
The Path to Baltimore's "Best Prospect" Jobs without a College Degree

Appendix 1:

Industry Sector Analysis of "Best Prospect"
Jobs and Community College Career
Credentialing Programs



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Industry Sector Analysis of "Best Prospect" Jobs and Community College Career Credentialing Programs

(Data sources are from 2002-2012)

- A. Construction**
- B. Health Care and Social Assistance**
- C. Leisure and Hospitality**
- D. Manufacturing**
- E. Professional, Business and Information Services**
- F. Trade, Transportation and Utilities**

A. Construction

The Opportunity Collaborative study suggests that Baltimore's regional construction sector will experience steady growth, adding 17,000 total job openings between 2012 and 2020 owing to growth and net replacement.¹ This outlook could improve further if major projects such as the Red Line move forward.

Demand - Best Prospect Careers in Construction

The "demand snapshot" for the Construction Industry is shown below in Figure 1. Using the snapshot, and the criteria discussed in the Overview, there are 14 occupations identified as best prospects in construction; they are grouped as Tier 1, Tier 2, or Tier 3 opportunities in Table 1, below.²

Among the "best prospects" in Table 1, over 60 percent are in Tier 1, where demand is strong and educational requirements are low. Another 14 percent are in Tier 2, where demand is high and educational requirements are higher, and the balance are in Tier 3, where demand is lower, but there are other redeeming qualities, i.e. special characteristics, that argue for adding a program to the "best prospects" list.³

¹ Opportunity Collaborative, p. 19.

² A note on how to interpret the Construction Demand Snapshot and the others like it follows here. In the demand snapshots, cooler colors like green and blue are better than warmer colors like yellow, orange and red because the cooler colors represent occupations with less intensive educational requirements. Larger bubbles are generally better than smaller ones because the larger bubbles are associated with more robust job growth. But it is also important to look at where a bubble is plotted. If a point is plotted away from the origin indicating a strong level of current or projected demand, we care less about projected growth, i.e., a smaller diameter bubble does not concern us much. In the superscript, larger numbers are better than smaller ones because the larger numbers mean higher median annual salaries. The superscript notations related to Career Pathway Potential (CP), Green/Emerging (GE), and Next Economy (NE) are important in that they may augment future demand for the occupation.

³ Programs shown on the demand snapshot below that were screened out, largely for reasons of low current and projected demand, include Stonemason, Hazardous Material Removal Worker, Reinforcing Iron and Rebar Worker, Elevator Installer/Repairer, Insulation Worker, and Construction and Related Workers, All Other.

Demand is strongest for Electricians, Carpenters, First-Line Supervisors of Construction and Trade Workers, Construction Laborers, First-line Supervisors of Mechanics, Installers and Repairers, Construction Managers, Plumbers and Pipefitters, Operating Engineers and Real Estate Agents. With the exception of Construction Laborer, included on the list because it has been characterized as “green or emerging,” the occupations shown in Table 1 have median annual salaries at or above \$34,000. Seventy percent of the best prospects are characterized as “green or emerging,” “next economy jobs,” or as having “career pathway potential.”

TABLE 1. "BEST PROSPECT" CAREERS IN CONSTRUCTION

Tier 1: Strong Demand, Modest Educational Requirements for Career Entry

Brick and Block Masons
Carpenters*
Construction Laborers*
Electrician*
First-line Supervisors of Construction and Trade Workers*
First-line Supervisors of Mechanics, Installers and Repairers*
Operating Engineers*
Plumber & Pipefitters*
Real Estate Agents*

Tier 2: Strong Demand, Higher Educational Requirements for Entry

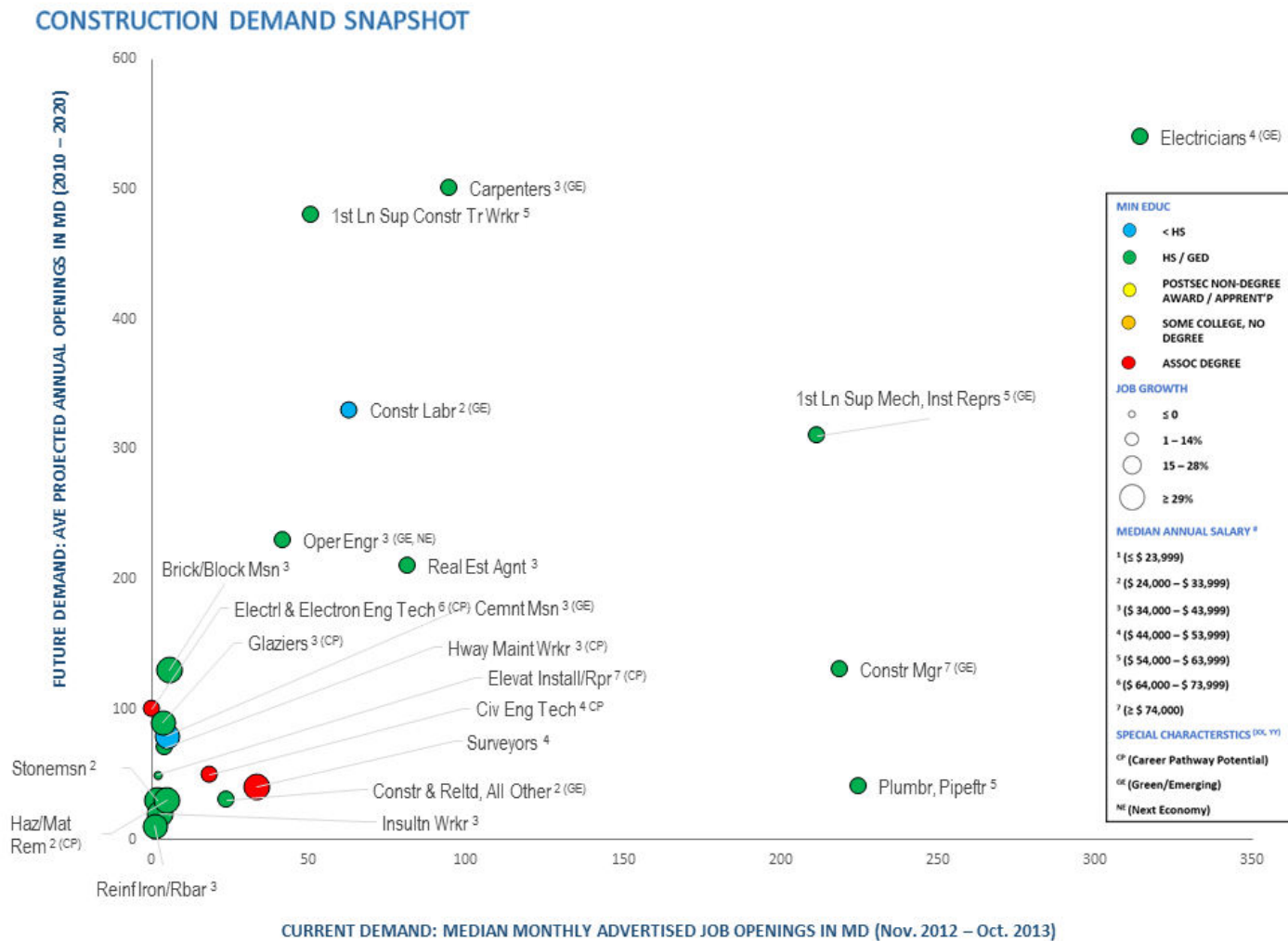
Construction Managers*
Electrical & Electronic Engineering Technicians

