



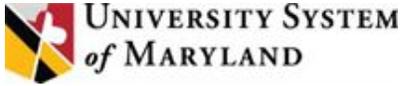
**Board of Regents  
Committee on Economic Development and Technology Commercialization**

**February 22, 2022**

Virtual (public listen only access at 443-353-0686, Conference ID: 452 360 620)  
Committee Members will be sent Zoom information

Public Session Agenda

- (1) [Featured Startup: MinnowTech](#) – Suzan Shahrestani, CEO (Information Item)
- (2) [USM Momentum Fund: Additional Fund Balance Allocation](#) – Ellen Herbst, USM Vice Chancellor for Administration and Finance (Action Item)
- (3) [Frostburg State University Economic Development](#) – Al Delia, Vice President for Regional Development and Engagement (Information Item)
- (4) [Early-Stage Support Feasibility Study Recommendations](#) – Lindsay Ryan, USM Venture Development Director (Discussion Item)



**BOARD OF REGENTS**

**SUMMARY OF ITEM FOR INFORMATION**

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**TOPIC:** Featured Startup: Minnowtech

**COMMITTEE:** Economic Development and Technology Commercialization

**DATE OF COMMITTEE MEETING:** Tuesday, February 22, 2022

**SUMMARY:**

Suzan Shahrestani, CEO of Minnowtech, will present the company and its progress. Minnowtech is an aquaculture technology company that provides a software imaging platform to enable shrimp farmers to estimate shrimp abundance non-invasively with precision. Shahrestani graduated from the University of Maryland Center for Environmental Science. She participated in entrepreneurship programming as a graduate student and launched Minnowtech in 2018. The company received federal SBIR funding, and in 2019, the USM Momentum Fund invested in Minnowtech, alongside co-investors.

**FISCAL IMPACT:** This item is for information purposes.

**CHANCELLOR'S RECOMMENDATION:** n/a

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COMMITTEE RECOMMENDATION:

DATE:

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BOARD ACTION:

DATE:

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SUBMITTED BY: Lindsay Ryan 410-409-2236

[lryan@usmd.edu](mailto:lryan@usmd.edu)

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## WE MEASURE SHRIMP

Suzan Shahrestani, PhD, CEO  
[www.minnowtech.com](http://www.minnowtech.com)











# THE CHALLENGE OF FARMING SHRIMP



*Shrimp aren't easy to count*

**Shrimp grow by the hundreds of thousands in turbid water.**

**Add in an aeration system and there's no way for the human eye or cameras to see below the surface.**



# MINNOWTECH'S SOLUTION

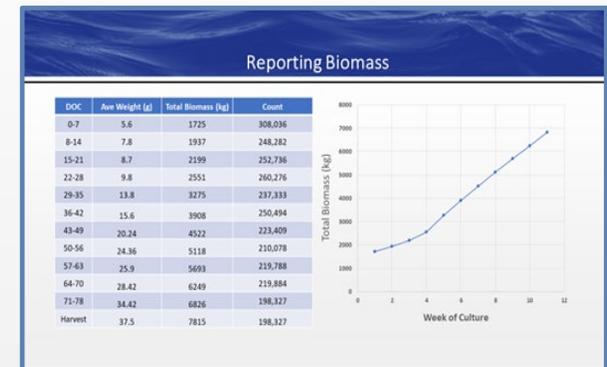
## We use sonar to see in murky water



**1.** Our sonar device is placed in the shrimp pond



**2.** The sonar device collects data on shrimp density and behavior

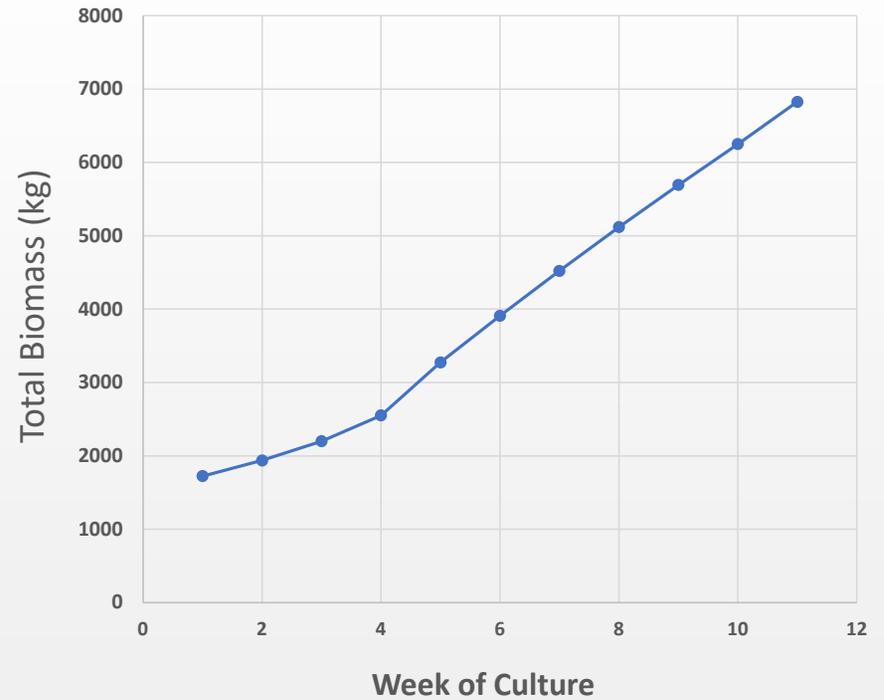


**3.** Shrimp Count and Biomass are analyzed and provided to the farmer

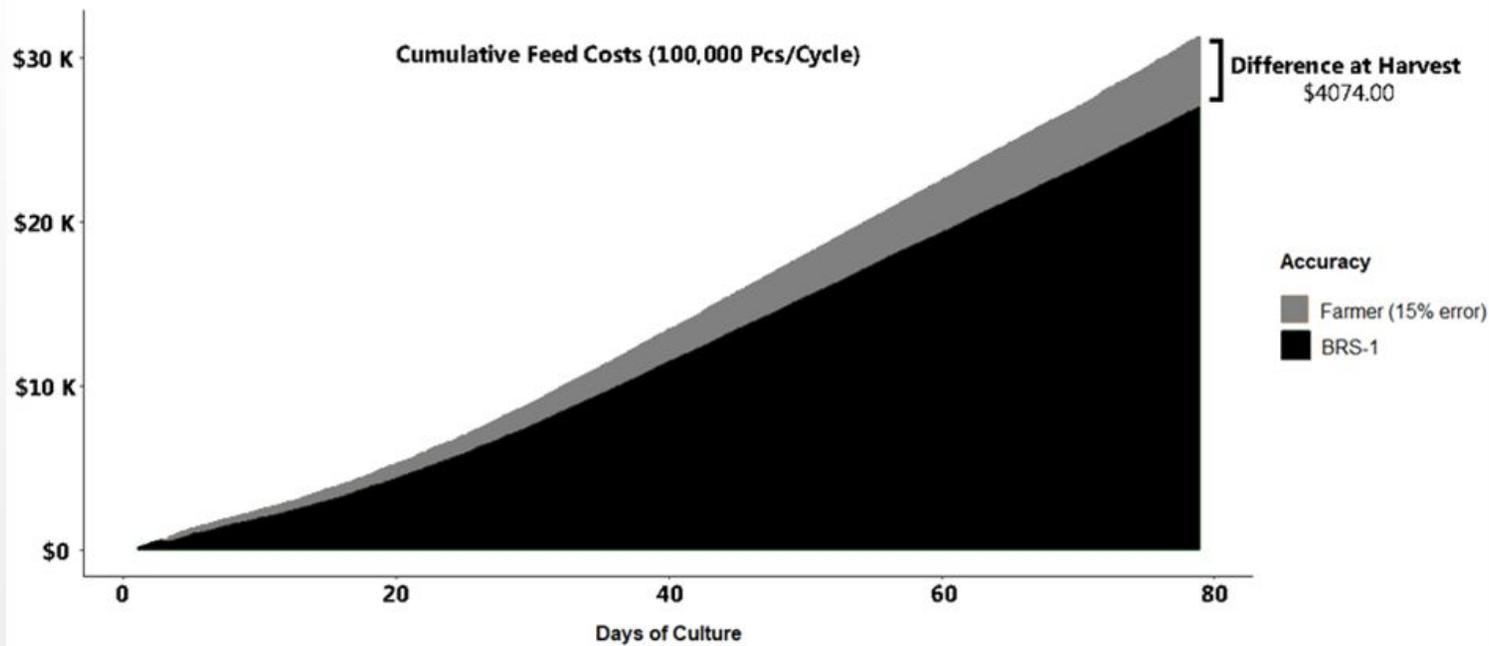
*Minnowtech's BRS-1 estimating shrimp biomass in Kauai, Hawaii*

# REPORTING BIOMASS

DOC	Ave Weight (g)	Total Biomass (kg)	Count
0-7	5.6	1725	308,036
8-14	7.8	1937	248,282
15-21	8.7	2199	252,736
22-28	9.8	2551	260,276
29-35	13.8	3275	237,333
36-42	15.6	3908	250,494
43-49	20.24	4522	223,409
50-56	24.36	5118	210,078
57-63	25.9	5693	219,788
64-70	28.42	6249	219,884
71-78	34.42	6826	198,327
Harvest	37.5	7815	198,327



