

Is RVA Ready?

Kelli Parmley, Executive Director (kparmley@vcu.edu)

Jason Smith, PhD, Evidence-Based Decision Making, Manager (smithjw4@vcu.edu)

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BRIDGING RVA
COLLECTIVE ACTION — CRADLE TO CAREER

I. Executive Summary

If the Richmond region needs an additional 65,000 (55% of our population) 2-year and 4-year degrees (11,000 in STEM-H, see Attachment A), and living wage opportunities for those with a high school degree or less are shrinking, what regional opportunities are available for the 45% without advance degrees?

Three Regional Opportunities:

- A. **Strengthen Career Exploration** – as early as middle school
- B. **Support Career and Technical Education (CTE) 2.0** – as a rigorous, relevant, and real-world approach to post-secondary attainment
- C. **Create Industry/Sector (e.g. healthcare, finance) Partnerships** – identify in-demand, regional career pathways and provide the “real-world” context for CTE 2.0

Career exploration is a critical opportunity to engage and inspire youth and yet is often overlooked as an important, life long, process. Engaging in career exploration requires that families and youth have access to accurate and timely information and tools. There is opportunity to develop **regional** tools to help families and youth engage in career exploration.

Career and Technical Education (CTE) is a key regional asset that could be better leveraged. National and local investments address rigor, relevance, and real-world experience in education through CTE. The retooled CTE 2.0 acknowledges that all students graduating with a high school diploma need core academic and career readiness skills that prepare them for post-secondary learning without remediation. CTE programs in our region create an opportunity to align with regional business needs in middle and high skill STEM-H occupations, while at the same time providing alternative post-secondary pathways.

Industry/Sector Partnerships create regionally tailored career pathways for middle or high skill occupations in key industry sectors. This is a critical piece of the foundation to meet the workforce demands of our employers. In the absence of sector-focus partnerships, the multiple assets that exist in the region will remain disconnected. When the region works together we find a place for collective vs. isolated impact. Further, multiple federal funding opportunities from the Department of Education and the Department of Labor, similar to the *Youth Career Connect* grant launched in the Fall 2013, require the clear demonstration of effective public/private/non-profit partnerships. It is imperative to lay the foundation for industry sector partnerships to leverage considerable resources from outside our region.

Recommendation A: Strengthen Career Exploration

- i. **Regional Career Exploration Portal** Develop a “portal” accessible to youth and families as early as Middle School
- ii. **Career Counselors** Advocate for reduced case-loads for professional and career counselors to provide sufficient capacity to support career exploration
- iii. **STEM-H Awareness** Leverage the Idea Station’s “Science Matters” to promote awareness of regional STEM-H occupations

Recommendation B: Support CTE 2.0

- i. **Public Perception Campaign** Leverage the strength of the Idea Station, colleges, and business partners to improve public perception of CTE 2.0
- ii. **Education Curriculum** Support access to front-line employee expertise to identify 21st century knowledge, skills, and abilities (KSAs)
- iii. **Dual Enrollment** Increase the number of teachers certified to teach dual enrollment classes, improve availability to underserved youth, and improve integration with CTE

Recommendation C: Develop Industry/Sector Partnership

- i. **Public Awareness Campaign** Promote the use of comprehensive tools, such as the Virginia Education Wizard, for use by families, counselors, non-profits, etc. to improve career exploration and planning
- ii. **Regional Career Pathways** Convene industry partnerships in sectors such as Healthcare, Finance, and Professional/Technical Services to identify at least one high-demand occupation and pilot the development of a regional career pathway
- iii. **Awareness and Work-based Learning** Utilize sector partnerships to increase awareness of high-demand occupations and coordinate opportunities to provide youth with work experiences

II. Introduction and Background

Employers are demanding more education and training (and will continue to do so in the future) and jobs that require a high school diploma or less are disappearing. Those low skills jobs that do remain provide lower wages and fewer opportunities for leadership and advancement, and require individuals to gain significant skills (likely through formal and education training) to advance out of them. In other words, middle and high skills careers are the path to the middle class - and a strong K-12 preparation for education and training beyond high school is the path to those careers (*The Future of the U.S. Workforce, National Governor's Association, 2013*).

National Competitiveness and the Skills Gap

The National Governor's association report is just one of several national reports that have called attention to the growing workforce gaps in the U.S. and the need to ensure that our youth have opportunities to navigate multiple pathways to middle and high skill careers. The Georgetown Center for Education and Workforce's June 2013 report projected that, by 2020, the United States will be short 5 million workers to meet industry demand. The Center identified 55 million job openings and 65% of those will require some college, an associates or a bachelor's degree. The fastest growing occupations will be in STEM, healthcare professions, healthcare support, and community services. All need education beyond high school (*Recovery: Job Growth And Education Requirements Through 2020, The Georgetown University Center for Education and the Workforce, June 2013*).

