



University of Connecticut

# NEXT GENERATION CONNECTICUT

---

Building Connecticut's Economic  
Future through STEM

February 2013

# IMPACT OF STATE INVESTMENT



	FY96 (Fall 1995)	FY13 (Fall 2012)
Undergraduate Students	14,667	22,301
Grad/Professional Students	7,804	7,427
Tenure/Tenure-Track Faculty	1,012	1,061
UConn SAT (National Avg)	1113 (1013)	1226 (1010)
Bachelor's Degrees	2,941	5,149 (FY12)
6 Year Graduation Rate	70%	82%
Grad/Professional Degrees	1,757	2,462 (FY12)
Budget	\$450.9M	\$1,054.9M
Research Awards (w/UCHC)	\$56M (\$98M)	\$124M (\$200M)
Scholarships/Grants	\$28M	\$142M

From FY96-FY12:

- UConn research awards totaled \$1.5B (\$2.9B w/UCHC)
- Business activity resulting from research totaled \$3.0B (\$5.6B w/UCHC)

# STEM: A SMART INVESTMENT FOR CT

- STEM jobs grew 3 times faster than non-STEM jobs (2000-2010)
- 2/3 of GDP growth is driven by STEM innovations
- Increasing STEM enrollments increases R&D, patents and Small Business Innovation Research awards
- Nearly 20% of STEM workforce is 55+ years old
- Increased STEM activities will leverage CT's current STEM initiatives: Bioscience CT, JAX Genomics Medicine & Tech Park
- The 2012 Kauffman Foundation State New Economy ranks CT:
  - #25 in Entrepreneurial Activity
  - #39 in Non-Industry R&D Investments
  - #50 in Job Churn (measure of entrepreneurship & innovation)

# STEM: A SMART INVESTMENT FOR UCONN

## Education:

- More than 240% increase in STEM applications since 2001
- More than 120% increase in STEM degrees awarded since 2001
- UConn's current faculty hiring plan will add 175 STEM faculty

## Research:

- In 2012, \$900M in STEM research proposals (\$460M @ Storrs)
- In 2012, \$170M in STEM research awards (\$98M @ Storrs)

## Workforce & Economic Development:

- 70% of UConn graduates work in CT to support the economy
- 270 patents
- Over 100 intellectual property applications per year
- Technology incubators to support faculty, student and entrepreneur innovations

# STEM INVESTMENTS TO BE COMPETITIVE



- STEM education involves learning through laboratory experience, capstone design, research and industry projects
- Recently constructed STEM facilities are at full capacity:  
Chemistry, Info Technology & Engineering, Pharmacy/Biology, Marine Science & Ag-Biotech
- Pre-1960's era STEM facilities are outdated and at full capacity:  
Gant, Torrey, Beach, Koons, Atwater, Engineering II, Bio-Science Laboratory, Bronwell, United Technologies Engineering, Longley
- Faculty cannot compete for major research grants or effectively teach students using outdated STEM facilities

# STEM RESEARCH OPPORTUNITIES



## Advanced Manufacturing

- Additive Manufacturing, Materials Genomics, Systems Engineering, Cyber-Physical Integration

## Energy, Environment & Resources

- Renewable Energy, Fuel Cells, Energy Storage, Microstorage, Pollution Control, Water Resource Management

## Systems Genomics, Biology & Biotechnology

- Human, Animal & Environmental Genomics, Personalized Medicine, Synthetic & Computational Biology, Drug Discovery

## Big Data, Deep Analytics & Digital Media

- High Performance Computing, Scientific Visualization, Business Informatics, Cyber-Physical Systems, Data Fusion

## Cognitive & Neuroscience

- Human-Computer Interaction, Neuropsychology, Communications Technology, Message Systems Analysis, Language Acquisition, Speech & Hearing, Autism

# NEXT GENERATION CT OVERVIEW



## Education & Workforce Development:

- Increase undergraduate (UG) enrollment by 6,580 (30%)
  - Increase STEM UG students by 3,290 (42%)
  - Increase Engineering UG students by 1,410 (70%)
  - Increase Biological, Physical and Chemical Science UG students by 1,800 (33%)
  - Increase Digital Media UG students by 840
  - Increase Risk Management & Global Business UG students by 680
- Award 50 STEM fellowships per year to train outstanding doctoral students