# SAVINGS WITH BIOMASS ACCURACY





# MID-SIZE FARMERS

10-50 ponds

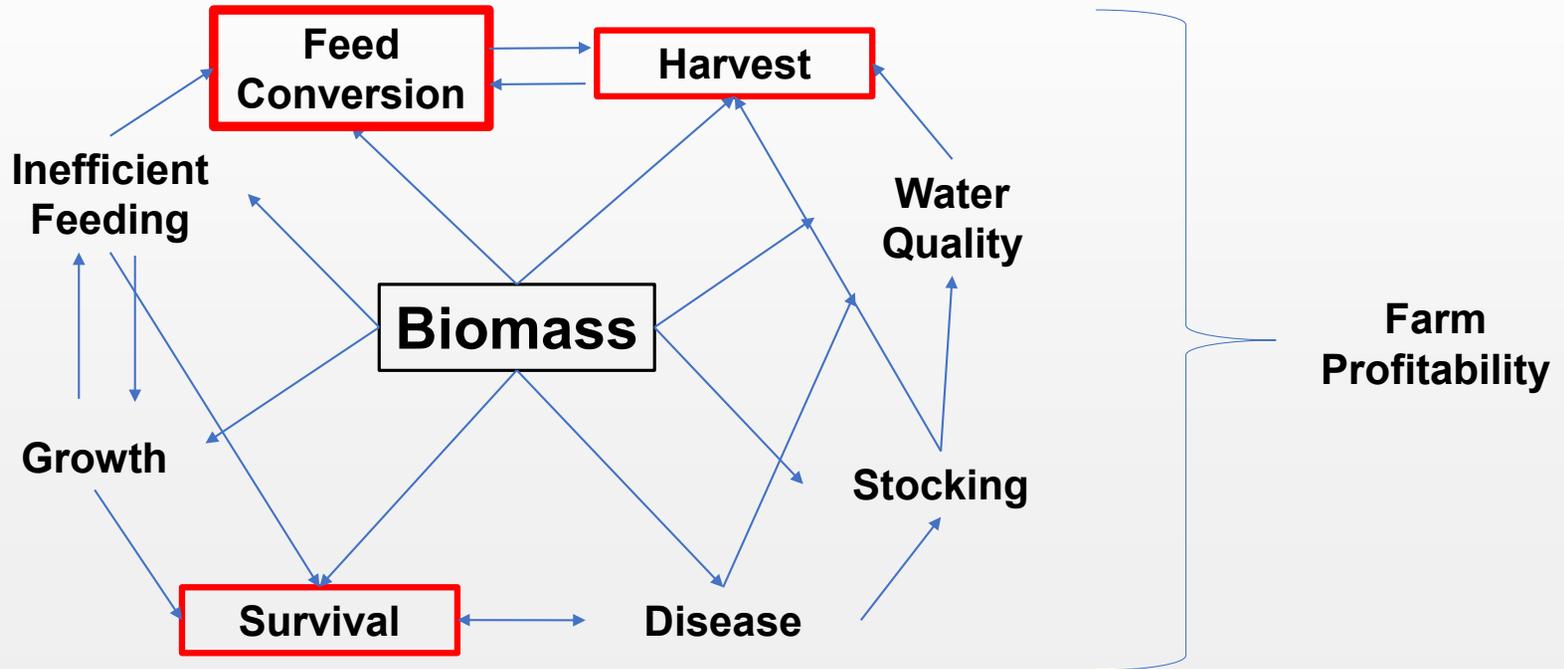


# LARGE-SCALE FARMERS

200+ ponds



# KNOWING BIOMASS ENABLES FULL FARM CONTROL





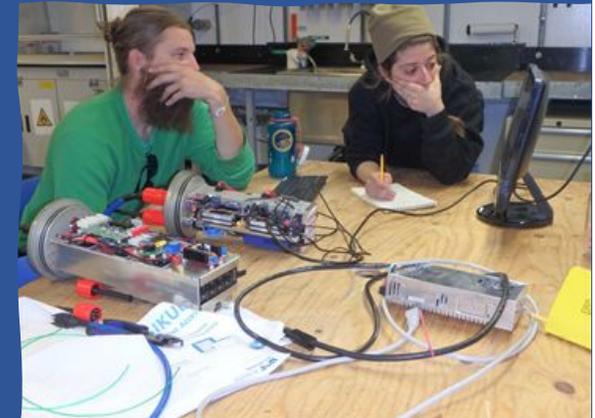
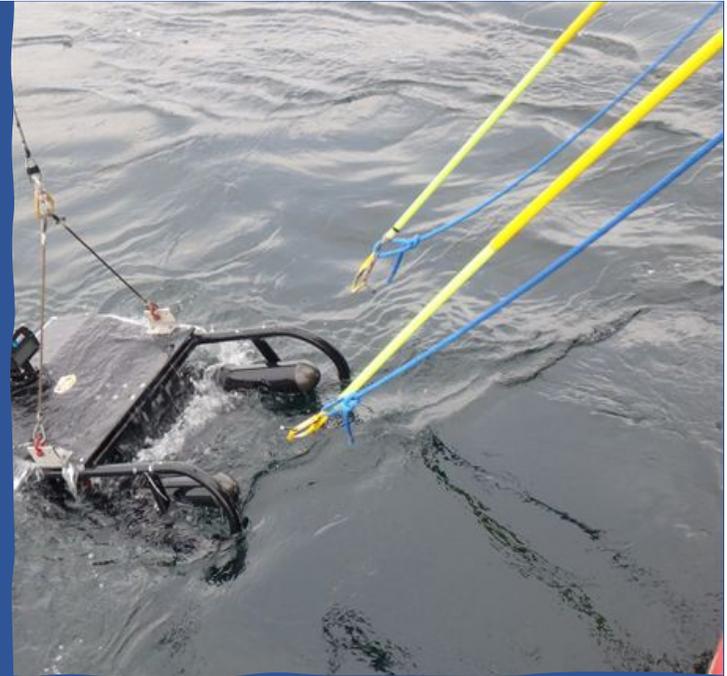


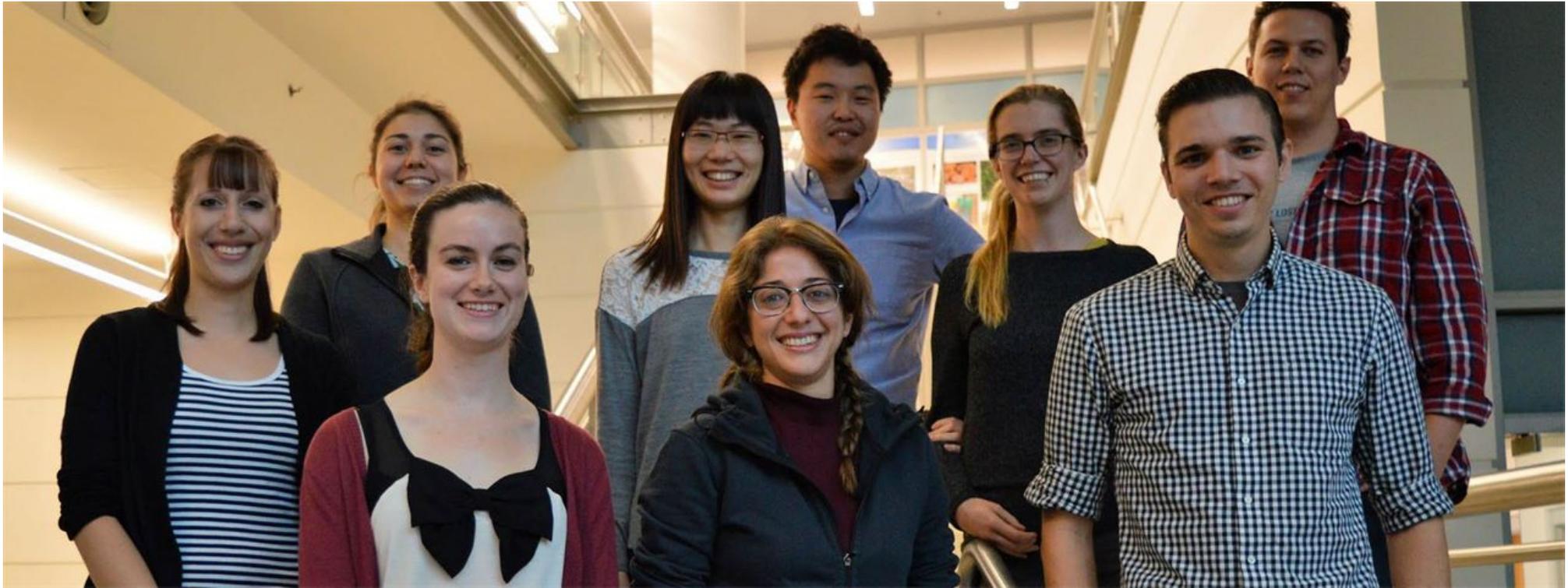
# Jellyfish in Murky Water





# Jellyfish in Cold Water





## Ratcliffe Environmental Entrepreneur Fellowship (REEF) program



# THE MINNOWTECH TEAM



Suzan  
Shahrestani  
CEO/Founder



Adam Van  
Dyke  
Director of  
Business  
Development



Laura Stein  
Aquaculture  
Industry Associate



Connor Walsh  
Research  
Technician



Kevin Kahover  
Data Analyst



Nancy Kanna  
Data Analyst



Daniel  
Nafarrete  
Field Technician



Mary Beth  
Wickless  
Industry Analyst



Kelli Booth  
Co-Founder



Ken Malone  
Co-Founder





**BOARD OF REGENTS**

**SUMMARY OF ITEM FOR ACTION**

**TOPIC:** USM Momentum Fund: Additional Fund Balance Allocation

**COMMITTEE:** Economic Development and Technology Commercialization

**DATE OF COMMITTEE MEETING:** Tuesday, February 22, 2022

**SUMMARY:** In June of 2016, the Board of Regents voted to create what is now called the USM Momentum Fund and fund it at \$10 million over 4 years. The Fund invests in early-stage USM-affiliated companies, such as companies based on USM-owned intellectual property, companies founded by USM faculty, students or recent graduates, and companies located in USM research parks, incubators, or RISE Zones. As of February 22, 2022, the Momentum Fund has invested \$6.4 million in 26 companies. An initial goal was to raise \$15 million external capital; to date MMF has raised an estimated \$65 million in external co-investment and \$2.4 million in co-investment from USM institutions.

