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1 Executive Summary

The ever-changing world of economics continues to bring challenges to the table. Economic globalization has caused the world to be more competitive than ever before. Breakthrough advancements in technology and communication and constantly changing necessities of the people are requiring us to take a fresh look at the challenges, economic goals and the ways to measure success. More emphasis is given to the concept of sustainable knowledge-based economy. There is no well-trodden path to build a successful economy for a region. This paper explores the path chosen by one community as it intentionally chooses to facilitate the transformation of the region into a revenue-producing, technology friendly hub with a sustainable quality of life. Even more notable, this community effort is citizen-driven. We call this knowledge based revenue producing hub "Technopolis."

2 Introduction

> *Coming together is a beginning. Keeping together is progress. Working together is success. If everyone is moving forward together, then success takes care of itself.*
> —Henry Ford

Creative society and progressive culture of innovation are not events, but rather transformations that require a complex non-linear process involving the interplay of socioeconomic and socio-cultural factors in which the collaborative work of communities (citizens), networks and aligned institutions (including governments) play critical roles. In an economically mature and successful society, indicators of its success can be traced back to the society's heritage, traditions, instincts, accepted norms, core values and cultural mix. When a society has a background of inventions, an affinity for progressive technology and critical people, it has natural potentials that may lead to a renewal path of innovation and subsequent economic growth.

In 2005, a group of enthusiastic people from the City of Clovis, California and a progressive local government began its journey to build a technology hub in the region. At the beginning of the process, as the group struggle to articulate its structure and its vision, it was much like an artist confronted with a blank canvas. "What would be the resultant product?" the group members asked themselves.

"Technopolis." Indeed. The word "technology" originates from *technologia* in Greek — which means *techne*, craft or art, and *logia*, word or thought, and the suffix *polis* means city in Greek. This is how TC3, initially Technology Clovis Core Committee, evolving into Technopolis Central California Collaborative, emerged as a citizen-driven, public/private collaborative effort to create a knowledge-based, revenue-producing, vibrant community in the region. During its inception, the focus was the city of Clovis in central California. However, as the TC3 members worked on developing the concept, they looked at key potentials of the geographic region, prospective elements of economic growth, opportunities for sharing and collaboration. Realizing the greater potential of expanding beyond the city of Clovis to California's Central Valley, the focus widened and the initiative became Technopolis Central California Collaborative – retaining the TC3 acronym.

3 Regional Economy & History

3.1 California's history of innovation: setting the stage

California's economic growth has traditionally taken place in a series of surges in various areas and disciplines.[1] The discovery of gold stimulated westward migration to California and supported the building of railroads connecting California's Great Valley agricultural products to the national economy. In the early 1900s, the development of Hollywood, followed by the growth of defense and aerospace industries during World War II, spurred the growth of the Southern California economy. Later the creation of the microelectronics industry in Silicon Valley during the 1960s drove the economy of Northern California, and subsequently evolved from personal computers in the 1980s to software and the Internet in the 1990s and further to stem cell research in the 2000s. At each stage of the state's economic progress, entrepreneurs saw new market opportunities and found innovative ways to serve those markets.

Critical investments were essential at each stage of California's economic progress. First, investments in railroad construction and then in water systems allowed agriculture to flourish in the Central Valley, and aqueducts to be built in Southern California. Investments in the defense and aerospace industries as well as the early developments in microelectronics and computers hardware and software gave birth to many industries. For example, the Internet evolved from a defense-funded project; our leadership in biotechnology has been stimulated by National Institutes of Health investments. California invested in the Master Plan for Higher Education, leading to the development of the world's best public system of research and learning through the University of California (UC) education system, which in turn has helped to develop and draw top talent to our state to support our technology leadership.

Thus, innovation and investments have gone hand-in-hand with the economic progress of California, combining the efforts of entrepreneurs who are seeking new opportunities through innovative products and services and who are supported by critical investments of technology, human infrastructure and capital infrastructure. In the past California's public investments anticipated growth and preceded private investments. This was case with the Master Plan for Higher Education as well as California's water and highway systems. This has not been the case recently. Global competition is forcing California firms to create innovative products and adopt process innovations to increase productivity and quality. These innovations have included total quality management in the 1980s, flexible (lean) production and just-in-time methods in the 1990s and movement toward continuous innovation and rapid design and prototyping of new products in this decade.

3.2 Opportunity and innovation in California's Central Valley

An invention does not demonstrate any value to mass unless there is an application which results into a tangible, meaningful outcome. Creativity, research, education and talent are key ingredients that produce innovation and prosperity for a region and its people. Irrigation of California's Central Valley is an innovation which transformed the area from desert to productive farmland. Technology paired with innovation makes an invention stronger and more efficient for its application. Education and research continue to fuel the advancement and progress of technology.

