The Connecticut Competitiveness Agenda Project

A report by the Connecticut Technology Council

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Executive Summary
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THE CONNECTICUT COMPETITIVENESS AGENDA

INTRODUCTION

Pundits often assume that what most established businesses need to survive – low taxes and less regulation – are equally important for fast-growing tech firms. In fact, recent interviews with leaders of fast-growing firms in a variety of industries and growth stages reveal something quite different. The good news is that what they want, the new governor can deliver readily.

To find out what would make Connecticut a compelling place for fast-growing technology companies, starting in June 2010 the Connecticut Technology Council interviewed a cross-section of Connecticut's fastest growing and strongest enterprises in most technology clusters, from start-ups to established titans. We also assembled a team of business leaders and graduate students, predominately from Yale and University of Connecticut, to research issues brought up by the CEOs and to review past reports and analyses of states' competiveness. What we found surprised us.

Today's most successful entrepreneurs and managers have a common and surprisingly consistent view—the state is not on their innovation and growth wave length. One after another the CEOs told us they like the quality of life here, but that it is a suboptimal location for their business. They expressed concern that the state's leaders "don't get it" when it comes to making Connecticut's institutions flexible and innovation-oriented. And given the high costs of running a business in Connecticut, the CEOs we spoke with expect our leaders to "get it."

This highlights a key point of distinction for fast-growing firms: Though they are concerned about high costs, they see the issue differently than do slow-growing firms. One CEO exemplified the attitude: "My margins are high enough that I can afford to be here." The firms we interviewed can afford Connecticut; yet for the high price they expect top notch performance. While firms with low margins may worry chiefly about the high costs of taxes and healthcare, for fast-growing companies the primary issues have to do with networks—*both social and physical*.

Networks are like blood vessels, carrying to innovative companies the ideas, talent, money and support they need to grow. The CEOs of Connecticut's top firms and the most promising divisions of larger companies are searching for a place where the governor knows them and helps them meet their future growth needs; where strong professional networks provide timely technical advice and support as well as young talent and investment dollars when needed. The CEOs wish for lively downtowns and fast transportation networks that help them access global markets and get customers and investors in to visit. Finally, they want the state to help more start-ups get going so Connecticut becomes a well-known, attractive place for technology entrepreneurs. Success loves stimulating company, it turns out.

THE CONNECTICUT PREDICAMENT

The state is not focused on helping fast-growing firms, where most good jobs are created.

Conventional wisdom in economic development has long been that growing jobs means either attracting and retaining big, successful companies or supporting small business. Yet new U.S. Census data shows that overwhelmingly, net job growth comes from young companies, regardless of their size. As a class, companies older than five years lose as many jobs as they create, on average.[1] Since disproportionally high shares of Connecticut jobs are in large companies,[2] which tend to be older, the state is set up to lose jobs faster than average (see Table 1). Attempting to retain jobs in legacy industries may prove futile because older companies survive by efficiency and overhead reductions. Instead, the solution is to grow jobs faster by helping start-ups and fast-growing firms.

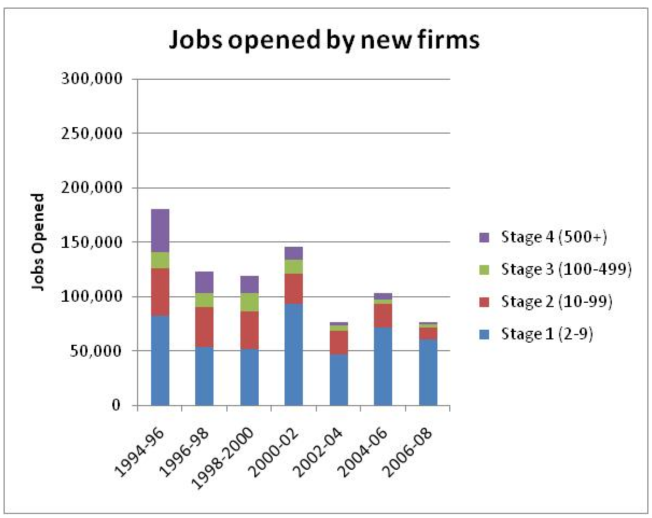
Table 1

Connecticut, 2008	Employees	% of Jobs	CT Rank in US
Stage 4	(500+)	15%	7
Stage 3	(100-499)	14%	23
Stage 2	(10-99)	33%	44
Stage 1	(2-9)	30%	34

Source: YourEconomy.com. Edward Lowe Foundation.

As the chart below shows, job creation by stage 2, 3 and 4 companies has collapsed in Connecticut in the 2000s, while stage 1 job growth has remained consistent.

Figure 1



Source: YourEconomy.com. Edward Lowe Foundation.

When we add in jobs created by existing firms expanding or moving into the state, the gross numbers increase, but the story remains the same.

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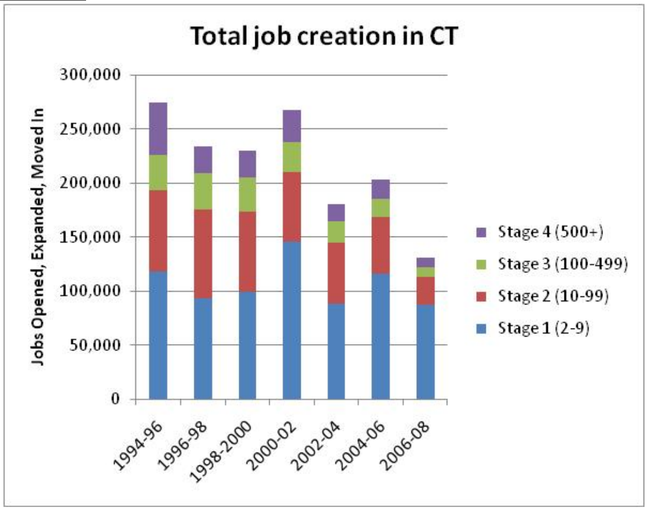
[1] John Haltiwanger, Ron Jarmin, Javier Miranda, "Who Creates Jobs? Small vs. Large vs. Young," NBER Working Paper 16300, p 30-31, available at http://www.nber.org/papers/w16300

[2] YourEconomy.org. Edward Lowe Foundation. http://youreconomy.org/pages/ranking/rank_Jobs.ye?&region=states&state=&year1=2007&year2=2008&sortby=Stage%201#ST (Last accessed 11/1/10).

Figure 2



Source: YourEconomy.com. Edward Lowe Foundation.