Additional research from the Center highlights the significant opportunities in middle skill jobs – those that do not require a bachelors degree. These jobs may have multiple mechanisms (e.g. apprenticeships, industry certifications, on-the-job training, etc.) for obtaining the necessary knowledge and skills: "There are 29 million "middle jobs" in the United States that pay \$35,000 or more on average and don't require a Bachelor's degree...The 29 million "middle jobs" represent one out of every five jobs in the American economy and nearly half of all American jobs that pay middle-class wages" (*Five Ways that Pay Along the Way to the B.A., The Georgetown University Center on Education and the Workforce, September 2012*). These opportunities (gaps) also exist at a time when many communities continue to face challenges in unemployment. In the case of youth and young adult unemployment there are some staggering statistics. Internationally, a McKinsey report estimated that 75 million youth (12.6% of global youth) are unemployed and half of youth surveyed for the report were not sure that their postsecondary education had improved their chances of finding a job (*Education to Employment: Designing a System that Works, 2012*). Another report by the Georgetown

University Center, *“YoungInvincibles”*, identifies the double digit unemployment (15%) for 16-24 year olds and the estimated cost of unemployment for 18-34 year olds to federal and state governments is about \$8.9 billion annually. Opportunity Nation estimated that 6.7 million young adults are neither working nor in school (*National Roadmap for Opportunity Youth (Opportunity Nation, September 2012)*). Finally, the Huffington Post recently cited a Gallup report that put a spotlight on college and career readiness and the gaps between the perspectives of the general public, employers, and higher education:

“14 percent of Americans -- and only 11 percent of business leaders -- strongly agree that graduates have the necessary skills and competencies to succeed in the workplace. That's in contrast to another recent survey, conducted by Inside Higher Ed in conjunction with Gallup, indicating that 96 percent of academic officers believe that they're effectively preparing students for success in the workplace.”
(http://www.huffingtonpost.com/julian-l-alssid/a-new-gallup-survey-says-_b_4862669.html)

State Priorities for Education and Workforce

Virginia's “Top Jobs” legislation called for improved postsecondary attainment and established a goal of 100,000 additional undergraduate degrees by 2025. While the legislation focused on key strategies for improving undergraduate degree attainment success overall, it was also instrumental in creating a focus on needed graduates in STEM-H occupations.

Blueprint Virginia, facilitated by the Virginia Chamber of Commerce, created a comprehensive direction and long-range economic development plan for Virginia. Blueprint identified the importance of education and workforce to the economic vitality of the State and the need for 2 million additional workers to support the State's economic growth. Several of the education and workforce strategies highlight important opportunities for regional efforts to create alternative postsecondary options for youth. Many of the strategies speak to the strategic involvement of business leaders with K-12 and postsecondary institutions, focus on STEM-H occupations that do not require a four year degree, improve alternative approaches to credentialing and career readiness, increase the availability and use of labor market data and information, and develop regional strategies that are tailored to regional occupational demand.

Regional Planning Initiatives

Four recent regional planning initiatives provide opportunities to leverage shared priorities, existing regional assets and investments, and regional leaders to execute shared strategies while aligning to national and state priorities. The Capital Region Collaborative (CRC) engaged business and government partners in a comprehensive regional process to identify

priorities for education, workforce preparation, and job creation. Following an October 2013 presentation of the CRC priorities, the CRC continues to refine and clarify regional strategies, investments, and the development of regional indicators.

A second regional planning initiative resulted in a new strategic plan for the Resource (Workforce Investment Board (WIB)) in July 2013. One of the imperatives identified in the plan is to “partner with educators to deliver workforce and labor market strategies to K-12 using career pathways as one collaborative strategy”. Additionally, in June 2012 the Youth Council of the Resource WIB released a comprehensive report, recommendations, and two extensive appendices developed by Communitas Consulting called “Aligning Potential: Matching the Need and Resources of Youth with the Capital Region’s Future”. The report affirms two areas of importance in creating post-secondary alternatives for youth: increased access to information and networks for young people and a coordinated and visible sequence of programs and educational options that youth can pursue.

A third initiative led by the Richmond Regional Planning District Commission (RRPDC) yielded, for the first time in December 2013, a Comprehensive Economic Development Strategy (CEDS). The CEDS establishes important connections between economic development priorities, education and workforce. The report identifies objectives that include implementing a cradle-to-career partnership, regional metrics for success, and defining career pathways for K-12, higher education, and workforce development programs. The CEDS also identifies an array of existing models, programs, and other assets in the region that have the potential for alignment for shared outcomes.

Finally, Bridging RVA (BRVA) is a cradle-to-career partnership that covers the same nine jurisdictions of the Greater Richmond Chamber, the RRPDC, and the Resource. The purpose of the partnership is to increase post-secondary attainment by: focusing on a shared agenda and goals; mobilizing and aligning strategies through action networks; and improving the process through local data, research, and community voice. In 2013, BRVA and Dominion co-facilitated the workforce preparation work group for the CRC. The recommendations became the foundation for goals and indicators in six areas across the regional pipeline. Two initial priorities were identified in middle school and post-secondary attainment (college and career readiness in high demand STEM-H occupations). The BRVA board established a regional post-secondary attainment goal of 55% for 2030. While BRVA has defined post-secondary attainment broadly, the initial focus is on 2 year degrees and above. This is a 10% point increase for our region which translates into 65,000 additional degrees of which 11,000 are targeted as STEM-H degrees. These figures are based on regional industry and occupational

mix and projected growth, an analysis performed by Chmura Economics and Analytics (*Bridging Richmond: Regional Post-Secondary Education, March 2014*). The post-secondary attainment goal serves as an “anchor goal” to align four additional goal areas and key transition points leading to post-secondary attainment (kindergarten readiness, elementary literacy, middle school math, high school graduation).