The emergence of the Caterpillar Corporation illustrates the convergence of creativity, research, education and talent to produce innovation. In agriculture-based central California, the Caterpillar Corporation (CAT) was formed on April 15, 1925 with the merger of Holt Manufacturing Company of Stockton, California and the C. L. Best Gas Traction Company of San Leandro.[2] Corporate sales for the first year

[1] Innovation, Productivity, and California's Prosperity, (http://www.labor.ca.gov/panel/pdf/espcrepmonoinov.pdf)

[2] History of Caterpillar Corporation (http://en.wikipedia.org/wiki/Caterpillar_Inc.)

were $13 million. By 1929, sales climbed to $52.8 million, and CAT continued to grow throughout the Great Depression of the 1930s. Much of the century-long history of tractor innovation took place in the Central Valley of California. In the early days, creative modifications were made on a farm-by-farm basis, as well as testing and development at the UC Davis School of Agriculture.

Another important example of innovation in the Central Valley region can be found in the recently developed water technology cluster. After identifying that the region had over 90 water technology firms employing more than 2,800 workers, an industry group was formed to promote technology development, training and exports to the $6 billion worldwide market in irrigation and agricultural and turf systems and the $40 billion worldwide municipal water systems market. Reports from Fresno's Collaborative Regional Initiative show that 38% of all federal research and development grants to universities in the region are related to irrigation research. Not surprisingly, 40% of the patents in the region are for water technology and agricultural technology.

Building on the traditional irrigation strengths of the region, the industry group, in collaboration with California State University, Fresno with assistance of the federal government, has established an International Center for Water Technology.[3] The International Center for Water Technology is a public-private partnership dedicated to the development and application of advanced technologies that enhance water use for urban, environmental, and agricultural purposes. To boost progress in water and energy innovation, the Claude Laval Water and Energy Technology (WET) Incubator, a collaborative venture among the Central Valley Business Incubator, California State University, Fresno, and the International Center for Water Technology, opened in March 2007. This multi-million dollar initiative represents the convergence of business incubation, education and industry resources.

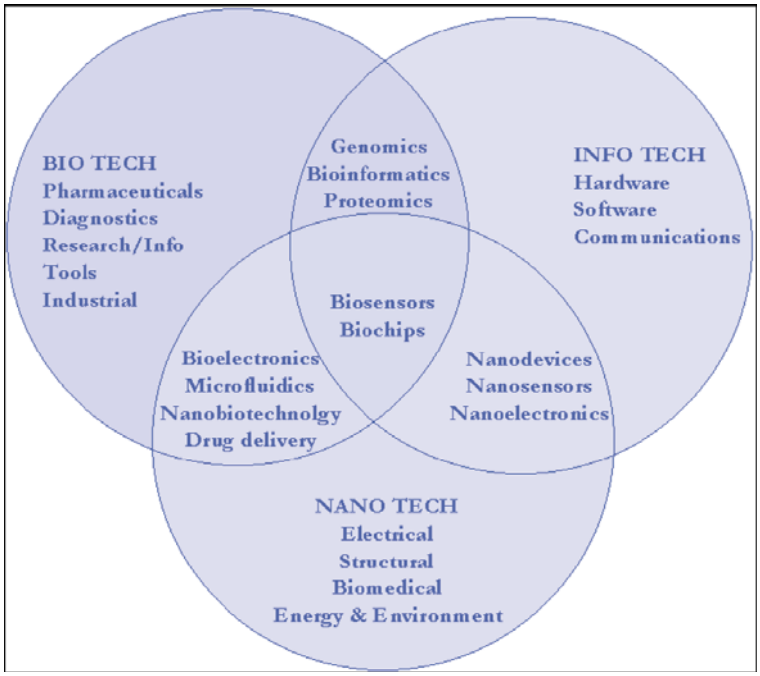
Clearly Central Valley innovation has focused on new opportunities which build on its traditional agricultural strength. Yet innovation is needed across all sectors, including health care, education and public sectors. The opportunities for productivity gains in all sectors are clear as a result of changes in the organization of work and the introduction of new technologies. Research on the Central Valley industry clusters indicate the same. For example, opportunities for health care have been created by the convergence of health sciences and health services in an innovative model of personalized medicine. At the same time, there is now a much better recognition of the impact of "disruptive technologies" that will transform markets and create new opportunities.

4 Initiatives and opportunities: are we ready?

In addition to *process* innovation and productivity improvements in leading technology-driven industries such as information technology, consumer electronics, and healthcare, and *product* introduction such as wireless communications and medical equipment, we can expect a convergence of disciplines such as information technology, biotechnology and nanotechnology to spawn a new generation of research initiatives, resulting in both product and process innovations in the near future.