INNOVATION AND ENTREPRENEURSHIP

High potential but poor results

It is not only insurance and manufacturing jobs that have declined. Connecticut's share of jobs in the high tech sector as a percentage of overall state employment has decreased since 2001. It is now quite low when compared to states like Massachusetts, Maryland, New Hampshire, and Washington. In 2008, Connecticut ranked 18th among the 50 states, and among seven peer states, Connecticut lost more high tech jobs as a share of overall employment between 2001 and 2008 than all but New Hampshire.[3] In fact, only four U.S. states have seen tech employment erode by a greater percentage than Connecticut's 13% decline over that period.[4]

Table 2

State	Share of Jobs in High Tech sector, U.S. Rank 2008
Massachusetts	1
Maryland	4
New Hampshire	6
Washington	7
Connecticut	18

Source: American Electronics Association, Cyberstates 2008 (Washington DC: 2008)

It is hard to understand why Connecticut lags its competitors in high tech jobs. For a state with so many of the key ingredients of innovation—high rankings in patents, industry R&D and the presence of venture capital—Connecticut does surprisingly poorly on measures of innovation *results.* Entrepreneurial activity, jobs in gazelle

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[3]All calculations made using American Electronics Association, (2008), and U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Accounts, www.bea.gov/bea/regional/data.htm.
[4] American Electronics Association, Cyberstates 2001, 2003, 2004, 2006, and 2008. Overall employment (denominator) taken from Bureau of Economic Analysis, Regional Economic Accounts.

companies, R&D work outside of industry, and job churning—a measure of the dynamism of an economy—all rank far lower than we should expect. For some reason the state does not convert innovation potential into results.

Table 3

	2010 Kauffman ITIF New Economy Index Ranking (among 50 states)
Manufacturing Value-Added	2
Inventor Patents	5
Industry R&D	5
Venture Capital	7
IT Professionals	10
Scientists & Engineers	12
High Tech Jobs	14
Entrepreneurial Activity	22
Gazelle Jobs*	23
Non-Industry R&D	37
Job Churning	50

Source: Kauffman Foundation and ITIF, 2010 State New Economy Index. *Gazelle Jobs taken from Kauffman Foundation and ITIF, 2008 State New Economy Index.

INTERVIEW RESULTS

With the data above in mind the Connecticut Technology Council talked to CEOs of fast-growing technology firms (small, medium and large) throughout Connecticut to find how the state could be a better place for companies like theirs to grow.

THE CONNECTICUT PARADOX

Surprisingly, these CEOs did not cite high costs as their big concern. They will tolerate high costs to be in a choice location *if it is a choice location.* Most CEOs said some version of the following: "Personally, I love it here, but it's not a great place for my business."

Most CEOs are conflicted about staying in Connecticut

Table 4

CEO feelings about Connecticut	% Respondents
It is good for me here	28%
It is not good for me at all	14%
It's great for me personally, and *for now* it's OK for my business	59%

These CEOs want high performance above all and to them high performance means six things:

Table 5

Issue	Mentioned in Interview
State (or Governor) doesn't know my company and does not know how to help me. Others state's seem more on top of my needs	72%
University Research – Hard to connect with professors, grad students and labs; tech transfer complicated. I do better with other state's universities.	66%
Connections & Networks – Regional innovation networks are frail or non-existent, hard for young talent to find us, hard to get to NYC or the world	62%
Risk Capital – Seems harder to get here and investors are not as excited about my industry	62%
Critical Mass – Not enough other entrepreneurial companies like mine. Top competitors are elsewhere. Need to be in the center of the action for future success. Will be harder to recruit top people, customers and investors.	55%
Is it Worth the Cost? – My objective is growth, not cost-minimization: high cost worth it if the environment is world class for growth and key employees. This competitiveness is not something people think about a lot here.	45%

RELATIONSHIP WITH THE STATE

QUOTES FROM CONNECTICUT CEOS

"I've had more meetings with Governor Schwarzenegger than with Governor Rell."

"Thank you so much for coming to visit. This is the first time anyone has ever asked how the state can help my business grow."

"I don't feel like I let anyone down when I don't hire here and I don't feel like I get a win when I do."

"The only state office to contact my company was the Department of Labor, to do an audit."

"You need to be able to innovate and reinvent yourself in order to create a sustainable path to growth. You can't keep doing what you've been doing indefinitely because eventually…your market, your product line, or your business platform will mature or be superseded by others in the marketplace who are competing at a higher level."

CEO PERSPECTIVE

Most CEOs were deeply surprised by the difference in outreach they experienced between Connecticut and other states. One talked about Ed Rendell finding him at a trade show and offering him space in the Philadelphia Navy Yards and a $30 million grant to move. Another CEO said that shortly after his mother moved to Florida he got a call from Governor Charlie Crist's assistant who said, "Would you like to move your company down here to be near your mother?" Though odd, it points to the homework some states do to bring in business. Nearly everyone we spoke to said they got regular calls from the economic development departments of states like North Carolina and Texas, offering them relocation deals. The CEOs still here do not want to move, but they are disconcerted by the apparent disparity in desire for their business between Connecticut and certain other states. Not only do they find the attention seductive, but they also see the signal these states are sending. It says, 'We know you and we want to know you better. We will do whatever we can to help you succeed.'

IDEAS TO ADDRESS CONCERNS

The Governor should lead the state's economic development effort. In addition to sending a compelling message about the importance of technology business to the state, the Governor's leadership should embrace four mutually-reinforcing components:

- <u>Data-driven development</u>—The state needs real-time, honest information to guide its development strategy.
- <u>Finding promising companies</u>—To identify the young, fast-growing companies that can create significant numbers of new jobs, the state needs to convene a representative body of technology leaders regularly to share information on company performance in order to inform strategic assistance.
- <u>Reaching out to listen and help</u>—The Governor and his deputies must reach out to identified companies to ask how the state can be a better place for their growth.
- <u>Catalyzing networks</u>—The Governor should use his power as a convener to help cluster leaders regularly bring together entrepreneurs, researchers, and investors in order develop vigorous networks of technology professionals.

Specifically, we recommend the following:

Create an Economic Development "War Room"—monthly state-wide strategy development meetings to direct resources to CT firms with highest growth potential

To concentrate efforts on the ideas, firms and opportunities with the best chances of success and most pressing short-term needs, key statewide players need a coordinated strategy. The governor should convene a monthly meeting of all state economic development departments, major state business associations, incubators, business acceleration programs and risk capital organizations to create a jobs growth plan and track progress toward its goals. Case managers from the "war room" will resolve issues for identified target companies.