Any returns from investing cycle back to the fund to be used again for investment. The portfolio is strong but still young. Benchmarking studies and portfolio tracking indicate that it may be several years until we have a large return. There is \$3.6 million remaining of the initial allocation, and adjusting for commitments, only \$2.7 million remains uncommitted. Of the \$2.7 million, \$1.5 million is intended for follow-on investing, and about \$1.1 million is intended for new companies. Given the strength of the portfolio so far, internal and external confidence in the process, and the other types of returns due to the development of the investment ecosystem and USM's role in it, an additional allocation of up to \$2 million per year over a 3-year period is recommended. In addition, other sources of funding should be sought if there is intention to continue to grow the impact of the Fund.

This item will also be presented to the Finance Committee, on April 13, for its consideration and recommendation.

**ALTERNATIVE(S):** The Economic Development and Technology Commercialization Committee could elect to not recommend an additional allocation or to request a smaller allocation. However, that would: 1) limit the ability of the Fund to make follow-on investments, which enhances return possibilities to USM and in some cases may be critical for the companies already supported; 2) send a signal that USM does not believe in the Fund, which limits the ability to raise outside capital for the Fund; 3) erode the structures such as the Advisory Board that have been developed and provide additional positive benefits to USM institutions and affiliated companies.

**FISCAL IMPACT:** The USM would invest up to an additional \$6 million over 3 years in the USM Momentum Fund. The fund source is USM Office unrestricted fund balances.

**CHANCELLOR'S RECOMMENDATION:** That the Economic Development and Technology Commercialization Committee recommend that the Board of Regents approve this proposal to allocate up to an additional \$6 million over 3 years in the USM Momentum Fund.

COMMITTEE RECOMMENDATION:

DATE:

BOARD ACTION:

DATE:

SUBMITTED BY: Lindsay Ryan 410-409-2236 [lryan@usmd.edu](mailto:lryan@usmd.edu)

# USM Momentum Fund Update and Bridge Funding Request

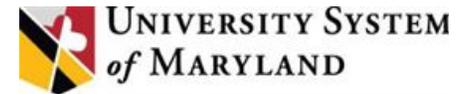
*Briefing for USM Economic Development and Technology Commercialization Committee*

*Ellen Herbst, USM Vice Chancellor for Administration and Finance*

February 22, 2022

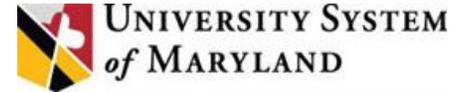


# Overview



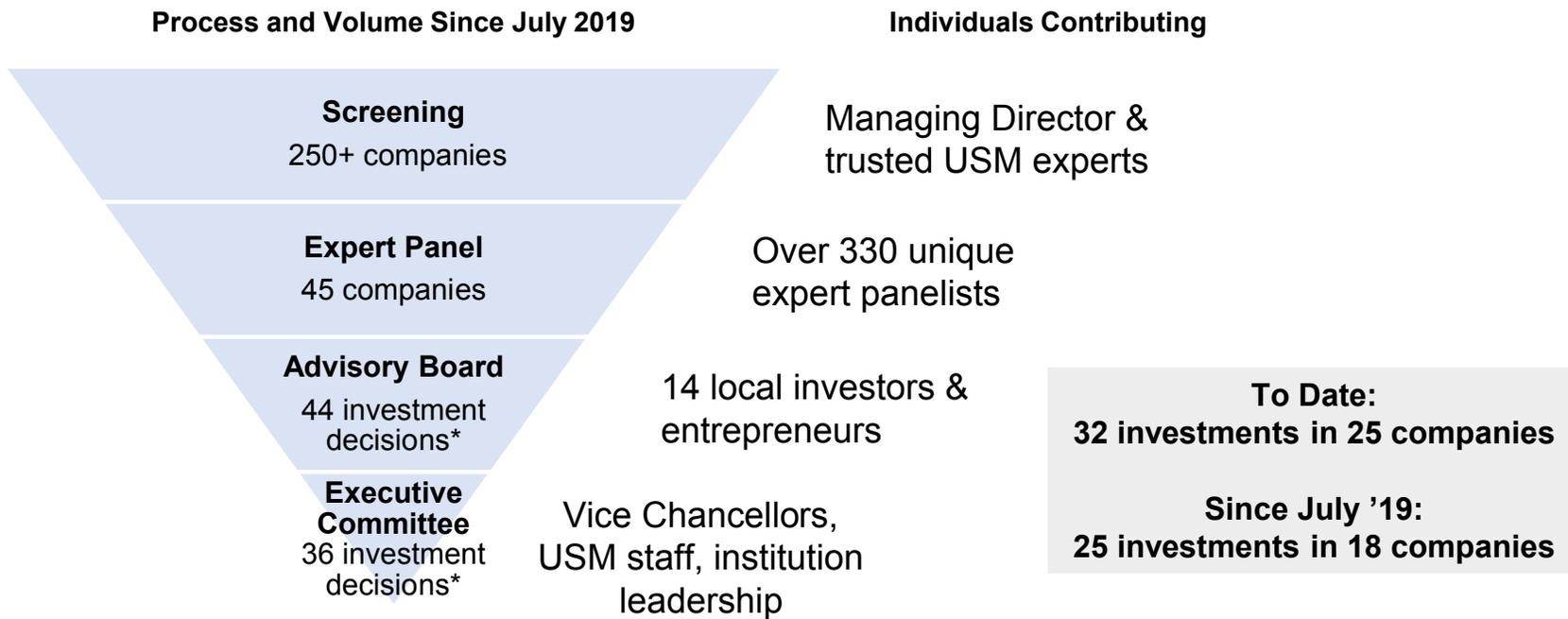
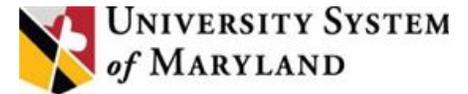
- **\$10MM University System of Maryland investment fund**
  - Established by USM Board of Regents in June 2016. Investments started in late 2017.
  - Funding source is System fund balance
- **Investing in the most promising USM-affiliated technologies and people**
  - Help promising early-stage companies bridge early-stage funding gaps
  - Support companies so they get to a point where they can raise additional funding with VCs or be acquired
- **Eligibility criteria**
  - Located in Maryland; Must have a co-investor(s) that will invest at least as much as MMF
  - Affiliated with one of the 12 USM institutions across the State of Maryland (any **one** of the below):
    - University-owned intellectual property
    - Founded by University faculty, staff, student, or alum
    - Located in a University-affiliated research park or incubator

# Meeting and Exceeding Goals



Goals	Progress
<p><b>Companies</b>  <i>Accelerating the success of USM start-ups;                      bridge early funding gaps</i></p>	<ul style="list-style-type: none"> <li>• 65% of portfolio has follow-on capital or achieved profitability</li> <li>• 250+ entrepreneurs received connections and advice since July 2019</li> <li>• Access to a growing network of 180 unique co-investors</li> <li>• Portfolio company revenues grew from \$4.49M to \$13.9M.</li> </ul>
<p><b>Maryland</b>  <i>Expanding economic development in the                      State of Maryland; keeping recent graduates                      in the State of Maryland</i></p>	<ul style="list-style-type: none"> <li>• 194 jobs created as of 12/31/21</li> <li>• 56% of MMF companies hire USM interns or recent grads</li> <li>• Convenes local investor network and attracts out-of-state investors</li> <li>• Significant player in filling a critical gap in state ecosystem</li> </ul>
<p><b>USM Institutions</b>  <i>Recruiting and retaining innovative students                      and faculty</i></p>	<ul style="list-style-type: none"> <li>• Almost 60% of portfolio involves USM faculty/employees, recent alum</li> <li>• Attracts attention to other USM offerings, such as incubators, EIRs</li> <li>• Storied entrepreneurs and investors learning about USM and able to help institutions and their entrepreneurs</li> <li>• Processes guide USM institutional investment of resources and capital (including \$2.4M co-investment by institutions)</li> </ul>
<p><b>Financial Sustainability</b>  <i>Generate <u>Long-Term</u> Financial Returns;                      Generate \$15M in Co-Investment</i></p>	<ul style="list-style-type: none"> <li>• In progress!</li> <li>• Raised more than \$65M to date; almost 7X match on USM \$</li> </ul>

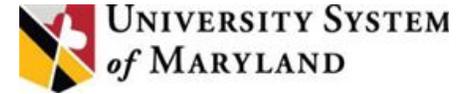
# Enabling Success: Diligent Management & Governance



Through MMF, USM gleans best practices from others and [shares](#) our own best practices and thought leadership: "[6 concepts to guide colleges that are getting into the venture capital game](#)"

\*Includes follow-on

# Enabling Success: Leadership & Governance



## **Advisory Board**

*(Voluntary) Role: advise on individual investments; mentor companies; inform overall strategy*

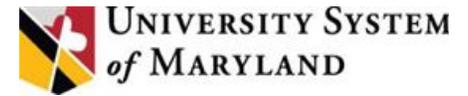
- **Maurice Boissiere** – Chief Customer Officer, DataTribe
- **Tim Braue** – Attorney, Nemphos Braue
- **Greg Cangialosi** – Venture Partner, Early Light Ventures
- **Jeff Cherry** – Executive Director, Conscious Venture Lab®
- **Steve Dubin** – Principal, SDA Ventures
- **Amritha Jaishankar** – Director, Programs and Strategic Alliances, Maryland Stem Cell Research Fund, TEDCO
- **Rick Kohr** – CEO, Evergreen Advisors
- **Elise Liberto** – Principal, Private Equity Group, Brown Advisory
- **Wendy Perrow** – Chief Executive Officer / Entrepreneur
- **Jenny Regan** – CEO, Key Tech
- **Paul Silber** – Founding Principal, Blu Venture Investors
- **Kyp Sirinakis** – Managing Partner and CEO, Epidarex, Oncologix
- **Sydney Ulvick** – Director, Intelligent Systems Works, Lockheed Martin
- **David W. Wise** – Entrepreneur in Residence, UMB

## **Executive Committee and Staff**

*Role: make final investment decisions; liaise with institution personnel and leadership; direct overall strategy*

- **Ellen Herbst** – Vice Chancellor for Administration and Finance, USM
- **Jim Hughes** – Senior Vice President and Chief Enterprise and Economic Development Officer, UMB
- **Gregory Simmons** – Vice President for Institutional Advancement, UMBC
- **Stan Smith** – Venture Investment Manager, UMCP
- **Celeste Denson** – Comptroller, USM
- **Claire Broido Johnson** – Managing Director
- **Lindsay Ryan** – Venture Development Director, USM

# Enabling Success: Portfolio Management, Follow-On Investment



## ***Portfolio Support***

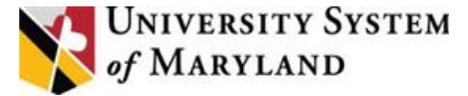
- Providing fundraising training, introductions to co-investors and potential partners
- Convening the portfolio and providing education on topics important to emerging companies
- Supporting portfolio companies on operational plans, sales strategies, etc.
- Providing more extensive support for some; e.g. monthly meetings with Advisory Board members to prepare for follow-on financing
- Monitoring progress quarterly to assess need for support and inform decisions about reserving funding for follow-ons

## ***Follow-On Investment Process***

- Companies seeking additional investment from MMF start the process again, starting at the Advisory Board.
- Matching investment typically required.
- Investment may have conditions, usually to ultimately help direct/benefit the company.



