, and chief challenges and opportunities for elected and other leaders to disseminate. (Action Item 4, First Implementation Step, page 35)
3. Address the need for local bioscience venture capital and commercialization resources to leverage L.A. County's extensive base of bioscience research and innovation, particularly in the area of healthcare delivery:
- Essential Priority: L.A. County Asset Management Group to identify potential parcels of county-owned land to be developed for the purpose of incubation, acceleration and shared spaces for bioscience start-up companies. (Action Item 8a, First Implementation Step, page 52)
  - Valuable: Bioscience Partnership to construct alternative "fund of funds" structures that match the county's goals. (Action Item 9, First Implementation Step, page 54)
  - Highly Recommended: Commonwealth Ventures to complete its analysis and cross-tabbing of county "dealmaker" data. (Action Item 8c, First Implementation Step, page 52)
  - Valuable: Bioscience Partnership to designate an independent, unbiased non-profit designee to create an "evergreen" fund for the county to ensure ongoing future bioscience investment. (Action Item 9a, First Implementation Step, page 56)
  - Valuable: Bioscience Partnership to identify a legal entity to house and manage L.A. County-focused intellectual property fund. (Action Item 9c, First Implementation Step, page 58)
  - Valuable: Non-profit designee to legally form and launch a new investment fund targeting early-stage firms (post-proof-of-concept, but pre-venture rounds) in L.A. County. (Action Item 9b, First Implementation Step, page 57)

- Valuable: L.A. County Supervisors to announce intent to launch “Applied Research LA” competition. (Action Item 10, First Implementation Step, page 60)
4. Focus on talent generation, retention and attraction across the spectrum of bioscience industry-related skills:
- Highly Recommended: Bioscience Partnership to conduct an initial scan of existing caches of job listings, along with other research and sources. (Action Item 11, First Implementation Step, page 64)
  - Highly Recommended: Bioscience Partnership to form Bioscience Cluster Response Team to secure agreements from local educational and workforce institutions to advance bioscience industry training and placement. (Action Item 12, First Implementation Step, page 66)
  - Valuable: Bioscience Partnership to retain a contractor to identify specific kinds of resources and/or bioscience industry assistance needed by local institutions committed to meeting the needs of the industry. (Action Item 13, First Implementation Step, page 67)
  - Valuable: Bioscience Partnership to inventory range of local best practice projects and initiatives that focus on filling the talent pipeline, as well as models from other communities that might be adapted for local implementation. (Action Item 14, First Implementation Step, page 28)
  - Valuable: Bioscience Partnership to identify and catalogue pools of both existing start-up/early-stage firms and available/interested business professional talent. (Action Item 15, First Implementation Step, page 70)
5. Develop commercial multi-tenant bioscience-specific lab buildings in L.A. County:
- A. *City of Hope Hub*
- Valuable: City of Duarte and City of Hope to develop a detailed schedule for all required planning actions. (Action Item 16, First Implementation Step, page 84)
- B. *Harbor + UCLA Hub*
- Highly Recommended: L.A. County and LA BioMed to develop a joint strategy to fill the financing gap for the LA BioMed incubator. (Action Item 17, First Implementation Step, page 87)
  - Highly Recommended: Third-party consultants to complete and submit the final Environmental Impact Report to the county for review. (Action Item 18, First Implementation Step, page 88)
  - Valuable: L.A. County Asset Management Group to create a database with lease terms and conditions for all tenants of Harbor + UCLA Campus, and develop a strategy to relocate existing tenants. (Action Item 19, First Implementation Step, page 88)
  - Valuable: L.A. County and LA BioMed to amend the ground lease to include the 15 acre “opportunity site.” (Action Item 20, First Implementation Step, page 89)
- C. *LAC + USC Hub*
- Essential Priority: L.A. County to hold three vision plan meetings with key stakeholders over an eight-week time period. (Action Item 21, First Implementation Step, page 93)
  - Highly Recommended: The L.A. County CDC to report back to the Board of Supervisors on potential public benefits for each primary hub, including the LAC + USC hub, recommending regular communications with stakeholders and the community surrounding the hub. (Action Item 22, First Implementation Step, page 94)

- Valuable: L.A. County Asset Management Group to identify a relocation site(s) for the Public Works Yards. (Action Item 23, First Implementation Step, page 96)
  - Valuable: L.A. County Asset Management Group and CDC to review the opportunity for a public-private partnership in detail and report back to the L.A. County Board of Supervisors within 90 days. (Action Item 24, First Implementation Step, page 97)
  - Valuable: L.A. County to finalize third-party report as to costs associated with refurbishing the existing lab space in the General Hospital for immediate occupancy. (Action Item 25, First Implementation Step, page 98)
  - Valuable: Relevant City of Los Angeles departments and the CDC convene regarding the possibility of a joint Enhanced Infrastructure Financing District to address the infrastructure needs of the 883-acre corridor. (Action Item 26, First Implementation Step, page 100)
- D. *MLK + Drew Hub*
- Essential Priority: MLK Health and Wellness, CDC and Supervisorial District Two to finalize the list of buildings on the medical campus that are candidates to be adaptively reused, as well as those that should be demolished and rebuilt. (Action Item 27, First Implementation Step, page 104)
  - Highly Recommended: L.A. County and Charles Drew University to jointly agree on the future uses on the county-owned land, and establish the terms and timeline for developing the sites. (Action Item 28, First Implementation Step, page 105)
  - Valuable: L.A. County and Charles Drew University to agree on details and timing for the construction of the bioscience building. (Action Item 29, First Implementation Step, page 106)
- Valuable: L.A. County to commission a market study/ feasibility analysis for the proposed mixed-use development. (Action Item 30, First Implementation Step, page 107)
  - Valuable: CDC and L.A. County Asset Management Group to develop a recruitment strategy to improve the tenant mix at the Kenneth Hahn Retail Center. (Action Item 31, First Implementation Step, page 109)
- E. *Olive View*
- Highly Recommended: Third-party consultants to complete and submit the final draft EIR to the county for review. (Action Item 32, First Implementation Step, page 111)
  - Valuable: The Bioscience Partnership to convene and facilitate webinars and/or face-to-face meetings with key stakeholders from the David Geffen School of Medicine at UCLA, ERI, L.A. County Department of Health Services and L.A. County's Department of Real Estate and Asset Management to determine the optimal and favored type of bioscience development at the hub and timing of construction. (Action Item 33, First Implementation Step, page 112)
- F. *Rancho Los Amigos*
- Highly Recommended: L.A. County Asset Management Group and/or CDC, in collaboration with Rancho Research Institute, to identify underutilized space on the campus that could be renovated into dry lab, computational facilities and/or manufacturing space for prototype devices. (Action Item 34, First Implementation Step, page 114)
  - Highly Recommended: L.A. County Board of Supervisors to vote on the Rancho Los Amigos South Campus Master Plan. (Action Item 35, First Implementation Step, page 115)



### G. *UCLA – Westside*

- Highly Recommended: University’s real estate and tech transfer departments to determine the current demand and supply for space for research. (Action Item 36, First Implementation Step, page 118)

### H. *Honor Ranch*

- Highly Recommended: Relevant county departments to review potential timing and budget implications for developing a Master Plan for Honor Ranch, which would also include an infrastructure assessment. (Action Item 37, First Implementation Step, page 120)
- Valuable: The CDC, other relevant county departments and private health-services firm to determine a process for allocating land for agreed upon medical uses, while simultaneously going through the master planning process. (Action Item 38, First Implementation Step, page 121)
- Highly Recommended: CDC and other relevant county departments to review the Master Plan and the infrastructure assessment along with the associated costs. (Action Item 39, First Implementation Step, page 122)

### I. *LAX – Northside*

- Highly Recommended: Los Angeles World Airports to secure approvals for the Los Angeles International Airport Northside Plan. (Action Item 40, First Implementation Step, page 123)

## II. Background

The Los Angeles regional economy, a vast tapestry of diversity and opportunity, possesses an abundance of human, economic, physical and research and development assets that provide distinct advantages over other regions and nations. Bursting with globally influential industries and firms, a large and talented workforce, world-leading innovation capacities, and powerful connections to the fastest growing economies on the planet, L.A. County has all the attributes for economic success in this globally connected, innovation-intensive 21st century.

However, the L.A. region, already burdened with large pockets of wrenching poverty, is being inexorably pulled – like the global economy – into the information age, presenting more of its residents with both the promise of economic success and the peril of being further left behind. Much like the Industrial Revolution, which brought workers off the farms and into manufacturing, the technology revolution of recent decades caused a transition from low-tech, routine production to an information-age economy, where even manufacturing is much less labor-intensive and more technology-driven, and economic rewards are earned by the highly skilled and well-educated.

At no other time in history has economic and industrial change occurred at such an accelerated pace – an economic transition that presents us with an entirely new set and scale of challenges. Indeed, this economic transition and the speed at which it is moving require all of us, as regional stewards, to answer the following trillion-dollar questions: “how will the L.A. region quickly adapt to take advantage of these changes and foster sustained regional economic prosperity?” and “how do we ensure that this prosperity is distributed more equitably, so the economically distressed will also experience higher standards of living and participate in the ‘American Dream’?”

For answers to these questions, L.A. County's public, private, education and philanthropy leaders have begun to look at implementing industry cluster development strategies, such as in Los Angeles County's Strategic Plan for Economic Development (2016-2020) and Los Angeles County's recent recommendation to develop a Countywide Industry Sector Development Strategy,<sup>3</sup> as a way to build capacity and create more and higher paying jobs in the county's key industries. The first of these county-initiated industry cluster development efforts targets L.A. County's bioscience industry cluster, which is an industry that is rapidly growing, continues to be highly competitive, pays higher than average wages, represents a convergence point for nanosciences and information technology, and produces striking multiplier effects that spillover onto the entire economy, including increasing average wages and job counts in our region's population-serving industries, such as construction, hospitality and retail.

### III. Project Team

In response to the bioscience industry's promise and potential in Los Angeles County, and under the directive of the Los Angeles County Board of Supervisors and Los Angeles County Community Development Commission (CDC), the Los Angeles County Economic Development Corporation (LAEDC) assembled an experienced bioscience capacity building team, bringing together significant transactional expertise in specific bioscience-related areas, including: capital formation; deal-making; industry-specific capacity building; and talent development.

Team members included not only organizations from across L.A. County, but from around the country, including nationally-recognized organizations from regions with highly-developed and mature life

sciences industries, such as San Diego, Silicon Valley and the "Research Triangle," NC. Each member of the team brought unique capacity building expertise, as well as several decades of combined economic development and bioscience-related experience. Key team members included, among others:

- LAEDC, which, as Los Angeles County's economic development leadership organization for over 35 years, has directly helped to retain or attract over 200,000 annual jobs in Los Angeles County with labor income of greater than \$12.3 billion and a fiscal contribution to the county (in the form of tax payments) of more than \$1.1 billion;
- Biocom, a 750-member, Southern California-based industry association with an over 20-year track record in building capacity within San Diego's world-leading biotechnology industry, is the largest and most developed regional life science trade association in the world;
- BioAccel, a Phoenix area-based, early-stage bioscience entrepreneur support nonprofit that has helped launch 17 bioscience firms, invested \$3.5 million over the past five years in proof-of-concept bioscience projects, and provided mentorship to over 100 bio-based entrepreneurs;<sup>4</sup>
- Collaborative Economics, a Silicon Valley-based consulting group with highly sought after expertise in crafting and implementing industry-led partnerships that engage business leaders in the design and execution of economic development and workforce strategies;

3) Supra note 1; see also, <http://laedc.org/strategicplan>

4) BioAccel's portfolio to date has resulted in a current book value of the portfolio that exceeds \$98.3 million, with a projected exit value of \$1.4 billion, achieving a 37 percent (37%) internal rate of return.

- CommonWeal Ventures, a “Research Triangle”-based partnership with proprietary expertise in identifying and exploiting regional firm-to-firm networks formed by serial entrepreneurs and investors to drive value creation within innovation-based ecosystems, such as life sciences; and
- Los Angeles Public Landowners Assistance Network (now, “Activate LA”), whose membership includes some of the L.A. region’s most prominent real estate attorneys, developers, architects and financiers, partners with the public sector, nonprofits and philanthropic institutions throughout Los Angeles County to deliver real estate and financing solutions that attract businesses and jobs from the industries and sectors, such as bioscience, that are, or will be, leading the Los Angeles regional economy.
- Los Angeles County’s regional economic development organizations, including the San Gabriel Valley Economic Partnership, the Santa Clarita Valley Economic Development Corporation, and The Valley Economic Alliance.

The team, armed with the Battelle Report, began to thoroughly analyze (beyond Battelle TPP’s high-level assessment) L.A. County’s existing bioscience industry assets in the areas of: research and development; capital sources; talent and job training programs and systems; real estate assets; networking structures; support cluster firms; the regulatory and public policy environments; and entrepreneurial networks and investor concentrations.

With thousands of collective hours of research and due diligence, supported by detailed conversations with over 125 individuals from a diverse array of bioscience fields, our research and analysis has identified a significant number of discrete assets, but also a number of gaps along the bioscience value

chain here in L.A. County, at all tranches of development, from “idea” to “export.” A set of preliminary action items were used as a “straw man” to guide four curated working group sessions and stakeholder interviews in the areas of:

- Marketing and Public Policy
- Research & Development (R&D) and Capital Formation
- Talent Development
- Real Estate Development

These sessions were attended by more than 80 bioscience firms and related organizations, represented by leaders in the bioscience industry and in the fields of: academia, consulting, finance, economic development, government, law, marketing, public relations, real estate services, research and workforce development. Participants at the working group sessions offered their own suggestions and presented entirely new ideas for inclusion, ensuring that this Bioscience Implementation Plan was developed not by a single consultant or organization, but in partnership with the broader L.A. County bioscience community. Their focused and thoughtful feedback was instrumental to this process, and to the inclusive and methodical nature of this plan.

#### **IV. The Economic Promise of Bioscience Industry Cluster Development**

##### *A. Countywide Industry Cluster Development Strategy: Economic Benefits*

##### **1. Traded & Local-Serving Industry Clusters**

Industry clusters are geographic concentrations of related firms, organizations and institutions that are present in a particular region. Evidence suggests that focused development of industry clusters – as a key organizational unit for understanding and improving performance of regional economies – can unleash incredible growth potential when used as an

approach that cuts across the traditional fields and tools of economic, community and workforce development, helping to enhance their effectiveness. Traded or export-oriented industries, such as many of the industry sectors that comprise the bioscience industry cluster, sell goods and services beyond the region in which they are located. They produce a reinforcing cycle of job creation, real wage growth, investment and economic prosperity, while also driving the local service economy, triggering ripple effects that are felt across our local businesses (in terms of jobs, wages and tax revenues), and offering the best chance for bringing greater prosperity to more residents and raising standards of living across more of L.A. County's communities.

The bioscience industry, like the aerospace and information technology industries, tends to develop in geographic clusters drawn into the area by labor market pooling, strong affiliations to major science universities, supplier specializations, and so-called "spawning" companies, as knowledge spills over to incubate more firms. As a cluster forms, support infrastructure such as venture capitalists, consultants, industry associations, specialized law firms and architects also begin to develop. This "web" of cluster firms, talent, research, capital, physical spaces, networks and support services means that as new firms form and mature in a specific geographical region there is strong motivation to remain in that area.<sup>5</sup> What's more, as concentrations of businesses, support services, suppliers and competitors grow, they generate better products and improved processes, attracting skilled workers and becoming even more competitive while gaining global market share.

## 2. Beginning to Execute the Countywide Industry Sector Strategy: Bioscience Implementation Plan

Since the economic multiplier effects tend to be more considerable in traded industries than their local-serving counterparts, it seems most appropriate to concentrate regional industry cluster development efforts towards developing the traded or export-oriented components of a given industry cluster, such as in bioscience. This is a key tenet of this Bioscience Implementation Plan, as well as the intent of the Countywide Industry Sector Development Strategy and Los Angeles County's five-year Strategic Plan for Economic Development (2016-2020).<sup>6</sup> As a plan for execution, the Bioscience Implementation Plan and the Action Items therein tend not to concentrate on local serving bioscience sectors, such as "Diagnostic Imaging Centers,"<sup>7</sup> which primarily serve the local population here in L.A. County (providing magnetic resonance imaging (MRI), computed tomography (CT), ultrasound and x-ray scans to local residents, for example). This is because these local-serving sectors need to be here to serve the resident consumer base, unlike a biopharmaceutical company that exports its products all over the world and, for this reason, can be located anywhere.

Moreover, the industry cluster development actions put forth in this Bioscience Implementation Plan are founded on and guided by the core principle that there is no one set of policies that will make all industry clusters – including bioscience – successful, and that regional economic development success is somewhat path dependent, where successful economic development strategies are usually those that extend, refine or recombine a region's existing strengths.<sup>8</sup> And so, the set of economic

5) Ernst & Young, "Biotechnology Park Feasibility Assessment: LAC & USC Medical Center Campus" (May, 2001) at page 37 ("Cluster" is defined as mini-economy with independent market players, including academic life sciences and medical research sectors, strong public sector investment, biomedical, pharmaceutical and medical device companies, and supporting infrastructure such as venture capitalists, merchant bankers, attorneys, etc.); see also, Sedway Group, "USC Biomedical Research Park Feasibility Study" (May 1, 2001) at page 21.

6) See supra notes 1 and 3.

7) NAICS Code: 621512

8) Id., at pages 23-24.



opportunities available to L.A. County in the bioscience industry is shaped, in large part, by the economic activities already established; by the landscape of physical, economic, networking, research and development, capital and talent assets already in place; by building on or recombining those unique assets and strengths; and by filling any gaps.

Simply stated, economic development across the L.A. County is best performed by building on the strengths of the L.A. region, such as the depth of the research and innovation base found in L.A. County and the sizeable pool of local bioscience graduates and talent,<sup>9</sup> rather than trying to be like other regions and, in so doing, indiscriminately chasing industries to become, for example, the next Silicon Valley.<sup>10</sup> In this regard, the power of such a regional cluster-based economic development approach is that it is driven by what an industry sector – in this case the bioscience industry – actually has innately, and needs intrinsically, to be successful here in L.A. County, not the more traditional “one-size-fits-all” approach to economic development that is practiced in less sophisticated regions across the globe.

### B. *Why the Bioscience Industry Cluster?*

Strictly speaking, the bioscience industry is not monolithic, but involves a number of diverse markets and cuts across manufacturing, services and research activities that apply knowledge of the way in which plants, animals and humans function.<sup>11</sup> According to the Biotechnology Industry Organization (BIO), the industry reflects five primary sectors: Therapeutics (drugs and pharmaceuticals); Medical Devices and Equipment; Research, Testing and Medical Laboratories; Bioscience-related

Distribution; and Agricultural Feedstocks and Chemicals.<sup>12</sup> It is, in large part, due to the size, scope and high value-add of these diverse market sectors that so many communities around the world are focused on developing their own bioscience industry clusters. Competition – intrastate, nationally and internationally – to attract firms and develop bioscience niches is intense and escalating, especially because the industry continues to forecast strong growth prospects, continues to attract increasing amounts of capital, pays higher than average wages, and remains less cyclical than other industries.

Emblematic of the bioscience industry really coming of age, is the strong financial performance of the U.S. biotechnology industry sector<sup>13</sup> and its associated move towards sustained growth and exponential increases in aggregate profitability. According to Ernst & Young’s 2015 Biotechnology Industry Report, in 2014:<sup>14</sup>

- Revenues of publicly-traded U.S. biotechnology companies grew by over 29 percent (29%) to \$93 billion;
- Net income for U.S. biotech companies almost tripled, reaching a new high of \$10.6 billion;
- The U.S. biotech sector set new records in capital raised (\$45.1 billion), as well as funds raised through initial public offerings (\$4.9 billion) and debt financings (\$23.9 billion);
- Biotech firms raised \$5.6 billion in venture capital financing (only slightly less the \$6.1 billion raised in 2007); and

9) Battelle Technology Partnership Practice, “Feasibility Assessment and Master Plan for Advancing the Bioscience Industry Cluster in Los Angeles County”, dated: July 2014 (“Battelle 2014”), at page 70 (Summary of Strategic “SWOT” Analysis).

10) See Joseph Cortright, The Brookings Institution, Metropolitan Policy Program, “Making Sense of Clusters: Regional Competitiveness and Economic Development” (2006), at pages 1-2.

11) Biotechnology Industry Organization, “State Bioscience Initiatives 2008: Technology, Talent and Capital” (June 2008).

12) Battelle 2014, at pages 6-7. Also see, e.g., Battelle Technology Partnership Practice, “Advancing a Biomedical Research Park at USC’s Health Sciences Campus: Feasibility Assessment and Conceptual Plans” (July 2006), at pages 24-5 (in conjunction with the Biotechnology Industry Organization.)

13) Biotechnology Industry Organization, “What is Biotechnology?” (<https://www.bio.org/what-biotechnology>). “Biotechnology” is a subset of the bioscience industry cluster that harnesses cellular and biomolecular processes to develop technologies.

14) Ernst & Young, “Beyond Borders: Biotechnology Industry Report 2015”, at pages 8-9.

- Global mergers and acquisitions (M&A) activity reached a 10-year high in both deal number (68) and value (\$49 billion).

The U.S. bioscience industry's growing economic intensity; its swelling financial prowess; and the increased global competition underway for bioscience-related assets and firms, taken together, provide the necessary motivation and urgency for L.A. County's public, private and philanthropic sectors to come together and co-fund, -promote and -execute a regional capacity building effort in L.A. County's bioscience industry.

### 1. California: The Home of America's Bioscience Industry

California is the nation's leading bioscience state, with 8,762 industry establishments, 242,557 workers, and a location quotient (LQ) of 1.26 in 2014.<sup>15</sup> The state's establishment, employment and LQ numbers broken down across BIO's five primary bioscience sectors are as follows:<sup>16</sup>

- Research, Testing & Medical Laboratories: 3,517 establishments with 81,336 workers; LQ of 16.8
- Drugs and Pharmaceuticals: 481 establishments with 47,163 workers; LQ of 16.1
- Medical Devices and Equipment: 1,149 establishments with 60,669 workers; LQ of 17.4
- Bioscience-related Distribution: 3,494 establishments with 50,233 workers; LQ of 0.96
- Agriculture Feedstock and Chemicals: 121 establishments with 3,157 workers; LQ of 0.35

Average annual wages paid to California bioscience industry workers reached \$122,048 in 2014,<sup>17</sup> an excess of about \$63,000 greater than the average annual wage in the private sector. And, average earnings in the "Drugs & Pharmaceuticals" and "Research, Testing & Medical Laboratories" sectors also topped the six-figure threshold in 2014 at \$157,714 and \$135,377, respectively.<sup>18</sup> In 2012, California's bioscience industry produced \$101 billion in revenue and paid \$3.7 billion in direct state and local taxes.<sup>19</sup> Exports from California's bioscience industry increased to \$22.2 billion (2013) from \$20.9 billion (2012).<sup>20</sup> And over 60 percent (60%) of all U.S. bio-directed venture capital was invested in California (2014).<sup>21</sup>

California's bioscience industry is concentrated in three regional clusters, including: the greater San Francisco Bay Area; Los Angeles/Orange County region; and San Diego/Imperial County region.

### 2. The Promise of Bioscience in the Los Angeles County Region

L.A. County is uniquely positioned with opportunities to grow as an industry world leader fueled by: world-class R&D capacities; broad entrepreneurship and innovation base, especially in innovative technologies outside of the capital-intensive and riskier biopharmaceuticals and medical devices areas, such as healthcare delivery; and a large, well-educated and bioscience industry-ready workforce.

Contrary to public perception, Los Angeles County is quantitatively-speaking a top-tier bioscience research region, with a large base of biomedical research

15) TEconomy/BIO, "The Value of Bioscience Innovation in Growing Jobs and Improving Quality of Life" (2016), pages 31-50. (Location quotient (LQ) is a way of quantifying how concentrated a particular industry cluster is in a region as compared to the nation.)

16) Id.

17) TEconomy/BIO, "The Value of Bioscience Innovation in Growing Jobs and Improving Quality of Life: California" (2016).

18) Id.

19) PwC, "Trends in the Bioscience Industry"

20) Id.

21) Id.

activity, including major scientific and academic centers (e.g., UCLA, USC, and the California Institute of Technology (Caltech)) and private research health institutions (e.g., Cedars Sinai Medical Center, the City of Hope National Medical Center and Children's Hospital Los Angeles) that go beyond typical hospitals in terms of advancing new clinical treatments.<sup>22</sup> County academic and medical centers combined to generate nearly \$1 billion in National Institutes of Health (NIH) funded research (2012), and several area universities rank among the top-30 in terms of federal financing dollars received for R&D – including UCLA (8) and USC (30).<sup>23</sup> What's more, total research expenditures at Los Angeles County's three major research universities: UCLA, USC and Caltech, were close to \$2 billion.<sup>24</sup> And, from January 2009 through August 2012, a total of 8,263 bioscience patents were issued or applied for by Los Angeles County inventors, primarily in 24 bioscience-related areas, further illustrating the extensive bioscience research, innovation and entrepreneurship capacity found in L.A. County.<sup>25</sup>

The county's bioscience industry continues to expand regionally and into different directions outside of the more traditional and linear development models of the "Drugs & Pharmaceuticals" and "Medical Devices and Equipment" sectors. Notably, the region is seeing strong convergence between sub-sectors within the industry, particularly between information technology, genetics, medical devices and therapies to improve the lives of diverse populations. According to a macro-analysis conducted by PricewaterhouseCoopers for this plan,<sup>26</sup> new information technologies are being developed and deployed here in L.A. County to

accelerate the pace of innovation in biopharmaceuticals and healthcare delivery by democratizing access to data and empowering consumers to manage their own health. Similarly, Battelle TPP found that substantial bioscience research and innovation activities conducted at the county's industry and academic institutions position the county for future growth in the area of innovations in healthcare delivery.<sup>27</sup> Indeed, as market forces push biopharmaceutical and life sciences firms closer to patients, new technologies – including technologies in which Los Angeles County has competitive advantages and greater access to prodigious amounts of consumer data – are catalyzing inter-sectoral collaboration and convergence opportunities throughout the broader industry cluster. In L.A. County, Battelle TPP identified three specific technology platforms emerging with a clear alignment of industry presence with research and innovation technology clusters:

1. Novel therapeutics and diagnostics, with a focus on cancer research and treatments and biologics for therapeutics and diagnostics;
2. Bioengineering solutions for treating diseases and medical conditions with a broad base of activity across cardiovascular devices, musculoskeletal implant and other electro-medical/imaging/surgical devices; and
3. Innovations in healthcare delivery with a focus on health informatics, as well as public health and healthcare services innovations.<sup>28</sup>

Presently, L.A. County's bioscience industry is home to approximately 450 bioscience establishments, employing 19,990 payroll employees with a total payroll of \$1.55 billion (2014), and an economic output of \$13.3 million in 2014. The LAEDC conducted a contribution analysis with the following

<sup>22</sup> Battelle 2014, at page 63.

<sup>23</sup> Id., at page 1. Also see, "Highest Research & Development Funding" at BestColleges.com (In 2016, UCLA received \$539.1 million and USC received \$443.8 million in federal R&D funding.)

<sup>24</sup> Id., at page 55 (UCLA: \$899 million; USC: \$593 million; and Caltech: \$504 million).

<sup>25</sup> Battelle 2014, at page 22 (twenty-four theme areas focused across biomedical applications, disease areas and basic biological sciences).

<sup>26</sup> PwC, "Trends in the Bioscience Industry"

<sup>27</sup> Battelle 2014, at pages 27-30.

<sup>28</sup> Id., at page 64.

establishment, employment and LQ numbers broken down as follows:<sup>29</sup>

- Biopharmaceuticals: 92 establishments with 7,700 workers; LQ of 0.88
- Medical Devices: 168 establishments with 7,680 workers; LQ of 0.97
- Medical Apparatus: 26 establishments with 3,030 workers; LQ of 1.42
- Research & Development in Biotechnology: 152 establishments with 1,570 workers; LQ of 0.34

Finally, the Los Angeles region generates a large and quality base of bioscience talent out of its community colleges, four-year colleges and research universities. Each year, L.A. County's colleges and universities award degrees to over 5,000 new graduates in bioscience fields covering the entire bioscience value chain, from lab technicians to basic biological/biomedical sciences to engineering.<sup>30</sup> Certainly, this broad talent pipeline is a significant comparative advantage for L.A. County over other regions.

However, there are significant challenges to marked and sustained growth in L.A. County's bioscience industry. While L.A. County does have important productive advantages, as described above, the region does not currently have strong regional specialized concentration in bioscience, with an average location quotient of only 0.86. And, unlike the San Diego/Imperial County and the San Francisco Bay Area clusters, Los Angeles is not perceived as an epicenter of bioscience industry activity – even though, in truth, the Los Angeles region has a fairly sizable and specialized export-oriented bioscience

industry, again with over 20,000 employees across 450 small, medium and large-sized establishments, in the traded components of L.A. County's bioscience industry cluster.<sup>31</sup> According to Battelle TPP, despite the large absolute size of its bioscience industry, Los Angeles County is missing the virtuous cycle that feeds growth and serves as a magnet to attract even more bioscience development.<sup>32</sup> Some of the key challenges facing the sustained growth and development of L.A. County's bioscience industry cluster include:<sup>33</sup>

- Los Angeles County has no identifiable commercial bioscience real estate market and no single area that has a high share of bioscience firm locations – no equivalent to a “Hollywood” for the bioscience industry.<sup>34</sup>
- Los Angeles County has very little pre-fitted lab space available, so that bioscience firms have to bear the cost of fitting out their own wet lab spaces and can face long delays and uncertainties with permitting.
- Los Angeles County is lagging in venture capital funding, particularly at the critical early stages.
- Los Angeles County has a “leaky bucket” phenomenon around bioscience commercialization despite the commercialization performance of its major research universities and institutions.
- Los Angeles County is not a regional draw for bioscience workers.

<sup>31</sup> Id.

<sup>32</sup> Battelle 2014, at page 2.

<sup>33</sup> Battelle 2014, at page 70 (“Summary of Strategic “SWOT” Assessment”).

<sup>34</sup> Id., at page 34. Within Los Angeles's bioscience cluster, there is not a single established area that serves as the center of bioscience firm activity in the county, but rather bioscience companies are dispersed in small active nodes spread throughout a fairly large geographical region. These activity nodes include, for example: City of Hope, Caltech and Pasadena Community College in the San Gabriel Valley; UCLA and Cedars-Sinai on the west-side; Harbor + UCLA Hospital and LABioMed in the South Bay; and USC, MLK-Drew University and Medical Center, and Rancho Hospital in the central county.

<sup>29</sup> For the “Los Angeles County Bioscience Industry Contribution Analysis” conducted by the LAEDC's Institute for Applied Economics, please see Appendix 1; also see, Battelle 2014 at pages 2, 47-51 (Total L.A. County's bioscience industry cluster – both traded and local-serving – employment stood at 42,000 in 2010.).

<sup>30</sup> Id.



Exacerbating matters, L.A. County's history of past biomedical initiatives has been primarily focused around discrete real estate projects, such as the planned USC Biomedical Research Park, which itself has been dominated by "fits and starts," including the commission of a number of well-intentioned feasibility studies and Master Plans languishing in libraries. In fact, this Executive Summary alone cites three past (all more than 10-years-old) USC Biomedical Research Park feasibility studies conducted by Sedway Group (now a subsidiary of CBRE), Ernst & Young and Battelle TPP in 2001, 2001 and 2006, respectively.<sup>35</sup> Point being, the region has been talking about and studying the feasibility of significant bioscience strategic efforts for decades, with very little to show for it; all the while, the "Research Triangle," North Carolina, for example, has had an actual and deliberative focus on bioscience since the mid-1980s, which has paid off nicely, as biosciences account for more than four percent (4%) of the private sector employment in the Raleigh-Durham region (the highest concentration of any major metropolitan area in the nation).<sup>36</sup>

The practical action items put forth in this Bioscience Implementation Plan cannot suffer the same fate as the past biomedical efforts. As a region, we must move forward under the leadership of this current L.A. County Board of Supervisors. And, while this Bioscience Implementation Plan provides a menu of tactical action items in the areas of ecosystem support, technology transfer, capital formation, talent and job training, and real estate hub development, the County of Los Angeles will have to make deliberative choices, with real opportunity costs, based on its priorities and the availability of adequate county resources to fund activities that accelerate the further development and growth of the industry. But make no mistake, it will take the commitment of the county – whether it is county land, seed fund investment capital or new incentive programs – together with the region's bioscience industry, which must provide direction and follow-through, to truly kick-start the industry.

<sup>35</sup> Supra notes 3 and 10.

<sup>36</sup> Battelle 2014, at page ES-4.

## V. Bioscience Implementation Plan: Five-Year Timeline of “Day One Actions” Start Dates

ACTION ITEM	YEAR ONE		YEAR TWO		YEAR THREE	
	0 – 6 MONTHS “DAY 1 ACTIONS”	7-12 MONTHS	13-18 MONTHS	19-24 MONTHS	25-30 MONTHS	31-36 MONTHS
(1) Bioscience Partnership	Day One Implementation Step: L.A. County Board of Supervisors to pass a motion to provide “seed” funding and appoint county representatives to serve on the “L.A. County Bioscience Partnership.”					
(2) Database and Website	(2a) Day One Implementation Step: L.A. County Bioscience Partnership to execute contract with database contractor to complete internal database of L.A. County bioscience assets.	(2b) First Implementation Step: L.A. County Bioscience Partnership to acquire licenses for public database management platform and program, as well as secure domain name for website (www.LALifeSciences.com) to launch public-facing website and bioscience resource navigator.				
(3) Industry Marketing Plan	Day One Implementation Step: Bioscience Partnership to retain a PR/Marketing firm to oversee and execute the marketing and communications campaign.					
(4) Elected Official Talking Points			First Implementation Step: Bioscience Partnership to begin to craft and test key messages, talking points, and chief challenges and opportunities for elected and other leaders to disseminate.			
(5) Industry Advocate Program			First Implementation Step: L.A. County Board of Supervisors to pass an enabling (legislation) motion directing the L.A. County CEO to report back on the viability of piloting an Industry Cluster Advocate Program.			
(6) Local, state, and federal policy agenda		(6a-1) First Implementation Step: Los Angeles County Board of Supervisors to request Office of the L.A. County Treasurer to report back on fiscal implications of different sales and use tax credit program scenarios.	(6a-2) First Implementation Step: Bioscience Partnership to construct and circulate a model ordinance and best management practices document for the phased elimination of the gross receipts tax for bioscience and other key industries identified in the Countywide Industry Sector Development Strategy.			

## V. Bioscience Implementation Plan: Five-Year Timeline of “Day One Actions” Start Dates (continued)

ACTION ITEM	YEAR ONE		YEAR TWO		YEAR THREE	
	0 – 6 MONTHS “DAY 1 ACTIONS”	7-12 MONTHS	13-18 MONTHS	19-24 MONTHS	25-30 MONTHS	31-36 MONTHS
(7) Export Readiness and Foreign Direct Investment			(7a) First Implementation Step: The Bioscience Partnership to identify a small group of county-based organizations focused exclusively on global trade and investment programs and strategies who will form an advisory group for export-readiness initiatives.		(7b) First Implementation Step: Bioscience Partnership, together with the WTC-LA, to begin cataloging core bioscience competencies of the 10 largest foreign direct investment source nations.	
(8) Innovation Initiative	(8c) Day One Implementation Step: Commonwealth Ventures to complete its analysis and cross-tabbing of county Dealmaker data.	(8a) First Implementation Step: L.A. County Asset Management Group to begin a feasibility analysis to identify potential parcels of county-owned land to be developed for the purpose of incubation, acceleration and shared spaces for bioscience start-ups.	(8b) First Implementation Step: LAEDC Center for Innovation will create a “Best Management Practices: Tech Transfer Playbook” to help facilitate regional technology transfer.			
(9) Fund of funds (FOF) Investment Vehicle		(9) First Implementation Step: Bioscience Partnership to construct alternative “fund of funds” structures that match the county’s goals.	<p>(9a) First Implementation Step: Bioscience Partnership to designate an independent, unbiased 501(c) (3) non-profit designee to create an “evergreen” fund for the county to ensure ongoing future bioscience investment.</p> <p>(9b) First Implementation Step: Non-profit designee to legally form and launch a new investment fund targeting early-stage firms (post-proof-of-concept, but pre-venture rounds) in L.A. County.</p> <p>First step Action Item (9c): Bioscience Partnership to identify a legal entity to house and manage an L.A. County-focused IP fund.</p>			
(10) Applied Research Initiatives				First Implementation Step: L.A. County Supervisors to announce intent to launch “Applied Research LA” competition.		

## V. Bioscience Implementation Plan: Five-Year Timeline of “Day One Actions” Start Dates (continued)

ACTION ITEM	YEAR ONE		YEAR TWO		YEAR THREE	
	0 – 6 MONTHS “DAY 1 ACTIONS”	7-12 MONTHS	13-18 MONTHS	19-24 MONTHS	25-30 MONTHS	31-36 MONTHS
(11) Skills Panel		First Implementation Step: Bioscience Partnership to conduct an initial scan of existing caches of bioscience job listings.				
(12) Partnership Agreements			First Implementation Step: Bioscience Partnership to form Bioscience Cluster Response Team to secure agreements from local educational and workforce institutions to advance bioscience industry training and placement.			
(13) Resource Clearing-house				First Implementation Step: Bioscience Partnership to retain a contractor to identify specific kinds of resources and/or bioscience industry assistance needed by local institutions committed to meeting industry talent demands.		
(14) Talent Pipeline Campaign				First Implementation Step: Bioscience Partnership to inventory range of local best practice projects and initiatives that focus on filling the talent pipeline, as well as models from other communities that might be adapted for local implementation.		
(15) Talent Connection Initiative			First Implementation Step: Bioscience Partnership to identify and catalogue pools of both existing start-up/early-stage firms and available/interested business professional talent.			
(16) City of Hope: Finalize Specific Plan & EIR	First Implementation Step: City of Duarte and City of Hope to develop a detailed schedule for all required planning actions.					
(17) Harbor + UCLA: Assist in Financing the Construction of a new Research and Development Facility	First Implementation Step: L.A. County and LA BioMed to develop a joint strategy to fill the financing gap for the LA BioMed incubator.					



## V. Bioscience Implementation Plan: Five-Year Timeline of “Day One Actions” Start Dates (continued)

ACTION ITEM	YEAR ONE		YEAR TWO		YEAR THREE	
	0 – 6 MONTHS “DAY 1 ACTIONS”	7-12 MONTHS	13-18 MONTHS	19-24 MONTHS	25-30 MONTHS	31-36 MONTHS
(18) Harbor + UCLA: Finalize the Harbor + UCLA EIR by Year-end 2016	First Implementation Step: Complete and submit the final Environmental Impact Report to the county for review by August 2016.					
(19) Harbor + UCLA: Phased relocation and demolition of current tenants of county-owned land.	First Implementation Step: L.A. County Asset Management Group to create a database with lease terms and conditions for all tenants of Harbor + UCLA Campus, and develop a strategy to relocate existing tenants.					
(20) Harbor + UCLA: Develop a Bioscience Research Park on approximately 15 acres of County owned land.	First Implementation Step: Amend the L.A. County/ LA BioMed ground lease to include the 15-acre “opportunity site.”					
(21) LAC + USC: Convene three vision plan meetings	First Implementation Step: L.A. County to hold three vision plan meetings with key stakeholders over a six-week time period.					
(22) Form a working group of hub and community stakeholders		First Implementation Step: The L.A. County CDC to report back to the Board of Supervisors on potential public benefits for each primary hub, including the LAC + USC hub, recommending regular communications with stakeholders and community surrounding the hub.				
(23) LAC + USC: Develop Biomedical Research Park		First Implementation Step: Identify a relocation site(s) for the Public Works Yards.				
(24) LAC + USC: Form a P3 Structure	First Implementation Step: L.A. County Asset Management Group and CDC to review the opportunity for a public-private partnership in detail and report back to the L.A. County Board of Supervisors within 90 days.					

## V. Bioscience Implementation Plan: Five-Year Timeline of “Day One Actions” Start Dates (continued)

ACTION ITEM	YEAR ONE		YEAR TWO		YEAR THREE	
	0 – 6 MONTHS “DAY 1 ACTIONS”	7-12 MONTHS	13-18 MONTHS	19-24 MONTHS	25-30 MONTHS	31-36 MONTHS
(25) LAC + USC: Adaptively reuse prime real estate assets	First Implementation Step: L.A. County to finalize third-party report as to costs associated with refurbishing the existing lab space for immediate occupancy.					
(26) LAC + USC: Create an Enhanced Infrastructure District	First Implementation Step: Convene City of Los Angeles Departments and the CDC regarding the possibility of a joint Enhanced Infrastructure Financing District to address the infrastructure needs of the 883-acre corridor.					
(27) MLK + Drew: Adaptively Reuse Buildings on the hub.	First Implementation Step: Finalize the list of buildings on the medical campus that are candidates to be adaptively reused, as well as those that should be demolished and rebuilt.					
(28) MLK + Drew: Optimize ownership and land uses.	First Implementation Step: L.A. County and Charles Drew University to jointly agree on the future uses on the county-owned land, and establish the terms and timeline for developing the sites.					
(29) MLK + Drew: Develop a state-of-the-art bioscience building at CDU.	First Implementation Step: L.A. County and Charles Drew University to agree on details and timing for the construction of the bioscience building.					
(30) MLK + Drew: Develop a multi-tenant bioscience/ mixed-use building			First Implementation Step: L.A. County to commission a market study/ feasibility analysis for the proposed mixed-use development.			
(31) MLK + Drew: Los Angeles County to redevelop the Kenneth Hahn Retail Center		First Implementation Step: Develop a recruitment strategy to improve the tenant mix at the Kenneth Hahn Retail Center.				

## V. Bioscience Implementation Plan: Five-Year Timeline of “Day One Actions” Start Dates (continued)

ACTION ITEM	YEAR ONE		YEAR TWO		YEAR THREE	
	0 – 6 MONTHS “DAY 1 ACTIONS”	7-12 MONTHS	13-18 MONTHS	19-24 MONTHS	25-30 MONTHS	31-36 MONTHS
(32) Olive View: UCLA Medical Center EIR	First Implementation Step: Third-party consultants to complete and submit the final draft EIR to the county for review by December 2016.					
(33) Olive View: Research and Development Facilities			First Implementation Step: The Bioscience Partnership to convene and facilitate webinars and/or face-to-face meetings with key stakeholders from the David Geffen School of Medicine at UCLA, ERI, L.A. County Department of Health Services, and L.A. County Department of Real Estate and Asset Management to determine the optimal and favored type of bioscience development at the hub and timing of construction.			
(34) Rancho Los Amigos: Adaptively reuse selective buildings on North Campus	First Implementation Step: Identify underutilized space on the campus that could be renovated into dry lab, computational facilities and/or manufacturing space for prototype devices.					
(35) Rancho Los Amigos: Develop a Specific Plan for the South Campus	First Implementation Step: L.A. County Board of Supervisors to vote on the Rancho Los Amigos South Campus Master Plan before the end of 2016.					
(36) UCLA – Westside: develop university-related lab space for entrepreneurs graduating from their programs.		First Implementation Step: University’s real estate and tech transfer departments to determine the current demand and supply for space for researchers.				
(37) Honor Ranch: Master Plan for Honor Ranch site		First Implementation Step: Relevant county departments to review potential timing and budget implications for developing a Master Plan for Honor Ranch, which would also include an infrastructure assessment.				