## Education, Research & Economic Development:

- Hire 259 faculty (in addition to 290 from current plan)
  - Hire 200 STEM faculty (in addition to 175 STEM faculty from current plan)
- Develop critical STEM facilities for faculty research and innovative teaching

## Education & Urban Renewal:

- Increase Stamford Campus programs by expanding Digital Media & Business
- Relocate Greater Hartford Campus to downtown Hartford

# NEXT GENERATION CT COMPONENTS

Capital Plan: \$1.77B (State Request: \$1.54B and UConn: \$235M)

- \$538M for construction & renovations of new STEM facilities
- \$682M for infrastructure improvements
  - \$565M for teaching and research labs to accommodate faculty & students
  - \$100M for steam line repair
  - \$17M for new water source (add'l \$8M from Tech Park funding)
- \$310M for research equipment, IT & teaching labs
- \$72M to convert existing housing to a STEM Living & Learning Community and construct two new dormitories (net of additional revenue earned)
- \$93M for 5,480 more surface and structured parking spaces
- \$70M for Greater Hartford Campus relocation
- \$10M for Stamford Campus student housing

# NEXT GENERATION CT COMPONENTS



## Establish premier Connecticut STEM Honors Program

- Eligibility criteria: minimum 1350 SAT & top 10% of high school class
- 1,400 full tuition scholarships by FY20 for Connecticut's best students
- "Big Idea" grants for undergraduate research projects with top faculty
- STEM industry internship/co-op experiences
- New STEM Honors living & learning community with STEM faculty and industry partners serving as mentors

# NEXT GENERATION CT COMPONENTS



## Stamford Component of New School of Fine Arts and Digital Design & Media

- Undergraduate and graduate degrees in animation, visual effects & production, interactive design, game development, motion media design, sports entertainment, data visualization and 'Big Data Analytics'

## Stamford Business Programs

- Undergraduate degrees & Graduate Certificates\* in financial management, int'l business, advanced risk management, crisis management, sports management, global business, business/engineering (dual graduate degree)

Proposed Growth	
Undergrad Enrollment	1,520/110%
Undergrad Degrees	304/119%
Faculty	35
State Operating Request	\$2.3M
UConn Commitment*	\$3.6M

## \$10M Capital Request for Housing and Campus Enhancements

\* The expansion of the graduate degree and advanced certificate programs will all be funded by UConn

# NEXT GENERATION CT COMPONENTS



## Downtown Hartford Campus Relocation

- Greater Hartford Campus serves the most diverse student group at UConn
- Enhanced accessibility and service to low income/high-potential students
- Enhanced service learning and internship opportunities for undergraduate and graduate professional education programs
- Expanded economic activity through increased interaction with local businesses
- Direct contributions to state workforce development from professional graduate programs in Business, Engineering, Public Administration, and Social Work
- Geographic proximity will increase transfer access for community college students

# RETURN ON INVESTMENT

- Median income of CT residents with STEM degrees earn \$11K more per year than graduates with other degrees
- Every \$1M in NIH research funding supports 15 jobs (average salary of \$60K)
- Each new science/technology job creates more than one additional job
  - Each job in chemical manufacturing creates 3.1 additional jobs
  - Each job in computers & electronics creates 1.3 additional jobs
- For every new research \$1, CT will gain \$1.95 in business activity
- Every \$2M in research expenditures will yield a patent
- Investments will increase research productivity to \$300K for STEM faculty
- By 2024 this will yield Connecticut:
  - \$146M in new research awards and \$285M in new business activity per year
  - 135 patents and disclosures per year
  - 2,190 new & 4,050 total permanent jobs
  - 30,000 total construction jobs

# FUNDING PROPOSAL



Operating (\$M)*	FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24
State Request	\$17.4	\$33.8	\$54.0	\$70.3	\$80.6	\$92.7	\$102.4	\$113.0	\$123.8	\$137.0
UConn Commitment	\$18.5	\$13.1	\$20.2	\$28.9	\$35.4	\$41.3	\$48.2	\$54.8	\$62.4	\$69.8

\* Amounts shown are cumulative & in addition to support of current faculty hiring plan of \$79M

