

WV Forward: Innovation & New Business Development

FOUR-PART STRATEGY FOR ECONOMIC DIVERSIFICATION

1. Maintain Current Industries

- / Energy
- / Aerospace maintenance, repair & operations
- / Auto parts manufacturing
- / Metals manufacturing
- / Fulfillment distribution
- / Building products

2. Differentiate in Growing Sectors Where West Virginia Has an Advantage

- / Fine chemicals
- / Carbon fiber and advanced plastics

3. Capture New Sectors that Have High Growth Prospects

- / Higher-end tourism
- / Cyber security, cloud & IT services

4. Keep an Eye on Potential Opportunities

- / Life sciences
- / Vehicle assembly plants

IMPROVE THE UNDERLYING ENABLERS

Business climate

- / Rebrand WV's strengths
- / Establish plan to combat rising utility costs
- / Eliminate inventory tax

Infrastructure

- / Create financing mechanisms to fund capital projects
- / Launch site certification program
- / Expand broadband coverage

Human capital

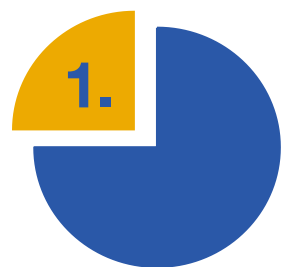
- / Create concerted state-wide human capital effort
- / Expand STEM talent pool
- / Encourage returning/relocating to West Virginia
- / Combat the opioid crisis
- / Train workforce in jobs that are high in demand

Innovation business development

- / Convene innovation organizations in the state
- / Increase support to growing startups
- / Enhance small business support resources
- / Change mix of incentive types
- / Expand investment attraction capabilities

Creating an enabling innovation environment to support new businesses involves focusing on four levers:





Innovative Corporations

West Virginia's large, patent-generating corporations are focused on pharmaceuticals and aerospace & defense

WEST VIRGINIA		
Company:	Industry:	Revenue:
Mylan	Pharmaceuticals	10,093
Pratt & Whitney	Aerospace & Defense	2,339
Teknetics	Electronics	83
Bombardier	Aerospace & Defense	76
Fibernet	Communications Equipment	62
HMS Technologies	IT Consulting Services	28



Issue: Need better connections with the large, patent-generating corporations in West Virginia

WVU Response: Change the way we work with companies to enable deeper, more strategic cross-campus relationships