## V. Bioscience Implementation Plan: Five-Year Timeline of “Day One Actions” Start Dates (continued)

ACTION ITEM	YEAR ONE		YEAR TWO		YEAR THREE	
	0 – 6 MONTHS “DAY 1 ACTIONS”	7-12 MONTHS	13-18 MONTHS	19-24 MONTHS	25-30 MONTHS	31-36 MONTHS
(38) Honor Ranch: Expedite consumer-serving medical uses	First Implementation Step: Determine a process for allocating land for agreed upon medical uses, while simultaneously going through the master planning process.					
(39) Honor Ranch: Employ a P3 financing structure				First Implementation Step: CDC and other relevant county departments to review the Master Plan and the infrastructure assessment along with the associated costs.		
(40) LAX – Northside Hub		First Implementation Step: Los Angeles World Airports to secure approvals for the Los Angeles International Airport Northside Plan.				

## VI. Gauging Bioscience Implementation Success: Key Metrics

Over time, the goal of the named institutions and organizations listed in this plan, along with others across the L.A. region, will be to incorporate many of this plan's priorities into their business models, weaning off any county-provided resources. With meaningful commitment on the parts of the public and private sectors, and if properly resourced up front, execution of the Bioscience Implementation Plan will help catalyze and connect L.A. County's life science ecosystem to positively impact our economy, health and quality of life. As we move towards that aspirational goal, successful execution of this Bioscience Implementation Plan over the next five years (2017–2021) will be gauged by a variety of measurable benchmarks and trends. In particular, as we move forward using the Bioscience Implementation Plan as a blueprint for tactical execution, we expect to see a significant increase in the following areas (except where noted, the source for all benchmark figures is Battelle TPP):

- Regional economic contribution of bioscience industry (i.e. direct, indirect, and induced job, output, and fiscal impacts)
- Regional competitiveness, as defined by non-hospital bioscience industry job concentration or the industry's location quotient (at 0.82 in 2014,<sup>37</sup> which is below-average concentration relative to the nation)
- Number of bioscience patents issued over five-year (2017-2021) period (e.g., 8,263 for the period from January 2009 through April 2012)
- Ratio of new bioscience patent applications and patents issued per every \$10 million in research expenditures at three major research universities (e.g., 5.07 and 1.22, respectively in 2010)
- Bioscience-directed venture capital investment (e.g., \$260.45 million in venture capital funding in 2011)
- Early-stage financing (pre-venture capital)
- Start-ups initiated at three major research universities (e.g., 43 in 2010) and county retention rate
- Number of L.A. County-based bioscience (or bioscience-related) traded industry establishments (e.g., 450 in 2014<sup>38</sup>)
- Amount of bioscience-related federal research dollars (e.g., NIH) directed to local research universities and institutes (e.g., \$1 billion in NIH-funded research in 2012)
- Number of new firms recruited to L.A. County over five-year period (prospects attracted)
- Average wage in the L.A. County bioscience industry cluster (e.g., \$72,052/year in 2010)
- Number of L.A. County-based therapies or devices in the Food and Drug Administration (FDA) clinical pipeline
- Number of local, regional, state, national and international media mentions of Los Angeles County bioscience firms and/or industry, including industry trade media
- New bioscience-related training programs on-boarded over five-year period of this plan

<sup>37</sup> See "Los Angeles County Bioscience Industry Contribution Analysis" conducted by the LAEDC's Institute for Applied Economics, please see Appendix 1.

<sup>38</sup> Id.



### VII. Conclusion

Using the above metrics, L.A. County's public, private, academic and nonprofit bioscience stakeholders can regularly track the region's shared progress and, if necessary, course correct. And while it is difficult to predict with reasonable accuracy the aggregate or percentage increases in economic activity (intensity) that will result from the execution of this Bioscience Implementation Plan, it's telling to see how well other benchmark regions/states have performed over the years and decades when implementing concentrated, collaborative and well-resourced capacity building programs in bioscience. For example, under the leadership of organizations such as the Massachusetts Biotechnology Council (MassBio), a partnership of government, industry, academic institutions, foundations and other bio-relevant organizations, biopharma employment in Massachusetts, a state with approximately 6.8 million residents, grew by 38 percent (38%) in 10 years, from 43,904 (2005) to 60,459 (2014).<sup>39</sup> Biopharma manufacturing employment in Massachusetts grew by almost 30 percent (30%) over that same 10-year time period. Investments in Massachusetts-headquartered bioscience companies grew 200 percent (200%) from \$600 million in 2005 to \$1.8 billion in 2014.<sup>40</sup> And, the state has added an additional six million square feet of commercial lab space since 2005 (with another 1.6 million square feet of additional lab space under construction).<sup>41</sup> These growth numbers speak for themselves.

What is also known is that L.A. County is already behind Massachusetts and other benchmark regions, such as Maryland/Washington, DC, "Research Triangle," NC, San Diego, San Francisco Bay Area

and Seattle.<sup>42</sup> In fact, nearly all the benchmark regions across the U.S. are more "specialized" with at least a 20 percent (20%) higher level of concentration of bioscience jobs than L.A. County (and the national average).<sup>43</sup> However, this is not a lost opportunity for the L.A. region, especially if L.A. County's private, public, nonprofit and education sectors choose to follow the lead taken by the L.A. County Board of Supervisors to focus on building this thriving growth industry and execute the Action Items contained in the "four corners" of this Bioscience Implementation Plan.

<sup>39</sup> Massachusetts Biotechnology Council, 2015 Industry Snapshot.

<sup>40</sup> Id.

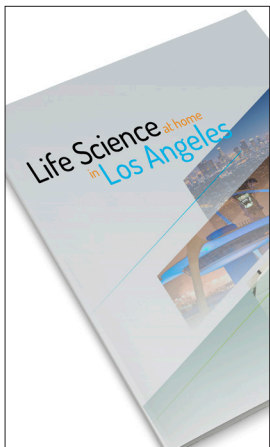
<sup>41</sup> Id.

<sup>42</sup> Battelle 2014, at pages 12-15 (L.A. County has a below-average concentration of bioscience jobs relative to the nation.)

<sup>43</sup> Id., at page 12.

## Relational Infrastructure

The Los Angeles region's bioscience sector needs to intensify its connections, build the relational infrastructure and strengthen the support systems for start-up, development-stage and commercial-stage firms in the region. This chapter provides a series of Action Items in the areas of ecosystem support, marketing and branding, and public policy.



## Action Item 1

Establish a new public-private bioscience partnership ("Bioscience Partnership") to serve as the implementing organization to oversee execution of the Bioscience Implementation Plan.

### Purpose:

The practical Action Items included in this plan must be brought to fruition through the efforts of the L.A. bioscience industry and other leaders in partnership with the County of Los Angeles. But, agreeing to partner is not enough - successful implementation of this plan demands a "backbone" infrastructure to support this public-private partnership, with dedicated, full-time staff to coordinate, organize, manage and track the many Action Items provided hereunder. In fact, successful best practice models throughout the nation, including the Bloomington Life Science Partnership (see, e.g., <https://bloomingtonlifesciences.com/about-us/>), reinforce the need to form a bioscience partnership that is adequately staffed and governed by an Advisory Board that includes members of private industry, higher education and local government.

The proposed Bioscience Partnership will have oversight over and be accountable for coordination of the Bioscience Implementation Plan's Action Items and Implementation Steps. The Battelle Report recommends an existing membership-based organization lead the county's bioscience effort; however, we believe that a well-resourced, independent Bioscience Partnership would be the most appropriate entity to lead the plan's execution phase. Specifically, we recommend that the Bioscience Partnership:

- Be formed and housed in an existing organization;
- Will not be membership-based; and
- Will therefore be representative of and open to all bioscience stakeholder categories and entities.

## Action Item 1 (continued)

Such a Bioscience Partnership is the best mechanism to ensure that there is maximum participation, buy-in and efficiency in terms of this program's resource allocations and operations over the next five years, until the Implementation Plan's business model can gain traction through the successful execution of the Action Items here under.

## Implementation Steps:

I. FIRST IMPLEMENTATION STEP: L.A. County Board of Supervisors to pass a motion to provide "seed" funding and appoint county representatives to serve on the "L.A. County Bioscience Partnership."

- Bioscience Partnership Legal Structure: Bioscience Partnership will be an independent, non-partisan and unincorporated association housed in an existing countywide organization ("Host Organization").
- Bioscience Partnership Board of Advisors: The Bioscience Partnership will have a Board of Advisors, which will be comprised of senior public and bioscience leaders drawn from L.A. County's industry, university, research, capital, economic development and public sectors, who will offer counsel, and provide guidance, direction and oversight on the Bioscience Partnership's progress executing the Action Items contained in the Bioscience Implementation Plan. The Bioscience Partnership Board of Advisors will include the following four (4) categories and number of representatives:
  1. Host Organization will designate three (3) representatives
  2. Funding Organizations (i.e., bioscience industry firms/organizations providing funding support for the Bioscience Partnership) will designate one (1) representative per funder

3. Private Bioscience Firms and Other Bio-Related Organizations: L.A. County CDC Bioscience Advisory Council will appoint 10 representatives drawn from regional bioscience business associations (Southern California Biomedical Council (SoCal Bio), Biocom, etc.), research and commercialization facilitating organizations (e.g., Larta Institute, L.A. BioMed, etc.), incubators/accelerator programs (e.g., Business Technology Center, Lab Launch, TechStars, etc.), bioscience firms and bioscience industry support organizations (e.g., attorneys, consultants, financiers, etc.) from throughout L.A. County
  4. Public Sector: L.A. County Board of Supervisors will designate five (5) representatives – one (1) per Supervisorial District
    - Bioscience Partnership Members: The Bioscience Partnership will be open to all, with no membership ("pay to play") requirements. All public-facing bioscience-related activities of the partnership will be unrestricted, through its industry council (see, e.g., part III below), to all bio-based and interested stakeholders throughout the L.A. region.
- II. FIRST SIX MONTHS: Bioscience Partnership to secure five-year funding commitment(s) to build the necessary internal organizational infrastructure, which will be led by an Executive Director.

Administrative overhead and functions (such as financial, legal, human resources and marketing) will be contracted with the Host Organization. The Bioscience Partnership will, from time-to-time, also contract with other entities, e.g., a PR/Marketing firm (see Action Item 3 hereunder).

## Action Item 1 (continued)

**III. SIX TO NINE MONTHS:** Bioscience Partnership to launch its L.A. County Bioscience Industry Council (Bio Council), deploying a best practice model<sup>44</sup> connecting regional bioscience leaders to the (Implementation Plan) work of the Bioscience Partnership. The L.A. Bioscience Industry Council will be open and free to all L.A. County bioscience-related firms, scientists, entrepreneurs, universities/colleges, incubators/accelerators, support cluster members (e.g., attorneys, bankers, etc.), municipalities and/or relevant agency/department that want to participate. The Bio Council will meet in-person semi-annually, at which times the Bioscience Partnership will provide updates on Implementation Plan progress and elicit feedback and input from council participants on relevant topics, issues, challenges and/or opportunities affecting the regional bioscience industry. By the six-month mark, the council should have at least 100 active participants, receiving regular progress updates and invitations to area bioscience events, forums, town halls, etc.

**IV. SIX TO 12 MONTHS:** Bioscience Partnership Executive Director, along with Advisory Board, to develop a business plan to ensure both the Bioscience Partnership's and the Bioscience Implementation Plan's financial viability after five years.

**V. SIX MONTHS AND BEYOND:** Bioscience Partnership Executive Director, along with support staff, will provide day-to-day management and drive the execution of the Bioscience Implementation Plan, creating and circulating annual deliverables, timelines, measurements of success, and offering support, where applicable and as enumerated within the Implementation Plan.

## Proposed Budget: Bioscience Partnership

Source	5-Year Total	Description
Partnership Advisors	\$1,000,000 (match and in-kind)	Match provided from Bioscience Partnership Advisors
LAEDC & Biocom	\$1,250,000	In-kind staff support provided from LAEDC & Biocom
Gap Financing	\$1,250,000 (\$250,000 per year)*	\$250,000/year for five years total
Total	\$3,500,000	

\* With County Motion to fund this essential Action Item, Action Items 2 through 7 will be kick-started, representing an additional private-sector match of over \$670,000.

<sup>44</sup> Such as the very successful Southern California Aerospace and e4 Mobility Alliance (advanced transportation) industry councils formed by the LAEDC, with 499 and 922 participants (June 2016), respectively.

## Action Item 2

### A. *Build rich internal database of L.A. County bioscience assets*

#### Purpose:

Assembling information about the region's bioscience industry is the first requirement to better align assets and fill gaps along the bioscience industry value chain. Indeed, an interactive map developed by LAEDC and CBRE has already proven to be instrumental in identifying physical and other assets, helping to better understand the dynamics of the industry in the region. With just a beta version, the interactive map has pinpointed research resources and centers of excellence around the real estate hubs, linked serial entrepreneurs with sub-regional economies, and identified deficiencies in infrastructure and other connectivity issues.

In addition, connecting the L.A. County bioscience community through a central hub is critical to empowering the industry's research, entrepreneurial and commercialization mechanisms. So, we recommend the internal database inform the build-out of a public-facing website (see Action Item 2b below).

#### Implementation Steps:

- I. FIRST IMPLEMENTATION STEP: Bioscience Partnership will extend the agreement with current database contractor to finish developing the internal database for the county and Bioscience Partnership, mapping critical data points and broadening the "visual" understanding of the dynamics of the regional bioscience network.
- II. FIRST SIX MONTHS: Database contractor will complete the aggregation of data about the L.A. County bioscience industry cluster.
- III. SIX MONTHS AND BEYOND: Bioscience Partnership will track and report on progress across all areas of development (see, e.g.,

measurements of success, page 20, i.e., job growth, establishment growth, training programs, capital investment, real estate parcels, lab spaces and vacancies, etc.).

The database will include very detailed information and datasets to track the health of the sector, including:<sup>45</sup>

- Sources of capital at all stages of development
- Bio-oriented land and real estate assets
- University/research institutes bioscience-related programs and centers
- Program specializations
- Resources for bioscience innovation and commercialization
- Entrepreneur and investor dealmaker data (see Action Item 8)
- Clinical trials and product development stages
- Bioscience firm information (location, contacts, size, specialty)
- Government incentives
- Export strategies

### B. *Launch public-facing website and bioscience resource navigator*

#### Purpose:

During the working group sessions, a number of bioscience leaders stated that they are constantly looking to keep up with what is happening in L.A. County's bioscience industry and want to learn about available bioscience-related resources. Compounding the industry's "connectivity" challenges, interested

<sup>45</sup> The mapping of this data into an interactive map, which will visually animate these data points to begin showing clustering and highlighting both geographic and programmatic areas of opportunity, has already begun.



**Action Item 2 (continued)**

bioscience stakeholders (e.g., entrepreneurs, scientists, educators, firm executives, job-seekers, etc.) often can't find L.A. County's abundance of business, capital, and economic, real estate and workforce development resources. Or, bioscience stakeholders may reach out to the "wrong" resources, which further frustrates intra-industry collaboration, which is so important to the future health and growth of this industry.

To address these challenges, the [www.LALifeSciences.com](http://www.LALifeSciences.com) website and bioscience resource navigator ("Bioscience Navigator") will share real-time, regional bioscience industry information, providing an interface for industry leaders, entrepreneurs, government officials, job-seekers and investors that gets them directly to the resources they need to succeed. This website would include an interactive map and the regional Bioscience Navigator to provide bioscience firms, as well as the "bio-curious" with fast, easy access to a "one-stop" portal (clearinghouse) that can help them find the right resources to finance, scale and further develop their idea, innovation, technology, firm, career, program, etc.

In addition, the website will serve as a branding mechanism, serving as the world's "front door" to L.A. County's bioscience industry. In this regard, the website will cultivate and catalogue our regional strengths by presenting continuous updates to brand and market the industry, providing an online venue and community in which to engage in a two-way, dynamic conversation with the broader L.A. bioscience community, while highlighting germane topics, such as local firm updates, webinars, professional development information, regional bioscience events, job openings and other important matters.

**Implementation Steps:**

**I. FIRST IMPLEMENTATION STEP:** Bioscience Partnership to acquire licenses for database

management platform and program, as well as to secure domain name for website ([www.LALifeSciences.com](http://www.LALifeSciences.com)).

**II. FIRST SIX MONTHS:**

- Bioscience Partnership to retain developers to complete platform customization and integrate platform for protected internal database and public website.
- Bioscience Partnership will contract with an outside data analyst to maintain, generate reports and manage data and users of program.

**III. SIX TO NINE MONTHS:** Bioscience Partnership to collect datasets and create a location for L.A. County-based bioscience firms to enter in their company information, identify other avenues to create a more robust database with multiple source data.

**IV. SIX TO 18 MONTHS:**

- Bioscience Partnership to develop and launch [www.LALifeSciences.com](http://www.LALifeSciences.com), an interoperable, user-friendly website that provides information about "everything bioscience" in L.A. County.
- Bioscience Partnership to integrate and launch the first iteration of the Bioscience Navigator with available bioscience resources across L.A. County.

**V. SIX MONTHS AND BEYOND:** Bioscience Partnership to track and report out on website traffic and key searches to further customize the user experience and inform on local market trends and optimize the public-facing experience.

**Proposed Budget: Database and Resource Navigation**

Source	5-Year Total	Description
Gap Financing	-0-	This action item is contingent on creation of the Bioscience Partnership to staff a data analyst
Partnership Advisors	\$90,000 (in-kind)	Support provided by partnership advisors
Total	\$90,000	



## Action Item 3

Develop an active and penetrating marketing and communications campaign with a focus on increasing the profile of Los Angeles County as a global leader in the life science community.

### Purpose:

As concluded in the Battelle Report, a significant opportunity exists to raise “the profile of Los Angeles County in bioscience development” by garnering recognition and attention, both internally (within L.A. County) and externally.<sup>46</sup> To date, there is not a unified voice communicating on behalf of the Los Angeles bioscience industry the many strengths the region possesses. Most messages are specific to a given company or research institute and not accounting for the combined strength of the region as a whole. This Action Item unifies and cohesively puts forward a transactional approach that highlights the successes and strengths of individual organizations, and also of the entire Los Angeles bioscience region.

Many of the Action Items and Implementation Steps in this report will roll into a comprehensive, overarching communications and marketing strategy. To be successful in the overall mission of this initiative, stakeholders have to effectively communicate all that is being built throughout this entire initiative. The top priority is to retain a PR/ Marketing firm that will be responsible for overseeing, executing and organizing – in collaboration with the Bioscience Partnership – the marketing and communications strategy. For this initiative to be successful, there will have to be a continued “drum beat” of messaging at all levels (local, regional, national and international) highlighting all that the region’s life science community has to offer. This will serve to encourage firms to remain and grow in Los Angeles County, as well attract resources and employers to the region.

<sup>46</sup> Battelle Report, pages 100-106.

## Implementation Steps:

- I. FIRST IMPLEMENTATION STEP: Bioscience Partnership to retain a PR/Marketing firm to oversee and execute a marketing and communications campaign.
- II. FIRST YEAR: Initiate a process of research and fact-finding through interview-based investigations that will help to achieve a deeper understanding of the people, processes and practical “ecology” surrounding the L.A. County-based life science industry and will reveal why bioscience firms have chosen to locate in L.A. County.
  - From the information sessions outlined above, the PR/Marketing firm will define the overall brand, audiences and key phrases to inform the campaign narrative. This will provide the foundation for overall positioning of the region and will be the starting point for a communications campaign.
- III. YEARS ONE AND TWO: PR/Marketing firm to build an impactful multimedia campaign based on the overall brand narrative, tailored to multiple stakeholder groups. This will include:
  1. Creating content (for print, outdoor, web and social) that showcases the value, strengths and potential of the life science industry in Los Angeles.
  2. Developing a logo, website with resource portal, pitch kits, fact sheets, (see Action Items 2 and 4 hereunder) video testimonials, “Q&A” documents, tagline(s), and overall messaging.
  3. Exploring the use of traditional and non-traditional communication channels to target various audiences, e.g., print campaigns, social media channels and on-campus channels.
  4. Identifying and engaging “Campaign Ambassadors,” selected from information session (see above) participants, and convene industry leaders (including policymakers) who

### Action Item 3 (continued)

will help rally support and foster a community of influencers to participate in the campaign and increase visibility for all that we are looking to accomplish.

5. Focusing on “leaky buckets,” such as research universities and institutions and their potential spin-out companies, investors who fund start-ups and serial entrepreneurs (per Action Item 8).<sup>47</sup>

**IV. YEAR TWO: PR/Marketing firm to launch a local campaign, targeting universities, local influencers, investors and companies with an existing or former attachment to the L.A. County bioscience community with the goal of energizing the industry’s known players. This will include:**

1. Working with local companies, patient advocacy groups and on-the-job workers, especially in the production-oriented areas of the industry, to find emotive stories, career pathway narratives and patient accounts.
2. Launching a local media relations campaign targeting the Los Angeles Times, local community newspapers, business journals, local academic newsletters, local talk radio and online news portals.
3. Emphasizing the importance of L.A. County bioscience inventions to local communities and society at-large with compelling firm, patient, worker and product success stories.
4. Showcasing Los Angeles County as a fast-growing cluster in the flourishing bioscience industry through participation at large conferences and recruiting events.<sup>48</sup>

5. Educating leaders at influential local organization, such as the Los Angeles Area Chamber of Commerce (L.A. Chamber of Commerce), the World Trade Center Los Angeles (WTC-LA), Los Angeles Tourism & Convention Board, etc. to synchronize messaging.



47) Battelle Report, page 56.

48) e.g., BIO International Convention

**Action Item 3 (continued)**

- v. YEAR TWO AND BEYOND:** PR/Marketing firm to focus the full launch on the broader bioscience community, including financiers, national media and industry decision-makers.

This comprehensive outreach campaign will:

1. Establish a strong L.A. County bioscience presence at leading life science trade and investment banking conferences.
2. Inform national and global bioscience firms about the concentration of contract research organizations (CRO) and contract manufacturing organizations (CMO) in L.A. County.
3. Educate relevant patient advocacy groups about the important therapies being developed by L.A. County-based bioscience firms, as well as the clinical trials being conducted at area research hospitals.
4. Launch semi-annual bus tours, inviting venture capitalists, investment bankers and “buy-side” fund managers from around the world to tour privately-held and publicly-traded L.A. County-based bioscience firms, much like the site visit tours once held in Boston-Cambridge, “Research Triangle” (NC), San Diego, Seattle, San Francisco Bay Area and The Woodlands, TX.
5. Launch an aggressive industry wide media campaign with a focus on key trade publications<sup>49</sup> and top-tier media<sup>50</sup> who cover the biotech space.
6. Pitch Los Angeles region for inclusion in annual cluster rankings, such as: the MoneyTree Life Sciences Report; FierceBiotech top clusters; and GEN’s Top-10 Biopharma Clusters.

Proposed Budget: Marketing and Communications Campaign

Source	5-Year Total	Description
Partnership Advisors	\$250,000 (In-kind)	Support provided by partnership advisors
Gap Financing	\$1,000,000 (\$200,000/year)	Funding for Bioscience Partnership to contract with PR/Marketing firm and for firm to make media buys
Total	\$1,250,000	

49) BioWorld, Medical Device Daily, FierceBiotech, FierceHealthcare, STAT, etc.

50) Andy Pollack/The New York Times, Ron Winslow/The Wall Street Journal, Caroline Chen/Bloomberg, etc.

## Action Item 4

Develop a “Pitch Kit” to define key messages and talking points for targeted audiences regarding the strengths of the region’s bioscience industry, as well as to educate on key advocacy challenges or opportunities.

### Purpose:

A key element of building momentum in the region’s bioscience industry will be to address the fact that “Los Angeles County’s emerging bioscience industry cluster is not well recognized locally, nationally or internationally.”<sup>51</sup> This lack of recognition and visibility undercuts the industry’s ability to retain and attract talent, generate home-grown firms and attract bioscience firms from outside of the region to invest and expand in the region.<sup>52</sup>

Motivating and uniting local political, media, industry and academic leaders to “speak with one voice” about the county’s emerging bioscience industry will pay outsized dividends in terms of quickly generating more recognition and visibility. The developed “Pitch Kit” of materials will provide:

- Data-driven sound bites supporting the region’s key assets, specializations, and capabilities, e.g., research and federal funding, sub-discipline strengths, employment data, advanced production, talent, engineering, etc. (A cursory cataloging of some of these supporting assets can be found in Battelle TPP’s analysis of the region’s core competencies.)<sup>53</sup>
- Unified talking points on the local initiatives supporting L.A. County’s bioscience industry, and the assets found within the L.A. County bioscience cluster.

- Background information on the region’s bioscience industry, including: list of industry cluster firms; research institutions (e.g., hospital, university, etc.); and cluster support service providers (e.g., venture capital firms, FDA/regulatory consultants, intellectual property attorneys, real estate brokers, site selectors, CROs and CMOs, etc.), along with bioscience industry association participation and opportunities for involvement.

### Implementation Steps:

- I. FIRST IMPLEMENTATION STEP: Bioscience Partnership to begin to craft and test key messages, talking points, and chief challenges and opportunities for elected and other leaders, including C-level executives, targeted members of the media, researchers and scientists, to disseminate.
- II. FIRST MONTH: Bioscience Partnership to determine key target audiences, i.e., key industry leaders and elected officials who will support and speak to the strengths of and opportunities with the Bioscience Industry in Los Angeles County.
  - Bioscience Partnership to create parallel introductory bioscience briefings, including key talking points specific to the L.A. County bioscience industry cluster and its current and forecasted economic, fiscal, and job contributions, along with “market intelligence” forums on future trends within the bioscience industry, such as so-called “precision medicine” and health informatics.

<sup>51</sup> Battelle 2014, at page 100.

<sup>52</sup> Id.

<sup>53</sup> See, e.g., Battelle 2014 (Appendix B: Profile of Core Competency Areas: Novel Therapeutics and Diagnostics; Bioengineering Solutions for Treating Diseases and Medical Conditions; and Innovations in Healthcare Delivery), at pages 109-126.





## Action Item 4 (continued)

- III. FIRST SIX MONTHS: Bioscience Partnership to aggressively engage with identified key targeted audiences, i.e., elected, industry, academic and other leaders, to:
  - Further refine key message points for each audience;
  - Find out what those target audiences currently know or perceive; and
  - Determine how each audience receives and disseminates its information.
- IV. SIX MONTHS AND BEYOND: Bioscience Partnership to host and organize on-site tours and organize educational events with elected officials, especially those serving on key local, state and federal legislative committees with jurisdiction over key advocacy challenges or opportunities. Ongoing outreach to elected officials will include talking points, events and regular briefings on developments within the industry.

## Proposed Budget: Pitch Kit

Source	5-Year Total	Description
Gap Financing	-0-	This action item is part of the Bioscience Partnership
Partnership Advisors	\$90,000 (In-kind)	Support provided by partnership advisors
Total	\$90,000 (In-kind)	

## Action Item 5

Pilot an L.A. County Industry Advocate Program to provide direct services to bioscience and other key industry firms with strong growth potential and high quality, family-supporting employment potential.

### Purpose:

According to the Battelle Report interviews, bioscience industry executives raised big concerns about having to “wrestle with permitting issues and delays and the uncertainties they create making moves out of the county and state more appealing.”<sup>54</sup> As the Los Angeles County bioscience industry cluster develops, along with other high-value growth industries to be identified as part of L.A. County’s January 25<sup>th</sup>, 2016 motion establishing a Countywide Industry Sector Development Strategy,<sup>55</sup> zoning and related policies will be a key determinant in whether specific hubs and firm concentrations within the L.A. County industry clusters, such as bioscience, will be viable and competitive with others across the nation and globe. These points were further corroborated and expanded upon in a 2015 LAEDC Business Climate Survey, commissioned by the LAEDC<sup>56</sup> and after interviewing and convening executives from several bioscience firms, both large and small, across the Los Angeles region. These firms have many needs that span broadly across regional governance jurisdictions and different agencies.

Based on our separate interviews, top cited challenges include:

- Navigating public permitting and entitlement processes
- Access to available incentives
- Expedited access to regional resources
- Inconsistent enforcement standards among individuals
- Site selection assistance and other business assistance service needs

To remedy some of the administrative process burdens on bioscience and other industry firms looking to come, stay or expand in L.A. County, it is advised that the L.A. County Board of Supervisors pilot an Industry Advocate Program, and appoint a single point of contact (“Industry Advocate”) within the County CEO’s office. This person will act as the centralized, industry-facing resource charged with helping bioscience and other key industry firms navigate intra- and inter- L.A. County departmental processes. This Industry Advocate will also assist in expediting and facilitating project delivery for high-priority initiatives associated with the bioscience and other key industries.

<sup>54</sup> Battelle 2014, page 69.

<sup>55</sup> See, CDC Report On The Establishment Of A Countywide Economic Development Trust Fund And Related Action Items (Item Nos. 1-D And 7, Agenda Of October 20, 2015)

<sup>56</sup> Business Climate Survey, conducted by Market Enhancement Group, was fielded May and June 2015. There were 1,000 respondents, with results statistically projectable at two standard deviations (a 95% confidence level). Overall data is subject to a maximum sampling error of +/- 3.2%. In this survey, respondents rated “permit and entitlement assistance” as one of the most important business assistance service that would help their companies grow over the next three years.



**Action Item 5 (continued)****Implementation Steps:**

- I. FIRST IMPLEMENTATION STEP: L.A. County Board of Supervisors to pass an enabling (legislation) motion directing the L.A. County CEO to report back on the viability of piloting an Industry Cluster Advocate Program within the CEO's office, including fiscal/budgetary impacts, and the possibility of using a small portion of the County's business license fee to fund the Industry Advocate Program.
- II. YEARTWO: Depending on the viability, per the County CEO's report-back, L.A. County Board of Supervisors to appoint/confirm the Industry Advocate.
- III. YEARS TWO and THREE: Industry Advocate to liaise, on a case-by-case basis, with firms from key industries, such as bioscience, who are located in L.A. County, but facing challenges, or looking to come to the region, as well as with designated industry partnerships, such as the Bioscience Partnership staff, regional economic development organizations and LAEDC Business Assistance Program staff.
- IV. YEAR FOUR: L.A. County CEO to report on the two-year progress made under the L.A. County Industry Advocate Program in terms of adding more firms and high-quality, family-supporting jobs in key industries, such as bioscience, identified in the Countywide Industry Cluster Development Strategy.

Proposed Budget: L.A. County Industry Advocate Program

Source	5-Year Total	Description
Gap Financing	TBD	Unknown cost at this time
Total	TBD	

## Action Item 6

Implement a local, state and federal policy agenda in support of L.A. County's bioscience industry

### *a. County and local policy initiatives*

#### **Purpose:**

Traditionally in bioscience, talent, along with a vibrant mix of universities and other research institutions, has been the key driver in biotech firm site selection decisions. However, in recent years the number of talent-rich locations has grown sharply throughout the U.S. and world, and with the transportability of highly skilled labor, comes geographic flexibility for bioscience firms.

Local county and municipal governments have the ability to create an optimal blend of factors that encourage growth of the region's bioscience industry by offering attractive incentives and a clear and streamlined process for bioscience firms to grow, relocate or expand in Los Angeles County. Many jurisdictions across the nation offer varying incentives to attract this much sought after industry. Examples of common incentive programs, include:

- Regional infrastructure grants to assist in revitalizing the infrastructure of a community to enhance its ability to accommodate the innovation-intensive needs of bioscience firms
- State, county and municipal tax incentives, including property tax exemptions, job incentives<sup>57</sup> and cash grants<sup>58</sup>

- Selling Losses and Credits, allowing unprofitable bioscience companies to raise cash by selling tax losses and R&D credits to other local businesses for a percentage, e.g., at least 75 percent (75%), of their value
- Subsidized land and leases, such as in the State of Florida where key bioscience-related projects were awarded hundreds of millions of dollars in incentives, including cash grants from the state and counties

The following are examples of either targeted incentive programs or changes in policies that will help L.A. County compete as a top location for bioscience firms, and help remove the confusing patchwork of varying local tax laws and regulations through which firms must navigate.

1. Provide an L.A. County Bioscience Sales and Use Tax Exemption (STE)

Many states, including California, promote their biotechnology industries by providing them with a taxpayer-friendly means either to be exempted from or to recover the sales and use tax expenses ordinarily paid on equipment and supplies used for bioscience manufacturing and R&D, including property such as microscopes, chemical reagents and software.

Under this Action Item's proposed sales and use tax exemption incentive program, L.A. County would create a five-year sales and use tax exemption, similar to the State of California's, for qualified establishments primarily engaged (50 percent (50%) or more of the time<sup>59</sup>) in the business of manufacturing or R&D in biotechnology and life sciences.<sup>60</sup> Under this Action Item, eligible firms may qualify for either a 0.75 percent (.75%) or a 1.5 percent (1.5%) L.A. County sales and use tax

<sup>57</sup> For example, the State of Massachusetts offers biotechnology companies that create 10 or more jobs in-state during a single calendar year can receive an incentive payment equal to 50 percent of the eligible jobs' salaries multiplied by the applicable Massachusetts income tax rate of the newly hired persons.

<sup>58</sup> For example, the State of North Carolina created the One North Carolina Fund, which allows the governor to distribute cash grants on an as-needed basis to win strategically important projects that are also looking at another state or country (see, e.g., <http://edpnc.com/incentives/one-north-carolina-fund/>).

<sup>59</sup> Either derive 50 percent or more of gross revenue from, or expend 50 percent or more of operating expenses in a qualifying line of business.

<sup>60</sup> These firms may be defined by the following NAICS codes: 325412, 325413, 325414, 333314, 334510, 334517, 339112, 339113, 339114, 339115, and 541711.

## Action Item 6 (continued)

exemption (see below) on eligible equipment purchases and leases in the following categories:

- Machinery and equipment, including component parts;
- Medical, laboratory, scientific, clinical, or testing equipment and supplies;
- Computer hardware and software used in R&D and manufacturing;
- Devices used or required to operate, control, regulate, or maintain machinery;
- Pollution control items;
- Materials and fixtures for manufacturing, processing, research, or laboratory facility renovations, retrofits, refurbishments or re-use;
- Materials and fixtures for buildings and foundations that are an integral part of the business (including warehousing); and
- Rentals payable under leases classified as “continuing sales” or “continuing purchases” in accordance to California Revenue & Taxation Code Sections 6006.1 and 6010.1.

Eligible L.A. County firms would qualify for a 0.75 percent (.75%) sales and use tax exemption for any qualifying purchases and leases, while eligible firms would qualify for the full 1.5 percent (1.5%) L.A. County sales and use tax exemption for any qualifying purchases and leases executed with a supplier-firm that is also based in L.A. County, supporting the entire ecosystem.

2. Advocate for county-wide Gross Receipts Tax Exemptions in Relevant Cities to Spur the Region’s Bioscience Industry

The City of Los Angeles and several other cities in the region have eliminated business taxes on various targeted industries to encourage existing firms to expand their operations and new firms to relocate to

these cities. In March 2016, the Los Angeles City Council moved to analyze the estimated fiscal and economic impact of reducing or eliminating business taxes on biotechnology firms to encourage the development of biotechnology-related industries in the City of Los Angeles. The City of Los Angeles also has a three-year business tax holiday for any new business that begins operations in Los Angeles. The “holiday” applies to every new business, regardless of their annual gross receipts.

Other cities within the County of Los Angeles with gross receipts taxes should replicate this model and provide a three-year gross receipts tax exemption for any new or existing establishment that participates in the bioscience-related production or R&D, as defined by North American Industry Classification System (NAICS) codes in Biopharmaceutical Manufacturing, Medical Device Manufacturing, Medical Apparatus Manufacturing and Research and Development in Biotechnology.<sup>61</sup> Furthermore, relevant cities should extend their gross receipts tax exemptions to five years for firms either located in economically distressed census tracts<sup>62</sup> within that city or located within a three mile radius of a Bioscience Hub (refer to Chapter 4).

- B. *Advocate for state/federal government policies that support L.A. County’s bioscience industry*

### Purpose:

It is acknowledged that state and federal policy is beyond the direct control of the County of Los Angeles, but due to the size and relative influence of Los Angeles County’s state and federal legislative delegations, the county’s active support and engagement in specific issues can directly affect outcomes of importance to the health and vibrancy

<sup>61</sup> These firms may be defined by the following NAICS codes: 325412, 325413, 325414, 333314, 334510, 334517, 339112, 339113, 339114, 339115, and 541711.

<sup>62</sup> U.S. Government Accountability Office’s dual criteria for “economically distressed” rating: 1) a poverty rate of at least 20%; and 2) an unemployment rate of at least 1.5 times the U.S. unemployment rate

## Action Item 6 (continued)

of L.A. County's bioscience industry.

And so, we can – and should – take advantage of the size and prowess of our legislative delegation, comprised of 18 United States Representatives, 13 California Senators (including the Senate President pro Tempore), and 26 California Assembly Members (including the Speaker of the Assembly).

A few key advocacy items at the state and federal levels are listed below, although many more will certainly come up and/or be identified going forward that are more specific to the success of the L.A. County bioscience industry cluster:

- Protect California R&D and Net Operating Loss (NOL) tax credits at current levels.<sup>63</sup>
- Enact a statewide solution to the collection of household hazardous waste.<sup>64</sup>
- Pass a FY2017 appropriation bill that would increase NIH funding to \$34.5 billion (currently appropriated at \$32.3 billion).<sup>65</sup>
- Pass legislation to reform corporate federal tax code.<sup>66</sup>

- Increase access to talent:
  - Sustain funding for STEM (Science, Technology, Engineering and Math) education at both the federal and state levels.
  - Pass immigration reform, including H-1B visa reform. (The current immigration system hinders the ability of L.A. County-based bioscience firms to attract and retain its most important asset: skilled talent.)
- Repeal for good (currently there is a two-year moratorium, signed in 2015) the Medical Device Excise Tax.<sup>67</sup>
- Pass/enact the President's Precision Medicine Initiative (PMI).<sup>68</sup>
- Utilize California's Capital Investment Incentive Program to advance bioscience industry R&D and production.<sup>69</sup>

c. Regularly convene bioscience industry stakeholders to proactively advocate for and respond to public policy, legislative and administrative law issues

<sup>63</sup> California's R&D and NOL credit programs are one of the most critical tools small life sciences have, and one of the few things that keeps California competitive with other states. They must be continued to be funded at 100 percent (100%) of current allocation.

<sup>64</sup> Currently, household hazardous materials are subject to local governance, resulting in a wide disparity of collection practices, often at a significant cost to life science companies. The state should adopt a statute which guides any local action on this issue.

<sup>65</sup> NIH is a key source of funding for L.A. County research and development, and many startups rely on it to get through proof-of-concept. Increased NIH funding would provide additional key seed money to many local firms seeking to move toward clinical trials.

<sup>66</sup> The current federal tax code leaves domestic bioscience companies – including L.A. –based ones – at a distinct disadvantage vis-à-vis foreign firms and currently discourages the repatriation and reinvestment of money held offshore back into the U.S.

<sup>67</sup> This took effect in January 2013, creating a new sales tax of 2.3 percent (2.3%) levied on medical devices regardless of firm profit. With 320 firms manufacturing Medical & Surgical Devices and Medical Apparatuses in the region L.A. County is a leader in medical device establishments and this tax strikes at the heart of this industry.

<sup>68</sup> PMI applies precision medicine to cancer focusing on innovative clinical trial design and to create a research cohort of Americans who will share genetic data, biological samples, and life-style information, all of which would have the potential to identify new targets for treatment and prevention, and lay the scientific foundation for precision/targeted therapies for many chronic and terminal diseases. Currently, precision medicine is merely a multi-billion-dollar industry; however, it has the potential to become a multi-trillion dollar industry, of which L.A. County – with core competencies in genetics and genomics – would very likely be a major economic (jobs, output and fiscal) beneficiary. Los Angeles County is already the home to numerous pre-eminent thought leaders and pioneering companies in this space (most notably Dr. Patrick Shoon-Shiong who has direct connection to the President's initiative), so Los Angeles County has already established an authoritative presence in the field.

<sup>69</sup> In the 1998-1999 fiscal year, the California State Legislature initiated an incentive that provides property tax abatement for up to 15 consecutive years for large capital investment by a qualified manufacturing facility to attract large manufacturing facilities to locate and invest in those facilities in California. The local government entity contributes by making an annual payment of 75 percent of the property taxes generated by the new investment. The Los Angeles Board of Supervisors approved the establishment of the County's CIIP on June 30, 2016. Any new CIIP would require the County Board of Supervisors to approve a Community Services Agreement and an annual Job Creations Plan with the manufacturing partner. CIIP was originally available to a broad range of manufacturers. However, the program has been narrowed down to provide property tax rebates beyond the first \$150 million of assessed property for industry codes 3321-3399 or codes 541711 or 541712, which include Research and Development in Biotechnology and Research and Development Physical, Engineering, and Life Sciences.



## Action Item 6 (continued)

### Purpose:

In order to best identify and respond in real-time to very specific recommendations within the context of a comprehensive package, the Bioscience Partnership will form a working group to identify specific ordinances, regulations or legislation that must be addressed in an ongoing and real-time basis to best facilitate the industry cluster's success, as well as develop a universal "toolkit" for local governments to use as appropriate. This type of participatory process, in which all sectors are involved in identifying and addressing policy and/or regulatory challenges, will help ensure that bioscience industry opportunities are maximized when considering statutory, rulemaking or procedural changes. This process may inform some state and federal legislative solutions supporting the bioscience industry both in L.A. County and throughout the state of California.

### Implementation Steps:

#### Action Item 6a-1:

- I. FIRST IMPLEMENTATION STEP: Los Angeles County Board of Supervisors to request Office of the L.A. County Treasurer to report back on fiscal implications of different sales and use tax credit program scenarios.
- II. SIX TO 18 MONTHS: Based on report from L.A. County Treasurer, Los Angeles County Board of Supervisors to pass motion enacting sales and use tax exemption for qualifying firms and equipment purchases/leases.
- III. YEAR TWO: Relevant Los Angeles County departments to develop rules for implementing the program.

#### Action Item 6a-2:

- I. SIX to 12 MONTHS: Bioscience Partnership to construct and circulate a model ordinance and best management practices document for the phased elimination of the gross receipts tax for bioscience and other key industries identified in

the Countywide Industry Sector Development Strategy.

- II. NINE TO 18 MONTHS: Bioscience Partnership to meet with relevant L.A. County cities, e.g. the City of Santa Monica, about enacting a three- to five-year tax holiday, exempting bioscience firms from the gross receipts business tax.

### Action Item 6b:

- I. YEAR TWO: Bioscience Partnership to coordinate state and federal advocacy efforts with local leaders, firms, and relevant trade organizations, using the pitch kit (see Action Items 3 and 4), as well as lead annual trips to Sacramento and Washington, DC in support of state and federal bioscience priorities, respectively.