From these four regional planning efforts, two important strategies appear to be relevant in supporting youth and young adults to identify and pursue regionally relevant, alternative pathways to post-secondary attainment. The first, cited in the Resource WIB’s Youth Council report and the strategic plan and identified in the CEDS, is the creation of regional career pathways within targeted industry sectors, “to increase access to information and networks for young people and provide a coordinated and visible sequence of programs and educational options that youth can pursue”. The second, identified within the CEDS report, Blueprint Virginia and was the focus of a BRVA engagement with 31 partners in January is to improve the college and career readiness of more youth for high-demand STEM-H occupations through a focus on career and technical education – beginning in K-12.

III. Leveraging Industry Sectors to Create Regional Career Pathways

Cheryl Hyman, Chancellor of City Colleges of Chicago, addressed several reasons why the skills gap exists: “First, there’s an information gap. 115,000-120,000 students show up at our colleges every year. Besides the basic things they’ve heard, they don’t understand that there are 84,000 open jobs in health care, 100,000 or more coming in transportation. How can we give them the skills they need if they don’t know what’s out there? The other thing is that employers must become part of the educational curriculum to ensure that our degrees are reflective of what’s important in the workforce today.” (*How Can America Narrow the Widening Skills Gap? Forbes, March 29, 2014*)

Importance of Career Exploration

Career exploration is part of a continuum of work-based learning and is an opportunity for youth to learn “about” work. Career exploration is a “long, progressive process of choosing education, training, and jobs that fit individual interests and skills”. Key elements of career exploration include assessment, exploring options, gaining skills, and managing a career. (Career OneStop. <http://www.careerinfonet.org/explore/>). The Linked Learning Alliance in California further describes career exploration and distinguishes it from career awareness:

“Career Exploration provides students with the opportunity to explore career options in a way that contributes to motivation for learning and informs students’ decisions about further experiences and career and educational options. Compared to Career Awareness experiences, Career Exploration experiences are designed to enable students to learn about targeted careers more deeply, are more personalized to the student’s interests, and give the student a more active role in selecting and shaping the experience. “
(<http://linkedlearning.org/>)

According to America’s Promise, career exploration provides an opportunity for young people to dream and be inspired and to “connect the dots” between school and career (<http://www.americaspromise.org/why-career-exploration-matters>). However, and an important consideration for our region, as Chancellor Hyman observes, is that it is an area often overlooked and encouraged too late.

Creating Regional Career Pathways

A **Career Pathway** is a coherent, articulated sequence of rigorous academic and career/technical courses, commencing in the ninth grade and leading to an associate degree, baccalaureate degree and beyond, an industry recognized certificate, and/or licensure. The Career Pathway is developed, implemented, and maintained in partnership among secondary and postsecondary education, business, and employers. Career Pathways are available to all students, including adult learners, and lead to rewarding careers. (*National Career Pathways Network: <http://www.cord.org/career-pathways/>*)

A career pathway is developed by adapting and adding to existing programs and services. In the process of creating pathways, partnerships between business, education and other support providers are strengthened. (*Career Pathways How-to Guide, The Workforce Strategy Center, October 2006*). The development of career pathways begins with a labor market analysis to identify and engage regional employers within industry sectors (e.g. healthcare, manufacturing). Employers focus on shared workforce gaps in high-demand occupations to identify and clarify the knowledge and competencies for success, then engage educational partners to identify specific ways (e.g. improvements to existing curriculum, development of new programs) to fill those gaps.

States and regions that have created career pathways improve the information available to youth, which also benefit adults, about a broader array of occupations for consideration, the alternative education opportunities that will prepare them for successively higher levels of employment, and the ability to access information about income potential. Unfortunately, a career pathway cannot be purchased off-the-shelf.

While the region may not be able to “purchase” career pathways off-the-shelf, multiple resources are available from the state, and examples can be found in other regions. The Virginia Community College System’s (VCCS) Workforce Development System report called “Taking Root: The Virginia Career Pathways System” (*Workforce Strategy Center, 2012*) provides evidence that career pathways initiatives are working. Additionally, VCCS has created the Virginia Education Wizard, a career exploration, assessment, and planning resource that uses real-time employment information to support youth, families, career coaches, and professional school counselors with comprehensive information.

The Virginia Manufacturing Association’s *Dream It Do It* initiative is an example of making career pathways information available in a “portal” where individuals can explore in-demand careers, perform assessments, identify educational opportunities to pursue those careers, and search for current jobs in manufacturing. The Virginia Energy Workforce Consortium (VEWC) is “the first partnership in Virginia between utilities, their associations, educators and workforce systems to focus the need to build a skilled, diverse workforce pipeline that will meet future industry needs”. The VEWC regularly shares data to identify workforce gaps, convenes employers to clarify potential initiatives or strategies, and engages with educational partners to execute those strategies. Finally, other regions within Virginia, like the Peninsula Council for Workforce Development, Region 2000 and the Dan River Region

Collaborative provide models and examples for accomplishing the creation of career pathways and making comprehensive information available within a region.

Industry/sector partnerships form the critical foundation for creating effective regional career exploration and regional opportunities for pursuing careers. These partnerships will create regionally tailored career pathways for high-demand middle or high skill occupations in key industry sectors. In the absence of these partnerships, the multiple assets that exist in the region will remain disconnected.

