



WEST VIRGINIA BLUEPRINT FOR
TECHNOLOGY-BASED ECONOMIC DEVELOPMENT

HIGHLIGHTS

March 2009



A report from: **TechConnectWV**

West Virginia Coalition for Technology Based Economic Development

With consultation and assistance from:

Battelle Technology Partnership Practice



A Blueprint for West Virginia's Innovation Economy

Why Technology-Based Economic Development (TBED)?

TBED is an **economic imperative**: Multiple studies show that a state's economic success can be largely attributed to the growth of high-technology businesses.

Technology-based jobs are simply **high-paying jobs**.

What is the WV TBED Blueprint?

It is a set of specific recommendations (strategies and actions) to boost and diversify West Virginia's economy. Those recommendations are provided in this document.

What is the WV TBED Blueprint Based On?

The recommendations address **WV's key gaps and technology strengths**, identified by Battelle in a report published in 2007 (Phase I of the Blueprint).

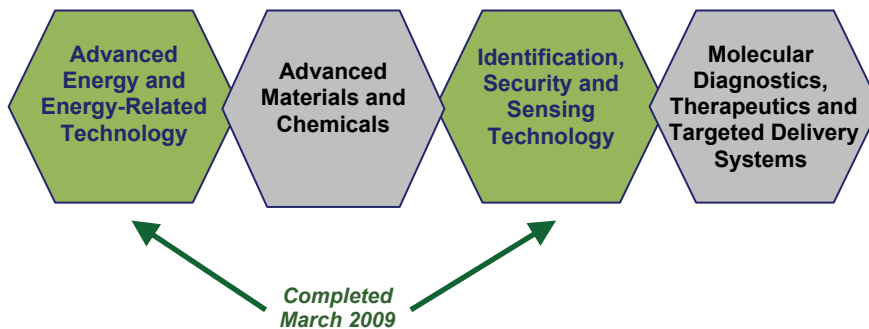
Identified Gaps in WV's TBED Infrastructure

From 2007
Battelle Study

- Talent
- Early-Stage Seed Capital
- Entrepreneurial Know-How
- Image
- Leadership

From 2008
Focus Groups

West Virginia's Strengths (Technology Platforms)





West Virginia Coalition for Technology Based Economic Development

What Must Happen Next?

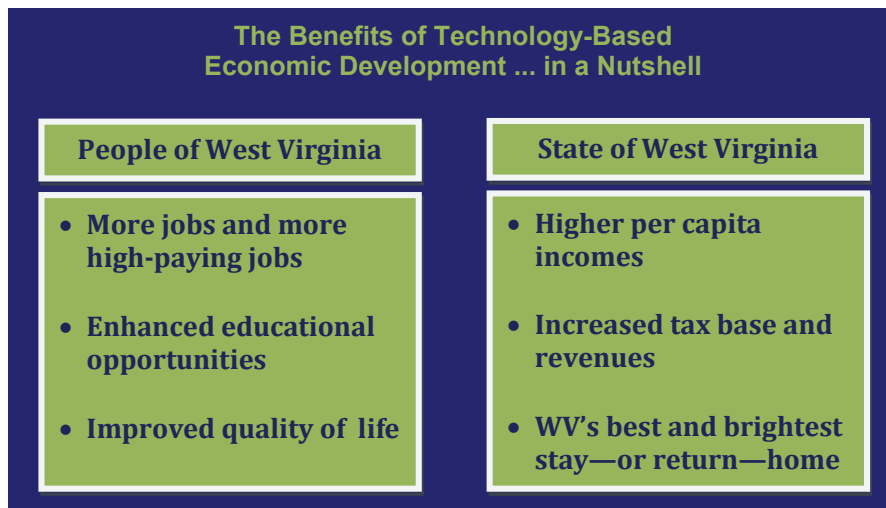
The State of West Virginia — including governmental agencies, economic development groups, universities, non-profit organizations, and business and industry — **must act boldly and quickly** to grow its research, technology transfer, and commercialization activities.