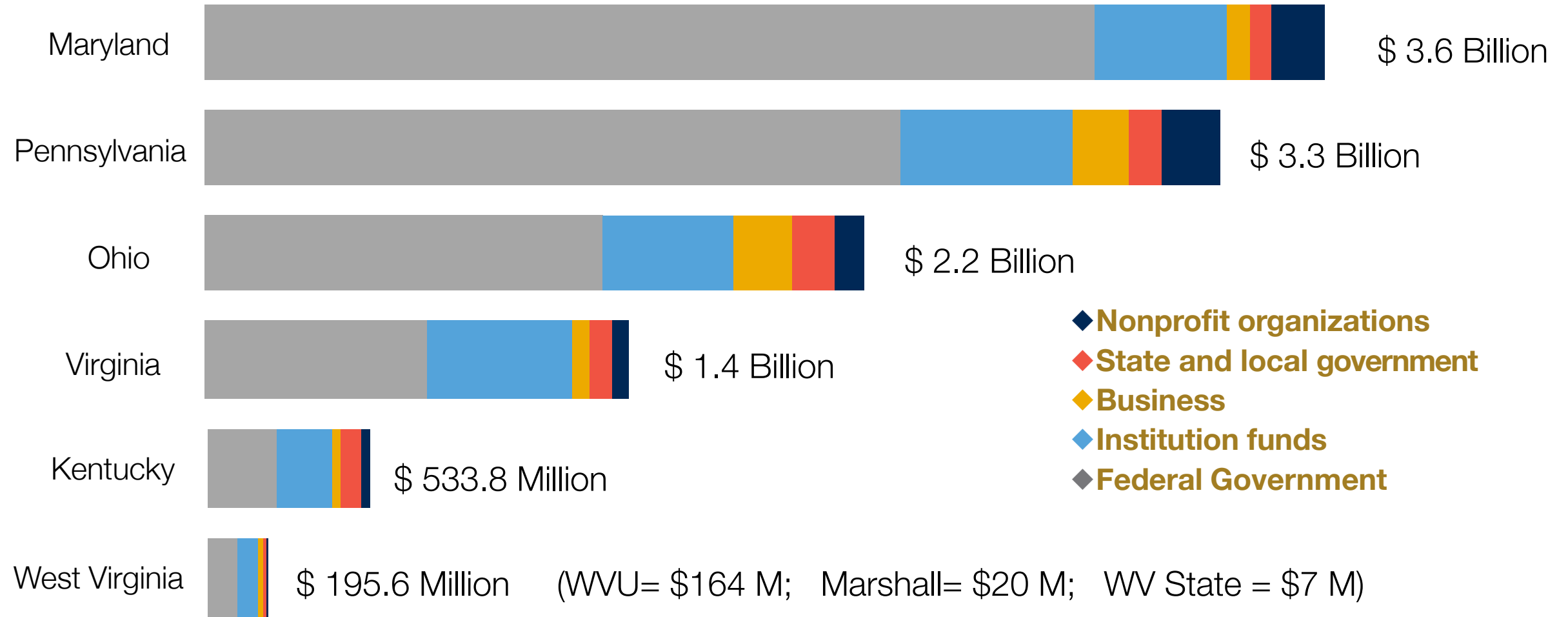
- / Created central Corporate Relations office to deliver concierge service for corporations with cross-campus potential**
- / Created the WVU Innovation Corporation to facilitate “commercial” applied research projects with corporate customers and DOD**

2.

Talent and Research

West Virginia's R&D investments are lower than peer states

Higher education R&D investments by source of funds, FY 2014



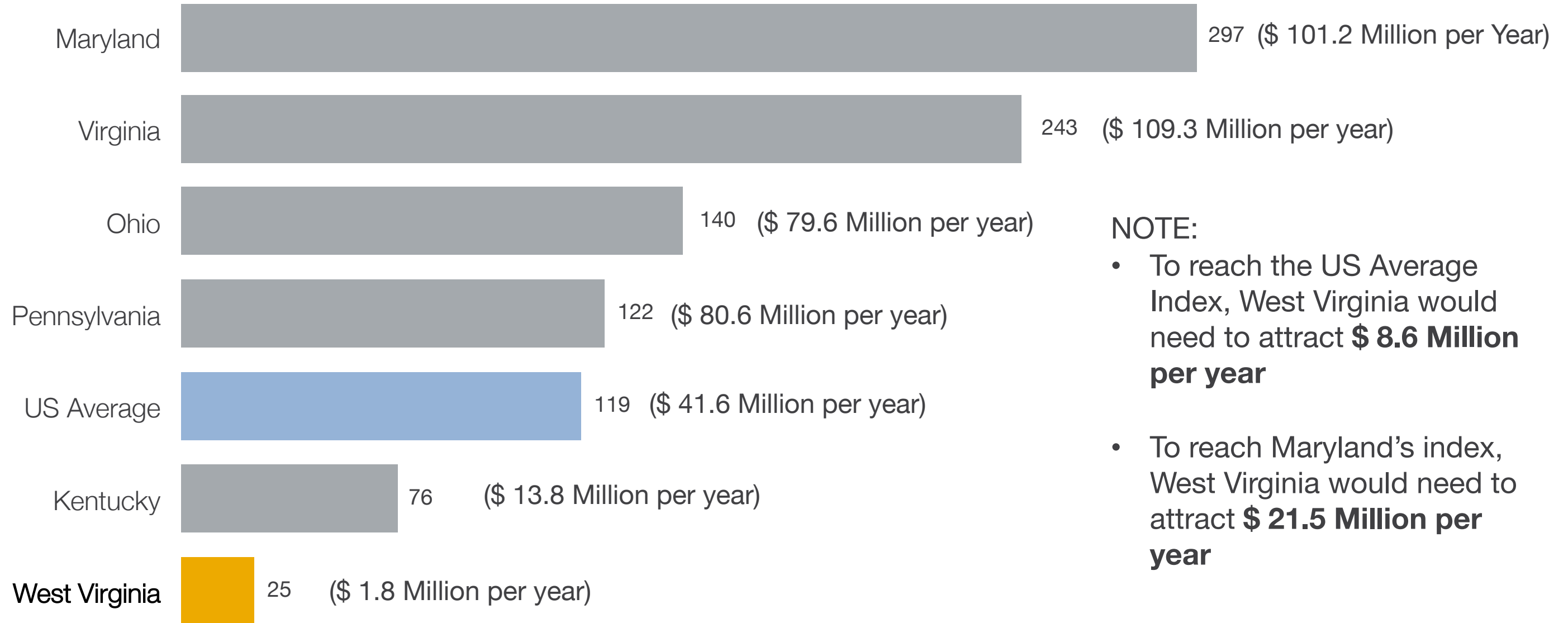
- ◆ Nonprofit organizations
- ◆ State and local government
- ◆ Business
- ◆ Institution funds
- ◆ Federal Government