### Action Item 6c:

- I. YEAR ONE: Bioscience Partnership to form and convene a state and federal public policy working group to determine areas of advocacy and work with the working group to update advocacy priorities regularly.
- II. YEAR TWO: Bioscience Partnership to develop and distribute a "toolkit" of model ordinances and regulations that should be developed for uniform treatment of bioscience firms across the county.

Proposed Budget: Local, state, and federal policy agenda

Source	5-Year Total	Description
Gap Financing	TBD	This action item is contingent on creation of the Bioscience Partnership to provide institutional support
Partnership Advisors	\$200,000 (In-kind)	Support provided by partnership advisors in the form of staff time, operational support and travel expenses
Total	\$200,000 (In-kind)	

## Action Item 7

- a. *Launch export-readiness initiative with programs and services for commercial-stage bioscience firms – especially in fast-growing areas, such as Healthcare Delivery Innovations, without the need to obtain regulatory approval abroad to sell their products, services, technologies and processes in new international markets*

### Purpose:

With increasing globalization and international connectedness, nations and regions engage in trade of goods and services. Firms, industries, regions and nations only export what other firms, industries, regions and nations cannot make, innovate or do for themselves. Yet, it is estimated that fewer than two percent (2%) of L.A. County-based firms currently engage in exporting.

Medical diagnostics and surgical devices represent important and lucrative export commodities for the L.A. region. Certainly, there is further untapped growth potential in the export these commodities, such as in dental, electro-medical and musculoskeletal devices, but there are also distinct opportunities for export growth in other fast-emerging areas, such as novel healthcare delivery and service platforms, including biomedical imaging and health informatics, which, according to Battelle TPP, represent key market opportunities for L.A. County.<sup>70</sup>

Imagine if L.A. County bioscience firms from these core L.A. County competencies and specializations could, through a number of low- to no-cost trade programs and services, gain a toehold in new foreign-flag markets. This would generate new sources of revenue that would come back into L.A. County, and also increase the likelihood of L.A. County-based firms developing relationships with future research and/or commercialization partners,

executing lucrative joint ventures and foreign licensing agreements, and securing new potential funding streams.

As part of this bioscience industry export readiness initiative, and by taking advantage of L.A. County's concentrated array of world-renown hospital centers (e.g., Cedars Sinai, City of Hope, among others), there is the possibility to adapt certain local-serving components of the L.A. County bioscience and health services industry clusters – i.e., medical and surgical hospitals<sup>71</sup> – into exportable commodities and services. This would be effected by aggressively marketing the county's leading medical center-affiliated hospitals, clinics, and "medical tourism" industry, and selling (exporting) innovative health care treatments, surgical procedures and point-of-care therapies to a new global audience of middle- and upper-class consumers, thus increasing the economic intensity (direct, indirect and induced economic, job and fiscal impacts) of these primarily local-serving sectors of the bioscience and health services industries.

This medical tourism initiative could prove to be an extremely lucrative market opportunity for L.A. County, with significant regional economic contribution. According to Patients Beyond Borders (PBB), around 8 million patients from across the globe seek overseas treatment each year, contributing to a global industry worth between \$24 billion to \$40 billion. Between 600,000 and 800,000 foreign those patients traveled to the U.S. for treatment last year, according to PBB. The top U.S. clinics that attract international patients include: the Cleveland Clinic in Ohio; Johns Hopkins Hospital in Baltimore; and Mayo Clinic, which has branches in Arizona, Florida and Minnesota. Why not Los Angeles?

<sup>70</sup> Battelle Report, at pages 28-30.

<sup>71</sup> NAICS Code: 622110



## Action Item 7 (continued)

### Implementation Steps:

- I. **FIRST IMPLEMENTATION STEP:** The Bioscience Partnership to identify a small group of county-based organizations focused exclusively on global trade and investment programs and strategies, such as: WTC-LA; Los Angeles Regional Export Council (LARExC); the L.A. Area Chamber of Commerce Global Initiatives Program, etc., (taken together, “Global Trade Organizations”) who will form the advisory group for export-readiness initiatives.
- II. **YEAR ONE:** The Bioscience Partnership to convene the identified advisory group of county-based organizations to create an annual agenda for the bioscience industry-focused trade facilitation and export assistance programs.
- III. **12 TO 18 MONTHS:** Bioscience Partnership, together with Global Trade Organizations, to identify and recruit county bioscience firms that have products on the market and thus primed to export. Additionally, the Bioscience Partnership, along with Global Trade Organizations taking the lead, to:
  - Contract with an entity to conduct proprietary research, based on L.A. County’s key market opportunities (as described in the Battelle Report),<sup>72</sup> assessing the size and viability of different international markets, identifying key global targets (“Identified Global Markets”)
  - Grow the effort beyond the Global Trade Organizations to form “bioscience export readiness” partnerships with existing export services programs in the region (e.g., Department of Commerce, California Manufacturing Technology Consulting, UCLA Global Access Program, USC International Business Consulting Project, etc.)
- Shepherd participating [primed-for-export] bioscience firms through a step-by-step process, which includes enrollment in effective export readiness programs and ensures success upon completion.
- IV. **YEAR TWO:** Global Trade Organizations to encourage international partners to help L.A. County firms secure business opportunities in foreign markets through targeted business development trips, aggressive follow up and ongoing relationship building, and personal matchmaking.
- V. **YEARS TWO AND THREE:** Bioscience Partnership, in partnership with Global Trade Organizations, to convene leading countywide health centers, clinics and medical center-affiliated hospitals to launch a pilot “medical tourism” initiative, targeting People’s Republic of China.
- VI. **YEAR THREE AND BEYOND:** Biosciences Partnership, along with Global Trade Organizations and other export readiness partners, to conduct bi-annual bioscience trade missions to Identified Global Markets to provide local companies and key decision-makers market access, as well as encourage “reverse trade missions” to extract the most value from forged relationships.

<sup>72</sup> Battelle Report, at pages 16-30.

### Action Item 7 (continued)

- b. *Attract foreign investment into the L.A. region within fast-growing areas of the bioscience industry where L.A. County has a core competency, such as genetics and genomics.*

### Purpose:

Foreign direct investment — or FDI — can take a number of forms, such as the direct purchase of an existing firm, investment into a joint venture with an entity in the destination nation, direct investment into a new venture, or construction and outfitting of a facility. FDI flows to the U.S. alone were \$384 billion in 2015, the highest level since 2000.<sup>73</sup>

One way of measuring the value of foreign investments is the number of employees of foreign-owned establishments (FOEs). In 2013, an estimated 6.1 million people were employed at FOEs in the United States, approximately 4.4 percent (4.4%) of national payroll employment.<sup>74</sup> Here in Southern California, there are an estimated 9,105 FOEs supporting 366,415 employees with wages of \$23.6 billion.<sup>75</sup> Of these, an estimated 4,367 FOEs are in L.A. County with 177,427 employees and estimated wages of \$11.9 billion; together with the indirect and induced impacts of FOE firms, 8.4% of all jobs in L.A. County are supported by FOEs.<sup>76</sup>

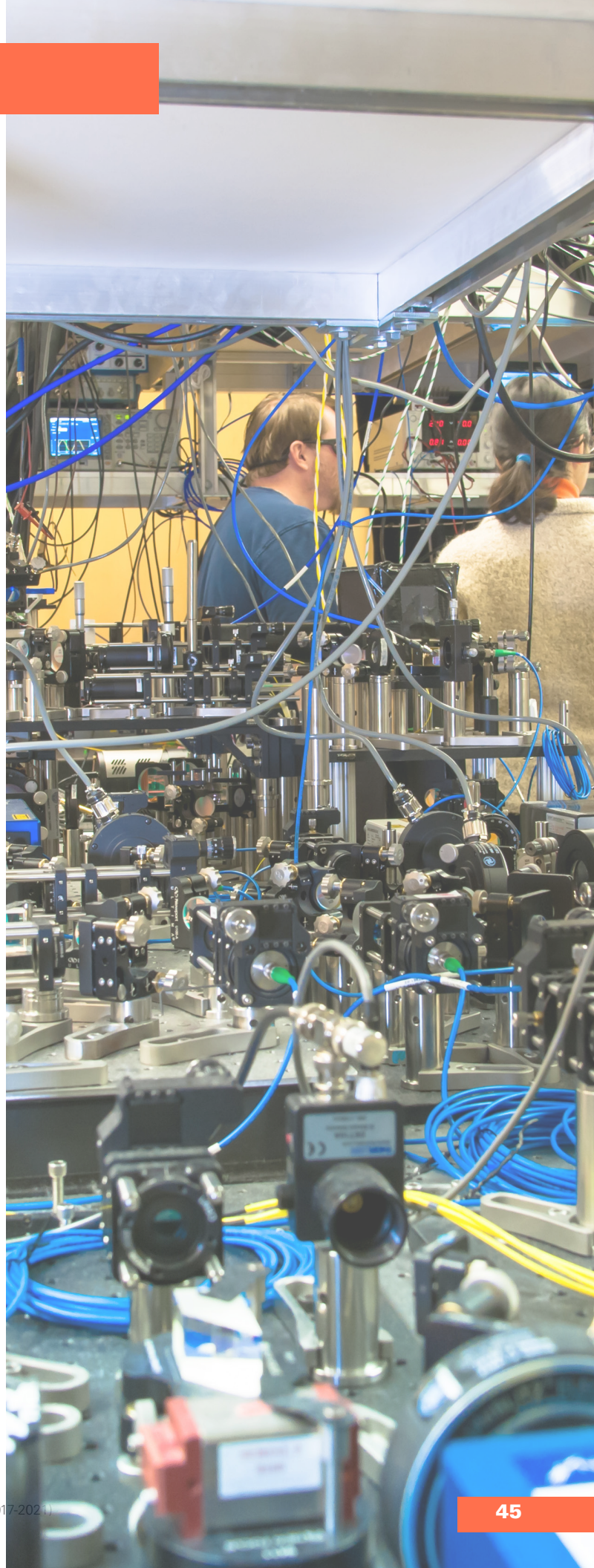
Point being, there's a lot of economic promise sitting outside of our borders – and, the county's bioscience industry must tap into this [FDI] opportunity. Supervisor Hilda Solis summed it up best, "Our draw, combined with our international connections, results in jobs and economic opportunity that provide benefits locally and throughout Southern California."

<sup>73</sup> World Trade Center, Los Angeles, "Foreign Direct Investment in Southern California" (report conducted by the LAEDC Kyser Center for Economic Research and the Institute for Applied Economics), dated: June 2016, at page 4.

<sup>74</sup> *Id.*

<sup>75</sup> *Id.*

<sup>76</sup> *Id.*, at page 22.



## Action Item 7 (continued)

Indeed, matching our region's international connections and foreign interest with the bioscience industry in Los Angeles County has the potential to exponentially grow the industry into a thriving and robust engine for jobs and economic opportunity.

### Implementation Steps:

- I. FIRST IMPLEMENTATION STEP: Bioscience Partnership, together with the WTC-LA, to begin cataloging core bioscience competencies of the 10 largest FOE source nations: Japan, United Kingdom, Switzerland, Germany, France, Canada, Netherlands, Ireland, Sweden and Australia.
- II. YEARTWO: WTC-LA to lead bioscience FDI attraction program through the following activities:
  - Produce a strategic plan that will help guide the Bioscience Partnership's bioscience FDI attraction program's proactive recruitment.
  - Actively screen incoming bioscience-interested foreign delegations, establishing an online intake and screening system on both the WTC-LA and [www.LALifeSciences.com](http://www.LALifeSciences.com) websites.
- III. YEARTWO AND BEYOND: WTC-LA to facilitate partnerships, using its own "Connection Program," and transactional business opportunities between foreign flag and L.A. County-based bioscience firms.
  - Establish bi-annual matchmaking session where selected L.A. County-based bioscience support service providers and partners are invited to conduct one-on-one consultations with a targeted group of foreign bioscience firms.
  - Establish a bi-annual global investor sessions where foreign investors are invited to hear from and meet exciting, up-and-coming L.A. County-based companies in fast-emerging core competencies, such as healthcare delivery innovations.

- Conduct outreach to leading foreign organizations, such as the Beijing Genomics Institute, one of the world's leading genome sequencing centers, in core L.A.-dominant genetics and genomics disciplines to establish North American "Centers of Excellence" in the L.A. region.

### Proposed Budget: Export Readiness and FDI Initiatives

Source	5-Year Total	Description
Gap Financing	-0-	This action item is embedded in and contingent on creation of the Bioscience Partnership
Partnership Advisors	\$40,000 (In-kind)	Support provided by partnership advisors in the form of staff time
Total	\$40,000	



### Capital and Bioscience Value Development

The dual objectives of this section are to create a rich bioscience innovation and entrepreneurial environment that accelerates new firm growth and to further sustain that growth through a “capital web” of investors, at all stages of development, including an in-flow of venture capital. For L.A. County to be globally relevant in such an incredibly capital-intensive industry as bioscience, it must address the region’s current dearth of bio-related capital available for investment, especially at the early-stages (i.e., proof-of-concept and pre-seed stages) of technology and product development. One of the reasons most often cited for bioscience companies leaving the L.A. region is the need to follow funders. This “follow the money” phenomenon, as described in the Battelle Report,<sup>77</sup> represents a major obstacle in developing the area’s bioscience industry. Indeed, much of the innovation and invention borne from the region’s array of research, medical and academic institutions leaves the region for “greener pastures,” seeking seed-, angel- and series-round funding elsewhere. Addressing this funding gap with a few highly targeted public-private funding initiatives that activate this capital web is paramount to the bioscience industry’s success in Los Angeles.

Traditionally, the federal government, i.e., by way of the Small Business Administration through Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs, has been a strong source of funding for early-stage innovation, while investments by the private sector have primarily driven successful commercialization of these innovations. At early stages, bioscience firms are at great risk because while the firm’s technology is in the development-stage there are no longer academic (research university) resources available to the company; this is known as the “Valley of Death.” And, without ample public sector funding, firms, especially in the biopharmaceutical sector, are

left to fill in that early-stage capital gap, ranging between \$8 and \$20 million for a novel drug before it even gets to the clinic,<sup>78</sup> with private sources to remain productive and alive. Problem is, biotech-directed venture capital (VC) funding usually doesn’t come until a drug candidate is at least in human trials, which takes many years, and sometimes not until the candidate has reached late-Phase II or early-Phase III in the clinical process, which requires many millions of dollars of capital just to get to that point. Couple that with the fact that only 11.8 percent (11.8%) of Phase I candidates eventually progress to FDA approval,<sup>79</sup> and it is easy to see why the road to commercialization for an early-stage biopharmaceutical company is so daunting. Unfortunately, the road to commercialization is only a bit less daunting for a medical device startup, where the preclinical stage typically takes two to three years and depending on the nature of the device may cost upwards of \$10 million before the device is ready for clinical testing, an amount that typically exceeds the capital requirements and means of most angel syndicates.<sup>80</sup>

77 Battelle 2014, page 56 (“leaky capital bucket”)

78 Tufts Center for the Study of Drug Development. Briefing: cost of developing a new drug (Tufts, 18 November 2014)

79 Id. (Tufts Center examined new molecular entities first tested in humans between 1995 and 2007)

80 Aaron Kaplan, MD, et al, “Medical Device Development: From Prototype to Regulatory Approval”, American Heart Association, Inc. (2004)

Complicating matters, venture capital does not flow as freely in Los Angeles County as it does in other more prominent bioscience networks (such as the San Francisco Bay Area, Boston/Cambridge and San Diego). And in L.A. County, the problem is further compounded because local investors – unlike those in more fecund biotech regions – lack the technical expertise needed to evaluate bioscience-oriented risk, and therefore avoid bioscience investment altogether. Accordingly, creating a mechanism to validate market relevance and risk can – and must – be established not only to attract investor interest but to secure early investment.

Additionally, technology transfer and the commercialization of intellectual property have proven to be challenging processes in which the L.A. region has significant opportunity for improvement. With existing “Centers of Excellence”<sup>81</sup> across the county that excel in research foci such as cancer, regenerative medicine and personalized medicine, the hubs – or cluster(s) of bioscience firms spatially concentrated in one or more geographical areas – identified in the Battelle Report can be further authenticated, developed, championed and supported such that more new bioscience innovations and products will not only originate in L.A. County, but also stay within the region, further buoying the county’s entrepreneur-investor network ecosystem.

All of these interrelated challenges must be unraveled and resolved to build a more cohesive and productive bioscience entrepreneur and investor network in Los Angeles County. By providing tangible and intangible resources, which include hands-on technical support and mentoring to assist entrepreneurs and early-stage companies, the private, nonprofit and public sectors in L.A. County can help drive research outcomes towards commercialization and can take immediate steps

to increase bioscience firm innovation and growth here in L.A. County. With the Action Items proposed in this chapter, the county can anticipate creating an improved bioscience product development ecosystem that establishes a strong foundation on which to build a sustainable and integrated network of entrepreneurs and investors.

<sup>81</sup> See Bioscience Research Strengths by Institution, Appendix 4

### Action Item 8

Direct tangible and intangible resources to further develop and integrate L.A. County's "commercialization » entrepreneur » investor" network, including the assimilation of area "dealmakers" and a maturing system of bioscience incubators and accelerators

#### Purpose:

Implementation of this bioscience commercialization Action Item will accelerate the development and retention of newly formed life science establishments and firms, supporting more direct jobs and the generation of local tax revenue. As these new firms grow, there will be amplified "multiplier effects," resulting in additional indirect and induced jobs, increased productivity and output, and accretive fiscal impacts.

This Action Item includes the following key elements:

- Construct additional incubator space
- Increase the pace of technology adoption and commercialization via technology transfer of the intellectual property from academic and research institutions to private companies
- Identify and engage investors and entrepreneurs using "Dealmaker" data<sup>82</sup>

As described in the Battelle Report and the Executive Summary to this Bioscience Implementation Plan, Los Angeles County is home to a large base of globally recognized bioscience research activity. It is clear that the R&D emanating from Los Angeles County research universities, institutes and hospitals is substantial and has the potential to creatively disrupt the status quo within the bioscience industry; but steps must be taken to ensure that commercially viable innovation is not stifled or exported. Unfortunately, too many L.A.

County-founded firms in the life sciences industry face the hard choice whether to leave the region in order to thrive and grow, primarily because they need to be closer to sources of accessible capital and/or affordable lab space. County public, private and education bioscience stakeholders would benefit greatly from retaining more of these firms that want to take advantage of the opportunity for continuous collaboration with the local institutions and scientists (hopefully within "white coat walking distance") that produce the innovations and continue to license new ones.

The first component of this Action Item is the creation of wet and dry lab space for incubators and accelerators. L.A. County is currently home to 23 bioscience-oriented incubators, accelerators and shared spaces. Accelerators, such as the partnership between TechStars and Cedars Sinai, tend to quickly accelerate growth by selecting a cohort of startup companies that moves through an acceleration program within a finite amount of time, utilizing a network of mentors and targeted training programs, and finalizing the business model and structure for participating companies. Incubators, in contrast, bring on companies for an indefinite amount of time, and as a consequence have very rigorous application processes. Once admitted, incubators typically provide much of the shared infrastructure, such as office space, labs, and prototyping areas, for startup companies to prove their concepts.

While both incubators and accelerators help start-up companies get off-the-ground, there are significant barriers to opening and operating new incubators and accelerators. Foremost among these barriers is physical lab space, including high costs of real estate and multi-tenant lab space. The cost of retrofitting existing real estate for wet labs can run well over \$150 per square foot.<sup>83</sup> The shortage of functional incubators and wet lab space is a chief

<sup>82</sup> For more information on the dealmaker analysis, refer to Dealmaker user guide for more information on the robust dataset provided by Commonweal in Appendix 3.

<sup>83</sup> Battelle 2014, page ES-6.



### Action Item 8 (continued)

impediment to startup companies staying in Los Angeles to develop and commercialize their

patentable innovations generated by county-based research institutions. And so, what would seem to be only a narrowly confined “space” challenge, actually begins to undermine L.A. County’s entire startup ecosystem of vibrant startup companies that want to be proximately located near one another to share knowledge, pool labor, entice new talent and entrepreneurs into the area, attract capital and co-develop future innovations and specializations.

The Los Angeles Cleantech Incubator (LACI) is a local case study in which the Los Angeles Department of Water and Power (LADWP) built (and owns) a 60,000 square foot building, including office space, prototyping facilities, a training center, and wet lab space. LACI’s portfolio of 48 companies has attracted more than \$65 million in invested capital in four years, generating more than \$180 million in long-term economic impact for the City of Los Angeles.<sup>84</sup> Outside of Los Angeles, JLABS, part of the Johnson & Johnston family of companies, partnered with the Texas Medical Center to house 50 life science startups in a new 34,000 square foot facility at the medical center. In this same way, L.A. County too can play a critical facilitation role, as did LADWP and the Texas Medical Center, in the expansion of incubators and wet labs by providing county-owned property at no- or low-cost (see, e.g., “Real Estate Chapter” hereunder). Additionally, the county may choose to explore application of the county’s purchasing power to negotiate discounted rates for expensive lab equipment.

The second component of this Action Item proposes to help increase the pace of technology adoption and commercialization via technology transfer of commercially viable intellectual property (IP) from

academic and research institutions to private companies. Unfortunately, general industry misinformation about technology transfer practices and policies at local universities and research institutions can stymie the process and present unnecessary obstacles in the path to commercialization. Two actions must be taken to address these inefficiencies. First, a document that standardizes best tech transfer practices and available resources should be made available and accessible to not only start-ups who wish to license intellectual property, but also to institutions who engage in the commercialization and/or transfer of technology. Second, targeted campaigns and partnership events to create a more productive working relationship between industry and research institutions will help to demystify and thus accelerate the process. While local technology transfer offices/organizations are certainly willing and able to license their intellectual property outside of the region, it would be of greater long-term benefit to these offices/organizations to keep these companies local where they can continue to collaborate with the area institutions from where the IP was generated, as well as continue to license new innovations.

The final component of this Action Item is to absorb existing Los Angeles “dealmakers” into the entrepreneur-investor network here. “Dealmakers” are actors (individuals, firms) who have founded, managed or invested in multiple private entrepreneurial firms, and hold concurrent equity stakes in three or more firms.<sup>85</sup> Knowledge about and integration of these dealmakers matters because existing affiliations play a critical role in driving value creation and shaping the industrial character of regional economies. Compared to the bioscience-focused “dealmaker networks” of San Diego and San Francisco, the Los Angeles region has a much less dense network, which negatively affects

<sup>84</sup> [http://lincubator.org/wp-content/uploads/laci\\_one\\_pager.pdf](http://lincubator.org/wp-content/uploads/laci_one_pager.pdf)

<sup>85</sup> Equity stake is classified by serving on Boards of Directors or Advisors, Investment or Management

### Action Item 8 (continued)

company (and entrepreneur) retention, since companies tend to locate near supporting individuals and firms.

To date, 1,980 “dealmakers” have been identified in the L.A. region.<sup>86</sup> The expertise of these individuals/firms must be harnessed to provide mentorship and investment in L.A. County-based startups, which will further advance the innovation and invention that already imbues the entrepreneurial culture of Southern California.

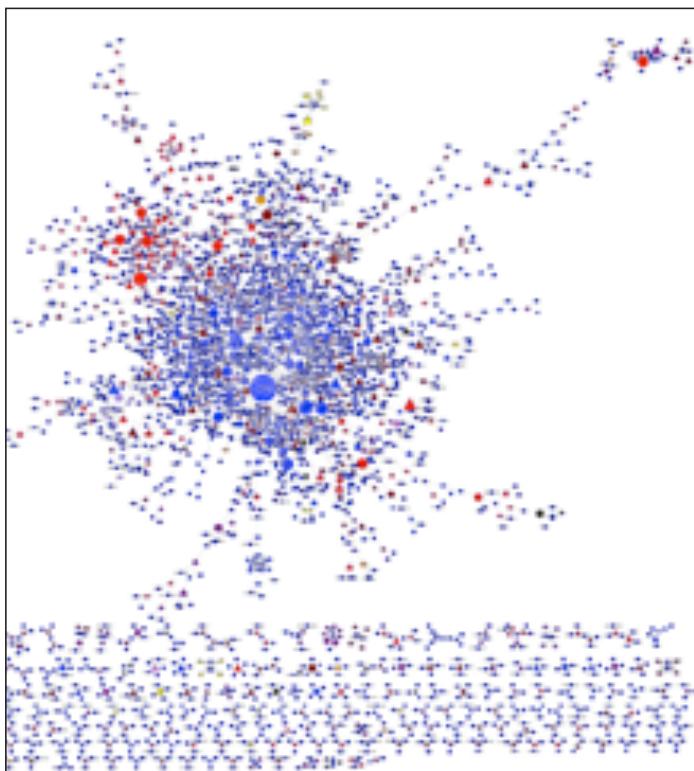


FIGURE 1. THE LOS ANGELES DEALMAKER NETWORK MAP INCLUDING HOSPITALS

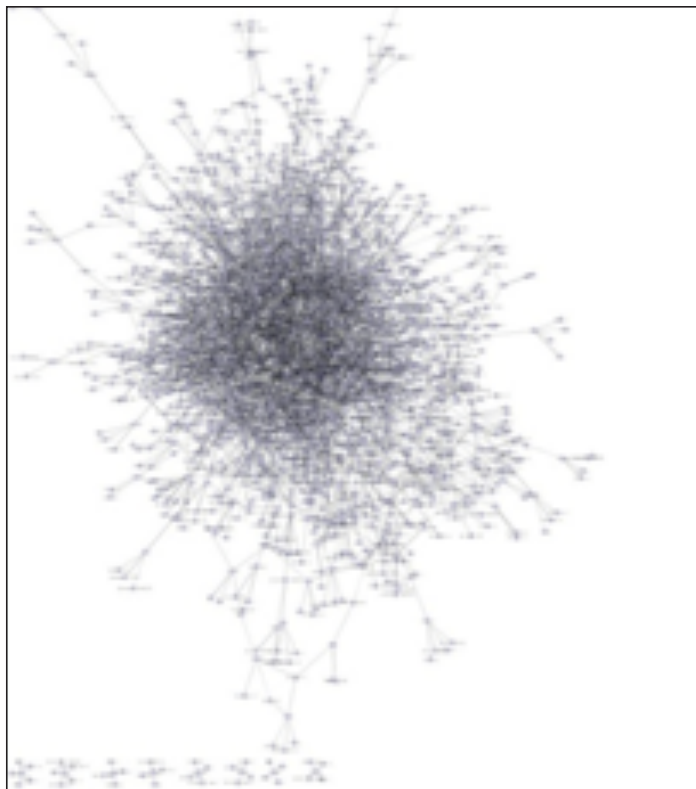


FIGURE 2. THE SILICON VALLEY DEALMAKER NETWORK MAP

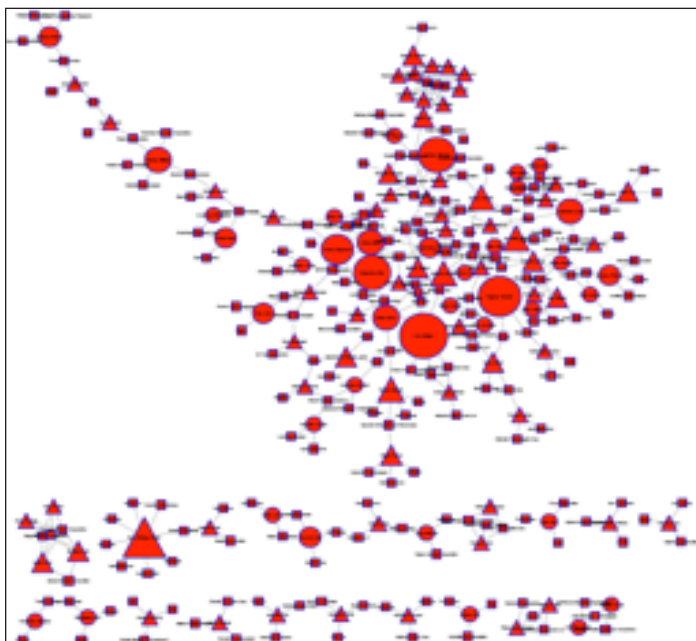


FIGURE 3. THE LOS ANGELES DEALMAKER NETWORK MAP

<sup>86</sup> See Appendix 3.

### Action Item 8 (continued)

#### Implementation Steps:

##### A. *Construct Additional Incubator/Accelerator/Shared Spaces*<sup>87</sup>

- I. FIRST IMPLEMENTATION STEP: L.A. County Asset Management Group to begin a feasibility analysis to identify potential parcels of county-owned land to be developed for the purpose of incubation, acceleration and shared spaces for bioscience start-ups.
- II. FIRST SIX MONTHS: Bioscience Partnership issue a “best practices” document of established, successful incubators, such as QB3 and J Labs, to replicate in L.A. County.
- III. FIRST NINE MONTHS: Bioscience Partnership to connect with the management teams from a few of the most successful incubators re public-private partnership opportunities here in L.A. County and the possibility to site new incubator facilities in Los Angeles.
- IV. 12 TO 18 MONTHS: Los Angeles County Purchasing and Contract Services (PCS) to catalog current purchasing policies and identify any opportunities, including partnerships with local bioscience industry associations, to provide discounts to purchasing lab equipment to any incubator located in Los Angeles County.
- V. 18 TO 24 MONTHS: L.A. County Board of Supervisors, under the leadership of the CDC, to finalize list of locations the county is willing to provide at no- or low-cost to build a new incubator.
- VI. YEAR TWO: County to release a RFP to develop the incubator/multi-tenant lab space.

##### B. *Technology Transfer Support*

- I. SIX TO 12 MONTHS: LAEDC Center for Innovation will create a Best Management Practices: Tech Transfer Playbook to help facilitate regional technology transfer, with the goal to create new, clearer pathways to commercial viability in technology transfer.
  - II. TWELVE MONTHS AND BEYOND: Bioscience Partnership to publish and market success stories (using [www.LALifescience.com](http://www.LALifescience.com)) and utilize “earned media” tactics (see Action Item 3), including publicizing ongoing efforts in area tech transfer offices to be more entrepreneurial, to communicate to the local and global bioscience industry the promising work being done with county-based universities and research institutions to more expeditiously commercialize technologies.
- ##### C. *Identify Investors and Entrepreneurs through “Dealmaker” data*
- I. FIRST IMPLEMENTATION STEP: Commonweal Ventures to complete its analysis, cross-tabbing and integration of county “Dealmaker” data.
  - II. SIX TO 12 MONTHS: Using Commonweal Venture’s completed analysis, Bioscience Partnership to create an execution plan to match serial entrepreneurs and investors to commercially viable IP and bioscience startups in the Los Angeles region.
  - III. YEAR TWO AND BEYOND: Bioscience Partnership to on-board a cohort of dealmakers (identified through “Dealmaker” data) to establish an Entrepreneurs-in-Residence program to serve as mentors to startup companies connected with area incubators and accelerators that align with the dealmaker’s center of excellence expertise.

<sup>87</sup> Also see Real Estate Action Items



Action Item 8 (continued)

Proposed Budget: Strengthen the Commercialization  
– Entrepreneur – Investor Network

Source	5-Year Total	Description
Partnership	TBD	
Gap Financing	TBD	
Total	TBD	



### Action Item 9

Establish an L.A. County “Fund of Funds” (FOF) investment vehicle that supports the creation and sustainability of early-stage and “growth” companies.

#### Purpose:

According to Harvard Business Review, startup activity can signal a region’s economic potential, but it’s actually the quality of the startups, not the quantity, that matters.<sup>88</sup> This is simply because many of these startups fail to grow into thriving local enterprises, thus creating a false impression of economic growth in a local region. This problem can be addressed both in the due diligence process and in the creation of capital funding sources with structures that increase the odds of identifying and investing in early-stage companies that have the strongest growth potential in term of maximizing the return on investment (ROI).

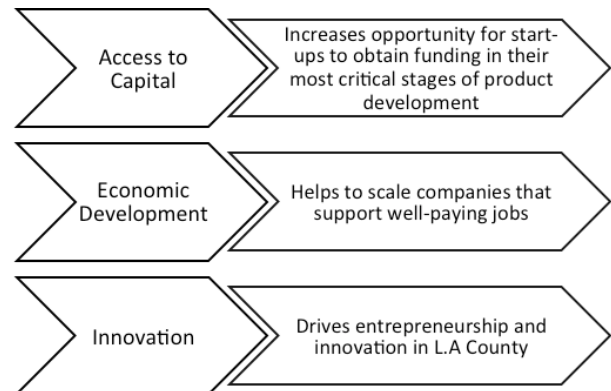
Creating an infrastructure that works with the universities, incubators and entrepreneurial community to identify and support a rich, investable pipeline of companies is critical to the ability to attract investors at the early stages of a firm’s development. It is equally important that the investment vehicle include proof-of-concept, seed and growth investments to ensure that the most promising early-stage companies have access to downstream capital at each stage of their commercial development, are scalable and reach their full growth potential. The following are two examples of highly successful “fund of funds” programs launched by other regions:

- The Utah FOF is a public-private partnership created by the Utah Legislature to provide the state’s entrepreneurs with increased access to a broad array of venture and private equity funding

sources. The fund invests in a diversified set of venture capital and private equity funds, which in turn invest in promising Utah-based growth companies.

- The Badger FOF is a limited partnership formed by the State of Wisconsin to invest in Wisconsin-based venture capital funds that in turn invest in Wisconsin-based new ventures. The State of Wisconsin committed \$25 million, in total, to the fund with an additional minimum of \$5 million to be raised from the private sector.<sup>89</sup>

#### FOF Goals:



#### Implementation Steps:

- I. FIRST IMPLEMENTATION STEP: Using successful FOF models from across the nation, Bioscience Partnership to construct alternative FOF structures that match the county’s goals.
- II. YEAR ONE: Predicated on the chosen FOF structure, L.A. County Board of Supervisors to direct the County Treasurer and Tax Collector to report back on the feasibility of the county participating in an FOF-directed portfolio (“Managing Entity”) with experience in bioscience investing and related capital funds.

<sup>88</sup> Walter Frick, Harvard Business Review, “The U.S. Startup Economy is in Both Better and Worse Shape than We Thought” (March 2016).

<sup>89</sup> Additional information here re: ACT 41

### Action Item 9 (continued)

- III. 18 TO 24 MONTHS: Managing Entity to conduct due diligence as to the following: interest and possible participation in the proposed FOF investment model; existing L.A. County-located venture funds that reflect the goals/objectives of the county that could be included in a FOF model; and whether any newly launched funds recommended within this Bioscience Implementation Plan (Action Items 9a-9c hereunder) should be integrated into such an FOF.
- IV. 18 TO 24 MONTHS: Managing Entity to secure a fund manager ("Fund Manager") to help structure the limited partnership.
- V. 18 TO 24 MONTHS: Managing Entity and Fund Manager to finalize FOF investment strategy.
- VI. 27 MONTHS: Managing Entity and Fund Manager to formalize relationships with selected local funds willing to participate in the FOF.
- VII. 27 MONTHS: Fund manager to develop investment documents (e.g., subscription agreements, private placement memoranda, etc.) necessary to raise private capital for FOF.
- VIII. YEAR THREE AND BEYOND: Fund manager to syndicate the FOF to potential limited partners (for private capital "match"), using "Dealmaker" data.
  - A. *Launch a "proof-of-concept" venture financing fund ("Proof-of-Concept Fund") within the FOF to strengthen investor-entrepreneur network and provide early-stage firms with critical capital.*

#### Purpose:

One of the most sensible best practices from our global scan is the ability to "de-risk" bioscience technology and start-up businesses through proof-of-concept funding, followed by the ability to provide pre-seed capital to accelerate the productivity and commercialization of technology in the startup.

The best practices that were reviewed relied on organizations that were typically independent, unbiased, possessed highly specialized life sciences expertise and were skilled in the management of early-stage capital investment. Funding at this tranche of development is typically the most difficult for early-stage companies to raise, and yet it is the stage where you can get the most impact for small amounts of funding. Relatively small investments to prove viability or generate needed data enable these companies to raise future funds that would be impossible to do without this initial funding.

Having an entity with the ability to lead an independent evaluation process and then allocate funds to the best concepts originating out of L.A. County-based research institutes or universities provides a strong platform for the bioscience community, while providing leverage for (and on) the assets being developed by local bioscience startups, which are in need of proof-of-concept and pre-seed funding. A successful "proof-of-concept" fund must ensure through collaborations and partnerships that the pipeline for new technology and start-up opportunities is sufficiently comprehensive (and thereby "de-risked") to include independent entrepreneurs, research entities, medical centers, industry and incubators/accelerators throughout the region.

The model proposed under this Action Item is an already successful and thus replicable model. Specifically, BioAccel, which deployed this model in Arizona, has invested \$3.5 million over the past five years in proof-of-concept projects, helping to create and/or grow 17 companies. Since their initial infusion of capital in 2009, BioAccel-funded companies have completed follow-on rounds of financing totaling more than \$18 million. Importantly, these companies together have a current portfolio book value of over \$70 million, with a projected exit value of \$1.4 billion. To date, the fund portfolio has achieved a 37



### Action Item 9 (continued)

percent (37%) internal rate of return, supporting ongoing sustainability.

### Implementation Steps:

- I. FIRST IMPLEMENTATION STEP: Bioscience Partnership to designate an independent, unbiased 501(c)(3) designee ("Non-Profit Designee"), such as BioAccel, that already has a special exemption from the IRS to use philanthropy to invest in startup companies, hold equity and create an "evergreen" capacity for the county to ensure ongoing future investment.
- II. 27 TO 36 MONTHS: FOF Managing Entity to contract with the Non-profit Designee to provide proof-of-concept funding to invest in startup companies, which, through equity returns, will create a self-sustaining evergreen fund for future and expanded investment in for-profit start-up companies.
- III. YEARTHREE: Non-profit Designee to match and lever FOF support through additional philanthropic contributions, grants and contracts to build, grow and sustain this enterprise. Non-profit Designee to establish a special advisory council comprised of Bioscience Partnership Advisory Board Members (see Action Item 1) with scientific and industry-leading expertise to provide counsel on "pre-seed" projects considered for investment.
- IV. YEARTHREE AND BEYOND: Non-profit Designee to work with L.A. County-based research institutes and universities, incubators and entrepreneurs to identify the most promising areas of commercially viable bio-based research that are potentially investable projects. Non-profit Designee to secure new funds using Dealmaker data to augment and sustain the fund operations over the longer term by attracting industry, philanthropic and federal support.

- V. YEAR FIVE: Based on anticipated budget, the Proof-of-Concept Fund will be invested in 10 new startup companies at the pre-seed phase, supporting at least 20 high-quality jobs.

- B. *Launch an L.A. County BioAccelerator Investment Fund ("BioAccelerator Fund") within the FOF to provide follow-on investment to start up initiatives generated through Proof-of-Concept Fund (see Action Item 9a), helping to capitalize early-stage firms in the so-called "Valley of Death"*

### Purpose:

With the average total cost of developing a new prescription medicine (novel drug) at nearly \$1.4 billion<sup>90</sup> and the average total cost to develop a low-to-moderate-risk 510(k) medical device from concept to FDA clearance at more than \$31 million (and more than \$94 million of expenditures before they earn regulatory approval to begin selling for higher-risk medical devices),<sup>91</sup> bioscience companies, from start-up to development-stage, that are focused on commercializing novel drugs and medical devices will obviously require financial capital – and lots of it – to grow.

However, unlike other L.A.-based small businesses with physical assets to use as leverage for bank financing, these high-potential bio-based ventures often focus on developing intellectual property that is not applicable to asset-based commercial bank lending. Rules based lending by commercial banks is simply not a financing option for these firms at the early stages of innovation and development. Moreover, many early-stage bioscience firms are not yet appealing to early equity investment, even from angel groups who are typically more risk tolerant.

<sup>90</sup> Tufts Center for the Study of Drug Development. Briefing: cost of developing a new drug (Tufts, 18 November 2014)

<sup>91</sup> Josh Makower, MD, "FDA Impact on U.S. Medical Technology Innovation: A Survey of Over 200 Medical Technology Companies" (November 2010)

### Action Item 9 (continued)

Indeed, whether we're talking about biopharmaceutical companies developing novel drug therapies, medical device companies developing surgical equipment or implants, reagent and toolkit companies accelerating drug discovery, or diagnostic companies identifying more efficient and effective methods to identify disease conditions when treatments can be most effective, bioscience innovation requires specialized investors with access to large pools of risk capital.

Based on the above challenges, it is clear that a new BioAccelerator Fund, which is an early-stage venture capital fund to create and/or accelerate progress in "investable" L.A. County-based companies, should be part of the county's FOF structure. The presence of a BioAccelerator Fund investing in companies at this stage will also encourage more investment from outside the region, either as follow on investors or in syndication with this fund or with the FOF (see Action Item 9).

### Implementation Steps:

- I. FIRST IMPLEMENTATION STEP: Non-profit Designee to legally form and launch a new investment fund targeting early-stage firms (post-proof-of-concept, but pre-venture rounds).
- II. FIRST NINE MONTHS: Non-profit Designee to engage investment bankers, investors and angels to be involved in analysis of proposed fund structures, metrics, design and deployment.
- III. YEAR ONE: Non-profit Designee to secure BioAccelerator Fund manager ("BioAccelerator Fund Manager").
- IV. 12 TO 18 MONTHS: Non-profit Designee and BioAccelerator Fund Manager to finalize fund structure, and develop and disseminate appropriate legal documentation (e.g. subscription agreements, private placement memoranda), and provide other oversight.

- V. 18 MONTHS AND BEYOND: Non-profit Designee will use "dealmaker" data to identify and target investor prospects, and conduct outreach to solicit "accredited investors" for the new BioAccelerator Fund.
  - VI. 27 TO 36 MONTHS: FOF Managing Entity to contract with the Non-profit Designee to provide capital to BioAccelerator Fund to invest in early-stage companies.
  - VII. YEAR FOUR: Levering FOF support/investment, Non-profit Designee and/or fund manager to raise \$10-15 million dollars for new BioAccelerator Fund from private capital sources.
  - VIII. YEAR SIX: Contingent on raising the full \$10-15 million, the BioAccelerator Fund will be invested in 7-10 new startups, supporting at least 75 high-quality jobs.
- C. *Launch an L.A. County-based investment fund within the FOF dedicated to acquiring and cultivating an IP and asset portfolio ("IP Fund") focused on precision and regenerative medicine.*

### Purpose:

L.A. County is uniquely poised to exploit the next wave in biomedical and healthcare innovation, possessing the appropriate infrastructure, financial depth and world-class technical expertise, all within the county. The purpose of this Action Item is to establish a public-private investment mechanism to identify, select and grow exciting opportunities in the area of precision medicine and regenerative medicine. Regenerative medicine therapies and precision medicine, which encompass the next generation of diagnostics ("omics" and digital health), represent the future of mainstream medicine, and L.A. county universities house many of the leading researchers and technologies in this field.<sup>92</sup>

<sup>92</sup> See Battelle 2014, at page 28.