Rekindle the cluster strategy:

- Technology cluster meetings—The Governor and presidents of the state's research universities should host regular events for industry cluster executives to foster growth of high-tech concepts. These meetings would focus on technologies being developed among Connecticut's universities and entrepreneurs while emphasizing pragmatic ways for the state and other high-energy stakeholders to help these ideas flourish.

- NGOs manage clusters—The Governor and DECD should support organizations like CURE, BEACON, AIF, CTC and CVG in their work of building networks within clusters.

Hold an Annual Governor's State of Technology Address

Once a year the Governor should hold a major event to present his technology agenda to the entire innovation community. In preparation for the event, the technology community should survey itself and provide to the Governor the information and insights generated.

UNIVERSITY-INDUSTRY COLLABORATION

QUOTES FROM CONNECTICUT CEOS

"If you want a high quality intellectual environment, you must have close relationships between universities, the state, and industry."

"While we start by looking for a research partner who is the best in his or her field, we end up working with the researcher who's easiest to work with."

CEO PERSPECTIVE

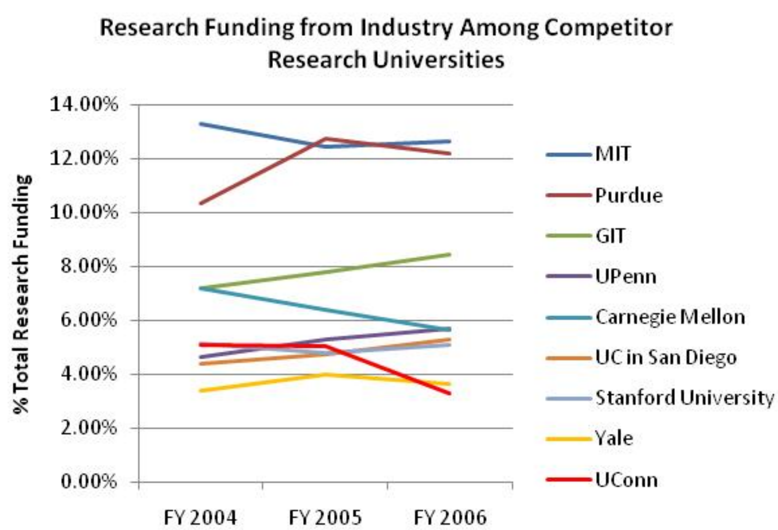
The CEOs we spoke with view universities as sources of innovation. They believe collaborative relationships with university researchers are important sources of value, catalyzing new commercializable discoveries. Yet these entrepreneurs say it is difficult, in Connecticut, to access university researchers to collaborate on projects, and when they find good people who want to team up, it is often expensive to realize the partnership. The CEOs cite three obstacles to symbiotic university-industry research relationships: 1) the lack of incentives for university researchers to work with technology companies; 2) the dearth of bridge programs between academia and industry; and 3) occasional deficiency of expertise in the relevant field.

FINDINGS

UCONN and Yale rank low in percent funding from industry

Though it is difficult to measure the amount of collaboration between universities and industry, the amount of a university's funding that comes from industry may be a fair proxy. The chart below shows Connecticut's universities performing below many of their peers in the percentage of total funding that comes from industry.

Figure 3



Source: National Science Foundation/Division of Science Resources Statistics, "Survey of Research and Development Expenditures at Universities and Colleges" http://www.nsf.gov/statistics/nsf10311/pdf/tab30.pdf

Collaboration starts with networks

States that do particularly well bringing university innovations to market—California, Massachusetts, Georgia, and Pennsylvania—commonly engage in two key practices: making connections and acceleration.[5] These states coordinate and promote interaction among researchers, VC's, and entrepreneurs; this is especially true for regions where universities launch cooperative efforts with one another that are not specific to a single school. For example, Carnegie Mellon University and the University of Pittsburgh formed a cluster called the Pittsburgh Life Sciences Greenhouse (PLSG) in November 2001 to attract life sciences investments, a cluster that in less than three years procured $110 million in net commitments given the access to a broad quantity of experts and intellectual property through the collaboration.

This complements other institution-agnostic acceleration efforts in the region such as Idea Foundry – a non-profit seed-stage investment fund – and Innovation Works, a state-supported program that provides both advisors and funding to locally-based new companies. Each of these programs has led to several successful exits of concepts from both CMU and Pitt, and underscore the value-add and greater efficacy of fostering university-centric economic development programs that extend beyond a single school. Similar success has been observed in Georgia through the state's Advanced Technology Development Center (ATDC), a competitive incubator program in Atlanta that has supported hundreds of startups. Although ATDC is located on Georgia Tech's campus, organizers indicate that fewer than one in four companies that they host were previously affiliated with the university.

Accessibility of researchers is more important than their prominence

It is important to note that even when a field's preeminent researcher is not within the state; Connecticut's universities can compete effectively for research collaboration. CEOs pointed out that when it comes to collaborating with industry, a professor's enthusiasm for the work is more important than being the best in their field. This implies that the first step to improving university-industry collaboration may not involve expensive adjustments to the type of work being conducted at Connecticut's research universities or dramatic improvements to its quality. Rather, the best strategy may be to change the university incentive structure and culture to support commercially relevant innovation.

IDEAS TO ADDRESS CONCERNS

Help CT universities create an entrepreneurial ethic and support for tech transfer

A number of initiatives have been designed at peer schools with the intent of encouraging students and professors to consider contributing to startups over the course of their academic careers. For example, some universities have started offering professors tenure credit not only for published research but also for certain kinds of industry-oriented accomplishments; others (such as Stanford) require professors to find external sources of funding for part of their annual financial support, thereby making start-up work an attractive option. Additionally, a few universities have experimented with revising their intellectual property policies so as to grant complete ownership to the original inventor (e.g., University of Waterloo). These policies and others that alter the incentive structure for academics to engage in start-ups have been found to greatly enhance the dialogue between universities and industry players, resulting in deeper relationship building and, ultimately, improved start-up activity.

[5] Palmintera, Diane. "Report to the Connecticut Technology Transfer and Commercialization Advisory Board of the Governor's Competitiveness Council." Innovation Associates, Inc., October 2004.