Further, multiple federal funding opportunities from the Department of Education and the Department of Labor, similar to the *Youth Career Connect* grant launched in the Fall 2013, are requiring the clear demonstration of effective public/private/non-profit partnerships that can leverage collective vs. isolated impact. It is imperative for our region to lay the foundation for industry sector partnerships to access considerable resources from outside our region.

IV. “Eduployment” through Career and Technical Education

“Eduployment is a funny word, but we need a new language to help us overcome the bifurcation of school and jobs, college and career, learning and work, white collar and blues collar. This siloed way of thinking trips us up every time. Although our policies now speak about college and careers, the emphasis is primarily on college, with little thought to the developmental process young people go through as they build an identify as a worker, manager, inventor or entrepreneur” ...Eduployment needs to become our shared framework so that we equally value learning and work in the transition to adulthood...We need to create a multi-sector infrastructure that refuses to let go of young people. “
(Eduployment: Creating Opportunity Policies for America’s Youth, Young Transitions Funders Group, April 2013).

National and State Context for Career and Technical Education (CTE)

Career and Technical Education programs in our region create a regional opportunity to align regional business needs in middle and high skill occupations, while at the same time providing alternative post-secondary pathways. The Virginia CTE resource center provides a unique state-wide resource that can accelerate the work of regions or localities seeking to: align CTE curricula with VDOE standards; develop common plans of study; foster the integration of CTE with core academic subject areas; and incorporate business and industry input in developing curricula addressing priority career clusters.

The Career and Technical Education opportunities available today are vastly different from those of prior generations. The national Association for Career and Technical Education (ACTE) provides essential information about best practices and the college and career readiness benefits of career and technical education (CTE):

CTE prepares both youth and adults for a wide range of careers and further educational opportunities. These careers may require varying levels of education - including industry-recognized credentials, postsecondary certificates, and two- and four-year degrees. CTE is offered in middle schools, high schools, area career and technical centers, community and technical colleges, and other postsecondary institutions. CTE is at the forefront of preparing students to be “college- and career-ready.” CTE equips students with:

- core academic skills and the ability to apply those skills to concrete situations in order to function in the workplace and in routine daily activities
- employability skills (such as critical thinking and responsibility) that are essential in any career area and
- job-specific, technical skills related to a specific career pathway

(ACTE Brief, What is Career and Technical Education?)

Career and technical education programs in Virginia public schools serve more than 550,000 students in grades 6-12 annually. These programs are designed to prepare young people for productive futures while meeting the commonwealth's need for well-trained and industry-certified technical workers. Virginia acknowledges the importance of career and technical education through diploma seals awarded by the Board of Education, by recognizing industry credentialing in its diploma requirements, and through the use of Career Pathways as an integral part of the newly required Academic and Career Plan. (*Virginia Department of Education*)

The Richmond region has strengths upon which to build, beginning in K-12 and extending to multiple postsecondary opportunities such as apprenticeships, industry recognized credentials, and 2- and 4-year degrees. The Comprehensive Economic Development Strategy (CEDS) and the Youth Council report from 2012 provide more detailed information about the array of career and technical education programs in each of the school districts and Attachment B provides a snapshot of CTE graduates by occupational cluster for 2012.

CTE 2.0 – Improving Rigor, Relevance and Real-world Experience and Changing Perceptions

While the region clearly has robust career and technical education programs, there are additional opportunities to improve the rigor, relevance, and real world experience of these programs and align them to regional business demand. “CTE 2.0” requires that higher standards be met for all high schools, so that students receiving diplomas are ready for some form of post-secondary learning and better understand how what they have learned relates to successful careers. Work is also needed to address negative public perception that developed since the onset of vocational training as educational preparation for manual labor during the industrial revolution in the United States.

Traditional vocational education lost popularity as it became associated with lower academic skills and social class, aiding to the perception that “vocational education was... an educational backwater for the disadvantaged” (Cohen and Besharov, 2002). At the same time, the college-for-all message further eroded the value attributed to CTE as a respectable pathway to good jobs. The negative public perception influences whether youth and families take advantage of viable pathways to career and further postsecondary attainment. Further compounding the issue, the public is not aware of new developments to “retool” CTE to better address the rigor, relevance, and real world experience needed for high-demand occupations.

According to remarks made by Secretary Duncan in response to the “Pathways to Prosperity” Report from the Harvard Graduate School of Education, “The mission of CTE has to change. It can no longer be about earning a diploma and landing a job after high school. The goal of CTE 2.0 should be that students earn a postsecondary degree or an industry recognized certification—and land a job that leads to a successful career.... CTE students also must have the academic skills to be able to engage in postsecondary education and training without the need for remediation.” (<http://www.ed.gov/news/speeches/new-cte-secretary-duncans-remarks-career-and-technical-education>).

The current regional effort being advanced by BRVA, to build upon strengths and address challenges is well timed because growing interest and investment opportunities from private and public federal sources. Federal initiatives through the Department of Education and Department of Labor are targeting communities with strong public-private partnerships to leverage the strengths of CTE and provide much needed investments in career and technical education. Through extensive engagement in the region in January 2014 (31 partners across higher education, K-12, business, and non-profit), BRVA developed a response to federal Department of Labor *Youth Career Connect* grant. The application, made possible through investment by *Richmond’s Future* and other community leaders, provides a roadmap for streamlining and integrating the pipeline from CTE (with dual enrollment and core academic subject areas) to two- and four-year degrees in STEM-H occupations in our region.