Action Item 9 (continued)

This IP Fund asset portfolio model will apply investment proceeds raised from public and private sources to support extremely early- and translational-stage projects. In particular, the IP Fund’s investment agenda is focused on majority-stake buy-ins of IP and assets that are durable and commercially viable – regardless of the success or failure of recipients of investment proceeds. This provides a strong economic foundation for long-term growth of the L.A. County bioscience ecosystem by providing investment funding to bridge the commercialization gap for regenerative medicine innovations (targeted to grow into a \$2 trillion industry) originating from L.A. County universities; attracting innovators to L.A. County in growth areas such as stem cell medicine, gene therapy, and gene sequence creation; and attracting revenues back into L.A. County resulting from the genius of innovators whose intellectual property and other assets in which the IP Fund holds a majority equity stake.

Implementation Steps:

- I. FIRST IMPLEMENTATION STEP: Bioscience Partnership to identify a legal entity to house and manage L.A. County-focused IP Fund (“IP Fund Entity”).
- II. SIX TO 24 MONTHS: IP Fund Entity to:
  - Begin negotiations with all technology transfer offices of universities in L.A. County known to possess IP in the regenerative medicine, as well as in neighboring SoCal counties to draw assets and innovators to Los Angeles County;
  - Select projects and assets upon which to perform due diligence (and ultimately invest); and
  - Begin soliciting private capital funding commitments.

- III. 27 TO 36 MONTHS: FOF Managing Entity to contract with IP Fund Entity to provide capital to IP Fund.
- IV. YEAR THREE AND BEYOND: IP Fund Entity to form IP holding company and establish both in- and out-licensing mechanisms.
- V. YEAR THREE AND BEYOND: IP Fund Entity to make investments.
- VI. YEAR THREE AND BEYOND: IP Fund Entity to execute its investment and IP licensing plan.

Proposed Budget: “Fund of Funds” (including Proof-of-Concept Fund, BioAccelerator Fund and IP Fund)

Source	5-Year Total	Description
Minimum Capitalization	\$25,000,000	Raised from private philanthropic, and public sources

### Action Item 10

Launch global capacity building “Applied Research” competitions to develop bio-based solutions to local environmental, health and social challenges, such as “food deserts,” certain chronic disease categorizes and local imported water dependence

#### Purpose:

This action item represents L.A. County’s “moonshot”; meaning, it boasts a ‘high-risk/high-reward’ profile, requiring significant capital and/or real estate appropriations, but has the potential for “game-changing” impacts.

In 2010, the New York City Economic Development Corporation (NYCEDC) launched “Applied Sciences NYC,” inaugurating a global competition, as a Request for Expressions of Interest (REI), to propose a new applied sciences campus in New York City (NYC) on Roosevelt Island. For its part, NYC offered city-owned land, up to \$100 million in capital, and other tangible and intangible incentives. In response to the REI, NYCEDC received 18 proposals from 27 world-leading institutions across six states and eight countries. In 2011, NYCEDC issued a formal Request for Proposals (RFP), to which it received seven qualifying responses from 17 world-class research institutions. Later that year, NYC Mayor Michael Bloomberg announced that Cornell University and Technion-Israel Institute of Technology (together, “Cornell Tech”) would build a \$2 billion, two-million-square-foot applied science and engineering campus on Roosevelt Island. In 2013, a 99-year lease to transfer 12 acres of Roosevelt Island to Cornell Tech was signed. Similar competitive initiatives, under the “Applied Sciences NYC” rubric, are now happening all over NYC.

Similar to Applied Sciences NYC, L.A. County would, under this Action Item, initiate one or a series of “Applied Research LA” competitions, with the goal to help build and support world-leading, best-in-class applied research institutes and training facilities in

bio-based technology and innovation to solve local social, health and/or environmental challenges and to dramatically increase the quality, speed and disruptive nature of translational research in these industry sectors. This will lead to accelerated commercialization of new (exportable) technologies, products, processes and services.

Levering its procurement, bonding authority, and real estate development capabilities, L.A. County would demonstrate to the world its commitment to establishing and nurturing a world-class life sciences industry, spawning new nascent export-oriented industry sectors, and providing the county with new and innovative potential revenue streams through equity and/or potentially lucrative future royalty payments from intellectual property and commercialized products emanating from these initiatives.

Example “Applied Research LA” initiatives might include:

- Launch a global competition – through an REI/ RFP process (like NYCEDC did on Roosevelt Island) – to “declare war” on a chronic disease that disproportionately affects/afflicts residents here in L.A. County (e.g., Diabetes, Sickle Cell Anemia, Sarcoidosis, etc.). County seed capital investment would be secured by L.A. County issuing disease “war bonds” to: finance the adaptive re-use of a strategic but underutilized county-owned real estate parcels; help pay for the development and buildout of a state-of-the-art research facilities; and help underwrite part of the research, in partnership with private dollar commitments, which would be conducted by world-leading scientists and researchers committed to finding a cure for the selected chronic disease. [\$10 million per year over 10 years (\$100 million), not including underutilized real estate designated by Los Angeles County for use in this sample proposal].

### Action Item 10 (continued)

- Launch a global competition for proposals to adaptively re-use or revitalize fallow and/or underutilized industrial parcels in underserved county communities plagued with “food deserts” to house facilities that research, develop and commercialize new bio-based urban agriculture technologies and combine them with vertical farming techniques that accelerate food production times, improve yield productivity, and bring healthier, more environmentally sustainable and less water-intensive food sources to the residents residing in these “food deserts.” [Foundation investment, perhaps matched by a federal Economic Development Administration (EDA) grant, and supplemented by L.A. County designation of fallow or underutilized parcels for locating facilities that research, develop and commercialize technologies that address “food deserts” in L.A. County]
- Initiate a county-led REI/RFP process, backed by county-owned land and seed capital investment from public/private/philanthropy, to attract and help underwrite proposals from world-class research institutes, universities and science centers from around the globe (e.g., Israel, Netherlands, Australia) in the area of bio-based water conservation technology solutions for water purification and treatment to help ameliorate Southern California’s worsening drought problems, while reducing Los Angeles County’s dependence on imported water sources. [\$5 million per year, over 5 years (\$25 million), in private capital investment and L.A. County- owned land to site an applied research facility to develop solutions that address local drought concerns and imported water dependency.]

### Implementation Steps:

- I. FIRST IMPLEMENTATION STEP: In collaboration with the Bioscience Partnership, L.A. County Supervisors to announce intent to launch “Applied Research LA” competition and will report back in six months to determine the targeted research areas of need in L.A. County.
- II. FIRST SIX MONTHS: Bioscience Partnership, in collaboration with L.A. County, to conduct analysis to determine targeted “applied research” areas of need, as well as “non-traditional” bio-based areas of strength (e.g. food processing, water technologies) in L.A. County.
- III. SIX MONTHS: Based on results of this collaborative analysis, L.A. County CEO to report back to L.A. County Board of Supervisors with recommended “Applied Research LA” proposals.
- IV. NINE MONTHS: L.A. County Board of Supervisors offer/pass a motion to initiate a global competition, as an REI.
- V. NINE MONTHS: L.A. County Board of Supervisors publicly announce L.A. County’s global “Applied Research LA” competition.
- VI. YEAR ONE: L.A. County to work on terms of RFP.
- VII. 12 TO 18 MONTHS: L.A. County CDC to identify suitable development site(s), perhaps engaging other municipalities, such as the City of L.A. and its “LAX-Northside” site).
- VIII. 18 MONTHS: L.A. County Board of Supervisors to offer/pass enabling legislation (motion) to appropriate “seed” investment capital in support of global “Applied Research LA” competition.
- IX. YEAR TWO: L.A. County to issue RFP, structuring the terms.
- X. YEAR THREE: L.A. County Board of Supervisors publicly announce selection of winning proposer within 24 months of announcement



### Action Item 10 (continued)

Proposed Budget: Applied Research LA

Source	5-Year Total	Description
Bioscience Partnership	\$20,000	Analysis of Applied Research Areas
Gap Financing	TBD	Real Estate and/or Funding for the Selection Applied Research LA project
Total	TBD	

### Talent Development

According to the Wall Street Journal, “companies flock to cities with top talent as businesses decide where to expand and hire, ‘people are the natural resources.’”<sup>93</sup> The availability of high-quality talent will, in large measure, determine if the bioscience industry cluster will thrive in L.A. County. Today, cluster businesses anecdotally report workforce shortages, holding back their ability to grow in the county. To date, there has been no systematic effort to identify and address the industry’s wide range of talent development needs. The first four (of five) Action Items in this chapter will focus on this comprehensive challenge—actively promoting bioscience careers with youth and transitioning professionals, as well as introducing a disciplined process for targeting specific occupational needs and building a stronger working relationship between businesses and local institutions to meet this demand. Importantly, the county is well-positioned to support these efforts using resources available to it through its local workforce system and, more specifically, the region’s Workforce Development Boards, as the County and City of L.A. Workforce Development Boards are investing in these types of talent development activities and programs in so-called “demand industries,” such as bioscience.

As uncovered in the “Los Angeles County Biomedical Workforce Sector Profile” prepared by Collaborative Economics, NimbleCat, Inc., and Halsey Consulting (see Appendix 5), this sector offers “a variety of jobs across workforce levels” including jobs for PhD level talent, to entry-level positions that pay good wages. There is growing demand for bioscience-related talent throughout the region; with targeted efforts that encompass the entire value chain associated with the industry, and with collaboration between the public, private, and nonprofit sectors, L.A. County can further develop

its thick and rich talent market, providing a balanced supply of talent to meet the diverse demand. Action Items 11 and 12 detail the tactical steps to be taken that will address this need.

In addition, as noted in the Battelle Report, a talent “leaky bucket” phenomenon is also compromising the ability of the industry to mature. Too many bioscience start-ups are having to find management talent (as well as investors) outside the region and are thus more likely to eventually locate outside Los Angeles County to secure top executive and/or management-level talent. A fifth Action Item focuses on helping more systematically connect local management talent with local entrepreneurs to help ensure that potential and recent start-up companies become rooted and grow locally.

The graphic below visually displays the process by which we propose to develop the bioscience talent pipeline.

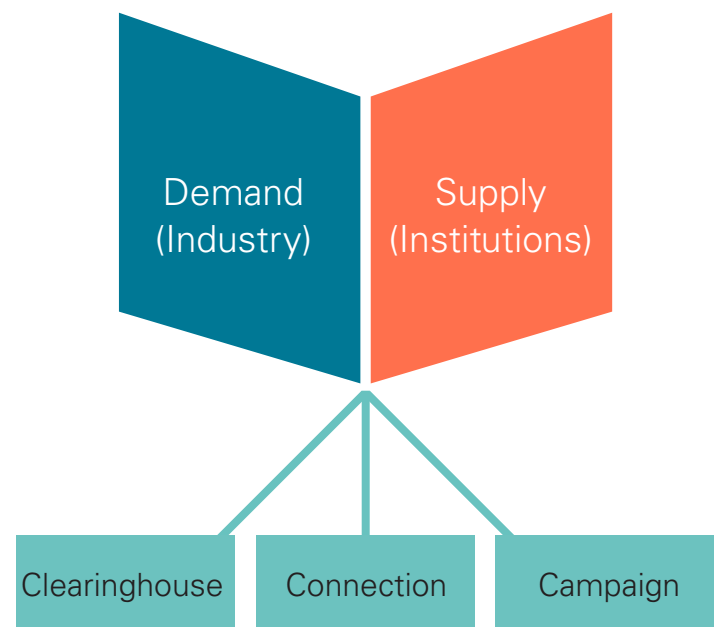


FIGURE 4.

<sup>93</sup> Weber, L. (2016, April 12). Companies Flock to Cities with Top Talent. Retrieved April 14, 2016, from: [http://www.wsj.com/article\\_email/companies-flock-to-cities-with-top-talent-1460482766-IMy-QjAxMTA2MjE5NDYxOTQ4Wj](http://www.wsj.com/article_email/companies-flock-to-cities-with-top-talent-1460482766-IMy-QjAxMTA2MjE5NDYxOTQ4Wj)

### Action Item 11

Execute a structured skills panel process to identify specific skills, proficiencies, and abilities required for now critical, as well as likely emergent, bioscience industry occupations and pathways, thereby developing a “Bioscience Talent Development Roadmap” for today and tomorrow.

#### Purpose:

There is an immediate need for L.A. County’s bioscience stakeholders to understand the full range of critical talent needs – of today and tomorrow – at a level of specificity that does not now exist. Prior research, surveys, focus groups, and interviews with local industry suggest some general priorities, but there has never been a robust, structured, disciplined process to understand specific occupations and pathways, and identify the skills, knowledge, and abilities needed in those areas. As identified in the Battelle Report, L.A. County has only an average concentration of employment in “key bioscience jobs” demonstrating the needs for a more diversified and skilled workforce. The Battelle Report posits that Los Angeles County generates a large number of “entry-level degree graduates in the life science fields, though is not yet generating the level of demand . . . needed to specialize in bioscience workforce development.”<sup>94</sup>

In partnership with countywide higher education and workforce system providers, the Bioscience Partnership will drive a sector-based skills panel process that would start with a scan of job listings and other research to identify potential areas of high need. Then, the Bioscience Partnership, together with higher education and workforce system providers, would convene the following key players: C-level executives who would develop consensus on priority talent needs to fuel industry growth; company human resources executives who would coalesce around specific skills, knowledge, and abilities required for key bioscience positions now, as well as the up-and-coming bioscience occupations that will lead in the future; and top performers in those positions who would provide deeper insights into the requirements to thrive in those positions. The results of this process would be documented and would inform the demand side of the Bioscience Partnership’s industry-wide bioscience talent development roadmap for action.

<sup>94</sup> Battelle 2014, page 53





### Action Item 11 (continued)

#### Implementation Steps:

- I. FIRST IMPLEMENTATION STEP: Bioscience Partnership to conduct an initial scan of existing caches of job listings, along with other research and sources.
- II. FIRST TWO MONTHS: Bioscience Partnership to convene C-level bioscience industry firm executives to identify top priority occupations/career pathways to enable industry growth, followed by HR executives from these companies to develop a consensus on the skills, knowledge, and abilities required for these key positions and pathways.
- III. FIRST THREE MONTHS: Bioscience Partnership to convene panels of high-performing employees in key positions for detailed insights into the requirements to thrive in these positions.
- IV. FOUR TO NINE MONTHS: Bioscience Partnership to summarize results in a Bioscience Talent Development Roadmap ("Talent Roadmap") for action, a consensus cluster statement of key talent needs.
- V. NINE MONTHS AND BEYOND: Bioscience Partnership to inform and support the Los Angeles effort for data collection for the biennial California Life Science Talent report in 2018, 2020 and beyond.

#### Proposed Budget: Bioscience Talent Development Roadmap

Source	5-Year Total	Description
Bioscience Partnership	\$10,000	In-kind staff time
Gap Financing	\$150,000 (\$30,000 per year)	
Total	\$160,000	

### Action Item 12

Secure agreements from local educational and workforce institutions and programs to meet the skill priorities of bioscience firms in the Los Angeles region.

#### Purpose:

There are many institutions and programs in the Los Angeles region focused on bioscience industry talent needs. With the “Talent Roadmap” developed in Action Item 11 as its guiding document, and an institutional/program inventory as a resource, the purpose of this Action Item is to secure written agreements with local institutions/programs willing to commit to meeting the occupational and pathway specifications identified through the skills panel process. A bioscience cluster response team (“Bioscience Cluster Response Team”) will be formed of cooperative and willing institutions/programs to develop linked industry-workforce/education system provider approaches to meeting local bioscience industry talent needs. In return for formal commitments to train needed talent, institutions/programs that are willing to work directly with bioscience firms would be eligible to receive a customized, comprehensive package of industry assistance, including equipment, faculty externships, certificate programs, career training tracks, student internships and other workplace experiences, curriculum supplements (such as problem-based case studies), industry guest speakers, and the like.

In addition, the Bioscience Cluster Response Team would work with the LAEDC, relevant L.A. County departments, county and local WDBs, California State Universities in the greater Los Angeles region (CSU-5), community colleges, workforce intermediaries and other education/workforce system partners to lever public and private funding to expand capacity of participating institutions and programs, and help underwrite student costs (e.g., Workforce Innovation & Opportunity Act (WIOA)), community college regional career technical education (CTE), Employment Training Panel (ETP) consortia training, and other funding streams).

An exemplar of this type of industry/workforce-linked program, which is already taking shape and would be further supported by the Bioscience Cluster Response Team, is the LAEDC’s Business Outlook Labor Demand (BOLD). The BOLD is a pilot program in partnership with L.A. City and L.A. County WDBs to better connect unemployed and underemployed jobseekers with identified “in demand” industry sectors, such as bioscience. The BOLD provides strategic assistance in the form of industry intelligence, connections and employer-workforce development system relationships to more successfully train, connect, and place jobseekers in bioscience and other high-demand sectors. Under this program, the LAEDC will work directly with bioscience and other targeted industry cluster executives, gaining first-hand understanding of the workforce needs and skills requirements in these industries today and, more importantly, tomorrow. This first-hand labor market intelligence and occupational information will be fed directly into the Talent Roadmap and the Bioscience Cluster Response Team, creating an “analysis to execution” wrap around talent development program serving the talent needs of our region’s bioscience industry.



## Action Item 12 (continued)

### Implementation Steps:

- I. FIRST IMPLEMENTATION STEP: Bioscience Partnership to form Bioscience Cluster Response Team.
- II. FIRST THREE MONTHS: Bioscience Cluster Response Team to:
  - Use the Talent Roadmap (Action Item 11) to identify areas to which each institution would like to respond, either on their own, using roadmap-derived information, or collaborating directly with bio-based firms, i.e., BOLD, with specific commitments to meet biosciences industry cluster talent needs.
  - Develop specific written agreements with willing institutions to help address specific elements of the Roadmap.
  - Work with LAEDC's BOLD program to harvest and insert firm-level occupational information directly into the talent roadmap to better inform and prepare/coach local educational and workforce institutions on relevant approaches to meeting the bioscience industry talent needs.
- III. SIX MONTHS AND BEYOND: Bioscience Partnership, along with Bioscience Cluster Response Team, to:
  - Identify and broker specific packages of industry and firm-level linkages and assistance to institutions that make commitments to Talent Roadmap implementation.
  - Target multiple funding sources to facilitate Talent Roadmap implementation.
  - Commence ongoing monitoring and accountability process to ensure follow-through on Talent Roadmap commitments.

### Proposed Budget Funding Structure: Bioscience Cluster Response Team

Source	5-Year Total	Description
Federal and state funding sources match	\$225,000	(various sources)
Bioscience Partnership Advisors	\$50,000	Support in the form of In-kind staff time
Gap Financing	\$250,000 (\$50,000 per year)	
Total	\$525,000	

### Action Item 13

Launch a bioscience industry talent resource clearinghouse to connect participating institutions and programs with resources from bioscience industry firms “willing to help.”

#### Purpose:

To meet today’s talent needs, a collaborative approach between industry and education/workforce is needed. Technologies and talent needs are changing too fast to expect institutions and programs to adapt quickly enough without strong industry partners.

The purpose of this Action Item is to develop and launch a specialized brokering platform to solicit, secure, package and place resource commitments from local companies for participating local institutions and programs focused on their priority talent needs. These would include equipment, faculty externships, student internships and other workplace experiences, curriculum supplements (such as problem-based case studies), industry guest speakers, key executives for advisory committees, advanced training for current employees and other resources deemed necessary to support successful outcomes at local institutions and programs. Innovative and effective approaches by existing local companies would be identified, documented, and turned into how-to templates and best practices for other companies and/or education and workforce institutions and programs.

#### Implementation Steps:

I. FIRST IMPLEMENTATION STEP: Bioscience Partnership to retain a contractor to identify specific kinds of resources and/or bioscience industry assistance needed by local institutions committed to meeting the needs of the Talent Roadmap (Action Item 13).

- II. FIRST SIX MONTHS: Bioscience Partnership to identify, document and promote specific bioscience company “best practices” (e.g., internship programs, equipment donation, etc.), creating templates that make it easier for other companies to participate in providing assistance to institutions/programs.
- III. FIRST SIX MONTHS: Bioscience Partnership to retain a contractor to build the brokering platform/ infrastructure to match companies and institutions with specific mutual expectations for collaboration.
- IV. SIX MONTHS AND BEYOND: Bioscience Partnership to secure commitments from local companies to make a range of assistance available to local institutions to help with Roadmap implementation, and via the platform, actively broker industry-institution connections to implement the Roadmap.

#### Proposed Budget: Industry Talent Resource Clearinghouse

Source	5-Year Total	Description
Private Capital	\$225,000	To be fundraised for platform buildout
Bioscience Partnership	\$150,000	Support in the form of In-kind staff time
Total	\$375,000	

### Action Item 14

Launch a bioscience talent pipeline campaign to attract youth and transitioning workers to careers in the bioscience industry.

#### Purpose:

Industry executives have identified the need to increase interest in bio-oriented careers in order to grow and diversify their talent pipelines—both in the short-term (i.e., through transitioning professionals from other industries, veterans, immigrants from other regions) and over the long-term (i.e., through local youth). Make no mistake, it is a “lifeblood” issue for bioscience firms here in the L.A. County region.

This Action Item involves a multi-faceted effort, with several key targets, conducted over a long time frame—that is, a sustained campaign to build a long-term talent pipeline for the L.A. County bioscience industry cluster of today and in the future. Key components include:

- Career awareness-building at the K-12 level through company tours, through hands-on science projects, internships, workshops for K-12 faculty, and other interventions;
- Targeted actions to reach, recruit and place specific pockets of professionals (e.g., retiring military, relocating bio professionals, manufacturing talent transitioning from declining industries); and
- A portfolio of collateral materials delivered through a multimedia platform that explains and promotes opportunities in the industry cluster.

At the outset, and as part of assembling the elements of the larger campaign, local best practices would be inventoried, connected and scaled, and “best practices” from other communities would be examined and potentially adapted for county implementation. Part of the infrastructure would be a new biosciences industry talent portal, included and embedded within the Re-

source Navigator on the [www.LALifeSciences.com](http://www.LALifeSciences.com) website for matching talent attracted by the campaign with interested companies participating on the Bioscience Partnership and with institutions/programs that could help them enter/advance in bioscience careers. Once the infrastructure is in place, a “STEM Festival Expo Day” with the L.A. County Board of Supervisors and other leaders will publicly launch initiate the effort by engaging the entire community (companies and their staff, colleges/ universities and their faculty and students) in showcasing to and engaging K-12 students and their families in hands-on STEM-related activities.

#### Implementation Steps:

- I. FIRST IMPLEMENTATION STEP: Bioscience Partnership to inventory range of local best practice projects and initiatives that focus on filling the talent pipeline—from career awareness building activities with youth to efforts to help individuals transition from other careers—as well as models from other communities that might be adapted for local implementation.
- II. FIRST SIX MONTHS: From the above inventory, Bioscience Partnership to develop a cohesive strategy that links, strengthens, and scales a full range of pipeline initiatives, in addition to adapting or creating a portfolio of “campaign” collateral materials and a multimedia platform to promote opportunities within the cluster, geared to reach specific high-priority audiences.
- III. FIRST NINE MONTHS: Bioscience Partnership to launch and sustain a bioscience industry talent portal within the Bioscience Navigator on the [www.LALifesciences.com](http://www.LALifesciences.com) website (see Action Item 2b), a central hub for matching talent with interested companies and appropriate institutions/programs to help enter or advance in bioscience careers.

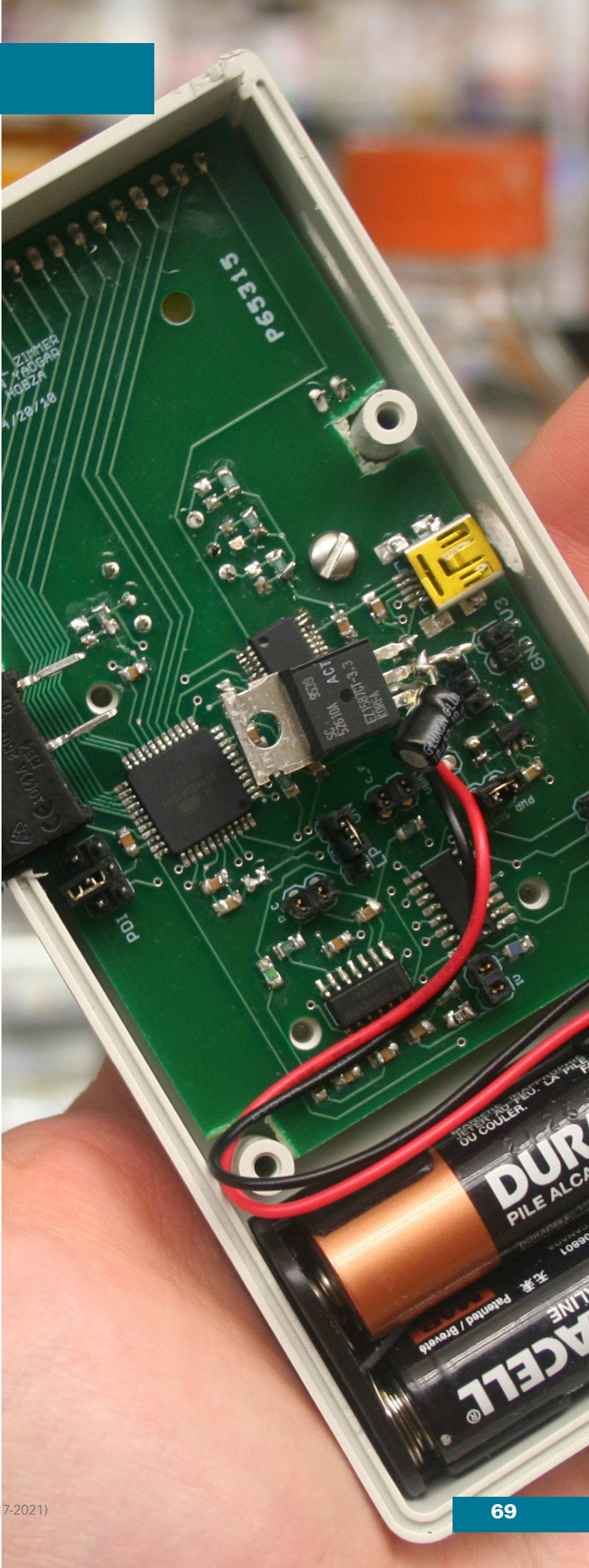


Action Item 14 (continued)

IV. YEAR ONE: Bioscience Partnership, in partnership with the L.A. County Board of Supervisors, to launch a “Los Angeles STEM” Festival launch with an Expo Day in late–2017 or early 2018 and quickly create a pathway to sustainability similar to, and in concert with, the San Diego Science and Engineering Festival.

Proposed Budget: Bioscience Talent Pipeline Campaign

Source	5-Year Total	Description
Private Capital	\$750,000	To be fundraised from various sources and sponsorship for STEM Festival program costs
Bioscience Partnership	\$25,000	Support in the form of In-kind staff time
Total	\$775,000	



### Action Item 15

Create a “Bioscience Talent Connection Initiative” to match bioscience entrepreneurs with executive and management-level talent to help scale and advance early-stage companies.

#### Purpose:

The growth of the bioscience industry cluster in L.A. County will be a product not only of both the attraction of new bioscience industry entrants into L.A. County market and the growth, development and expansion of existing companies, but the formation and growth of newly formed companies. However, these new companies must get beyond the early-stage, where too many of them fail, to have a real impact on L.A. County’s bioscience industry overall. As part of a comprehensive talent strategy, a new “matchmaking” capacity to help match early-stage companies with experienced, professional business talent is required to help navigate de facto “science projects” from start-up into a growing development-stage company. Professional talent can take several forms: mentors, providers of donated and paid services, and actual employees, and would tap several sources, ranging from professional firms offering pro-bono services to retired executives. To maximize overall bioscience ecosystem impact, the effort will focus predominately on the specific competencies, or areas of research strength, and start-up activity concentrated in L.A. County, as identified in the Battelle Report. (See Appendix 4)

#### Implementation Steps:

- I. FIRST IMPLEMENTATION STEP: Bioscience Partnership to identify and catalogue pools of both existing start-up/early-stage firms and available/interested business professional talent.
- II. FIRST FOUR MONTHS: Bioscience Partnership to develop the criteria and best mechanism(s) for connecting these startups/early-stage firms to professional talent more systematically.
- III. SIX MONTHS AND BEYOND: Bioscience Partnership to contract with an outside firm to launch, manage and scale a Bioscience Talent Connection Initiative, including an effort to recruit out-of-area serial entrepreneurs with successful track records to act as entrepreneurs-in-residence for these start-up/early-stage firms in L.A. County with the understanding that, for the right opportunity, they might consider relocating to L.A. County or work remotely with county-based startup.

#### Proposed Budget: Bioscience Talent Connection Initiative

Source	5-Year Total	Description
Private Capital	\$150,000	To be fundraised from various sources
Bioscience Partnership	\$10,000	Support in the form of In-kind staff support
Total	\$160,000	





### Diverse Physical Spaces

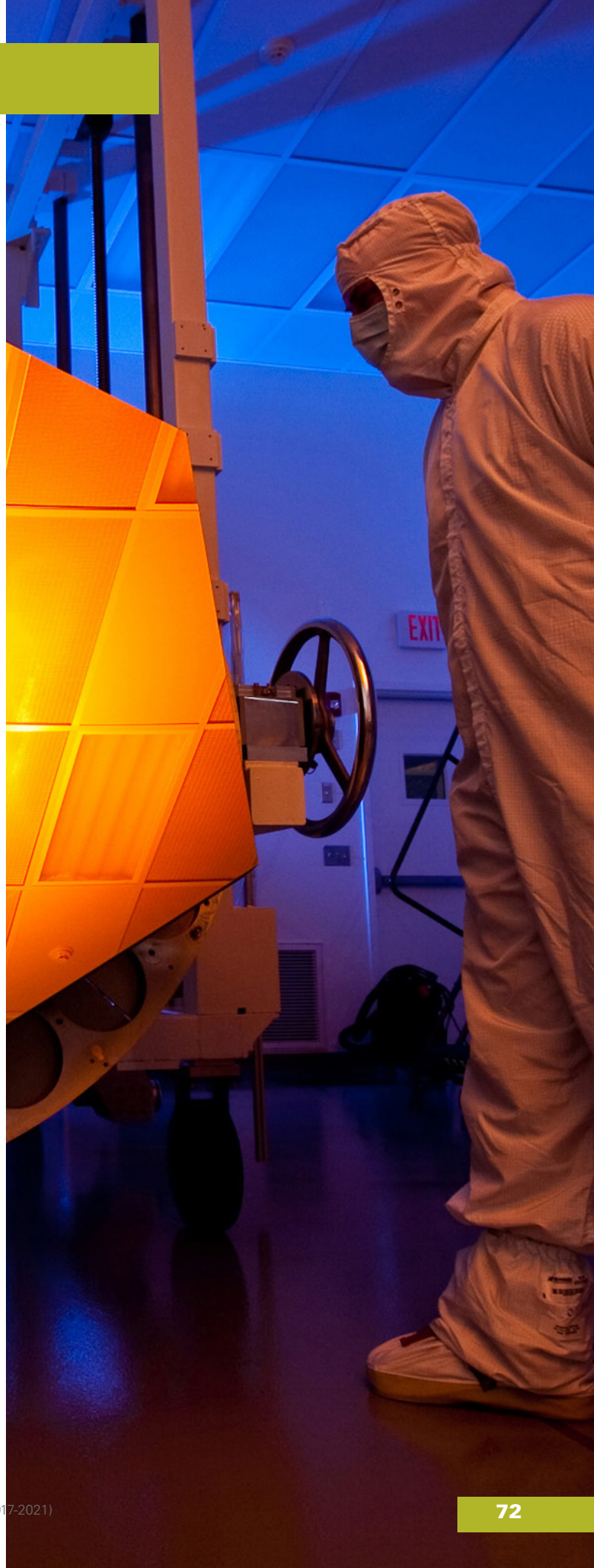
According to the Battelle Report and other researchers, a key gap in commercial bioscience real estate in the Los Angeles region is for multi-tenant facilities that can support firms at all stages of development. As seen at other successful bioscience hubs from around the country, multi-tenant space – especially when offered in varying sizes and with the ability to scale-up – is a critical draw for attracting start-ups and emerging firms. Altogether, however, the regional bioscience ecosystem will require a mix of multi-tenant, single-tenant commercial, and industrial space, along with mixed-use facilities that create a live-work-play environment.

### **Characteristics of Successful Bioscience Hubs:**

Based on the Battelle Report and supplemental research conducted by the LAEDC, nine common characteristics of successful bioscience research hubs (“bioscience hubs”) have been identified. They are as follows:

1. Sizable amount of developable space to accommodate present and future development;
2. Linkages with research institutes and/or universities;
3. Provision of incubator space;
4. Availability of core lab services;
5. Presence of an anchor tenant;
6. Presence of clinical anchors (i.e., hospitals, medical clinics, veterinary schools);
7. Strong leadership and/or governance structure;
8. Inclusion in community renewal efforts; and
9. Access to venture capital.

A recurring hallmark of bioscience hubs across the nation is integration between research/scientific institutions (academia, federal or non-profit research facilities) and industry. Whether it’s proximity to a major research institution (see, e.g., University Park at MIT and the White Head Institute), a nationally-recognized laboratory (see, e.g., Mission Bay and the J. David Gladstone Institute), a major scientific university (see, e.g., the Stanford Research Park and the University of Wisconsin Research) or a combination thereof, having substantial research infrastructure at or near a bioscience research and development building plays a key role in the bioscience hub’s development. As indicated in Table 1 below, these characteristics have been observed at several bioscience hubs throughout the country. All of the successful biomedical hubs, as outlined in Table 1, are linked to a research facility.



Some of the bioscience hubs, such as the Alexandria Center, were established to work collaboratively and to attract researchers and firms from myriad local universities, institutes and medical facilities.

Research suggests that there is no “de facto” minimum size for a bioscience hub. Although many of the prominent bioscience hubs listed below are more than 40 acres, there are numerous successful bioscience hubs that have much smaller footprints. In addition, there appears to be a positive and

significant correlation between the availability of incubators, core lab services and anchor tenants with the successful development of a bioscience hub. Furthermore, a successful bioscience hub should also address the broader needs of the research institutions, firms and their employees such as: restaurants, recreational facilities; retail services; hotels, conference facilities, access to shared lab facilities; and linkages to commercialization services.

Table 1

Best Practices of Sample Biotech Hubs in the United States										
Biomedical Research Park	Location	Park Size	Link to Research Institute or University	Incubator Space	Core Lab Services	Anchor Tenancy	Clinical Anchor	Governance Structure	Part of Community Renewal Process	Proximity to VC Community
Alexandria Center	New York City	3.5 acres (city-owned)		✓	✓	✓			✓	✓
Audubon Biomed Science & Technology Park	New York City	100,000 square feet	✓	✓	✓	✓	✓			✓
BioSquare	Boston	14 acres	✓	✓	✓	✓	✓	✓		✓
Centennial Campus	Raleigh	1,334 acres	✓	✓	✓	✓	✓	✓		
Chicago Technology Park	Chicago	56 acres	✓	✓	✓	✓	✓	✓	✓	✓
East Baltimore Biotech Park	Baltimore	22 acres	✓	✓	✓	✓	✓	✓	✓	
Grafton Science Park	Medford, MA	106 acres	✓	✓	✓	✓	✓		✓	✓
Innovation Village	Pomona, CA	65 acres	✓	✓	✓	✓				✓
Massachusetts Biotech Research Park	Cambridge	105 acres	✓	✓	✓	✓	✓	✓	✓	✓
Mission Bay	San Francisco	43 acres	✓	✓	✓	✓	✓	✓	✓	✓
Science Center	Philadelphia	2 million sq. ft.	✓	✓	✓	✓	✓			
UMD Baltimore BioPark	Baltimore	10 acres	✓	✓	✓	✓	✓	✓	✓	
University Wisconsin Research Park	Madison	255 acres	✓	✓	✓	✓	✓	✓		
Virginia Biotech Research Park	Richmond	43 acres	✓	✓	✓	✓	✓		✓	



### Potential Los Angeles County Bioscience Hubs

Los Angeles County has one of the nation's most developed public healthcare systems. According to the Battelle Report, it is a \$3.5 billion enterprise with a network of outstanding hospitals and outpatient facilities across the County.<sup>95</sup> As a result, the focus of this real estate implementation strategy is to leverage the extensive network of hospitals, universities and under-utilized public land across the region to stimulate the growth in the bioscience industry and to create hub environments with basic amenities.

Our research supports Battelle's recommendation that the county partner with private developers to establish three to five signature bioscience innovation hubs across the county to serve the needs of start-up and emerging bioscience firms. With existing locations of research institutions and major hospital centers across the county, the Battelle Report identifies the following potential bioscience hubs:<sup>96</sup>

- City of Hope
- Harbor + University of California Los Angeles Medical Center (Harbor + UCLA)
- Los Angeles County + University of Southern California Medical Center (LAC + USC)
- Martin Luther King, Jr. Community Hospital + Charles Drew University (MLK + Drew)
- Olive View- UCLA Medical Hub (Olive View Hub)
- Rancho Los Amigos National Rehabilitation Center (Rancho Los Amigos)
- University of California, Los Angeles- Westside (UCLA-Westside)

While these seven (7) potential bioscience hubs are part of an integrated medical district, we also provide an overview of two (2) secondary bioscience hubs: Honor Ranch/ Mann Biomedical and LAX-Northside. Although neither secondary bioscience hub has a medical facility directly located on the campus, both are conveniently situated within a reasonable distance from active bioscience firms or a research center, and can serve as either standalone or supplemental research parks that provide additional space for any of the six above listed bioscience hubs that have reached capacity on their current campuses. These secondary locations could also serve to support complementary manufacturing facilities or expansion opportunities for firms.

It is optimal for the county to leverage its ongoing and already-planned investment in its public hospital campuses to stimulate a commercial bioscience real estate market in the region. The five (5) hubs that offer this opportunity are listed below.

1. Harbor + UCLA
2. LAC + USC
3. MLK + Drew
4. Olive View- UCLA Medical Hub
5. Rancho Los Amigos

<sup>95</sup> Battelle 2014, at page 50

<sup>96</sup> Battelle 2014, at page ES-9

### On-Site Employment Potential at Select Hubs

The purpose of Table 2 below is to provide an estimated order of magnitude for permanent job generation at Harbor + UCLA, LAC + USC, and MLK + Drew. The Rancho Los Amigos hub was excluded from the analysis because the North Campus Master Plan does not dedicate land for bioscience related development, and the South Campus Master Plan is still in draft form. The Olive View Hub was also excluded because the programming for the commercial space has not yet been determined. As indicated in the table below, at full build-out of the first phase of development, there will be approximately 607,000 square feet of new multi-tenant space on the market in Los Angeles County.<sup>97</sup> According to CBRE, the national average square foot per worker is approximately 170 square feet, and Cushman and Wakefield estimates that the metric for research and development activity is closer to 300 square feet per worker. For example, Innovation Village, which is associated with Cal Poly Pomona, has approximately 564,380 square feet of net rentable area with a reported 1,900 employees. This results in an average of 297 square feet per worker. Our analysis of the hubs anticipates that office use will be slightly more than at Innovation Village; therefore, our calculation uses an average of 260 feet per worker. Our analysis suggests that these projects will support over 2,300 permanent employees at full-build out of the first phase of the development. These estimates are additionally conservative because they do not take into consideration the potential employment boost from adaptively reusing several buildings on each of the campuses for biomedical purposes.

Table 2

Hub	Total land at hub (acres)	Total buildable area (square feet) <sup>98</sup>	1st phase of development (square feet)	1st phase estimated employment at full build-out <sup>99</sup>
MLK-Drew	124	102,500 <sup>100</sup>	50,000	190
LAC+USC <sup>101</sup>	129	13,500,000	500,000 <sup>102</sup>	1,920
Harbor+UCLA	75	250,000 <sup>103</sup>	57,000	220
Totals	328	2,452,500	607,000	2,330

<sup>97</sup> According to the 2014 Battelle Report, on page ES-9, the market is expected to absorb 42,000 square feet annually. This would imply that the build-out will occur over a 14 year period. If the absorption happens at a slower pace of 25,000 to 30,000 square feet per year then the build-out period could be extended to 20 years or more.

<sup>98</sup> The criteria for square footage to be included in this column is that 1) county has to own land AND 2) space has to be potential R&D, lab space or support office space.

<sup>99</sup> Based off of average square feet per employee for office space (CBRE - 170 square feet.) and R&D space (Cushman & Wakefield - 300 square feet)

<sup>100</sup> "MLK Medical Center Campus Master Plan & the Willowbrook MLK Wellness Community Vision" June 2012, page 58.

<sup>101</sup> LAC + USC numbers include Alcazar Yards sites and adjacent properties.

<sup>102</sup> The 500,000 square foot estimate obtained from USC's real estate department.

<sup>103</sup> The March 15, 2016 Board of Supervisors Motion indicated stated that a biotech park of at least 250,000 square feet shall be constructed at that the Harbor + UCLA hub.



### Primary Hub Research Focus

As indicated in Table 3 below, each primary hub has distinct areas of research that would support the creation of “centers of excellence”<sup>104</sup> at each hub that nurtures productive advantages in these areas of research through knowledge spillovers and virtuous, self-supporting bioscience ecosystems that are engaged in collaboration with various universities, institutes, and corporations (both domestically and internationally). The objective would be to develop physical spaces at each primary hub that complements the research focus and consequently attracts firms that are engaged in that particular bioscience discipline.

TABLE 3

Bioscience Hub	Center of Excellence	Research Institutions and Hospitals	Incubators and Accelerators
Harbor + UCLA	Cancer Infectious disease Regenerative medicine Personalized medicine	Harbor + UCLA Medical Center LA BioMed	LABioMed (pending) Cal-X Stars UCLA California Nanosystems Institute (CNSI)
LAC + USC	Cancer research Neuro-intensive care Diabetes Heart disease Infectious disease Radiation & preventative therapies Health Disparities in urban communities	Los Angeles County Medical Center University of Southern California Health Sciences Campus Cal State Los Angeles	Cal State LA Incubator (LA BioSpace opens in 2017) USC Health Sciences Incubator Alfred Mann Institute
MLK + Drew	Cancer Cardio-metabolic disease HIV/AIDS Health Disparities in urban communities	Martin Luther King, Jr. Community Hospital Charles Drew University	N/A
Olive View	Pharmaceuticals/ Drug Testing Clinical Research	David Geffen School of Medicine at UCLA Olive View-UCLA Education and Research Institute (ERI)	N/A
Rancho Los Amigos	Spinal cord injury Stroke Brain injury Physical and developmental disorders Robotics Pain project and Lifestyle redesign Orthotics	Rancho Los Amigos National Rehabilitation Center Rancho Research Institute	N/A

<sup>104</sup> A Center of Excellence is shared facility or an entity that provides leadership, best practices, research, support and/or training for in a focus area.

### Assessing the Development Potential at the Bioscience Hubs

Each of the five primary hubs are part of a medical district that is experiencing a significant amount of capital infusion due to the construction of new consumer serving facilities. All of the primary hubs have available land that can be levered along with private investment. All of the primary hubs have either completed a recent Master Plan or are in the final drafting stages of a Master Plan. As discussed in more detail below, the primary hubs provide an opportunity for the creation of bioscience labs, R&D, office, and manufacturing space, as well as the opportunity to develop open space and other amenities that would significantly enhance each bioscience hub.<sup>105</sup>

Our analysis suggests that City of Hope and Harbor + UCLA would have relatively short development timelines because of their strong research and commercialization capacities, sufficient amenities and available land with little or no associated relocation issues. Furthermore, both of these hubs have either completed or are in the process of adopting environmental documents that will expedite development.

