University-Driven Hyper-Local Innovation Ecosystems:

How to Grow & Leverage Their Strategic Potential

Mike Cohen
Director, Innovation Ecosystem Development
UC Berkeley Office of Technology Licensing
mike.c@berkeley.edu
510-643-7201

Provocative Premise:

To continue its advance toward the top-tier of research universities, UC Davis must establish a world class hyper-local innovation ecosystem.

This should be a top 3 (not just top 10) strategic priority for the UC Davis STEM-B* Programs…

**STEM-B: Science, Technology, Engineering, Math & Business/Management*

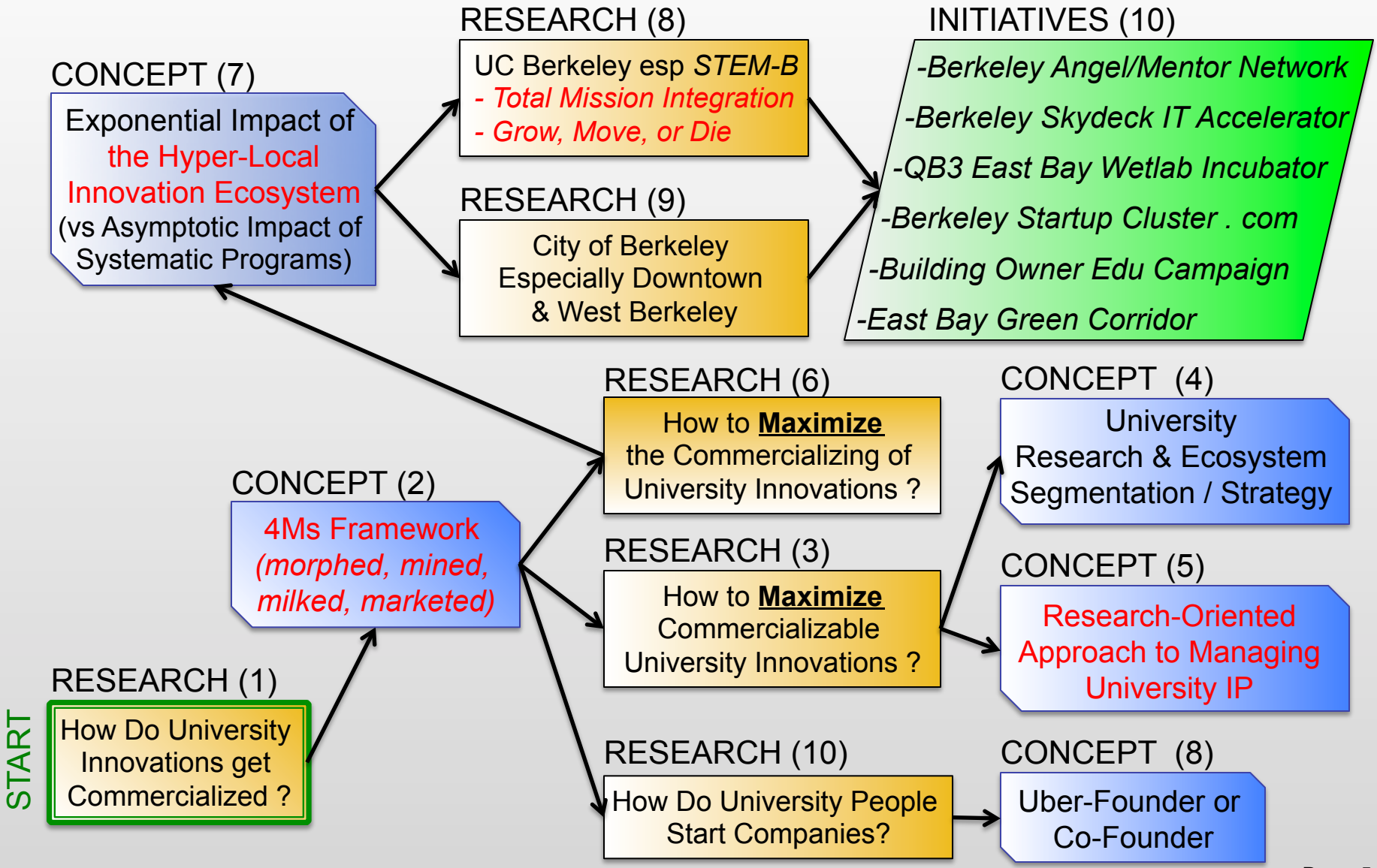
Agenda: *Hyper-Local Innovation Ecosystems*

1. Brief Bio
2. Framework for How University Innovations Get Commercialized
   - The 4Ms: ***Morphed***, ***Mined***, ***Milked*** & ***Marketed***
   - University startup ***spin-outs*** versus ***blast-outs***
   - ***Co-founders*** versus ***uber-founders***
3. Bifurcation of Activities that Drive Commercialization
   - Systematic activities that have an ***asymptotic*** impact
   - Organic activities that have an ***exponential*** impact (and are cost-effective)
4. University Hyper-Local Innovation Ecosystems (Hy-LIE)
   - Definition & segmentation
   - Strategic value to university
   - Role of accelerators to localization
5. Hy-LIE 10 Best Practices & 5 Predictions
6. Town-Gown Case Study: Berkeley CA

Bio: *Commercializing Leading-Edge Technology*

1. Engineering undergraduate degree
2. Systems Engineer @ HP (back when most admired company)
3. MBA degree
4. Sun Microsystems Inc (product manager)
5. Mips Computer Systems Inc (product line manager)
6. Silicon Graphics Inc (product family of servers, $100M revenue)
7. Netpulse Networks Inc (co-founder, $10M+ in venture funding)
8. Peak Democracy Inc (co-founder, bootstrapped lean startup)
9. UC Berkeley

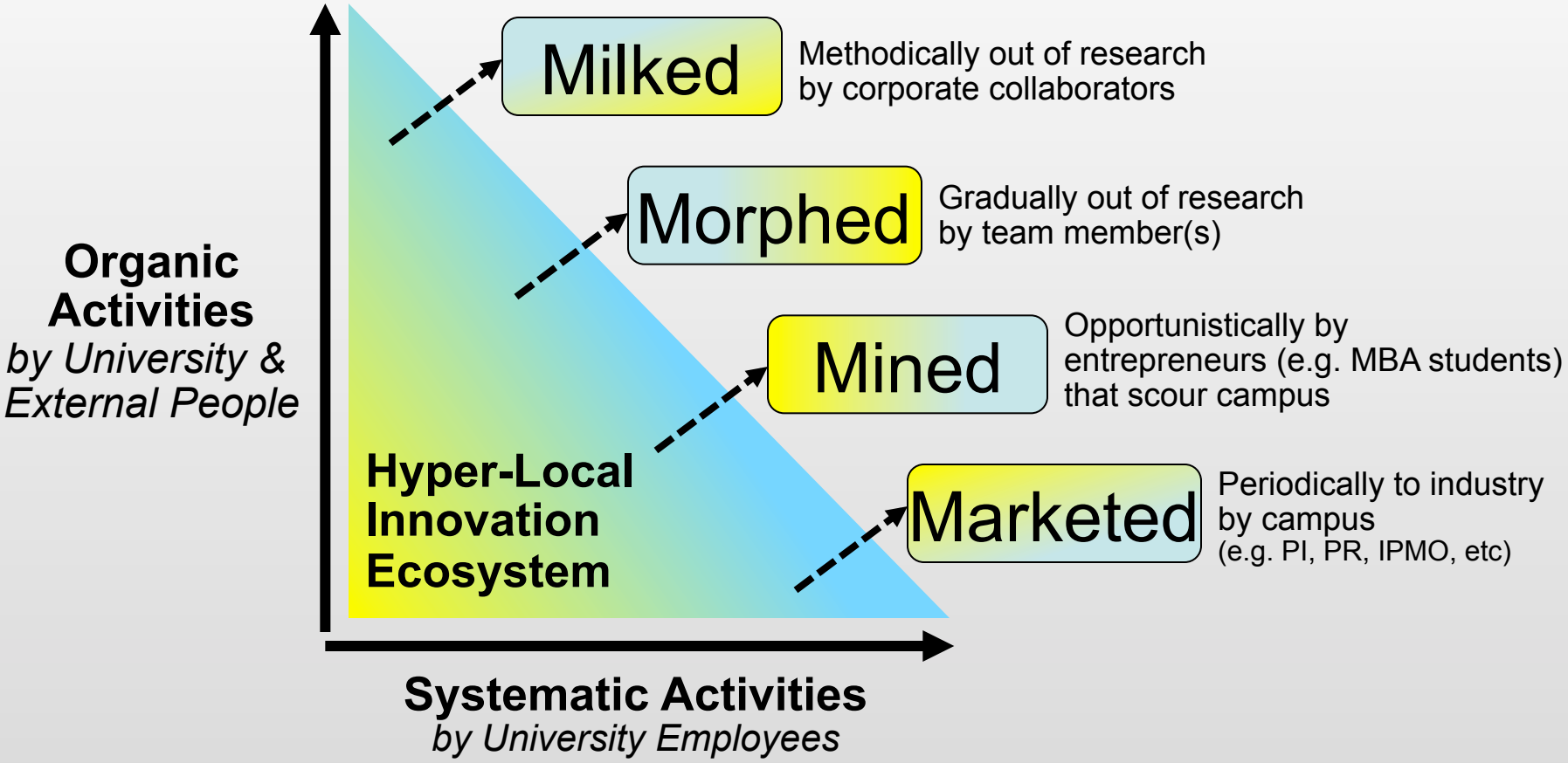
Bio: *UC Berkeley Research, Concepts & Initiatives*



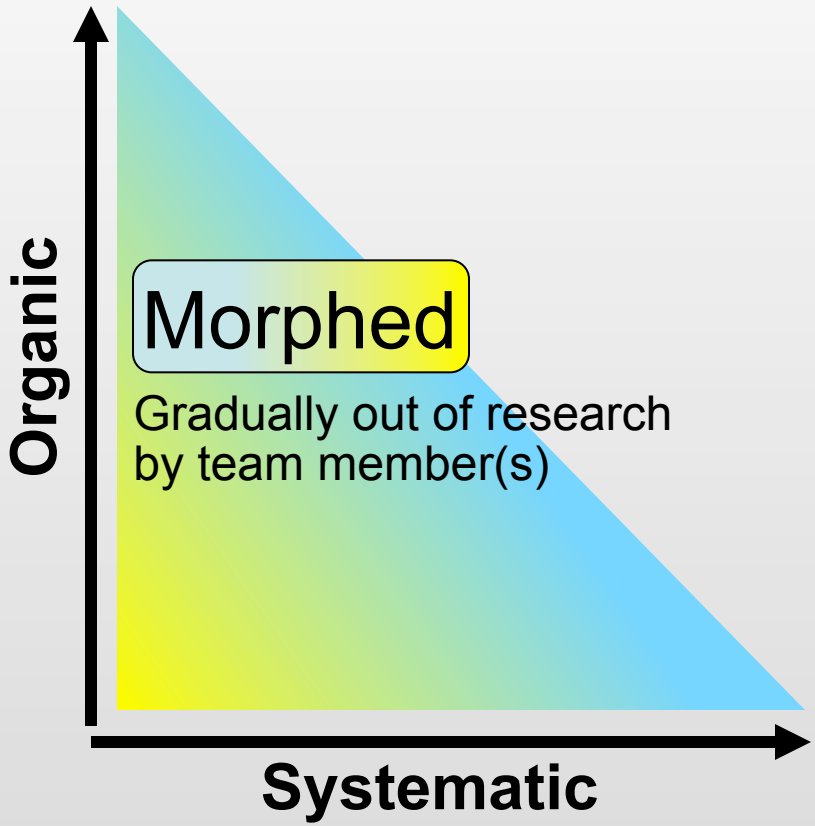
Research: *How Univ Innovations Get Commercialized ?*

- **Questions**: How do university innovations get commercialized?
  - Conventional answer is linear (research=>invention=>license =>commercialize)
  - What and/or who catalyzed the commercialization?
  - How are universities involved in the process?
  - How can universities increase innovation commercialization?
- **Answers**:
  - Researched commercialization of >50 UCB & LBNL innovations
  - Research revealed 4 common patterns/pathways
  - Developed a useful framework based on 4 patterns
  - Developed strategies for optimizing the 4 pathways

4Ms Framework: *4 Pathways for Commercialization*

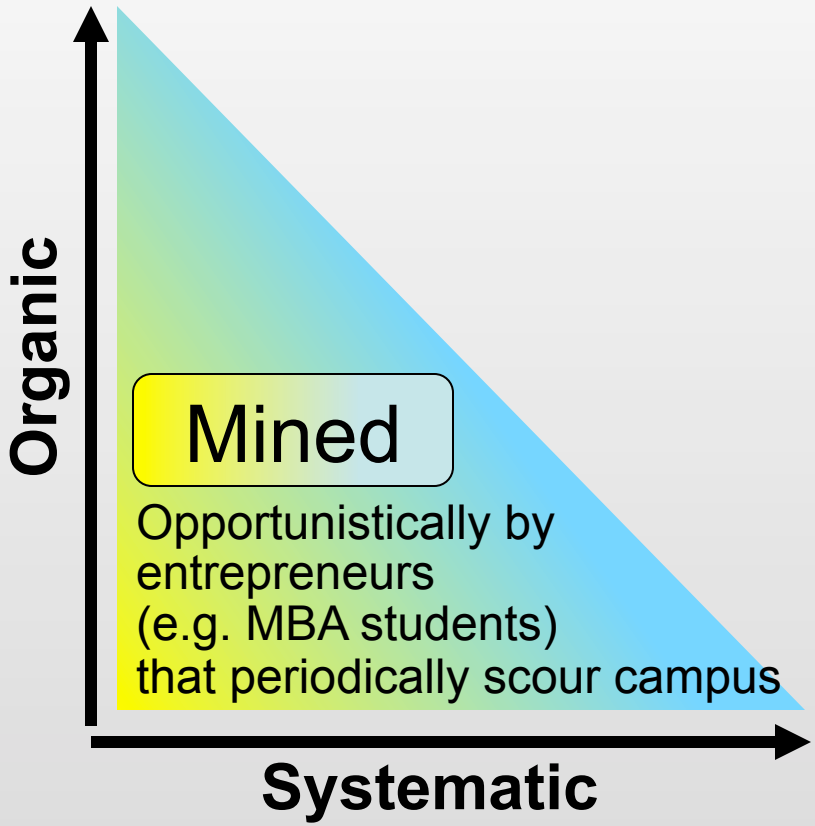


4Ms Framework: ***Morphed***, *Mined, Milked, Marketed*



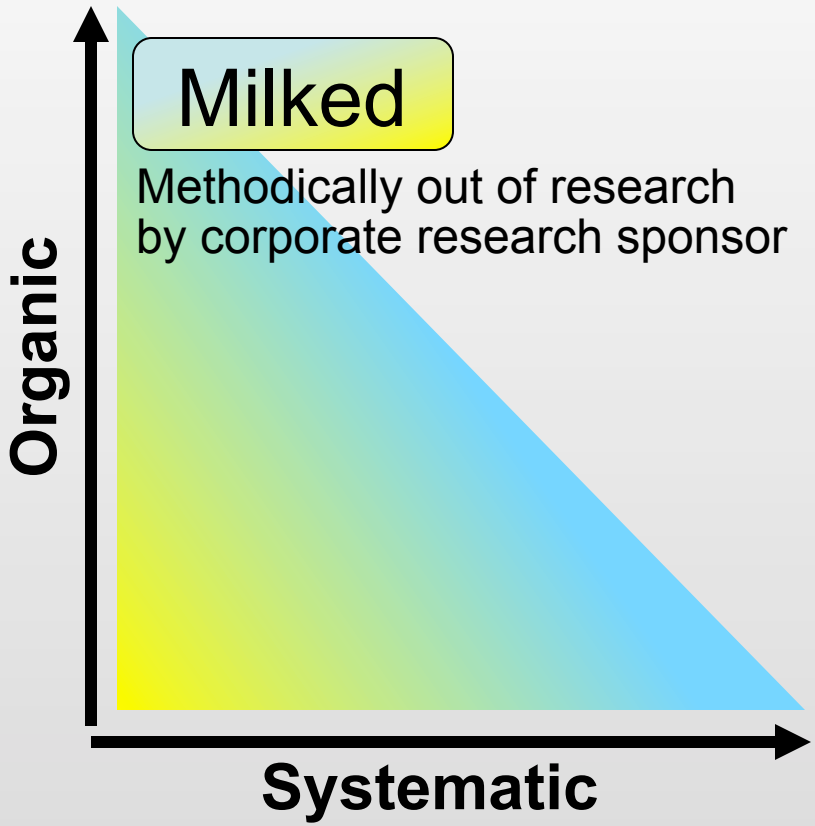
- Examples: Amyris, Calimetrics, CaliSolar, CellASIC, Chiron, Ensighta Security, Excellin, Fluxion Biosystems, GoodGuide, Harmonic Devices, Hybrid Wisdom Labs, Inktomi, Integrated Diag, IntelliOne, Kalinex, Lumiphore, Mercator Med, MicroClimates, MicroFluiDX, OnWafer, ON Diagnostics, PhotoSwitch Bioscience, Redwood Bioscience, Safely, SiClocks, TheraFuse, Urban Scan, Verimetra Med, Wireless Industrial Tech, Dust Networks, Iris AO, SiTime, NanoGripTech*
- Drivers:
  - Quantity & Quality of Research
  - Ecosystem: Spin-out vs Blast-out
- IP:
  - Some obtain exclusive license to improve biz plan & attract investors
  - Some ignore or abscond with IP