The Chmura Economics and Analytics STEM-H report, commissioned by *Richmond’s Future*, identified the most in-demand STEM-H occupations. A majority of the top ten occupations were in computer science and information systems, including: Computer support specialists; Computer systems analysts; Software developers; Network and computer systems administrators; Computer and information systems managers; Computer programmers; Software developers/systems software; Information security analysts/web developers/computer network architects. Additional evidence suggested that employers are filling some of these occupations with H1-B visa holders, despite the relatively large number of college graduates in these areas. The data and anecdotal employer feedback may suggest career readiness challenges even upon college completion.

Additionally, with the engagement of partners and analysis from Chmura, BRVA identified four target populations for improving post-secondary attainment. At the broadest level it is for students transitioning from high school to college or career and within that population specific focus on three specific target populations: low socio-economic status communities (identified using free and reduce lunch and median household income data), Black/African

American communities, and Latino communities. Evidence from recent analysis performed by Chmura Economics and Analytics identifies a growing Latino population in three jurisdictions with gaps in achievement. It also identified achievement gaps across all of our jurisdictions for our Black and African American populations.

Following the endorsement of its board in May, BRVA will use the analysis, approach, and engagement from January 2014 to launch an action network of K-12, higher education, business, and other non-profits focused on career and technical education in computer science and information systems. While BRVA executes the action network through next year there are additional, regional opportunities to support career and technical in the region.

V. Concluding Remarks

Our region is clearly rich in assets that provide a solid foundation for moving forward and addressing the challenges our families and youth face in making informed decisions and smart choices about a wide array of post-secondary options. By improving those choices for everyone, our employers (current and future) benefit from a talented and diverse workforce. The four converging regional planning initiatives coupled with key national and state priorities provide a clear opportunity to identify shared interests for shared results. To move the region forward, commitment must be made to seek out partnerships that align common interests and missions, pursue those partnerships with a shared sense of purpose and clear results (not just discussion), and improving results based on evidence (data, research/best practice, and community voice). In doing so we can change the prevailing approach to collaboration, partnership and shared accountability characterized in the cartoon below:



VI. References

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- Bridging Richmond: Regional Post-Secondary Education (Chmura Economics and Analytics, March 2014)
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- Eduployment: Creating Opportunity Policies for America's Youth (Youth Transitions Funders Group, April 2013)
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- National Roadmap for Opportunity Youth (Opportunity Nation, September 2012)
- Recovery: Job Growth And Education Requirements Through 2020 (The Georgetown Center for Education and Workforce, June 2013)
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- Taking Root: The Virginia Career Pathways System (Workforce Strategy Center, September 2012)
- Work based Learning in Linked Learning: Definitions, Outcomes, and Quality Criteria (Linked Learning, November 2012)

Kelli Parmley, Executive Director (kparmley@vcu.edu)

Jason Smith, PhD, Evidence-Based Decision Making, Manager (smithjw4@vcu.edu)

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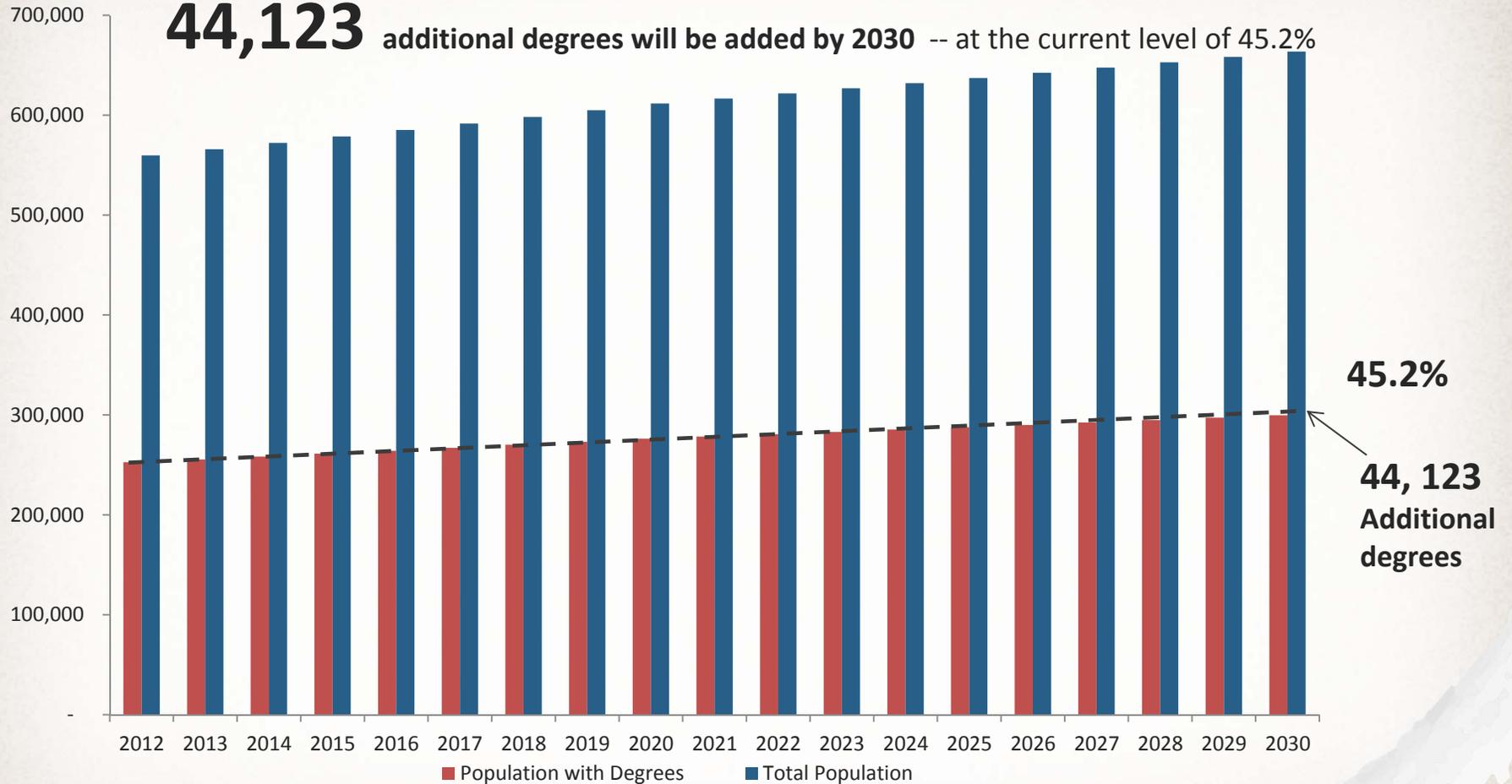