The LAC + USC hub has many of the attributes that are associated with a successful hub, including a built-in anchor-tenant. Given the immature market for commercial bioscience multi-tenant real estate space, having a credit-worthy anchor tenant, such as USC, makes a project financially viable because the anchor tenant can take significant space in the facility. In addition, USC is in the process of constructing a 200-bed hotel, student housing, upgrades to wayfinding, and street beautification, which will add several key amenities to the area. The potential for the development at the LAC + USC hub

is relatively high, especially if many of the substantial relocation issues can be resolved in a timely fashion.

Although considered a secondary hub the LAX / Northside site, offers a unique and potentially lucrative opportunity. It consists of 340 acres of undeveloped land that is strategically located in the high-demand area between Westchester, Playa Vista and the Los Angeles World Airport. The “shovel readiness” of this site is further enhanced by the fact that the Environmental Impact Report (EIR) has been completed; approximately 1 million square feet (msf) has been designated for office and R&D; and the land is publicly owned by the Los Angeles World Airports.

All the hubs in Los Angeles County have strengths and weaknesses that define and support the type and timeline for development. Another critical factor that impacts the timing and development potential for each hub is the type of governance structure associated with each; specifically how will key decisions be made, and who will monitor the outcomes associated with the stated objectives for tenancy, employment, etc.

Since all the primary hubs anticipate development on county-owned land, the L.A. County Board of Supervisors will vote on the various actions needed to operationalize development on these sites. The agreements will take various forms, such as: ground leases; purchase and sale agreements; development and disposition agreements (DDAs); and ancillary documents, which will define the scope of development, and delineate the terms and conditions for development. However, the ongoing day-to-day operations and management of any multi-phased projects may function more effectively employing a non-government structure.

<sup>105</sup> UCLA-Westside would be an equally strong primary hub candidate, but for the fact that it has limited available land on campus to support new developments from researchers who are not affiliated with the university. Furthermore, the university's administration has found it challenging to persuade their key researchers to locate to satellite space off campus, according to an LAEDC interview with UCLA research staff and employees within the real estate department.

### Governance Structure

There is a great diversity of governance structures across the successful bioscience hubs described above in table 3. These include the following:

- University-affiliated
- Medical hospital / research institute-affiliated
- Government agency, quasi-public corporation or public authority
- Independent, private non-profit
- Formal joint venture among diverse organizational types
- For-profit developer

Each model comes with intrinsic opportunities and obstacles, which can be mitigated with government oversight and/or well-crafted partnership agreements and mandated community benefit packages. Our research suggests that only a handful of the successful bioscience hubs are governed exclusively by either a university (see, e.g., BioSquare by Boston University and Centennial by NC State University) or a for-profit developer. Rather, a majority of the successful bioscience hubs are governed by nonprofits of various kinds. The most common models are: an affiliate of a university (see, e.g., UMB BioPark), public (state-, county-, or city-chartered) authority (see, e.g., Chicago Tech Park), or an independent development corporation (see, e.g., New East Baltimore/Biotech Park). The nonprofit governance structure seems to predominate because it is perceived as adaptable and nimble. Non-profit organizations may be effective as vehicles for governance simply because they are better able to integrate the needs of industry, government and community partners.

A “best practice” of an effective public-private partnership (P3) governance structure used to develop a successful bioscience hub can be found in Baltimore, Maryland. In conjunction with the development team at Forest City, the East Baltimore Development Inc. (EBDI), a private non-profit 501(c)(3), partnered with the City of Baltimore, Johns Hopkins University, and numerous philanthropic foundations to establish an 88-acre bioscience hub that also serves as the catalyst for revitalization of an underserved community; in fact, the EBDI has made economic opportunity, community engagement and monitoring of community benefits a priority. The development process was made entirely transparent through board reports. EBDI publishes regular reports with key metrics. In addition, EBDI maintains a website that provides information regarding job and contracting opportunities in the affected project area.

Academic research anchors offer distinct features including the scale of their operations, extensive collaborations with other research institutions, and traditionally multi-disciplinary approaches that integrate complementary technologies to create a focus and comparative advantages in a broad-based area of the bioscience industry. This broad scale and scope promotes both sustainability and flexibility in a rapidly changing bioscience universe. Accordingly, it is recommended that the major research institutions located at each bioscience hub location be involved in the operations and management of the hub’s office and research facilities. This is further reinforced by the “Advancing a Biomedical Research Park at USC’s Health Science’s Campus: Feasibility Assessment and Conceptual Plans” Battelle Report, which recommends, for example, that USC play an active role in the development of a bioscience research facility at the LAC + USC hub with the potential of forming a non-profit development entity that can pursue joint partnerships with various financing sources, collaborators and partners including philanthropic foundations.

### Hubs: Potential Anchors for Community Revitalization

Anchor Institutions—typically universities, hospitals, cultural establishments and large non-profit organizations—are referred to as “anchors” because of their permanence and physical, networking, and economic ties to surrounding communities. Henry Webber and Mikael Karlström define anchor institutions as “nonprofit or corporate entities that, by reason of mission, invested capital, or relationships to customers or employees, are geographically tied to a certain location.” Each of the primary hubs contain at least one anchor institution. These anchor institutions can play an integral role in establishing the tenant base for new physical spaces at the hubs and they also serve as drivers of community revitalization.

The process of engaging anchor institutions in innovative partnerships with local community stakeholders to achieve mutually beneficial outcomes can be challenging, but when done effectively it unifies the visions of various stakeholders in a community. Michael Porter of the Initiative for a Competitive Inner City (ICIC) and other researchers have developed a strategic framework that identifies six impacts that anchors have on local job and business growth, especially in underserved communities:

1. Purchasing of goods and services
2. Providing Employment
3. Developing real estate
4. Creating business incubators
5. Advising businesses and building networks
6. Workforce development

This framework has been further refined and adapted for healthcare institutions to include three additional roles played by healthcare-oriented anchors in a community:

1. Service Provider
2. Funder
3. Community / neighborhood Developer

These nine activities are in line with the core operating, investing, and serving/learning functions that health institutions carry out. Purchasing and employment are primarily related to operations; real estate and community/neighborhood development, local business incubation, and funding are related to investing; and the roles of advisor/network builder, service provider, and workforce developer are related to serving and learning.

### Anchor Strategies in Action:

There are numerous examples of anchor institutions looking beyond their campuses to engage with the community around them to facilitate meaningful economic development. In particular, the University of Pennsylvania’s (Penn) West Philadelphia Initiative provides a good case study of what is possible.

In 1994, West Philadelphia’s crime rate had risen 10 percent (10%) over the preceding decade, the community was blighted, and local schools were struggling. University officials concerned that the neighborhood’s troubles would negatively impact student enrollment and/or faculty recruitment developed and implemented the West Philadelphia Initiatives (WPI). The purpose of the WPI was to enhance the quality of life in the neighborhood surrounding the university and increase the economic opportunity for community residents. The WPI focused activities in five key issue areas: improving neighborhood services and capacity (including safety); providing high quality, diverse housing choices; reviving commercial activity; accelerating economic



development; and enhancing local school options. Led internally by Penn President Judith Rodin and her administration, the university's efforts formed strong partnerships with neighborhood organizations and civic groups, the private sector, and local government. An evaluation conducted in 2003 found that the initiatives had met a number of key benchmarks related to accomplishing its goals, including:

- 40 percent (40%) drop in crime reports requiring action by Penn's Division of Public Safety from 1996–2002
- 386 university city homes purchased by Penn-affiliated households between 1998 and 2004
- 150,000 square feet of new, university-created retail space housing 25 businesses
- \$134 million in university-related construction contracts awarded to minority- or women-owned businesses between 1997 and 2003
- The "Buy West Philadelphia" program resulted in \$344.1 million in university purchases from West Philadelphia vendors between 1997 and 2003
- Opening of a new university-assisted public school in 2001

In 2013, ICIC in conjunction with current LAEDC staff applied the framework illustrated in Figure 5 to the Martin Luther King Jr. Community Hospital Medical Campus and Willowbrook Community. The purpose of the assignment was to work with L.A. County to do the following:

- Establish an advisory group of stakeholders
- Develop a shared understanding of priority projects for the medical campus and surrounding community
- Create a roadmap for taking action on the highest potential opportunities

The priorities established by the advisory group extended beyond real estate development. It also included approaches to local workforce development, local purchasing opportunities and the expansion of primary / urgent care in the area. This framework could be established and applied to the LAC + USC hub and others in an effort to develop a shared set of values that could guide real estate development, community engagement and other priorities.



Note: This figure adapted from "Leveraging Colleges and Universities for Urban Economic Revitalization: An Action Agenda" A Joint Study by Initiative for a Competitive Inner City and CEOs for Cities, 2003

FIGURE 5. STRATEGIC FRAMEWORK

### Potential Government Contributions

The role that local government played in the development of successful bioscience hubs across the country varies significantly. This is important as L.A. County prioritizes its action items, especially as they relate to how the county will invest in real estate transactions. The most common forms of assistance are as follows:

- Contributing land
- Financing infrastructure costs
  - Utility installations
  - Street improvements
  - Sidewalks
  - Sewers
  - Landscaping
  - Wayfinding / signage
- Financing land / building acquisition
- Facilitating public financing
  - Tax-exempt bonds
  - Creation of Tax Increment Districts
- Entitlement / Community relations support

### Potential Funding Sources

The capital stack for the most of the new development projects outlined in the following sections will assimilate numerous resources. The most common funding strategies are outlined in Figure 1 below.

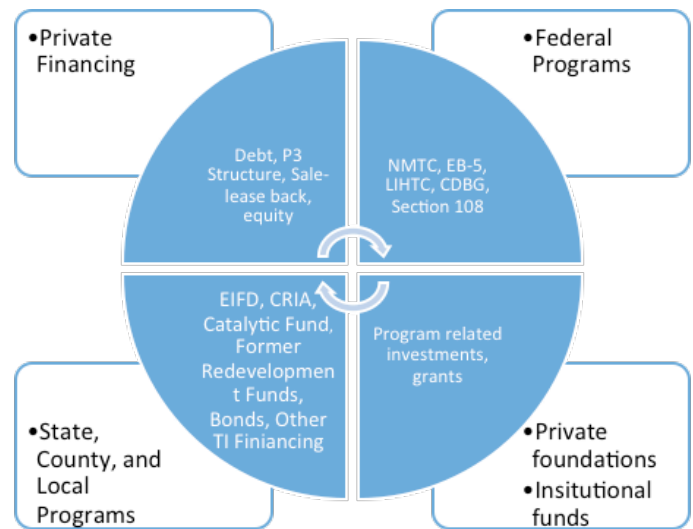


FIGURE 6. POTENTIAL FUNDING

Several of the bioscience hubs provide ample opportunity for adaptively reusing existing space. In addition, in some instances public facilities may need to be relocated and new buildings constructed to accommodate the program needs of the relevant government department. The county could fund these development activities through the capital improvement program or issue tax-exempt debt. With competing financial interests and worthy mission critical projects countywide, the county should consider alternative financing mechanisms such as P3s that could potentially lessen the financial burden and ongoing oversight responsibilities of the county. The key advantages of a P3 structure are as follows:

### Key Considerations / Advantages of P3

- Raises capital quickly to attend to maintenance or rehabilitation of facilities
- Shifts construction responsibility and cost overrun risk to a third party
- Installs third party property manager to maintain property over the life of the lease
- Most likely can be structured as an operating versus capital lease or general obligation debt

### City of Hope Hub

The City of Hope Hub is a significant driver in growing the regional bioscience ecosystem. Significant growth of patient care services and research activities at City of Hope have culminated in the development of a comprehensive Master Plan of its 110-acre campus. Although there are no immediate plans for an incubator on the campus, the Master Plan includes around 1.7 million gross square feet of development and also includes a 150,000 square feet research facility off campus in Monrovia that will provide additional wet- and dry-lab space.

The Beckman Research Institute at City of Hope was the first of five Beckman Institutes to be founded nationwide, and it has held a National Cancer Institute Cancer Center Support grant for over 30 years. Investigating the biology, biological chemistry, and pathology of cancer and diabetes, Beckman Research Institute scientists and researchers have also explored the emerging links between the diseases, which has resulted in the formation and spin off of at least half a dozen companies.

City of Hope excels in translational research, bridging the gap between laboratory and treatment, and so there is a significant amount of collaboration between clinicians and researchers at the hub and the California Institute of Technology (Caltech) and local community colleges and universities. There are two incubators, nearby in Monrovia that support the innovation climate of the region: Lab Launch and MADIA Tech Launch. Furthermore, the City of Hope Hub has many strengths, including R&D, physical space and clinical advantages due to its strong research focus, established inpatient and outpatient hospital, and aggressive plans for expansion. Further, in light of the new L.A. County Metro Gold Line station along Duarte Road within walking distance of the Campus, the City of Duarte is collaboratively working with the City of Hope to develop amenities that will benefit the growth of the campus.

As indicated in the list below, the only weakness heard consistently from entrepreneurs is the perception that the City of Hope Hub is not centrally located and is perceived as a suburban location.

#### Strengths:

- Number of Patents in Sciences & Technology
- Specialized equipment/specialized lab space
- Dedicate Tech Transfer Office
- Areas of Focus/research excellence
- Number of specialties with national ranking
- Number of clinical trials completed in last 5 years
- Amount of Foundation funding for scientific research (2010-2015)
- Amount of other private funding for Biosciences and related fields
- NIH Grants (2013-2015)
- Other Government Grants
- Availability of private land for new development
- Existing or pending incubator space within 3 miles
- Quality and relatively affordable housing nearby
- EIR is in process

#### Weaknesses:

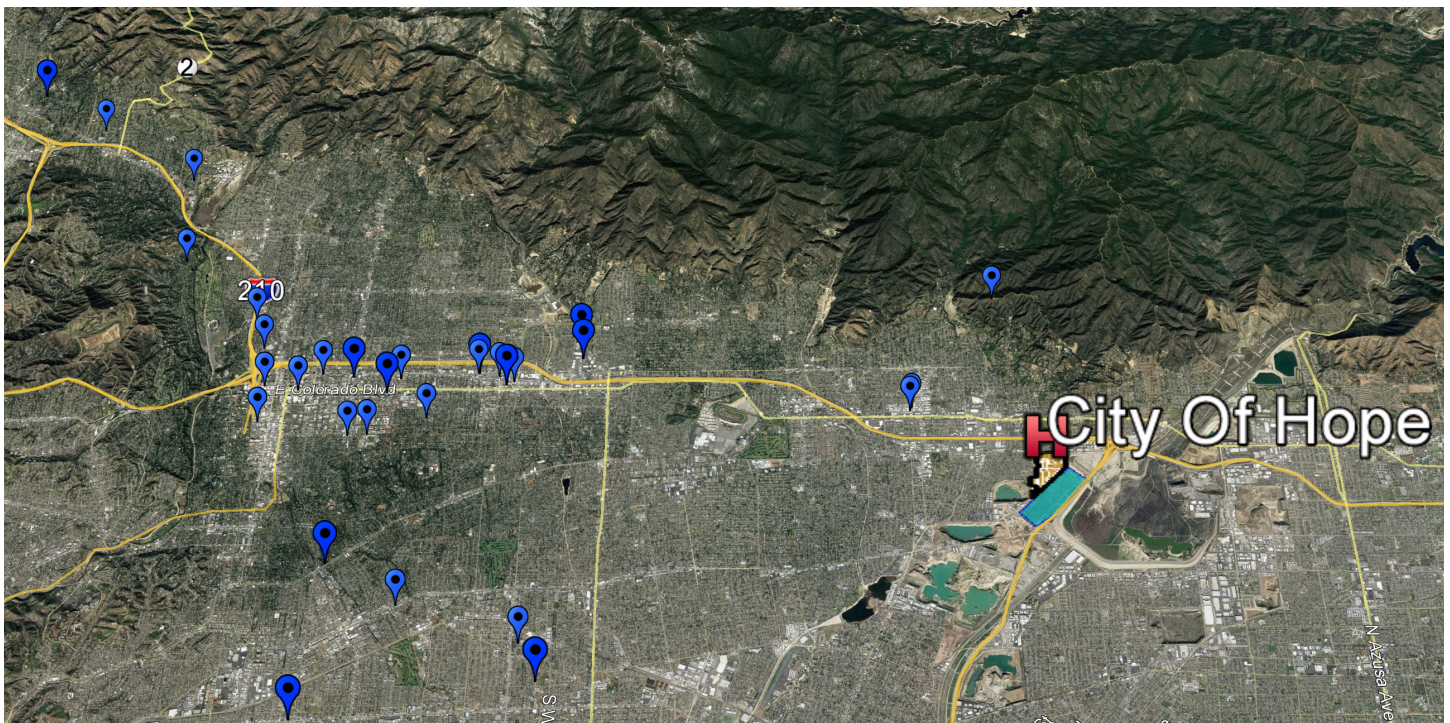
- Perception of not being centrally located



The positive factors outlined above has stimulated private investment. As indicated in the map below a cluster of firms engaged in research and development have emerged in close proximity to the hub.<sup>106</sup>

Although the City of Hope campus itself is developed solely on privately-owned land, the transit-oriented development adjacent to the campus and approval of the Master Plan through the City of Duarte Specific Plan process will require government assistance. Due to the strong R&D that is currently taking place at the City of Hope Hub, the lack of county-owned land near the hub, and the fact that very little county action is needed to realize the potential of this hub, there are relatively few recommendations for the county to act on.

<sup>106</sup> The pins in the map represent establishments as classified by the North American Industry Classification Code (NAICS) 541712 and 541711. These firms are primarily engaged in conducting research and experimental development in the physical, engineering, and life sciences and research and development in biotechnology.





### Action Item 16

Finalize Specific Plan & EIR by 2017 to expedite development.

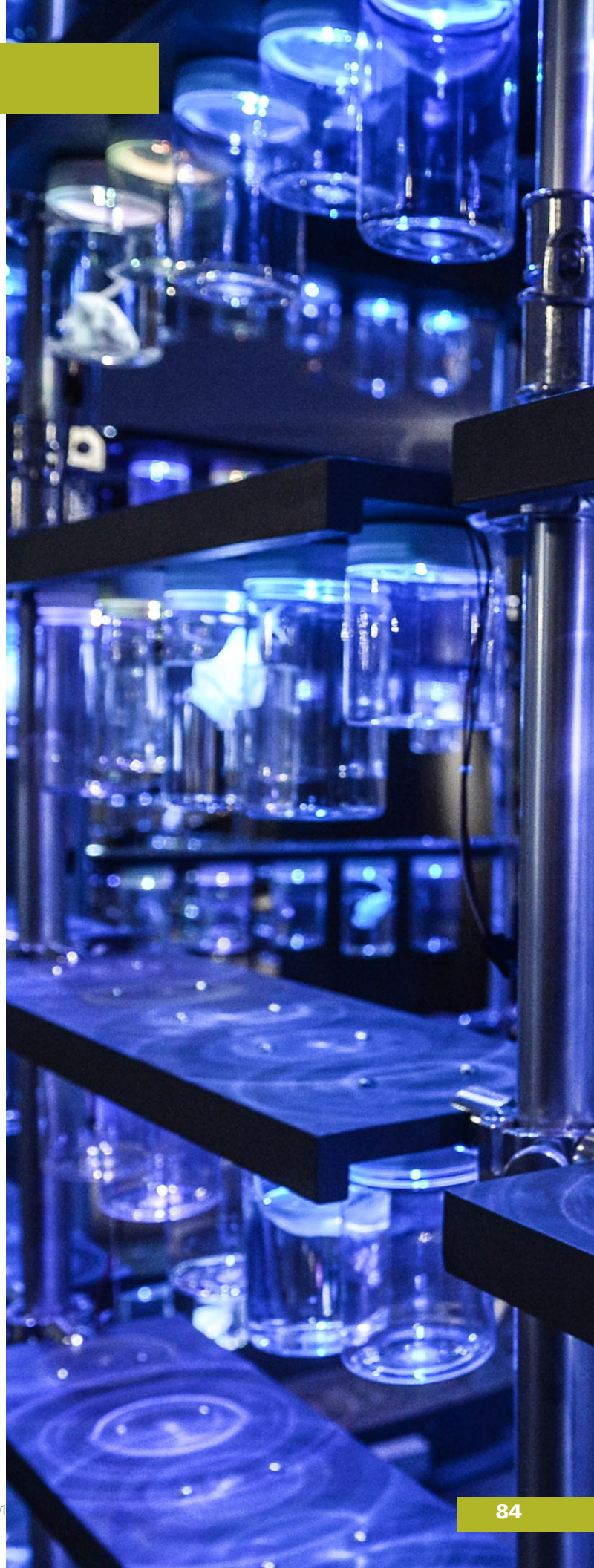
#### Purpose:

The City of Hope National Medical Center will need approval of its Campus Plan,<sup>107</sup> which through a comprehensive Specific Plan would provide direction for the enhancement and development of the campus over a period of 20 years, including the replacement of outdated and/or obsolete buildings with modern facilities. It is recommended that the City of Duarte finalize the EIR by 2017 in order for the county to market the City of Hope Hub's unique strengths and the opportunity for development within the adjacent TOD as part of the marketing campaign discussed hereunder in Recommendation Two. The Specific Plan would tie the City of Duarte's General Plan together with development activity throughout the project site.

#### Implementation Steps:

- I. FIRST IMPLEMENTATION STEP: City of Duarte and the City of Hope real estate department to develop a detailed schedule for all required planning actions.
- II. FIRST YEAR AND BEYOND:
  - Create Certification of the City of Hope Campus Plan EIR
  - Approve City of Hope Specific Plan
  - Approve General Plan Amendment

<sup>107</sup> [www.cityofhopecampusplan.com](http://www.cityofhopecampusplan.com)





### Harbor + UCLA Hub

The Harbor + UCLA hub possesses many of the constituent elements needed to foster the growth of a bioscience cluster. The two main anchors of the 72-acre site are the 373-bed hospital and the Los Angeles Biomedical Research Institute (LA BioMed). At full build-out, the medical campus will contain approximately 2.15 million square feet of developed floor area. Under the current plan, a new, centrally-located Hospital Tower will be the focal point of the Medical Campus. Outpatient facilities will be consolidated to provide greater access and proximity between these services and to the New Hospital Tower. For more than 50 years, Harbor + UCLA has been affiliated with and has conducted a broad range of important medical research in partnership with LA BioMed. This productive partnership has resulted in the modern cholesterol test, important contributions to treatments for aneurisms, cancer, infectious diseases, pulmonary disorders, and other conditions, as well major clinical discoveries in perinatal, vaccine, and women's care research. As a standalone entity, LA BioMed attracts significant research funding and is responsible for a variety of medical accomplishments as reflected by numerous patents, license agreements, and about a half-dozen spin-off firms. The colocation of Harbor + UCLA Medical Center and LA BioMed creates an ideal situation for the integration of research and clinical care and an optimal flow of information and innovation from the bedside to the bench.

The hub has many strong attributes, many of which makes it "shovel ready" for new private investment. These factors include an expertise in technology transfer, research excellence, and availability of publicly-owned land for development. In addition, the site has completed a Master Plan and an EIR (in process) that anticipates 250,000 square feet of research and development space on the approximately 15 acres of county-owned land.





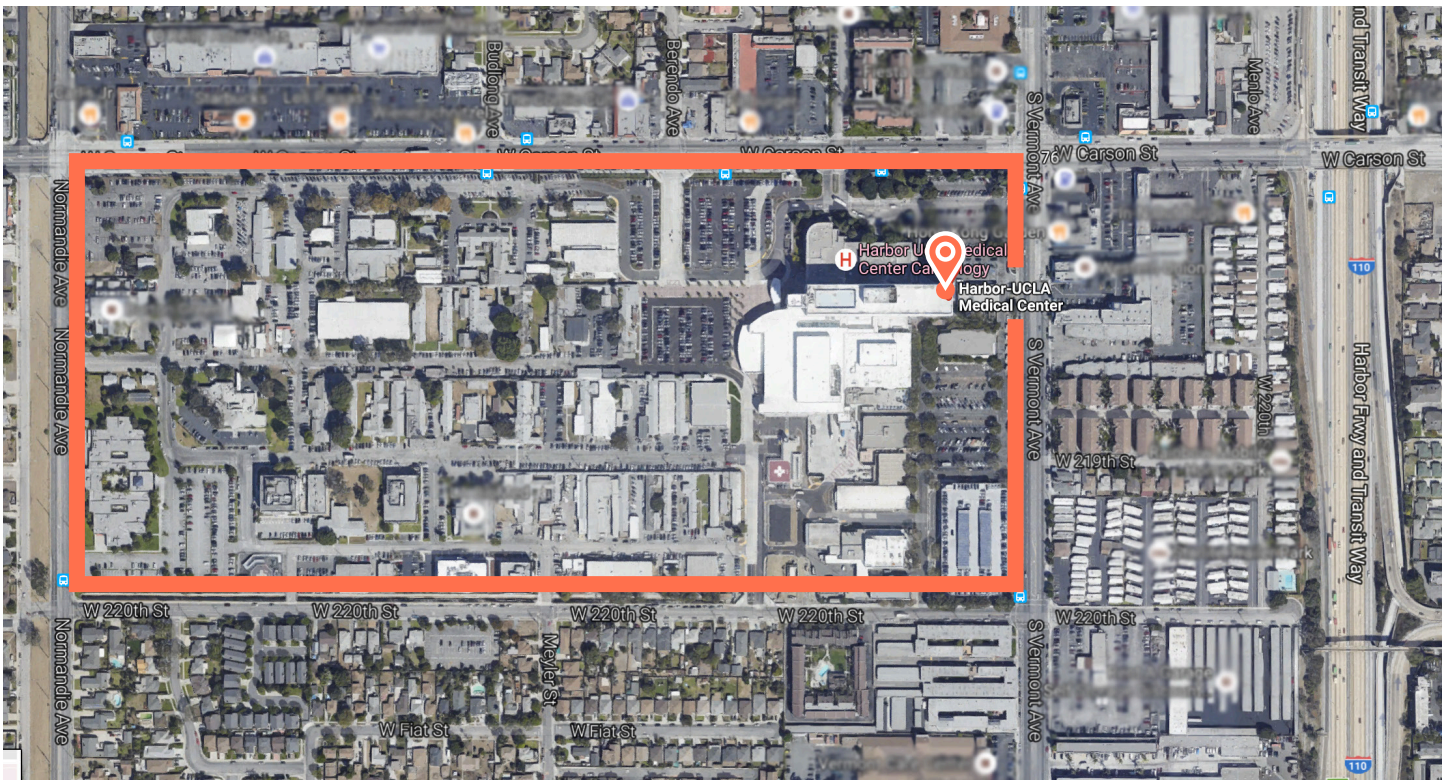
### Strengths:

- Number of patents in sciences & technology
- Specialized equipment / specialized lab space
- Dedicated tech transfer office
- Clinical areas of focus / research excellence
- Number of specialties with national ranking
- Diversity of population for clinical trials
- Number of clinical trials completed in last 5 years
- Amount of other private funding for Bioscience and related fields
- Numerous NIH grants

- Nearby restaurant options
- Availability of existing public space for adaptive reuse
- Availability of public land for new development
- Existing or pending incubator space within three miles
- Master plan completed in the last five years
- EIR In process or completed

### Weaknesses:

- Lack of private land for new development
- Utility and other infrastructure upgrades are needed



### Action Item 17

Finance the construction of a new research and development facility.

#### Purpose:

LA BioMed's development plan, which was recently approved by the L.A. County Board of Supervisors, includes the development of a four-story 79,000 square foot building to accommodate the relocation and consolidation of existing uses from older buildings elsewhere on the Harbor + UCLA campus. The new development will include: around 40,000 square feet of wet- lab and dry- lab space; a 15,000 sq. ft. incubator; food services; office space; a conference room; and other bioscience- related facilities. Each floor will be between 19,000 and 21,000 square feet. It is estimated that the total cost of construction for this building will be around \$63 million, and that the building will be under construction before the end of the 2016 calendar year.

Completing the construction of LA BioMed's new facility will be a bona fide catalyst for the development of the county's land for a bioscience research park purposes. Start-ups and early-stage companies graduating out of LA BioMed's incubator will create built-in demand for space in close proximity to the institution and can organically create a campus for bioscience firms in the area.

Currently, it is estimated that the project has a \$3 million to \$6 million funding gap for construction associated with the incubator. While the project is not eligible for New Market Tax Credits, the estimated capital stack includes EB-5 financing, EDA funds, institutional investors and philanthropic donations.

### Implementation Steps

- I. FIRST IMPLEMENTATION STEP: L.A. county and LA BioMed to develop and implement a joint strategy to fill the financing gap for the incubator.<sup>108</sup>
- II. FIRST SIX MONTHS: CDC and/or third-party consultant to identify funding gap.<sup>109</sup>
- III. Year One: L.A. County Board of Supervisors to pass a motion directing the appropriate departments to budget and allocate the funds needed to fill the funding gap. The CDC and the county's asset management group will draft the appropriate agreements.

<sup>108</sup> LA BioMed has completed a third-party business plan and operating budget for the incubator.

<sup>109</sup> After confirming the funding gap, the county should assess the potential for providing additional financial support to assist in closing the remaining gap. Section 108 financing, with a repayment stream of a pledge of Community Development Block Grant (CDBG) may be appropriate. However, a site-specific revenue repayment option is not viable since LA BioMed does not pay property taxes.



### Action item 18

Finalize the Harbor + UCLA EIR by  
December 31, 2016

#### Purpose:

The Harbor + UCLA Medical Campus Master Plan was completed in June of 2012. The cost to implement the Master Plan by 2018 is in the range of \$1.6 to \$2.3 billion. The proposed projects are as follows: (1) administrative and mental health building; (2) outpatient building(s); (3) parking structures; (4) central plant; (5) acute care inpatient tower; and (6) existing inpatient tower (to be adaptively reused).

The EIR, which is underway, will identify any potential environmental impacts related to implementation of the projects proposed in the campus Master Plan project. In addition, the EIR will address the impact of developing a biotech research park with at least 250,000 square feet of gross area. This action will expedite the development of the opportunity site.

Although a Mitigated Negative Declaration was prepared for LA BioMed's facility, it does not address the project's parking requirements, which are tied to the Harbor + UCLA EIR and Master Plan. LA BioMed will be unable to move forward with construction until the Harbor + UCLA EIR and Master Plan are approved. These documents are scheduled to go to the L.A. County Board of Supervisors for approval by year-end 2016.

#### Implementation Step

- I. FIRST IMPLEMENTATION STEP: Third-party consultants to complete and submit the final EIR to the County for review.
- II. FIRST THREE MONTHS: The County Board of Supervisors to approve the Harbor + UCLA Master Plan and EIR.

### Action Item 19

Phased relocation and demolition of current tenants of county-owned land.

#### Purpose:

Once the EIR and Master Plan are approved by the L.A. County Board of Supervisors, the county will need to develop and implement a strategic plan for relocating the current tenants of the county's 15-acre site opportunity site. This relocation to happen according to the phased development of the campus subject to executed leases.

#### Implementation Steps

- I. FIRST IMPLEMENTATION STEP: L.A. County's Asset Management Group to create a database of lease terms and conditions for all tenants of Harbor + UCLA Campus and create a strategy to relocate tenants either on or off campus once their leases have expired.
- II. FIRST 3 MONTHS: L.A. County's Asset Management Group to report back to the L.A. County Board of Supervisors within 90 days on the optimal relocation strategy.



### Action Item 20

Develop a Bioscience Research Park on approximately 15 acres of county-owned land.

### Purpose:

There is a 15 acre development opportunity site – as indicated in the map below. The EIR, which is being finalized, anticipates that this site would contain, at total build-out, approximately 250,000 square feet of R&D, lab and office facilities. These uses will be complemented by open space and amenities such as retail, restaurants and recreational facilities. The optimal development team will include LA BioMed and a partnership that can ensure that the projects involve meaningful community engagement and benefits.

### Implementation steps

- I. FIRST IMPLEMENTATION STEP L.A. County and LA BioMed to amend the ground lease to include the 15 acre opportunity site.
- II. FIRST SIX MONTHS: The L.A. County Board of Supervisors to vote on the amended ground lease.

Proposed Budget: Harbor + UCLA

Source	5-Year Total	Description
Bioscience Partnership	\$50,000	In-kind services
Federal Funds	\$3,000,000	Estimate for EDA grant for construction
Gap Financing	\$6,000,000	Estimated costs for incubator development, third party consultants, demolition of county buildings on 15-acre opportunity site. All other real estate costs TBD.
Non-government Equity	\$4,000,000	
Private Foundations & Institution	\$20,000,000	
Private Sector Debt	\$34,500,000	
Total	\$67,550,000	

### LAC + USC Hub

The 75-acre LAC + USC Hub anchors a three-mile, 883-acre corridor that contains Grifols USA to the northeast, the future LA BioSpace incubator located on California State University, Los Angeles's ("CSU LA") campus to the east, and an industrial area that could support bioscience manufacturing or perhaps bioprocessing<sup>110</sup> between LAC + USC and CSU LA. Both segments of the campus have completed Master Plans that provide guidance for a 20-year renewal process that will focus on innovative healthcare services, expanding R&D services, and constructing efficient parking, as well as providing amenities and housing.

Both the LAC + USC Master Plan and the USC Health Science Campus (HSC) Master Plan have anticipated bioscience development. The USC HSC project further includes amenities for the campus that have historically not been available in the surrounding area. The first of several phases of USC HSC Master Plan is underway. The project includes: a 200-bed hotel with conference space, ground-floor retail, and a sit-down restaurant; 157 units of student housing; a 114,000 square feet clinical building dedicated to cancer treatment; a 134,000 square feet research incubator; and streetscape beautification. The LAC + USC Master Plan includes both the adaptive reuse of several buildings, as well as new development for outpatient care, ambulatory surgery, office space, mixed-use retail, and child care services. As discussed in more detail below, there is existing lab space with the potential to spur and drive bioscience research on the campus.

The existing world-renowned network of USC scientists and engineers is one of the primary strengths of the LAC + USC Hub. As outlined below, the hub has several key strengths that

suggest it has the capabilities necessary to support a new bioscience research park, the most notable being their research capabilities, tech transfer office, and the availability of public and private land. The most significant weakness is the potential high cost of relocating some government uses off of the publically-owned land.

#### Strengths:

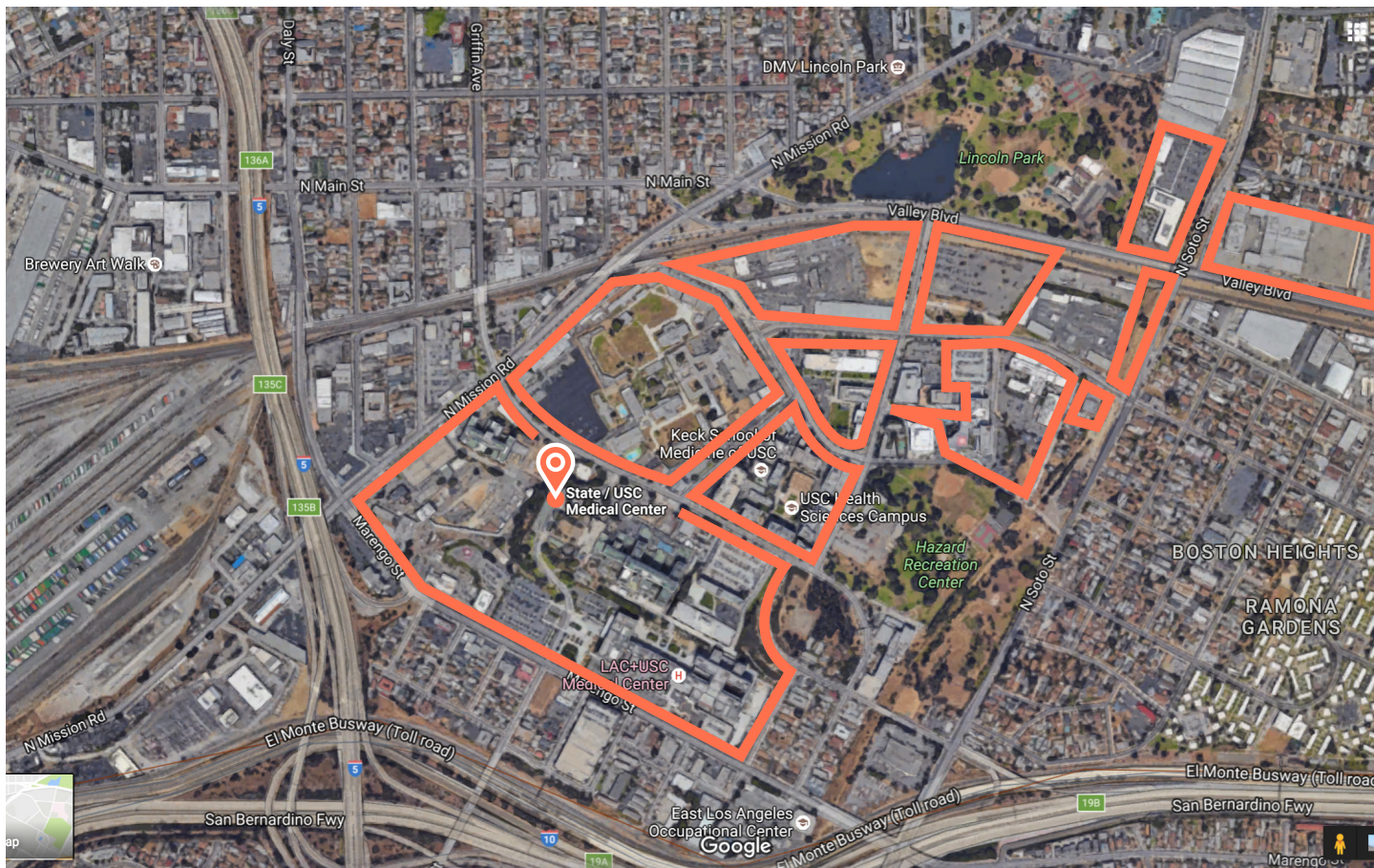
- Number of Nobel Laureates in sciences and technology
- Number of patents in sciences and technology
- Specialized equipment / specialized lab space
- Dedicated tech transfer office
- Areas of focus / research excellence
- Number of specialties with national ranking
- Amount of Foundation funding for scientific research
- Amount of Industry funding for scientific research
- Amount of other private funding for bioscience and related fields
- Availability of existing public space for adaptive reuse
- Availability of public land for new development
- Availability of private land for new development
- Existing or pending incubator space within 3 miles

#### Weaknesses:

- High relocation costs of public works yard
- Lack of amenities
- EIR is not in processes or completed
- Potential need for significant infrastructure upgrades
- Lack of affordable housing

<sup>110</sup> The National Academy of Sciences defines bioprocessing as a "sub-discipline within biotechnology that is responsible for translating the discoveries of life sciences in to practical products, processes or systems that can serve the needs of society."







### Action item 21

Convene vision plan meetings with key stakeholders to discuss biomedical research park.

#### Purpose:

As stated in the Executive Summary hereunder (pages 13-14), previous efforts to develop the planned USC Biomedical Research Park have been dominated by “fits and starts.” All parties have commissioned expensive feasibility studies. The purpose of this action item is to bring together various L.A. County departments (i.e., CDC, Asset Management Group, Department of Health Services, Supervisorial offices, etc.), The Housing Authority of the City of Los Angeles, the City of Los Angeles’s Planning Department and USC, to develop consensus on the short- and long-term vision for developing the Bioscience Biomedical Research Park at the LAC + USC Hub.

#### Main Objectives of the Meetings:

- USC to present their vision for the research and academic programming for the potential new research facilities.
- USC to provide their overall vision, including real estate and research programming for the proposed research park, including the square footage dedicated to academic versus other types of uses, e.g., commercial, office, retail, sit-down restaurant, R&D. (Information should be provided by phase and at full build-out.)
- USC to provide draft timeline and development schedule by phase.
- USC to present architectural renderings of the proposed new research park.
- City of Los Angeles Planning Department to provide initial feedback on entitlement process.
- L.A. County to brief on relocation issues and potential solutions.

#### Implementation Steps:

- I. FIRST IMPLEMENTATION STEP: L.A. County to organize, schedule and conclude the vision plan meetings over an eight-week time period.
- II. FIRST THREE MONTHS: After the conclusion of the meetings, the CDC to develop and circulate a follow-up memorandum participating stakeholder groups, including USC, outlining key decision points and next steps on developing a multi-tenant Biomedical Research Park. L.A. County First Supervisorial District office and USC will meet to discuss the follow-up memoranda and determine a path forward.

### Action item 22

Form a working group of hub and community stakeholders to implement and monitor suggested public benefits and community engagement programs.

#### Purpose:

The December 15, 2015 motion by the Board of Supervisors directed the Executive Director of the L.A. County CDC to initiate a community outreach program on the County's bioscience industry sector initiative and provide recommendations based on the types of community benefits that should be realized from the County's Bioscience Initiatives. According to the motion the public benefits that could be considered include: (i) providing access to employment and training opportunities; (ii) youth mentoring; (iii) small business and social enterprise participation; (iv) expanding medical care and public health programs; (v) support for local community-based organizations; (vi) ongoing community engagement programs; (vii) increasing the supply of affordable housing; (viii) transportation improvements; and (ix) improvements that address deficient local services and resources.

This follows an extensive 18-month community engagement effort that was completed by Lee, Burkhart, Liu, Inc. (LBL) and Katherine Padilla and Associates (KP&A) in 2013. The outreach approach for the project was designed to obtain community input into the LAC + USC Master Plan. This was achieved through four distinct, interactive components:

- Community meetings;
- Stakeholder interviews;
- Presentations to neighborhood councils and other community organizations; and
- E-mail, e-newsletters and project website.

Over 50 community based-organizations, chambers of commerce, and schools were contacted during the process and 19 stakeholders were interviewed,

including representatives from: Lincoln Heights Neighborhood Council; Puente Learning Center; Los Angeles Unified School District; USC Real Estate and Asset Management; Department of Public Health; Coroner's Office; Probation Department; Patient Services; and Department of Community Health. The LAC + USC Medical Center Master Plan Community Report (November 2013) documented the process, the issues raised by the community during the assignment, and participants. While the information gathered during this assignment was very valuable for the master plan process, an effective anchor community engagement strategy will require ongoing interaction by local community residents, organizations and the leadership of the anchor institutions to implement sustainable meaningful actions that have the potential to positively transform the lives of those who live and work near the bioscience hubs.