## Stakeholder Voices



**Matt Cohen, CEO, SIMPLi:** Although SIMPLi did not receive funding from the MMF, Claire and Lindsay were impactful resources. Through their generosity of spending time with us to fine tune our pitch deck, provide constructive feedback of our presentation, and introducing us to several members of the local community, we had a very successful equity and debt funding round. We appreciate the commitment Claire and Lindsay continuously put towards entrepreneurs and emerging businesses that are connected to the University System of Maryland.”

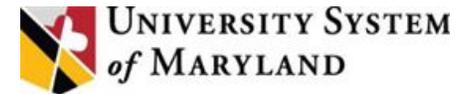
**Elaine Haynes, CEO, Kalocyte (Portfolio Company):** “MMF was KaloCyte’s first investor following our move from St. Louis to Baltimore. The connections and credibility gained through MMF’s diligence process and ongoing support have helped us access other investors, strengthen our business approach, and accelerate building our local network of quality business partners.”

**Gregory Simmons, Vice President for Institutional Advancement, UMBC:** “MMF is invaluable in our efforts to support our alumni entrepreneurs, to attract companies to our research parks, and to enable our faculty to commercialize their scientific accomplishments.”

**Steve Dubin, Principal at SDA Ventures and MMF Advisory Board Member:** ““The Maryland Momentum Fund (MMF) provides critical, patient funding and validation for very early-stage companies that spring forth from the University of Maryland System, its students and professors. There is insufficient early-stage capital available in Maryland. Without the support and funding provided by MMF, many of the companies that have been funded and are developing technologies important to the future economic development of the State of Maryland would need to move elsewhere or cease to exist. I applaud the work of MMF and its terrific leader, Claire Broido Johnson and am happy to volunteer my time to aide in this important and impactful effort.”

**Paul Silber, Principal at Blu Venture Investors and MMF Advisory Board Member:** "The MMF provides a critical component of the local investing ecosystem, providing essential capital to early-stage Maryland companies that others are unlikely to invest in. Not surprisingly, the focus on early-stage investing by MMF means a considerably longer timeline to exits.”

## MMF is On-Track for Long-Term Financial Returns - *Benchmarking*



Comparison to 21 university funds that invest \$150-500K per investment and are sector agnostic...

**Fund Size:** Averages \$10M - \$50M

- MMF is on the small side

**Funding Source:** Endowment, angels, alum

- MMF funding source is unique

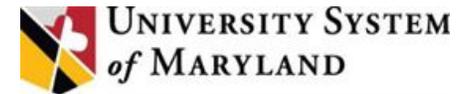
**Time to Exit:** Average time to exit is 5-7 years, so late 2022 to 2024 for MMF

- Quarterly monitoring of portfolio shows promising indicators

**Return on Exit:** Averages 0.5 - 3X

- MMF's increased valuation on notes converting in follow-on rounds are promising early indicators

# Addressing the Fund's Funding Gap



## **MMF Faces a Funding Gap**

The fund has \$2.7M in uncommitted funds, with about \$1.5M reserved for follow-on investments (needed for the companies and to maximize our returns). That leaves about \$1.1M to invest in new companies, which is about 5 companies.

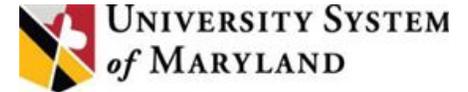
## **Time is of the Essence**

As a small fund of only \$10M, the Momentum Fund *could* have generated returns to provide *continuous* investment at a similar level, but it was not likely and has not happened yet, nor is the Fund anticipating this to happen before the \$1.1M for new companies is fully invested.

## **Bridge Funding is an Informed Path Forward**

However, with responsible management, \$10M has been sizeable enough to make a large impact and generate enough information to inform a path forward.

# Bridge Funding Recommendation



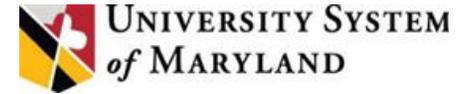
Bridge funding mitigates the risk to USM's current investment in the Momentum Fund and fully enables the opportunity it presents.

Other sources of capital have and will be sought, but those sources often need a more fully proven track record. Therefore, USM fund balance is recommended, but USM's financial exposure must be limited.

An additional allocation of up to \$2 million per year over 3 years is recommended from the USM fund balance, due to the strength of the portfolio so far, internal and external confidence in the process, and the other types of returns due to the development of the investment ecosystem and USM's role in it.

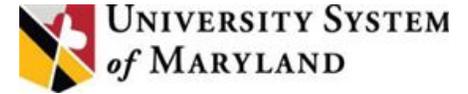
***Eileen O'Rourke, CFO of Abell Foundation (Co-Investor): "The Maryland Momentum Fund is an important anchor to the growing entrepreneurial ecosystem, and a value-added investor in launching innovative companies through its capital, expertise and connections. While momentum is clearly accelerating, USM's consistent support and patient capital is critical to realizing the potential of a strong, diverse and vibrant business community."***

# Bridge Funding for Continued Success



<b>Goals</b>	<b>Positive Impacts of Bridge Funding</b>
<p><b>Companies</b></p> <p><i>Accelerating the success of USM start-ups and bridge early funding gaps</i></p>	<p>Won't strand portfolio companies</p> <p>Continues infrastructure supporting many more USM companies</p>
<p><b>Maryland</b></p> <p><i>Expanding economic development in Maryland; keeping recent graduates in Maryland</i></p>	<p>Continues job-creating capitalization of new companies</p>
<p><b>USM Institutions</b></p> <p><i>Recruiting and retaining innovative students and faculty</i></p>	<p>Signals USM commitment</p>
<p><b>Financial Sustainability</b></p> <p><i>Generate <u>Long-Term</u> Financial Returns; Generate Co-Investment</i></p>	<p>Enables "follow on" investing for maximum returns</p> <p>Enables co-investment for individual companies and non-USM funding routes</p>

# The Other Side of the Bridge



**Remembering What We've Learned:** The recommended bridge funding *should* be enough for MMF to invest continually. However, it is not guaranteed, due to the unpredictable nature of early-stage investing.

## **MMF Can Scale for Greater Impact:**

MMF is investing in a fraction of USM companies; it could be investing an estimated \$10M per year. The need/opportunity is growing, with pre-seed funding and entrepreneurial activity growing across USM institutions and in Maryland.

## **USM Fund Balance Cannot Scale MMF:**

Institutions are co-investing and will hopefully grow:

- UMB UM Ventures (~\$200-300k annually since 2015)
- [UMCP Chesapeake Bay Seed Capital Fund](#) (~\$450k annually)
- [UMCP Dingman Angels](#) Established 2005; currently invests an average initial investment of \$100-250k per company; since 2018, 38 initial financings, with an average of 11 companies per year. Since 2005: over 150 transactions representing over \$20 M (initial and follow-on) in capital deployed.
- More USM institutional investment sources emerging!

With a track record will come a greater ability to approach additional external sources of capital.

Scaling also requires infrastructure, particularly if taking external capital. Thank you to UMB and UMCP; and all USM institutional co-investors for their support so far.

# APPENDIX

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*Briefing for USM Economic Development and  
Technology Commercialization Committee*

