Enhancing Opportunity through Research

Abbas Ourmazd
Outline

- **UWM DIN to invest in research**

- **Why research?**
  - Economic development
  - Student opportunity
  - Return on investment

- **Why UWM?**
  - Outstanding research outcomes and potential
  - Regional development impact has limited radius of influence

- **Why more money?**
  - Re-allocated 5% of GPR to seed investment in research
  - Internal possibilities exhausted
Background

- Academia
  - Oxford, Göttingen, Brandenburg, UWM

- Corporate R&D, industry
  - Bell Labs, AT&T, Agere Microelectronics

- National labs, government
  - LBL, NREL, IHP (Germany), DoE, DoD

- Startups
  - Two from “soup to nuts”, six as sponsor
- Enhance regional economic development & opportunity
  - Strengthen existing regional companies
  - Turn research outcomes into economic competitiveness
  - Provide quality workforce with research training

- Biennial total request of $12.6M
  - Assuming ½ of non-faculty FTE in 07/08

- 50 faculty FTE
  - 20 for cluster hires
  - 15 for undergraduate research initiative
  - 15 for research growth initiative

- Academic staff, graduate students, S&E
Why Research?
Why Research?

- Research drives economic development & opportunity
  - In the US, in Europe, in Asia

- Example: Atlanta and Georgia Tech
  - Impressive economic performance

- Milwaukee and Atlanta in same benchmarking pool
  - Periodic study of comparable metropolitan areas
Atlanta a Tiger?

Job Growth

- Phoenix (Mesa): 6.1%
- Portland (Salem): 4.7%
- Denver (Boulder, Greeley): 4.1%
- Miami (Ft. Lauderdale-dade): 2.9%
- Seattle (Tacoma, Bremerton): 2.6%
- San Diego: 2.3%
- Cleveland (Akron): 2.0%
- Pittsburgh: 1.9%

Quality Job Growth

- Phoenix (Mesa): 6.4%
- Tampa (St. Petersbort, St. Pet.sburg): 4.7%
- Denver (Boulder, Greeley): 4.6%
- Miami (Ft. Lauderdale-dade): 3.1%
- Seattle (Tacoma, Bremerton): 2.9%
- San Diego: 2.2%
- Cleveland (Akron): 2.1%
- Pittsburgh: 1.0%

GMP Growth

- Phoenix (Mesa): 8.1%
- Portland (Salem): 7.3%
- Tampa (St. Petersburg): 6.4%
- Miami (Ft. Lauderdale-dade): 5.9%
- Kansas City: 5.3%
- San Diego: 4.8%
- St. Louis: 4.2%
- Seattle (Tacoma, Bremerton): 3.8%

Population Growth

- Phoenix (Mesa): 3.6%
- Portland (Salem): 2.9%
- Seattle (Tacoma, Bremerton): 2.1%
- Miami (Ft. Lauderdale-dade): 1.5%
- Kansas City: 1.3%
- San Diego: 1.0%
- St. Louis: 0.9%
- Milwaukee (Rad tow): 0.3%
- Milwauke (Rad tow): 0.1%

Abbas Ournazd
Atlanta a Tiger?

High Tech Gorillas

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<tr>
<th>City</th>
<th>Score</th>
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Startups

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High Tech Gazelles

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Productivity

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From Research to Enterprise

- Georgia Tech Research Institute
  - Nonprofit applied research arm serving 200 companies

- Advanced Technology Development Center
  - Business incubator
  - Over 100 enterprises, incl. publicly traded companies

- Technology Development & Technology Ventures
  - Serves business, industry, economic development

- Universities a key to regional transformation
  - Know of no metropolitan area succeeding without it
Why UWM?
“Radius of Influence”

MIT Startups in Massachusetts

Universities have limited radius of entrepreneurial influence

(Startup/sq. mile)x1000
Source: “Impact of Innovation”
Why UWM?