Develop a university-industry research and commercialization institute

The state should foster closer collaboration between its research universities and innovative companies to help formalize ongoing R&D work as well as to establish deeper contacts between members of the state's industry and academic communities in general. We propose three critical components as part of this solution:

- "Edgelab for All" – We envision a centrally-coordinated system of incubators that would permit development of cross-disciplinary teams from CT's research universities and innovative companies. Under this arrangement, professors, graduate researchers, business students and company experts would pursue industry-relevant research, product development and commercialization in close proximity to one another.

- Investment in State-Based Collaboration – We recommend that a board consisting of representatives from industry and academy should oversee a $3-5M annual fund on a 2:3 matching basis for projects proposed by in-state firms with plans to work with in-state universities.

- The Spin-Out Shop—Many of the state's largest companies have intellectual property sitting on "the shelves" that could be used to create viable businesses. The Governor might convince the business community to work through internal impediments to releasing such ideas. Supported by an office attached to a CI- or CCAT-like entity, the Spin-Out Shop could search for these opportunities, create ways to convert the concept to a new enterprise and then provide connections to an innovation accelerator to continue the development process.

Create a clearinghouse of regional tech transfer activities for the Northeast (from Princeton to MIT)

Universities can increase the power of their tech transfer offices to help build new companies by combining innovative ideas across institutions. New Haven could be the intellectual property hub of the Northeast innovation corridor if Connecticut created an organization to monitor tech transfer offices and seek opportunistic combinations of researchers, labs and early stage concepts in the region's major public and private universities. Moreover, the creation of a centralized clearinghouse could help realize economies of scale that have been observed in regions such as Pittsburgh (e.g., CMU and Pitt) and greater Atlanta (e.g., ATDC).

GLOBAL CONNECTIVITY

QUOTES FROM CONNECTICUT CEOS

"Transportation here stinks. At Bradley, no one's there and there's no direct flight anywhere you're going."

"It would be great if Bradley worked! …If they ever fixed 84 to reduce traffic. The problem with Bradley is the flights are expensive and few. In terms of ease of use, Hartford would be better. In terms of flights, schedules, fares they are not comparable to JFK."

"Not having a train line here makes a significant difference. I would certainly consider moving my company. It's pretty isolated here."

CEO PERSPECTIVE

Despite Connecticut's strategic location between two of the most desirable cities in the US, CEOs want better connections to the global community. Connecticut's proximity to New York City and Boston is an asset, yet many CEOs find it inconvenient to travel to these cities to connect with the region and the global marketplace. They say Bradley and Tweed Airports offer too few direct flights and that customers and venture capitalists find visiting inconvenient. Connecticut could build on its geographic advantage if it were known for its ease of travel.

FINDINGS

Air travel is particularly important for high-tech industry

To compete in the globally networked economy, frequent air travel is inevitable as business owners' demand for connectivity, speed and agility increases. A study by University of North Carolina professor John Kasarda has shown that air accessibility is especially important for information technology and technology firms. "High-tech professionals travel by air 400 percent more frequently than workers in general."[6] Government assistance can tangibly impact the development of airports. Such help at Raleigh's airport helped make the city a technology center.[7] Connecticut could bolster Bradley and Tweed airports by providing incentives to increase the number of direct flights and lower airfares.

Ground travel: An opportunity, not a major concern

Most CEOs expressing concern over commuting times were in the Bridgeport-Stamford area. Average travel times to work in that Bridgeport-Stamford would be in the top ten out of 43 large U.S. metro areas if it were a large city rather than a medium one. Out of 31 medium U.S. metro areas its hours of delay per traveler were 6th in 2007.[8] Further from New York City, New Haven and Hartford have substantially lower commuting times and hours of delay.

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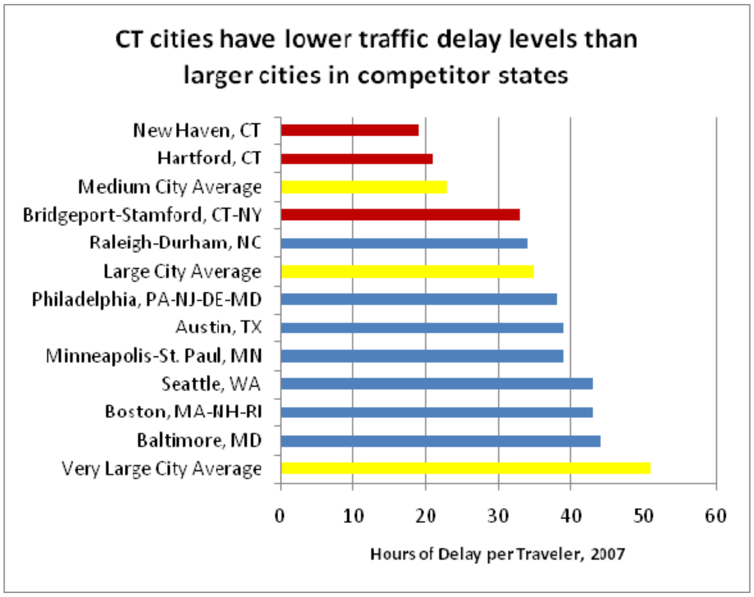
[6] "The Evolution of Airport Cities and the Aerotropolis", John Kasarda: http://www.aerotropolis.com/files/evolutionChapter1.pdf

[7] Ibid.

[8] Congestion Trends – Wasted Hours (Annual Delay per Traveler, 2007), Texas Transportation Institute, http://mobility.tamu.edu/ums/congestion_data/tables/national/table_4.pdf

Figure 4



Source: Texas Transportation Institute http://mobility.tamu.edu/ums/congestion_data/tables/national/table_4.pdf

Connecticut's traffic should be seen as an opportunity for improvement rather than a cause for major concern. As one CEO put it, traffic congestion is not a big competitive issue for employees "because, where are they going to go? They're going to move to New York or LA or San Francisco or Silicon Valley, and traffic is worse in all those places." Traffic is better in New Haven and Hartford than in many competitor cities. And though traffic is relatively congested in Bridgeport-Stamford, that is due to the area's proximity to New York, the benefits of which surely outweigh the costs of traffic. Connecticut is not in danger of losing high-skilled workers or fast-growing companies due to traffic, but if it can reduce congestion and improve downtown livability it will increase its attractiveness as a location.

IDEAS TO ADDRESS CONCERNS

Improved access to and flights from Bradley, Tweed

To better connect the state to key global markets and make it more attractive to emerging businesses, Connecticut should increase direct flights from the area's key airports to major cities. Specifically, the state should examine ways to increase flight breadth and frequency at New Haven's Tweed airport while ensuring enhanced transportation options to Bradley International (such as the high-speed rail link being discussed), in an effort to promote a convenient, comprehensive transportation infrastructure that is appealing to businesses.