What is Needed for Successful Implementation of the Blueprint?

- **Significant investments** in West Virginia’s technology infrastructure
- **Strong leadership** from the recommended lead organizations — and other groups and individuals within the state
- **Long-term commitment** from all stakeholders, including West Virginia’s citizens
- **Strong resolve** to make critical and sometimes difficult decisions
- **Genuine will to compete**

What will be the Result WHEN West Virginia is Successful?

West Virginia’s citizens will have abundant vocational, professional, and educational opportunities...and access to high quality, **high-paying jobs well into the 21st century.**

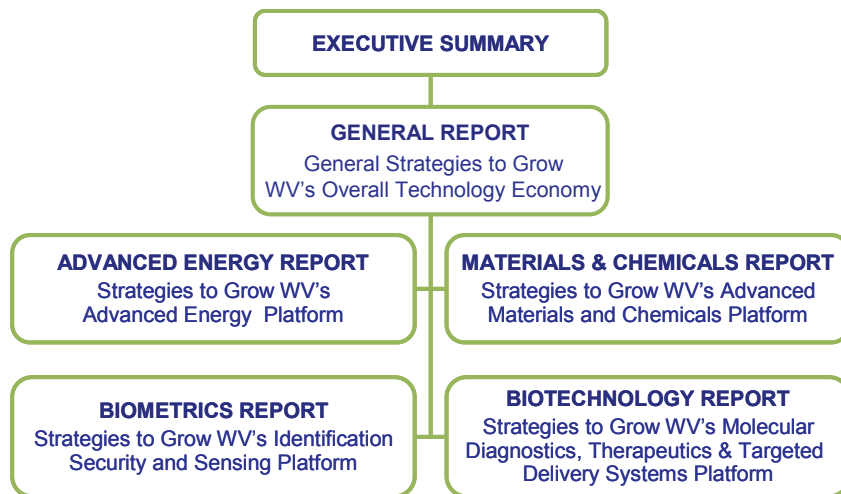


This document provides an overview of the blueprint recommendations

Full reports can be found at:
www.TechConnectWV.com

The Blueprint is organized into six distinct reports:

1. **Executive Summary** (Completed)
2. **General Report** (Completed)
3. **Advanced Energy Report** (Completed)
4. **“Biometrics” Report** (Completed)
5. **Advanced Materials and Chemicals Report** (To Be Developed)
6. **“Biotechnology” Report** (To Be Developed)





West Virginia Coalition for Technology Based Economic Development

TechConnectWV Executive Committee

Russ Lorince
Director, Economic Development
West Virginia University
Chair, TechConnectWV
russ.lorince@mail.wvu.edu

Mary Hunt-Lieving
Senior Program Officer
Claude Worthington Benedum
Foundation

Vice Chair, TechConnectWV
mhunt-lieving@benedum.org

Amy Anastasia
Assistant Director, Technology
Transfer Office
Marshall University

Secretary, TechConnectWV
amy.anastasia@marshall.edu

Greg Clutter
Director, Commercialization
MATRIC
Treasurer, TechConnectWV
greg.clutter@matricresearch.com

John Maher, Ph.D.
Vice President for Research
Marshall University
maherj@marshall.edu

Diane Newlon
Technology Transfer Manager
National Energy Technology
Laboratory
newlon@netl.doe.gov

Keith Pauley
President and CEO
MATRIC
keith.pauley@matricresearch.com

Guy Peduto
Director
INNOVA Commercialization Group
WV High Technology Consortium
Foundation
gpeduto@wvhtf.org

TechConnectWV Staff

Kevin DiGregorio, Ph.D.
Executive Director
kevindic@suddenlink.net

Michelle Koon
Administrative Assistant
Center for Entrepreneurial Studies
and Development, Inc.
mkoon@mail.cesd.wvu.edu