There are opportunities for innovation at the intersection of various disciplines as well. For example, we can expect major advances in biotechnology to align with advancements in information technologies, which may create new opportunities in the emerging fields such as bioinformatics, biomaterials, and biochips. The commercialization of nanotechnology holds the potential to revolutionize chip and computer manufacturing while creating a new foundation for further developments in information and biotechnology.

[3] International Center for Water Technology (http://www.icwt.net/)



The mapping of the human genome was a historical milestone that required new tools at the intersection of biotechnology and information technology. The use of sophisticated computational methods has opened the door to entirely new medical products and services. Years of significant investments by the National Institutes of Health are now beginning to pay off in commercial applications.

The market potential of these converging technologies is substantial. Based on an analysis of existing estimates, McKinsey Global Institute (MGI)[4] predicts that the cumulative market for converging info-, bio-, and nano-technologies could top $1 trillion in about a decade.

Could these innovations along with advances in energy and environmental technologies drive productivity and prosperity in California to new levels? This will require investments to equip a workforce with the skills required for these new opportunities, as well as investments in the infrastructure to support entrepreneurs who need access to the technology and capital to make this vision a reality.

There are a few questions to ask ourselves.

- Are we ready to pursue these opportunities?
- Are we ready to handle the challenges and responsibilities that come with these opportunities?
- Is our current infrastructure and investment in human and technology adequate for the innovation-based economy?
- Can we sustain the increasing productivity growth, leading to high-wage jobs and shared prosperity?

[4] The McKinsey Global Institute (MGI), an independent economics research organization founded in 1990. (www.mckinsey.com/mgi/)

We believe there is no single solution to the questions raised above. A region, be it a country, state, city or a locality, may choose to seek answers for those questions by looking at its key strengths, its core values that need to be preserved, availability and prospect for hard and soft infrastructure and, above all, how the region itself wants to be defined.

5 California industry clusters of opportunity: a case study

To address the questions above, TC3 first assessed the assets and challenges of the region by cataloguing its key attributes of the.

If the California Central Valley was a U.S. State, it would have….[5]

- A population greater than 23 States
- A land area greater than 10 States
- More revenues from agriculture than every other State
- More world-class national parks than every other State
- A higher population growth rate than all but six States

….but it would also have:

- The highest rate of unemployment;
- The highest percentage of people living below the poverty line;
- The lowest per capita income;
- The worst air quality; and
- The lowest access to health care.

It is in this environment that the Central Valley produced an initiative entitled the "Regional Jobs Initiative" to improve its economic challenges. The Regional Jobs Initiative (RJI)[6] is a cluster-based public-private initiative for regional economic development that seeks to fundamentally change the approach to business competitiveness, job creation and economic diversification. It was planned in 2003 and launched in January 2004. The mission of the RJI is to develop a short- and long-term comprehensive strategy aimed at creating 25,000 to 30,000 net new jobs within five years at an average salary of $29,500. The annual economic impact of the additional jobs in the region was estimated at over $885 million. By 2008, the RJI estimated that its initiative had, directly or indirectly, resulted in the creation of an additional 20,000 jobs. While this number was 5,000 jobs short of its initial goal, the impact, which will be on-going, cannot be overstated.

Clusters of opportunity[7] are sectors of the economy identified by growth in one or more areas: value, jobs or wages. A cluster of opportunity elaborates on the concept of an economic cluster which is traditionally seen as export-oriented, geographically concentrated, and interdependent industry sector characterized by competing firms and buyer-supplier relationships, shared labor pools and other specialized infrastructure. A cluster of opportunity focuses not only on export-oriented sectors, but also population-driven sectors—as well as sectors that offer occupations with career potential. Clusters of opportunity are a combination of related sectors that share one or more of these attributes.

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[5] San Joaquin Valley – Regional Economic profile 2008, (http://www.labor.ca.gov/panel/pdf/2008_San_Joaquin_Valley_Economic_Profile.pdf)

[6] Central Valley RJI Industry Clusters (http://www.fresnorji.org/industry/clusters.php)

[7] Industry Clusters of Opportunity User Guide – September 2008 (http://www.labor.ca.gov/panel/pdf/Industry_Clusters_of_Opportunity_User_Guide_September_2008.pdf)

Successfully promoting regional economic prosperity means that workforce development and economic development organizations must work closely together. Workforce Investment Boards, for example, have mandates to help residents train for and find jobs when they are unemployed, and have moved beyond that role to develop programs focused on career paths and upward mobility. But, they are also playing a growing role in economic development as a skilled workforce is one of the main determinants of economic success. Economic development organizations have become more focused on workforce development for the same reason.