West Virginia receives fewer SBIR awards than its peers.

Small business innovation research awards (SBIR), 2012-2014

Index of Total Funding Relative to Size of State GDP (and Total Amount of SBIR Funding - 3-year average)



NOTE:

- To reach the US Average Index, West Virginia would need to attract **\$ 8.6 Million per year**
- To reach Maryland's index, West Virginia would need to attract **\$ 21.5 Million per year**



Issue: West Virginia's research investments and SBIR awards are lower than peer states

WVU Response: Recruit innovative researchers in key fields

2010-13: WVU Mountains of Excellence "cluster hires"

- / Radio Astronomy
- / Regional Health Disparities
- / STEM Education
- / Shale Gas Utilization
- / Water Resources

2015-17: WVU Medicine Signature Programs

- / Neurosciences
- / Cardiovascular
- / Cancer
- / Children
- / Critical Care
- / Surgical Services

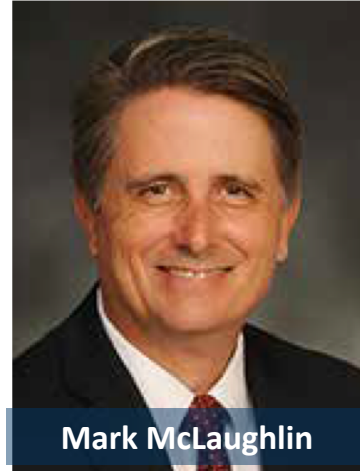
2016: Achievement of Research "R1" status



New hires are bringing startups & IP to WVU



Lori Hazlehurst



Mark McLaughlin



John Hu



Vinay Badhwar



Ali Rezai



Michael Kolodney



Partho Sengupta



Example: Lori Hazlehurst & Mark McLaughlin



Lori Hazlehurst

2015 Recruit



Mark McLaughlin

2016 Recruit

Cancer Therapeutic Startup:



Three cancer drugs in development:

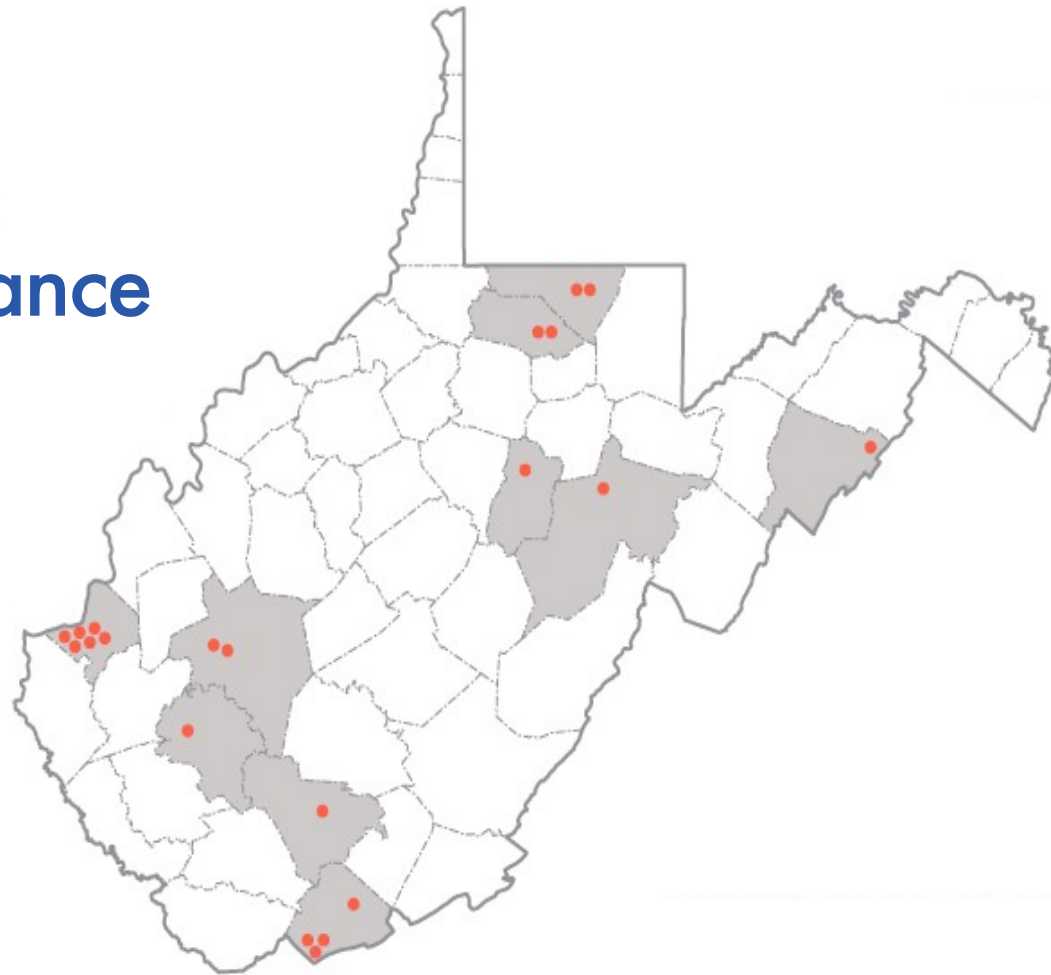
- / Melanoma
- / Multiple Myeloma
- / Brain Cancer

Recently awarded **\$4.5 million** in SBIR Grants (additional \$2 million in process)

Business incubators and accelerators are fragmented and have limited capacity



Incubators and Business Assistance



- / There are a handful of small incubators and support organizations spread across the state, typically with 1-2 person staffs and **limited capacity**
- / Little coordination between support organizations, and startups may struggle with finding the right place to go to
- / Support organizations may compete with each other for limited funds, creating perverse incentives on sharing information



Issue: Business incubators and accelerators are fragmented and have limited capacity

WVU Response: Increase incubation and business assistance for researchers, students and entrepreneurs across West Virginia

Researchers

- / Health Sciences Innovation Center
- / Patenting and Licensing Services
- / Commercialization Training Seminars

Students

- / LaunchLabs and MakerLabs
- / IDEA Fellows
- / Student Intellectual Property Services
- / WVU Young Innovators
- / Innovators-in-Residence
- / Innovation Living-Learn Community
- / Competitions and Hackathons