TechConnectWV Board Members

Tom Aman
Managing Member
Toothman Rice PLLC
taman@toothmanrice.com

Ron Basini
Director, Rahall Technology Center
Business Incubator and
Entrepreneurial Program
Concord University
rb12436@aol.com

Clifton Dedrickson
WV Operations Site Service Leader
The Dow Chemical Company
clifton.dedrickson@mail.wvu.edu

Patrick Esposito II, J.D.
Chief Operating Officer
Augusta Systems, Inc.
patrickesposito@augustasystems.com

Lee Fisher
Board Representative
Gilmer-Braxton Technology
Research Institute
redtractor@wildblue.net

John Golden
Director, External Affairs
Verizon West Virginia
john.e.golden@verizon.com

Larry Headley, Ph.D.
Senior Associate
Technology & Management
Services, Inc.
larry.headley@tm.netl.doe.gov

Rudy Henley
General Partner
Mountaineer Capital, LP.
jrhenley@mtncap.com

Greg Henthorn
Chief Executive Officer
Kinetic Star, Inc.
ghenthorn@kineticstar.com

Paul Hill, Ph.D.
Vice Chancellor for Science and
Research
WV Higher Education Policy
Commission
paul.hill@wvresearch.org

Herve Kopciak
Managing Member
CZJS Resources LLC
hkopciak@czjsresources.com

Burt Lidgerding
Executive Director
Shepherd University Research
Corporation
blidgerd@shepherd.edu

Bill Loope
Director of Institutional
Advancement
New River Community and
Technical College
wloope@newriver.edu

Tim McClung
Business Development, Science
and Technology
Wells Fargo Insurance
tim_mcclung@wellsfargois.com

Bob McLaughlin
President
I-79 Development Council
rmclaughlin@i79developmentcouncil.com

Jerry Miller
President
Strategin, LLC
jmiller@strateginllc.com

Harry Siegel
President and CEO
HMS Technologies, Inc.
hsiegel@hmstech.com

Mike Smith, J.D.
Of Counsel
Steptoe & Johnson PLLC
mike.smith@steptoe-johnson.com



West Virginia Coalition for Technology Based Economic Development

Advanced Energy Working Group

Richard Bajura, Ph.D.
Director
National Research Center for Coal and Energy
West Virginia University

Gene Cilento, Ph.D.
Dean
College of Engineering and Mineral Resources
West Virginia University

Anthony Cugini, Ph.D.
Director, Office of Research and Development
National Energy Technology Laboratory

Mark Dempsey
VP External Affairs in WV
AEP's Appalachian Power Company

Betsy Dulin, J.D.
Dean
College of Information Technology and Engineering
Marshall University

Mridul Gautam, Ph.D.
Associate VP for Research and Economic Development
West Virginia University

Andrew Gellman, Ph.D.
Head of Chemical Engineering Development
Carnegie Mellon University
Research Director, CWP Inc.

Larry Headley, Ph.D.
Senior Associate
Technology & Management Services, Inc.

Jeff Herholdt
Director
WV Division of Energy

Kenneth Kirk
Executive VP, Production
Equitable Resources

Diane Newlon
Technology Transfer Manager
National Energy Technology Laboratory

Keith Pauley
President and CEO
MATRIC

Ray Prudnick
VP Operations
Triana Energy

Rick Remish
Executive Director
Imagine WV

Scott Rotruck
Vice President, Corporate Development
Chesapeake Energy Corporation
Research Director, CWP Inc.

Dick Winschel
Director, Research Services
CONSOL Energy Inc.

Biometrics Working Group

Ralph Bean, J.D.
Member
Steptoe & Johnson PLLC

Brian Bell
Vice President and General Manager
Global Science and Technology

Thomas Bush
Assistant Director
Criminal Justice Information Services, FBI

Valerie Evanoff
Chief Executive Officer
Biometric Services International, LLC

Patrick Farrell
Deputy Program Manager
Biometrics Task Force Services
Computer Science Corporation

Terry Fenger, Ph.D.
Director, Forensics Science Center
Marshall University

Craig Hartzell
President
Azimuth Inc.