BRIDGING RVA
COLLECTIVE ACTION — CRADLE TO CAREER

Attachment A

**Projected Working-Age Population (25-64)
Associate's degree or Higher in the Bridging Richmond Region**

44,123 additional degrees will be added by 2030 -- at the current level of 45.2%



Source: Weldon Cooper Center for Public Service, accessed February 2014. Working Age defined as 25-64. 2012 degree attainment percentages from the U.S. Census, American Community Survey, 5-Year Estimates by city/county applied to population projections from Weldon Cooper Center. 2012 degree attainment percentages by city/ county were: 40.84% City of Richmond; 19.89% Charles City; 45.89% Chesterfield; 44.09% Goochland; 45.66% Hanover; 49.40% Henrico; 33.57% New Kent; 34.80% Powhatan; 45.15% Bridging Richmond Region

Degrees Needed Based on Current Industry Mix

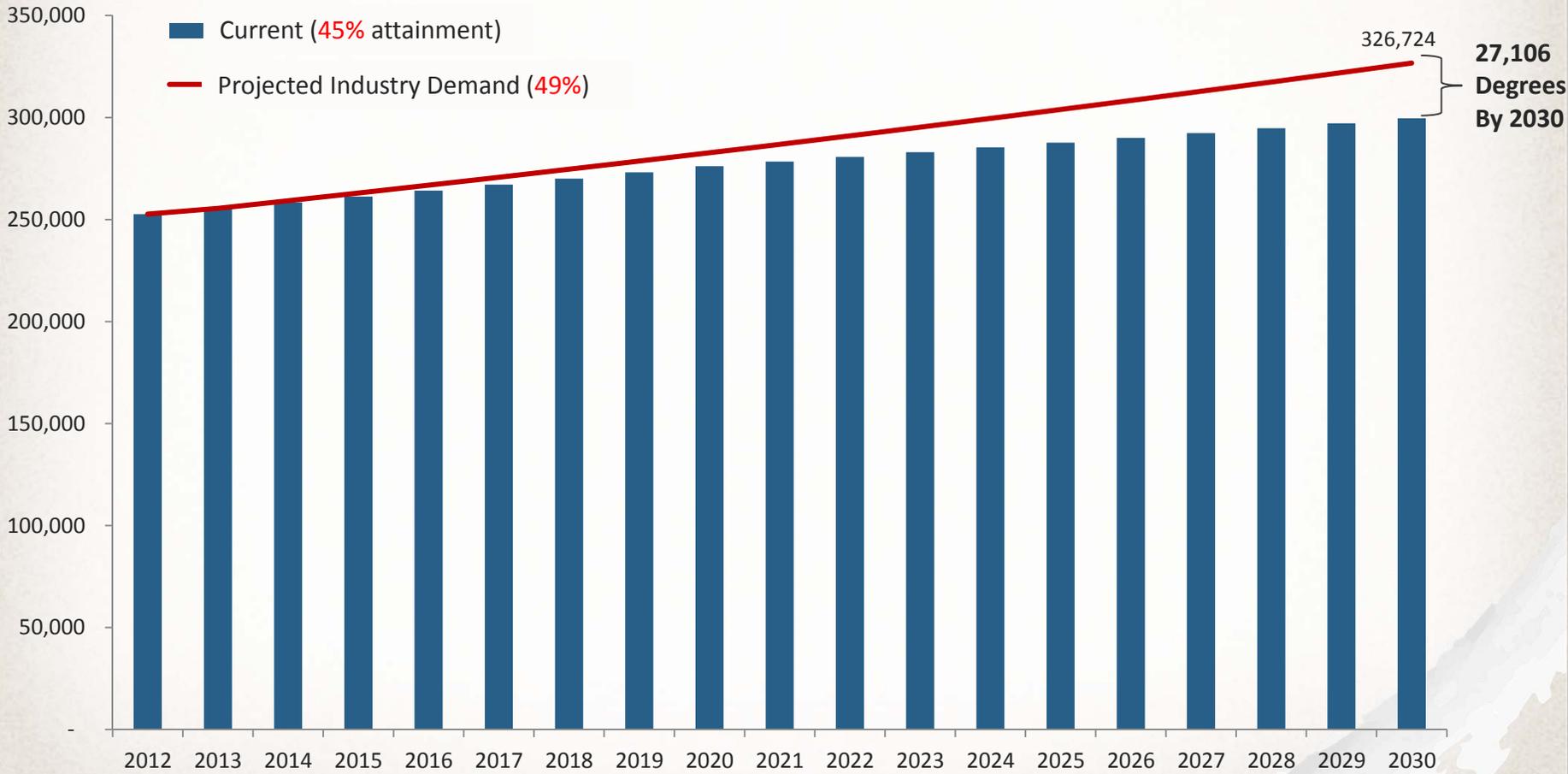
Bridging Richmond Region					Degree Demand		Degree Gap 2013-2030
NAICS	Industry	Employment	% Total Employment	Average % with Degrees	2013 Degrees	2030 Degrees	
62	Health Care and Social Assistance	73,152	14%	53.1%	36,674	54,631	17,958
61	Educational Services	47,469	9%	57.4%	32,786	42,074	9,289
54	Professional, Scientific, and Technical Services*	35,290	7%	51.0%	23,042	30,574	7,533
52	Finance and Insurance	36,278	7%	54.5%	19,308	25,962	6,654
44	Retail Trade	56,469	11%	37.3%	16,630	21,227	4,596