Connecticut Connection: Investments in private transportation (Bolt Bus, CT Limo, etc.)

Despite their proximity, getting to major East Coast cities can be expensive and slow. It is a challenge to get venture capitalists and major customers to Connecticut. To be a global player, Connecticut should invest in private transportation to make the state remarkably accessible. For example, it should ensure that inexpensive, rapid bus services stop in Hartford and New Haven between New York and Boston.[9] And at JFK and LGA, international travelers should quickly see signs for Connecticut Limo, which should run regular, speedy, inexpensive trips.

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[9] In the autumn of 2010 Megabus started a service from Hartford to Amherst, MA and New York City. See this Hartford Courant article: http://www.courant.com/news/connecticut/hc-hartford-bus-1116-20101116,0,6650096.story. Around the same time TransportAzumah started bus service from New Haven to Boston, but then cancelled it. The City of New Haven is working to get Bolt Bus to add a stop. See these articles: http://www.yaledailynews.com/news/2009/nov/25/transportazumah-cancels-routes-to-nyc-boston/; http://www.yaledailynews.com/news/2009/sep/03/city-may-try-to-lure-boltbus/

WORKFORCE ATTRACTION

QUOTES FROM CONNECTICUT CEOS

"The most glaring issue for me in this part of Connecticut is, how do you keep innovative, bright young people here?"

"It's dire. If you're looking for local retail help you can probably figure that out. But if you're looking for people who will drive a software company forward, at the middle level—not the senior level, because there are a lot of senior executives around Connecticut—it's hard to find bright people with business initiative."

"I see a move to a place that's more attractive for young people…There's nothing for single people to do. I do understand that Connecticut is about families, but it's not so good for jobs."

"[We left because] we couldn't find enough programmers in New Haven. That and there weren't good, inexpensive housing options downtown. I've got to be downtown. I want to keep my college lifestyle: no car and lots to do."

-CEO of firm that left Connecticut

CEO PERSPECTIVE

There was a diversity of views among CEOs over workforce attraction. Big, well-known firms reported no trouble hiring bright young people, either from Connecticut or elsewhere. But smaller companies and those not in New Haven or Stamford—the two cities that attract young professionals easily—reported significant difficulty finding young employees at the middle level to feed their business's innovation and growth. They blame this on three factors: lifeless down towns; inconvenient and expensive transportation options to Boston and New York; and the lack of networks to draw together critical masses of young people in similar fields.

FINDINGS

Connecticut's young professional population is growing slowly

Despite Connecticut's reputation as a high-quality place to live, recent college graduates have been leaving the state at an increasing rate over the years, often taking with them entrepreneurial energy and potential. Some of this trend can be traced to the fact that Connecticut is in the unique and enviable position of attracting a large number of out-of-state students – often as much as 40% of a typical college class – to its public and private universities. By contrast, colleges in most "competitor" states tend to draw only 10%-20% of their classes from elsewhere, and therefore see fewer of their students leaving after graduation.[10] While this certainly speaks to the quality of Connecticut's academic institutions, the high out-migration of recent graduates suggests that a large percentage of recent graduates find Connecticut to be an unattractive location for post-college life.

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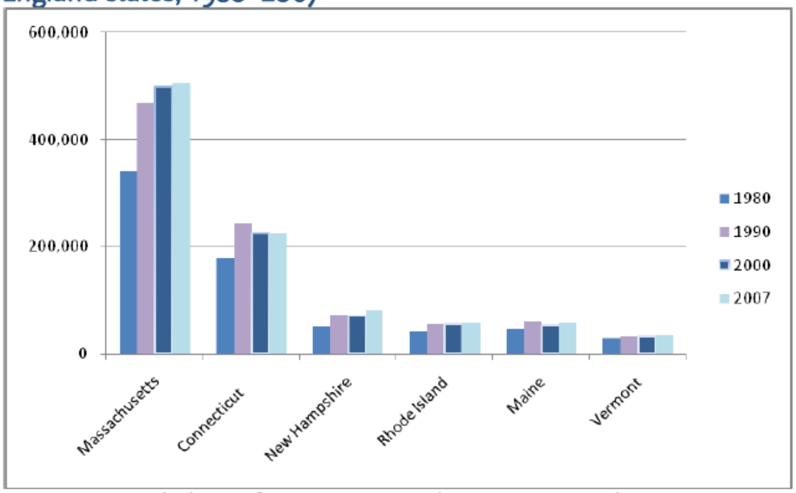
[10] "Baccalaureate and Beyond Longitudinal Study, National Center for Education Statistics (NCES), U.S. Department of Education." 2001.

Figure 5

Figure 1: Population of 25-39-year-olds with a B.A. and not currently enrolled in school in New England states, 1980–2007



Source: NEPPC calculations from 1980, 1990, and 2000 censuses and 2007 ACS. Direct comparisons of 2007 ACS and 2000 Census data should be treated with caution. The 2007 ACS estimates draw from a smaller sample size and have a different definition of residency. [11]

Source: New England Public Policy Center, Discussion Paper 09-1

The power of internships

It turns out that internships are a powerful means of connecting job seekers and employers. A 2010 study by the National Association of Colleges and Employers found that 83% of US companies primarily run their internship programs as feeders for full-time jobs, with firms reporting that they successfully hire 53.3% of interns who are extended full-time offers; moreover, interns represent almost a majority (44.6%) of college hires at US companies.[12]

Half the recent graduates who leave Connecticut (and New England) shortly after finishing their degrees do so to pursue employment.[13] Connecticut does not offer sufficient internship resources to set many college students on a track to stay in the state after graduation. BusinessWeek's 2009 rankings of the best college internships shows that only two of the top 40 intern programs are run by companies based in Connecticut[14], and a similarly small number of in-state employers were ranked among the top 50 most desirable companies nationwide in a recent survey of college students.[15] These figures are all the more stark when taking into account that approximately 50% of recent college graduates have completed some kind of internship by graduation.[16] Connecticut's ability to retain more of its university students will be heavily influenced by how effectively it can help future graduates pursue work opportunities with the state's employers starting from their penultimate year in school, if not sooner.

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[11] Brome, Heather. New England Public Policy Center, Discussion Paper 09-1. Federal Reserve Bank of Boston.

[12] "2010 Internship & Co-op Survey." National Association of Colleges and Employers, May 2010.