Workforce development is naturally most focused on preparing people for jobs than exist today, while economic development must nurture not only the industries of today but those of tomorrow. Thus, the sectors or clusters championed for long-term economic development purposes may be providing few jobs today and even fewer opportunities with career potential because the cluster is not yet at the necessary size and maturity. The cluster of opportunity enables regions to bridge this natural gap between these goals by including some sectors and occupations requiring immediate workforce development, and some sectors and occupations that are emerging and may become more important in the future.

Thus, clusters of opportunity help provide the focus for meeting the twin challenges of economic growth and workforce investment. A cluster of opportunity can be export oriented, population-driven, or represent an opportunity with career potential for local residents – or, it can combine several elements that meet economic growth and workforce investment goals.

Within every regional economy is found a number of industries and clusters of related industries. Cluster-based economic development targets those industries that naturally exist in a local economy, focusing available resources on developing the things most needed to grow those targeted industries. Strategies might include customized training programs, physical infrastructure requirements, and specialized research programs at local universities.

After an assessment of the most relevant industries to the area, RJI targeted the following clusters for the Central Valley region:

- *Advanced Manufacturing* : highly flexible, short- to medium-run production
- *Clean Energy*: designed to generate clean (e.g., no C02 emissions), renewable power
- *Construction* : designers, contractors, suppliers, building trade organizations, apprenticeship programs, home builders, industry associations and educators
- *Food Processing*: research, development, manufacture, and/or delivery of goods and services related to the production, sales, marketing, and distribution of food.
- *Healthcare*: hospitals, training centers, clinics and other health-related service providers
- *Information Processing*: Call Centers: information processing businesses
- *Logistics and Distribution*: transportation, storage, and allocation of products
- *Public Sector*: public sector agencies
- *Software Development*: software development
- *Tourism*: hotels and motels, tour operations, and restaurants
- *Water Technology*: manufacture and deployment of technology that enables water reuse, conservation, energy efficiency, lower cost innovations, improved water quality and water exploration.

6 Technopolis prospect in the Central Valley

Technopolis can be defined as a knowledge-based revenue-producing community. For the citizens who drive the technopolis dream, the work of TC3 represents the hope of emergence of a vibrant, innovative technology hub in California's central valley. TC3's vision of a technology hub is more than the creation of a technology industrial park and increasing the number of technology businesses; the vision is one of a Petri dish-like environment that nurtures creative people implementing innovative ideas. In this vision, the community becomes knowledge-based and revenue-producing, providing a sustainable quality of life characterized by a healthy, safe, culturally wholesome and refreshing home and work environment. The Technopolis Initiative espouses sharing information in a collaborative, knowledge-based approach that extends locally, regionally and globally.

From its beginning, the Technopolis concept[8] has been different from other approaches to knowledge-based enterprises, commonly known as science parks or technology parks, which can be described as real estate reserved for research and technology users. The technopolis framework instead encompasses a region rather than a defined parcel or a section. A technopolis is the product of the metamorphosis of a residential or industrial city that chooses to transform itself from a community primarily funded by retail- or industry-driven revenue, to one where commerce evolves from knowledge. The technopolis city is dynamic, intellectually attuned to the fabric of change, actively committed to improving its educational inventory and offering its citizens the highest quality of life. When a community earns its revenues—public and private—from diversified intellectual products, a technopolis emerges. In a technopolis, citizens embrace paradigm change in which residents are engaged in cooperation, partnership and problem solving for financial return. In essence, the community becomes "smart," that is, intelligent in approaching problems, rapid in applying solutions, and elegant in addressing difficult issues. As knowledge-based entrepreneurs flourish, not only do new businesses emerge individually, but those businesses create additional enterprises through value-added opportunities. In the long term, businesses expand, household wages increase, and the community gains tax revenues.

So what about the Central Valley sparked the desire for technopolis? Was it the characteristics of the region? Agricultural, available land, more people than jobs? Or was it more a function of a desire to change?

The city of Clovis, where TC3 had its origins, is located midway between the state's major population centers of Los Angeles and San Francisco, in the midst of the most rapidly growing area in California, and at the foot of the Sierra Nevada mountain range. Its heritage, like that of most Valley communities, is rural and agrarian. Clovis does indeed have some unique characteristics. It has a deep and ongoing respect for its cultural heritage and tradition, a true appreciation for entrepreneurial innovation, and a genuine tolerance for divergent viewpoints and attitudes. Its city government was willing to make the initial investment in the vision of technopolis. And its success has always been, and continues to be, driven by the innovative entrepreneurial spirit introduced by its early pioneers who valued both thriving commerce and a certain quality of life.

6.1 Uniqueness of TC3's initiative

While TC3's initiative to build a Technopolis with vibrant communities, innovative knowledge workers and sustainable quality of life is not uncommon, striving to create a Technopolis that encompasses a region was, and remains, unique. Extending the success measurements beyond the traditional quantifiable metrics of profit, jobs created or business tax revenue collected is even more unusual.