4Ms Framework: *Morphed, **Mined**, Milked, Marketed*



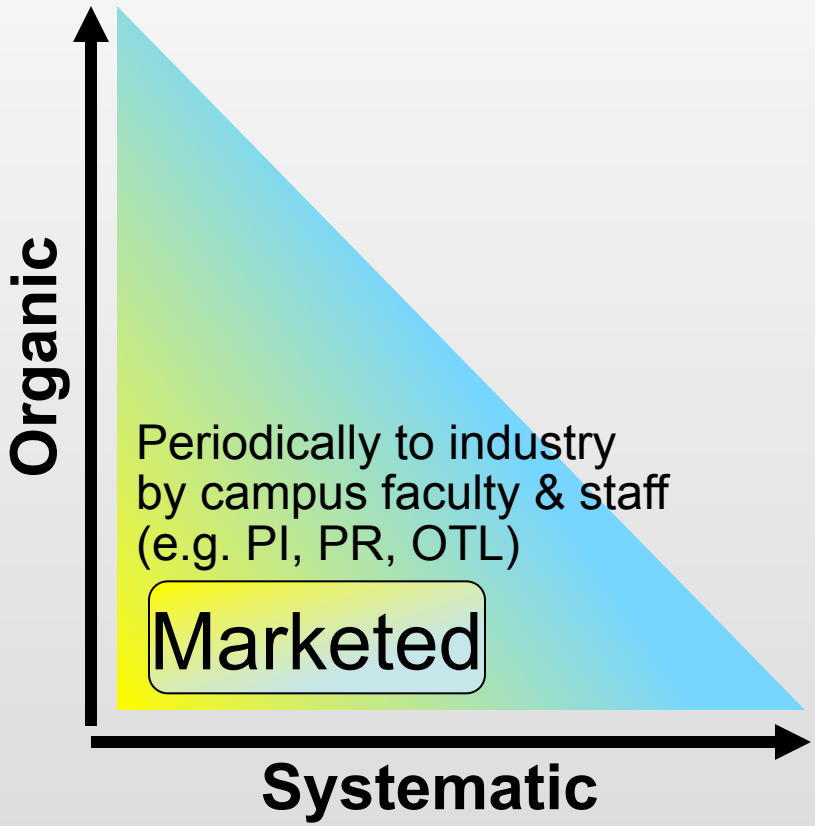
- Examples: Adura Tech, Aurora Biofuels, CommandCAD, Euclid Media, MediFuel, NanoRay, nanoPrint
- Drivers:
  - Quantity & Quality of Research
  - MBAs, Biz plan comp, OTL mrktg
- IP:
  - Many obtain exclusive license to improve biz plan & attract investors
  - Some ignore or abscond with IP
- Comments:
  - Pathway with highest growth rate
  - MBAs are the campus's EIRs

4Ms Framework: *Morphed, Mined,* ***Milked****, Marketed*



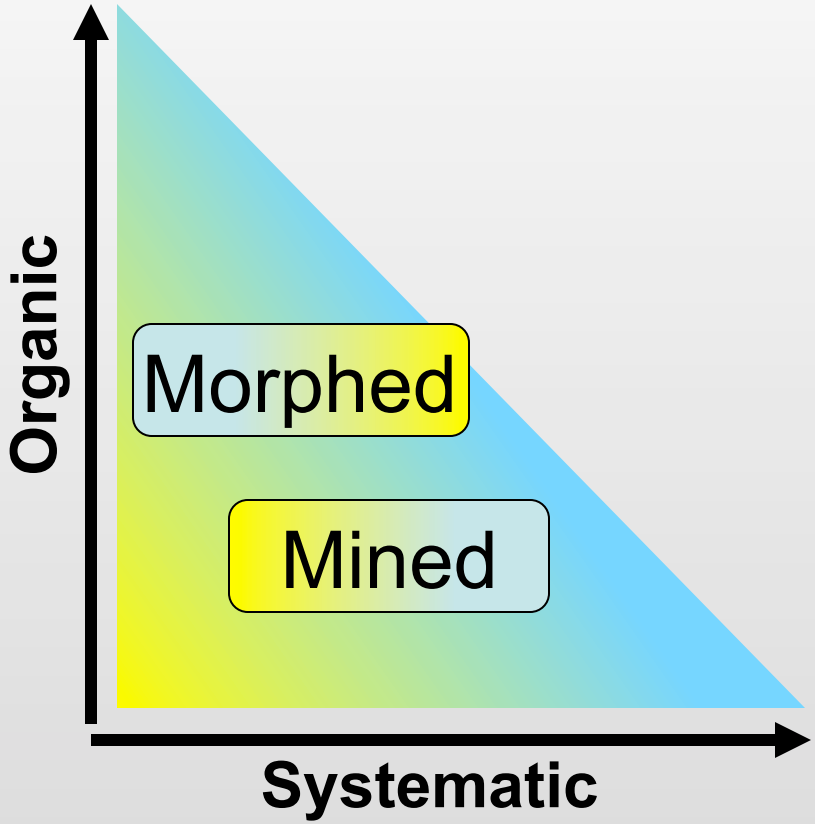
- Examples (*that licensed IP*): Analog Devices, Nueprene (XL Tech), Google, Honeywell, Intel, Berkeley Bionics (first morphed then milked)
- Drivers:
  - Great sponsored research with optimized terms (i.e. 1st access, NERF, open source, etc)
  - Off-campus corporate labs (i.e. BWRC, Intel, Cadence, Yahoo, Starkey, etc)
- IP:
  - Some jointly own IP
  - Some obtain a license to legally use IP or thwart competitors
  - Some ignore or abscond with IP (why license when get know-how)

4Ms Framework: *Morphed, Mined, Milked,* ***Marketed***

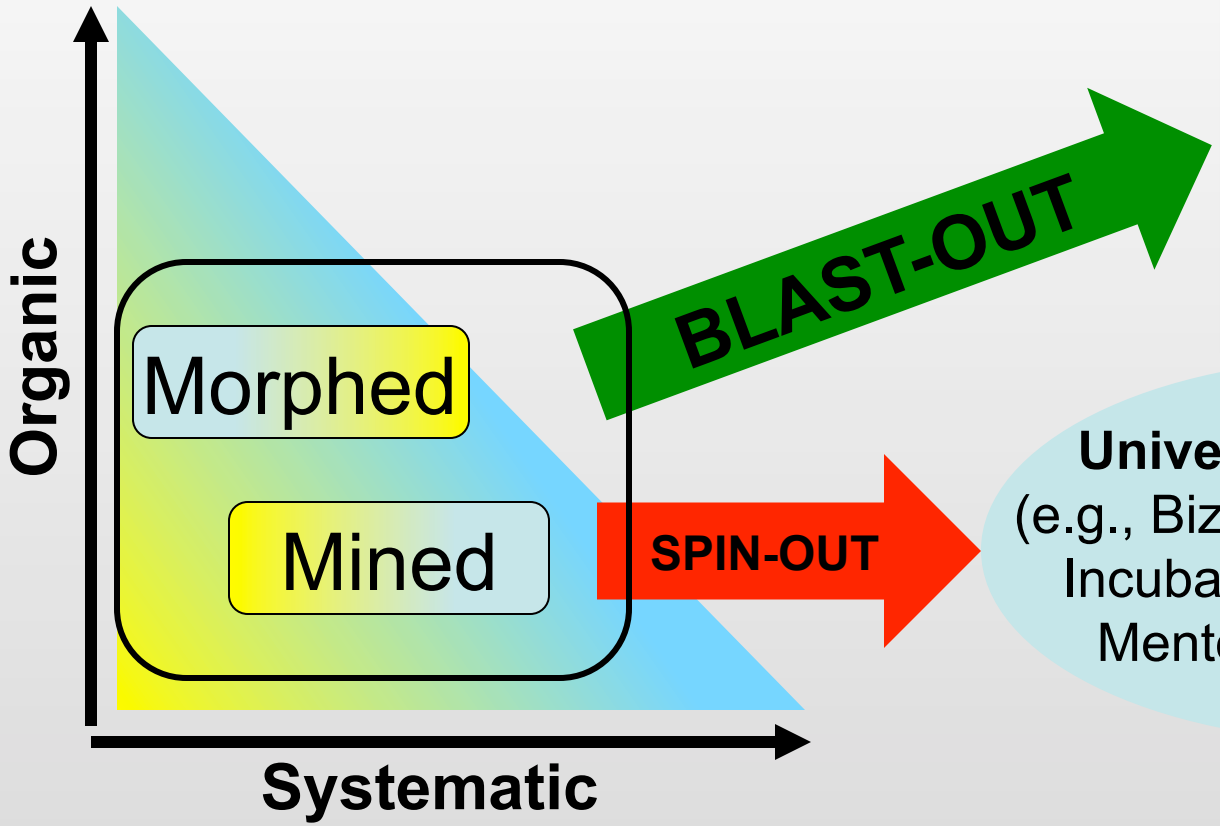


- Examples: Arkal Medical, Cisco, ClimateCooler, FuelFX, Luminus Devices, Honeywell, Microchip Biotech, Renovis, Sand9, Silicon Basis, Solexel, Vitesse, 3M
- Drivers:
  - Quantity & Quality of Research
  - Marketing (i.e. IP Licensing offices, University PR programs, Faculty pubs & ppts, Patent pubs, etc)
- IP:
  - Most obtain exclusive license to stay legal, improve BP, attract investment, or thwart competitors
  - Some ignore IP or abscond with IP
- Comments: Didn't get *morphed*, *milked* or *mined* because tech or market too nascent when invented

4Ms Framework: *University Startups*



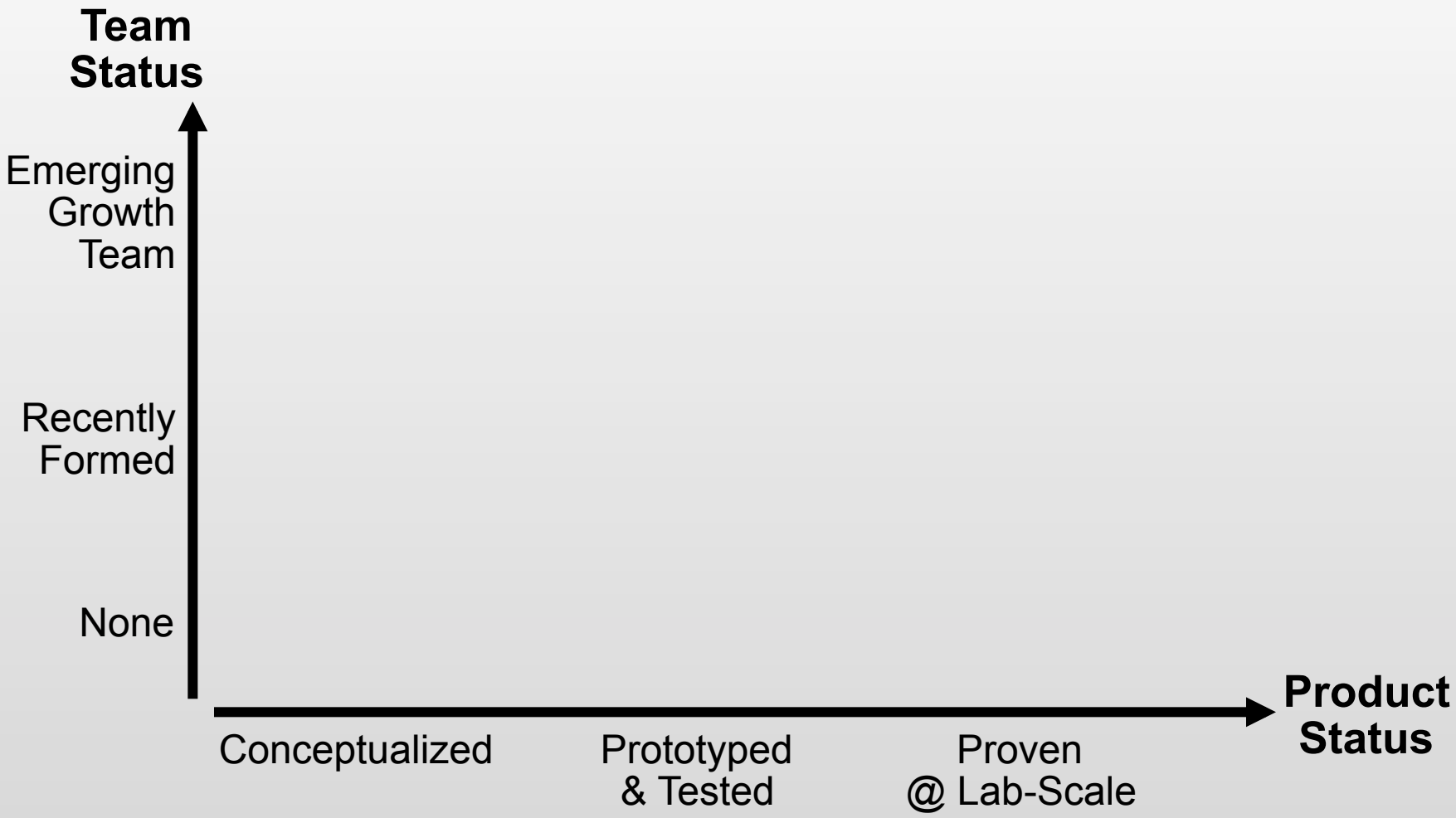
University Startups: *Spin-outs vs Blast-outs*