[13] Current Population Survey, 1999-2007, cited in New England Public Policy Center, Research Report 08-1, <http://www.bos.frb.org/economic/neei/articles/skilledlabor/skilledlabor.pdf>

[14] "Best Internships of 2009." Bloomberg BusinessWeek. <http://www.businessweek.com/careers/special_reports/20091211best_places_for_interns.htm>, December 2009.

[15] "The World's Most Attractive Employers 2010." <http://www.universumglobal.com/Top50> Universum Group, September 2010.

[16] "2010 Internship & Co-op Survey." National Association of Colleges and Employers, May 2010.

IDEA TO ADDRESS CONCERNS

Expanding Internship and Job Opportunities

To counteract an ongoing draw of students to employment opportunities and away from Connecticut, the state should work closely with its employers – including the myriad of small, fast-growing companies – to create, support, and market internships to students, particularly those who are originally from the state. As an example of an effective program, the Colleges of Worcester Consortium created an on-line internship database in 2005 that simplifies the process of connecting students with state-based employers, particularly the state's early-stage tech firms. Last year, this system played a key role in placing 3,000 students in a combination of internships and coops throughout central and eastern Massachusetts.[17]

[17] http://www.bos.frb.org/economic/neei/articles/skilledlabor/skilledlabor.pdf

CRITICAL MASS IN CLUSTERS

> "A cluster is defined as a concentration of companies and industries in a geographic region, which are interconnected by the markets they serve, and the products they produce, as well as the suppliers, trade associations and educational institutions."[18]

QUOTES FROM CONNECTICUT CEOS

"You can't legislate stickiness."

"In cities like Austin and Boston there's a large population of people doing the same thing, so you don't need to tell [new employees] how a start-up, high energy, high impact culture works. You just don't need to cover this material."

"In software, young people gravitate to areas where there's a lot going on that space…Where your social network is going to be other people in other software companies."

"People want to know, if it doesn't work out with my company, that there are other opportunities. A place with twenty-five other similar companies, where everyone's meeting each other—that's attractive!...It's really the lack of that kind of stuff that I think makes people move out of state."

"You need connectors! The more you connect people the more attractive your place becomes to employees because you create built-in vibrancy that, at the moment, doesn't exist."

CEO PERSPECTIVE

Many CEOs believe being near companies related to their own improves their ability to attract top talent, sustain their supply chains, and drive forward innovation. When similar firms are located within the same job market, they can hire talent already trained by bigger companies; CEOs and employees can form social and intellectual networks with others focused on similar problems, providing support and inspiration; and all companies can ameliorate trailing spouse concerns, making it easier to attract key employees.

WHY CLUSTERS WORK

Evidence suggests that strong business clusters lead to higher growth rates in new firm formation, new establishments of existing firms, and enhanced performance of existing start-ups.[19] Clusters also give employees mobility between companies: they can be trained in one company and then move to another, which creates a more attractive place for employees and a more skilled workforce to attract firms. This dynamic, high-skill environment attracts investment capital to the region in turn.

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[18] "Connecticut Industry Clusters" Department of Economic and Community Development. http://www.ct.gov/ecd/cwp/view.asp?a=1100&Q=249794

[19] Mercedes Delgado, Michael E. Porter and Scott Stern "Clusters and entrepreneurship" Journal of Economic Geography (2010) P 19-21. http://joeg.oxfordjournals.org/content/early/2010/05/28/jeg.lbq010.full.pdf+html)

Studies suggest that clustered firms benefit from knowledge transfer, labor sharing, economies of scale in transportation and production, and increased customers. Network effects among firms are particularly important for high-tech firms, which depend on inter-firm interaction to facilitate access to complementary goods, share expertise and spur innovation.[20]

According to the National Governors Association, "The real strength of clusters lies in their intangible assets, particularly the tacit knowledge that resides within the employees and routines of companies in the cluster and the mechanisms for sharing it across companies and institutions."[21] In our interviews, one CEO of a large company emphasized the importance or small and medium suppliers in supporting the state's larger firms. Complementarily, a CEO of just such a supplier said it has stayed in Connecticut because its largest customer is here.

IDEAS TO ADDRESS CONCERNS

Branding Connecticut for Innovation

Build an innovation and technology branding theme for the state in the US and internationally in order to improve perceptions of Connecticut's suitability for high-tech companies and innovative young professionals.

Use state government's ability to give proof of concept contracts

Start-ups need to test their products in the marketplace. To provide proof of concept testing and reviews the Governor should encourage agencies and local government to use their purchasing power to give high-potential firms the reference accounts and leverage they need to find additional customers.

[20] Aydogan, Neslihan and Yiu Por Chen. *Social Capital and Business Development in High-Technology Clusters.* Springer: New York. 2008

[21] National Governor's Association. *Innovation America: Cluster-Based Strategies for Growing State Economies.* http://www.nga.org/Files/pdf/0702INNOVATIONCLUSTERS.PDF

ACCESS TO CAPITAL

QUOTES FROM CONNECTICUT CEOS

"I talk with Kleiner Perkins, Sequoia, but who is the VC to call in Connecticut?"

When asked why the lack of venture capital firms in Connecticut is a problem, one successful CEO said: "The first thing Sequoia or Kleiner Perkins will tell me is, 'We'll talk with you because we know you and what you've done in the past.' But if you [current graduate student] start a business, they're not going to talk with you. They'll say, 'Look, we're on the West Coast. We need to be able to see you.' It's the same thing if you call Boston. It's a two hour drive. It's not much. But they won't come here. They'll say, 'Why don't you locate your business near us so we can walk over and see what you're doing?' Mostly to make sure you're not absconding with their money."

"The juice that takes the idea and wraps it in a commercialization strategy and commits the startup funds to it is absent [in Connecticut]. The reason why MIT has done as well as it's done with their commercialization pathway is access to capital."

"Incubators add value by keeping start-ups alive long enough for them to figure out their business models."

"In California you can have ten angel meetings in a day. In Connecticut it takes much longer to meet that many angels. Mostly, I met angels in New York or Boston, and though that's not far, traveling took me away from my work."

-CEO of firm that moved out of Connecticut

CEO PERSPECTIVE

Start-up CEOs in Connecticut say it is hard to find early stage investors in-state, particularly ones that can add value through technical expertise or industry connections. These CEOs find it impossible to set up several angel or VC meetings in a day, as they could in Silicon Valley or Boston. To find appropriate angels and VCs they often must travel out-of-state. This presents two problems. First, it takes entrepreneurs away from their work growing their fledgling businesses. Second, the early-stage investors they find in Boston, New York or California often ask them to move their business nearby.