Barry Hodge
President and CEO
SecurLinX Corporation

Todd Hooker
Manager
Business and Industrial Development
West Virginia Development Office

Steve Hooks
Program Manager
DoD Biometrics Fusion Center
Computer Sciences Corporation

Kris Hopkins
Manager
Business and Industrial Development
West Virginia Development Office

Larry Hornak, Ph.D.
Co-Director
NSF Center for Identification Technology Research
West Virginia University

Mike Kirkpatrick
Executive Director
West Virginia Biometrics Initiative

Jason Lis
Account Executive
TEK Systems

John Maher, Ph.D.
Vice President for Research
Marshall University

Bob McLaughlin
President
I-79 Development Council

Chirag Patel
President & CEO
Innovation Management & Technology

Curt Peterson, Ph.D.
VP for Research and Economic Development
West Virginia University

Charles Schliebs, J.D.
Co-Founder and Managing Director
iNetworks

Steve Spence
Director, International Division
West Virginia Development Office

Linda Wellings
President
MPL Corporation

Bob Wentz
President
Information Research Corporation

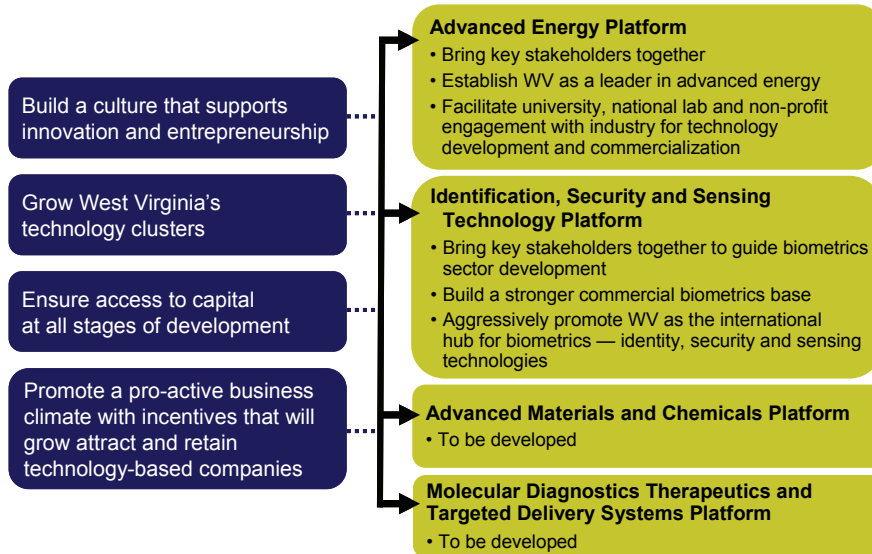
LaRue Williams
Associate Director, Biometric Knowledge Center
NSF Center for Identification Technology
Research, West Virginia University

Michael Yura, Ph.D.
President
Yura Consulting LLC



General Strategies Proposed for West Virginia

Strategies to Grow West Virginia Technology Clusters



General Strategies and Actions Proposed for West Virginia

STRATEGY ONE		Build a culture that supports innovation and entrepreneurship and the creation and growth of technology-based companies			
ACTION	PRIORITY	TIMEFRAME	LEAD ORGANIZATION	RESOURCES	
Action 1: Support and expand TechConnectWV	Critical	Immediate	TechConnect WV	\$250,000 annually	
Action 2: Support and expand a statewide network providing comprehensive commercialization services and support to technology entrepreneurs and early-stage start-up companies	Critical	Immediate	INNOVA and WV Small Business Development Center (WVSBDC)	\$500,000 annually	
Action 3: Encourage the state's universities to continue to increase support for technology transfer and commercialization	High	Immediate	TechConnect WV	Included in TechConnectWV budget	
Action 4: Create a university-industry matching grant program	Medium	Mid-Term	WV Higher Education Policy Commission (WVHEPC) and WV Development Office (WVDO)	\$500,000 annually	
Action 5: Publicize and celebrate TBED successes	Medium	Short-Term	TechConnectWV and WVDO	Included in TechConnectWV budget	



