Forces of Global Change

- Knowledge
- Technology
- Economy
- Enrollment Demand
National Trends and Global Trends

• 50 Years of massive investment in science and technology
• Sputnik spurred research and education
• Technological superiority translated into economic growth and productivity
The rest of the world is catching up...

- By 2010, 90% of all scientists and engineers will be Asians working in Asia
- Foreign-owned companies and inventors account for nearly half of all U.S. patents
- Sweden, Finland, Israel, Japan, and South Korea each spend more on R&D as a share of GDP than the U.S.
- China overtook the U.S. in 2003 as the top global recipient of foreign direct investment
- Only 6 of the world’s 25 most competitive IT companies are based in the U.S.; 14 are based in Asia
A Stagnant Knowledge Economy

Past commitments are not enough

- Federal funding as percent of GDP is now half its mid-1960s rate
- Corporate R&D dropped nearly $8 billion in 2002
- Scientific papers by American authors have declined 10% since 1992
- Manufacturing has not been linked up to the new sciences and technologies
Digitization is Driving Globalization Forward

- Global economy stands transformed
- Information technology inventions
- How we communicate, invest, secure medical diagnoses
BRICs and Their Impact on Global Trading

- 3 billion more people joined global trading
- BRICs will exceed the G6 in 40 years
- BRICs developing middle class
China’s Strategy: Outrace US and EU

- The largest producer of university graduates
- Scientific professionals at 10% of US salaries
- Investment in industrial laboratories
Projected Change in US Population by Age


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### Aging of the Global Workforce

<table>
<thead>
<tr>
<th>Country</th>
<th>% Pop. Aged 60+</th>
<th>Median Age (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2000</td>
<td>2020</td>
</tr>
<tr>
<td>Japan</td>
<td>23.3</td>
<td>34.0</td>
</tr>
<tr>
<td>Germany</td>
<td>23.2</td>
<td>29.3</td>
</tr>
<tr>
<td>Sweden</td>
<td>22.3</td>
<td>28.9</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>20.7</td>
<td>24.5</td>
</tr>
<tr>
<td>United States</td>
<td>16.1</td>
<td>22.0</td>
</tr>
<tr>
<td>China</td>
<td>10.1</td>
<td>16.8</td>
</tr>
<tr>
<td>Brazil</td>
<td>7.8</td>
<td>13.3</td>
</tr>
<tr>
<td>India</td>
<td>7.5</td>
<td>10.8</td>
</tr>
<tr>
<td>Mexico</td>
<td>6.9</td>
<td>11.8</td>
</tr>
</tbody>
</table>

Projected Change in High School Graduates by State

2002-2018

Source: Western Interstate Commission for Higher Education
# The New Melting Pot

## Growth in immigrant population, 1995-99

<table>
<thead>
<tr>
<th>State</th>
<th>Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. North Carolina</td>
<td>73%</td>
</tr>
<tr>
<td>2. Nevada</td>
<td>60%</td>
</tr>
<tr>
<td>3. Kansas</td>
<td>54%</td>
</tr>
<tr>
<td>4. Indiana</td>
<td>50%</td>
</tr>
<tr>
<td>5. Minnesota</td>
<td>43%</td>
</tr>
<tr>
<td>6. Virginia</td>
<td>40%</td>
</tr>
<tr>
<td>7. Maryland</td>
<td>39%</td>
</tr>
<tr>
<td>8. Arizona</td>
<td>35%</td>
</tr>
<tr>
<td>9. Utah</td>
<td>31%</td>
</tr>
<tr>
<td>10. Oregon</td>
<td>26%</td>
</tr>
</tbody>
</table>

Source: Urban Institute
Education Determines Earnings

- Not H.S. graduate: 1.0
- H.S. graduate: 1.2
- Associate degree: 1.6
- Bachelor's degree: 2.1
- Master's degree: 2.5
- Doctoral degree: 3.4
- Professional degree: 4.4


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U.S Manufacturing Jobs

Change in Employment, January 1998-April 2003

Source: CT Business Magazine, Focus on Manufacturing, July/August 2003

- 2.2% to 11.6%
- -1.9% to -11.8%
- -12.0% to -14.6%
- -15.5% to -17.6%
- -18.3% to -25.5%

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Manufacturing Production by Region of the World

Index 2000 = 100

Source: IMF, World Bank, Various Country Statistical Agencies, MAPI

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Projected Job Growth by Level of Education Required

1998-2008

First professional Degree: 16%
Doctoral Degree: 23%
Master's Degree: 19%
Bachelor's Degree: 24%
Associate Degree: 31%
Postsecondary certificate: 14%

Worker skills must keep pace with market demands

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Tsunami or a Level Playing Field

- STEM Issues
- Technology Transfer
- Innovation
The Call to Action

Innovation: The intersection of invention and insight, leading to the creation of social and economic value.
National Innovation Agenda

- Talent
- Investment
- Infrastructure
National Innovation Agenda

• Build a diverse base of scientists and engineers
• Build bridges between research and commercialization
• Equip workers for lifelong learning
National Innovation Agenda

- Restore federal commitment to frontier and multidisciplinary research
- Create Innovation Hot Spots
- Reinforce risk-taking and long-term innovation strategies
National Innovation Agenda

• Create innovation growth strategies
• Create a 21st century intellectual property regime
• Strengthen America’s manufacturing capacity
Future Clusters Competitiveness Task Force

Key strategies include:
• Promote growth of industry clusters where region has competitive advantage
• Develop creative, inclusive approaches to rural prosperity
• Create agile leadership networks to respond to market challenges, changes, and opportunities
• Integrate higher education into economic development efforts
• Balance targeted recruitment, global branding, business creation, and retention

Source: Staying on Top, Research Triangle Regional Partnership, March 2004

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Priority Growth Opportunities

Research Triangle Region

- Nanoscale Technologies
- Analytical Instruments
- Pervasive Computing
- Advanced Medical Care
- Informatics
- Agricultural Biotechnology
- Therapeutics
- Biological Agents & Infectious Disease

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NC State University Institute for Advanced Fruit and Vegetable Science

Institute will focus on:

- Improving nutritional value of crops
- Discovering better and faster ways to grow crops
- Extending harvest season
- Improving disease resistance
- Extending preservation and shelf life
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**UNC Nutrition Institute**

Institute will focus on:

- Nutrition and the brain
- Obesity
- Nutrition and cancer
Fostering Statewide Economic Growth

A Three-part Strategy

• Agriculture
• Manufacturing
• Biotechnology
Future success requires sustained, well-coordinated leadership among:

- Government
- Private sector
- Universities
- Non-government organizations