[8] TC3 Concept Development Plan (http://www.clovistechnopolis.com/PDF/TC3%20Phase%20III%20CDP%2010.19.07.pdf)

Like so many ideas, the idea of TC3 arose from a conversation. That conversation ultimately led to the commitment of the City of Clovis to provide three years of initial funding to jumpstart the project. With the assistance of the City's Economic Development Department and consultants, a call for citizen volunteers was put out, and a committee – Technopolis Clovis Core Committee – was formed. From this public-private partnership, the vision, goals and objectives were defined and an action plan was formed. And, more importantly, the citizen infrastructure was established. Today TC3 has expanded to a regional initiative, and a non-profit organization that is entirely citizen-driven.

The Central Valley region, however, is like many other areas. It has a large geography. It is economically distressed. These characteristics are hardly those that might give rise to an initiative as bold as technopolis. The difference lies in the acknowledgement of the problem, and most importantly, the desire to seek an answer. The belief is that the answer lies in a creative approach to solving the problem, a knowledge-based approach.

Winston Churchill said "Courage is the first of human qualities because it is the quality which guarantees all others." The uniqueness of the initiative does not lie in "what we have and others don't" but in "what we want to do but others don't." It is a work in progress. It is a transformation happening daily.

6.2 The necessity to share

Many factors have transformed the way in which organizations now view knowledge, but perhaps the pivotal development has been the dramatically extended reach of know-how through new information technology. Rapidly falling costs of communications, highly sophisticated computing and the extraordinary growth and accessibility of the World Wide Web present new opportunities for knowledge-based organizations to share knowledge more widely and affordably than ever before.

A fundamental element of TC3's approach is to work in collaboration with other stakeholders in the region. Such an approach requires shared ownership, shared knowledge and shared vision. Former President William "Bill" J. Clinton said: "The future is not an inheritance; it is an opportunity and an obligation. In today's knowledge-based economy, what you earn depends on what you learn." In a sustainable ecosystem, individuals and organizations are obligated to share that power-producing knowledge.

6.3 Partners and stakeholders

As TC3 begins its implementation of the vision articulated in its concept development plan, it places high value on building partnerships with regional initiatives. At this stage of its development, TC3 has identified potential stakeholders, and begun to establish connections. Possibilities for collaboration in development of technopolis have been identified:

- Local and regional governments (city, county, state);
- Academic institutions;
- Regional businesses ;
- Technological research centers;
- Business and science incubators;
- Creative organizations and cultural centers.

The partnering process has already begun through the work of the Regional Jobs Initiative clusters, and other area networks. The challenge is to articulate the technopolis vision, to identify and create ownership of new roles and relationships, and inspire commitment to the work ahead. For TC3, this process is in its beginning stages.

7 Measuring success: a new set of metrics

In the constantly changing arena of economics and globalization, the world continues to research, explore, and theorize concepts in urban economics and urban geography. Experts continue to propose definitions and measurements of success for economic development initiatives. In a linear model, success must be quantifiable by a number:[9] the number of jobs, the rate of employment, the consumer price index, the gross domestic product, and so on.[10] Without question, there is a place for hard numbers as indices.

But is that the entire picture? And how relevant are these metrics to the development of technopoleis?

In the very competitive state of globalized economy of the twenty-first century, rapid advancements in technology and communications, redefined product development, manufacturing and marketing strategy and approaches require us to take a fresh look at how we measure success of an initiative. Using an economic model, how do economic developers prove their value to the various entities to whom they are answerable (including governments, businesses, shareholders and the public) especially if those entities – like most business people – are looking for quantifiable goals?

Traditionally, the number of jobs produced has usually been the primary indicator of a successful economic development program. Whenever an economic developer stands before the board of directors asking for more money, or solicits funds from the local business community, the supporting statistics invariably include the number of new jobs to be created by the program.

Jobs are indeed an important number, because not only do they reduce the local unemployment rate, they also bring follow-on spending into the local economy, which translates to additional tax revenue to help improve local infrastructure and public services.

In today's environment of global economic downturn, the pressure for quantifiable success is even more intense. As business and government are cutting expenses and/or reducing project funding in order to make up for revenue loss, the temptation to look at job creation as the most important indicator of success is especially strong.

Unfortunately, the development of technopolis is not a short-term solution. And what's more, the impact of technopolis – the improvement of the quality of life, the environmental benefits, the development of collaborative approaches, and the education of a broad community – is organic enough to defy clear cause-effect relationships.