### Action Item 22 (continued)

#### Implementation steps

- I. **FIRST IMPLEMENTATION STEP:** The L.A. County CDC will report back to the Board of Supervisors on potential public benefits for at least each primary hub. The report will be based primarily on the findings from the Community Outreach Plan that is currently underway by ELP Advisors. However, the LAC + USC analysis should also include findings from previous outreach efforts, including the 2013 Community Report. The LAC + USC hub report to the Board of Supervisors should include recommendations for maintaining regular communications with the stakeholders and community at the LAC + USC hub.
- II. **FIRST THREE MONTHS:** Utilizing the ELP Advisor's completed Community Outreach Plan and the targeted list of stakeholder groups that was formulated during the process the L.A. County CDC should establish a list of key stakeholders and decision makers to form a working group that will implement and monitor the suggested public benefits and programs that will be documented in the pending Community Outreach Plan.
- III. **FIRST YEAR AND BEYOND:** The database contractor (Action Item 2) will build social media platforms and a website to keep stakeholders informed and engaged at the LAC + USC hub.
- IV. L.A. County CDC will enter into a contract with a third-party consultant to monitor and update the on-line content. The third-party consultant's tasks will also include establishing the meeting schedules for the working group, setting the agendas, facilitating the meetings, and providing notes and briefings to the L.A. County CDC and the first supervisorial district.

### Action Item 23

Develop Biomedical Research Park on county-owned opportunity site located at the LAC + USC campus.

#### Purpose:

Develop the Biomedical Research Park on one of two primary opportunity sites, as indicated on the map above. They are the 19 acres of L.A. County Department of Public Works facilities (Alcazar Street) located along Valley Boulevard and the 31 acres of county-owned land located west of State Street.

#### Option 1 - OPTIMAL LOCATION

##### Alcazar Yard Sites:

The optimal long-term site for a Biomedical Research Park at the LAC + USC Hub includes the 11-acre 1525 Alcazar Street site and 8-acre 2275 Alcazar Street, which are currently controlled by the county's DPW. The factors contributing to identifying Alcazar Yard as an opportunity site are:

- Ability to combine the 19 acres with USC's parcels to create 31 acres of contiguous land
- Adjacency to numerous USC medical research facilities
- Adjacency to several USC project's under construction (i.e., graduate student housing and a 275-room hotel) that will contribute to a 24 /7 environment that will attract talent
- Adjacency to a USC-owned parcel that has the environmental clearance to develop a bioscience related building up to 100,000 square feet. This facility would satisfy physical space demands as the Alcazar sites came on-line.

The Public Works Yards are currently occupied and should be relocated to accommodate the development of a new biomedical research park.

### Action Item 23 (continued)

A September 2013 analysis<sup>111</sup> commissioned by the L.A. County Public Works Department estimated that the relocation costs – including environmental cleanup and hazmat abatement on both sites – could exceed \$230 million for their preferred work program and building configuration.<sup>112</sup> As outlined below the consultant team recommends re-evaluating these cost estimates.

### Option 2 - ALTERNATIVE SITE

The 31-acre site west of State Street on the medical campus contains a number of vacant and/or under-utilized properties. The LAC + USC Master Plan suggests that over 750,000 square feet of biotechnology space could be developed along Marengo Street and North Mission Road.<sup>113</sup>

Based on our analysis, the lack of direct linkages to USC research facilities and amenities, such as the hotel, suggest that this is not the optimal hub site for the initial development. However, this location will not require the same level of private and public investment for relocation, and the historical uses suggest that there will be a modest amount of environmental cleanup. It could serve as an expansion site for future phases of the biomedical research park

### Order of Magnitude Pro Forma Analysis

The order of magnitude pro forma analysis suggests that the initial phases of the development will require gap financing. From a cash flow perspective, the initial phases bear the brunt of the costs associated with infrastructure upgrades and remediation. In addition, since this is not a proven market, lease rates and terms will have to be very competitive to attract the desired tenants.

As indicated in Table 4 below, a hypothetical initial building with 75,000 square feet of net rentable area has a negative residual land value<sup>114</sup> ranging from \$2.9 million to \$14.6 million, depending on several variables, including rental rates.

Table 4

	R&D/Laboratory	R&D/Laboratory	R&D/Laboratory
Lot (AC)	3.8	3.8	3.8
Net Rentable SF	75,000	75,000	75,000
Type of Construction	A–Good	A–Good	A–Good
Estimated Occupancy	85%	85%	85%
Annual Rent (NNN)	\$30.00	\$35.00	\$40.00
Average Floor Area	25,000	25,000	25,000
Landscaping	11,250	11,250	11,250
Parking Stalls	150	150	150
Parking SF	53,250	53,250	53,250
Total Land (SF)	164,500	164,500	164,500
Value (\$)	\$33,700,000	\$39,600,000	\$45,515,706
Construction Costs	(\$30,600,000)	(\$30,600,000)	(\$30,606,696)
Relocation/Remediation/Demo	(\$17,800,000)	(\$17,800,000)	(\$17,800,000)
Total Development Costs	(\$48,400,000)	(\$48,400,000)	(\$48,400,000)
Construction Costs psf	\$408	\$408	\$408
Total Costs per SF	\$645	\$645	\$645
Residual Land Value	(\$14,600,000)	(\$8,800,000)	(\$2,900,000)
Value per AC	(\$3,900,000)	(\$2,300,000)	(\$800,000)

111 Analysis conducted by Gonzalez Goodale Architects. Private Report.

112 Although our analysis indicates that the relocation and cleanup costs could be significant, independent third parties interviewed, indicated that the relocation could be completed at a much lower cost than that was expressed in the Gonzalez Goodale report.

113 [www.lausc.lblarch.com/](http://www.lausc.lblarch.com/)

114 Residual land value is the value of the land that remains after any and all deductions associated with the cost of developing, maintaining or reselling the land.



### Action Item 23 (continued)

#### Implementation Steps:

- I. FIRST IMPLEMENTATION STEP: Secure a relocation site(s) for the Public Works Yards.
  - L.A. County's Asset Management Group will complete an assessment of publicly-owned land that meets the requirements of the Public Works Department and present at least three site options to the L.A. County Board of Supervisors and DPW.
  - L.A. County Asset Management Group to receive weekly updates from the brokerage community regarding available properties, as there are currently no privately held parcels of land for sale or lease that are 8 acres or more within a five-mile radius of the site.
- II. FIRST THREE MONTHS:
  - L.A. County to enter into discussions with USC regarding their Valley Boulevard property.<sup>115</sup>
  - L.A. County Public Works to revise relocation and remediation estimates based on a selected relocation site, along with industry accepted construction cost metrics.
- III. SIX TO NINE MONTHS: L.A. County to issue an RFP for a development team to construct a Biomedical Research Park on the Alcazar properties.
  - CDC and/or the county's Asset Management Group to assemble a team of government and non-government experts to review the proposals and select a development team.
  - The County Board of Supervisors will vote on the selection of the development team.
- IV. FIRST YEAR: L.A. County to execute an Exclusive Negotiating Agreement (ENA) with the selected development team ("Development Team").
  - L.A. County and the Development Team to negotiate the community benefits package.
  - Development Team to convene a series of community meetings to keep residents and local stakeholders apprised of the proposed project.
  - L.A. County to conduct a financial and feasibility analysis of the Development Team's detailed proposal.
  - Development Team to commence the entitlement process.
- V. YEAR TWO: L.A. County to execute an agreement to transfer the Alcazar Yard properties to the Development Team via a sale or long-term ground lease.
  - Development Team will finalize the capital stack for the first phase of construction.
- VI. YEAR THREE: L.A. County to secure control of future public works yard relocation site through a legal agreement (i.e. option agreement).

<sup>115</sup> In the long-run, relocating the Public Works yards to this location may constrain the growth of the Biomedical Research Park and the overall economic activity in the area. However, it could expedite the development of the initial phases of the research park.

### Action Item 24

Form a P3 structure to relocate public facilities on the LAC + USC Hub.

#### Purpose:

A P3 would expedite the relocation and reduce the construction costs of a new public works yard. While P3s structures can vary significantly, the most common type of P3 used in California is when a single contract is entered into with a private partner (often a consortium of several companies) for the design, construction, finance, operation and maintenance of an infrastructure facility.

Under this P3 approach, the county would transfer a significant amount of design and construction responsibility associated with the development of the new public works yard to the private sector. The private sector partner would make design and construction decisions, and be responsible for paying the costs to resolve any construction issues and for ensuring that the project is completed on time. Under this structure, the county must still identify a revenue stream to repay the private partner over a pre-determined period, usually ranging from 25 to 100 years.

The P3 model has been used to complete several public facilities in Southern California, including the City of Long Beach courthouse. As indicated in Appendix 9, LAEDC and other partners worked with a development team to locate a site that is currently available in the City of Santa Fe Spring. The development team completed a preliminary site plan and relocation estimates that are consistent with the Public Works Department's preferred specification as stated in the 2013 Gonzalez Goodale report.

#### Implementation Steps:

- I. FIRST IMPLEMENTATION STEP: L.A. County Asset Management Group and CDC to review the opportunity in detail and report back to the L.A. County Board of Supervisors within 90 days.
- II. FIRST YEAR AND BEYOND: L.A. County Asset Management Group to complete a cost benefit analysis of pursuing a P3 approach versus other alternatives, i.e., design-bid-build; design-build and other traditional tools, for relocation of public facilities, and report back to the L.A. County Board of Supervisors regarding potential relocation sites and optimal funding and procurement alternatives.<sup>116</sup>

<sup>116</sup> "Maximizing State Benefits from Public-Private Partnerships," State of California Legislative Analyst Office Report, 2012 page 3. The report outlines best practices and recommends conducting a comparative analysis on a range of procurement options before pursuing a P3 approach.

### Action Item 25

Adaptively reuse prime real estate assets.

#### Purpose:

The 2014 LAC + USC Master Plan includes a facilities analysis that suggested reusing several buildings. For the purposes of near-term, impactful development, our analysis focused on four buildings that will soon be vacated, as well as the iconic Los Angeles County General Hospital (“General Hospital”).

There is approximately 57,000 square feet of lab space located in four buildings on the medical campus (1801 Marengo, 1303 Mission, 1321 Mission and 1331 Mission). This space will be vacated in phases by USC over the next 24 months. These spaces could be easily upgraded and redeployed for use, especially since several entrepreneurs engaged in bioscience research and development expressed an interest in leasing the facilities.<sup>117</sup>

The General Hospital is the most recognized building on the campus, and has well-documented historic and preservation value. The adaptive reuse of the 1.4 million square foot structure will require substantial infrastructure upgrades. The complete rehabilitation of the hospital may exceed \$300 million.<sup>118</sup> The future programming of the building could accommodate several county objectives such as: (1) providing affordable housing for a myriad of income levels; (2) office space for non-profits, government departments and the private sector; (3) recreational facilities; and (4) neighbor serving retail.

<sup>117</sup> At the March 23, 2016 Bioscience Real Estate Stakeholder meeting held at the California Club, Lab Launch and several bioscience start-up companies attended and expressed interest in potentially leasing space in the soon to be vacated buildings.

<sup>118</sup> “Battelle Technology Partnership Practice “Advancing a Biomedical Research Park at US’s Health Science Campus: Feasibility/assessment and Conceptual Plans” (July, 2006).

### Implementation Steps:

#### I. FIRST IMPLEMENTATION STEPS:

- L.A. County, through the Asset Management Group, to commission and finalize third-party reports for the costs associated with refurbishing the lab space for immediate occupancy by bioscience entrepreneurs.
- L.A. County, through the Asset Management Group, to commission a detailed report analyzing and itemizing the costs of redeveloping the former General Hospital into a mixed-use development.

#### II. FIRST SIX MONTHS: L.A. County Asset Management Group to report back to the L.A. County Board of Supervisors on the findings, costs and benefits of adaptively reusing the lab and hospital space.

#### III. FIRST NINE MONTHS: L.A. County Asset Management Group to oversee an international competition for an REI<sup>119</sup> for the redevelopment of the General Hospital. (See, e.g., Action Item 10)

#### IV. FIRST YEAR AND BEYOND:

- L.A. County Asset Management Group and CDC to evaluate the REI responses for the General Hospital, and develop a shortlist of potential developers and building uses.
- L.A. County Asset Management Group and CDC to craft and issue an RFP to a shortlist of qualified developers for the General Hospital.

#### V. YEAR TWO: L.A. County Board of Supervisors publicly announce selection of winning proposer.

#### VI. FIRST 30 MONTHS: L.A. County Asset Management Group and CDC to negotiate and execute an agreement for the redevelopment of the General Hospital.

<sup>119</sup> As part of a procurement process an entity seeks to shortlist potential suppliers before then seeking detailed bids.

### Action Item 26

Create an Enhanced Infrastructure District as a means of capturing tax increment revenue to fund infrastructure improvements along the three-mile, 883-acre corridor which includes the LAC + USC Hub.

### Purpose:

In 2014, the California Legislature created the Enhanced Infrastructure Financing District (EIFD) as a new way to finance public infrastructure, affordable housing and other projects. In 2015, refinements were made to make the legislation a viable tool for redevelopment purposes. EIFDs have been used successfully around the state, most notably in West Sacramento for rail removal, demolition of buildings, remediation of contaminated sites, and development of streetscapes, utilities and parks. And, both the City of Los Angeles and the County of Los Angeles have initiated reviews of the potential use of EIFDs as a tool for economic development.

Also in 2015, the California Legislature enacted Assembly Bill 2 (Alejo), authorizing local agencies to form community revitalization and investment authorities (CRIA) within economically disadvantaged communities for purposes related to infrastructure, affordable housing, and economic revitalization, which would be financed by, among other things, the issuance of bonds serviced by tax increment revenues.

A CRIA and an EIFD have several requirements in common but are different in several ways, including, but not limited to:

- CRIA operates solely within a specifically defined area characterized by social and economic deterioration or a former military base; whereas an EIFD can be used for a wide range of infrastructure and other development and established anywhere within a city or county.
- CRIA is an “agency” for purposes of the tax-increment provisions of the California

Constitution used by former redevelopment agencies; whereas an EIFD is modeled off of existing Infrastructure Financing District law rather than Community Redevelopment Law.

- Issuance of bonds by CRIA does not require voter approval; whereas issuance of bonds by an EIFD requires 55 percent (55%) voter approval.
- CRIA must dedicate 25 percent (25%) of tax increment revenue on affordable housing; whereas an EIFD may provide affordable housing as an option.

Facilities financed by EIFD may include but are not limited to:

### Public Facilities:

- Highways, interchanges, ramps and bridges, arterial streets, parking and transit facilities
- Sewage treatment, water reclamation plants and interceptor pipes
- Facilities for the transfer and disposal of solid waste
- Facilities to collect and treat water for urban uses
- Flood control levees and dams, retention basins, and drainage canals
- Parks, recreational facilities, open space and libraries
- Brownfield restoration and other environmental mitigation

### Private Facilities:

- Transit priority projects
- Acquisition, construction and repair of industrial structures for private use.
- Affordable housing
- Childcare facilities



## Action Item 26 (continued)

As indicated on the City of Los Angeles' interactive map ([www.arcgis.com/home/webmap/viewer](http://www.arcgis.com/home/webmap/viewer)) there are only a limited number of census tracts around the 883-acre corridor that meet the requirements for a CRIA. As a result, an EIFD may be a more effective tool.

### Implementation Steps:

- I. **FIRST IMPLEMENTATION STEP:** The City of Los Angeles Mayor's business team bioscience representative, the City of Los Angeles's Economic and Workforce Development Department (EWDD), The Housing Authority of the City of Los Angeles, and the CDC to convene regarding the possibility of a joint EIFD to address the infrastructure needs of the 883-acre corridor, start-up costs and determine potential impacts to the General Fund of both the City and the County of L.A. (The City of Los Angeles Mayor's business team, EWDD and the CDC develop a regular meeting schedule for a set time period to collaborate and share research findings.)
- II. **FIRST THREE MONTHS:** CDC to report back to L.A. County Board of Supervisors on the potential costs, benefits and timing for the City of Los Angeles and the County of Los Angeles forming a joint EIFD.
- III. **FIRST SIX MONTHS:**
  - City of Los Angeles to establish EIFD boundaries for 883-acre corridor that includes the LAC + USC hub.
  - City of Los Angeles to engage the third-party consultants necessary to legally form the EIFD.
  - The City and County of Los Angeles to jointly create a Public Financing Authority (PFA), which is the legislative body that governs the EIFD and is comprised of members of the legislative bodies of the participating affected taxing entities plus two members of the public.

- IV. **SIX MONTHS AND BEYOND:** The PFA will implement an infrastructure plan that describes the type of public facilities and development that will be financed by the EIFD at the hub.

Proposed Budget: LAC + USC

Source	5-Year Total	Description
Bioscience Partnership	\$50,000	In-kind services
City of Los Angeles	\$325,000	Estimate for third party consultants
Gap Financing	\$250,000,000	Estimated costs for adaptively reusing the General Hospital. All other real estate costs to be determined.
Total	\$250,375,000	

### MLK + Drew Hub

The MLK + Drew Hub is anchored by both the Martin Luther King, Jr. Community Hospital (MLK Hospital) and Charles Drew University (CDU). CDU's research has emerged as a leading player in the national effort to eliminate health disparities, specifically through three (3) areas of focus:

1. Cancer
2. Cardio-metabolic diseases (including diabetes and hypertension)
3. HIV/AIDS

These three disease areas disproportionately affect the surrounding South Los Angeles Service Planning Area 6 ("SPA 6").<sup>120</sup> These efforts have garnered national and international recognition, numerous awards, and competitive grant funding from the NIH, the Department of Defense, and other federal sources. Based on its research excellence, CDU has consistently ranked in the top 10 percent (10%) of all U.S. institutions receiving federal funding and the top three percent (3%) of historically black colleges and universities receiving federal funding.

The MLK Hospital, a private, non-profit hospital, re-opened in July 2015. The hospital has a mission to provide innovative quality care and has invested considerable resources into the design and implementation of its state-of-the-art applications in health information technologies. MLK Hospital's efforts were recognized in February 2016, when it received an award for innovations in electronic medical records adoption.<sup>121</sup>

In addition, there is a significant amount of public and private investment occurring in the Willowbrook area that is transforming the community and providing increased amenities and quality affordable housing. The projects include a medical office building at the southwest corner of 120<sup>th</sup> Street and South Wilmington Avenues; the 105-unit affordable senior community complex and public library; and the \$70 million that the Los Angeles County Metropolitan Transit Authority has secured to rebuild and expand the nearby Willowbrook/Rosa Parks Station.

In collaboration with the County of Los Angeles, we have identified at least two (2) opportunity sites for new multi-tenant office and research space on the medical campus, with land also potentially available on CDU's campus. In addition, the hub contains several under-utilized buildings that could be adaptively reused for various purposes in support of a bioscience hub.

The section below outlines the salient strengths and weaknesses of the hub. The hub has a clear research niche that is unique, contains specialized lab facilities and serves a diverse population cohort for clinical trials. It also has several limitations such as weak commercialization processes or linkages; shortage of R&D firms in the area; absence of an incubator and/or accelerator to draw bioscience entrepreneurs and firms into the community; and limited available amenities.

<sup>120</sup> DPH has divided the county into eight regions in an effort to develop and provide more relevant public health and clinical services targeted to the specific health needs of the residents in these different areas. The MLK Hospital is in Service Planning Area 6.

<sup>121</sup> This figure was calculated by HIMSS Analytics. HIMSS Analytics is a wholly owned not-for-profit subsidiary of the Healthcare Information and Management Systems Society (HIMSS). The company collects and analyzes healthcare data related to IT processes. The hospital received the award from HIMSS.



### Strengths:

- Areas of focus / research excellence in cancer, cardio-metabolic disease, and HIV/AIDS
- Specialized lab space for research
- Diversity of population for clinical trials
- Proximity to public transportation
- Availability of existing public space for adaptive reuse
- Availability of public land for new development
- Availability of private land for new development
- Current development opportunity sites do not require significant relocation
- Wet lab/dry lab space available for rent to start-up companies

- Master Plan completed in the last five years

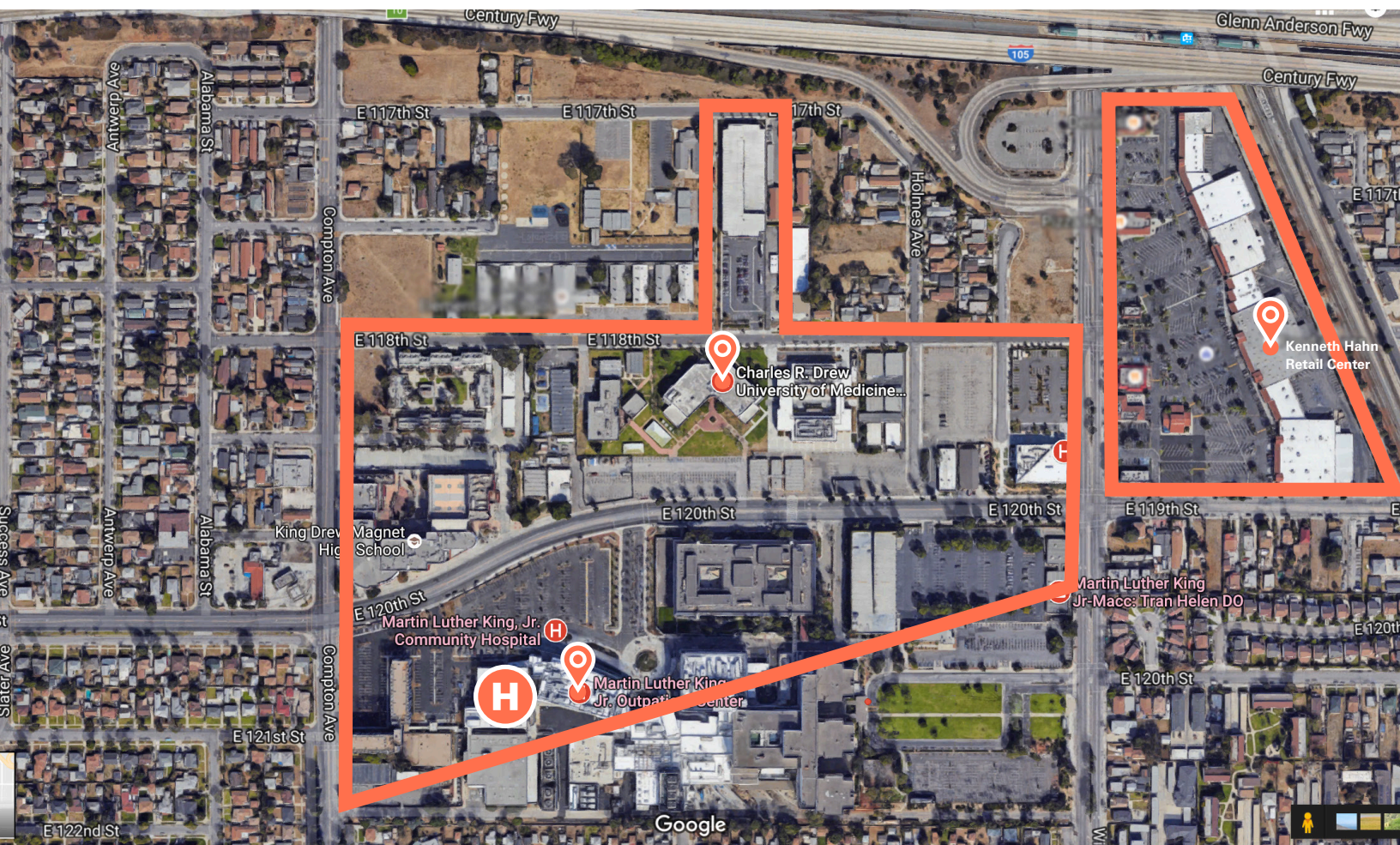
- Draft Specific Plan completed

### Weaknesses:

- No commercialization or tech transfer officer
- Limited number of biosciences companies near the hub
- Dearth of private funding for bioscience and related fields

The action items below were developed to leverage the hub's strengths, such as ample available space to adaptively reuse facilities to further the county's mission as it relates to bioscience and support services.

The action items are also meant to address perceived weaknesses, such as a lack of incubator / accelerator space, as well as facilities with reasonably priced wet- and dry-lab space to support emerging firms.



### Action Item 27

Adaptively Reuse Buildings on the hub.

#### Purpose:

Reusing and retrofitting underused buildings at the MLK + Drew Hub will allow it to grow sustainably to meet the changing demand for various physical space uses, such as office, lab space, conference facilities, child care, housing, retail, etc. There are several buildings on the medical campus that can be adaptively reused. Our analysis focuses on two: MLK Jr. Multi-Service Ambulatory Care Center (MACC) and August Hawkins Building.

#### Former MACC Building

Although structural limitations suggest that the costs would be significant, the six-story, approximately 495,000 square foot former MACC Hospital has the potential to be adaptively reused. A 2016 feasibility study completed by AECOM suggests that the construction costs for a complete renovation of the existing MACC building for housing and other uses, including an Autism Center, would be approximately \$90 million.

The team interviewed real estate professionals and potential users regarding adaptively reusing the MACC for bioscience purposes. The vast majority indicated that the building configuration was not conducive for this purpose. However, a small group of entrepreneurs suggested that the space on the first floor could be retrofitted and used as a bioscience incubator and/or accelerator.

There is potential to lease approximately 25,000 to 45,000 square feet of the refurbished building as office space to firms focused on healthcare IT or health delivery innovations. As stated earlier in the Bioscience Implementation Plan, Los Angeles County is taking a leadership position in seeking innovative approaches to healthcare delivery and as a result there has been a recent emergence of health services and health informatics firms companies

locating to Los Angeles County.<sup>122</sup> To this end, firms engaged in innovations relating to healthcare IT could locate to this building since their space needs are more conducive to dry-lab and co-working spaces.

#### August Hawkins Building

The August Hawkins building on the medical campus is a candidate for demolition. Its location could function as open space or a potential development site. Utilizing this space to optimize the proximity of CDU to MLK will enhance a comprehensive campus environment between the university and hospital. The demolition costs are conservatively estimated to be in the range of \$11.5 to \$12.5 million. If the building is retained, the full rehabilitation of the currently underused facility could take several years. In the meantime, the county should consider modest upgrades and lease the space in furtherance of this bioscience initiative. For example, the 14,000 square feet of lab space at the Hawkins building could be used as a temporary incubator / accelerator. Entrepreneurs, whom we interviewed, found this site appealing due to access to specialized research lab facilities, a conference room, and easy access to CDU researchers.

<sup>122</sup> See, Battelle 2014 (Appendix B: Profile of Core Competency Areas: Novel Therapeutics and Diagnostics; Bioengineering Solutions for Treating Diseases and Medical Conditions; and Innovations in Healthcare Delivery), at pages 109-126.



## Action Item 27 (continued)

### Implementation Steps:

- I. FIRST IMPLEMENTATION STEPS: The MLK Health and Wellness Community Development Corporation ("MLK Health and Wellness CDC") was founded in November of 2015 to assist the County in developing and implementing a strategy for adaptively reusing the real estate assets on the medical campus and coordinating activities in the broader community. The MLK Health and Wellness CDC in coordination with Supervisorial District Two should finalize the list of buildings to adaptively reuse versus those that should be demolished and rebuilt. The suggested additional tasks are as follows:
  - The MLK Health and Wellness CDC and the county's Asset Management Group will validate third-party reports regarding costs of rehabilitation versus demolition of the buildings and report back findings to Supervisorial District Two.
  - CDU and the county's Asset Management Group to finalize cost structure for upgrading the facilities at the August Hawkins building for temporary occupancy by potential bioscience companies regardless of whether or not the building is retained or demolished and report findings to MLK Health and Wellness CDC and Supervisorial District Two.
  - The county's Asset Management Group will update database and legal contracts for current occupancy of the buildings, lease rates and lease terms and report findings to MLK Health and Wellness CDC and Supervisorial District Two.
  - The county's Asset Management Group will finalize all county current and future space needs that could impact long term occupancy on the medical campus and report back to the MLK Health and Wellness CDC.
- II. FIRST SIX MONTHS: Utilize available space on campus for near-term occupancy to further the bioscience initiative, which includes:
  - MLK Health and Wellness CDC and county Asset Management Group to finalize timeline for demolition and/or redevelopment of the buildings and report findings to Supervisorial District Two.
  - CDU, MLK Health and Wellness CDC and the county to establish potential parameters for reusing lab facilities for start-up companies in the August Hawkins building.
  - The MLK Health and Wellness CDC, the county's Department of Public Health services should finalize a relocation strategy for the current August Hawkins occupants and present results to the Board of Supervisors.
  - L.A. County in collaboration with CDU will issue an RFP for an operator of the temporary incubator / accelerator for space on the medical campus, with the primary option in the August Hawkins building.
  - L.A. County in collaboration with MLK Health and Wellness CDC to issue a Request For Information to redevelop the former MACC building using a credit tenant loan or other P3 structured finance model, which will allow the county to review and analyze the potential value perspective of the approach versus more traditional methods.

### Action Item 28

Optimize ownership and land uses at the MLK + Drew Hub to facilitate the growth of MLK Medical Campus and capacity at CDU.

#### Purpose:

In an effort to optimize the development potential of the hub, several parcels that are currently owned by the CDC and CDU should be swapped. The swap would allow both entities to assemble contiguous land for the development of projects that furthers their respective missions. Furthermore, there are several parcels along East 120th Street that are owned by the county that may be conveyed to CDU – via an outright sale or long-term ground lease – for the execution of CDU’s Master Plan.

Specifically, the land along East 120th would be utilized for the development of a \$34 million federally qualified health center (FQHC) and gateway to CDU. Other planned developments include student housing, a bioscience research facility, and conference halls, as well as related office and administrative facilities.

#### Implementation Steps:

- I. FIRST IMPLMENTATION STEP: L.A. County and CDU to jointly agree on the future uses on the county-owned land, and establish the terms and timeline for developing the sites. CDU will present their Master Plan along with a preliminary budget and potential financing plan. CDU and the county’s Asset Management Group and the CDC will finalize the parcels that will be conveyed.
- II. FIRST SIX MONTHS: L.A. County to execute an agreement with CDU for control of the agreed upon parcels.



**Action Item 29**

Develop a state-of-the art bioscience building at CDU.

**Purpose:**

The MLK +Drew Hub's multi-tenant R&D space must support and augment the ongoing and existing research capabilities at CDU. As a result, CDU's Master Plan should include a bioscience building(s) that consolidates and expands the ongoing activities on campus. The building should include at least 5,000 square feet of wet- and dry-lab space that could be leased to researchers not affiliated with the university. The proposed building program includes the spaces indicated in the chart below.

**Implementation Steps**

- I. FIRST IMPLEMENTATION STEP: CDU and L.A. County to meet regarding development details and timing for the construction of the bioscience building, since the preliminary plans suggest that the building will be developed on land that is currently owned by the county.
- II. FIRST SIX MONTHS: CDU is to complete a business plan for incubator and feasibility analysis and construction estimates.<sup>123</sup>
- III. FIRST YEAR AND BEYOND: CDU is to do the following actions:
  - Complete architectural drawings and entitlements
  - Complete construction drawings
  - Complete entitlement process
  - Complete fund raising program
  - Complete state, local and federal grant applications (i.e., US Economic Development Administration)

Table 5

Area	Sq Ft	%	Description
Ancillary Service Space	975	2	Space for data processors, general M&O storage
CDU Research Laboratory Space/ Services	20,000	31	Research space for researchers, faculty, students, and trainees. Health disparity research in basic and clinical sciences across the translational spectrum in disease areas of focus: Cancer, Cardiometabolic, HIV/AIDS research.
Conference Rooms/Lecture Hall	1,000	2	Location for conferences, discussions, and 1 small lecture hall for scientific seminars, workshops, and lectures.
Clinical Diagnostic Laboratory (Pre/ Post Biomarkers)	5,000	8	Pre and Post clinical diagnostics services for research and clinical purposes.
Incubator Laboratory Space	10,000	15	Incubator space that is available for biomedical research.
Laboratory-Based Classrooms	2,000	3	Laboratory space dedicated for class-room based instruction (including for biology, chemistry, and upper division/ graduate level lab-based courses)
Learning Resource Center	825	1	Dedicated space for learning and education.
Office/Office Services	10,200	16	Office space for employees, administrative support offices, and services offices.
Vivarium/ Comparative Medicine	15,000	23	Fully equipped comparative medicine/vivarium.
Total	65,000	100	

<sup>123</sup> Currently, the construction costs are estimated to be in the range of \$40 to \$50 million.

### Action Item 30

Develop a multi-tenant bioscience/mixed-use building that focuses on the MLK + Drew Hub's Center of Excellence.

#### Purpose:

There is a dearth of available dry- and wet-lab space in the area to sustain entrepreneurs that are engaged in the research at Charles Drew University or healthcare IT. This unmet demand could be satisfied with the development of a from a 45,000 to 55,000 square foot mixed-use development that offers flexible designs and lease structures to bioscience and healthcare IT firms. There are several opportunity sites on campus.

### Implementation Steps

- I. FIRST IMPLEMENTATION STEP: L.A. County, through the Asset Management Group, to commission a market study / feasibility analysis and proposed community benefits for the proposed development.<sup>124</sup>
- II. FIRST YEAR: L.A. County Asset Management Group to craft and issue an RFP for a development team to develop a mixed-use building with office and wet and dry lab space.
- III. FIRST 18 MONTHS: L.A. County Board of Supervisors to announce the selection of a winning proposal.
- IV. FIRST 21 MONTHS: L.A. County to execute an exclusive negotiating agreement and develop a draft community benefits package.
- V. FIRST 30 MONTHS: L.A. County and the selected development team to come to terms on a financing structure that incorporates an innovative capital stack, which reduces and/or eliminates the county's need to contribute funding to the project, including non-county sources such as: New Market Tax Credits, EB-5, federal grants, etc.
- VI. YEAR THREE: L.A. County to execute an agreement with the development team that outlines final deal points and community benefits package.

<sup>124</sup> Community benefits based on findings from ELP Advisors.



### Action Item 31

Los Angeles County to redevelop the Kenneth Hahn Retail Center to increase amenities in the community.

#### Purpose:

A number of entrepreneurs and researchers we interviewed have reservations about locating at MLK + Drew hub due to a lack of amenities such as sit-down restaurants, cafes, hotels, and housing for all income levels. The redevelopment of the nearby Kenneth Hahn retail center could accommodate all of these uses. The CDC has an executed ground lease with Kimco Realty Corporation, a real estate investment Trust, which extends until February of 2015<sup>1</sup>. The plaza is a 165,195 square foot “grocery-anchored” community shopping center located adjacent to the Rosa Parks Metro Station. The anchor tenants include Food 4 Less (Kroger), Rite Aid, Factory 2-U and General Discount. Other national and regional retailers at the property include Payless Shoes, Radio Shack, Rainbow Apparel, Subway, Pizza Hut, Denny’s, McDonald’s, KFC and Taco Bell.

This neighborhood shopping center is situated at one of the busiest intersections in the area; as such, it experiences large volumes of both pedestrian and vehicular traffic. Commuters who work at, or visit, nearby MLK Hospital or CDU and patrons who ride the Green and Blue Line light rail system can easily access the shopping center. Despite its prime location and large traffic numbers, Kenneth Hahn Plaza is underperforming financially, primarily due to its limited tenant mix. Furthermore, a large portion of its estimated 15-acre site is dedicated to surface parking.<sup>125</sup>

In the short-term, a better mix of retail tenants is needed to serve the needs of the Willowbrook area residents, along with employees of and visitors to MLK, CDU and other organizations in or near the MLK + Drew Hub. L.A. County Metro is in the process of completing significant upgrades at the station, which will include some additional and limited retail opportunities, but the plaza is in need of a complete refurbishment.

Over the long-term, the Specific Plan in place envisions that the Kenneth Hahn Plaza will transform into a mixed-use TOD project that takes advantage of the proximity to the Rosa Parks Station. Moreover, the MLK Medical Center Campus Master Plan, Urban Land Institute Technical Advisory Panel study, and Rosa Park Station study, have similarly envisioned a mixed-use TOD project on the site. The Specific Plan envisages that this site provides an integrated, complementary residential and commercial development with a continued emphasis on neighborhood serving retail, restaurant and service uses for the local community. Since there are limited amenities at the hub itself, it is important that the plaza in the medium- to long-term is developed in a manner that fulfills most of the demand for local, quality sit-down restaurants, cafes, and other consumer uses.

<sup>125</sup> ULI Martin Luther King Jr. Medical Center and Surrounding Project Area Technical Assistance Report

## Implementation Steps:

- I. FIRST IMPLEMENTATION STEP: CDC and L.A. County Asset Management Group in conjunction with Kimco to develop a recruitment strategy to improve the tenant mix at the plaza.
- II. FIRST SIX MONTHS: Kimco to develop a budget for the improvements that are necessary to implement the short-term recruitment strategy.
- III. FIRST NINE MONTHS: Kimco to develop and present to the county a long-term vision and plan for a mixed-use development that meets the objectives outlined in the Specific Plan and various studies.
- IV. FIRST YEAR: L.A. County and Kimco to negotiate the terms for the redevelopment of the Kenneth Hahn Plaza.
- V. FIRST 12 to 18 MONTHS: L.A. County to approve Kimco's long-term development plans, and the two parties to execute an agreement that would facilitate financing.
- VI. FIRST 18 MONTHS AND BEYOND:
  - L.A. County and the potential development team to complete marketing materials to provide to potential retailers, with data that highlights neighborhood strengths and economic opportunity.<sup>126</sup>
  - L.A. County and the development team to establish a process to keep key stakeholders informed of the project's progress.
  - L.A. County to establish and execute a community benefits package.

## Proposed Budget: MLK + Drew

Source	5-Year Total	Description
Bioscience Partnership	\$50,000	In-kind services
CDU	\$55,000,000	Estimated costs for Life Science building, incubator, entitlement process, third party consultants and related actions.
Gap Financing	\$90,000,000	Estimated costs for adaptive reuse of select buildings. All other real estate costs TBD
MLK Wellness CDC	\$5,000,000	Estimated fundraising for adaptive reuse projects
Total	\$150,050,000	

<sup>126</sup> This information will work in conjunction with tours sponsored by the CDC of the Willowbrook community for select retailers. The purpose of these tours is to highlight the untapped buying power and retail leakage of the hub.

### Olive View- UCLA Medical Hub

The Olive View – UCLA Medical Hub (Olive View Hub) is situated on 230 acres of land in Sylmar, approximately 28 miles from downtown Los Angeles. The hub is generally bounded by the Angeles National Forest on the north, Olive View Drive on the south, Wilson Canyon Park on the east, and Bucher Avenue to the west. However, the hub has several natural constraints that limit the buildable area to approximately 130 acres.

The county has recently completed a master planning process to redevelop the Olive View Hub into an integrated health care facility that would support the existing state-of-the-art 377-bed hospital, which is closely affiliated with the David Geffen School of Medicine at UCLA.

One of the main anchors at the hub is the Olive View – UCLA Education and Research Institute (ERI). ERI administers and manages all research conducted at the medical center. It is contractually obligated to coordinate research activities with the hospital's professional staff and UCLA.

The Olive View Hub has a unique patient population with wide-ranging pathology. This population is younger than that of many other county hospitals, with an average age between 40 and 50. Furthermore, approximately 50 percent of patients are Hispanic; the other 50 percent are Caucasians, Asians, African-Americans and many other diverse ethnicities. The patient diversity is one of the main reasons that ERI focuses on drug testing and clinical research.

The master plan, which was completed during the third quarter of 2015, bifurcates the development into Tier I and Tier II projects. The Tier I projects are expected to be constructed before 2035. The EIR is underway, and it is anticipated that the full build-out of the master plan could result in approximately 1.38 million square feet of development throughout the campus, which is a net gain of approximately 550,000 square feet from the existing conditions.

#### Strengths:

- Areas of focus / research excellence
- Number of specialties with national ranking
- Diversity of population for clinical trials
- Number of clinical trials completed in last five years
- Availability of existing public space for adaptive reuse
- Availability of public Land for New Development
- Master plan completed in the last five years
- EIR In process or completed

#### Weaknesses:

- No commercialization or tech transfer officer
- No pending or existing incubator / accelerator space
- Lack of specialized lab and research facilities
- Proximity to earthquake fault lines



### Action item 32

Finalize the Olive View – UCLA Medical Center EIR by March 31, 2017

#### Purpose:

The Olive View – UCLA Medical Center Master Plan was completed in August 2015. The Tier 1 developments include approximately 519,000 square feet of new development that will include a 296,000 square foot ambulatory care center, a community center, a parking structure, and other medical center campus improvements. The Tier II developments are slated to occur after 2035, and will include the construction of 120,000 square feet of research and development space, a new inpatient hospital, long-term care and recuperative housing, retail space, and county department buildings, along with the reuse repurpose and renovation of the existing inpatient hospital.

The EIR, which is underway, will identify any potential environmental impacts related to implementation of the projects proposed in the campus master plan. This action will expedite the development of the opportunity sites at the hub.

#### Implementation Steps:

- I. FIRST IMPLEMENTATION STEP: Third-party consultants to complete and submit the final draft EIR to the county for review by December 2016.
- II. FIRST 18 MONTHS: The County Board of Supervisors should approve the Olive View Hub Master Plan and EIR by March 2017.



**Action Item 33**

Assist the leadership at the David Geffen School of Medicine at UCLA to implement several suggested action items from their May 2010 strategic plan that could expedite the construction of research and development facilities at the Olive View Hub.

**Purpose:**

Currently, the master plan does not anticipate significant research and development construction until after 2035. However, an expedited development plan in conjunction with UCLA could assist the university in achieving several of its stated strategic plan goals. One of the major strengths of the Olive View Hub is the abundance of land in comparison with the UCLA Westwood campus, which has numerous constraints that limit the expansion of bioscience facilities at that site. In fact, an independently conducted strategic planning survey ([www.strategy.healthsciences.ucla.edu](http://www.strategy.healthsciences.ucla.edu)) of a broad array of constituency groups at UCLA, including faculty, staff, students, and trainees, concluded that further development of the Westwood hub had several primary weaknesses that should be addressed, including:

- Insufficient, non-contiguous research space at the Westwood campus
- A lack of UCLA presence in the greater Los Angeles community, and too much focus on the Westside of Los Angeles

A UCLA-led research and development project as part of the Tier 1 development at the Olive View Hub could address both of the perceived weaknesses associated with the Westwood hub, as described above.

**Implementation Steps:**

- I. **FIRST IMPLEMENTATION STEP:** The Bioscience Partnership to convene and facilitate webinars and/or face-to-face meetings with key stakeholders from the David Geffen School of Medicine at UCLA, ERI, L.A. County Department of Health Services, and L.A. County Department of Real Estate and Asset Management to determine the optimal and favored type of bioscience development at the hub and timing of construction.
- II. **FIRST 12 MONTHS:** The county's Real Estate and Asset Management Department to report back to the Board of Supervisors on UCLA's optimal development strategy and timing.

Proposed Budget: Olive View Hub

Source	5-Year Total	Description
Bioscience Partnership	\$125,000	In-kind services for convening stakeholders and related activities
Total	\$125,000	

### Rancho Los Amigos Hub

The Rancho Los Amigos Hub includes both the Rancho Los Amigos National Rehabilitation Center and the Rancho Research Institute (RRI). It is a public rehabilitation center that provides comprehensive rehabilitation to individuals of all ages with physical disabilities due to catastrophic injuries or illnesses. For more than two decades, Rancho Los Amigos has been ranked among the high performing rehabilitation hospitals by U.S. News and World Report.<sup>127</sup> The hub is bifurcated into the 48-acre North Campus and the 79-acre South Campus. Currently, the first phase of the North Campus involves 818,000 square feet of redevelopment, with an expected completion date of 2020. Phase II of the North Campus includes 823,000 square feet of development that has been reserved for various private and public development opportunities that serve the community and support the health care mission of Rancho Los Amigos, such as a medical office building, commercial and office space, as well as uses for the bioscience industry. The South Campus is in the process of completing its Master Plan, which will likely be presented to the L.A. County Board of Supervisors before the end of 2016; it includes plans for county and economic development uses and a community sports center.