Tier 3: Lower Demand, Other Redeeming Qualities

Cement Masons
Civil Engineering Technicians
Glaziers

**Indicates programs with the strongest current and/or projected demand.*

FIGURE 1. CONSTRUCTION DEMAND⁴



⁴ Sources: Future demand, median salary, min. educ., projected job growth, green/emerging characteristics taken from occupational profile data for Maryland, America's Career InfoNet, www.careerinfonet.org; Current demand data taken from Maryland Workforce Exchange, <https://mwejobs.maryland.gov/vosnet/Default.aspx>; Career pathway potential taken from Opportunity Collaborative, [Baltimore Regional Pipeline Development Study](#) (Oct. 2013); Next economy characteristics taken from J.Vey, [Building from Strength: Creating Opportunity in Baltimore's Next Economy](#) (Brookings Institution, 2012).

Supply – Programs and Outcomes in Construction

We turn next to a discussion of programs associated with each of these occupations, their accessibility, and outcomes related to enrollment, completion and earnings, which are summarized in the supply snapshot included below as Figure 2.

Program Availability: BCCC and/or CCBC offer programs associated with 11 of the 14 Best Prospect occupations in Construction. There are 12 programs associated with Tier 1 occupations, three programs associated with Tier 2 occupations, and one, Engineering Technician, associated with a Tier 3 occupation.⁵

Neither college offers a related program in Brick and Block Mason (Tier 1), Cement Mason (Tier 3) or Glazier (Tier 3).

Among the 16 programs shown below, 10 (62 percent) are at CCBC and six (38 percent) are at BCCC.⁶ Their characteristics and outcomes are summarized in the “supply snapshot” included as Figure 2, below.⁷ CCBC also offers an Operating Engineer Apprenticeship Training Program in partnership with the International Union of Operating Engineers, Local 37 for which we lacked information sufficient to plot program characteristics in Figure 2.

Enrollment, Completion and Wage Data: Enrollments in Tier 2 construction programs tend to be higher than those in Tier 1, a somewhat surprising result, given their length and increased cost; this issue will surface again as we examine outcomes in other industries.

In Figure 2, well over half the offerings are non-credit or hybrid apprenticeship programs for which enrollment and completion information are unavailable. These programs are shown as “sidelined” in Figure 3 for this reason. This lack of data is a limiting factor when it comes to evaluating all of the non-credit and hybrid programs that typically make up the bulk of Tier 1 opportunities discussed in this study. This result is particularly unfortunate in this sector, given that the apprenticeship trade programs at CCBC (i.e., carpenter, electrician, plumber) are hybrid programs involving the award of college credit upon completion of the apprenticeship, can be completed at little or no cost to the student, and are associated with journeyman credentials that are valuable and portable. It would be useful to be able to understand how many students are enrolling in and completing these programs, and to see how earnings change over time.

⁵ This report covers a ten-year period ending in 2012. Since 2012, BCCC has received approval from MHEC for a new program in Electrical Engineering, one of the best prospect programs highlighted in this section of the report.

⁶ In December 2014, BCCC reported that it is adding building trades offerings at its National Weatherization Training Center. J.Reichenberg, Comments on Draft (December 2014).

⁷ A note on how to interpret the Construction Programs and Outcomes Snapshot, and the others in this report like it: Again, cooler colors are typically better than warmer colors, as the cooler colors represent programs that require less education. Smaller bubbles are better than larger bubbles because smaller bubbles are associated with programs that are less expensive to complete. Looking at the line weights associated with each circle, lighter line weights are better than heavier line weights because the lighter line weights are associated with programs that are shorter in length. In the superscript associated with each program, many show “ND” for “no data,” meaning that the Jacob France Institute was unable to provide data on earnings for program participants. Others show a number from 1 to 8, which correlates with the percentage gain in earnings calculated by the Jacob France Center when examining graduates’ earnings, pre- and post-credential. Obviously, a higher number here is better than a lower number because higher numbers mean greater earnings gains. Other important factors in the superscript are whether the program leads to a credential (“C”) and whether there are policies in place that would affect the program’s accessibility, like enrollment caps (“EC”), selective admissions rules (“SA”), a health manpower shortage designation (“HM”), or a designation of statewide (“SW”).

BCCC's programs in the construction trades are much shorter and more expensive to complete than those at CCBC. They are not apprenticeship programs, as such, so enrollees must pay for them out-of-pocket. BCCC's programs are meant to provide exposure to the trades and, while BCCC's materials state that "[o]n completion of [the] programs, tradition [sic] apprenticeships are available to students seeking to gain hands on experience prior to their entry into the world of work," we could find no further information on-line about how one might go about doing so at BCCC. This is unfortunate given the strong median wages and demand projected for these occupations and the numbers of city residents who need these opportunities.

At CCBC, on the other hand, the transition from apprenticeship to college credit is well articulated, with students able to earn college credits as apprentices and with clear opportunities to earn a Construction Craft Professional certificate or degree at CCBC upon completion of the apprenticeship.⁸ Both Construction Craft programs have relatively low numbers of students enrolled and few degrees and certificates awarded, however; this is a surprising result given the opportunity an apprenticeship provides. These programs, along with Construction Management, are designated as "Statewide," meaning that students from Baltimore City and other jurisdictions can enroll in them at in-county rates.⁹

Programs with reported data show low numbers of degrees and certificates awarded (under 10), even where enrollments, e.g., in the Construction Management and Engineering Technology degree programs, are comparably robust. As a result, the Jacob France Institute was not able to supply information on earnings gains pre- and post-credential for any programs with two exceptions: Construction Management Degree and Construction Management Certificate, where earnings gains were found to be modest.