February 22, 2022



# Investments

		2020		2021	
		First Half	Second Half	First Half	Second Half
<b>2017-2018</b>	<b>2019</b>	<b>InferCabulary</b> Feb. 2020, \$250K \$783K Round	<b>NextStep Robotics</b> Aug. 2020, \$250K Add-on; \$500K Round	<b>Veralox</b> Jan 2021, \$250K Add-on; \$5MM Round	<b>Aqualith</b> Sep. 2021, \$100K \$1.5MM Round
<b>MF Fire</b> Nov. 2017, \$192.5K \$1.2MM Round	<b>Retrium</b> May 2019, \$400K \$1.6MM Round	<b>ARMR</b> Feb. 2020, \$350K \$750K Round	<b>MiRecule</b> Aug. 2020, \$250K \$3.5MM Round	<b>Dynamhex</b> Feb. 2021, \$250K \$800K Round	<b>To Be Announced</b> Oct. 2021, \$250K \$4MM Round
<b>NextStep Robotics</b> Feb. 2018, \$250K \$1.14MM Round	<b>Veralox</b> Jun. 2019, \$500K \$5.4MM Round	<b>DataKwip</b> Apr. 2020, \$250K \$650K Round	<b>N5 Sensors</b> Sept. 2020, \$300K \$1MM Round	<b>Qualytics</b> Apr. 2020, \$250K \$2.1MM Round	<b>Several rounds of follow-on investment approved pending co-investment</b>
<b>PaverGuide</b> Mar. 2018, \$300K \$675K Round	<b>Gemstone</b> Aug. 2019, \$250K \$1.3MM Round	<b>Pathotrak</b> May 2020, \$150K \$1.2MM Round	<b>InferCabulary</b> Sept. 2020, \$100K Add-on, \$1MM Round	<b>Target Docs</b> Apr. 2020, \$250K \$850K Round	
<b>NAWEC</b> Apr. 2018, \$350K \$1.5MM Round	<b>Neoprogen</b> Oct. 2019, \$245K \$1.5MM Round	<b>KaloCyte</b> June 2020, \$300K \$1MM Round	<b>Voxy Engen</b> Oct. 2020, \$500K \$6.75MM Round	<b>KaloCyte</b> Apr 2020, \$300K Add-on, \$500K Round	
<b>MF Fire</b> Oct. 2018, \$500K Add-on \$400K Round	<b>Minnowtech</b> Nov. 2019, \$150K \$600K Round		<b>VisiSonics</b> Nov. 2020, \$500K \$3.5MM Round	<b>Liatris</b> June 2021, \$250K \$800K Round	<div style="border: 1px solid black; padding: 5px;"> <ul style="list-style-type: none"> <li>DeepTech/Engineering Technology</li> <li>Consumer Product</li> <li>Therapeutic</li> <li>Data</li> <li>Education Technology</li> <li>Aquaculture</li> <li>MedTech</li> <li>Other Life Science</li> <li>FinTech</li> </ul> </div>
<b>Zest Tea</b> Dec. 2018, \$300K \$1.035MM Round	<b>Zest Tea</b> Dec. 2019, \$200K Add-on \$650K round			<b>Veralox</b> June 2021, \$500K Add-on, \$16MM Round	

# Portfolio Companies



**UMCP IP and Alum**  
Advanced wood burning stove



**UMB IP, Towson Alum**  
Exoskeleton robot to reverse foot drop for stroke victims.



**UMCP IP, Alum**  
Advanced pulse jet engine



**UMB Alum**  
Anticoagulant drug, therapeutics for rare blood disorders



**UMCP Alum**  
High caffeine tea, energy drink product



**UMB IP and Faculty**  
Cell-based therapy for cardiovascular disease



**UMCP IP**  
Advanced semipermeable pavement system



**UMCES Alum**  
Sonar to measure shrimp biomass



**UMCP Alum**  
Agile software development management product



**UMBC and UMCP Alums**  
Tissue regeneration via stem cells



**UMCP Alum**  
Software platform to manage energy across buildings



**UMCP IP and Faculty**  
Food safety testing technology



**UMB/UMBC Faculty, UM BioPark Affiliate**  
Dried artificial red blood cell



**UM BioPark Tenant**  
Next-gen tourniquet



**Towson Alum, TU Incubator startup**  
Ed-tech vocabulary app



**UMCP IP and Faculty**  
Spatial and personalized audio solutions



**UMCP Alum and Faculty**  
Language upskilling platform



**UBalt Professor**  
climate change modeling and action platform



**UMCP Alum**  
RNA Therapeutics



**UMCP IP and Faculty**  
Semiconductor sensor technology



**UMCP Employee**  
Fireproof, lightweight insulation



**UMCP Professor**  
More efficient lithium ion batteries



**UMCP/UMB Alum**  
Financial products for small commercial solar installations

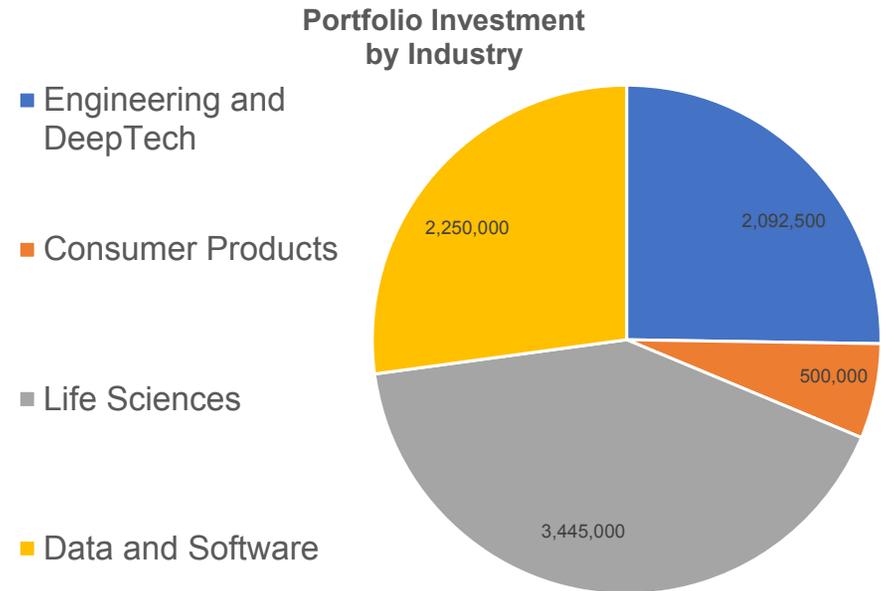
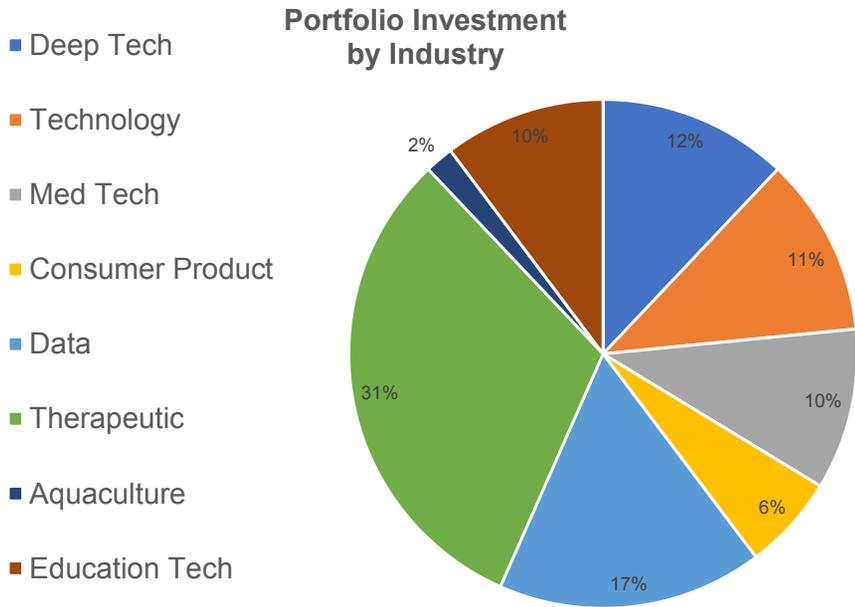


**UMBC BwTech**  
Data integrity

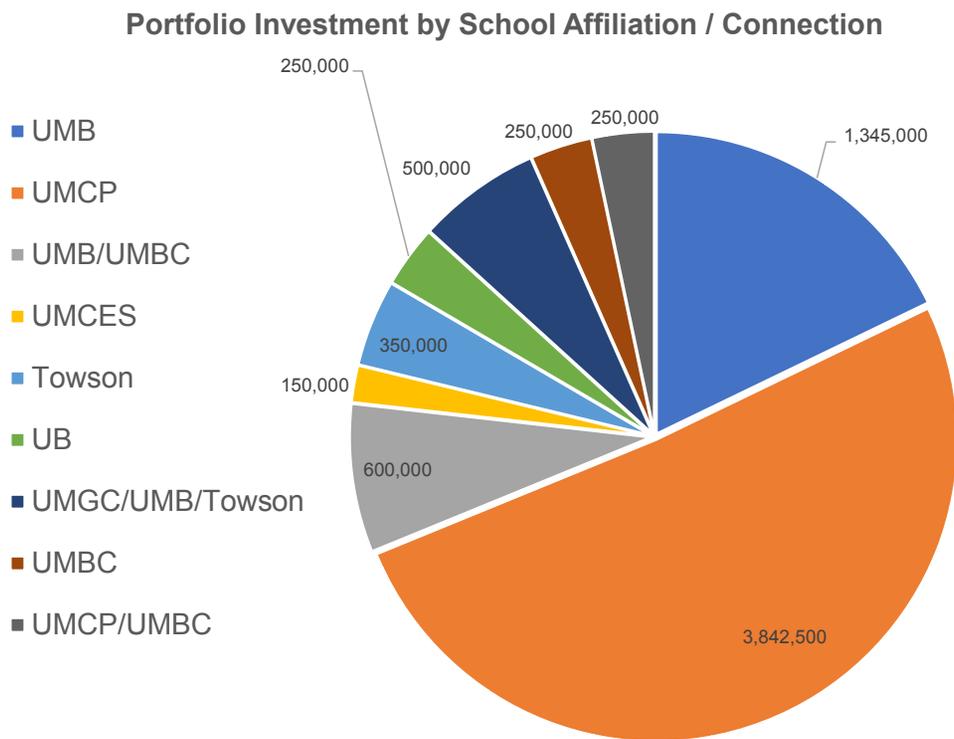


**UMCP Alum**  
Data platform for construction industry

# Investment by Industry – shown two ways



# Investment Detail



## Universities Used in Benchmarking

- Umass Investment Fund
- Rochester Institute of Technology Venture Fund
- UCLA Ventures
- UC San Diego – Triton Technology Fund
- University of North Carolina – Carolina Research Ventures
- University of Illinois – Illinois Ventures
- NYU Innovation Venture Fund
- U of Chicago Innovation Fund
- Case Western – CWRU Technology Ventures
- University of Michigan – Accelerate Blue Fund, MINTS
- Red Cedar Ventures: Michigan State University
- University of Wisconsin- Madison
- University of Texas Horizon Fund
- Indiana University – Innovate Indiana
- University of Virginia – LVG Seed Fund
- University of Washington – the W Fund
- Washington Research Foundatoin (WRF) Capital
- Duke University – Innovation Fund
- Ohio Innovation Fund
- University of California Ventures Bow Capital
- Johnson Business School at Cornell – Big Red Ventures

## Conclusions on Reviewing University Funds Structure

- Most university funds utilize an evergreen model, but also include funding from
  - University Endowments
  - Alumni
  - IP licensing
- Half of the universities have more than one fund – some funds are system-wide and some are with just one school
- Funds have strategic partnerships with technology transfer office and VC firms
  - Deal sourcing
  - Promotion
  - Funding
  - Management
- Most university funds have a team of more than two people managing the fund
- Many university funds not as constrained (i.e. can invest outside of state)

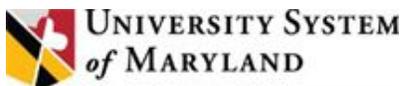
## Quotes from leaders in the industry



**Jeff Strovel, CEO, Veralox:** “The MMF was first to consider investment in Veralox and their support was vital to securing our initial seed funding and participation from blue-chip venture firms and strategic investors. They continue to support the company with significant follow-on investments and access to their network of experienced advisors.