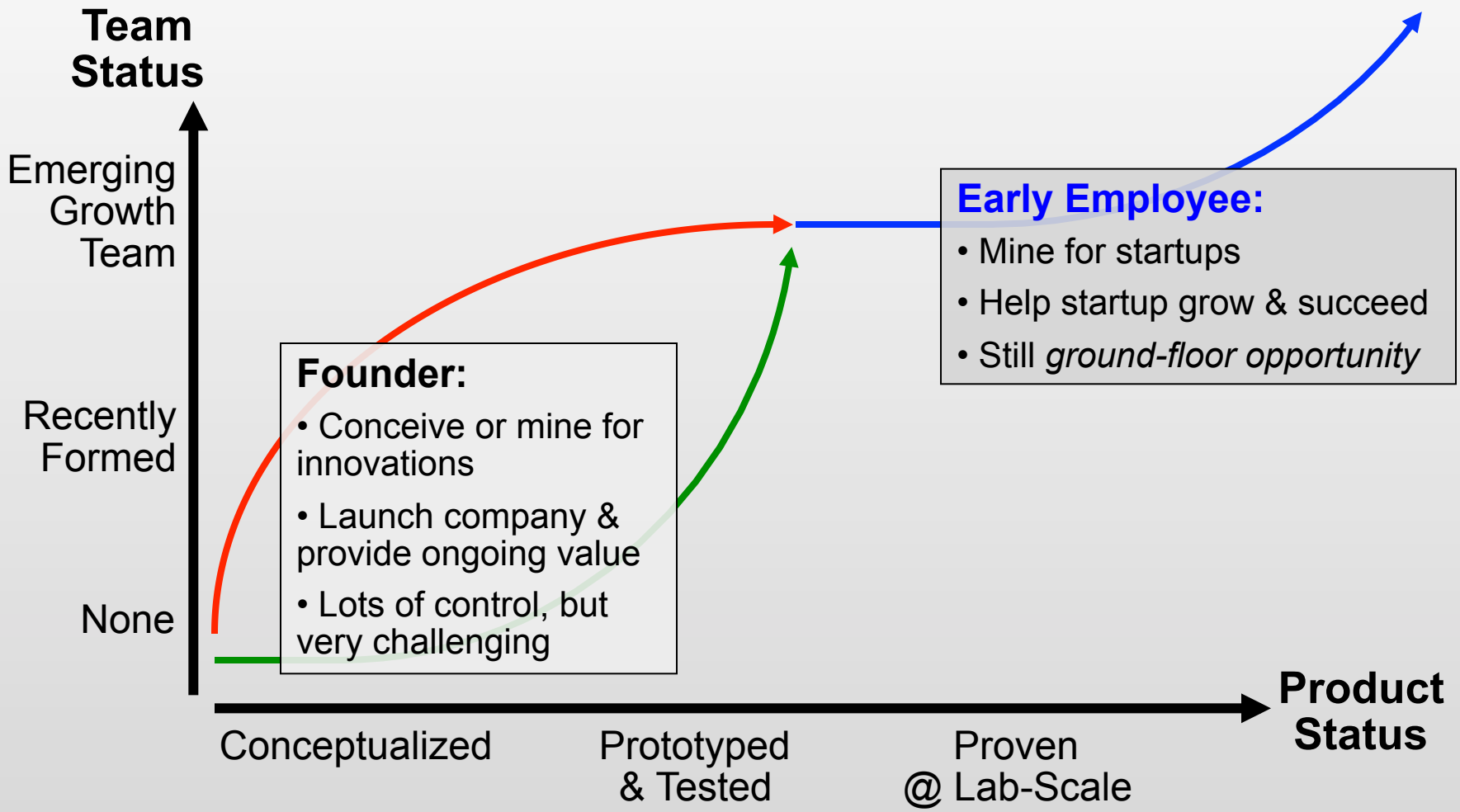
Examples: Amyris, CaliSolar, Chiron, Ensighta Security, GoodGuide, Inktomi, IntelliOne, Mercator Med, OnWafer, ON Diagnostics, Safely, TriFacta, Dust Networks

University Resources
(e.g., Biz Plan Competitions, Incubators/Accelerators, Mentor Networks, etc)

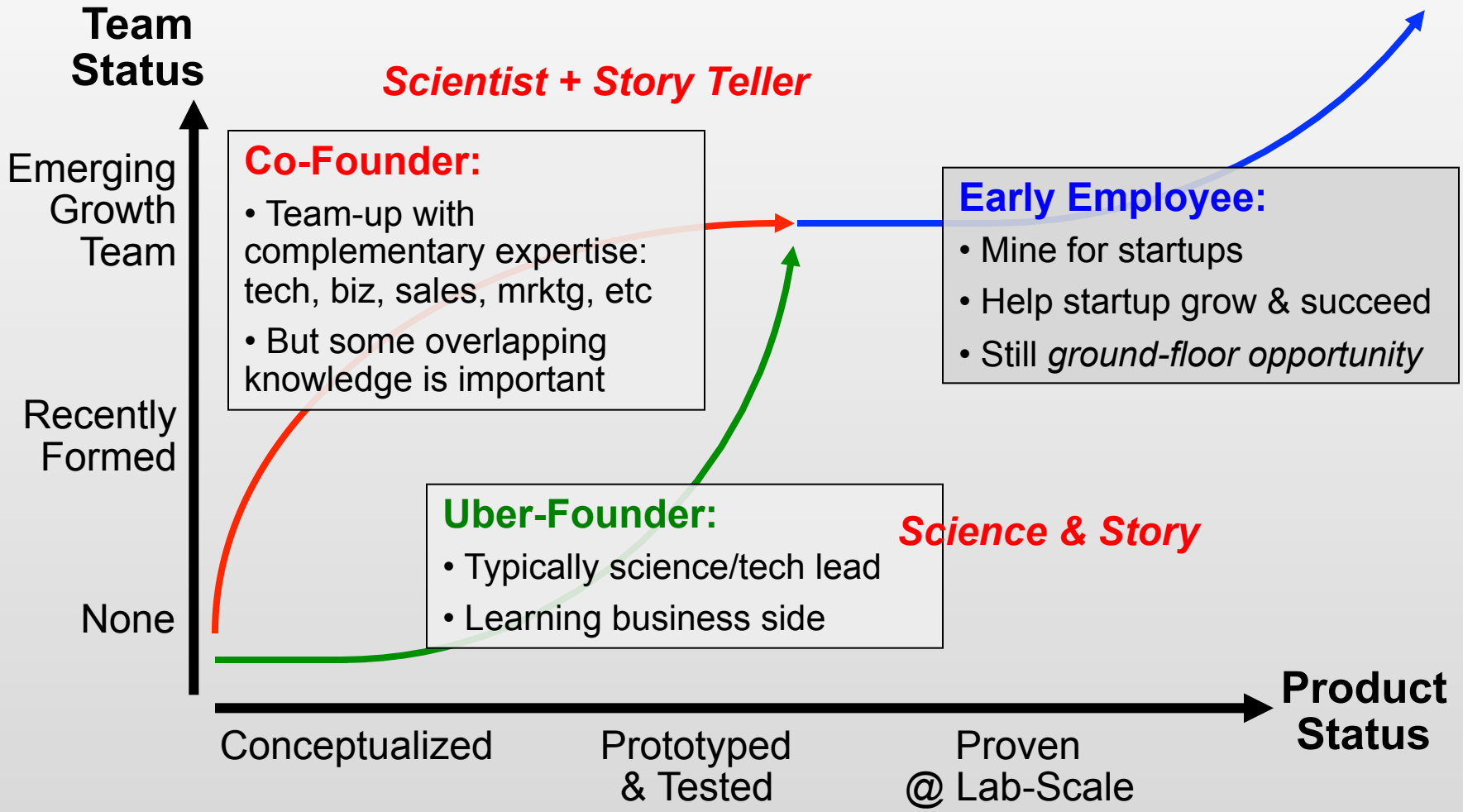
University Startups: *Tapping into Ecosystem*



University Startups: *Founder vs Early Employee*



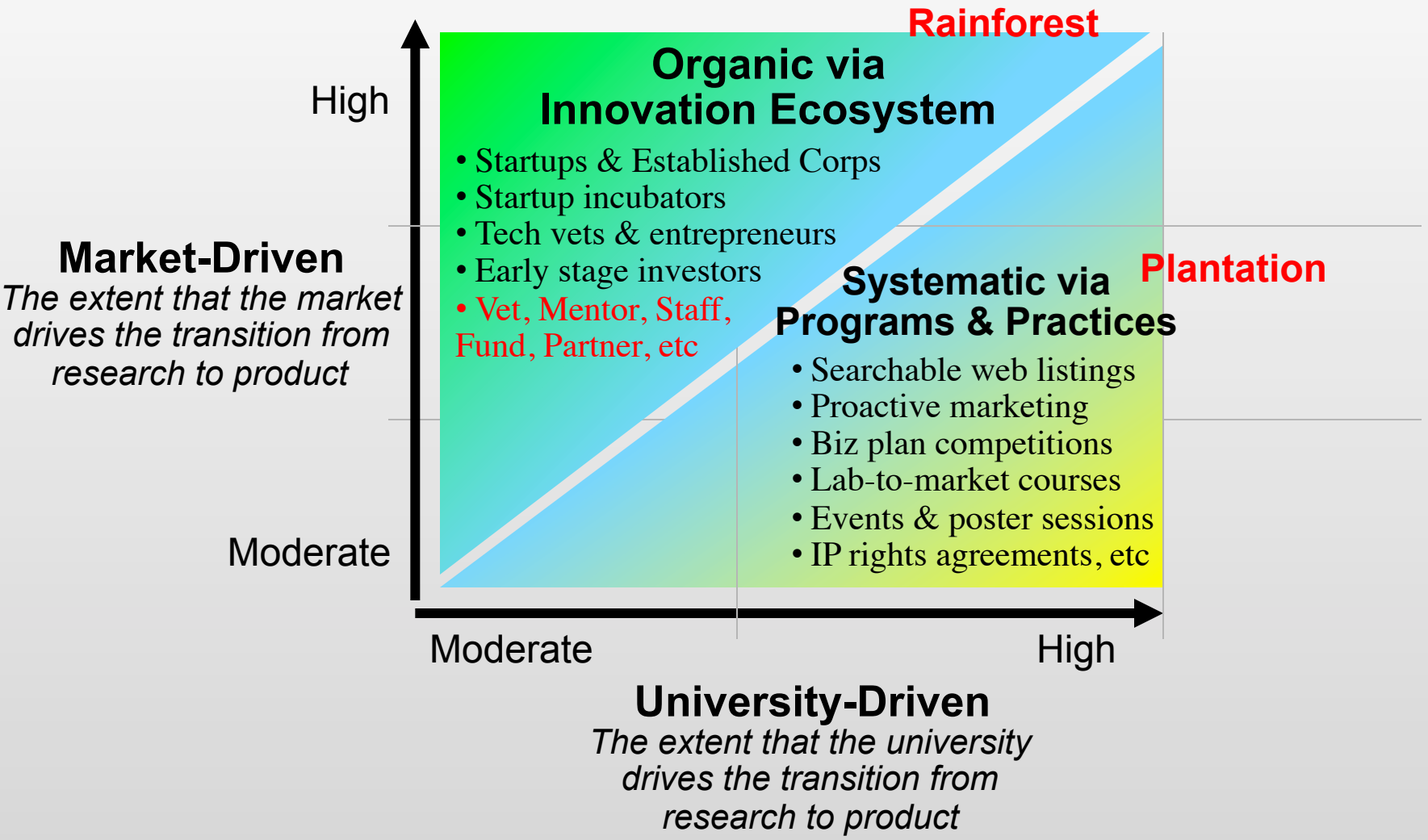
University Startups: *Uber-Founder vs Co-Founder*



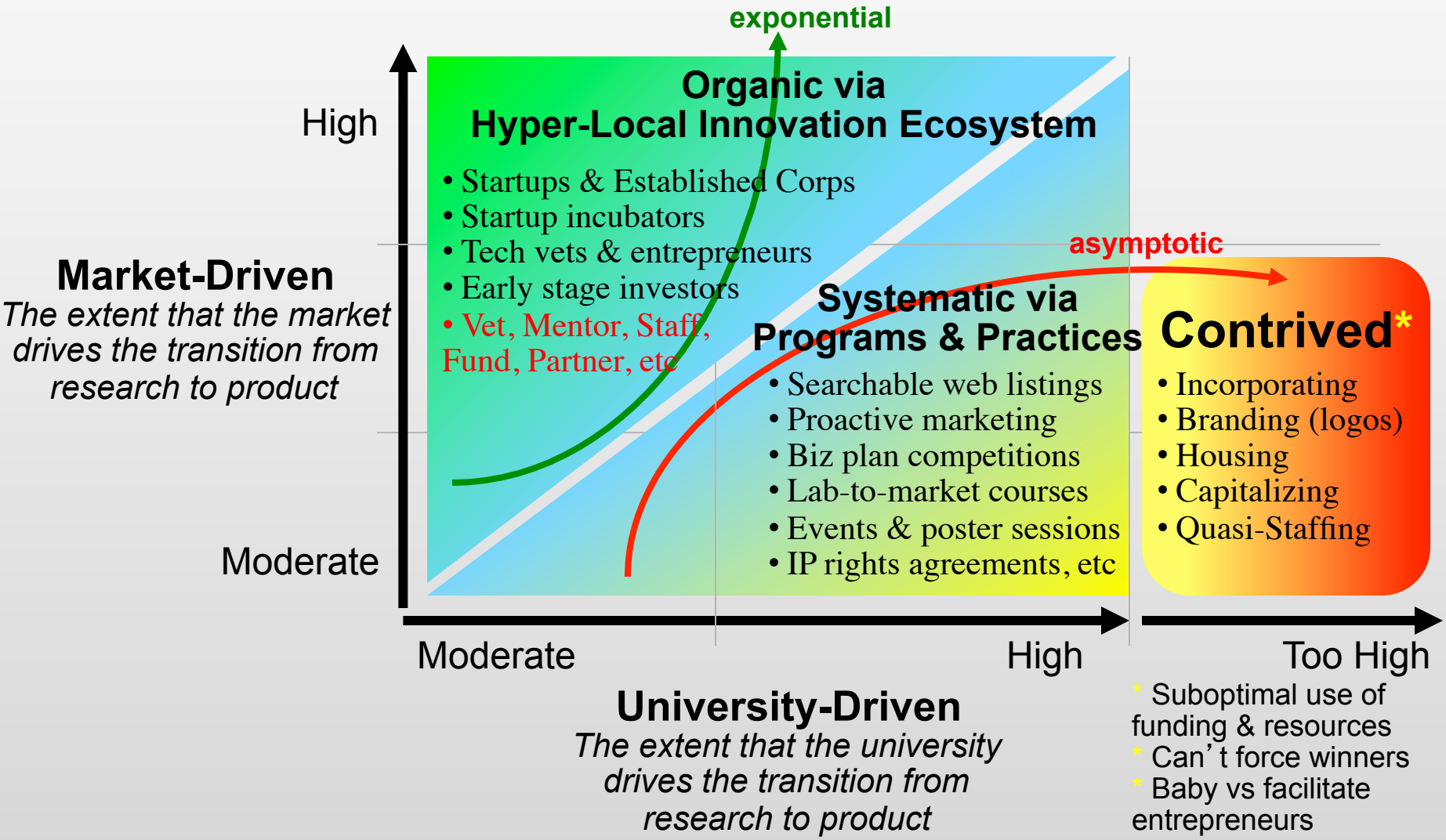
Research: *What Campus Activities Drive the 4Ms ?*

Pathways (4Ms)	Activities, Catalysts, Programs, Initiatives	Recent Progressive Approaches	Offices	Ideas & Comments
Morphed	•Entrepreneurship classes •On-campus Incubators •Entrepreneurial Admissions •Entrepreneurial Culture	•On-campus incubators co-located with special lab facilities	•CET (CoE) •Haas (MOT, Lester) •OTL	•SBIR/STTR help center •Berkeley Startup Cluster
Mined	•Entrepreneurial MBA Program (EIRs) •Biz Plan & Tech Competitions •Research-to-Market Courses (C2M) •Seminars & Poster Sessions (YAPS) •Haas Speaker Series & VC Office Hours •Haas Bancroft Incubator	•Cleantech-2-Market Course	•Haas (Lester) •OTL •CoE •CITRIS •QB3 •Student Clubs (BERC)	•Berkeley Startup Cluster •Berkeley Center for Growth Companies
Milked	•Institutional response to RFPs •Opportunistic PIs •Sponsored Research Agreements •Visiting Industrial Fellows •Faculty Consulting & Student Hiring	•Research-Oriented Approach to Managing IP rights (e.g. NERFs, BIP, SRA IP grants, etc)	•VCRO •IPIRA (IAO & OTL) •CoE •CITRIS •QB3	•Adjacent R&D Office Parks/Buildings •Research Enterprise Marketing
Marketed	•Newsletters & Press Releases •Searchable Web Listings •Serial Entrepreneur & VC Discussions •Scholarly Publications & Presentations	•	•CoE •OTL •NewsCenter	•EBGC Customer Cred Program •EBGC Cluster Clubs •Email Mrktg