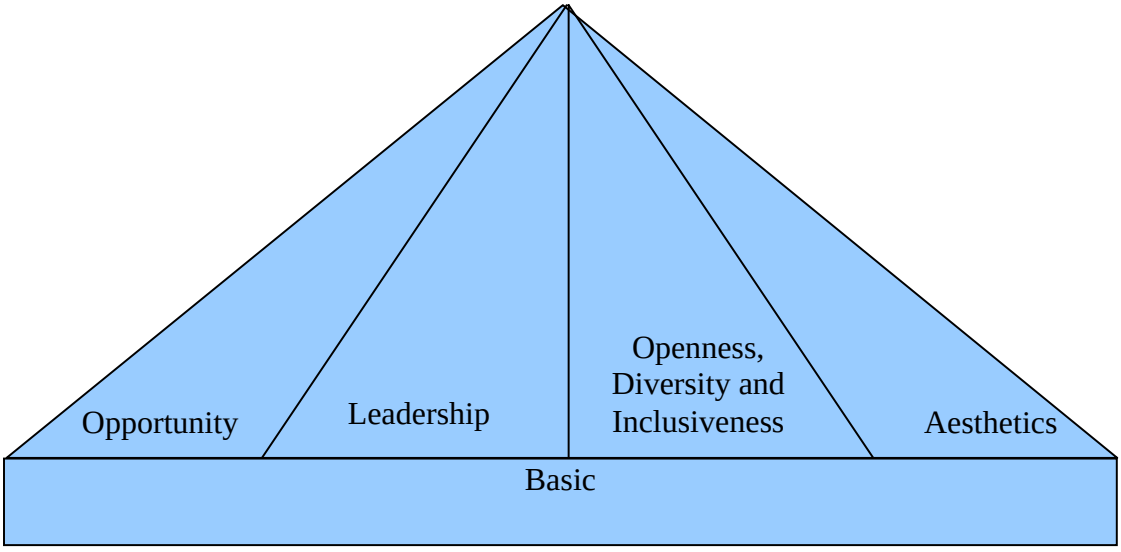
7.1 Quality of Place, TC3's vision of Nirvana

> *The Great Society is a place where every child can find knowledge to enrich his mind and to enlarge his talents. It is a place where the city of man serves not only the needs of the body and the demands of commerce but the desire for beauty and the hunger for community. It is a place where men are more concerned with the quality of their goals than the quantity of their goods.*
> —Lyndon B. Johnson

The search for measurements with numbers can blind us to attributes that make a significant, though less quantifiable, difference in the lives of people. The core components of TC3's dream vision for a technopolis align closely with the attributes a community must possess to reach actualization, as

[9] Principles in Economic Development - Measurement and Evaluation (http://www.hhh.umn.edu/centers/slp/economic_development/principles_measurement_evaluation.html)
[10] Economic Indicators: (http://www.gpoaccess.gov/indicators/browse.html)

explained by Richard Florida in his book, *Who's Your City?* Florida refers to these characteristics as "Quality of Place."



The TC3 concept includes the following elements, which define our vision of Nirvana – achievement of "quality of place"[11] for the region.

1. Basic – low crime, safe streets, good schools, affordable living.
2. Opportunity – for employment and/or creating new businesses and jobs.
3. Leadership – that is ethical, open and organic, enabling residents to connect with and be a part of the community, while encouraging creative expression.
4. Openness, diversity and inclusiveness – welcoming to young professionals, cultural and ethnic diversities and minorities.
5. Aesthetics – amenities, cultural offerings, physical beauty.

Within these characteristics are the definitions of success by which outcomes can be measured. How safe is a community? One can cite crime rates. And schools, are they good? One can compare test scores. And one can measure new businesses and jobs. These indicators that can be measured form the first two stages of a successful community. But as a community looks for greater success, the indicators become less metric-oriented than descriptive – traits like honest leadership and an engaged citizenry are not necessarily easily recognized within the time frame desired by some. And how does one measure openness, diversity and inclusiveness? How many economic developers stand ready to face their bosses with a report card that says the diversity now is better than it was before?

[11] Florida, R. L. (2008). *Who's your city? How the creative economy is making where to live the most important decision of your life*. New York: Basic Books.

The contributions to social and economic theory by leading intellectuals like Richard Florida are based on rigorous research and high volume survey data which provide a true reflection of what matters to us, the people. In the context of our subject, they are useful to describe the assets and contributions of technopoleis or science parks, and provide both a vocabulary to communicate their benefits and a measure of success. The “Quality of Place” defined by Florida validates our approach to look beyond quantifiable metrics.

Florida says that “cities have personalities, too.” A place that offers happiness tends to be open-minded. Vibrant places, where people feel free to express themselves and cultivate their identities naturally become a Petri dish to foster creativity.

That creativity leads to economic success. It is this vision to which TC3 aspires.

7.2 Value to the community

TC3 members have developed a vision for the kind of economic hub that will attract new economy companies and their employees. To achieve this, citizen leaders must ensure that all community decisions focus on becoming a community that welcomes knowledge-based companies and their employees.