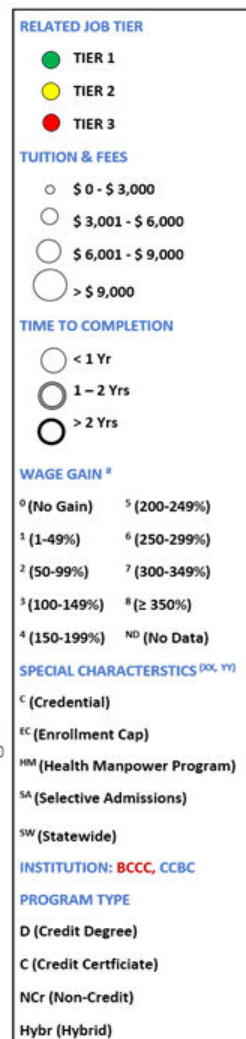
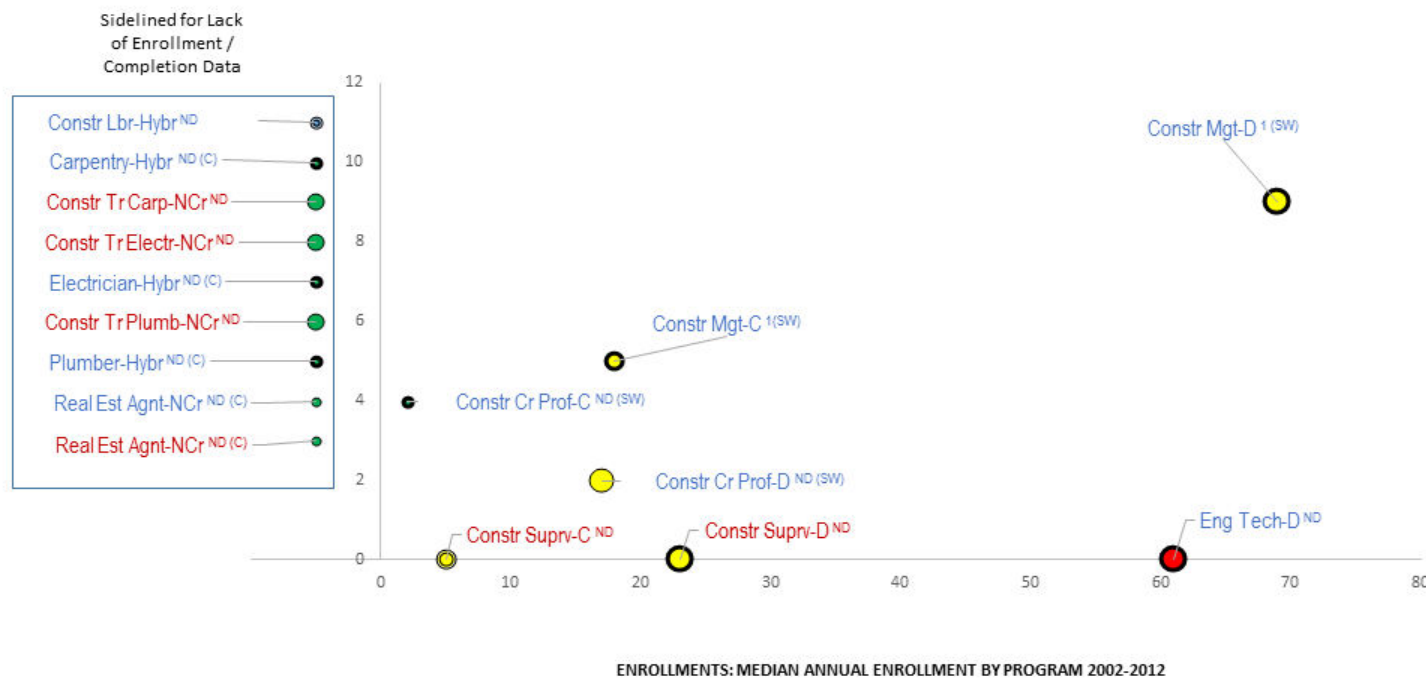
⁸ CCBC added the Construction Craft Professional Degree and Certificate programs in 2007.

⁹ The Maryland Higher Education Commission may designate certain community college programs as statewide and typically does so where a college has developed a program area that can be expensive to replicate.

FIGURE 2. CONSTRUCTION SUPPLY¹⁰

CONSTRUCTION SUPPLY SNAPSHOT

COMPLETIONS: MEDIAN ANNUAL DEGREES / CERTIFICATES AWARDED 2002-2012



¹⁰ All data on enrollment is from MHEC, *Trends in Enrollment by Program* (1999-2012), data on degrees and certificates awarded is from MHEC, *Trends in Degrees and Certificates Awarded* (1999-2012), and data on earnings was compiled by the Jacob France Institute.

Construction Supply/Demand Summary

TABLE 2. CONSTRUCTION TAKEAWAYS

Demand

Best Prospect Occupations	14
Best Prospects by Tier	Tier 1: 9 (60%) Tier 2: 2 (14%) Tier 3: 3 (26%)
Med. Annual Wages	13 (93%) \geq \$34,000; 7(50%) \geq \$44,000
Special Characteristics of Best Prospects	3 (26%) Career Pathway Potential (CP) 7 (50%) Green or Emerging (GE) 1 (7%) Next Economy (NE)

Supply

Programs Aligned with Best Prospects	Number: 16 Institution: BCCC: 6 (37%); CCBC: 10 (63%) Type: Credit: 7 (44%); Non-credit: 5 (31%); Hybrid: 4 (25%)
Best Prospects without Programs	3 Occupations: <ul style="list-style-type: none">• Brick & Block Mason (Tier 1)• Cement Mason (Tier 3)• Glazier (Tier 3)
Cancelled Programs Aligned with Best Prospects	None
Program Outcomes	<ul style="list-style-type: none">• No data on the 9 non-credit/hybrid programs.• Enrollment is highest for longer, more expensive, degree programs and the number of completers is low across all programs, even those designated as “statewide”• Modest earnings gains for the few programs where this data was available
Special Characteristics of Aligned Programs	5 (31%) programs, all non-credit, associated with a credential (C) 3 (19%) programs, all construction at CCBC, designated “statewide” (SW)

B. Health Care and Social Assistance

The Opportunity Collaborative study, referenced above, cites health care as one of the largest employment sectors in the Baltimore region, employing 188,000 individuals in 2012 across 24 healthcare systems and medical centers.¹¹ In Baltimore City, health care is, in fact, the largest employment sector. The Opportunity Collaborative study also found that enrollment and program completions are low when compared to hiring demand for a number of health care occupations in the Baltimore region, including Surgical Technicians, Radiologic Technicians and Technologists, LPNs, EMTs, and Respiratory Therapists.¹²

1. Demand - Best Prospect Careers in Health Care and Social Assistance

There are 17 occupations that qualify as best prospects in health care, with roughly 60 percent in Tier 1 and 40 percent in Tier 2, as shown in Table 3, below.