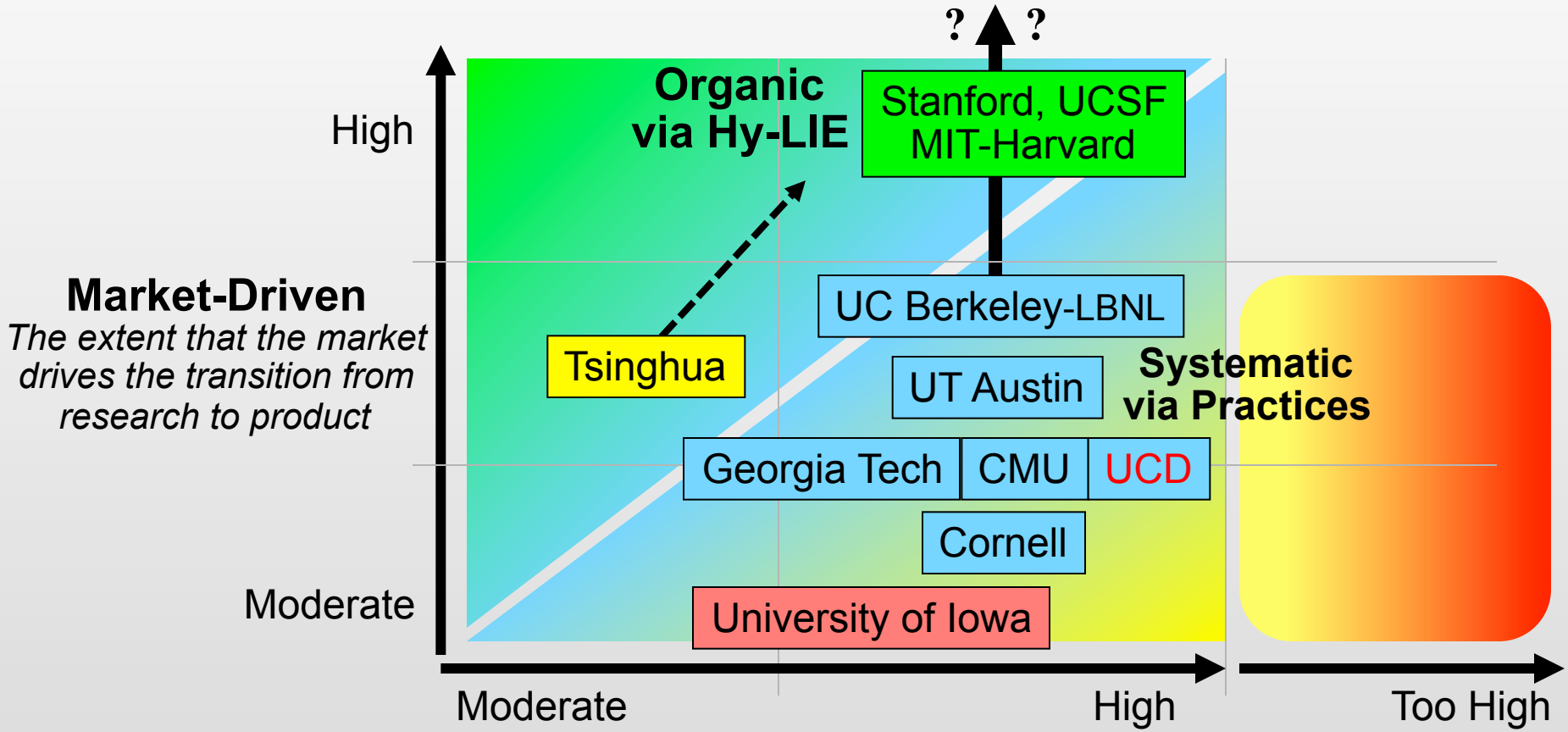
Bifurcate Campus Activities: *Systematic & Organic*



Systematic v Organic: *Impact - Asymptotic v Exponential*



Systematic v Organic: *Comparing Position & Potential*



Research: *University's Hyper-Local Innovation Ecosystem?*

- **Situation:**
  - UCB / UCD is a California public university (not a Berkeley university)
  - UCB / UCD prides itself on its global perspective & reach
  - UCB / UCD has been delighted with just getting its innovations commercialized – regardless of where (from Berkeley to Boston)
- **Question**: Should UCB / UCD be indifferent as to where its innovations get commercialized ?
  - Does local commercialization only help the local economy ?
  - Could local commercialization also help the University ?
- **Answers**:
  - Defined what is a University Hy-LIE & Assessed what are its benefits
  - Hy-LIEs have strategic value to university – not just econ value to region

Hyper-Local Innovation Ecosystem (Hy-LIE): *Definition*

University Hyper-Local Innovation Ecosystem:

Cluster of R&D-oriented entities readily accessible to the campus – including small & large corps, tech vets, entrepreneurs & early stage investors as well as related supply chains & service providers

Hyper Local: Convenient: walk, bike, shuttle or short drive (with easy parking)

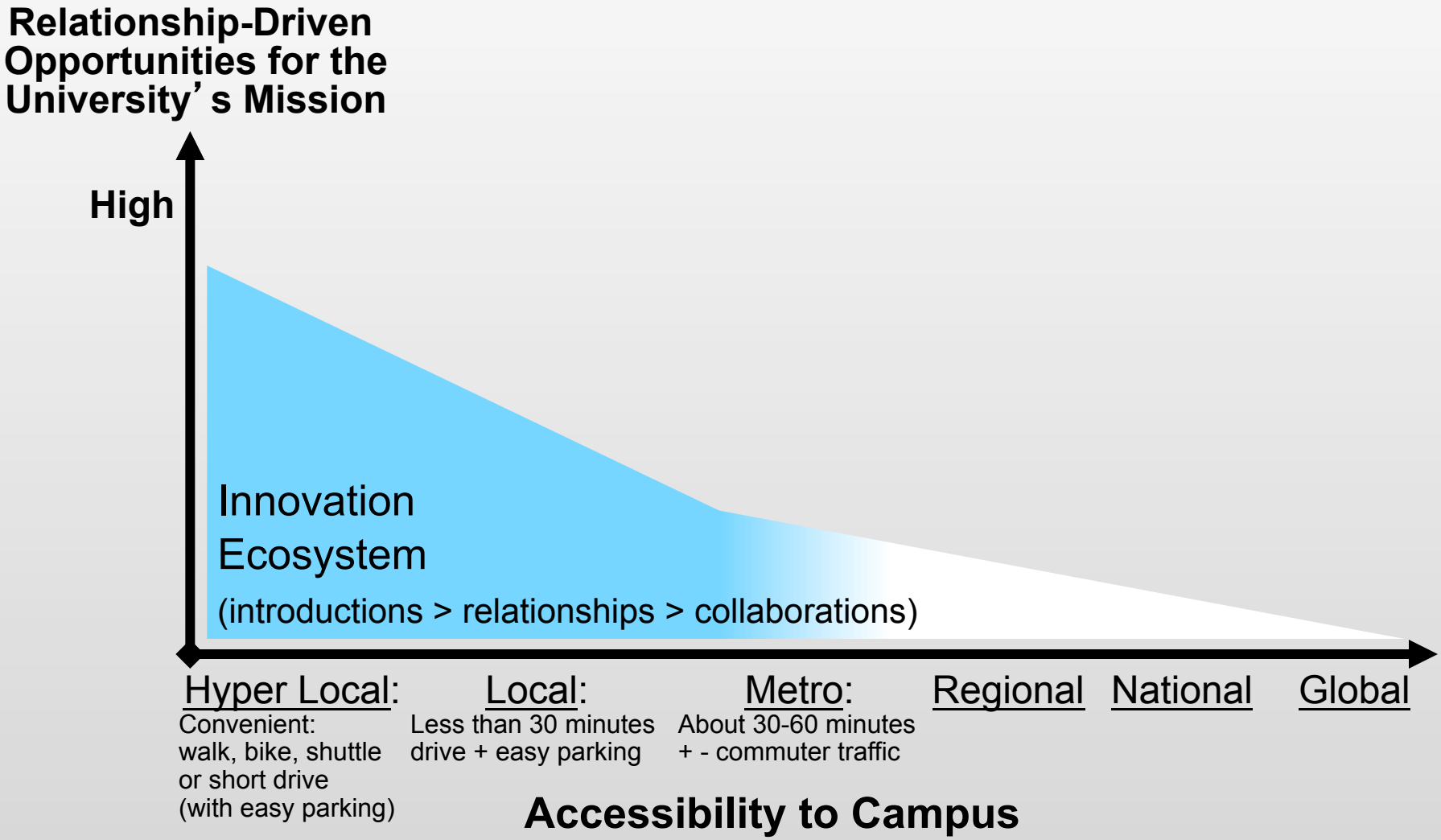
Local: Less than 30 minutes drive + easy parking

Metro: About 30-60 minutes + - commuter traffic

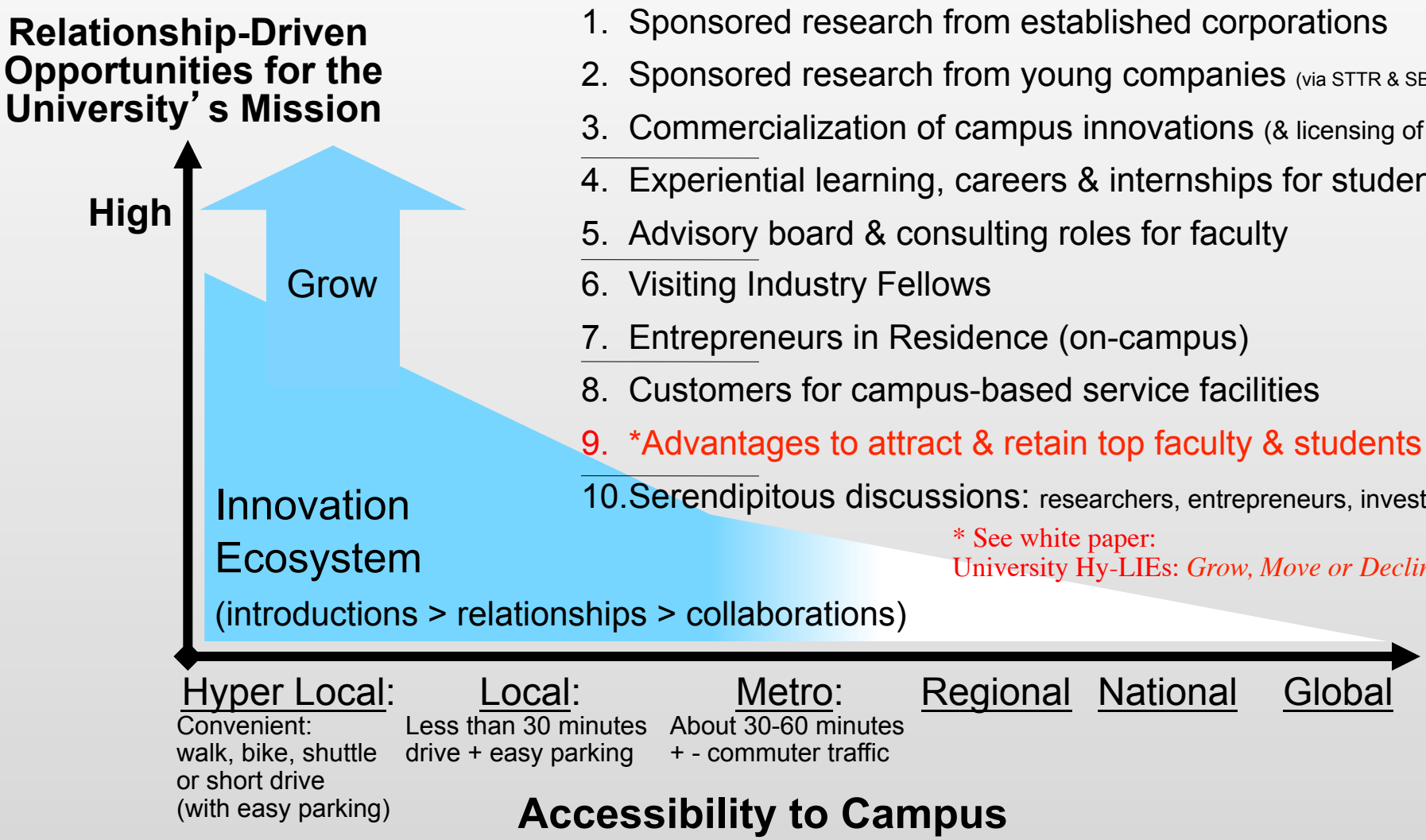
Regional **National** **Global**

Accessibility (not just Proximity) to Campus

Hy-LIE: *Strategic Value to University*



Hy-LIE: *Bolster Research, Education & Tech Xfer*

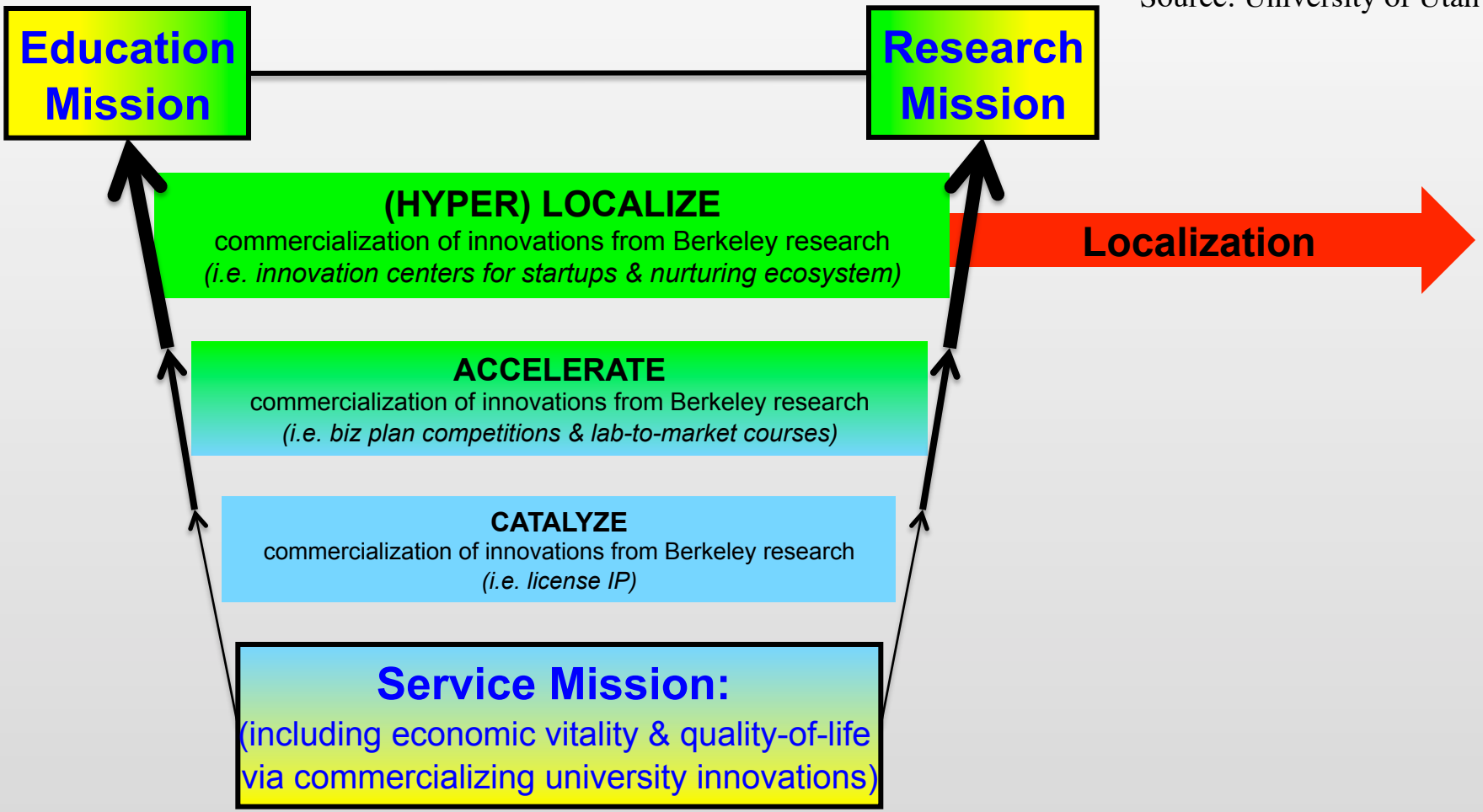


1. Sponsored research from established corporations
2. Sponsored research from young companies (via STTR & SBIR)
3. Commercialization of campus innovations (& licensing of IP)
4. Experiential learning, careers & internships for students
5. Advisory board & consulting roles for faculty
6. Visiting Industry Fellows
7. Entrepreneurs in Residence (on-campus)
8. Customers for campus-based service facilities
9. *Advantages to attract & retain top faculty & students
10. Serendipitous discussions: researchers, entrepreneurs, investors