### Strengths:

- Rancho Los Amigos adds a unique dimension to the regional bioscience ecosystem because of the proximately located cluster of medical instruments and supply manufacturers, as well as due to the rehabilitation centers interest and use of cutting edge orthotic devices, such as robotic limbs controlled by neural (brain) implants.
- RRI has contractual affiliations with several well-known universities around the county including USC, UCLA, and the California Institute of Technology (CalTech).

### Weaknesses:

- No commercialization or tech transfer officer
- No pending or existing incubator / accelerator space
- Lack of private funding for biosciences and related fields
- Few patents in science and technology
- Limited supply of physical space on North Campus for private commercial development.



<sup>127</sup> <http://health.usnews.com/best-hospitals/area/ca/rancho-los-amigos-national-rehabilitation-center-6930990/rankings>

### Action Item 34

Adaptively reuse selective buildings on North Campus for near-term occupancy.

### Purpose:

During interviews with RRI staff, we learned that they are working on several robotics projects in collaboration with CalTech, the University of California, Irvine and other research institutions. One of the major projects is the “Brain Computer Interface” to develop implantable wireless interfaces for the restoration of walking in spinal cord injury patients. Several RRI partners have expressed an interest in housing their researchers on campus to facilitate the sharing of information, access to patients, and expediting “bench to bedside” transactions. However, there is not enough physical space to accommodate their needs.

Presently, there is an existing cluster of bioscience-related manufacturing companies near the Rancho Los Amigos Hub.<sup>128</sup> LAEDC, utilizing the proprietary database and interactive map that was developed in collaboration with CBRE, mapped the locations of all the manufacturing firms currently engaged in 11 bioscience-specific NAICS.<sup>128</sup> These firms and their suppliers offer additional potential demand for adaptively reusing space on the North Campus.

### Implementation Steps:

- I. FIRST IMPLEMENTATION STEP: L.A. County Asset Management Group and/or CDC, in collaboration with RRI, to identify underutilized space on the campus that is within close proximity to RRI and could be renovated into dry lab, computational facilities and/or manufacturing space for prototype devices.
- II. FIRST SIX MONTHS: L.A. County Asset Management Group and/or CDC to finalize the construction budget for the reuse and upgrade of the identified facility.<sup>129</sup>
- III. FIRST YEAR: L.A. County departments to report back to the L.A. County Board of Supervisors on the identified building(s) and optimal amount of square footage, cost and timeline for the renovations.
- IV. FIRST 12 TO 18 MONTHS: L.A. County Asset Management Group to complete and issue an RFP to university researchers, entrepreneurs and/or established firms at market or below-market rates.<sup>130</sup>
- V. YEAR TWO: L.A. County and selected occupants execute lease agreement(s).

<sup>128</sup> These firms may be defined by the following NAICS codes: 325412, 325413, 325414, 333314, 334510, 334517, 339112, 339113, 339114, 339115, and 541711.

<sup>129</sup> This includes determining market rates for similar and available space in the nearby vicinity.

<sup>130</sup> A panel of government and non-government experts should review the RFP responses and select occupants that furthers the county's vision for the hub.

### Action Item 35

Develop a Specific Plan for the South Campus that provides enough flexibility to accommodate the development specifications for medical devices and other bioscience manufacturing sectors.

#### Purpose:

The South Campus Master Plan draft is nearing completion and is scheduled for an L.A. County Board of Supervisors vote during the third or fourth quarter of 2016. In addition, the City of Downey was awarded a \$425,000 grant from the L.A. County Metro TOD Planning Grant Program. This TOD grant will assist in funding a new South Rancho Campus specific plan for the area surrounding the future transit station (“Eco- Rapid Transit stop”) that will be situated on the edge of the South Campus. The Specific Plan will create development standards to allow for residential developments, as well as new commercial and manufacturing developments around the future station, which is proposed to be located at the southwest corner of the South Rancho Campus. An updated Specific Plan will benefit the county, City of Downey and developers by providing detailed information as to the allowable land uses and building specifications. In addition to these assurances, it will reduce processing and development proposal review times for the City of Downey and the County of Los Angeles.

There is ample opportunity for a portion of the South Campus, over the long-term, to provide substantial land for environmentally sound manufacturing focused on key sectors such as medical instruments and supplies. As indicated in the Map above, this type of development would complement the existing cluster of firms in the vicinity.

#### Implementation Steps:

- I. FIRST IMPLEMENTATION STEP: L.A. County Board of Supervisors to vote on the Rancho Los Amigos South Campus Master Plan before the end of 2016.
- II. SIX MONTHS AND BEYOND: The City of Downey, in consultation with the county, to incorporate the South Campus Master Plan into the Specific Plan process and the environmental document execution.<sup>131</sup>

<sup>131</sup> The final Specific Plan should accommodate flexible land designations and overlay zones for a portion of the site to reflect the diversity of the bioscience industry and the potential for manufactures to relocated or expand into the area.



### **UCLA-Westside Hub**

The UCLA-Westside Hub has a multitude of significant demand drivers due to its existing campus that includes accessibility to: the UCLA hospital; several bioscience-related incubators, such as the California Nanosystems Institute; 10 bioscience-related research institutions; an array of talent from graduate students and professors; a robust commercialization program; funding for research; and existing amenities both on and off campus. As indicated below, the challenge for the hub is the lack of available land. As a result, the university has aggressively pursued a policy of adaptively reusing facilities to expand their life sciences capabilities.

#### **Strengths:**

- Number of Nobel Laureates in sciences and technology
- Number of Patents in sciences & technology
- Specialized equipment / specialized lab space
- Dedicated tech transfer office
- Areas of Focus / research excellence
- Number of specialties with national ranking
- Number of clinical trials
- Large amount of Foundation funding for scientific research
- Large amount of industry funding for scientific research
- Large amount of private funding for bioscience and related fields
- Numerous NIH and other government grants
- Number of researchers at the Hub
- Number of support staff for bioscience activities
- Number of university graduate programs for science related fields

- Number of private bioscience firms in the vicinity
- Existing or pending incubator space within three miles
- Ample wet- and dry-lab space available for rent for start-up firms
- Ample co-working spaces within three-mile radius
- Amenities on and off campus

#### **Weaknesses:**

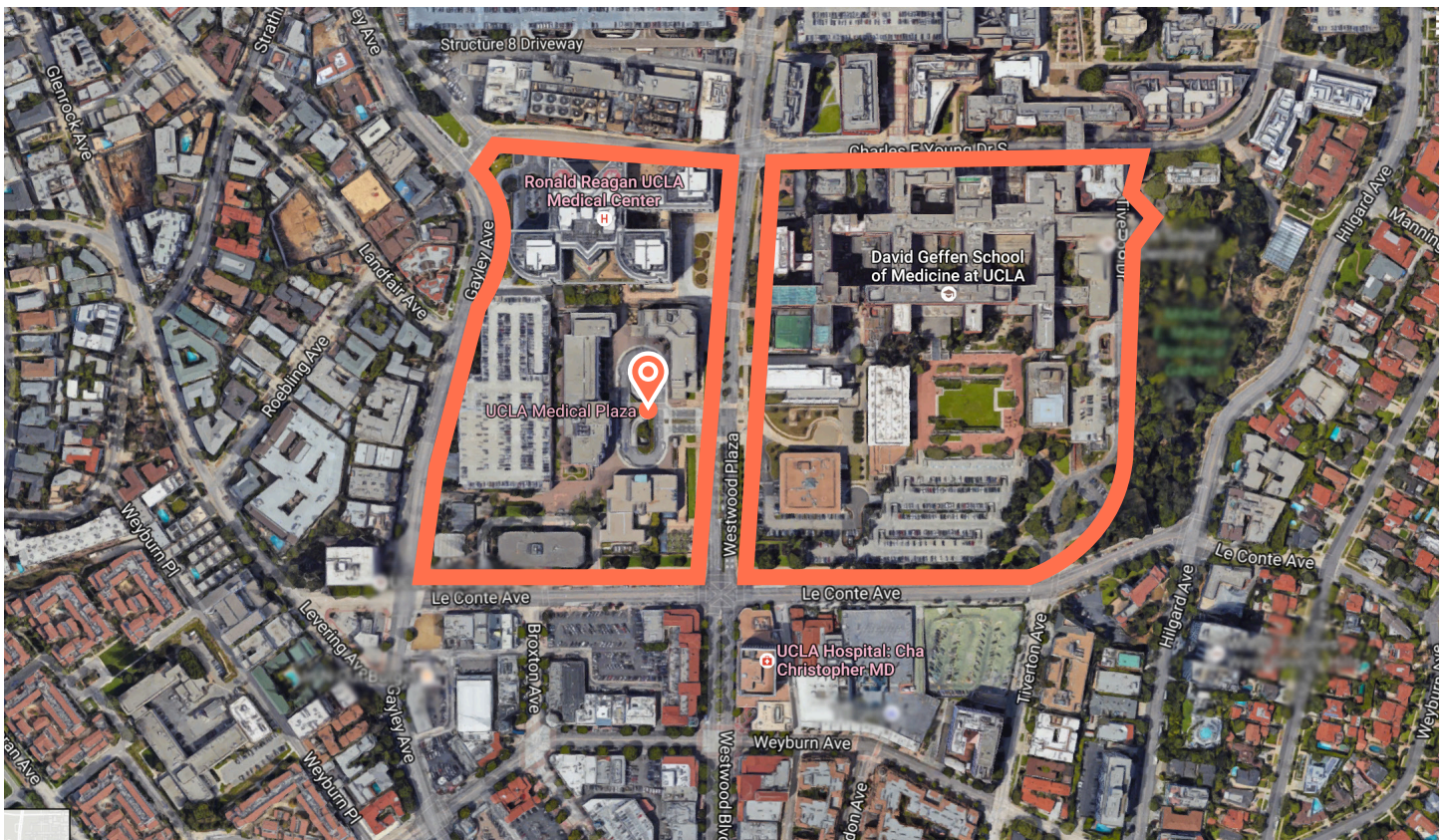
- High cost of commercial real estate in nearby communities
- Lack of available public and private land for new development

The 1994 Northridge earthquake irreparably damaged the UCLA Medical School and hospital. After completing a Master Plan, the Board of Regents decided to construct the 1.1 million-square-foot Ronald Reagan UCLA Medical Center and remodel the former hospital into a state-of-the-art research and laboratory facility. UCLA completed the seismic retrofitting of its 10-story, 443,000 square foot former hospital in December 2015. The aggregate cost of the preliminary plans, working drawings and construction was approximately \$203 million or \$458 per square foot. Approximately 59 percent (59%) of the funding came from state lease revenue bonds.

The majority of former hospital will be used for research and laboratory space and classrooms to support UCLA's health science departments.

However, floors eight through 10 have been developed for wet and dry lab space for lease to entrepreneurs and researchers who may not necessarily be affiliated with the university. The space is on the market for \$4.00 to \$6.00 per square foot NNN.<sup>132</sup> Similar to the City of Hope, the UCLA-Westside Hub is already incredibly strong in many bioscience research focuses. Additionally, there is no county-owned land on or near the main campus. Therefore, minimum county action is needed to realize the potential of this hub and relatively few recommendations are provided for the county to take action on.

<sup>132</sup> A triple net lease is a lease agreement on a property where the tenant or lessee agrees to pay all real estate taxes, building insurance, and maintenance on the property in addition to any normal fees that are expected under the agreement.



## Action Item 36

UCLA's tech transfer and real estate departments to collaborate with secondary hubs to develop university-related lab space for entrepreneurs graduating from their programs.

### Purpose:

Once development of available space has been maximized on UCLA's campus, UCLA should develop a strategy to expand their campus to publicly-owned land already entitled for lab facilities and office space in the secondary hubs. One such example is LAX-Northside, which is discussed in more detail below in the secondary hubs section to the Bioscience Implementation Plan. The LAX-Northside hub is approximately 10 miles south of the campus near Playa Vista. This potential site would give UCLA the opportunity to expand beyond their campus, creating accessible university-related facilities around the region.

### Implementation Steps:

- I. FIRST IMPLEMENTATION STEP: UCLA's real estate and tech transfer departments to determine the current demand and supply for space for researchers that are associated with the university and those that are independent.
- II. FIRST SIX MONTHS: UCLA's real estate department to create a detailed building inventory that includes the total square footage of the following:
  - Available office space
  - Available wet lab and dry lab space
  - Available space for redevelopment
- III. FIRST YEAR: UCLA's real estate department, in conjunction with the deans of the appropriate schools, to conduct an analysis of efficient uses of all space currently being used for bioscience purposes and, if appropriate, create a strategy around consolidating uses to maximize available space for further expansion.

- IV. FIRST 15 MONTHS: UCLA's tech transfer office and real estate department to create a shared database of startup firms that are near graduation, and analyze and estimate the demand for lab space in the next 2-5 years.
- V. YEAR TWO AND BEYOND: Once availability of space on the current campus has been established, UCLA's real estate department and tech transfer office to convene with L.A. County and City of Los Angeles to discuss the potential of creating lab facilities and office space at other hubs.<sup>133</sup>

### Proposed Budget: Rancho Los Amigos

Source	5-Year Total	Description
Bioscience Partnership	\$50,000	In-kind services
City of Downey	\$425,000	Estimated planning process costs
Gap Financing	\$200,000	Estimated costs for adaptive reuse of select building(s) and third party consultants. All other real estate costs TBD
Rancho Research Institute	\$2,500,000	Estimated contributions/fundraising for building up-grades and third party consultants
Total	\$3,175,000	

<sup>133</sup> In collaboration with UCLA, the County and City of Los Angeles should focus on the development of affordable wet- and dry-lab facilities at the secondary hubs. (The current available lease rates on campus are prohibitively high for many early-stage companies.)

### SECONDARY HUBS

The two secondary hubs identified in the Bioscience Implementation Plan: Honor Ranch/Mann Biomedical Research Park and LAX-Northside have unique opportunities for development. The LAX-Northside Hub is considered a secondary hub because it is not currently affiliated with a research institution or major medical facility, and thus, it does not currently possess the demand drivers needed to support a multi-tenant bioscience facility. Even so, the LAX-Northside Hub is blessed with a number of distinct advantages, such as having several parcels fully-entitled for R&D uses.

Honor Ranch/Mann Biomedical Research Park is, the other secondary hub, contains a research institute, but does not have a local-serving medical facility associated with it. Honor Ranch, which is approximately 475 acres of government owned land is adjacent to the privately-held Mann Biomedical Research Park. The development of this site for bioscience multi-tenant or manufacturing will only be triggered once the Mann Biomedical Park approaches capacity. Honor Ranch could also serve as a site for life sciences firms seeking to expand into facilities that have a “campus-like” appeal.

### Honor Ranch/Mann Biomedical Research Park

While the Honor Ranch/Mann Biomedical Research Park does not have a medical facility associated with the campus, it is well-positioned to serve an important function and play a critical role in ameliorating the physical space constraints of the regional bioscience ecosystem. The 600,000+ square foot Mann Biomedical Research Park, which was recently purchased by Intertex Development, is home to a wide variety of tenants, but with a concentration of medical device and biotechnology firms. Furthermore, the Biomedical Park is fully-entitled to build additional industrial and office buildings throughout the 167-acre development. Commercialization at the park is largely enabled by the presence of the Alfred Mann Foundation, which serves as an international leader in the development and incubation of lifesaving medical technologies.



### Action Item 37

DRP to commission a Master Plan for the Honor Ranch site that would guide the development over the build-out period.

#### Purpose:

Honor Ranch, which is adjacent to the Mann Biomedical Park, contains 125 acres of county-owned land. The site has numerous infrastructure challenges since it contains a flood channel. Coordination among the Mann Biomedical Park, Alfred Mann Foundation, private sector developers, private sector tenants, and the county will be required to maximize the value of the site. Ultimately, increased coordination amongst these stakeholders should result in the development of a long-range vision for this site that stimulates job-producing bio-related development and is consistent with community's viewpoint.

#### Implementation Steps:

The FIRST IMPLEMENTATION STEPS: DRP, CDC and other county departments to review potential timing and budget implications for developing a Master Plan, which would also include an infrastructure assessment for Honor Ranch.

- I. THE FIRST SIX MONTHS: The L.A. County Board of Supervisors to direct the relevant county departments to prepare formal budget and identify funding for a master planning process.
- II. YEAR ONE: L.A. County, through DRP, to issue an RFP for a team of architects to develop the Master Plan, which is to include both an infrastructure assessment and a mobility plan that focuses on freeway access.
- III. THE FIRST AND SECOND YEAR: The master planning team to engage the community in a series of stakeholder meetings to inform the design process.
- IV. YEAR TWO: The L.A. County Board of Supervisors to take an action to adopt the Master Plan, whose recommendations are to be incorporated into the General Plan and any subsequent specific plans.

### Action Item 38

Expedite consumer-serving medical uses on the site to support “bench to bedside” applications of innovations on the existing Mann Biomedical Research Park.

### Purpose:

Our analysis suggests that there is strong demand for the locally-serving health facilities, such as a hospital and/or outpatient medical office buildings, to accommodate the local population and support clinical research for bioscience firms.

### Implementation Steps:

- I. FIRST IMPLEMENTATION STEP: There has been an unsolicited request from a private sector health-services population-accommodating establishment to develop a facility on 30 acres or more. The CDC, the private sector firm, other relevant county departments, and the supervisor’s office should convene to determine a process for allocating land for agreed upon medical uses, while simultaneously going through the master planning process.
- II. THE FIRST SIX MONTHS: CDC and other relevant county departments to identify an optimal site on the Honor Ranch footprint that could be developed within the next three years.
- III. YEAR ONE: L.A. County, through the CDC, to issue an RFP for the development of private sector consumer-serving medical uses on the selected site.
- IV. 18 MONTHS AND BEYOND:
  - CDC, using an advisory committee, to select a development team or owner-user to proceed with development.
  - L.A. County and the selected development team to execute an ENA.
  - L.A. County to execute an agreement to transfer the property to selected entity via sale or long-term ground lease.

### Action Item 39

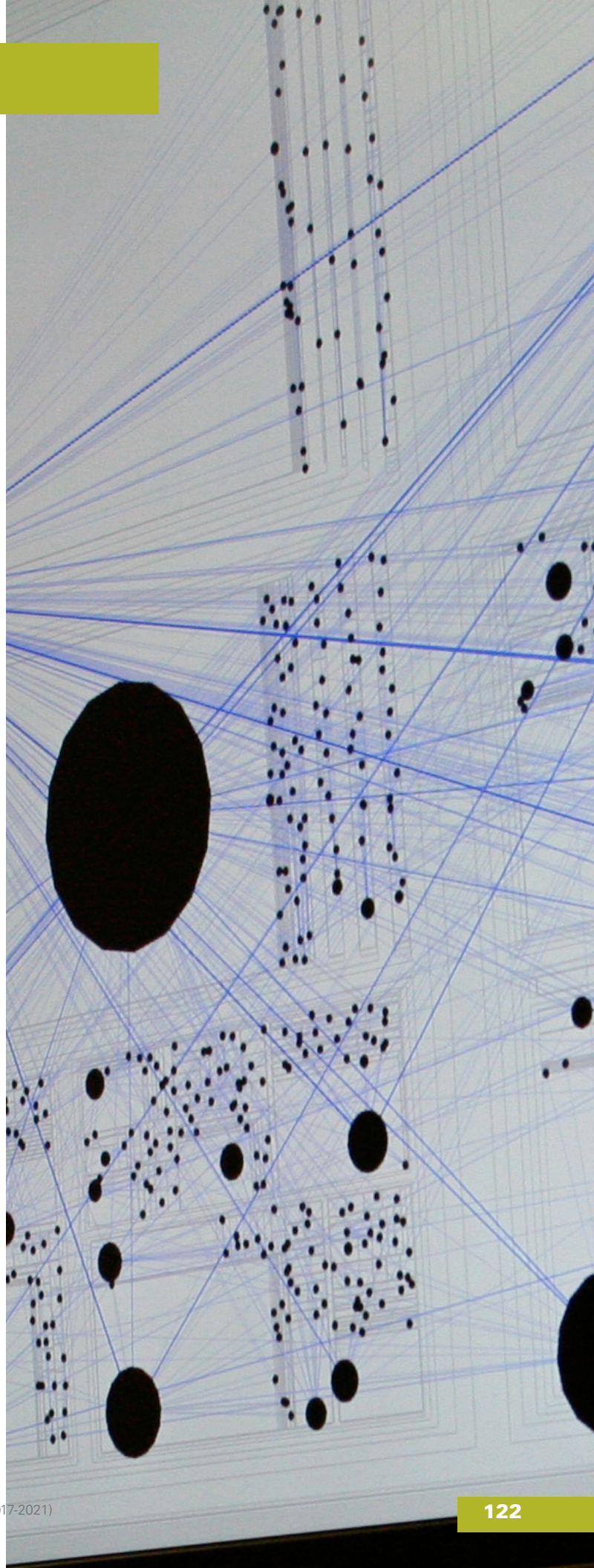
Employ a P3 financing structure to expedite infrastructure development on the entire Honor Ranch site.

#### Purpose:

Using an innovative financing structure, such as a P3 model, will reduce the draw on the county's General Fund and expedite the implantation of infrastructure development at the hub.

#### Implementation Steps:

- I. THE FIRST IMPLEMENTATION STEP: CDC and other relevant county departments to review the Master Plan and the infrastructure assessment along with the associated costs.
- II. THE FIRST SIX MONTHS: L.A. County to commission a third-party report to assess the viability of using a P3 structure to finance the infrastructure needs.
- III. YEAR ONE: L.A. County to issue an RFI to a pool of potential bidders to determine the qualifications that are necessary to design, build, finance, operate, and maintain the infrastructure facilities at the site.
- IV. FIRST 18 MONTHS: L.A. County Asset Management Group or CDC to craft and issue an RFP for a development team.
- V. FIRST 21 MONTHS: L.A. County Board of Supervisors to announce the selection of a winning proposal.
- VI. FIRST 30 MONTHS: L.A. County to execute an exclusive negotiating agreement and develop a draft community benefits package.
- VII. FIRST 30 MONTHS AND BEYOND: L.A. County to execute an agreement with the development team that outlines final deal points and community benefits package.



### LAX – Northside Hub

With proximity to the world’s busiest origin and destination airport, LAX-Northside, located just north of the Los Angeles International Airport (LAX), has the potential to become an innovation village that would attract educational institutions from around the world. In short, this hub could provide the physical spaces needed to launch and support one or more of the proposed sample “Applied Research LA” initiatives through the City of Los Angeles versus the County of Los Angeles, as described in Action Item 10 (Chapter 2) hereunder, and be Los Angeles’s equivalent to Roosevelt Island in NYC. (See “Applied Science NYC”)

### Action Item 40

Erect a multi-phased mixed-use “Applied Research LA” development anchored by world-class educational institutions.

#### Purpose:

The LAX / Northside Hub has no relocation or zoning challenges. The EIR has been completed for the approximately 340 acres of underutilized land and allows for 2.3 million square feet of retail, restaurant, office, hotel, R&D, higher education, civic, airport support, recreation, and buffer uses. The plan currently anticipates that nearly half of the allotted square footage would be earmarked for office and R&D uses. This is a prime location to house R&D, as well as provide additional space for primary hubs that have reached physical capacity at their current campuses.

#### Implementation Steps:

- I. FIRST IMPLEMENTATION STEP: Los Angeles World Airports (LAWA) to secure approvals for the LAX Northside Plan from the Board of Airport Commissioners, the City of Los Angeles, the County of Los Angeles Airport Land Use Commission, and the Federal Aviation Administration.
- II. YEAR ONE: City of Los Angeles to commission a feasibility study to determine demand and timing for development of bioscience facilities at the LAX/Northside Hub.
- III. 18 MONTHS: L.A. City Council to offer/pass a motion to initiate a global competition, as an EOI.
- IV. YEAR TWO: L.A. City Council and Mayor, along with L.A. County Board of Supervisors, if conjoined with Action Item 10 (here), to publicly announce global competition.
- V. YEAR TWO AND BEYOND: The City of Los Angeles to issue an RFP, structuring terms, for a development team.
- VI. YEAR THREE AND BEYOND: L.A. City Council and Mayor, along with L.A. Board of Supervisors, if appropriate, to publicly announce selection of winning proposer. In addition, the City of Los Angeles to:
  - Enter into an ENA with the development team; and
  - Execute an agreement (via sale or ground lease) to transfer land to the selected development team.



The purpose of these Appendices is to support the recommendations with additional information, data, details, and documentation. This information can be referenced when considering further research best practices and may serve to further inform some of the ideas and proposals found in the recommendations.



## APPENDIX ONE: BIOSCIENCES IN LOS ANGELES

## DESCRIPTION OF INDUSTRY

There are certainly many definitions of “Biosciences.” This analysis broadly adopts definitions produced by the Cluster Mapping Project (CMP) developed by the Harvard Business School and the EDA (please refer to the appendix for details). Several of the clusters defined by CMP can be considered to be part of “Biosciences.” These are, specifically, Biopharmaceuticals and Medical Devices. In addition to these clusters, we add the two industries that comprise the Medical Apparatus sub-cluster of CMP’s Information Technology and Analytical Instruments cluster, and the single specialty research industry, Research and Development in Biotechnology.

The overall resulting taxonomy of our industry is shown below. Complete industry descriptions are provided in the Methodology section below.

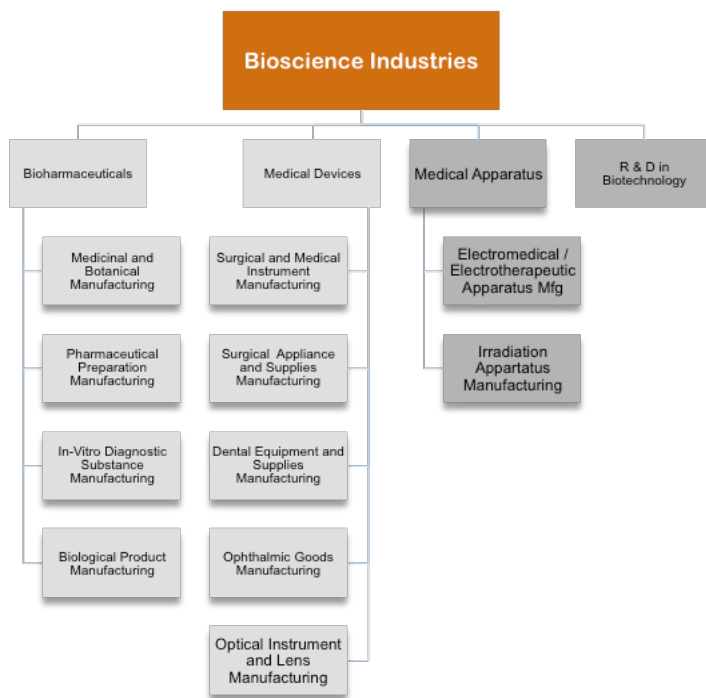


FIGURE 1. POTENTIAL FUNDING

## SIZE OF INDUSTRY

The size of the industry in Los Angeles County in terms of establishments, employment and payroll is shown below. Overall, the industry employed 19,990 payroll employees in 450 establishments, with a total payroll of \$1.55 million in 2014, the most recent year for which complete data is available.

Size of LA's Bioscience Industry 2014			
Component Industry	Establishments	Employment	Payroll (\$ millions)
<b>Biopharmaceuticals:</b>			
Medicinal & Botanical Manufacturing	28	1,680	\$82.9
Pharmaceutical Preparation Mfg.	52	4,660	\$280.8
In-Vitro Diagnostic Substance Mfg.	9	400	\$46.3
Biological Product (except Diagnostic Manufacturing)	3	960	\$73.9
Subcluster	92	7,700	\$484.0
<b>Medical Devices:</b>			
Surgical & Medical Instrument Mfg.	37	2,260	\$169.0
Surgical Appliance & Supplies Manufacturing	61	3,240	\$264.9
Dental Equipment & Supplies Manufacturing	24	1,070	\$72.6
Ophthalmic Goods Manufacturing	18	840	\$44.1
Optical Instrument & Lens Manufacturing	18	270	\$20.1
Subcluster	168	7,680	\$570.6
<b>Medical Apparatus:</b>			
Electromedical & Electrotherapeutic Apparatus Manufacturing	30	2,710	\$286.9
Irradiation Apparatus Manufacturing	6	330	\$28.5
Subcluster	36	3,030	\$315.5
<b>Research &amp; Dev. in Biotechnology</b>			
Research & Dev. in Biotechnology		1,570	\$182.2
<b>BIOSCIENCES CLUSTER</b>	<b>450</b>	<b>19,990</b>	<b>\$1,552.2</b>

Sources: CMP; QCEW; Estimates by LAEDC

## REGIONAL COMPETITIVENESS

A region's competitiveness in an industry is a function of many factors, including the attractiveness and value of the products produced by the industry, the costs of inputs such as labor and energy, the productive capabilities of individual companies, and the geographic concentration of the industry. Industries that are highly-concentrated in a region are likely to be more competitive. A common metric to capture competitiveness is employment concentration or location quotients. An employment location quotient for an industry in Los Angeles County shows the percentage of total employment in the industry compared to the average percentage nationwide. For example, For example, if 4 percent of employment in the county is in the motion picture industry compared to 1 percent across the nation, the employment location quotient for the motion picture industry in Los Angeles is 4. This means that Los Angeles County is relatively more specialized in motion pictures.

Similarly, if a location quotient is equal to one, then the employment concentration in Los Angeles is equal to that elsewhere, meaning the region is not highly-specialized in that industry. Higher location quotients will imply a competitive advantage. Although there is some variation in this metric, it is thought that the threshold to demonstrate regional specialization (and therefore competitiveness) is a location quotient of at least 1.2.

Using this threshold, it appears that location quotients of many of the component industries in the biosciences industry cluster reveal a surprising lack of employment concentration, ranging from a low of 0.44 for ophthalmic goods manufacturing, to a high of 2.37 for medicinal and botanical manufacturing. As a whole, the biosciences cluster in Los Angeles County has a location quotient of 0.82. The only subcluster displaying regional competitiveness is Medical Apparatus, with a location quotient of 1.42.

Location Quotients of LA's Bioscience Industries	
Component Industry	LAC v. USA
<b>Biopharmaceuticals:</b>	
Medicinal & Botanical Manufacturing	2.37
Pharmaceutical Preparation Manufacturing	0.72
In-Vitro Diagnostic Substance Manufacturing	0.57
Biological Product (except Diagnostic Manufacturing)	1.08
Subcluster	0.88
<b>Medical Devices:</b>	
Surgical & Medical Instrument Manufacturing	0.61
Surgical Appliance & Supplies Manufacturing	1.03
Dental Equipment & Supplies Manufacturing	2.14
Ophthalmic Goods Manufacturing	1.01
Optical Instrument & Lens Manufacturing	0.44
Subcluster	0.87
<b>Medical Apparatus:</b>	
Electromedical & Electrotherapeutic Apparatus Manufacturing	1.57
Irradiation Apparatus Manufacturing	0.81
Subcluster	1.42
Research & Development in Biotechnology	0.34
BIOSCIENCES CLUSTER	0.82

Sources: CMP; QCEW; Estimates by LAEDC



## ECONOMIC CONTRIBUTION OF BIOSCIENCES CLUSTER

The concept of economic contribution answers the question, “what contribution does this sector make?” and measures not only the direct activity but also indirect and induced activity. This contribution is dependent on the payments made to suppliers of intermediate goods and services in the region and payments made to workers, who usually live locally and spend most of their incomes on household purchases from local suppliers.

In addition to the 19,990 direct jobs in the biosciences industry in Los Angeles County, an additional 30,220 jobs were supported in 2014 through indirect effects of supply chain purchases that are not made within the biosciences cluster itself, and 21,020 jobs were supported through the household spending of employees in the industry and its supply chain, for an overall contribution of 71,230 jobs. Labor income (which includes wages and benefits) earned by all biosciences-supported employment in Los Angeles County reached \$5.5 billion, accounting for approximately 1.5 percent of all labor income paid in Los Angeles County in 2013. Together, the industry produced \$10.1 billion in value-added, which accounted for 1.6 percent of the county’s GDP.

The overall impacts are widely distributed across many sectors of the economy through indirect and induced effects, including in manufacturing, professional and technical services, management, wholesale and retail trade, administrative and waste services, and health and social services.

Total Economic Contribution of Bioscience Industry Cluster (2014)			
	Direct	Total	% of Los Angeles County
Output (\$ millions)	13,333	22,376	2.1
Employment (jobs)*	19,990	71,230	1.2
Labor Income (\$ millions)	1,975	5,492	1.5
Value-Added (\$ millions)	4,590	10,086	1.6

Sources: Estimates by LAEDC

Total Economic Contribution Across Industries			
Industry Sector	Jobs	Labor Income (\$ mil)	Output (\$ mil)
Agriculture, F&F	10	\$0.3	\$0.5
Mining	40	6.4	29.6
Utilities	90	11.5	83.0
Construction	630	33.0	105.1
Manufacturing	18,950	1,872.9	13,337.5
Wholesale Trade	4,700	360.7	1,139.0
Retail Trade	3,910	150.8	358.3
Transportation / warehousing	2,440	133.9	368.5
Information	1,570	245.8	807.5
Finance and insurance	2,560	219.0	584.4
Real estate and rental	2,370	86.1	982.6
Professional / technical services	8,190	730.6	1,437.2
Management of companies	6,530	807.7	1,530.6
Administrative & waste services	5,170	185.6	339.4
Educational services	890	45.4	74.2
Health & social services	4,870	278.6	478.3
Arts, entertainment/recreation	1,010	43.3	96.9
Accommodation & food services	3,640	95.1	226.3
Other services	3,190	124.2	252.2
Government	500	61.8	145.5
TOTAL: All Industry Sectors	71,230	\$5,492.5	\$23,376.3

Sources: Estimates by LAEDC



## FISCAL CONTRIBUTION OF BIOSCIENCES CLUSTER

The total fiscal contribution of the economic activity in 2014 attributable to the biosciences industry, including direct, indirect and induced activity, reached \$2.2 billion.

This includes, for example, property taxes paid by firms and households, sales taxes on consumption purchases, income and profits, taxes paid on net earnings and payroll taxes for and by employees.

Total Fiscal Impacts by Type	
By Type of Tax:	\$ millions
Personal income taxes	\$610
Social insurance	620
Sales and excise taxes	320
Property taxes	220
Corporate income taxes	350
Other taxes	120
TOTAL	\$2,240
By Type of Government:	
Federal	\$1,400
State	460
County	230
Cities	100
TOTAL	\$2,240

Sources: Estimates by LAEDC

## METHODOLOGY

### Data Sources

All data was obtained from the Bureau of Labor Statistics and the Census Bureau. Annual employment and payroll data are from the Census of Employment and Wages series. Estimates for non-disclosed employment and payroll data were produced using proportional shares for the prior year's data or using midpoint estimates from the County Business Patterns program.

### Economic Impact and Contribution Analysis

Economic contribution analysis is used to estimate that portion of a region's economic activity that can be attributed to an existing industry sector. The primary economic contribution to the Los Angeles economy of the bioscience industry is the expenditure of billions of dollars towards goods and services from regional vendors. This continuing injection of funds circulates from the initial recipients to the owners and employees of establishments that help supply the goods and services that the sector purchases.

Bioscience industries also spend billions of dollars every year for the wages and benefits of employees and contingent workers. These workers, as well as the employees of all suppliers, spend a portion of their incomes on groceries, rent, vehicle expenses, healthcare, entertainment, and so on. The recirculation of the original expenditures multiplies the initial spending through these indirect and induced effects.

The extent to which the initial expenditures multiply is estimated using economic models that depict the relationships between industries (such as accommodation and its suppliers) and among different economic agents (such as industries and their employees).

These models are built upon actual data of expenditure patterns that are reported to the U.S. Bureau of Labor Statistics, the U.S. Census Bureau and the Bureau of Economic Analysis of the U.S. Department of Commerce. Data is regionalized so that it reflects and incorporates local conditions such as prevailing wages rates, commuting patterns, and resource availability and costs.

The magnitude of the multiplying effect differs from one region to another depending on the extent to which the local region can fill the demand for all rounds of supplying needs. For example, the automobile manufacturing industry has high multipliers in Detroit and Indiana since these regions have deep and wide supplier networks, while the same industry multiplier in Phoenix is quite small. In another example, the jobs multiplier for the construction industry is higher in, say, Arkansas, than in California because the same amount of spending will purchase fewer workers in Los Angeles than in Little Rock.

Multipliers can also differ from year to year as relative material and labor costs change and as the production “recipe” of industries change. For example, the IT revolution significantly reduced the job multiplier of many industries (such as manufacturing, accounting, architecture and publishing) as computers replaced administrative and production workers.

The metrics used to determine the value of the economic contribution are employment, labor income, value-added and the value of output. Employment includes full-time, part-time, permanent and seasonal employees and the self-employed, and is measured on a job-count basis regardless of the number of hours worked. Labor income includes all income received by both payroll employees and the self-employed, including wages and benefits such as health insurance and pension plan contributions. Value-added is the measure of the contribution to GDP made by the industry sector, and consists of

compensation of employees, taxes on production and gross operating surplus. Output is the value of the goods and services produced. For most industries, this is simply the revenues generated through sales; for others, in particular retail industries, output is the value of the services supplied.

Estimates are developed using software and data from IMPLAN Group, LLC which traces inter-industry transactions resulting from an increase in demand in a given region. The economic region of interest is the Los Angeles County, and the activity is reported for 2014, the most recent year for which a complete set of data is available. Estimates for labor income and output are expressed in 2014 dollars to maintain consistency with the reported industry activity. The total estimated economic contribution includes direct, indirect and induced effects.

Direct activity includes the materials purchased and the employees hired by the industry itself. Indirect effects are those which stem from the employment and business revenues motivated by the purchases made by the industry and any of its suppliers. Induced effects are those generated by the household spending of employees whose wages are sustained by both direct and indirect spending.

Contribution analysis differs from economic impact analysis in that linkages between the individual component industries are removed so that indirect activity is not double-counted as also part of direct activity. For example, the accommodation industry may purchase services from the food services and drinking establishments industry, which would then be included as both direct revenue of food services and as an expense of the accommodation industry, resulting in a double-counting of overall revenue. Breaking these inter-industry linkages eliminates this double-counting and is a more accurate method of estimating the economic contribution of the industry cluster.

## **INDUSTRIES OF THE BIOSCIENCES INDUSTRY CLUSTER**

The following industries comprise the Biosciences Industry Cluster (descriptions reprinted from North American Industry Classification System, published by the U.S. Office of Management and Budget (2102):

### **NAICS 325411: Medicinal and Botanical Manufacturing**

Establishments in this U.S. industry are primarily engaged in (1) manufacturing uncompounded medicinal chemicals and their derivatives (i.e., generally for use by pharmaceutical preparation manufacturers) and/or (2) grading, grinding and milling uncompounded botanicals.

### **NAICS 325412: Pharmaceutical Preparation Manufacturing**

Establishments in this U.S. industry are primarily engaged in manufacturing in-vivo diagnostics substances and pharmaceutical preparations (except biological) intended for internal and external consumption in does forms, such as ampoules, tablets, capsules, vials, ointments, powders, solutions and suspensions.

### **NAICS 325413: In-Vitro Diagnostics Substance Manufacturing**

Establishments in this U.S. industry are primarily engaged in manufacturing in-vitro (i.e., not taken orally) diagnostics substances, such as chemical, biological or radioactive substances. The substances are used for diagnostic tests that are performed in test tubes, petri dishes, machines and other diagnostics test-type devices.

### **NAICS 325414: Biological Product (except Diagnostic) Manufacturing**

Establishments in this subsector are primarily engaged in manufacturing vaccines, toxoids, blood fractions and culture media of plant or animal origin (except diagnostic).

### **NAICS 333314: Optical Instruments and Lens Manufacturing**

Establishments in this U.S. industry are primarily engaged in one or more of the following: (1) manufacturing optical instruments and lens, such as binoculars, microscopes (except electron, proton), telescopes, prisms and lenses (except ophthalmic); (2) coating or polishing lenses (except ophthalmic); and (3) mounting lenses (except ophthalmic).

### **NAICS 334510: Electromedical and Electrotherapeutic Apparatus**

This industry is comprised of establishments primarily engaged in manufacturing electromedical and electrotherapeutic apparatus, such as magnetic resonance imaging equipment, medical ultrasound equipment, pacemakers, hearing aids, electrocardiographs and electromedical endoscopic equipment.

### **NAICS 334517: Irradiation Apparatus Manufacturing**

This industry includes establishments primarily engaged in manufacturing irradiation apparatus and tubes for applications, such as medical diagnostic, medical therapeutic, industrial research and scientific evaluation. Irradiation can take the form of beta-rays, gamma-rays, X-rays or other ionizing radiation.

### **NAICS 339112: Surgical and Medical Instrument Manufacturing**

Establishments in this industry are primarily engaged in manufacturing medical, surgical, ophthalmic and veterinary instruments and apparatus (except electrotherapeutic, electromedical and irradiation apparatus). Examples of products made by these establishments are syringes, hypodermic needles, anesthesia apparatus, blood transfusion equipment, catheters, surgical clamps and medical thermometers.

### **NAICS 339113: Surgical Appliance and Supplies Manufacturing**

Establishments in this industry are primarily engaged in manufacturing surgical appliances and supplies. Examples of these products are orthopedic devices, prosthetic appliances, surgical dressing, crutches, surgical sutures, personal industrial safety devices (except protective eyewear), hospital beds and operating room tables.

### **NAICS 339114: Dental Equipment and Supplies Manufacturing**

Establishments in this industry are primarily engaged in manufacturing dental equipment and supplies used by dental laboratories and offices of dentists, such as dental chairs, dental instrument delivery systems, dental hand instruments and dental impression material and dental cements.

### **NAICS 339115: Ophthalmic Goods Manufacturing**

Establishments in this industry are primarily engaged in manufacturing ophthalmic goods, such as prescription eyeglasses (except manufactured in a retail setting), contact lenses, sunglasses, eyeglass frames and reading glasses made to stand power, and protective eyewear.

### **NAICS 541711: Research and Development in Biotechnology**

Establishments in this industry are primarily engaged in conducting biotechnology research and experimental development. This involves the study of the use of microorganisms and cellular and biomolecular processes to develop or alter living or non-living materials. This research and development may result in the development of new biotechnology processes or in prototypes of new or genetically-altered products that may be reproduced, utilized or implemented by various industries.



## APPENDIX TWO: PARTNERSHIP CASE STUDIES

The following Industry Organization examples represent facets or features of the L.A. Bioscience Partnership proposed in Recommendation One. Precedent for an industry Organization such as this exists around the County and can be mirrored in the Los Angeles region to ensure the development of a more closely-knit relational infrastructure and to endow the responsibility implementing many of the recommendations proposed here in the plan.