West Virginia Coalition for Technology Based Economic Development

STRATEGY TWO		Grow West Virginia's technology clusters by building R&D and commercialization capacity around the targeted technology platforms			
ACTION	PRIORITY	TIME FRAME	LEAD ORGANIZATION	RESOURCES	
Action 6: Continue to provide support for the WV Research Trust Fund, which supports both faculty recruitment and development of research infrastructure	Critical	Immediate	WVHEPC	Annual investments to achieve \$180 million (cumulative) by 2015	
Action 7: Establish an Innovation Institute Program focused on the technology platforms that would fund people, equipment, and facilities and create proof-of-concept funds to support cluster development projects	High	Short-Term for plans Mid-Term for Institute Short-Term for Proof-of-Concept (PoC) Funds	WVHEPC, WVDO and TechConnectWV	Initial program grants of \$250,000 per Institute Approximately \$25 million per Institute over multiple years \$500,000 for PoC Funds scaled up to \$1 million to \$2 million over time based on demand	
Action 8: Form technical networks around each of the platform areas	High	Short- to Mid-Term	TechConnect WV	Staff support could be included in the TechConnectWV budget Alternatively, \$35,000 per year for part-time support	

STRATEGY THREE		Ensure access to capital at all stages of firm development			
ACTION	PRIORITY	TIME FRAME	LEAD ORGANIZATION	RESOURCES	
Action 9: Provide funds to match SBIR and STTR Phase I awards received by WV companies	Critical	Immediate	WVSBDC and INNOVA	\$700,000 in FY 2010 to be increased as the number of SBIR awardees increases	
Action 10: Increase funding for INNOVA's seed and early-stage investment fund	Critical	Immediate	INNOVA	\$5 million annually, with a minimum of \$5,000 and maximum of \$250,000 per award	
Action 11: Use tax credits to make capital available to early-stage technology companies	High	Immediate	WV Angel Network	Cap of \$2 million annually for the High Growth Business Investment Tax	
Action 12: Attract venture fund investments in West Virginia technology companies	Medium	Mid-Term	TechConnectWV	Included in TechConnectWV budget	





West Virginia Coalition for Technology Based Economic Development


STRATEGY FOUR	Promote a proactive business climate with incentives that will grow, attract, and retain technology-based companies			
ACTION	PRIORITY	TIME FRAME	LEAD ORGANIZATION	RESOURCES
Action 13: Invest in technology infrastructure, including research parks, incubators, and laboratories	High	Short- to Mid-Term	WVDO, Universities, WV HEPC, TechConnectWV	To be determined
Action 14: Maintain the state's refundable R&D tax credit and Economic Opportunity Tax Credit for specified taxpayers	High	Immediate	TechconnectWV and WVDO	Existing resources
Action 15: Develop a branding and marketing strategy that builds on the technology and location strengths of WV	Medium	Short-Term	WVDO	\$250,000 to \$500,000 for outside firm Or existing resources
Action 16: Identify and build awareness of 21st century skills needed to support TBED and future workforce needs of the state's technology industries	Medium	Mid-Term	WORK-FORCE WV Department of Education, WVHEPC	Existing resources
Action 17: Facilitate and expand talent recruitment efforts	High	Immediate	WVDO with support from TechConnectWV, Create WV, and Generation WV	Existing resources
Action 18: Undertake a communications campaign to increase understanding of the technology economy and the opportunities it will provide to West Virginians	High	Short-Term	WVDO with support from TechConnectWV and Create WV	Included in budget for branding and marketing campaign