92	Public Administration	32,477	6%	49.7%	19,698	24,200	4,502
55	Management of Companies and Enterprises	20,560	4%	49.7%	11,727	15,437	3,710
	Administrative and Support and Waste						
56	Management and Remediation Services	35,470	7%	42.6%	9,729	12,688	2,959
42	Wholesale Trade	21,815	4%	38.9%	8,569	11,200	2,630
23	Construction	29,911	6%	34.0%	6,407	9,022	2,615
81	Other Services (except Public Administration)	18,062	3%	44.4%	5,615	7,384	1,769
31	Manufacturing	24,398	5%	37.7%	6,565	8,043	1,478
51	Information*	8,420	2%	49.4%	4,715	6,134	1,419
72	Accommodation and Food Services	40,560	8%	35.8%	7,333	8,745	1,411
71	Arts, Entertainment, and Recreation	10,371	2%	45.9%	3,713	4,915	1,202
53	Real Estate and Rental and Leasing*	6,626	1%	40.6%	2,547	3,183	636
48	Transportation and Warehousing	15,476	3%	39.5%	3,583	4,204	622
22	Utilities	2,256	0.4%	46.4%	851	1,080	229
21	Mining, Quarrying, and Oil and Gas Extraction	282	0.1%	23.4%	49	65	16
11	Agriculture, Forestry, Fishing and Hunting*	678	0.1%	33.0%	ND	ND	ND
	All Industries	516,076	100%	43.2%	219,539	290,768	71,229

* Employment data at the detailed occupation level are non-disclosable; data for Richmond MSA substituted where difference with overall Bridging Richmond Region employment was negligible.

Source: Chmura's JobsEQ®. Total degree demand includes growth and replacement demand.