**Jamie McDonald, CEO, Upsurge Baltimore:** “The Maryland Momentum Fund is a recent, but vital addition to the regional startup ecosystem. University of Maryland is rapidly establishing itself as a leading public university for entrepreneurship. MMF extends that leadership into direct support for promising startups which will accrue long-term benefits to both the university and the areas of the state in which those companies operate. University support and investment has been one of the hallmarks of company formation and retention in other thriving startup cities/states, and we are just in the early stages of feeling the benefit of MMF here.”

**Christy Wyskiel, Senior Advisor to President for Innovation & Entrepreneurship, Executive Director, Johns Hopkins Technology Ventures, Johns Hopkins (Ecosystem Partner):** “Claire has been a critical part of building the Maryland ecosystem, providing advice to entrepreneurs, giving feedback on investment decks, and selecting the most promising companies from USM for investment. She brings a lifetime of knowledge as an entrepreneur, and as a result, USM continues to build a reputation as an entrepreneur-friendly university. This will continue to result in favorable relationships with successful alumni who build businesses and in turn look to give back to their alma mater.”



**BOARD OF REGENTS**

**SUMMARY OF ITEM FOR  
INFORMATION**

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**TOPIC:** Frostburg State University Economic Development

**COMMITTEE:** Economic Development and Technology Commercialization

**DATE OF COMMITTEE MEETING:** Tuesday, February 22, 2022

**SUMMARY:**

Al Delia, Vice President for Regional Development and Engagement at Frostburg State University, will present information about recent developments in the strategy and activities related to economic development. This include several "placemaking" developments, workforce development initiatives, and small business and community support and outreach.

**FISCAL IMPACT:** This item is for information purposes.

**CHANCELLOR'S RECOMMENDATION:** n/a

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COMMITTEE RECOMMENDATION:

DATE:

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BOARD ACTION:

DATE:

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SUBMITTED BY: Lindsay Ryan 410-409-2236  
[lryan@usmd.edu](mailto:lryan@usmd.edu)

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*One University. A World of Experiences.*

# **FSU Economic Development Leadership & Initiatives in Western Maryland and Beyond**

Helping to transform the region we serve.

## Initiatives Underway

- Western Maryland Advanced Technology Center at FSU Innovation Park
- Center for Applied Research and Innovation (CARI)
- I-68 Regional Alliance (5-county/3-state regional group)
- Centers of Excellence:
  - Laboratory Training & Education; Clean Energy; Waste-to-Value
- Clean Energy Entrepreneur-in-Residence
- Legacy Business Transition Program (SBDC)
- Remote Work Center
- Advanced Product Design and Manufacturing Center
- TEDCO Maryland Innovation Initiative (MII) Pilot



## External Resources for University and Regional Needs

### Office of Sponsored Programs

#### *Continuous improvement*

- Increased grant awards from \$2.4 million in FY 2018 to more than \$3.8 million FY 2021: (does **NOT** include more than \$15 million from CARES Act or American Rescue Plan funding granted to FSU.)
- Acquired ***GrantForward***, a new funding opportunity database that provides multiple educational and training resources
- Making available grant research/writers to support faculty, staff and students



# Helping Small Businesses



## Small Business Development Center

Helping businesses survive COVID-19 and succeed

- In FY '20-21 - Approximately 1800 jobs supported; 334 clients seen; 13 new businesses started; more than \$7.2 million in capital infusion and secured special grant funding for Legacy Business Transition Program



## FSU Regional Science Center/Challenger Center

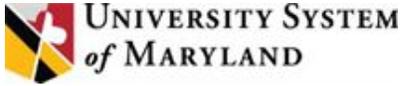


### *Improving Enrollment, Education and Workforce*

- Secured former Frostburg City Hall as the new home of FSU Regional Science Center
- State funding of \$3 million for renovations + \$ match
- Building planning and design work has begun
- Launch in late 2023



One University. A World of Experiences.



**BOARD OF REGENTS**

**SUMMARY OF ITEM FOR  
DISCUSSION**

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**TOPIC:** Early-Stage Support Feasibility Study Recommendations

**COMMITTEE:** Economic Development and Technology Commercialization

**DATE OF COMMITTEE MEETING:** Tuesday, February 22, 2022

**SUMMARY:**

USM provides a portfolio of resources to promote and support entrepreneurship among its student, faculty, and community. However, gaps remain, and some potential is untapped. On September 2, the Economic Development and Technology Commercialization Committee encouraged USM to study the feasibility of developing a multi-institution resource(s) that: 1) promotes and supports entrepreneurial success, generally at an earlier stage than the Momentum Fund; and 2) equitably supports a diversity of entrepreneurs and ventures, with broad engagement across USM as a primary goal.

Lindsay Ryan, USM Venture Development Director, will present recommendations resulting from a multi-stakeholder analysis and process addressing the topic. The recommendations include to establish: 1) More efficient and effective coordination, interoperability, and communication of existing entrepreneurial resources within and outside of USM; 2) Collaborative efforts to enhance several specific existing entrepreneurial resources within and outside of USM; and 3) In the context of the other recommendations, flexible, non-prescriptive non-dilutive capital to be deployed alongside resources and accountability.

**FISCAL IMPACT:** This item is for information purposes.

**CHANCELLOR'S RECOMMENDATION:** n/a

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COMMITTEE RECOMMENDATION:

DATE:

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BOARD ACTION:

DATE:

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SUBMITTED BY: Lindsay Ryan 410-409-2236  
[lryan@usmd.edu](mailto:lryan@usmd.edu)

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# USM Economic Development

*Briefing for USM Economic Development and  
Technology Commercialization Committee*

February 22, 2022





## New Early-stage Resource(s) Feasibility *Background*

- USM provides a portfolio of resources to promote and support entrepreneurship among its student, faculty, and community. However, gaps remain, and some potential is untapped.
- On September 2, this Committee encouraged USM to study the feasibility of developing a multi-institution resource(s) that: 1) promotes and supports entrepreneurial success, generally at an earlier stage than the Momentum Fund; and 2) equitably supports a diversity of entrepreneurs and ventures, with broad engagement across USM as a primary goal.
- The study spurred *action!*
  - We thought and discussed deeply as a USM entrepreneur support community
  - We analyzed the ecosystem we have, where we want to be, and the gaps
  - We reached out to others – partners, entrepreneurs, industry members
  - We are already underway with activating some recommendations



## New Early-stage Resource(s) Feasibility *Recommendations Overview*

Following a multi-stakeholder analysis and process, recommendations for how USM can (often in collaboration) better support early-stage entrepreneurs can be grouped into the following categories:

- 1. Connect** – More efficient and effective coordination, interoperability, and communication of existing entrepreneurial resources within and outside of USM
- 2. Enhance** – Participate in collaborative efforts to enhance existing entrepreneurial resources within and outside of USM
- 3. Capitalize** – In the context of the other recommendations, enable flexible, non-prescriptive non-dilutive capital to be deployed alongside resources and accountability.

***Overarching recommendation: Leverage existing resources, when possible, instead of creating new ones.***

## Existing Portfolio of Resources

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## Space, Programs, Mentorship, Intellectual Property

**Every** institution except UMGC has or is in the process of developing a **physical place** and **programs/mentorship** for entrepreneurs. Several institutions actively assist startups commercializing university-owned technology.

**292 ventures over the last 3 years** (July '18 – '21; ~100 all-student ventures).

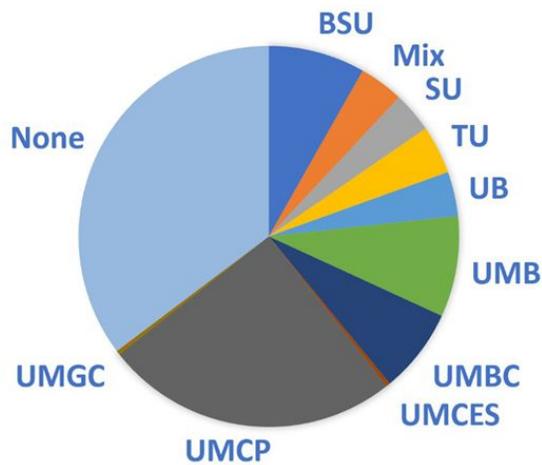
### **Important Notes:**

- Captures only ventures significantly assisted by USM
- Shows where an institution has been, not necessarily where it is going
- Reporting is robust, but there is room to improve