The complaints are not all on the entrepreneurs' side. In-state venture capitalists wish more Connecticut start-ups had experienced start-up management, and they long for a higher concentration of co-investors with whom to spread the risk of early-stage investments.

Several CEOs, including those who had not received funding from Connecticut Innovations (CI), spoke of the challenges that accepting CI investment had created for them. CI's restriction that companies in which it invests may not move out of state without repaying CI's investment with a 25% return creates two problems, even for companies that want to stay in-state. Reducing start-ups' future geographic flexibility makes them less attractive targets for other investors, who often value the ability of a company to move if the need arises. It also negatively affects how companies are perceived: investors assume that since CI money comes with strings attached, start-ups that accept CI investments must not have been able to find other money. Even though many of these companies would be content within Connecticut, this requirement impinges on their ability to grow.

Many of the complaints that crop up in the start-up CEO community result from the low concentration of entrepreneurs and early-stage investors. Start-up CEOs long for more law firms with emerging-companies practices (hosting events and offering favorable terms to the capitally-constrained), and more competition among early stage investors to improve the quality of deals offered to entrepreneurs. The unsatisfying but true answer to these concerns is that the state needs to find ways to encourage simultaneous growth in the entrepreneur and risk capital communities.

FINDINGS

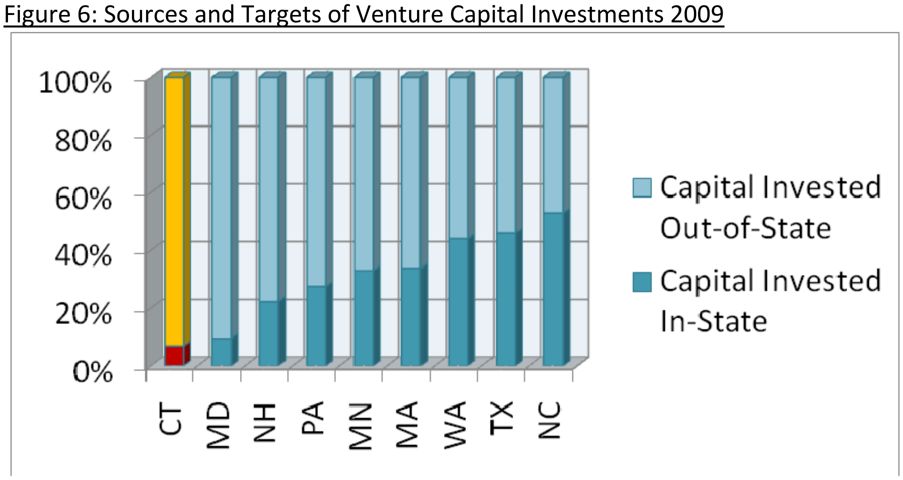
The state can only provide so much

To achieve high growth, start-ups need easy access to risk capital.[22] Capital received early on puts companies on the map, providing traction for later investments. The state is doing relatively well providing direct investment, but it is doing less well creating and capitalizing on networks to drive private investment in Connecticut companies. Connections to seed and early-stage risk capital providers often come through networks of young companies, universities, service providers and other investors, and it is here where Connecticut falters.

Though a great deal of private venture capital is managed in Connecticut, the chart below shows that relatively little gets invested within the state. This seems odd since the conventional wisdom is that venture capitalists prefer to invest nearby in order to keep watch over their investments. However, it may be explained by two facts: regions such as Raleigh-Durham, Silicon Valley and Boston got early leads in tech start-ups. As a result, venture capitalists that started investing there have relied on their growing networks in those places to find new deals. Also, venture capitalists nationally have been favoring later stage investments[23], for which proximity matters much less.

Connecticut's Percent of In-State Investment is Lower than Competitor States

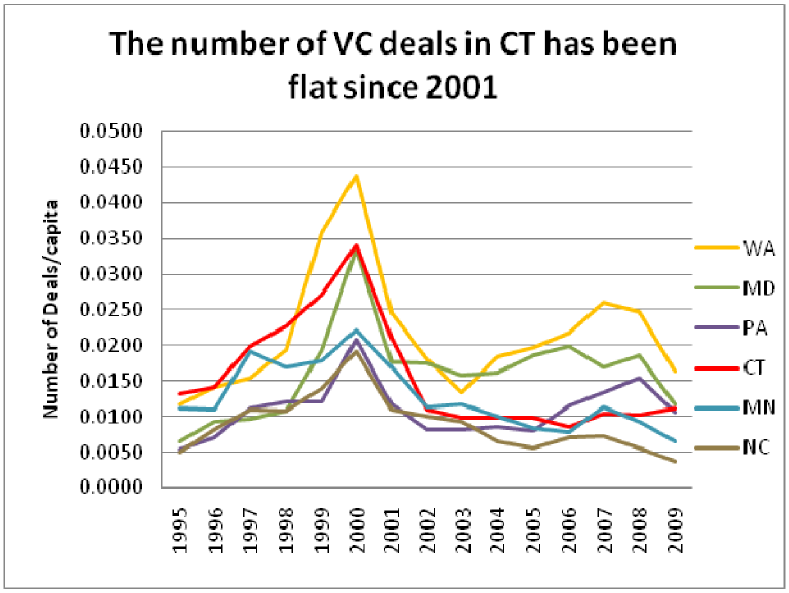
Figure 6: Sources and Targets of Venture Capital Investments 2009



Source: National Venture Capital Association, PriceWaterhouse Coopers

[22] SSTI, "A Resource Guide for Technology Based Economic Development." 2007.
[23] Ibid.