Proposed Advanced Energy Strategies and Actions


 ADVANCED ENERGY STRATEGY ONE	Bring key stakeholders together to guide advanced energy sector development			
ACTION	PRIORITY	TIME FRAME	LEAD ORGANIZATION	RESOURCES
Action E1.1: Form platform steering committee comprising representatives from industry, government, and R&D institutions	Critical	Immediate	TechConnect WV to form committee	Included in TechConnectWV budget Alternatively, \$35,000 per year for part-time support
Action E1.2: Develop opportunities and high-value technology areas with alignment to existing energy-related statewide strategic plans	High	Short-Term	Advanced Energy Platform Steering Committee	\$50,000 in consulting support and analytical services
Action E1.3: Develop key stake-holder groups or subcommittees that are chartered with developing and implementing plans, projects, or activities focused on specific high-priority theme areas (e.g., clean coal technology, carbon sequestration, combustion technology, etc.)	High	Short- to Mid-Term	Advanced Energy Platform Steering Committee	Variable depending on the needs of individual subcommittees


 ADVANCED ENERGY STRATEGY TWO		Establish West Virginia as a leader in advanced energy		
ACTION	PRIORITY	TIME FRAME	LEAD ORGANIZATION	RESOURCES
Action E2.1: Build an active and strong portfolio of advanced research projects funded by the federal government under its advanced energy program initiatives	High	Short-Term	Advanced Energy Platform Steering Committee, WVDO, WV Division of Energy, and Congressional Delegation	Research and public policy support service may be conducted by Advanced Energy Platform Committee members and related institutions
Action E2.2: Establish a significant level of nationally known technology programs funded by industry and venture capital firms	High	Mid- to Long-Term	Advanced Energy Platform Steering Committee	Included in TechConnectWV budget (and related organizations' budgets for support activities)
Action E2.3: Develop capability to write position papers on economic and / or policy issues related to energy across the spectrum of state government, universities, non-profits, and industry sectors	High	Short-Term	Advanced Energy Platform Steering Committee and WVU Energy Policy Leaders	Research and public policy support service may be conducted by Advanced Energy Platform Committee members and related institutions (especially WVU)
Action E2.4: Take a leadership role in promoting interstate programs for energy research, demonstration, or deployment of advanced technologies	High	Short- to Mid-Term	Advanced Energy Platform Steering Committee	Support may be provided by Advanced Energy Platform Committee members and related institutions (especially WVU and CWP Inc.)
Action E2.5: Implement advanced energy initiatives throughout governmental, government-related, industrial, and private sector sites to promote energy conservation and efficiency or deploy more environmentally friendly technologies	High	Mid-Term	Advanced Energy Platform Steering Committee, WVDO, WV Division of Energy	Could be significant, requiring state policy supports and financial incentives, but with value established, could far outweigh expenditures
Action E2.6: Increase West Virginia's non-fossil fuel and energy portfolio	High	Mid-Term	Platform Steering Committee, WVDO, WV Division of Energy	Initial support may be provided by Advanced Energy Platform Committee members and related organizations


 ADVANCED ENERGY STRATEGY THREE		Facilitate university, national lab, and nonprofit engagement with industry for technology development and commercialization		
ACTION	PRIORITY	TIME FRAME	LEAD ORGANIZATION	RESOURCES
Action E3.1: Hold a series of forums/events in which energy-sector industry representatives outline their needs to the university, national lab, and nonprofit research leaders	High	Short-Term	Advanced Energy Platform Steering Committee	\$10,000
Action E3.2: Seek establishment of a nationally recognized (such as NSF) industry-university collaborative center in advanced energy technologies to be located at WVU and to focus on commercialization	High	Short- to Mid-Term	Advanced Energy Platform Steering Committee and WVU (possibly National Research Center for Coal and Energy)	Volunteer time plus a potential planning grant
Action E3.3: Encourage commercialization of intellectual property from the National Energy Technology Laboratory	Medium	Mid-Term	WVHEPC and WVDO (with support from Advanced Energy Platform Steering Committee)	\$250,000 annually (for related University-Industry Matching Grant Program)



