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The Story of the Stanford Industrial/Research Park
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The Stanford Industrial Park ("Park") was authorized in 1951 by setting aside 209 acres of Stanford land holdings for light industrial use. The first occupant of the park, in 1953, was Varian Associates, a company with close ties to Stanford University. The purpose of the Park was to provide a source of income, as Stanford University was struggling financially in 1950. A master plan for the use of Stanford's extensive land holdings (8,800 acres), prepared in 1953, was to include housing, campus development, and the Stanford Shopping Center. The idea for a "Park" is said to have resulted from a trip to Denver, Colorado by Al Brandin, Vice President for Business Affairs. He discovered a residential development in an attractive park-like setting and realized Stanford land could also accommodate industrial development in such a park-like setting. He thus advocated this as part of the strategic planning for uses of Stanford land.

The 1953 master plan promoted bringing light technology-focused industry onto Stanford land, where residential property taxes would be relieved by such industry - to be developed under rigid regulations governing land coverage, architectural design and open areas for parking and landscaping (e.g., buildings would be of limited height and occupy only 40% of the leased land, with parking in the back of the building away from the street side. Also, there had to be at least a 90 foot green space buffer between the building and the street). The University has maintained this tight control over all aspects of the Park development to attract the high-tech industry that would enhance the reputation of the University and provide valuable connections to industry. Potential tenants must complete an application form and must be approved by the University. The result of this careful planning and tenant selection is an industrial area with the look and feel of the Stanford college campus. In 1958, the Park was featured in an exhibit at the World's Fair in Brussels. This brought a steady stream of visitors from other countries after the Fair to see for themselves this example of modern industrial development.

The Park also served the master plan of Frederick Terman, who set out in the 1950's to convert Stanford University ("Stanford") from a financially struggling regional university to an internationally recognized world-class research university. Terman, whose father was a Professor at Stanford, earned his engineering degree at Stanford, then pursued his PhD degree at MIT, under the supervision of Vannevar Bush. It was Bush, who oversaw the university

contributions to the war effort in World War II, who influenced the U.S. Government to invest heavily in university research after the war. His paper *Science, the Endless Frontier* provided a blueprint for such investments. Terman, who returned to work with Bush during the war, foresaw after the war how the research funding plans of the Government could provide great benefit to Stanford. Terman also observed that the close relationships between MIT and local industry were a key element in the success and recognition of MIT as a world-class research university. He wanted the same for Stanford. Unfortunately, all that surrounded Stanford in 1946 were acres of fruit orchards. This had to change.

Terman started immediately after his return in 1946 to build the research capability of the School of Engineering, where he had been appointed Dean. He introduced salary splitting, where Professors were urged to find a patron, normally the Government, to fund up to 50% of their salary. This provided funds for Terman to increase faculty size and increase the graduate student base. The U.S. Department of Defense was eager to fund research leading to advanced weapons systems (the Cold War was underway), and Terman steered his faculty towards seeking such research grants. Terman was also distressed that his best graduating Masters and PhD students would leave the area for the East Coast, where the research jobs were located. He recalled the MIT model, where excellent jobs could be found in the area surrounding the university. And where collaborations could be formed, and where the innovation created at the university could be converted into useful products. He understood that placing graduated students in local companies created vital links between industry and the university.

And so, when Terman learned of the Stanford plans to provide land for "light industrial use", he recognized the importance of this for his own ambitions for Stanford. He joined the Faculty Advisory Committee on Land and Building Development, formed in 1951, to advocate attracting R&D based companies to the Park. To make the Park attractive for such companies, he created the Honors Cooperative Program ("HCP"), where employees of companies in the Park could take classes at Stanford leading to Masters and PhD degrees. The companies paid double tuition, and this incremental funding became another source of dollars to build the strength of the faculty and graduate student base within Engineering. When technology-based companies spread beyond the Park and into the surrounding community, a closed circuit television system was installed so HCP students could take courses at their place of employment. The HCP continues today with hundreds of companies as subscribers and where most classes are now on the internet.