Capital Request (\$M)*	FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24
Academic & Research Facilities	\$15.0	\$35.0	\$75.0	\$100.0	\$100.0	\$125.0				
Deferred Maintenance				44.0	104.0	101.0	141.0	71.0	92.0	52.0
Equipment	35.0	10.0	30.5	34.5	35.0	43.0	20.5	20.0	20.0	21.5
Hartford Relocation	30.0	40.0								
Residential Life Facilities	20.0	20.0			12.0			20.0		
Parking Garage # 3							30.0	33.0		
Stamford Campus Housing	5.0	5.0								
Total Request	\$105.0	\$110.0	\$105.5	\$178.5	\$251.0	\$269.0	\$191.5	\$144.0	\$112.0	\$73.5

\* Amounts shown are annual increments and are in addition to the reallocation of existing UCONN 2000 funds

# FY 2015 OPERATING PROPOSAL: \$35.9M



- \$17.4M State request; \$18.5M UConn commitment
- Increase undergraduate enrollment by 785 (285 @ Stamford)
- Hire 38 faculty (20 STEM faculty)
- Establish premier Connecticut STEM Honors Program
  - 325 full tuition scholarships for Connecticut's best students
  - 325 "Big Idea" grants for undergraduate research projects with top faculty
  - STEM industry internship/co-op experiences
- Award 15 STEM fellowships to train outstanding doctoral students
- Increase Stamford Campus programs by expanding Digital Media & Business

# ENROLLMENT & FACULTY INCREASES



Enrollment*	FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24
<b>Storrs STEM</b>	<b>325</b>	<b>627</b>	<b>1,075</b>	<b>1,503</b>	<b>1,808</b>	<b>2,098</b>	<b>2,404</b>	<b>2,692</b>	<b>2,998</b>	<b>3,290</b>
Storrs non-STEM	175	338	580	810	975	1,130	1,294	1,451	1,615	1,770
Stamford	285	575	955	1,310	1,430	1,520	1,520	1,520	1,520	1,520
<b>Total Enrollment</b>	<b>785</b>	<b>1,540</b>	<b>2,610</b>	<b>3,623</b>	<b>4,213</b>	<b>4,748</b>	<b>5,218</b>	<b>5,663</b>	<b>6,133</b>	<b>6,580</b>
Faculty*	FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24
Storrs STEM	12	24	46	66	86	116	136	156	176	200
Storrs non-STEM	8	16	24	24	24	24	24	24	24	24
Stamford	18	26	35	35	35	35	35	35	35	35
<b>Total Faculty</b>	<b>38</b>	<b>66</b>	<b>105</b>	<b>125</b>	<b>145</b>	<b>175</b>	<b>195</b>	<b>215</b>	<b>235</b>	<b>259</b>

\* Amounts shown are cumulative

# EXAMPLES FROM OTHER STATES



- Over 20 years, Georgia's \$400M investment in research yielded \$2B in federal and private funds and created 5000 new technology jobs and 120 new technology companies
- In the University of California system, every dollar of state-funded research in 2000-2001 led to an additional \$3.89 in federal and private funding
- At UConn: Four new faculty in Pharmacy increased research expenditures in the department from \$2.9M in FY08 to \$5.3M in FY12 (up to \$600K per faculty member per year)

# RETURN ON INVESTMENT



	FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24
<b>Research Awards (M) (New)</b>	\$167 (\$43)	\$189 (\$65)	\$201 (\$77)	\$210 (\$86)	\$220 (\$96)	\$232 (\$108)	\$241 (\$117)	\$250 (\$126)	\$260 (\$136)	\$270 (\$146)
<b>Business Activity (M) (New)</b>	\$325 (\$84)	\$368 (\$127)	\$392 (\$151)	\$410 (\$169)	\$428 (\$187)	\$452 (\$210)	\$470 (\$228)	\$488 (\$246)	\$506 (\$264)	\$527 (\$285)
<b>Jobs (New)</b>	2,503 (643)	2,835 (975)	3,018 (1,158)	3,156 (1,296)	3,295 (1,435)	3,478 (1,618)	3,617 (1,757)	3,755 (1,895)	3,894 (2,034)	4,050 (2,190)
<b>Construction Jobs</b>	2,100	2,200	2,110	3,570	5,020	5,380	3,830	2,880	2,240	1,470

Sources: National Institutes of Health, American Society for Engineering Education