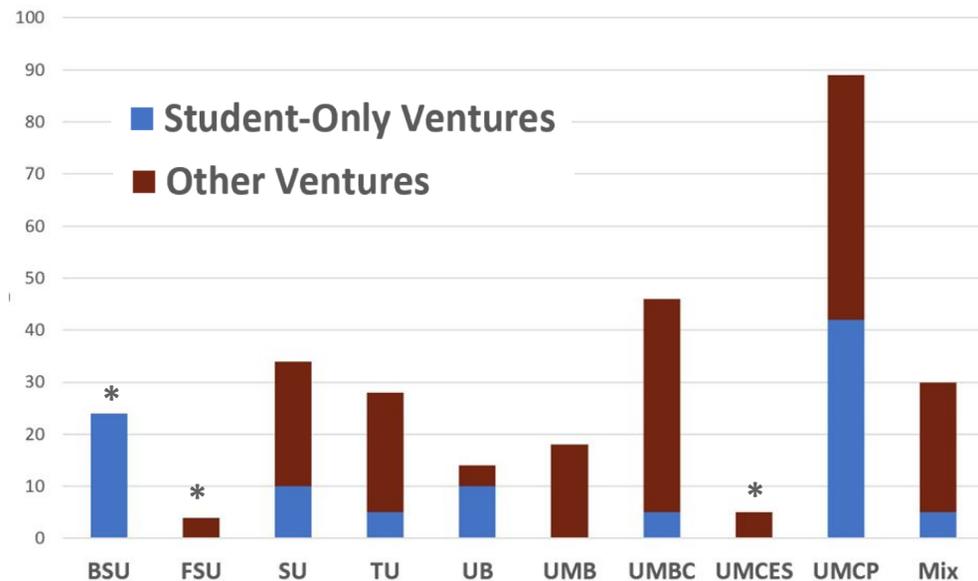


# Ventures Newly Supported with Space, Programs and/or Intellectual Property

*By Founder or IP Affiliation*



*By Institution Providing Support*



\* = Began reporting in the last 3 years

## Capital Support

Access to capital is distributed throughout USM, but not all institutions have capital or every type of capital on their own campus:

- **Competitions and Seed Grants** for students, maybe alum (many institutions)
- **TEDCO MD Innovation Initiative/MII** ([UMCP](#), [UMB](#), [UMBC](#); soon [FSU](#), [BSU](#))
- **Pre-seed Investment** ([UMB](#), [UMCP](#))
- Several hosted by one institution but open to more: **Maryland Industrial Partnerships** – [MIPS](#) ([UMCP](#)), **Shore Hatchery** ([SU](#)), **StarTUp Accelerator** ([TU](#)^), **Baltimore Fund** ([UMB](#))

**\$12.5M to 236 ventures in 3 years** (July '18 – '21; ~95 student-only; 182 new to USM)

- \$5.4M equity investment – \$4.62M [MMF](#); \*[Dingman Angels](#), \*\*[CBSCF](#), MII
- \$5.9M in-kind – Mostly [MIPS](#), some MII Grants; both go to the university
- \$1.3M non-dilutive – Grants, prizes

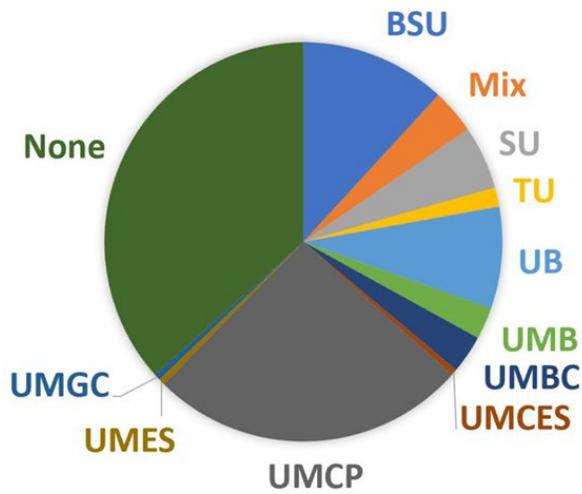
*\*6 investments, dollar value not known | \*\* open to all | ^new*

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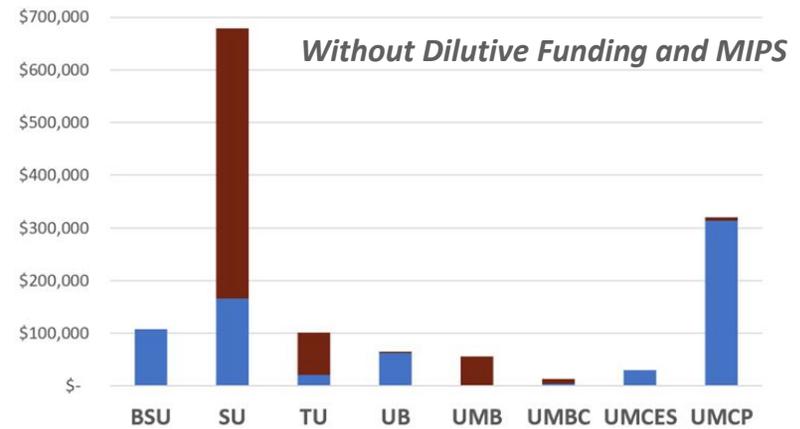
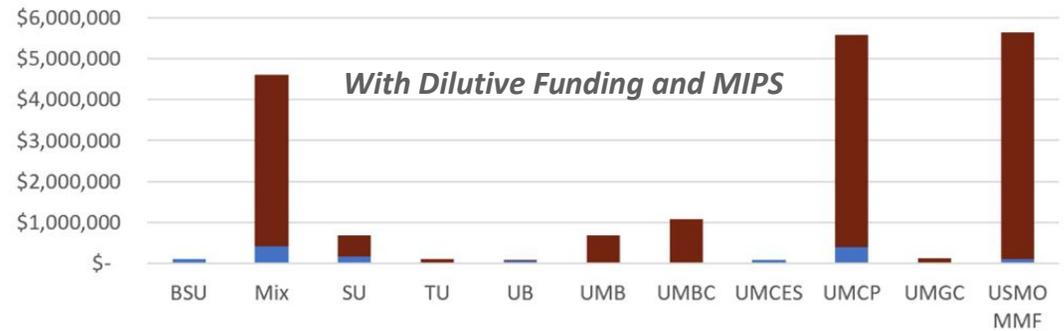
# Ventures Newly Supported With Capital

*By Founder or IP Affiliation*



*By Institution Providing Capital*

■ Other Ventures ■ Student-Only Ventures



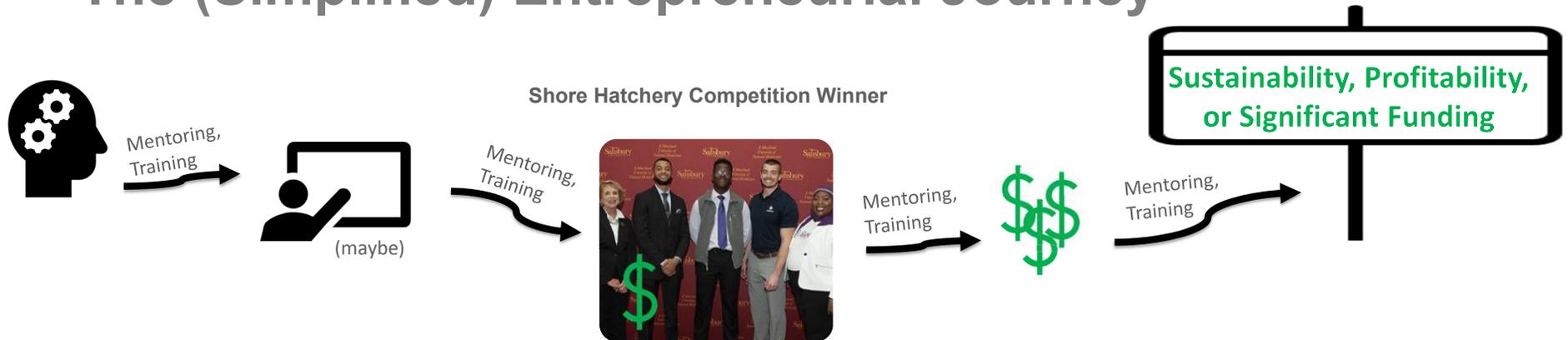


## Additional USM Activity – Looking Forward to Growth!

- **UMES** – Participate in MIPS; recently named their first [Endowed Chair in Entrepreneurship and Innovation](#)
- **CSU** – Recently established the Center for Strategic Entrepreneurship and active partner in the new [Maryland Innovation Extension](#)
- **FSU** – Frostburg State University has been ramping up [placemaking initiatives](#)
- **USG** – The Universities at Shady Grove recently established the [Lab for Entrepreneurship and Transformative Leadership](#)

***USM already significantly invests in many student, faculty, and community ventures, and it this will only increase!***

# The (Simplified) Entrepreneurial Journey



## Common Challenges / Gaps

- Takes money to make money*
- Takes customers to make customers*
- Out-of-Network Specialists*
- Speakeasy feel*
- No room at the inn*
- No or moving goalposts*
- The check is in the mail*

# New Early-stage Resource(s) Feasibility Study

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## Goals & Scope

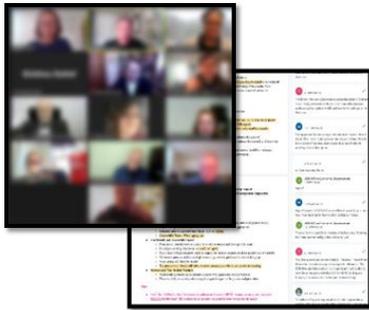
Each USM institution has their own goals for entrepreneurship, with the balance between economic and institutional impacts varying. For this Early-stage Resource(s) Feasibility study, the following is the proposed focus, as determined by the USM entrepreneur supporters:

### **Generate economic development outcomes while...**

- being open **beyond USM** students and faculty, including alumni, ventures physically located near campus, and ventures with some other collaborative tie to USM
- **proactively addressing diversity, equity, and inclusion** across venture types, founders, industries, entity types, communities, and universities
- focusing on entrepreneurs **pursuing ideas but before they have attracted significant capital** or are earning significant revenue

***The goals and scope are ambitious; and so are the people who are recommending them!***

## Process and Learnings to Date



### Internal Outreach – USM Entrepreneur Supporters

Collective identification of goals, gaps, and recommendations

34 individuals from 14 institutions/programs; over 8 hours on Zoom

### External Outreach – Corporates, Investors, Entrepreneurs

Feedback on goals, gaps, and recommendations

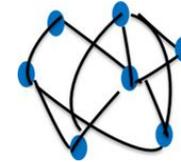
Outreach to 73 individuals; feedback from 38; over 200 views

### Process Benefits:

- Made connections and informed
- Catalogued existing resources, **challenges/gaps**
- Surfaced strong themes across multiple perspectives
- Identified potential partnerships
- Developed blueprint for future progress



## Recommendation #1 - *Connect*



*More efficient and effective coordination, interoperability, and communication of existing resources within and outside of USM.*

- Begin with continuing and enhancing collaborative efforts already under way, such as the Innovation Extension and Rural and Urban Business Innovation Initiatives. Can build on and go beyond the Maryland Entrepreneur Hub.
- Resources include:
  - **People:** mentors; advisors/experts in all sectors and organizations types; students; talent.
  - **Physical Infrastructure:** spaces, facilities, and equipment.
  - **Programs and Capital:** training; funding
- Access levels will vary depending on resource and type of venture; aiming for open access but being clear either way.