Another attraction for Park tenants was the close proximity to consulting services of Stanford faculty. Professors were granted one day per week release time for consulting work (still the policy today) and the Park was only a short bicycle ride from their on-campus offices. This gave Park tenants access to the problem solving expertise of Stanford Professors and provided supplemental income for the Professors. It also provided the Professors with knowledge about what skills companies would be seeking in graduating students. This led to revision of course content, or the creation of new courses, or sometimes new departments (such as the Computer Science Department).

In the 1950s, Terman recognized that the leading scientists in the areas of solid state physics and electronics were in industry, and began recruiting these people to build a "Steeple of Excellence" in these areas. These new faculty sought out government grants and contracts to build state-of-the-art facilities and support the work of graduate students. Terman recognized the importance of maintaining close linkages to the industrial research laboratories, so he proposed an Industrial Associates Program in solid-state electronics. In the late 1950s, he targeted 22 companies to join this new Program, asking each to contribute an annual tax-deductible gift of \$5000. This program was so successful that other university departments developed their own Industrial Associates Programs (now called Industrial Affiliate Programs). Today, over 40 such Programs flourish at Stanford and contribute over \$10 million in gift income.

That Varian Associates ("Varian") was the first tenant in the Park is not surprising. Varian was formed directly from research work at Stanford in 1948, and building on Government contracts, it grew rapidly. By 1950, it needed larger space, and a location next to Stanford was highly attractive. Also, Terman was on the Board of Directors of Varian, and encouraged the Board to move the R&D facilities of the company to the emerging Park. In October, 1951, an agreement was signed granting Varian a 99 year lease on 10 acres in the Park (a lease longer than 99 years, by California law, is considered a conveyance of title to the property). By then, the Park had two stated principles: (a) companies wished to have a park-like and creative atmosphere for their employees; and (b) the Park advances the University's academic program through its tenants contributions to research, scholarships, recruitment, and even capital improvements.

The first companies settling in the Park were all under 99 year leases, as the banks providing funding for buildings and other capital improvements required this as protection for their loans. These leases were prepaid, with Varian paying \$41,000 for its 10 acre 99 year lease and Eastman Kodak, the second tenant, paid \$120,000 for a 10 acre 99 year lease in November 1952. However when the lease expires, all improvements made by the company on the land is transferred to Stanford. The prepaid leases provided needed funding for roads, utilities, and

other infrastructure as the Park expanded. Later, leases would be based on annual rents tied to land value, indexed for inflation and subject to periodic reappraisals.

In 1955, Terman was promoted to Provost, where he was to expand his program of building “steeples of excellence” to other parts of the university. In 1956, Hewlett-Packard made the Park its world headquarters. David Packard, who was a member of the Stanford Board of Trustees, joined Terman in promoting the growth and expansion of the Park. By 1960, there were more than 40 companies, and Terman and Packard convinced Stanford to expand the Park to 450 acres. The Park was presented as the new look of American Industry – not smokestacks, soot, noise, and pollution, but lawns, flowers, trees, recreational areas, i.e., a pleasant place to conduct work. And helped by the interactions with Stanford, a spirit of cooperation and sharing developed among the tenants, where companies would share ideas and even facilities to ensure the success of the region. This became a hallmark of Silicon Valley as companies spread outward towards both San Francisco to the North and San Jose to the South. This sharing and open networking is often pointed to as a major element in the remarkable story of the growth and success of the Silicon Valley (the term Silicon Valley was first used in an article in *Electronics News* in 1971).

Another Park tenant that would have a strong impact in the region was the company formed in 1955 by William Shockley, co-inventor of the transistor (for which he would receive the Nobel Prize in 1956). Shockley left the AT&T Bell Laboratories to return to his hometown of Palo Alto. Terman contacted Shockley in 1955 to point out the advantages of locating a proposed Shockley Transistor Laboratory near Stanford. Shockley recruited the best researchers from around the country to join him in forming this new company to commercialize the transistor. Unfortunately, Shockley was not a good manager of people and within two years, eight of his top employees left him to form Fairchild Semiconductor Corporation and his company declined thereafter. But Shockley’s company was the seed from which the Silicon Valley semiconductor industry grew. By 1980, over 50 semiconductor companies in the Valley could be directly linked to Shockley’s initial start-up venture.