TABLE 3. “BEST PROSPECTS” IN HEALTH CARE AND SOCIAL ASSISTANCE

Tier 1: Strong Demand, Modest Educational Requirements for Career Entry	
	Dental Assistants
	Emergency Medical Technicians
	Massage Therapists
	Medical Assistants*
	Medical Coders
	Medical Secretaries*
	Pharmacy Technicians
	Practical Nurses*
	Surgical Technicians

Tier 2: Strong Demand, Higher Educational Requirements for Entry

	Dental Hygienists
	Medical Equipment Repairers*
	Medical Lab Technicians
	Occupational Therapy Assistants*
	Physical Therapy Assistants*
	Radiology Technicians
	Registered Nurses*
	Respiratory Therapists

**Indicates programs with the strongest current and/or projected demand.*

¹¹ Opportunity Collaborative, p. 15.

¹² Ibid., p. 16

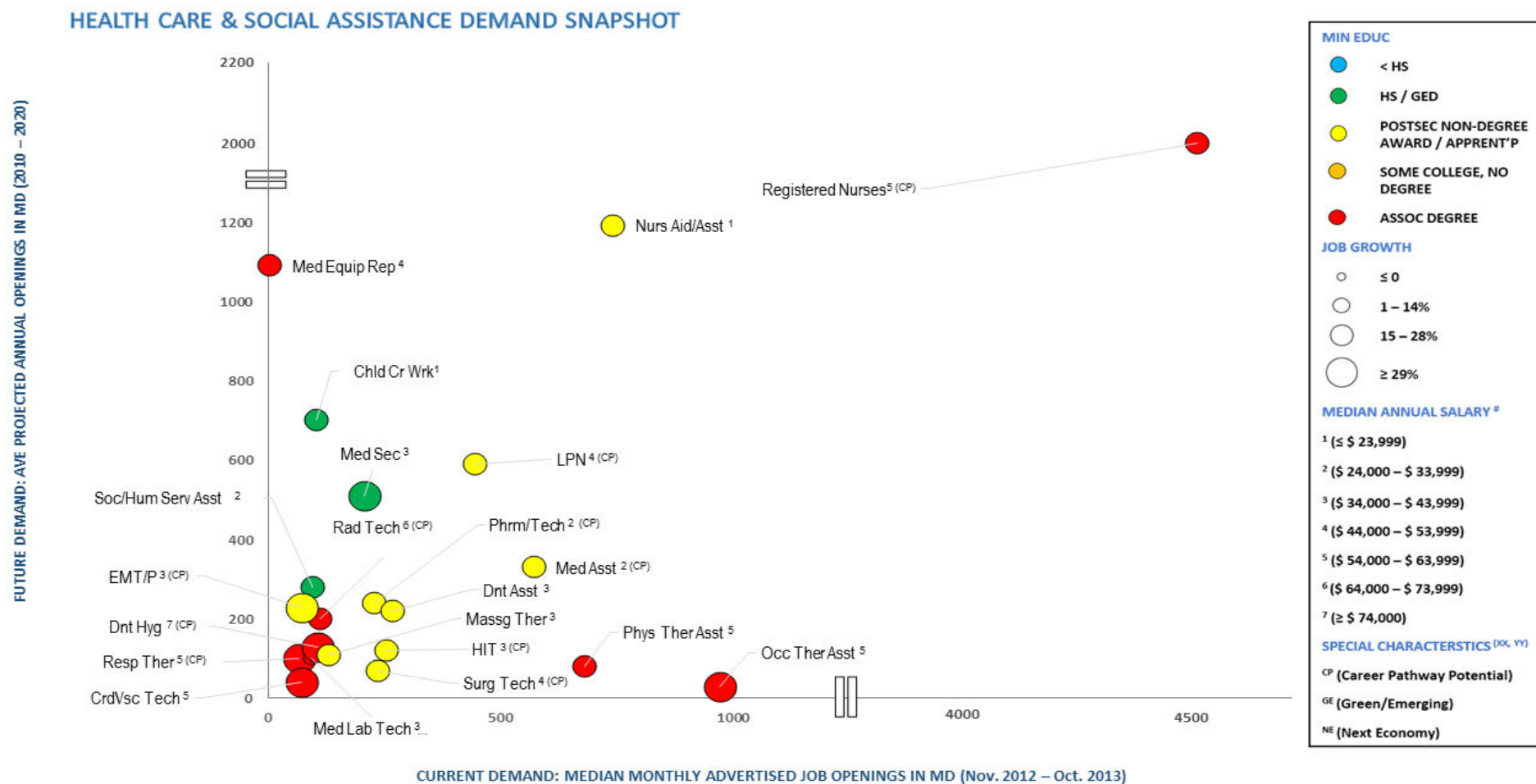
Among the more striking features of the data in Figure 3 is the strength of demand for registered nurses. Current and projected demand figures necessitated expanding the x and y axes to be able to show demand for this position in the same chart as demand for other roles in the Health Care and Social Assistance Sector. Current and/or future demand is also robust for Medical Secretaries, Practical Nurses (LPNs), Medical Assistants, Physical Therapist Assistants and Occupational Therapy Assistants. Another remarkable feature is the strong projected future demand for Medical Equipment Repairers.

Over half of the best prospects have an annual median wage at or above \$44,000. However, nearly all of the positions in the Health Care and Social Assistance Sector have, as a minimum educational requirement, attainment of a post-secondary award or associate's degree. Fifteen of 17 of best prospects have an annual median wage at or above \$34,000, with Medical Assistant and Pharmacy Tech falling below that bar but remaining on the list owing to their career pathway potential. In addition to these career pathway occupations, other best prospects with strong career pathway potential include EMT, Practical Nurse (LPN), Surgical Technician, Dental Hygienist, Medical Lab Technician, Radiology Technician, Registered Nurse, and Respiratory Therapist.

Jobs that did not make the cut as "best prospects" include Nursing Aid/Assistant, Child Care Worker and Social/Human Services Assistant, owing to their relatively low salaries and lack of other special characteristics that would elevate their consideration.¹³ Cardiovascular Technician did not make the list based on relatively low current and projected demand.

¹³ Care providers – including child care workers, personal and home care aides, and home health aides – make up a major segment of the low-wage workforce. Half of the 557,000 workers who provide child care earn less than \$8.20 an hour. Boushey, p. 13

FIGURE 3. HEALTH CARE DEMAND ¹⁴



¹⁴ Sources: Future demand, median salary, min. educ., projected job growth, green/emerging characteristics taken from occupational profile data for Maryland, America's Career InfoNet, www.careerinfonet.org; Current demand data taken from Maryland Workforce Exchange, <https://mwejobs.maryland.gov/vosnet/Default.aspx>; Career pathway potential taken from Opportunity Collaborative, *Baltimore Regional Pipeline Development Study* (Oct. 2013); Next economy characteristics taken from J.Vey, *Building from Strength: Creating Opportunity in Baltimore's Next Economy* (Brookings Institution, 2012).