* See white paper:
University Hy-LIEs: *Grow, Move or Decline*

Hy-LIE: *Achieve "Total Mission Integration"**

* Source: University of Utah



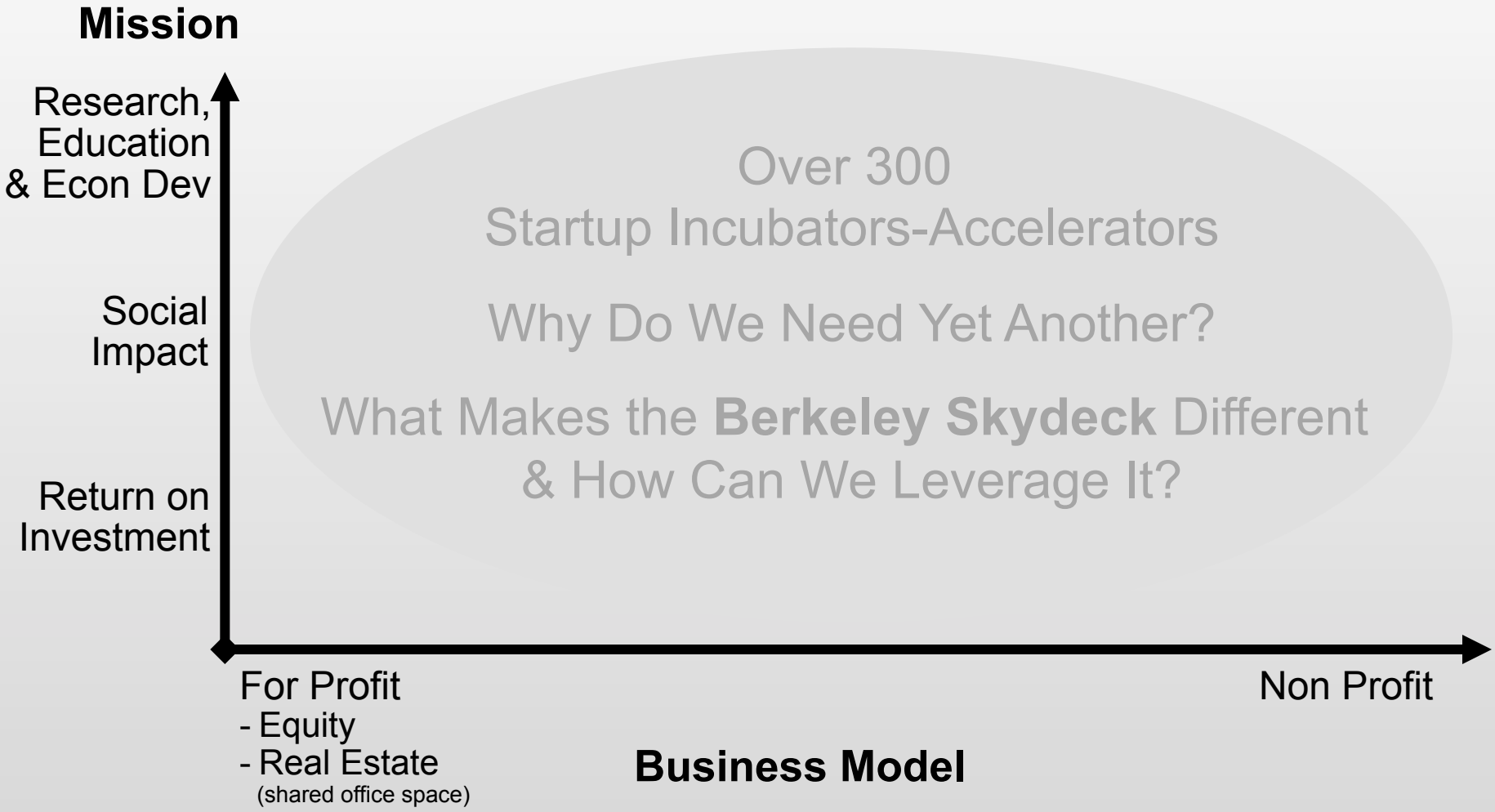
Localization: *Role of University Startup Accelerators*

Over 300
Startup Incubators-Accelerators

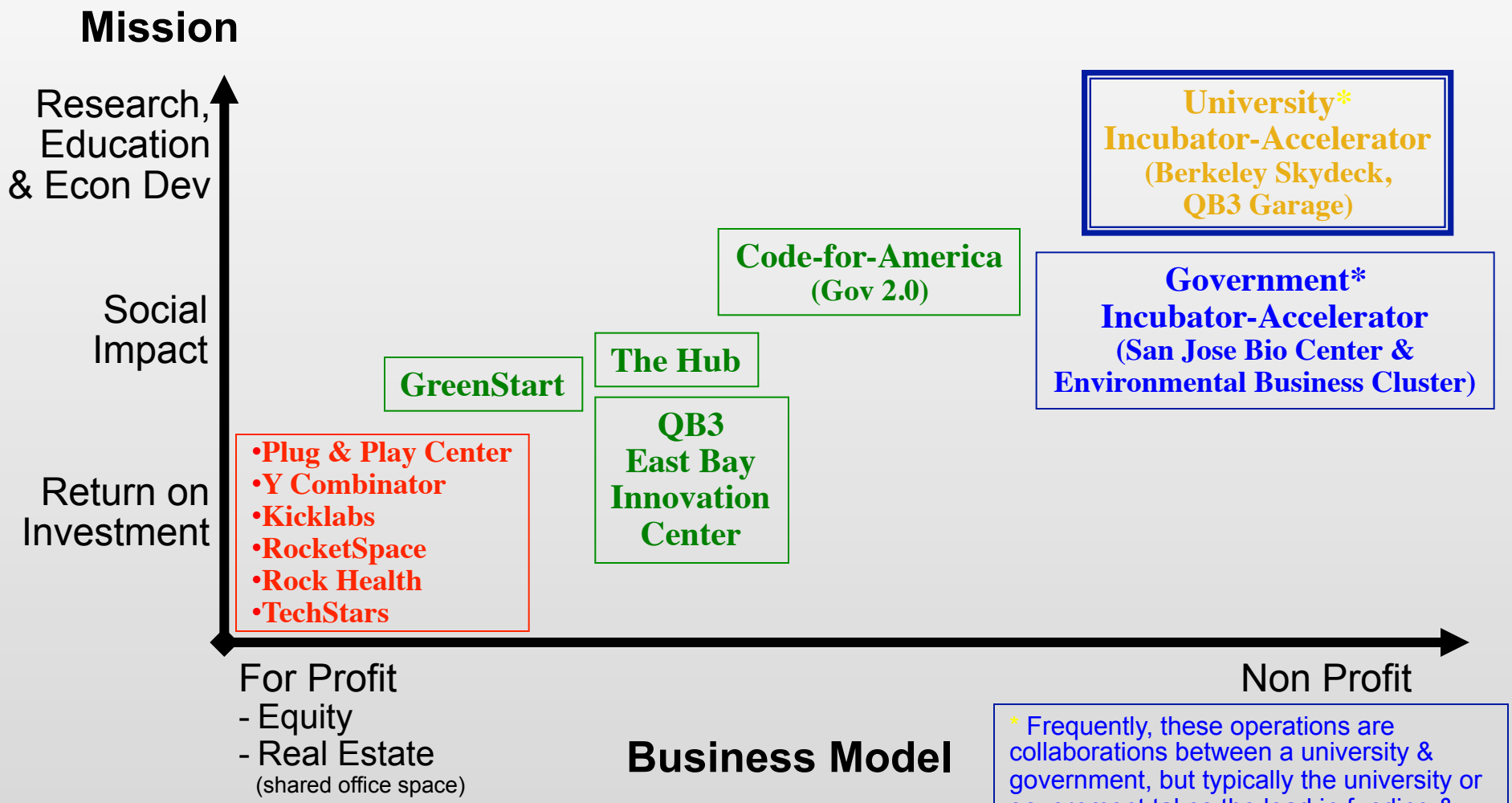
Why Do We Need Yet Another?

What Makes the **Berkeley Skydeck** Different
& How Can We Leverage It?

Localization: *Accelerator Segmentation*



Localization: *Accelerator Landscape*



Localization: *Deep Integration into Univ STEM-B**

Deep Integration into UCB STEM-B (& LBNL) Research, Education & Service Programs

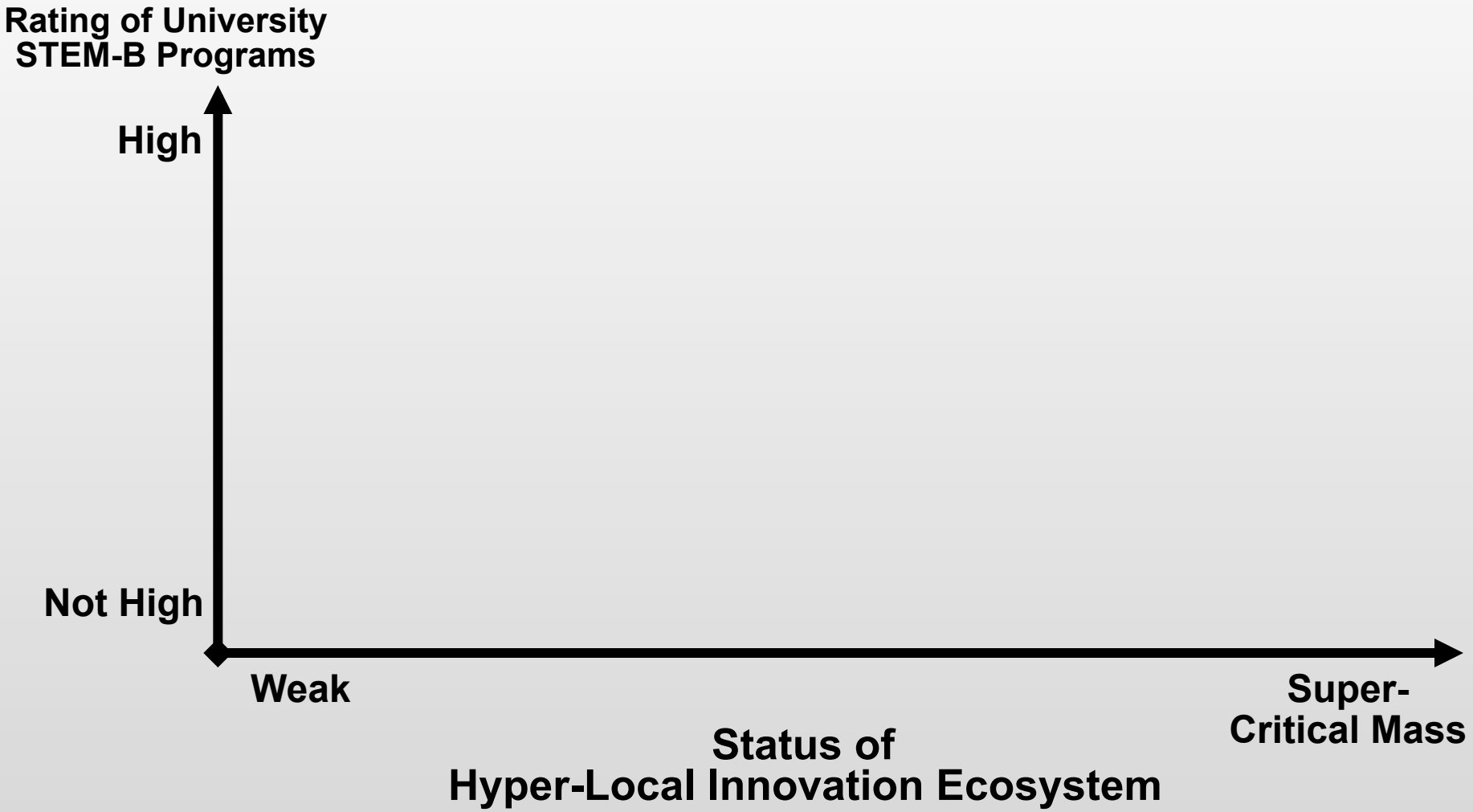
Berkeley Skydeck
Accelerator

**STEM-B: Science, Technology, Engineering, Math & Business*

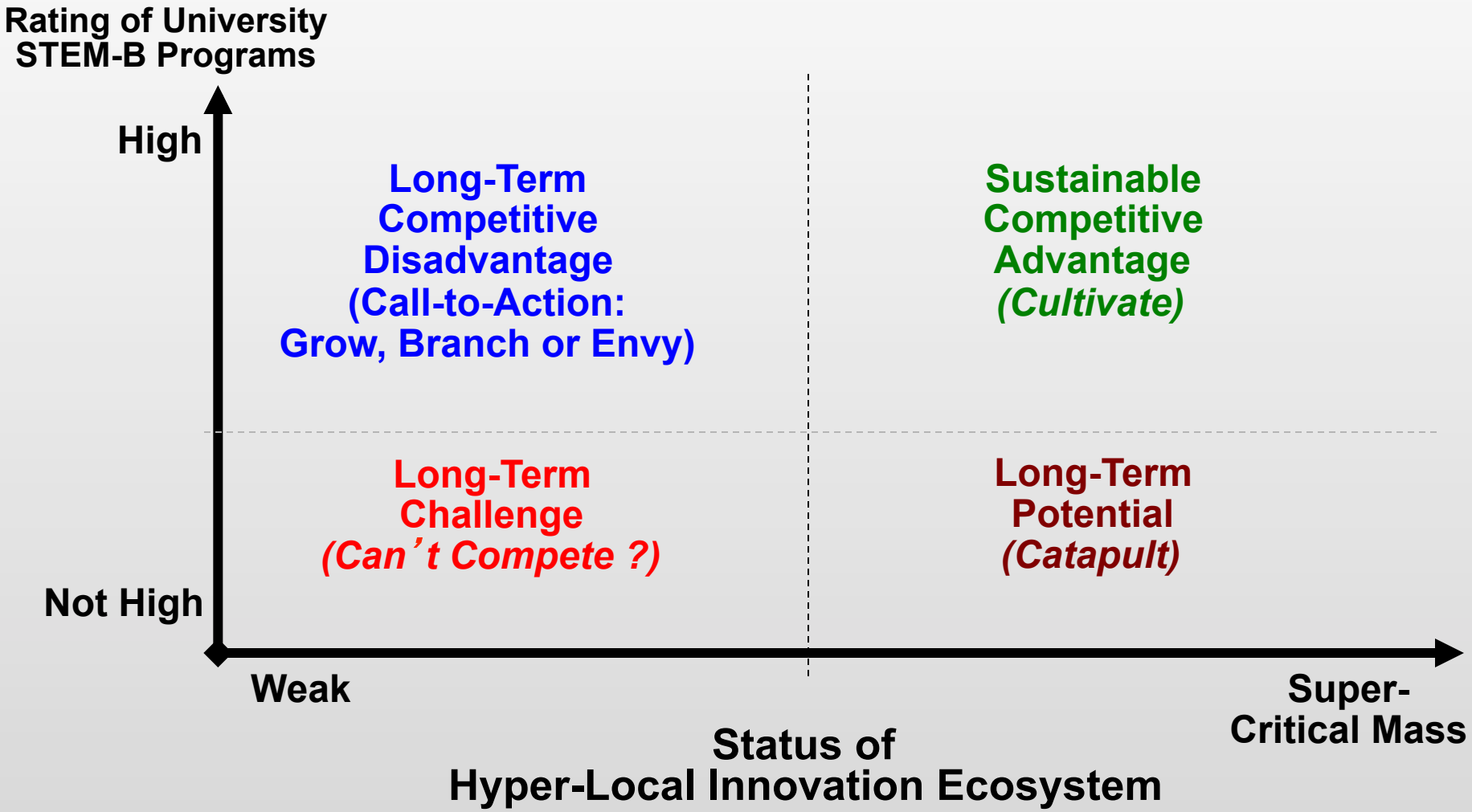
BENEFITS:

- Commercialization of campus innovations (& licensing of Intellectual Property)
- Experiential learning & internships for students
- Entrepreneurship opportunities for graduates
- Collaborations with university faculty
- Mentorship from alumni & UC Berkeley network
- Exchanges with partner university incubators
- Advantages to attract top faculty & students
- Serendipitous discussions that create corps (researchers, entrepreneurs & investors)

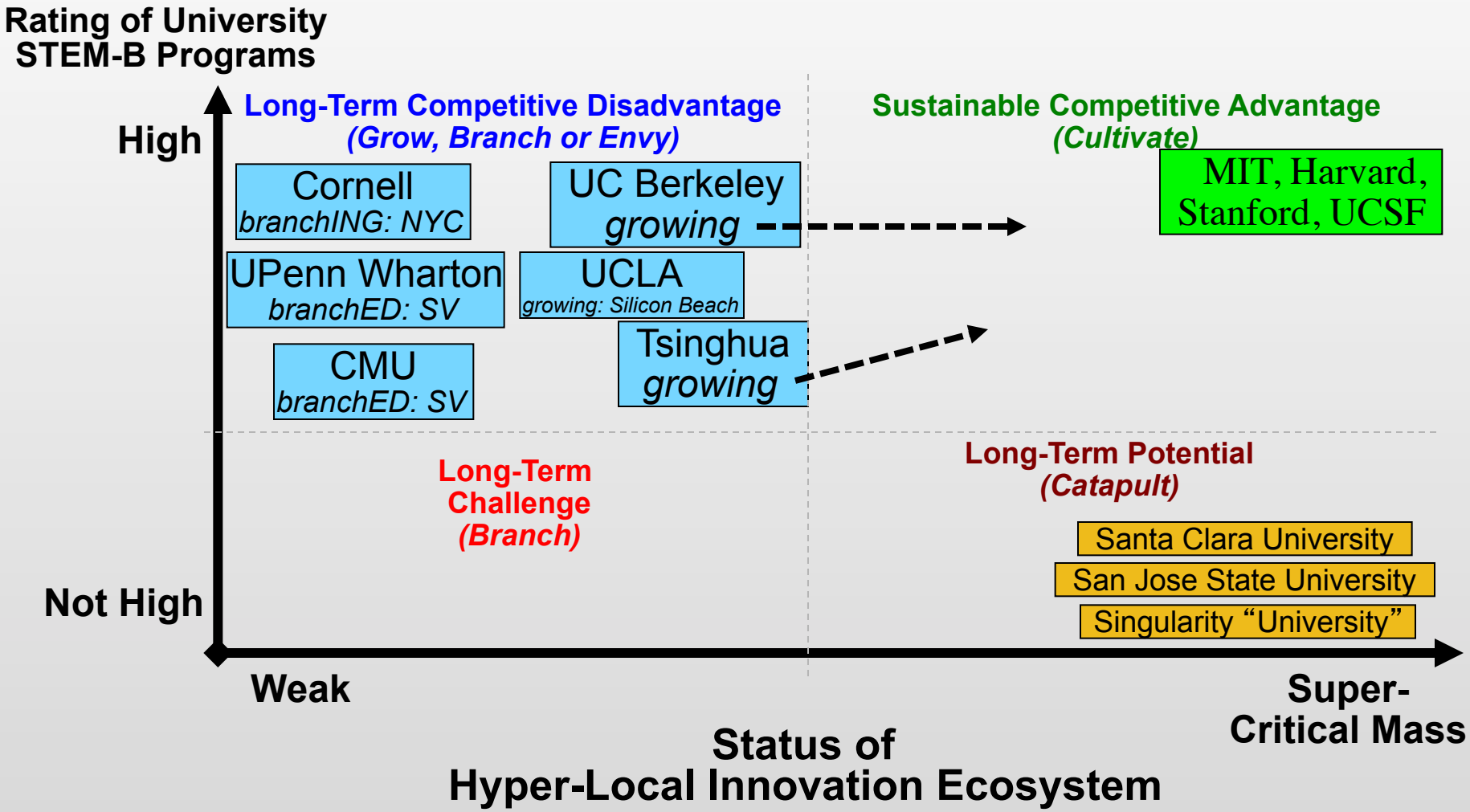
Trend: *Hy-LIE Effect on STEM-B Programs*



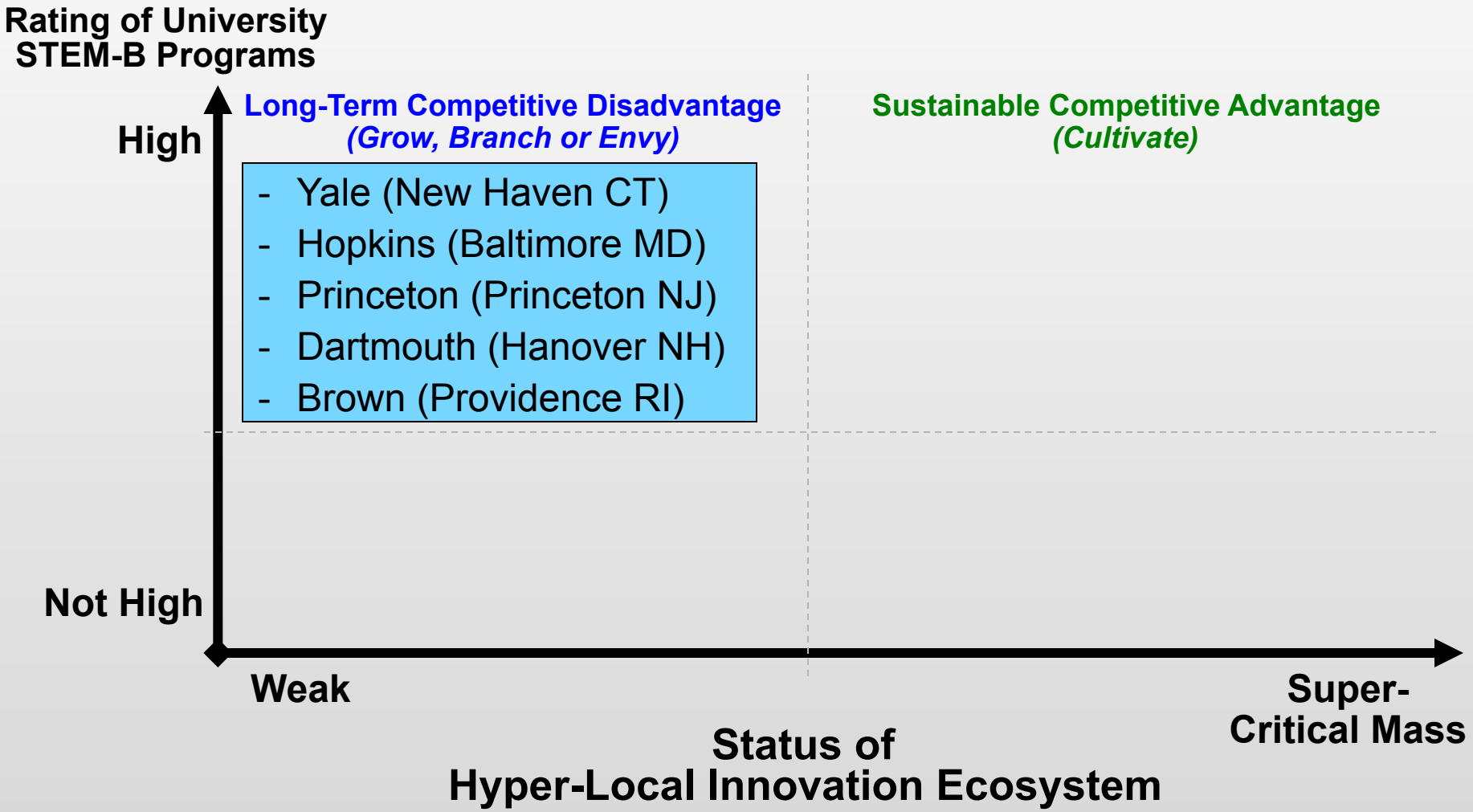
Trend: *Hy-LIE vs STEM-B Segmentation*



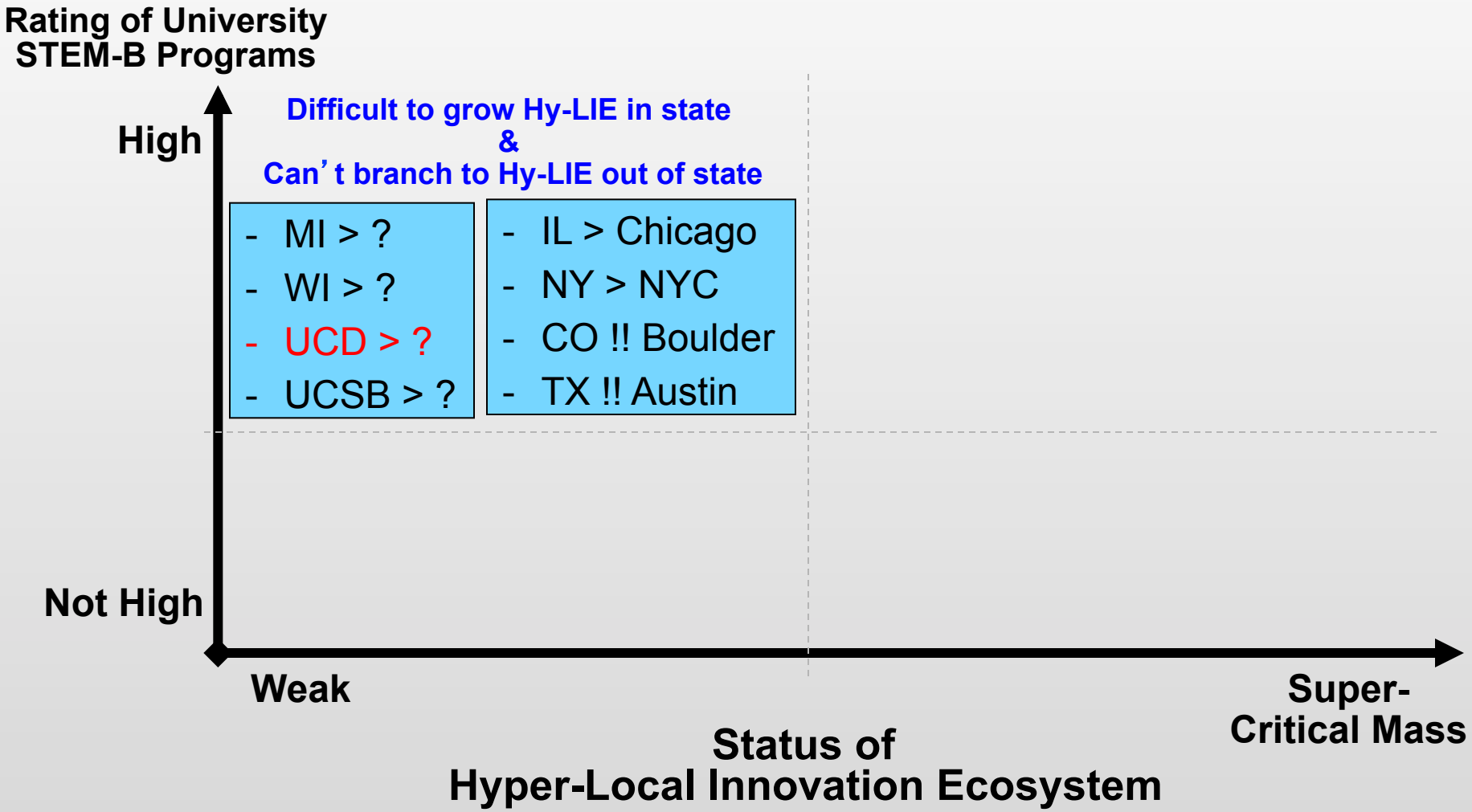
Trend: *Grow, Branch or Envy (Die)*



Trend: *Univ Ratings Based on Many Factors*



Trend: *Dilemma for Some Public Universities*



Hy-LIE: *10 Best Practices to Foster University Hy-LIEs*

1. Students & Faculty: Entrepreneur-oriented MBA & tech management programs – from admissions to curriculum to culture
2. Mixers: MBA, applied sciences & engineering events: yet-another-poster session (YAPS), seminar series, etc – even across nearby institutions (i.e. UCB & LBNL)
3. Competitions: startups, biz plans, tech innovations, big ideas
4. Research-to-Market Courses: Project-based classes with interdisciplinary teams (i.e. UC Berkeley's Cleantech-to-Market course)
5. University startup accelerators (i.e. Skydeck & Foundry) & idea incubators
6. Office park(s) for mature corps to leverage university & act as an anchor for startups
7. IP Management with an "impact-oriented approach to IP" (not just $)
8. University resources (not just IP rights): students as workforce; faculty as advisors; alumni as mentors; the university as an early (beta) customer to help establish a startup's credibility in its market
9. Startup service packages (with local biz): legal, finance, SBIR, etc
10. Partnering: university, local biz & gov (i.e. BerkeleyStartupCluster.net)

- ❑ Not: University funding of startups (that circumvents organic vetting process, & is different from proof-of-concept (POC) funding)

Hy-LIE: *5 Predictions on Hy-LIE Impact*

1. Research universities will have a campus startup accelerator (just as they have libraries, sports stadiums, fitness centers & student centers): ETTC

   1b. Many universities with accelerators will establish "University Startup Accelerator Stock Equity (U-SASE) programs to monetize the support provided to startups