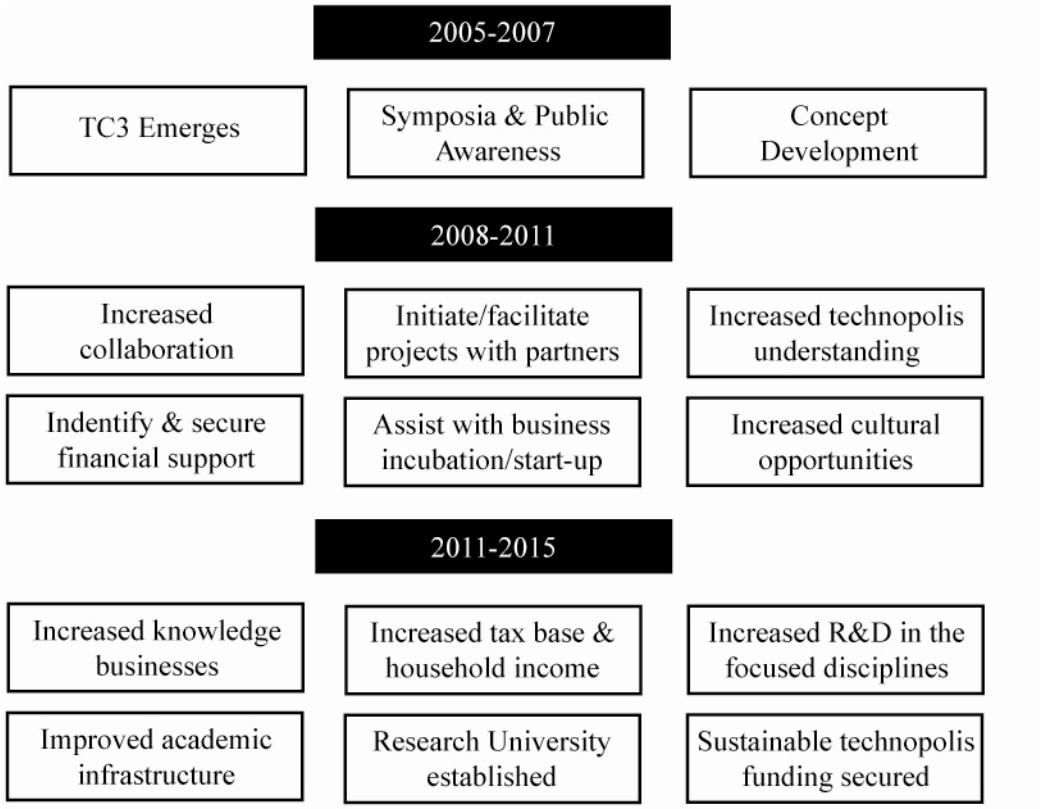
The technopolis envisioned and being developed by TC3 places a balanced emphasis on the overall quality of life in the region, the talent pool produced and retained in the region, the hard and soft infrastructure developed, and the amenities offered. TC3 believes that not only will these more intangible benefits create a livable environment and result in a creative population, but will additionally contribute to the more typical quantifiable benefits of technopoleis.

Ultimately, a transformation will occur. That transformation will result in:

- Increased job availability
- Improved environment
- Desired quality of life
- Affordable and desirable real estate
- Available transportation
- A wide variety of educational opportunities

Working with these collaborative partners, TC3 envisions the region as an ever-improving community, one with attractive amenities including technological and humanistic connectivity, cultural events, physical and recreational activity; retail, restaurants, and entertainment options. It is this shared vision that has the potential to become a model for other regions seeking to define their strategies for achieving prosperity and improve quality of life.

TC3 is exploring territory that is, for this region and perhaps beyond, uncharted. We believe we will achieve our vision – but we do not know this for certain. It is essential, however, to pursue the vision in the context of this uncertainly and to use this uncertainty to inspire our creativity and to strengthen our ability to meet and resolve the challenges. To track progress, and continue to establish goals, the following projections have been made.



8 TC3 Technopolis as a model

The TC3 technopolis began as a concept to be tested in a community that already possessed a number of core values similar to the attributes identified by Florida. Perhaps more importantly, the community had the vision to invest in an idea. In the four years since the technopolis vision began to be developed, the city of Clovis has embraced that vision, its citizens have taken leadership roles, and collaborative partners have joined together. The technopolis beginning is developing into a model, and the concept is evolving into a regional initiative.

The TC3 approach is different from the classic “science park” approach, primarily because of its “bottom up,” or citizen-driven, approach. Most science parks are established by a partnership between industry and education, and located within a defined area, a park purchased and set aside specifically for the research, teaching, training, business development. Most are administered by paid staff. Most have an address, most have buildings.