2. Supply - Programs & Outcomes in Health Care

Program Availability: Nearly all of the Health Care occupations are associated with at least one credit or non-credit offering at BCCC or CCBC, and many occupations have programs that offer both certificates and two-year degrees. There are 13 programs associated with Tier 1 opportunities and 15 programs associated with Tier 2 opportunities. (See Figure 4, below.) Among the 30 health-related programs, roughly one-third are at BCCC and two-thirds are at CCBC. In addition, credit programs outnumber non-credit programs by a margin of nearly four to one.

BCCC recently discontinued several programs that we included in Tier 1 as “best prospects.” Those programs include three EMT certificates, an EMT degree program, a Medical Administrative Assistant degree option, and a certificate program in Surgical Technology. When the college discontinued these programs in 2011, it cited low numbers of enrollees and completers as the rationale for these decisions,¹⁵ as well as “ensuring academic programs are relevant and responsive to future market trends and new economy jobs,... maximizing student employability,... [and] strengthening fewer programs vs. many weak programs. Nationally, community colleges in cities comparable to Baltimore do provide training for EMS staff: Denver Community College in Denver Colorado, Seattle Community College in Seattle, Washington, Central Piedmont Community College in Charlotte, North Carolina and Maricopa Community College in Phoenix, Arizona all offer EMT programs. With new leadership in place since these decisions were originally made, BCCC now says it is working on a proposal to reinstitute an Emergency Medical Services program.”¹⁶

Medical Equipment Repairer, a Tier 2 job, is the sole occupation for which there is no comparable program at either BCCC or CCBC.¹⁷

Enrollment, Completion and Wage Outcomes: For the most part, the occupations showing the highest demand in Figure 3, i.e. Registered Nurse, LPN, Physical Therapist Assistant, and Occupational Therapist Assistant, are matched by relatively strong program outcomes in Figure 4. The exceptions are Medical Assistant and Medical Secretary, where the existing credit programs at CCBC have both low enrollments and low numbers of completers. As such, they present opportunities for un- and underemployed individuals with an aptitude for administrative work.

Degrees: There are large earnings gains associated with completing many of the degree programs shown there, with Dental Hygiene at both BCCC and CCBC showing gains exceeding 350 percent, Radiation Tech (CCBC) and Physical Therapist Assistant (BCCC) showing gains in the range of 300 to 349 percent, and Respiratory Therapy (CCBC), Occupational Therapy (CCBC) and Registered Nurse (CCBC) posting gains in the range of 250 to 299%. Again, there were also a number of sidelined and low enrolled programs on which we are unable to comment on earnings gains.

¹⁵ Baltimore City Community College (2011), p. 1.

¹⁶ J.Reichenberg, Comments on Draft (December 2011)

¹⁷ The closest program geographically is at Howard Community College.

Credit Certificates: Tier 1 credit certificate programs, which can be completed more quickly than degree programs and typically at a lower cost, tend to have low enrollments and low numbers of completers at both institutions, with the exception of Practical Nursing at CCBC. Six programs shown in figure 4 have the “Health Manpower” (HM) designation, which is designed to improve the pipeline of individuals to and through programs leading to health occupations experiencing worker shortages. This designation enables out-of-county students to enroll in the program at less expensive in-county rates.¹⁸ This is good news for low-enrolled programs like Medical Office Assistant at CCBC because of the prospect that exists for enrollment growth in the form of new students from other jurisdictions. The tuition differential presents less of an opportunity for low-enrolled programs at BCCC because all State residents pay the same tuition there, given that BCCC is a State institution. For more highly enrolled programs, like Occupational Therapy Assistant, Health Informatics and Information Technology, and Radiographer, all at CCBC, the designation could mean that local applicants will face stiffer competition in getting into programs that, with the exception of Health Informatics and Information Technology, already have a selective admissions process.

All but two programs, Medical Office Administration and Medical Office Assistant, are associated with credentials in the form of a State license required for practice, completion of a national certification exam, or both. Unfortunately, because individual data on credential attainment is unavailable, we were unable to evaluate how many program completers featured in this study actually obtained a credential.

Tier 2 programs in health are associated with stronger wage outcomes. They require, however, more time to complete and have higher tuition and fees; these programs are more likely to have selective admissions and/or enrollment cap policies that may limit enrollment. In addition, several have robust numbers of enrollees especially Dental Hygiene (BCCC and CCBC), Registered Nurse (BCCC and at CCBC), Occupational Therapy Assistant (CCBC), Radiographer (CCBC), and Respiratory Therapy (CCBC). A few can also be described as having relatively robust numbers of graduates, including Dental Hygiene at BCCC and Registered Nurse at (BCCC and CCBC).

Annual median degrees/certificates awarded hovered around 10 or fewer for the vast majority of programs we have characterized as best prospects. In addition, many of the programs with relatively low numbers of enrollees and completers are administrative positions, e.g. Health Information Technology, Medical Coding, Medical Office Administration, as opposed to technical or patient care roles. These programs also lack the enrollment cap and selective admissions policies that limit enrollment in the technician and patient care disciplines. For this reason, they are good opportunities for un- and underemployed individuals with an aptitude for administrative work.

Finally, across both tiers, programs at BCCC are less expensive to complete than those at CCBC, owing largely to the fact that BCCC’s tuition per credit hour is set at \$88 and CCBC’s at \$109. For City residents wishing to attend a CCBC program that does not have the Health Manpower Shortage