## Recommendation #2 - *Enhance*



*Participate in collaborative efforts to enhance existing resources within and outside of USM.*

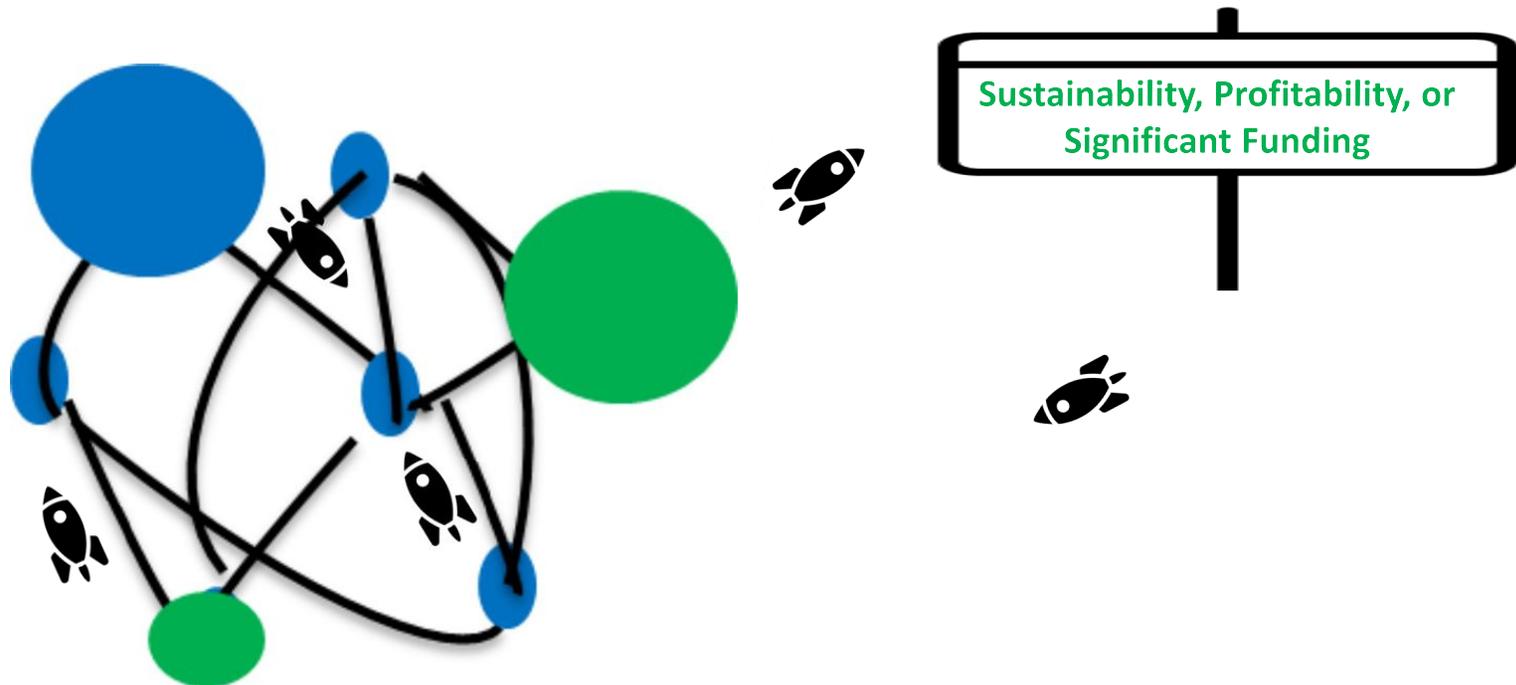
1. Greater access to **angel investment**
2. Better access to **professional services** e.g., accounting, legal, regulatory
3. Greater **facilities and equipment** availability; e.g, wet labs, cooking facilities
4. Greater **MIPS** program capacity; emphasis on non-major research institutions

## Recommendation #3 – *Capitalize*



*In the context of the other recommendations, enable flexible, non-prescriptive non-dilutive capital to be deployed alongside resources and accountability.*

- **Funding Vehicles** – A mix of options, including grants, convertible notes
- **Funding Levels** – Generally no more than \$75k, with larger amounts typically with a vehicle for potential return. However, smaller amounts deployed correctly can be immensely valuable.
- **Goal: Maximize Leverage of the Capital** – ensure good and efficient use; form strategic relationships to provide what is needed for less; attract matching funds, etc.
- **Special Considerations**
  - If barriers or lack of resources at any institution prevent robust participation in capital programs, addressing those is *within* the scope of this effort.
  - Different considerations may be required for students as part of the process and promotion.



***Strategic alignment of recommendations will lead to a more effective ecosystem not just for USM but for Maryland***



## Looking Forward

***Defining success:*** “Generate economic development outcomes” –  
Simple, right?

***How we do things matter as much as what things we do:*** The most thriving ecosystems haven’t gained success through carefully orchestrated maneuvers but through commitment and a culture that supports the flourishing of entrepreneurship.

***This ecosystem is dynamic; we must continually adjust***

***We go further together – continue institutional engagement and create structures to incorporate institutions in sustainable leadership of these efforts!***

# APPENDIX

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## Gaps Identified

The following are examples of some of the gaps identified through the process, some of which are better poised to address collectively and as USM than others:

- Better awareness and coordination of access of existing resources
- Evaluating the feasibility of a business beyond customer discovery, including market size, unit economics/financial model, regulatory processes, manufacturing, etc.
- More robust networks of individuals (entrepreneurs, corporates, and service providers) who can inclusively support early-stage innovators. Near-peer and peer connections and mentorship (team-building); more systematic, pinpointed, and reliably helpful network leveraging
- Personally assisted navigation, including understanding “prerequisites for programs” for those not in an incubator or dedicated program
- Increase space capacity -- flexible, affordable lab space in some locations; commercial kitchen space in others; general space in others, being solved through repurposing
- Appropriate personal housing for entrepreneurs, which impacts their business
- Pilots and early manufacturing help
- Funding for proof of concept work
- Angel funding, pre-seed investment, non-dilutive funding across a variety of scenarios

## Design Recommendations/Guidelines

- Consider and proactively address any systemic and/or institutional barriers to access.
- Involve entrepreneurs, investors, and other stakeholders in design and implementation.
- Aim for flexibility and inclusion, sometimes clustering by industry, venture type, etc. to help ensure proper coverage, access, and navigation; and potentially attract non-USM support.
- Systematizing milestones can help entrepreneurs and those who help them better understand benchmarks generally for success and in terms of what resources when.
- Emphasize resources for finding and acquiring customers (including sandboxes and pilots) and business planning; help ventures define who their customer will be and if it could be viable before they go after resources to execute.
- Although not primary goals, don't miss opportunities to: 1) create exposure and raise the spirit of entrepreneurship; 2) promote student and faculty development; 3) bolster and enhance the capability of those who help entrepreneurs; and 4) help later-stage ventures
- Build in mechanisms for continued collaborative needs assessment, action, and storytelling, in addition to impact evaluation, in line with USM's commitment to innovation and continuous improvement.

## Design Recommendations/Guidelines *Specific to Early Capital*

### Optimize Impact and Accessibility

- Investigate existing slowdowns in transfer of capital.
- Max \$ must be high enough to make an impact, but smaller amounts quickly can be valuable.
- Submission process can have multiple routes (e.g., written, pitch) and/or submission prep.
- Stage-gating and standardizing terms for upfront/milestone payment will likely be helpful.
- The process itself should add value even for entrepreneurs who do not receive the funding.
- Leveraging diligence via other programs

### Funding Vehicles - Ideally, a mix of options below

- *Grants* - Conventional. Best for lower amounts. Optimize for progress, not serial grant obtainers.
- *Loans* - Not preferred, but provide connections to local banks when appropriate.
- *Reimbursable Grants/Revenue Share* - Lots of options.
- *Convertible Notes* – And SAFE notes when appropriate.



## Recommendations – *Next Steps*

Recommendation	Next Step
<p><b>Connect</b> – More efficient and effective coordination, interoperability, and communication of existing entrepreneurial resources within and outside of USM</p>	<p>Better connect USM resources through pilots, coordinating outside USM as well</p> <ul style="list-style-type: none"> <li>- Human resources</li> <li>- Physical resources</li> <li>- Overall navigation</li> </ul>
<p><b>Enhance</b> – Participate in collaborative efforts to enhance existing entrepreneurial resources within and outside of USM</p>	<ul style="list-style-type: none"> <li>- Continue to seek MIPS enhancement</li> <li>- Convene others regarding angel investment</li> <li>- Professional services pilot; e.g. iStart</li> <li>- Join collaborative efforts to call for resources to create wet lab space; advocate for RISE Zone program; identify funding sources for infrastructure; collaborate with others such as federal labs on access to equipment</li> </ul>
<p><b>Capitalize</b> – In the context of the other recommendations, enable flexible, non-prescriptive non-dilutive capital to be deployed alongside resources and accountability.</p>	<ul style="list-style-type: none"> <li>-Further define “tracks” of funding for a pilot</li> <li>-Further define sources for such funding</li> <li>-Further define other value-multiplying facets</li> </ul>