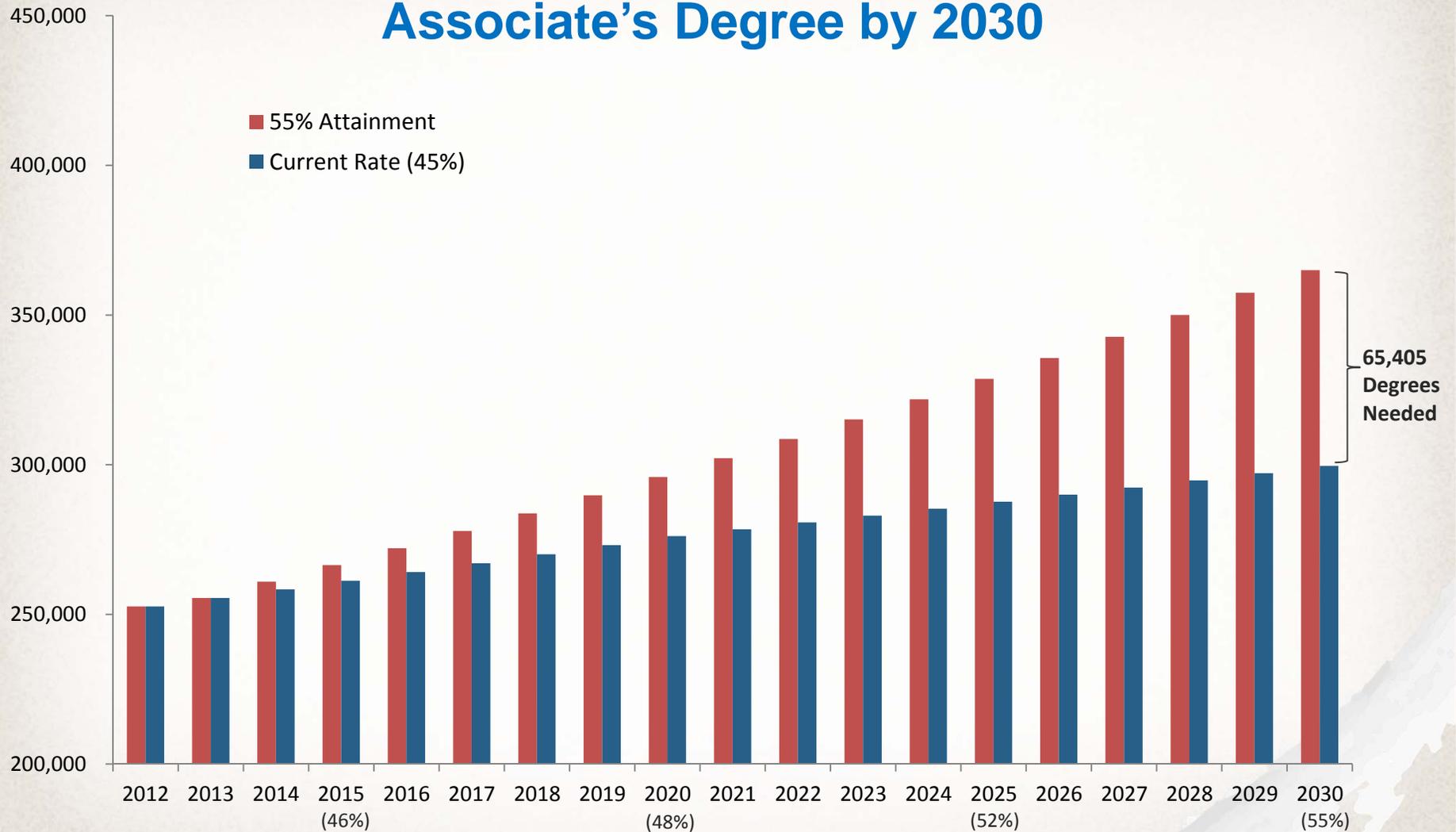
Note: Unemployed individuals with degrees are not included in this calculation, which may partially account for the difference between 2013 estimates of employed individuals with degrees based on industry employment and Weldon Cooper's projections of population data.

Projected Degree Gap (2030) Based on Industry Mix : 27,106 Degrees



Sources: Weldon Cooper Center; U.S. Census, American Community Survey, 2012; Chmura' JobsEQ®; BLS Employment Projections. Projections assume that future degree requirements for occupations remain close to current requirements-- higher education requirements for occupations, to replace experience, for example, would create a larger gap.

Scenario 2: 55% of Population with at least an Associate's Degree by 2030



Source: Weldon Cooper Center; U.S. Census, American Community Survey, 2012, Chmura Economics & Analytics

2012 Career and Technical Education -- Completers

	Charles City County	Chesterfield County	Colonial Heights City	Dinwiddie County	Goochland County	Hanover County	Henrico County	Hopewell City	New Kent County	Petersburg City	Powhatan County	Richmond City	Sussex County	Grand Total
Accounting					36	12	141					62		251
Agricultural Machinery Service						96								96
Agricultural Production				4							60			64
Apparel and Accessories Marketing		180					84							264
Automotive Body Repair								6						6
Automotive Body Technology		30					4							34
Automotive Service Technology		32				32	56							120
Automotive Servicing		8												8
Business (Special)		6												6
Business(Regular)Occupational	16	288	64	16		42	102		72		64	376	12	1052
Carpentry							16				48			64
Communication and Info Tech							40							40
Computer Information Systems		4	24	16			142	16		64		160		426
Computer Network Software Operations						64								64
Computer Networking Hardware Operations		48												48
Computer Systems Technology							15							15
Control Technology							44							44
Cosmetology		40				32	48					4		124
Criminal Justice							28							28
Culinary Arts		172		20		4	110	8			56	4		374
Database Design and Management		40												40
Dental Assistant		32												32
Design		132		4	32		10					22		200
Design and Technology												20		20
Early Childhood Education & Services		82	20		24	36								162
Electricity							40							40
Electronics Technology						32								32
Emergency Medical Technology						6								6
Executive Marketing		100						8						108
Family and Human Services	8													8
Family Focus		28					356					170		554
General Marketing		66				158	228							452
Graphic Imaging Technology											32			32
Health Career Cluster		57				16					16			89
Horticultural Science						66								66
HVACR							8							8
Leadership and Citizenship Development Program		119		8		122	164	16			64	122	40	655
Nail Technician											32			32
Nursing Aide							60	16			64			140
Pharmacy Technician							2							2
Practical Nursing		12												12
Precision Machining Technology							4							4
Pre-Engineering (PLTW)							52					12		64
Production Technology							162							162
Radio Communications							4							4
Sports and Recreational Marketing		368		16		24	138							546
Sports Medicine							20							20
Teacher Preparation Program							44							44
Technical Design and Illustration		303		16		128	32							479
Television Production					16	68								84
Turf Grass Management						36								36
Work and Family Management							141							141
(blank)	92	1135	112	244	136	392	1148	196	116	144	180	659	116	4670
Grand Total	116	3282	220	344	244	1366	3443	266	188	208	616	1611	168	12072