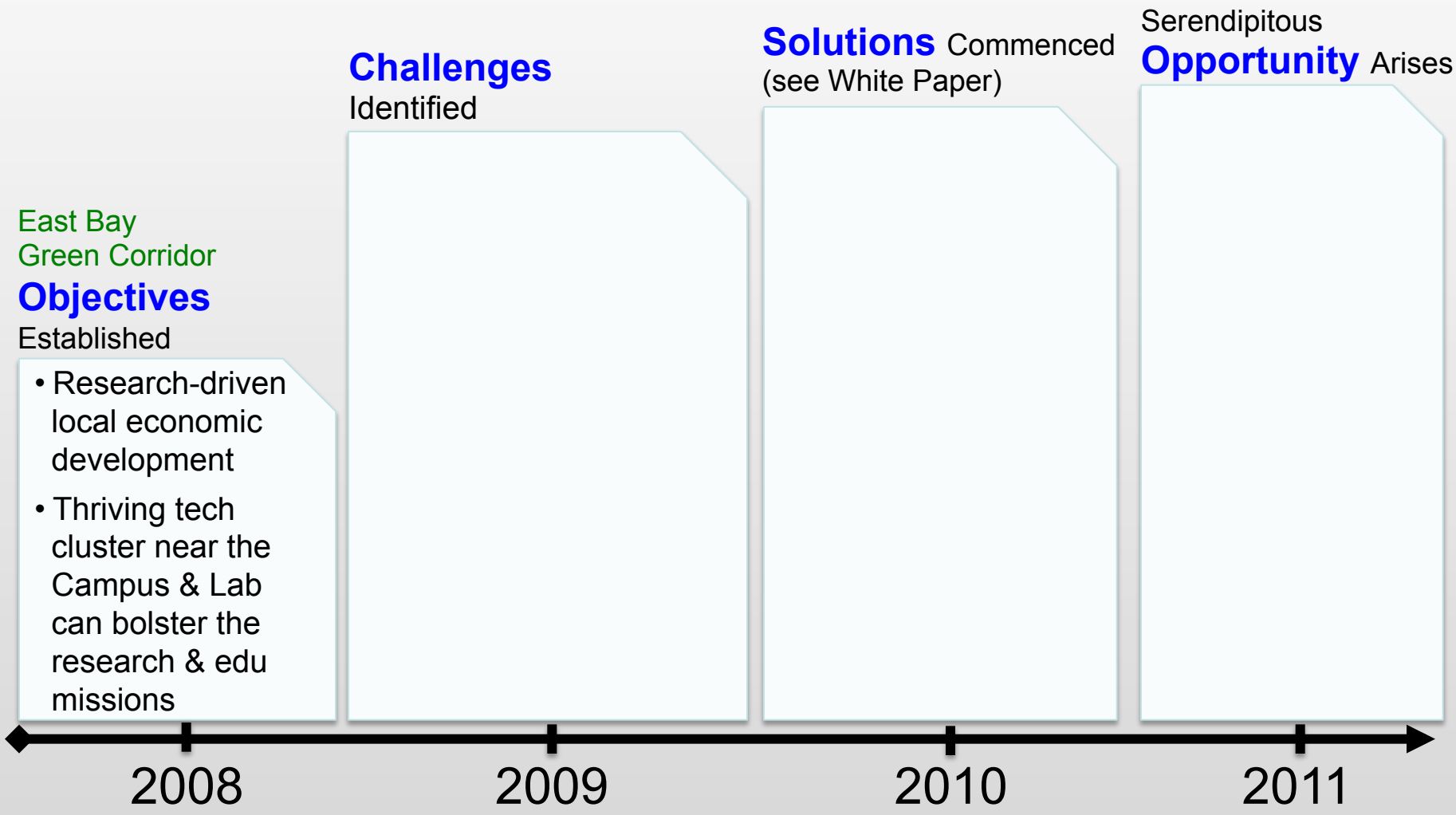
2. Many research universities will have campuses located in 1 or more leading Hy-LIEs (analogous to how many US corporations became multinational entities)

3. Many research universities will have economic development collaborations with their local governments (many already do): SARTA

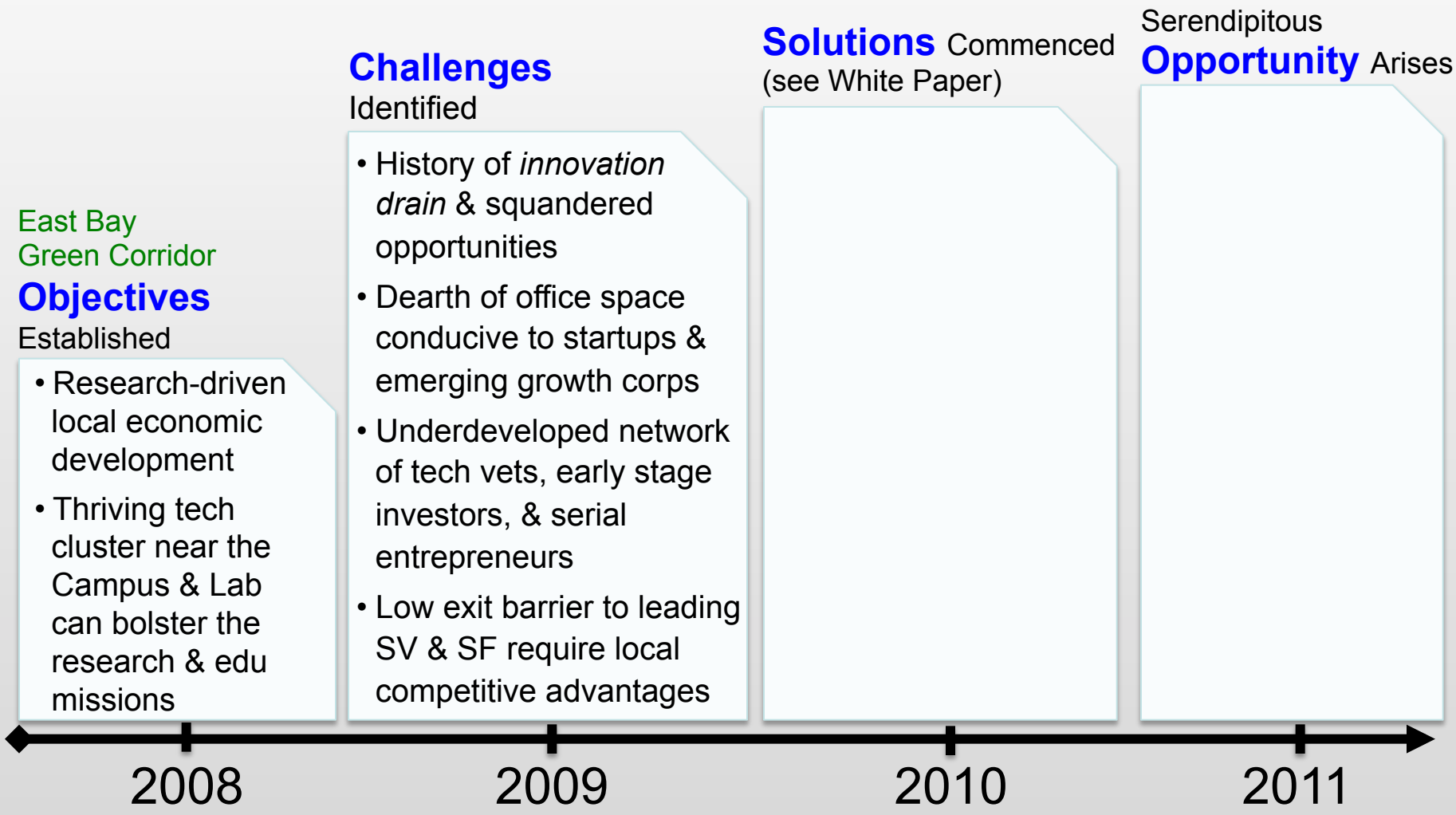
4. Many research universities will have an employee responsible for local innovation ecosystem development

5. Hy-LIE attributes will become a new metric by which to evaluate & rank research university excellence (this will be problematic for some public universities that can't grow or branch)

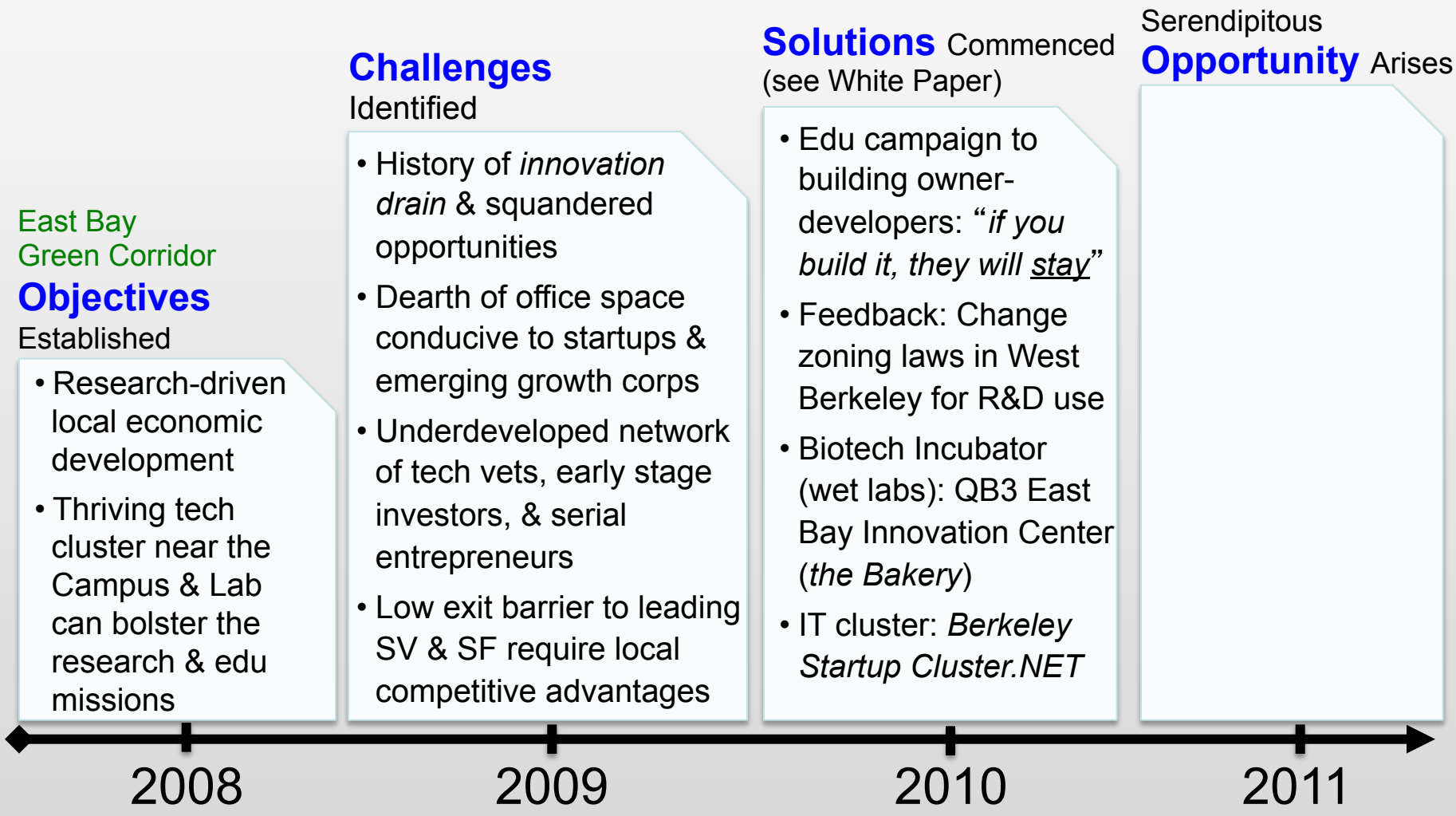
Case Study: *Berkeley Hy-LIE – Inspiration*



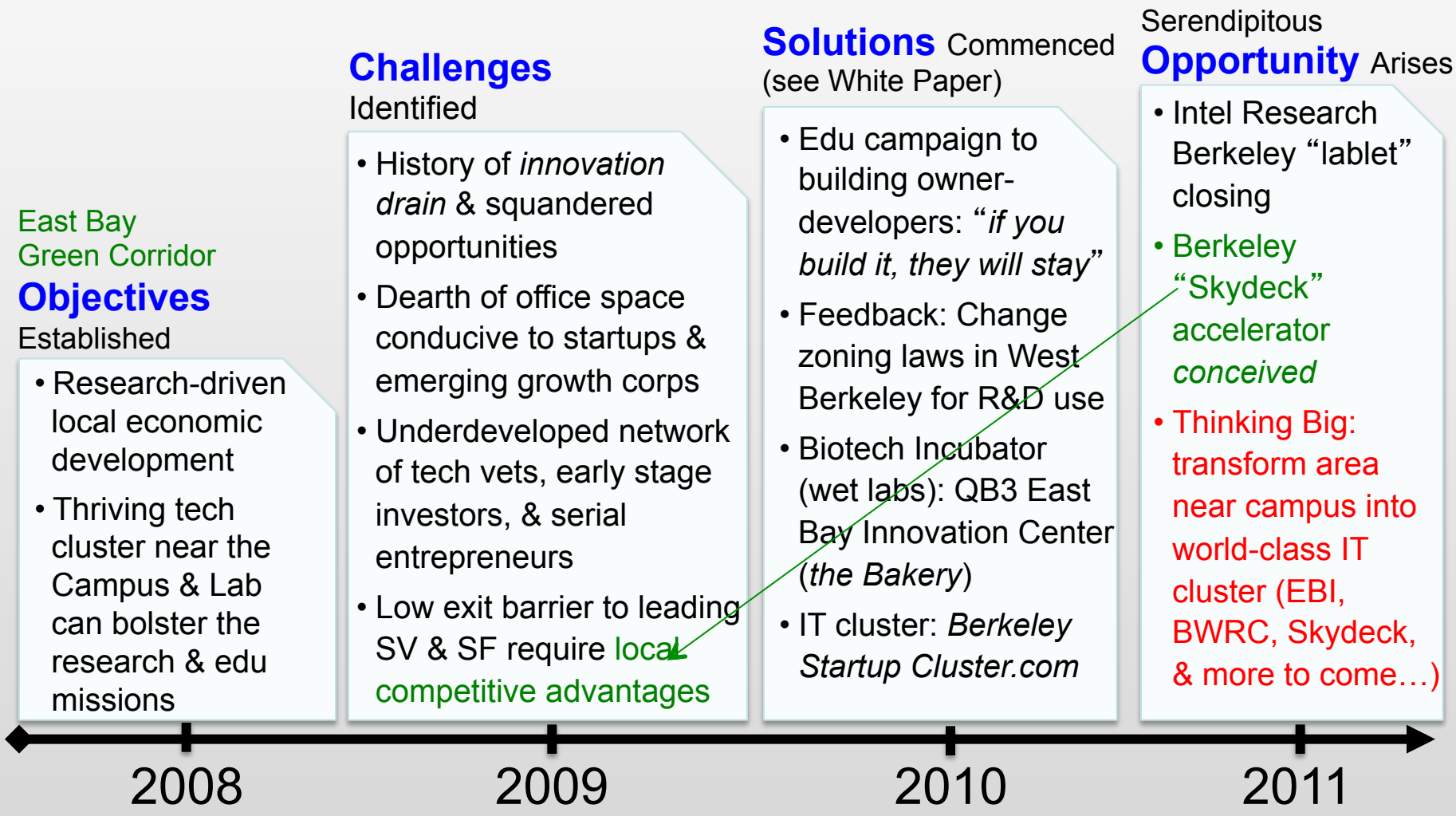
Case Study: *Berkeley Hy-LIE – Challenges*



Case Study: *Berkeley Hy-LIE – Solutions*



Case Study: *Berkeley Hy-LIE – Opportunities*



Case Study: *Berkeley Hy-LIE – Next Steps*

Execution

- Skydeck accelerator becomes epicenter for the Berkeley Startup Cluster
- The Berkeley Startup Cluster grows events (see website)
- The Berkeley Startup Cluster forms an Advisory Committee:
  - Civic and business missions
  - Berkeley residents who are successful tech vets, entrepreneurs or early stage investors