- Universities have limited radius of influence
  - See, e.g., MIT

- The region in urgent need of transformation

  *The need for the Milwaukee region to compete [in the knowledge-based economy] is unprecedented. It is imperative that we capitalize on region’s assets. “Milwaukee 7”*

- But why UWM?
  - Is UWM “research capable?”
The Research Growth Initiative

- Re-allocated $14M to seed-funding research
  - Project-based “investments” as opposed to “subsidies”
  - Unanimously supported by faculty senate

- Received 285 proposals from over 500 faculty in 7 weeks
  - Participation from over half faculty
  - Crossed all disciplinary boundaries

- Proposals reviewed by independent external experts
  - 66 reviewers, 22 panelists
  - Many served on funding agency review boards
Reviewer Institutions

**Arts & Humanities**
- Princeton
- Univ Kansas
- Univ Missouri

**Life & Health Sciences**
- Albert Einstein College
- Cornell
- Iowa State
- MCW
- PharMac LLC
- Univ Michigan
- Univ Pittsburg
- Univ Texas
- Univ Washington
- Yale

**Natural, Mathematical, Engineering, & Physical Sciences**
- Arizona State
- Duke
- MIT
- NREL
- Ohio State
- Rutgers
- Univ Chicago
- Univ Minnesota
- UC – Berkeley
- UW – Madison
- Vanderbilt

**Social & Behavioral Sciences**
- Case Western Reserve
- Cleveland State
- Indiana University
- Stanford
- UC – Berkeley
- UC – Riverside
- Univ North Carolina
- Univ Pittsburg
- Vanderbilt
- Yale
The Research Growth Initiative

- Proposals ranked according to Quality, Risk, Reward
  - Each defined different dimension

- Top quality: “Alpha” in top 10% of its field nationally
  - Based on typical proposals to national funding agencies

- ¼ of proposals ranked “alpha”, 14% on “Must Fund List”
  - “alpha” = top 10% of their field nationally
  - “Must Fund: If you don’t, then we will”
“My impression before I did the review was that they were a 2\textsuperscript{nd} rate School, not really doing research. I was totally amazed at the quality of the work I was asked to review.”

Max Lagally
Professor of Nanotechnology, UW-Madison
Milwaukee Journal Sentinel, May 7, 2006
Research Excellence:
Recent Examples

- Drug licensed to BMS; Market potential $1B-$3B
- Drug discovered for chronic Chlamydia; No previous cure
- Mechanisms of memory loss; Alzheimer's
- Aquaculture technologies; 24% of US protein supply
- Heterogeneous catalysis; Fuel refinement efficiency
- Probabilistic weather models; Weather derivatives
Why More Money?
Why More Money?

- Substantial upside potential in extramural funding
  - Internal assessment, external review, benchmarks

- Cannot seed-fund all the RGI alpha projects
  - Excellent proposals could not be supported

- Every dollar of research investment brings back three
  - US benchmark

- Exhausted internal means
  - Meager internal resources already re-allocated

- DIN investments would bring substantial returns
The Innovation Loop

Research

Knowledge

Innovation

Abbas Ourmazd
Driving Innovation

- Leverage RGI to enhance research excellence
  - Open competitive process for best use of limited resources
  - Seed-funding investments rather than permanent subsidies
  - DIN request

- Cluster hires to enhance regional strengths
  - Work closely with regional partners
  - Example: WIBHT (GE, Aurora, MCW, BTA)
  - DIN request

- Provide quality workforce with research training
  - Companies hire those that “can find out”
  - DIN request

- Establish mechanisms for entrepreneurial innovation
Conclusions

- Research is root of economic competitiveness
  - 462 new companies in FY04 based on academic discoveries

- Enhanced research excellence enhances student access
  - “Access” means access to quality education, quality jobs

- UWM has essential role to play in region
  - Research universities have limited reach
  - 75% of companies in state/province of academic institution

- Excellent research capability, untapped potential
  - Starved of resources

- DIN impact substantially exceeds requested investment
  - On UWM and region
We Need Your Support

Knowledge-Based Economy in Southeastern Wisconsin

- Start-ups Created
- Wisconsin Companies More Competitive
- New Companies Attracted to Wisconsin

- Research Growth Initiative
- Cluster Hires for Regional Priorities
- Advanced Workforce Development
### UW - MILWAUKEE

#### 2007-09 BIENNIAL BUDGET PROPOSAL

**FISCAL SUMMARY (TOTAL REQUEST)**

**NO FTE IN 2007-08**

#### EXPENDITURE ITEMS

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**ANNUAL TOTALS**

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**BIENNIAL TOTAL**

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