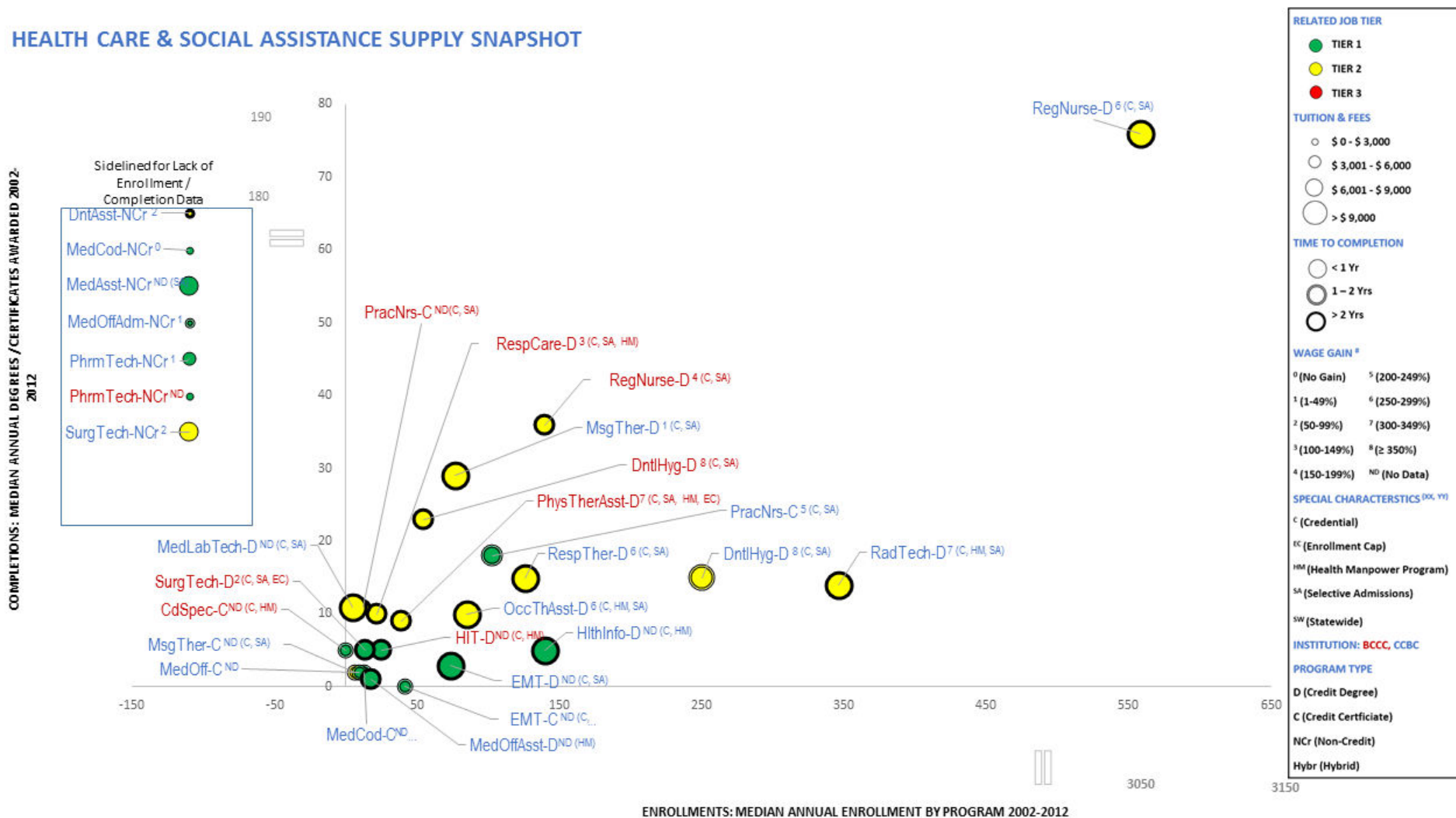
¹⁸ Md. Higher Education Commission, State Aid to Community Colleges Manual, p. 8 (Revised 1-1-2006) (available at <http://mhec.maryland.gov/publicaitons/ccaidmanual.pdf>). All of BCCC’s EMT programs held the Health Manpower Designation at the time that they were cancelled.

designation, there is an even bigger tuition differential, as the tuition rate for in-state, out-of-county residents is \$208 per credit hour.¹⁹

¹⁹ The Community College of Baltimore County, College Catalog (2013-2014) (available at <http://catalog.ccbcmd.edu/content.php?catoid=16&navoid=952>).

FIGURE 4: HEALTH CARE SUPPLY 20

HEALTH CARE & SOCIAL ASSISTANCE SUPPLY SNAPSHOT



²⁰ All data on enrollment is from MHEC, *Trends in Enrollment by Program* (1999-2012), data on degrees and certificates awarded is from MHEC, *Trends in Degrees and Certificates Awarded* (1999-2012), and data on earnings was compiled by the Jacob France Institute.

Health Care & Social Assistance Demand Supply Summary

TABLE 4. HEALTH CARE & SOCIAL ASSISTANCE TAKEAWAYS

Demand

Best Prospect Occupations	17
Best Prospects by Tier	Tier 1: 9 (59%) Tier 2: 8 (41%)
Med. Annual Wages	15 (88%) ≥ \$34,000; 9(53%) ≥ \$44,000
Special Characteristics of Best Prospects	11 (65%) Career Pathway Potential (CP)

Supply

Programs Aligned with Best Prospects	Number: 30 Institution: BCCC: 9 (30%); CCBC: 21 (70%) Type: Credit: 23 (77%); Non-credit: 7 (23%)
Best Prospects without Programs	1 occupation: Medical Equipment Repairer (Tier 2)
Cancelled Programs Aligned with Best Prospects	BCCC (6 Programs) <ul style="list-style-type: none"> 3 EMT Certificates EMT Degree Medical Administrative Assistant Degree Surgical Technology Certificate
Program Outcomes	<ul style="list-style-type: none"> No data on the 7 non-credit programs Enrollment and completion outcomes are highest for longer, more expensive, degree programs; outcomes are particularly strong for nursing degree at CCBC 10 programs with earnings gains in excess of 100%
Special Characteristics of Aligned Programs	18 (60%) selective admissions; exceptions are administrative and HIT positions 5 (17%) health manpower designation 27 (90%) associated industry credentials 2 (7%) enrollment caps

C. Leisure and Hospitality

The Opportunity Collaborative study, referenced above, cites the hospitality industry as one of the largest employment sectors in the Baltimore region.²¹ Few of these jobs, however, require extensive knowledge or skills, and most tend to be low-paying and devoid of opportunities for significant career advancement, as a result.²² The lone exceptions to this rule are supervisory and management roles.²³

1. Demand - Best Prospect Careers in Leisure/Hospitality

Among the more striking features of Figure 5 are the dearth of best prospect hospitality occupations and the relatively low median wages for most of the occupations shown there. As a result, only two of the five occupations were categorized as “best prospects” in Table 5.

There is strength in both current and projected demand for first-line supervisors; both of the occupations have median annual salaries at or above \$34,000.

TABLE 5. "BEST PROSPECTS" IN LEISURE & HOSPITALITY

Tier 1: Strong Demand, Modest Educational Requirements for Entry

Chef/Head Cook

Tier 2: Strong Demand, Higher Educational Requirements for Entry

First-line Supervisor of Food Preparation and Service Workers*
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**Indicates programs with the strongest current and/or projected demand.*