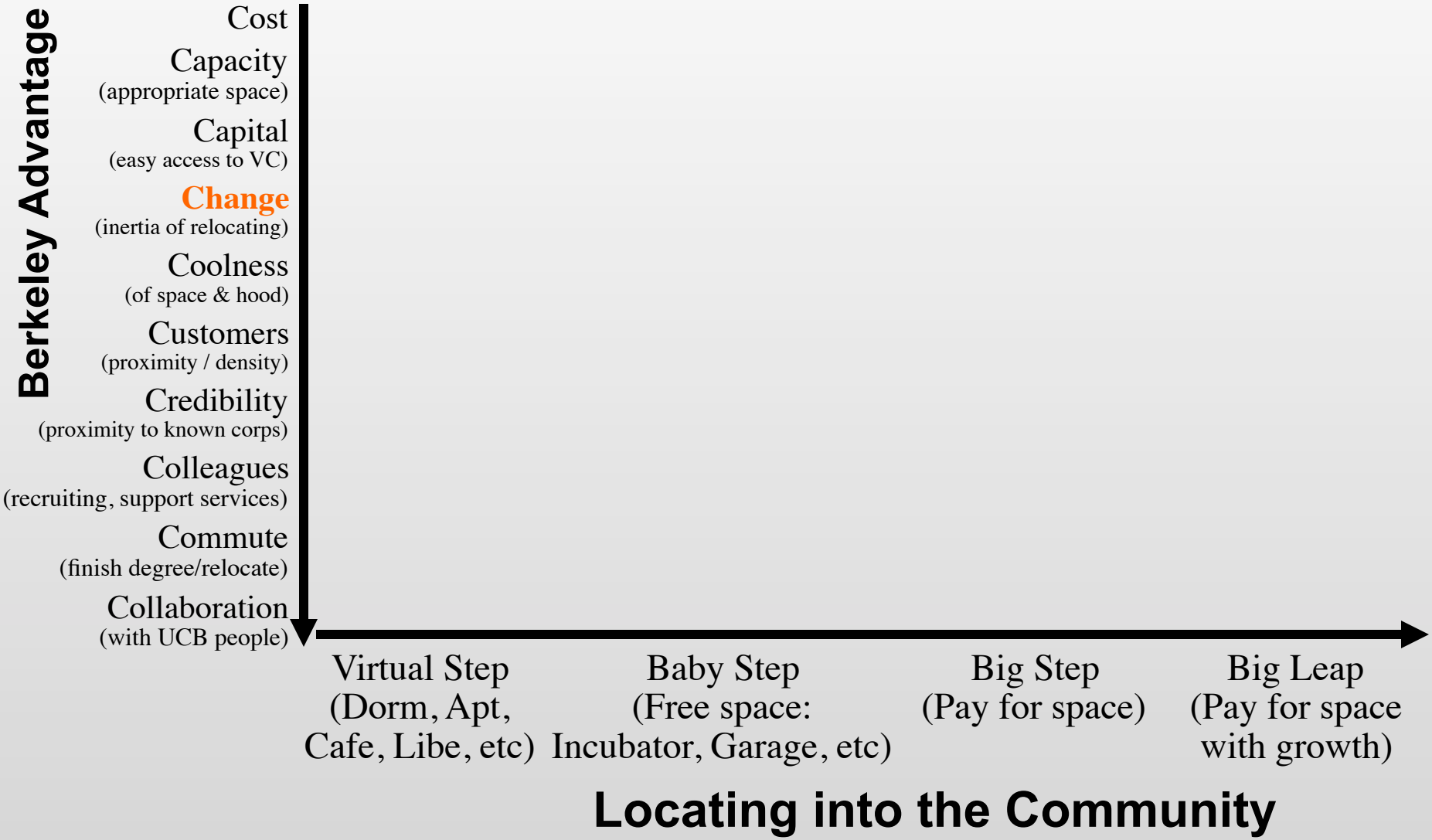
Status

- Accelerators:
  - Skydeck (software)
  - Foundry@CITRIS
  - QB3 East Bay Innovation Center
- Startup Office Space:
  - NextSpace – Berkeley
  - HUB – Berkeley
  - Sandbox Suites - Berkeley
  - Skydeck building full

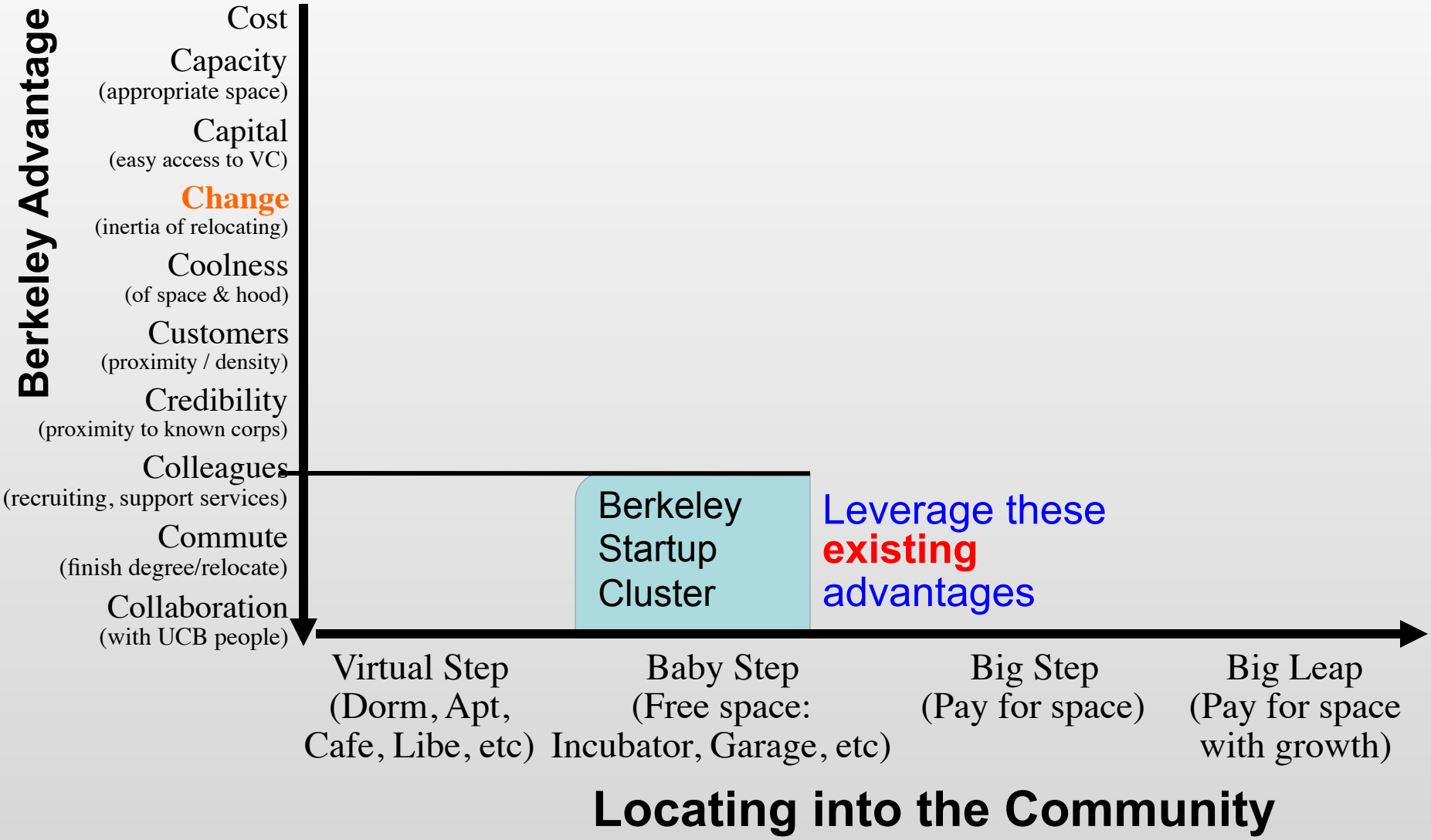
Plan

- More Class A office space
- More events
- Larger & denser people networks
- Better connections between Campus & Berkeley Startup Cluster to West Berkeley (~2 miles from campus)

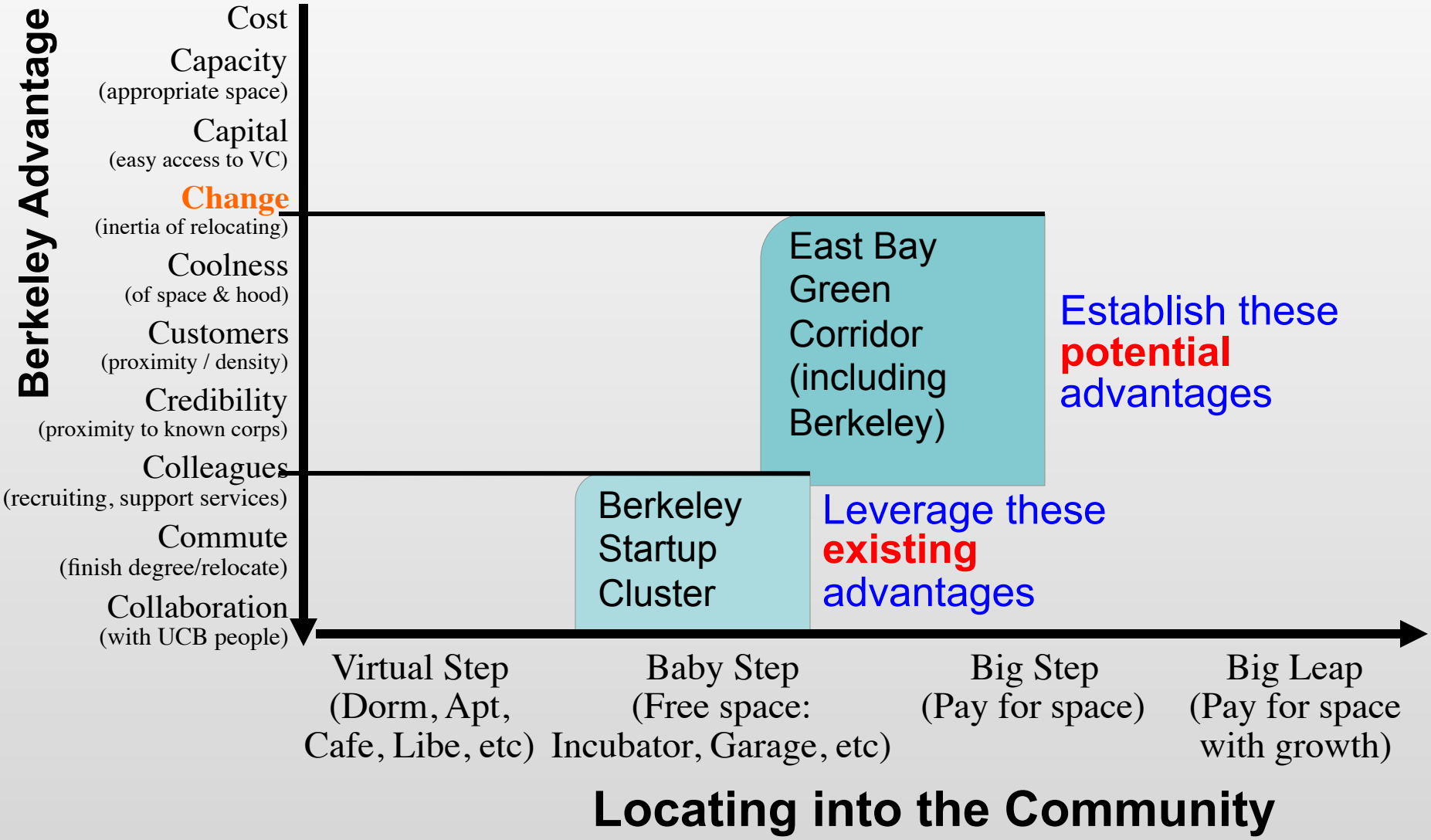
Case Study: *Berkeley Competitive Strategy*



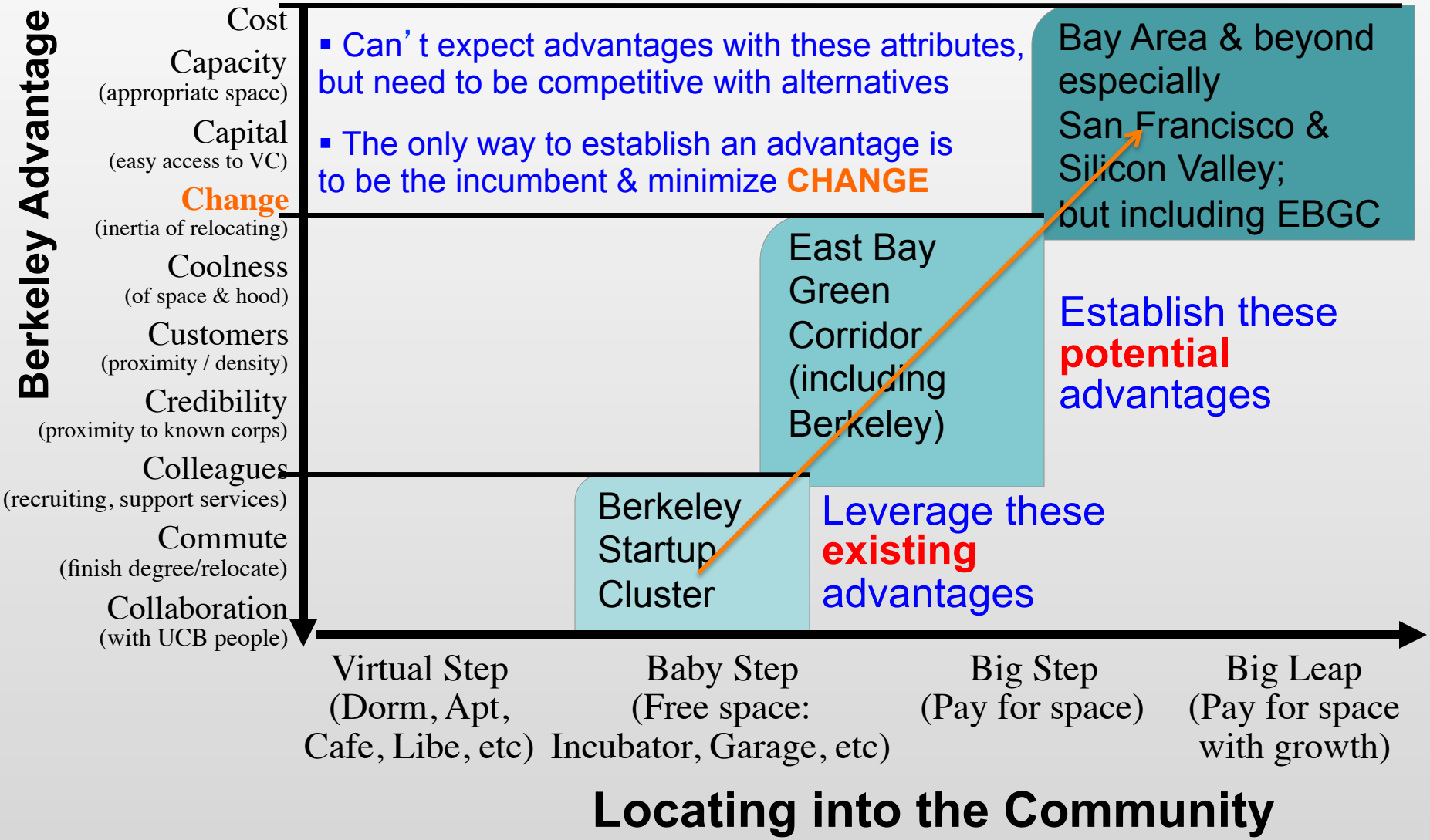
Case Study: *Berkeley Competitive Strategy*



Case Study: *Berkeley Competitive Strategy*



Case Study: *Berkeley Competitive Strategy*



Agenda: *Q & A*

1. Brief Bio
2. Framework for How University Innovations Get Commercialized
   - The 4Ms: ***Morphed***, ***Mined***, ***Milked*** & ***Marketed***
   - University startup ***spin-outs*** versus ***blast-outs***
   - ***Co-founders*** versus ***uber-founders***
3. Bifurcation of Activities that Drive Commercialization
   - Systematic activities that have an ***asymptotic*** impact
   - Organic activities that have an ***exponential*** impact (and are cost-effective)
4. University Hyper-Local Innovation Ecosystems (Hy-LIE)
   - Definition & segmentation
   - Strategic value to university
   - Role of accelerators in localization
5. Hy-LIE 10 Best Practices & 5 Predictions
6. Town-Gown Case Study: Berkeley CA