By the late 1980’s, the Park had grown to 660 acres with over 100 companies in residence. It had long ago changed its name to the Stanford Research Park, something more attuned to its close association with Stanford University. Tenants with large blocks of land included Varian, Hewlett-Packard, Ampex, Lockheed Space and Missile Division, and Xerox Palo Alto Research Laboratory. The Park was earning over \$6 million per year from rents (\$5 million) and from returns on investments made from the payments of the original prepaid leases (\$1 million). The returns to the City of Palo Alto were estimated at \$20 million,

from net utility income, sales taxes, and property taxes. And the Hewlett and Packard tax-exempt foundations had made large gifts to Stanford, such as the funding for the Terman Engineering Building. Such gifts from successful Stanford entrepreneurs and Alumni would grow where today they amount to hundreds of millions of dollars each year.

Today, the Park resides on 700 acres, has 10 million square feet of developed buildings and facilities, with 23,000 employees in 150 companies occupying 162 buildings. Companies are predominately scientific, technical, and research oriented with major representation in the fields of electronics, space, biotechnology, computer hardware and software, as well as law offices and consulting firms.

The latest brochure for the Park provides the following information for potential tenants:

Today the Stanford Research Park has a world-class reputation as one of the largest and best-known parks of its kind in the world, offering its companies a unique set of benefits. First and foremost, as part of the Stanford community, the Park offers access to one of the world's finest research universities. Of special value to industry is the opportunity to form close relationships with Stanford faculty and students, who are just a short bicycle ride away. Stanford's Office of University Corporate Relations helps to foster productive partnerships between corporations and the university. Companies may, for example: (a) Sponsor joint research projects with Stanford faculty and students; (b) Recruit Stanford graduates; (c) Conduct seminars and workshops that encourage the exchange of technical information; (d) Offer internships to students; (e) Invite faculty to join corporate boards; (f) Retain faculty as consultants; and (g) Consult with Stanford's Office of Technology Licensing.

The Stanford Center for Professional Development (SCPD), which offers graduate level courses, certificate programs, research seminars, and executive education programs to engineers, scientists, technology managers, and professionals around the world. Courses are broadcast online and through the Stanford Instructional Television Network. Proximity to campus gives Stanford Research Park students the added benefit of meeting directly with faculty and other Stanford students.

The Stanford Affiliates Programs, which offer proven, convenient, and direct means of communication between faculty and Research Park company scientists and professionals. Managed by individual departments, each affiliate program offers individual contact between the representatives of a

company and the faculty and students in the program. More information on university corporate relationships can be found at <http://corporate.stanford.edu/index.html>

The Stanford Research Park is located in Palo Alto, adjacent to the Stanford University campus. Just twenty miles north of downtown San Jose and 32 miles south of San Francisco, the Park offers easy access to the vast array of business, educational, and cultural opportunities at Stanford, in Silicon Valley, and around the Bay Area.

An ideal climate The Stanford Research Park is located on flat to rolling terrain. California's warm sun turns the surrounding foothills golden during the spring and summer, and in the winter, refreshing rains turn the landscape a vibrant shade of green. Large landscaped setbacks throughout the Park provide a campus-like setting. The mid-Peninsula climate is pleasantly mild with daytime temperatures generally ranging between winter lows in the high 50's and summer highs in the low 90's.

A vibrant community More than 100 years old, Palo Alto offers an unusual mix of old and new, from tree-lined streets and historic architecture to cutting-edge technological development. Along with its neighboring communities, Palo Alto offers impressive array of public services, libraries and theaters, parks and open space, fine restaurants, top-rated schools, executive housing, and bustling retail centers. This friendly community offers an appealing work environment and lifestyle for professionals and their families.

In conclusion, the Stanford Research Park was created from the need for Stanford in the early 1950's to earn income from its extensive land holdings. The Parks form and growth was shaped by the vision of Frederic Terman, who saw the critical need to locate R&D companies near Stanford in a park-like setting that mirrored the Stanford campus. Terman believed strongly that without the close proximity of technology-focused companies to hire graduating students and create productive collaborations, Stanford could not become a world-class university. He was right, and the efforts and leadership of a number of Stanford administrators helped realize his vision. The Stanford Research Park and the surrounding Silicon Valley is the result.

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