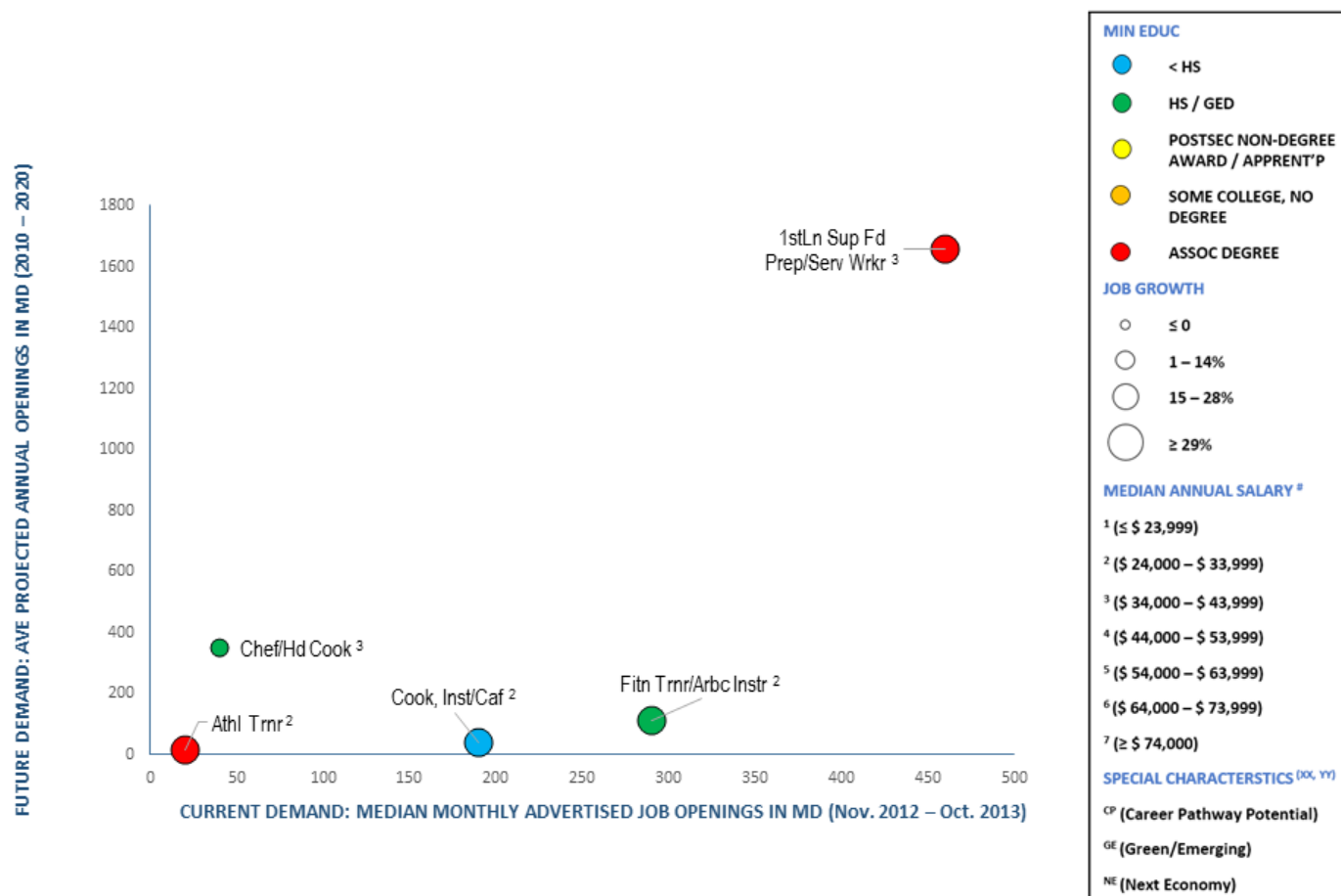
²¹ Opportunity Collaborative, p. 15.

²² Ibid.

²³ Ibid.

FIGURE 5. LEISURE & HOSPITALITY DEMAND²⁴

LEISURE & HOSPITALITY DEMAND SNAPSHOT



²⁴ Sources: Future demand, median salary, min. educ., projected job growth, green/emerging characteristics taken from occupational profile data for Maryland, America's Career InfoNet, www.careerinfonet.org; Current demand data taken from Maryland Workforce Exchange, <https://mwejobs.maryland.gov/vosnet/Default.aspx>; Career pathway potential taken from Opportunity Collaborative, *Baltimore Regional Pipeline Development Study* (Oct. 2013); Next economy characteristics taken from J.Vey, *Building from Strength: Creating Opportunity in Baltimore's Next Economy* (Brookings Institution, 2012).

2. Supply – Programs & Outcomes in Hospitality

We turn next to a discussion of programs associated with each of these occupations, their accessibility, and outcomes related to enrollment, completion and earnings, which are summarized in the supply snapshot included below as Figure 6.

Program availability: Of the two occupations shown in Table 5, only First-Line Supervisor of Food Preparation and Service Workers has comparable programs at either college. In Tier 1 is CCBC's non-credit Food Service Manager Program, which costs just \$1,975, can be completed in a half year or less, and leads to two industry certifications. We have no data from which to draw conclusions about outcomes for this program. In Tier 2 is CCBC's Hospitality Management Degree Program, a relatively costly option by comparison to its non-credit cousin. The program has had a modest median enrollment over the period examined by this study and a relatively low median number of completers, which, until 2011, had been rising consistently.

BCCC discontinued its Hospitality Management Program in 2011, which had degree options in Food Service Management and Hotel/Restaurant Management. It cited the low numbers of enrollees and completers, and the need to ensure that academic programs are relevant and responsive to future market trends and new economy jobs as reasons for its decision.²⁵ Baltimore is considered a Tier Two destination city, one with amenities available to travelers at a bargain, compared to Tier One cities like Los Angeles, Chicago, and New York. Most meeting planners are fond of Tier Two cities for conventions for this reason. How many other public community colleges in Tier Two cities like Denver, Seattle, Charlotte, and Phoenix don't train for the hospitality industry? The answer – among the list, only the Community College of Denver lacks a hospitality management program. The thinking may be that Stratford University, a private institution in Baltimore that offers Associate-level programs in hotel and restaurant management and Baccalaureate-level programs in Hospitality Management, may have the demand covered, but, at \$370 per quarter credit hour, tuition there may be out of reach for many city residents.²⁶

Neither BCCC nor CCBC has a program to train Chefs/Head Cooks, arguably because Stratford University is again able to meet most of the local demand. But the same concern about affordability may ultimately make this option an unrealistic one for most low-income job seekers.