The Life Science Network is the destination for life science professionals who wish to network, communicate, share ideas and connect with others. Our group is composed of more than 15,000 executives, scientists, entrepreneurs, investors and media across biotechnology, pharmaceutical, medical technology, diagnostics and research communities. Most importantly, the Life Science Network brings no industry agenda. You won't find us pushing promotion disguised as learning. We come together for easy communication, to make new connections, find new ways to collaborate, and help one another find the latest jobs or partnering opportunities.



BioEnterprise is a business formation, recruitment, and acceleration initiative designed to grow healthcare companies and commercialize bioscience technologies. Based in Cleveland, BioEnterprise's founders and partners are Case Western Reserve University, Cleveland Clinic, and University Hospitals. The initiative comprises the collective activities of BioEnterprise and its partners' commercialization offices: Case Office of Technology Transfer, Cleveland Clinic Innovations, and University Hospitals Case Medical Center-Center for Clinical Research.



The BEDC/BLSP continues to carry out its mission of attracting quality jobs to Bloomington and Monroe County. We are fortunate to have a vibrant, diverse and accepting community with a strong academic, advanced manufacturing, life sciences and

technology base that add to and support our extraordinary quality of life. With assets like Indiana University and Ivy Tech Community College, we will continue to attract the highly skilled and talented workforce our local employers and community need. The BEDC will continue to address the opportunities and challenges our businesses face, and is confident that our community will maintain its distinction as one of the best places to do live, work and do business in Indiana.



The Massachusetts Life Sciences Center (MLSC) is an investment agency that supports life sciences innovation, research, development and commercialization. The MLSC is charged with implementing a 10-year, \$1-billion, state-funded investment initiative. These investments create jobs and support advances that improve health and well-being. The MLSC offers the nation's most comprehensive set of incentives and collaborative programs targeted to the life sciences ecosystem. These programs propel the growth that has made Massachusetts the global leader in life sciences. The MLSC creates new models for collaboration and partners with organizations, both public and private, around the world to promote innovation in the life sciences.



MassBio is a not-for-profit organization founded in 1985 that represents and provides services and support for the world's leading life sciences supercluster. MassBio is committed to advancing Massachusetts' leadership in the life sciences to grow the industry, add value to the healthcare system and improve patient lives. Representing more than 700 biotechnology companies, academic institutions, disease foundations and other organizations involved in life sciences and healthcare, MassBio leverages its unparalleled network of innovative companies and industry thought leaders to advance policy and promote education, while providing member programs, events, industry information, and services.

## APPENDIX THREE

### Los Angeles Bioscience Dealmaker Network Output Owner's Manual

#### A Work In Progress

This document provides the Los Angeles Bioscience Coalition with short guide to understanding and interpreting the output generated by the CommonWeal Dealmaker Analytics Engine. It is intended to function as a continuous work-in-progress to be refined and extended by LAEDC, Los Angeles County and the Bioscience Coalition going forward as they implement the bioscience cluster support strategy. All items described in the guide have been submitted under separate cover.

#### The Dealmaker Approach

This approach is based on the concept that networks of serial entrepreneurs, investors and their affiliated companies play a critical role in driving value creation and shaping the character of robust regional economies. Firm and company level information identifying the actors and their connective relationships can provide a new window into the innovation dynamics within a regional economy as a whole and just as importantly into the entrepreneurial behavior, investor focus and innovation hot spots within specific industry sectors and clusters. "Dealmakers" are actors who have founded, managed or invested in multiple private entrepreneurial firms, and hold concurrent equity ties to multiple firms as a consequence of their serving on the boards as advisors, investors or managers of these firms. They are specifically defined as those individuals who have three or more concurrent equity positions in private entrepreneurial firms as a consequence of their entrepreneurial or investment activities. Generally, by virtue of their experience, the most facile and active entrepreneurs and investors are considered Dealmakers. The output generated by the Dealmaker analytical engine is drawn primarily from the Capital IQ database, a private database

maintained and licensed by Standard & Poor, that provides quantitative research data and analysis applications to over 4,200 investment management firms, private equity funds, investment banks, advisory firms, corporations, and universities. This unique private dataset maintains detailed records about private firms, their managements, and their boards of directors based on data submitted by the companies at incorporation and through the shelf registration process, and made available to licensees on a current snapshot basis. As a general rule, firms that have received some form of "formal" outside investment will be captured within this database.

#### The Bioscience Coalition GICS-Based Bioscience Cluster Definition

The CommonWeal Dealmaker approach employs the Standard and Poor's Global Industry Classification Standard (GICS) organizational scheme to structure, analyze and present its output. The GICS system model is the global standard for categorizing companies into sectors, industries and sub-industries. The GICS typology was developed for the worldwide financial community and has become the commonly accepted global industry analysis framework. Each company's classification category reflects its primary business model based on its financial performance. GICS is comprised of 10 sectors, 24 industry groups, 68 industries and 154 sub-industries.

#### Market Area: Los Angeles, Orange, and Ventura Counties

#### The Definition

The bioscience cluster definition we use is pretty straightforward with GICS codes for biotechnology, life sciences tools and services, pharmaceuticals, health care technology, health care equipment. We then generate another output version that adds health care facilities. Health care facilities are often excluded because hospitals are primarily engaged in patient care and not in the use of biological systems and living organisms to make or derive commercial

products and services. Additionally, their employment numbers when added to the mix conceal the dynamics (or lack thereof) of the cluster's core value-creating bioscience companies, products, services and R&D activities. On the other hand, hospitals can play an important role in a bioscience cluster when they are actively engaged in clinical trials and their own research. In view of these circumstances, as a point of information, this Los Angeles bioscience cluster description will offer a conventional bioscience core definition and an expanded definition that includes health care facilities.

### **Core Definition #1**

Here are the GICS codes that define the first core definition. After we do this we add hospitals and take another look.

#### **35101010 Health Care Equipment**

Manufacturers of health care equipment and devices. Includes medical instruments, drug delivery systems, cardiovascular & orthopedic devices, and diagnostic equipment.

#### **35101020 Health Care Supplies**

Manufacturers of health care supplies and medical products not classified elsewhere. Includes eye care products, hospital supplies, and safety needle & syringe devices.

#### **35103010 Health Care Technology**

Companies providing information technology services primarily to health care providers. Includes companies providing application, systems and/or data processing software, internet-based tools, and IT consulting services to doctors, hospitals or businesses operating primarily in the Health Care Sector

#### **35201010 Biotechnology**

Companies primarily engaged in the research, development, manufacturing and/or marketing of products based on genetic analysis and genetic engineering. Includes companies specializing in protein-based therapeutics to treat human diseases. Excludes companies manufacturing products using biotechnology but without a health care application.

#### **35202010 Pharmaceuticals**

Companies engaged in the research, development or production of pharmaceuticals. Includes veterinary drugs.

#### **35203010 Life Sciences Tools & Services**

Companies enabling the drug discovery, development and production continuum by providing analytical tools, instruments, consumables & supplies, clinical trial services and contract research services. Includes firms primarily servicing the pharmaceutical and biotechnology industries.

### **Core Definition #2**

Same as #1 but with Health Care Facilities added.

#### **35102020 Health Care Facilities**

Owners and operators of health care facilities, including hospitals, nursing homes, rehabilitation centers and animal hospitals.

### **Refinements and Augmentations**

Once the critical path core bioscience cluster Dealmaker network is identified, mapped, and profiled it may make sense to search for bioscience-intensive companies and Dealmakers in other sectors. In this case a separate investigation should be performed to generate output for some GICS codes that may contain industry, agricultural and clean tech-bio-related entrepreneurs/investors and companies. This exercise will be tricky in that only a small percentage of the companies will qualify so this information will need to be sifted record by record – most probably using key word searches.

The Databases

The Network Foundation Database

As a first step, the output for entrepreneur and investor records across all industry domains are identified and configured in a traditional Excel spreadsheet database organized by Dealmaker ties, with each actor identified by sector/industry for each of their affiliated companies, their role as key executive and/or board member, and by Dealmaker type (e.g., Serial Investor, Investor, Entrepreneur, Entrepreneur with Finance Tie). The data captures the number of equity positions within companies for each individual, their roles within the associated companies as key employee and/or board member (color-coded), the GICS sector and within that sector, the industry for each company. Business biography summaries are also collected for each individual in the database.

Finally each individual is assigned to one of four “finance type” categories.

- Serial Investors: Finance affiliated and a Key Executive of 2 or more finance firms
- Investors: Finance affiliated and a Key Executive of only 1 finance firm
- Entrepreneur with Finance Tie: Finance affiliated, but not a Key Executive of a finance firm
- Entrepreneur No Finance Tie: No finance affiliations

The Network Foundation Database, as presently configured, contains 60,041 entrepreneur/investor records across all GICS sectors except Finance. The Finance sector is being identified and analyzed separately to support capital formation and access strategies. Those actors who predominantly play investor or serial investor role are presented in bold type.

The Los Angeles Bioscience Cluster Dealmaker Database

This database contains only those individuals with equity positions in companies that qualify for inclusion of our bioscience cluster definition. As presently configured the core definition without health care facilities contains 5,837 individual records. When health care facilities are included the record jumps to 9,362.

The Dealmaker Counts

Dealmakers

Individuals with at least 4 equity positions	
Core Definition:	32
Health Care Facilities Included	47

Dealmakers Plus Emerging Dealmakers

Emerging Dealmakers are individuals with 3 equity positions	
Core Definition:	105
Health Care Facilities Included	166

Dealmakers Plus Emerging Dealmakers Plus Nascent Dealmakers

Nascent Dealmakers are individuals with 2 equity positions. The latter category is included because, although they don’t generate “Dealmaker level” impact, these are individuals who may indicate the capacity or inclination to become Dealmakers because they have two concurrent equity positions. These actors are of strategic interest because after playing an entrepreneur and/or investor role, they have chosen to do it again.	
Core Definition:	498
Health Care Facilities Included	831



## The Maps

The Dealmaker network maps capture the density and nature of the connections among various actors and firms within the network. The maps are produced in two formats. One version is presented in a Portable Document Format (PDF) that allows for the reproductions of the map. In addition, the user can magnify the PDF-formatted map and view a specific area to extract serial entrepreneur network relationship and connection information. The second and more robust version, presents the network maps in a “yEd” interactive format. The yEd-formatted maps provide quick and easy access to the useful information embedded in the maps by allowing the user to click on an individual to highlight that person’s company, investment and entrepreneurial connections and relationships within the map. This application can be downloaded as freeware: <https://www.yworks.com/products/yed>

The maps show individual-to-firm connections within the network. The square icons indicate companies; the circular icons indicate individuals that the Dealmaker approach classifies as primarily investors; and the triangular icons denote the individuals classified as primarily entrepreneurs.

When the scope of the Dealmaker network analysis covers all industry sectors in the region the information in the maps is color-coded by industry using Global Industry Classification Standard (GICS) designations. The color of the squares is set to match the color-coding key based on the industry affiliation of the company. The color of the icons representing individuals is determined by their most common industry connection.

As presently configured, the Dealmaker Network Map bundle for the Los Angeles bioscience cluster contains two sets of six maps – one set in PDF and one in yEd formats. Each set contains network maps with and without the Health Care Facilities actors for Dealmakers only, Dealmakers plus Emerging Dealmakers and Dealmakers, Emerging Dealmakers

and Nascent Dealmakers. By way of example, a bird’s eye view and a section blowup from the Bioscience Cluster Dealmaker/Emerging Dealmaker Network maps are shown below. All maps contain only red symbols because at this point the plot is confined to our core Health Care-based bioscience definition.

The bird’s eye view of the entire network reveals a tightly connected core with a single connected tendril radiating into the northwest corner apparently sparked by a two investors. The two rows of actors at the bottom of the map shows a series of “lone wolf” entrepreneurs, investors and companies in the sense that they are not connected to the core network. From a regional innovation strategy perspective, one important goal moving forward might be to introduce new value generation and business growth potency into the core by crafting approaches to feeding the development of these unconnected actors and connecting them into the main network.

## Los Angeles Dealmaker Bioscience Sub-Industry Presence Profile

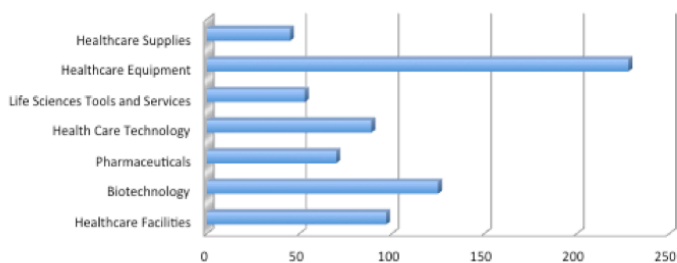
The Los Angeles Dealmaker Bioscience Sub-Industry Presence Profile presents a bird’s eye view of serial entrepreneur and investor activity levels across the various sub-industries that define the bioscience cluster. As such, it offers a quick glimpse into what kind applications and companies are receiving the most Dealmaker attention.

In this case we identified all 1,980 individuals in the database from all sectors in the Los Angeles economy that had attained Dealmaker status (at least three concurrent equity positions). Of these 1,980 Dealmakers we then identified every individual with at least one equity position a particular sub-industry within the bioscience cluster.

The presence profile chart below shows the activity level distribution across these sub-industries. The Healthcare Equipment grouping leads the other sub-industries by a wide margin. This group contains devices, instruments, diagnostic equipment, and drug delivery systems so its showing is not surprising in view of the region's strong medical device performance. The second most active group operates within the Biotechnology sub-industry. This category contains all the Dealmakers associated with companies that are primarily engaged in the research, development, manufacturing and/or marketing of products based on genetic analysis and genetic engineering for healthcare applications.

Additionally, the nominal Dealmaker presence counts for each Bioscience sub-industry are presented below. It is interesting to note that 11.5 percent of all Dealmakers who are operating in the Los Angeles area have at least one equity position in the Healthcare Equipment sub-industry.

**Los Angeles Dealmaker Bioscience Sub-Industry Profile**



Number of Dealmakers from All Sectors in the Economy with at Least One Position in the BioScience Sub-Industry

Sources: CommonWeal, LLC. 2016

#### Dealmaker Bioscience Sub-Industry Presence Counts

Sub-Industry	Healthcare Facilities	Biotechnology	Pharmaceuticals	Health Care Technology	Life Sciences Tools and Services	Healthcare Equipment	Healthcare Supplies
Number of Dealmakers with at least one connection	97	125	70	89	53	228	45
Share of all LA Dealmakers	4.9%	6.3%	3.5%	4.5%	2.7%	11.5%	2.3%

Sources: CommonWeal, LLC. 2016

#### Customized Los Angeles Bioscience Cluster Dealmaker Network Element Profiles

The output generated by the CommonWeal Dealmaker Analytics Engine also includes a series of customized profiles distilled from the Los Angeles Dealmaker Network platform to support the analyses and recommendations generated by Bioscience Coalition's Capital, Real Estate, R&D, Talent, and Public Policy Working Groups.

#### Dealmaker Home Company and Individual Business Bios

This spreadsheet Dealmaker database profile features 1) the "home" company for each individual with at least three concurrent equity positions (Dealmaker and Emerging Dealmakers), 2) the home company's industry sector, and 3) a business bio for the individual Dealmaker.

#### Dealmaker Company and Connectivity Profile

This element identifies all the companies with connections to Los Angeles bioscience Dealmakers. It then presents a group of network connectivity descriptors including the number of Los Angeles bioscience dealmakers linked to the firm and the individual within the firm with the largest number of connections to the Dealmaker network. This information is followed by a business description for the company and the company's street address and website address.

#### Dealmakers With Finance Links into Los Angeles Bioscience Cluster Companies

This element canvases all Dealmakers from all industries and identifies those individuals with one or more finance links to companies within the Los Angeles bioscience cluster. The Dealmaker Analytical Engine found 776 individuals with finance links to the bioscience cluster companies. Of these, 150 people had at least 2 finance connections and 28 individuals had at least 3 finance connections. For the home finance company for each individual, a business description and street and website address are all presented within the spreadsheet.

### Los Angeles Bioscience Cluster Equity Transaction Inventory

This customized element presents a listing of the equity transactions for companies within the bioscience cluster definition. The profile for each transaction includes the investment target, the investor, the transaction value, the investment target industry, address of investment target, business description of investment target, address for the investor/buyer and business description for the buyer. This spreadsheet contains 1,347 transactions dating back to 2000.

### Dealmaker Company Stakeholder Candidates

The element offers a group of bioscience cluster companies as candidates to be included in stakeholder meetings going forward. The companies were selected based on their connectivity within the cluster. Measures include company connections within the network, number of Dealmakers linked to the firm, and number of serial investors linked to the firm. In addition to the connectivity measures, the company profile information includes the name of the individual Dealmaker within the company with the most connections to bioscience cluster companies, the street and website addresses, a company business description and the year the company was founded.

### Individual Dealmaker Stakeholder Candidates

This customized spreadsheet element present two lists of candidates for consideration to be included in cluster stakeholder meetings going forward. The first offering includes 19 individual Dealmakers who are active within the core bioscience cluster that excludes hospitals and other healthcare facilities. Only those Dealmakers with at least 5 concurrent equity positions within bioscience companies were included. A second list is also included for the healthcare facilities subsector within the cluster. This group contains 4 individuals – all with 8 or more equity positions within the healthcare facilities subsector. A business bio is provided for candidates in addition to listing their bioscience cluster equity position companies.



## APPENDIX FOUR

Research Strengths Mapped by Research Institution		
Novel Therapeutics & Diagnostics	Bioengineering Solutions for Treating Diseases and Medical Conditions	Innovations in Healthcare Delivery
Adult Congenital Heart Disease Center (UCLA)	Adaptive Systems Laboratory (UCLA)	Active Materials Laboratory (UCLA)
Ahmanson/Lovelace Brain Mapping Center (UCLA)	Advanced Systems Research (UCLA)	Atherosclerosis Research Unit (UCLA)
Alzheimer's Disease Center (UCLA)	Antenna Research, Applications, and Measurement Laboratory (UCLA)	ATS Statistical Computing (UCLA)
Biochemical Engineering Laboratory (UCLA)	Asad Abidi Research Group (AA Group) (UCLA)	Biocybernetics Laboratory (UCLA)
Biopolymer Lab (UCLA)	Center for Advanced Surgical and Interventional Technology (CASIT) (UCLA)	Borun Center (UCLA)
Brain Injury Research Center (UCLA)	Center for Biomedical Modeling (UCLA)	Center for Adolescent Health Promotion (UCLA)
Brain Mapping Division (UCLA)	Center for Cell Control (UCLA)	Center for Community Health (CCH) (UCLA)
Brain Research Institute (UCLA)	Center for Embedded Networked Sensing (CENS) (UCLA)	Center for Developmental Neurobiology (UCLA)
California NanoSystems Institute (CNSI) (UCLA)	Center for Image and Vision Science (UCLA)	Center for Digital Innovation (UCLA)
Cardiovascular Research Lab (UCLA)	Center for Metabolic Disease Prevention (UCLA)	Center for Domain Specific Computing (UCLA)
Center for Addictive Behaviors (CAB) (UCLA)	Center for Neurobiology of Stress (UCLA)	Center for Health Improvement for Minority Elders (CHIME) (UCLA)
Center for Autism Research and Treatment (CART) (UCLA)	Center for Neurovisceral Sciences and Women's Health (CNS) (UCLA)	Center for Health Policy Research (UCLA)
Center for Behavioral and Addiction Medicine (UCLA)	Center for Occupational and Environmental Health (UCLA)	Center for Healthier Children, Families & Communities (UCLA)
Center for Computational Biology (CCB) (UCLA)	Adult Congenital Heart Disease Center (UCLA)	Center for HIV Identification, Prevention, and Treatment Services (CHIPTS) (UCLA)
Center for High Frequency Electronics (UCLA)	Ahmanson/Lovelace Brain Mapping Center (UCLA)	Adaptive Systems Laboratory (UCLA)
Center for Human Nutrition (UCLA)	Alzheimer's Disease Center (UCLA)	Advanced Systems Research Laboratory (UCLA)
Center for Integrative Medicine (UCLA)	Biochemical Engineering Laboratory (UCLA)	Antenna Research, Applications, and Measurement Laboratory (UCLA)
Center for International Research in Disease (CIRID: India) (UCLA)	Biopolymer Lab (UCLA)	Asad Abidi Research Group (AA Group) (UCLA)
Center for Molecular Medicine (UCLA)	Brain Mapping Division (UCLA)	Center for Advanced Surgical and Interventional Technology (CASIT) (UCLA)
Center for Nanoscience Innovation for Defense, LA branch (CNID) (UCLA)	Brain Research Institute (UCLA)	Center for Embedded Networked Sensing (CENS) (UCLA)
Center for Reconstructive Biotechnology (Weintraub) (UCLA)	Center for Computational Biology (CCB) (UCLA)	Center for Image and Vision Science (UCLA)
Center for Neurobehavioral Genetics (CNG) (UCLA)	Center for Human Nutrition (UCLA)	Brain Injury Research Center (UCLA)
Beckman Research Institute (UCLA)	Center for International Research in Disease (CIRID: India) (UCLA)	California NanoSystems Institute (CNSI) (UCLA)
Center for Catalysis and Chemical Synthesis (UCLA)	Center for Nanoscience Innovation for Defense, LA branch (CNID) (UCLA)	Center for High Frequency Electronics (UCLA)
Center for the Chemistry of Cellular Signaling (UCLA)	Center for Reconstructive Biotechnology (Weintraub) (UCLA)	Center for Integrative Medicine (UCLA)
Pathology Core (UCLA)	Active Materials Laboratory (UCLA)	Center for Molecular Medicine (UCLA)
Analytical Pharmacology Core Facility (UCLA)	Center for Neurobehavioral Genetics (CNG) (UCLA)	Alzheimer's Disease Center (UCLA)



Research Strengths Mapped by Research Institution (continued)		
Novel Therapeutics & Diagnostics	Bioengineering Solutions for Treating Diseases and Medical Conditions	Innovations in Healthcare Delivery
Alfred Mann Institute for Biomedical Engineering (USC)	Beckman Research Institute (City of Hope)	Brain Research Institute (UCLA)
Alzheimer Disease Research Center (USC)	The Molecular Observatory (CalTech)	Center for Computational Biology (CCB) (UCLA)
Biomedical Simulations Resource (BMSR) (USC)	Center for the Chemistry of Cellular Signaling (CalTech)	Center for Human Nutrition (UCLA)
Center for Alcoholic Liver and Pancreatic Diseases and Cirrhosis (USC)	Analytical Pharmacology Core Facility	Center for Nanoscience Innovation for Defense, LA branch (CNID) (UCLA)
Center for Craniofacial Molecular Biology (USC)	Animal Tumor Model Core	Center for Reconstructive Biotechnology (Weintraub) (UCLA)
Center for the Digital Future (USC)	Biomimetic MicroElectronic Systems (BMES) (USC)	Analytical Pharmacology Core Facility
Eli and Edythe Broad Center for Regenerative Medicine and Stem Cell Research at USC (USC)	Center on Biodemography and Population Health (USC)	Translational Research Laboratory
Institute for Neuroimaging and Informatics (USC)	Center for Dark Biosphere Energy Investigations (USC)	Brain and Creativity Institute (USC)
Norris Comprehensive Cancer Center (USC)	Communication Sciences Institute (USC)	Game Innovation Lab (USC)
Roybal Institute on Aging (USC)	Information Sciences Institute (USC)	Hamovitch Social Work Research Center (USC)
Saban Research Institute at Children's Hospital (USC)	Ming Hsieh Institute for Engineering Medicine for Cancer (USC)	Institute for Communication Technology Management (CTM) (USC)
Zilkha Neurogenetic Institute (USC)	Resource Center for Medical Ultrasonic Transducer Technology (USC)	Institute for Creative Technologies (USC)
KGI Center for Biomarker Research	USC-Lockheed Martin Quantum Computation Center (USC)	Institute for Health Promotion & Disease Prevention Research (USC)
KGI Center for Rare Disease Therapies	Alfred Mann Institute for Biomedical Engineering (USC)	Integrated Media Systems Center (USC)
KGI Amgen Bioprocessing Center and associated labs	Biomedical Simulations Resource (BMSR) (USC)	Leonard D. Schaeffer Center for Health Policy and Economics (USC)
KGI Vaccine Research Center	Center for Alcoholic Liver and Pancreatic Diseases and Cirrhosis (USC)	Southern California Clinical and Translational Science Institute (USC)
KGI Martchenko Lab	Center for the Digital Future (USC)	USC Institute for Global Health (USC)
KGI Niemz Lab	Eli and Edythe Broad Center for Regenerative Medicine and Stem Cell Research at USC (USC)	Biomimetic MicroElectronic Systems (BMES) (USC)
KGI School of Pharmacy Research Labs	Institute for Neuroimaging and Informatics (USC)	Communication Sciences Institute (USC)
	Norris Comprehensive Cancer Center (USC)	Ming Hsieh Institute for Engineering Medicine for Cancer (USC)
	Saban Research Institute at Children's Hospital (USC)	Resource Center for Medical Ultrasonic Transducer Technology (USC)
	KGI Center for Biomarker Research	USC-Lockheed Martin Quantum Computation Center (USC)
	KGI Center for Rare Disease Therapies	Biomedical Simulations Resource (BMSR) (USC)
	KGI Amgen Bioprocessing Center and associated labs	Center for the Digital Future (USC)
	KGI Niemz Lab	Norris Comprehensive Cancer Center (USC)
	KGI Ray Lab	Saban Research Institute at Children's Hospital (USC)
	KGI Sterling Lab	KGI Ray Lab
	KGI School of Pharmacy Research Labs	KGI Sterling Lab
		KGI School of Pharmacy Research Labs

## APPENDIX FIVE

### Los Angeles County Biomedical Workforce Sector Profile

PREPARED BY COLLABORATIVE ECONOMICS  
NIMBLECAT, INC. & HALSEY CONSULTING

#### Executive Summary

This report focuses on the employment opportunities and trends of the Biomedical industry and its subsectors in Los Angeles County. It is organized into three sections. Section I contains the research conducted by Collaborative Economics, Inc., providing valuable information on the growth of the industry over time as well as the key occupations associated with the industry. Research conducted by NimbleCat, Inc., is presented in Section II. This research adds a workforce demand and quality dimension to the report through analysis of a real-time sampling of job openings and talent available in LA County. Section III provides a project retrospective of the efforts undertaken to foster the industry, education, and private sector relationships needed to ensure the workforce required to meet the talent demands of the industry will supply the right candidates in the right numbers at the right time.

#### Industry Profile Highlights

The Biomedical Industry is a complex and innovative group of subsectors with a significant presence in Los Angeles County. There is a growing opportunity for Los Angeles to build on its regional assets and strengthen its position as a Biomedical Industry hotspot.

Los Angeles County has developed a prominent and growing Biomedical Industry, which includes both the traditional, service-based healthcare system, as well as a thriving value chain of research, retail, and device manufacturing.

- In 2013, over 420,000, or ten percent of the Los Angeles County workforce worked within the Biomedical Industry.

- The Biomedical Industry has proven it is a key economic driver for the region by maintaining employment throughout the recession and having strong projected growth.
- The Bioscience Sector—the research, retail, and manufacturing components of the larger Biomedical Industry—employed roughly 33,000 people in 2013, a five percent increase from 2007 levels.

The Bioscience Sector offers a variety of jobs across workforce levels. This includes jobs for PhD level biomedical engineers, as well as good paying entry-level positions in the production and export aspects of the sector.

Los Angeles County's regional assets are a key component to the strength and success of the Bioscience Sector.

- In 2013, the County received \$794 million in funding to academic and research centers from the National Institute of Health. While down 13 percent from 2007, this significant amount of research funding has helped support the growth of the industry.
- The number of Biopharmaceuticals and Medical Devices & Equipment investment deals has increased since the recession, as has overall investment. Biopharmaceuticals investment, in particular, rose to \$246 million in 2012 compared to \$8.5 million three years prior, although investment fell to \$123 million in 2013.

#### Workforce Profile Highlights

Through analysis of a sampling of posted jobs and resumes of professionals in the Los Angeles area yielded valuable information regarding the supply of and demand for bioscience professionals in Los Angeles County. Additional comparative analysis of the workforce characteristics of the Los Angeles talent-pool was conducted against the talent-pools of the San Diego and San Francisco Bay areas providing a picture of the supply and quality of the bioscience workforce available in the County.

### Characteristics of Current Bioscience Employment Opportunities

- The majority of the bioscience jobs in Los Angeles analyzed during the study period required at least a Bachelor's degree.
- The distribution of jobs in Los Angeles is greatly weighted toward jobs in Clinical Research, though jobs in other professions are also represented.
- Jobs in Biostatistics, Analytical Chemistry and Genomics point to a strong research and development focus in Los Angeles.
- A majority of the jobs posted in Los Angeles during the study period required between one to two years of experience and therefore would be suitable for recent entrants to the work force who possess the appropriate degrees.

### Characteristics of the Sampled Workforce

- The workforce resumes analyzed indicated a large population of Clinical Research professionals, indicative of a balance between supply and demand.
- The available biosciences workforce in the Los Angeles area is significantly smaller than either San Diego or the Bay Area.
- The quality of the workforce in Los Angeles is excellent. A very large percentage of individuals across all study areas attended top ranked educational institutions.
- Across the board, high value professionals with backgrounds from industries other than the core biosciences are working or interested in working in the bioscience industry.

### Recommendations

While Los Angeles County has a substantial Bioscience Sector, more can be done to ensure the continued success of the industry, such as:

- Develop a cohesive Bioscience cluster that supports startups and connects local talent to jobs.
- Develop economic development strategies that address the needs of the research and development business phase of this emerging sector, specifically
  - Achieve clarity on where research and development efforts are geographically located,
  - Create customized business development services needed in response to the business start-up opportunities coming out of R & D efforts,
  - Create the supports necessary to meet the needs of these companies as they reach the next phase of the business cycle—Commercialization and Manufacturing.
- Synchronize the talent development pipeline to the maturation cycle of the businesses that dominate the sector in LA County.
  - Facilitate communication between industry leaders, the workforce, economic development and education systems in LA County,
  - Consider and plan for the long-term talent needs of the industry by evaluating the potential of the LA County WIB's Youth Programs to begin partnering with area colleges and universities to expose high risk youth to careers in this field,
  - Call for innovation and inter-departmental collaboration between Community College and University programs internally and with each other for the purpose of creating the hybrid training programs required to produce scientists, engineers, advanced manufacturing professionals and other professional with the cross-disciplinary training needed to keep pace and lead the next wave of innovation this industry will produce,

- Assess the viability of creating pathways into Bioscience careers for low, unskilled and transitioning workers through the use of customized training programs, On-the-Job Training programs and apprenticeship models to provide entry into the industry
- Utilize the leadership position of the Los Angeles County Workforce Investment Board to serve as the neutral convener and broker of a comprehensive workforce supply and demand strategy jointly developed with business, economic development, educators, local associations, community-based organizations, other LA County based WIBs and government leaders.
  - Focus this effort on the facilitation of leveraged and sequenced education and workforce development strategies for the industry with the goal of maximizing coordination and collaboration on funding strategies, educational offerings and career pathway mapping, resulting in the formation of a cohesive county-wide approach to growing talent for the industry.
  - Build on the successful use of customized training programs as a strategy for providing entry and mid-level talent development assistance to businesses that are beyond the research and development phase and engaged in commercial activities, tailoring delivery of workforce training to specified employer needs. This is an effective way to meet the workforce demands of the industry as it continues to grow, and allows training partners to be responsive to the needs of the industry while not oversupplying talent ahead of demand. It also allows for a high level of industry engagement, forging strong support for programs developed and giving educators the value of industry feedback as programs become institutionalized.
- Work with local colleges and universities to assess the quality and quantity of the Bachelors, Masters and Ph.D. talent pipelines as these degreed professionals are essential to keeping the research and development cycle of the industry healthy and supporting it as it matures to the next level of business development.
- Concerted effort must be made to addressing the needs of each of the components of the value chain that surround the industry. As LA County pursues the development of a comprehensive Biomedical Sector Strategy, further exploration of the wholesale component of the industry as it is represented in logistics and manufacturing is needed, as is research on the needs of entrepreneurs and start-ups.
- Explore and leverage the opportunities associated with the economic advantages LA County has in other sectors such as aerospace, advanced manufacturing and health as part of future sector intermediary or sector strategy projects;
  - There are shared academic and practical disciplines that cross industry designations, e.g., production planning, laboratory/clinical disciplines, advanced manufacturing and logistics practices.
  - Opportunities to crosswalk training and degree preparation programs to the benefit of multiple industries visa vie the creation of hybrid degree and training programs could be quick wins serving entry level through professional level development across industry classifications.





- Identify and coordinate initiatives at the governmental, educational and community-based level in order to allow alignment of efforts where appropriate for the greatest positive impact on the industry to be realized, e.g.,
  - Infrastructure planning and development
  - Education and Workforce planning, funding and implementation
  - Financing strategies
- Talent development strategies must encompass the entire value chain associated with the industry and must take their cue from the current and future state needs of the industry, requiring deep employer engagement and open collaboration among educational providers resulting in a balanced supply of talent to the demand of this diverse industry.

**APPENDIX SIX****Cal State LA and Los Angeles County's Biosciences Strategy**

March 25, 2016

**Overview:**

This memo provides information to the LAEDC report authors on Cal State LA's position in the overall County bioscience strategy. Cal State LA, with \$3.5 million from the Board of Supervisors, is constructing a 20,000 square-foot incubator on its campus to provide wet lab space for 20 startup firms. It is projected to open in the 2017-2018 academic year. Cal State LA is a master's-level university with 28,000 students, located at the eastern edge of the city of Los Angeles and western end of the San Gabriel Valley. Cal State LA is a Hispanic-serving institution, with a majority low-income student population.

Cal State LA envisions its incubator as a center for local economic development and scientific education for bachelor's and master's degree students (pre-Ph.D). Additionally, Cal State LA will continue its tradition of close partnerships with community colleges and K-12 schools in its incubator programming. This mission differentiates Cal State LA's incubator from those sited at major research universities, which have as a core purpose commercializing research by faculty.

**Area Environment:**

Cal State L.A. is bordered by four low-income, predominantly Latino communities: El Sereno, East Los Angeles, Lincoln Heights and Boyle Heights. The combined population of these four neighborhoods is approximately 300,000. Median household income ranges from a high of \$53,000 in El Sereno to a low of \$33,000 in Lincoln Heights. Latinos comprise more than 90% of residents in the combined four communities. In the largest of the four communities, East Los Angeles (a Census Designated Place,

population 126,000 per 2010 U.S. Census), the unemployment rate during 2011-2013 was 9.2%, more than 3 percentage points higher than the national average (5.9%), while its per capita income was \$12,053 during 2011-2013, only 43% of the national average (\$27,884) (American Community Survey, US Census Bureau, online data, 2015).

**Job Creation:**

Area companies have pledged to create 300 new positions through partnerships with the incubator. Cal State LA expects that number to grow once the incubator is in operation.

Investments in job creation have a multiplier effect. When workers are hired on a new project (direct job creation), that action generates new jobs among subcontractors and other businesses engaged in direct transactions with the project (indirect job creation). Furthermore, when those newly hired workers spend their wages, another ripple of job creation occurs among service businesses with which they have interacted (induced job creation). The degree to which indirect and induced jobs are created varies greatly by regions and industry types. A national bioscience industry study by Battelle concluded biosciences jobs produce a multiplier of 4.9. That is, for every bioscience industry worker directly hired, 4.9 additional indirect or induced jobs are created. These multiplier benchmarks vary greatly by geographic sub-regions. But even with a very conservative multiplier of, for example, 2.0, the job creation potential of this project can be transformative (Battelle, 2014).

If one were to use only the 300 jobs currently committed as a base of direct jobs, the number of additional jobs created through the proposed EDA invested project could range from 6500 to 14,700 jobs.



**Grifols/Cal State LA/East Los Angeles College Partnership for Biomanufacturing:**

An especially exciting industry-education partnership is the Biomanufacturing certificate program being developed by Grifols Biologics, Inc., Cal State LA and East Los Angeles College. This one-year program for students without bachelor's degrees will train future workers for Grifols and other area bioscience firms. These students will learn manufacturing processes as well as broader skills such as writing, mathematics and team-building and career development skills (interviewing, resume writing). East Los Angeles College will provide the bulk of course instruction, while Cal State LA and Grifols will supplement the coursework with internship and practicum experiences at their sites.

By placing students in a community college, a bioscience workplace and a university campus, the program is intended to expose students to a range of career paths. Students will be prepared to earn a living wage through the biomanufacturing certificate program alone. But credits earned will be applicable to community college and university degrees. It is hoped that familiarity and comfort with the East Los Angeles College and Cal State LA campuses will encourage students to pursue higher education while working for companies like Grifols, which will also benefit from the value-added to their employee's potential through education. The program ideally would create the kind of apprenticeship pathways common in Western Europe, where workers simultaneously have the option of earning college, then advanced degrees.

Cal State LA hopes Los Angeles County will be able to support this program with a grant for the scientific equipment necessary to provide state-of-the-art instruction to students in this program, who will quickly become valuable assets to bioscience companies and the communities in which they live.



### APPENDIX SEVEN

Develop & Execute an L.A. County STEM (science, technology, engineering & math) EXPO Day

Be the Leader in building a future workforce for Los Angeles and showcasing to the community that education and students are a top priority by making hands-on learning opportunities available to thousands of young learners who might otherwise never be exposed to the realm of possibilities that their future holds. Ignite a spark through science and be part of the change that is needed for the next generation of innovators.

Biocom Institute – The Biocom Institute (BI), who has a proven record of success in this area, will support the L.A. team through a multitude of layers. As these positions will be an extension of the Biocom Institute team, they (along with the ED of Biocom L.A.) will conduct the hiring of these positions. Upon the positions being filled, the BI team will help steer the direction of the strategic vision and initial 5-year goals plan. The L.A. staff will have regular reporting and check-in meetings with the San Diego team. The San Diego team will be also a part of the annual logistical support team for Los Angeles EXPO Day and any expansion programming. The Los Angeles EXPO Day will truly be a “sister” event to the San Diego Festival of Science & Engineering. The events and will be co-marketing and the Los Angeles EXPO Day will be supported fully as needed throughout each step by the SDFSE.

WHO is the San Diego Festival of Science & Engineering (SDFSE) and WHY do we have a proven record of success?

### OUR VALUE STATEMENT

The San Diego Festival of Science & Engineering is passionate to explain to young people that science and technology is in everything we do, every day. We advocate for investing in STEM education as one

of – if not the – most effective way to build a secure socio-economic environment for everyone regardless of race, creed, gender or personal beliefs. We feel that it is everyone’s job – not just teachers – to spark that sustained level of excitement for science and engineering into the minds of young people. We subscribe to the principles of selflessly giving back to San Diego as a way to ensure our community’s growth potential and quality of life. We lead by example in developing partnerships and initiatives that will advance this cause.

### FESTIVAL WEEK

The San Diego Festival of Science and Engineering features a week of interactive demonstrations, hands-on activities and dynamic speakers to engage kids and families in science and engineering. The week kicks off with EXPO Day at PETCO Park, where over 25,000 San Diegans attend to get excited about science, technology, engineering and math. With over 125 exhibitors and stage performances, there is something for everyone. Touch, explore, see, ask, learn, and get inspired! Hundreds of community businesses and organizations present more than 60 events throughout the county over the course of the week. Last year, we reached over 75,000 kids, parents, scientists, educators and community members throughout our Festival Week where we celebrated all things STEM.



## Tactics

### Phase One

#### (Year One – Research and Development)

- Hiring of two positions; Managing Director and Events & Outreach Manager
- Research of current STEM programming in greater L.A. County; including but not limited to: school districts, non-profits and professional societies
- Collaboration with current SDFSE partners that have a presence through Los Angeles and meetings with potential funders from the corporate and philanthropic landscape
- Development of website, branding materials and social media pages

### Phase Two (Year Two – Building the Brand)

- Development and sponsorship plan executed
- Venue and logistical needs secured, looking at options for 2-years out while bidding
- Creation and implementation of full scale marketing plan to businesses, schools and community members
- Inaugural EXPO Day carried out and tracked with evaluation methods for growth options and changes needed the following year

### Phase Three (Year Three – Showcasing A Successful Formula)

- Strategic plan reassessed for long-term options including expansion of EXPO into multi-day events and programming
- Meetings with community stakeholders who want to have a place in the bigger picture as we lay out a plan for direct in-school programming
- Maintain a sustainable funding model by recruiting back first year sponsors who not only return but receive additional benefits by referring and “championing” the EXPO day to new funders

- Build an ambassador program where industry professionals can connect directly into the classroom throughout the year.

## Budget & Timeline

EXPENSE	Year One	Year Two	Year Three
Salaries & Benefits	\$175,000	\$185,000	\$265,000
Marketing	\$45,000	\$55,000	\$55,000
Venue/Logistics	\$30,000	\$135,000	\$140,000
Programming	\$0	\$25,000	\$55,000
Administrative	\$30,000	\$30,000	\$30,000
TOTALS	\$280,000	\$430,000	\$545,000
Income	Year One	Year Two	Year Three
Gap Funding	\$300,000	\$200,000	\$200,000
Corporate Sponsors	\$0	\$200,000	\$250,000
Grants/Foundation	\$0	\$15,000	\$75,000
Exhibitor Booth Fees	\$0	\$20,000	\$30,000
Merchandise Sales	\$0	\$2,500	\$4,500
TOTALS	\$300,000	\$437,500	\$559,500
Reserve Totals	Year One	Year Two	Year Three
	20,000	7,500	14,500

## APPENDIX EIGHT

Biomedical Parks in the United States			
Biomedical Park	Academic Affiliations	Park Size	Current R&D Build-Out
Alexandria Center (NYC)			
Audubon Biomed Science & Technology Park	Columbia University	100,000 sq. ft.	100,000 sq. ft.
BioSquare	BU Medical Campus, Boston Medical Center	14 acres, 2.5M total sq. ft	1.1M sq. ft.
Centennial Campus	NC State University	1,334 acres (214 acres- Biomed Campus)	2.7M sq. ft.
Chicago Technology Park	UIC, Illinois Medical District	56 acres	500,000 sq. ft.
East Baltimore Biotech	Johns Hopkins Univ. School of Medicine	80 acres in total 22 acres for Biotech Park	1.1M sq. ft.
Grafton Science Park	Tufts University	106 acres	348,000 sq. ft.+354,000 later
Innovation Village	California Polytechnic State University, Pomona	65 acres	376,000 sq. ft.
Massachusetts Biotech Research Park	University of Massachusetts Medical Center	105 acres	800,000 sq. ft.
Mission Bay	UC San Francisco	43 acres, 6 m sq. ft. for bioscience	165,000 sq. ft. under const.
Science Center	Consortium of Owners (UPenn still controls 40%)	2 m sq. ft., Target- 3.5 m sq. ft.	2.0M sq. ft.
UMB BioPark	University of Maryland, Baltimore	10 acres	360,000 sq. ft.
University Research Park	University of Wisconsin- Madison	255 acres	1.5M sq. ft.
Virginia Biotechnology Research Park	Virginia Commonwealth University	34 acres	1.2M sq. ft.

## APPENDIX NINE

## Potential Alternative Public Works Site