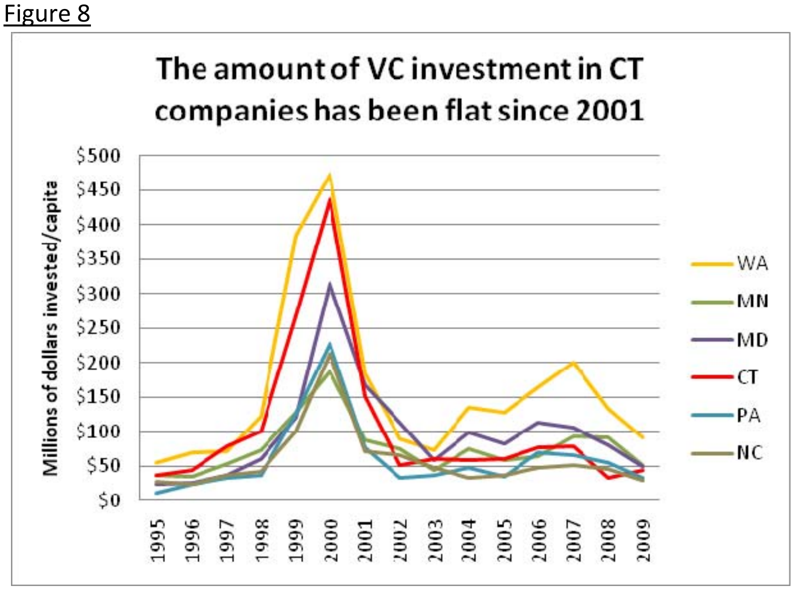
Figure 7: Historical Venture Capital Activity by Connecticut firms



Source: Money Tree. https://www.pwcmoneytree.com/MTPublic/ns/nav.jsp?page=historical

Connecticut's per capita investments are in the middle of the group of competitor states. While some other states managed to grow both the number of VC deals and the amounts invested between 2002 and 2008, Connecticut did not.[24]

Figure 8



Source: Money Tree. https://www.pwcmoneytree.com/MTPublic/ns/nav.jsp?page=historical

Things are looking up. Connecticut's 2010 Jobs Bill made improvements in the provision of risk capital for start-ups. It provides a one-time payment of $5 million to CI for a variety of pre-seed grants and programs, $200 million of reprogrammed insurance premium tax credits for use in capitalizing venture funds targeted at Connecticut-

[24] This chart omits Massachusetts because its values are so high they make other states' values difficult to read.

based technology and green energy firms, and $6 million a year to fund a 25% tax credit for qualifying angel investments. [25]

Growing a thriving entrepreneurial community requires an array of investors who can together provide significant levels of early-stage investment. Though Connecticut Innovations is considered one of the better state-run venture capital organizations,[26] its efforts are most effective when used to leverage the capital, expertise and networks of the private investment community.

IDEAS TO ADDRESS CONCERNS

Shift CI from evergreen fund into annual, publicly funded entity

Since an initial injection of public funds in 1989, Connecticut Innovations has supported itself exclusively from investment returns. Its results have been impressive, including $510 million gross state profit and 5,000 job-years. Yet despite an abundance of promising candidates, CI can back only a small number of companies per year. To maintain its investment positions in successful firms it must reserve significant amounts of money for follow-on funding as firm valuations increase. The state should supply annual funding to amplify CI's exceptional track record of creating self-sustaining high-tech jobs in-state by reducing the amount it must reserve for follow-on funding.

Develop More and Better Acceleration Organizations

- Full service early stage virtual accelerator—The state needs a coordinated system of innovation acceleration. The first piece is a full-service virtual accelerator providing promising ventures with pre-seed funding, access to creative peers, legal, technical and strategic advice, and networking events with angels and venture capitalists.

- $1M Start-Up X Prize to attract attention—The state could capture attention as being hungry for entrepreneurs by moving the Yale Entrepreneurial Institute model beyond Yale undergrads to emulate incubators like Cleveland's JumpStart and start-up intensives like Boulder's Tech Stars. We envision a well publicized program that recruits global talent for a set number of slots, offering one year's stipend, mentorship, incubator space and the ultimate promise of CI-backed funding for the best ideas at the end of the year.

- Start-up executive-in-residence program—Venture capital firms investing in Connecticut companies face a dearth of experienced start-up management talent to help young ventures grow quickly. It is difficult to lure experienced start-up CEOs to Connecticut, where they fear it will be hard to find work after the venture's exit. To mitigate such dramatic career changes risk for managers the state should invest in a cadre of start-up executives, each running three ventures and each free at any point to go to work with a venture full-time.

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[25] Connecticut DECD. "Governor Rell Hails Passage of Comprehensive Bipartisan Jobs Bil.l" http://www.ct.gov/ecd/cwp/view.asp?a=1104&q=459694

[26] "CI received national recognition in 2007, winning the Excellence in TBED Award from the SSTI, a national nonprofit organization dedicated to improving state and regional economies through science, technology and innovation. The award recognized CI and its Eli Whitney Fund for successfully increasing early-stage technology companies' access to capital." http://www.ctinnovations.com/blog/?p=228

CONCLUSION: HIGH COSTS REQUIRE A SUPPORTIVE, DYNAMIC BUSINESS ENVIRONMENT

QUOTES FROM CONNECTICUT CEOS

"The margins are high enough in my business that I can stay here."

"High taxes and healthcare costs make hiring risky."

"If taxes get worse and the money's not going to deficit reduction, I'll just go to Ireland."

CEO PERSPECTIVE

Tech CEOs want to be in Connecticut for its talented workforce, good schools, and high quality of life—the proximity to New York, Boston, and New England natural resources. They are willing to continue paying high prices to live here *if it means being in a world class innovation environment*, which Connecticut currently is not.

FINDINGS

The cost-to-value ratio is what matters

There is no doubt that high business costs are annoying and do not help Connecticut grow, retain or attract companies. However, it appears from our interviews that not all companies view high costs the same way. Legacy firms with low margins may not be able to abide high costs, but fast-growing technology companies appear to care more about growth than costs, and to the extent a place can help them grow may be worth a big price tag. When we compare Connecticut's costs with those of its competitor states we find an interesting trend: states that do well on competitiveness rankings tend to have high costs. The best way of looking at costs is in relation to value. Connecticut could be more attractive either by lowering its costs or by improving its competitiveness. We believe it is far easier to do the latter.

Table 6

State	2010 State New Economy Index (Kauffman/ITIF)	2007 Cost of Doing Business Index, 2007 [1 = least expensive] (Milken Institute)
Massachusetts	1	46
Washington	2	35
Maryland	3	39
Connecticut	**5**	**45**
New Hampshire	11	38
Texas	**18**	**26**
Pennsylvania	22	29
North Carolina	**24**	**19**

Competitiveness

Cost

To grow their companies in Connecticut, CEOs of high potential growth firms need a few things. They want relationships with the governor and others at the state level who are empowered to make the system work smoothly. They need to be in a place where it is simple and fast to get out to the rest of the world. They must find it easy to connect with leaders, researchers and companies in related fields to be at the intellectual forefront of their industry and to access fluid labor markets. And start-up CEOs need to operate within networks that provide advice, contacts and risk capital.

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