WV Businesses

- / BrickStreet Center
- / Women's Business Center
- / Entrepreneurship and Innovation Law Clinic
- / New B&E Accelerator program

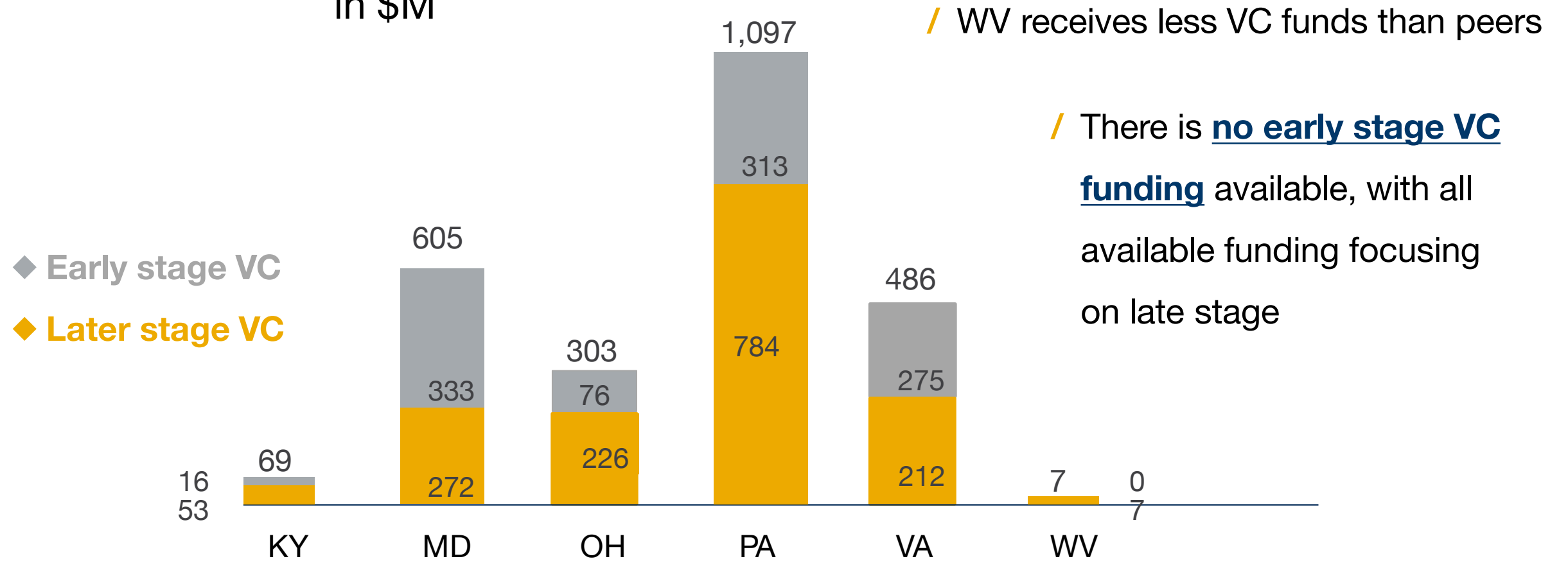


Funding

Venture Capital funding is extremely limited, and only dedicated to later stage companies

VC Funding by Stage

in \$M



Issue: Venture capital funding is extremely limited, with zero early-stage VC funding in West Virginia

WVU Response: Create internal pools of funds for students and researchers; partner with private investors for angel and venture capital funding

Internal WVU Funding:

- / **Huntington Bank Student Seed Fund** \$50 K/yr
- / **Mountaineer Innovation Fund** \$1 million

External Private Funding:

- / **West Virginia Growth Investment (Angel Fund):** \$1.6 million
- / **Mountain State Capital (Venture Fund):** \$25 million target

WVU is creating an enabling innovation environment to support new businesses across all four levers:



Thank You

Matt Harbaugh

Associate VP, WVU Office of Transformation

Executive Director, WVU Innovation Corporation

Matt.harbaugh@mail.wvu.edu