Proposed Biometrics Strategies and Actions

 BIOMETRICS STRATEGY ONE		Bring key stakeholders together to guide biometrics sector development		
ACTION	PRIORITY	TIME FRAME	LEAD ORGANIZATION	RESOURCES
Action B1.1: Fund the WV Biometrics Initiative to form the platform steering committee comprising representatives from industry, government, nonprofit, and R&D institutions	Critical	Immediate	WV Biometrics Initiative and WVDO	\$250,000 annually (see Action 8 in General Strategies)
Action B1.2: Continue to identify and promote opportunities and high-value projects with alignment to existing capabilities in identification, security, and sensing technology areas	High	Immediate	WV Biometrics Initiative	WV Biometrics Initiative and key stakeholders
Action B1.3: Continue to develop and implement plans, projects, or activities focused on high-priority theme areas	High	Short- to Mid-Term	WV Biometrics Initiative	WV Biometrics Initiative and key stakeholders

 BIOMETRICS STRATEGY TWO		Bring key stakeholders together to guide biometrics sector development			
ACTION	PRIORITY	TIME FRAME	LEAD ORGANIZATION	RESOURCES	
Action B2.1: Integrate biometric applications and technologies within state-controlled facilities to spur development of WV biometrics companies and industry	High	Mid-Term	WV Biometrics Initiative, WVDO	Could be significant, requiring state policy supports and financial incentives; but, with value established, could far outweigh expenditures	
Action B2.2: Encourage intellectual property development and technology transfer at WV universities and invest in technology commercialization of biometrics products from WV R&D institutions	High	Immediate	WV Biometrics Initiative Plus lead organizations noted in related actions in General Strategy section	WV Biometrics Initiative and key stakeholders (plus resources from related actions in General Strategy section) <i>This is not an independent action but instead links to several general recommendations under Strategies One and Two</i>	
Action B2.3: Provide funds to small WV biometrics companies to support joint R&D projects with area universities and user organizations specific to commercial product development	High	Short- to Mid-Term	WV Biometrics Initiative Plus lead organizations noted in related actions in General Strategy section	WV Biometrics Initiative and key stakeholders (plus resources from related actions in General Strategy section) <i>This is not an independent action but instead links to several general recommendations under Strategies One and Two</i>	
Action 2.4: Recruit a product-based company in the biometrics space	High	Mid-Term	WV Dept of of Commerce, WVDO, WV Biometrics Initiative	Significant — will likely require location incentives from the State of West Virginia and local government	

 BIOMETRICS STRATEGY THREE		Aggressively promote WV as the international hub for biometrics, identity, security and sensing technologies			
ACTION	PRIORITY	TIME FRAME	LEAD ORGANIZATION	RESOURCES	
Action B3.1: Provide funding through the WV Department of Commerce to support and expand the WV Biometrics Initiative's sector-promotion activities	High	Immediate	WVDO and WV Biometrics Initiative	\$250,000+	



MEASURES OF SUCCESS

The ultimate measures of success — or outcomes — of the recommended strategies and actions will not come from one particular strategy or action. Instead, the various strategies and actions will work together to produce the overall results — an overall boost in technology-based economic development in West Virginia.

- Continue to **grow the WV academic R&D base** at a pace that significantly exceeds that of the nation with a target of \$360 million by 2015
- **Increase R&D funding in platform areas** in all sectors (academia, non-profits, and industry)
- **Increase industry-supported R&D** at West Virginia's universities and colleges to match the national average by 2020
- **Increase the number of technology-based companies** in WV at a rate higher than the national average
- **Increase employment** in private-sector, technology-based companies in WV to reach national average by 2020
- **Increase the number of spin-off companies** developed from technology created at WV's universities to achieve the national average by 2020



This document is only an excerpt.

The full reports can be found at:

www.TechConnectWV.com

This report was funded by contributions from the West Virginia Development Office, West Virginia University, Marshall University, and the Claude Worthington Benedum Foundation with assistance provided by Vision Shared Inc.

This report was prepared by TechConnectWV with consultation and assistance from Battelle Technology Partnership Practice