TC3, on the other hand, hopes to create an environment, a catalyst, a Petri dish. It depends upon an assessment of the challenges and assets of a region, and without collaboration and partnerships it will fail. It will not produce profits for a single company, but it has the potential to elevate the quality of life for a region. Its value will not be centralized, but dispersed throughout the region, even to those who have invested only their presence in the region. While its value may benefit the region’s corporations, it will also benefit the region’s individual entrepreneurs and, indeed the region’s future generations.

8.1 Challenges

Change is difficult, or put differently, initiatives in general and economic development initiatives in particular are never free of challenges. Given the correlation between challenges, creativity and innovation, the challenges must be embraced for their potential to inspire. Nonetheless, transformation of any entity is a painful and challenging exercise; it is always hoped that the end result validates the effort.

In the early years of TC3 the following challenges were identified; many of these have materialized during the four-year history of the initiative:

1. Resistance to innovation, prejudices and public perception
2. Lack of financing
3. Environmental and social factors
4. Policies, rules and bureaucracy
5. Human resources
6. Maintaining initiative momentum
7. Responding to business practicalities
8. Unrealistic expectations of rapid technopolis development.

The challenges become more prominent in an economic distress situation in which people are cautious about their jobs and financial well-being, and public and private entities are more watchful than ever of their investments. Nonetheless, TC3 is addressing these challenges in a variety of ways.

- Organize symposia, citizen's workshop on technopolis. In future, plan for an international technology conference.
- Continue to work with the local government and expand collaboration between TC3 and public offices across cities in Central Valley of California.
- Besides maintaining the close relationship with the CSU Fresno and community colleges, work with universities like UC Merced, Stanford and explore the possibility of satellite campuses.
- Collaborate with other regional initiatives like Creative Fresno, Café Scientific, RJI clusters.
- Provide entrepreneurial resources to interested parties, such as business incubator facility, affordable business facility rental, start-up or business plan writing assistance, venture fund using the connections with the TC3 partners.
- Help improve the communication infrastructure in the region, such as city wide wi-fi.

8.2 Lessons

Steve Jobs, an inventor and successful business leader of innovative products and solution said, "Sometimes when you innovate, you make mistakes. It is best to admit them quickly, and get on with improving your other innovations." TC3's flight has not been free of turbulence. The process has been dynamic, and as the concepts of the regional technopolis have evolved, we have experienced issues and challenges. The learning is, and must be, continuous, but the primary lessons emerging are:

- Regional and national innovation policies impact such an initiative;
- Support and collaboration between the key players is essential;
- Creative thinkers and innovative ideas must be nurtured; repressive policies must be avoided;

- The vision must be clearly communicated, realizing the difficulty in articulating benefits that escape quantification;
- Creativity requires both belief and risk-taking.
- Capability to adapt is key for economic success

In spite of the challenges that are posed, TC3 realizes that it is a long journey; only a passion for its vision, confidence and commitment to its objectives, and persistence on its execution can move the initiative forward.

8.3 Sharing the model

The key potential of a community lies within the core values which are protected and nurtured by the community. TC3's approach to building a technopolis is citizen-driven and collaborative; TC3 cannot and is not willing to do it alone. This approach is a long-term catalytic process that requires embracing the vision, continuous learning, heeding lessons and building collaborative bridges.

Although the TC3 technopolis is a creation in progress, the model has sparked interest in economic development circles throughout California as well as among a number of international groups. The response to TC3's approach has grown from curiosity to acknowledgment of its potential to become successful and serve as a mature model.

As was noted earlier, the impetus for TC3 was a simply a desire to approach a better community from a different perspective, a knowledge-based and collaborative approach. This willingness was the primary factor in the development of technopolis. This one ingredient can be transferred to any other community or region. This first step is indeed the most critical of the entire process.

9 Conclusion

TC3's technopolis concept has already expanded from its genesis as a product of the City of Clovis to a regional project. At the heart of the TC3's journey to become a technopolis is the idea that the Central Valley region with Clovis at its epicenter is poised on the brink of something exciting. Groundwork has been put in place for the region to enter a global arena in its development as a technopolis, a knowledge-based, revenue-producing community which values and emphasizes the development of local entrepreneurs and innovators within an attractive and welcoming community. A technopolis can be an extraordinary asset to any visionary community open to metamorphic change. A technopolis is an exciting place for residents, a place where education binds them together, offers excellent employment opportunities, and produces abundant revenue and a desirable living environment. As TC3 attracts the attention of larger audiences, it is essential the model be shared. TC3 believes that communities and nations can only reach their full potential through an "open source" approach that recognizes our global interdependence, shares its resources, and continues to act as catalyst in that evolutionary process.