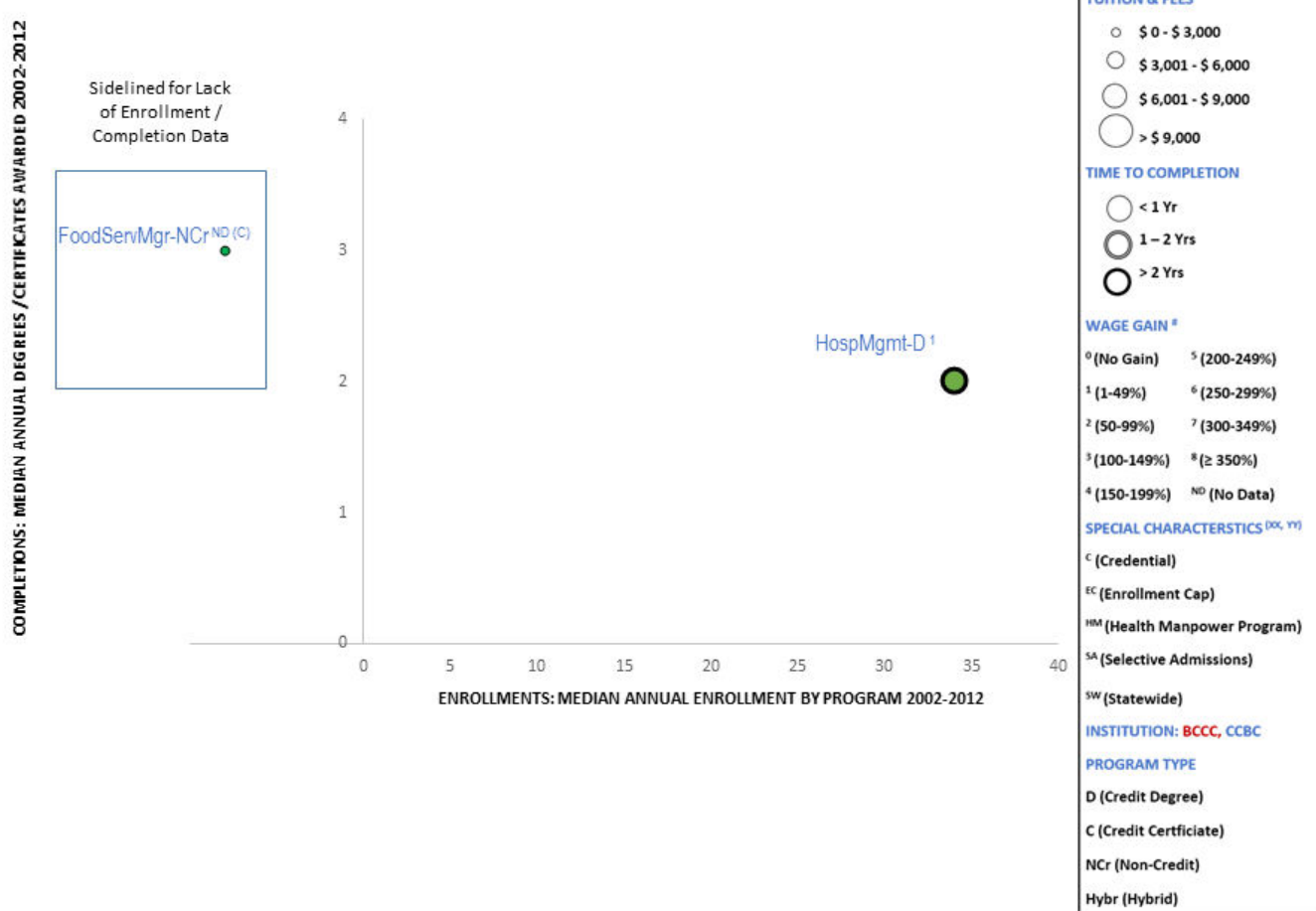
Enrollment, Completion and Wage Outcomes: While the Food Service Manager program offers no data from which to draw conclusions, graduates of CCBC's Hospitality Management program have seen modest wage gains following completion.

²⁵ Baltimore City Community College (2011), p. 1.

²⁶ Stratford University, Baltimore, *Tuition and Fees* (Available at <http://www.stratford.edu/content-pages/admissions/tuition-and-fees>).

FIGURE 6. LEISURE & HOSPITALITY SUPPLY²⁷

LEISURE & HOSPITALITY SUPPLY SNAPSHOT



²⁷ All data on enrollment is from MHEC, *Trends in Enrollment by Program* (1999-2012), data on degrees and certificates awarded is from MHEC, *Trends in Degrees and Certificates Awarded* (1999-2012), and data on earnings was compiled by the Jacob France Institute.

Leisure & Hospitality Demand/Supply Summary

TABLE 6. LEISURE & HOSPITALITY TAKEAWAYS

Demand

Best Prospect Occupations	2
Best Prospects by Tier	Tier 1: 1 (50%) Tier 2: 1 (50%)
Med. Annual Wages	2 (100%) \geq \$34,000
Special Characteristics of Best Prospects	None

Supply

Programs Aligned with Best Prospects	Number: 2 Institution: BCCC: 0; CCBC: 2 (100%) Type: Credit: 1 (50%); Non-credit: 1 (50%)
Best Prospects without Programs	1 occupation: Chef/Head Cook (Tier 1)
Cancelled Programs Aligned with Best Prospects	BCCC (1 Program) <ul style="list-style-type: none">Hospitality Management Degree
Program Outcomes	<ul style="list-style-type: none">No data on 1 non-credit programEnrollment in Hospitality Management has been modest and completions low.Hospitality Management graduates saw modest wage gains.
Special Characteristics of Aligned Programs	None

D. Manufacturing

Since 2007, Baltimore has lost 25,000 manufacturing jobs.²⁸ According to *The Baltimore Sun*, Maryland's manufacturing losses – the results of cutbacks, shutdowns and technological innovations requiring fewer employees – are among the nation's steepest.²⁹ This also underscores the outsized harm done to workers without a college education and the stark contrast to the early part of the 20th century, when Maryland had more manufacturing plants than all but 14 states.³⁰

As for manufacturing's future prospects, the Opportunity Collaborative study sums things up this way:

The future trend in the manufacturing sector is far from certain, since cyclical patterns after a recession can also lead to growth in manufacturing jobs. As a result, the projection for this sector is flat during the forecast period. The Baltimore Region has a small base for high paying manufacturing jobs with firms like Lockheed Martin and is well supported by a robust supply chain across the entire mid-Atlantic region, strong transportation and logistics, and a good network of roads, rails, airports and warehouses. These factors along with federal, state and local initiatives to bring back manufacturing jobs *might* give this sector a greater upward potential for growth.³¹ [emphasis added].

1. Demand - Best Prospect Careers in Manufacturing

Six occupations in Manufacturing have been categorized as best prospects --all Tier 1 occupations in Table 7, below.

TABLE 7. "BEST PROSPECTS" IN MANUFACTURING

Tier 1: Strong Demand, Modest Educational Requirements for Entry

First-Line Supervisors of Production and Operating Workers*
Industrial Machinery Mechanics
Inspectors, Testers, Sorters, Samplers and Weighers*
Machinists*
Team Assemblers
Welders

**Indicates programs with the strongest current and/or projected demand.*

The occupations in highest demand, i.e. Machinist, First-line Supervisor of Production and Operating Workers, Inspectors, Testers, Sorters, Samplers and Weighers, Welders, Industrial Machinery

²⁸ J. Hopkins, MD Manufacturing job losses outstrip most of U.S., *The Baltimore Sun*, Nov. 17, 2013.

²⁹ Ibid.

³⁰ Ibid. To address these challenges, Governor O'Malley reconstituted a Maryland Advisory Commission on Manufacturing in 2012, which was set to issue a first round of recommendations in late 2013, but has yet to do so.

³¹ Opportunity Collaborative, p. 51.

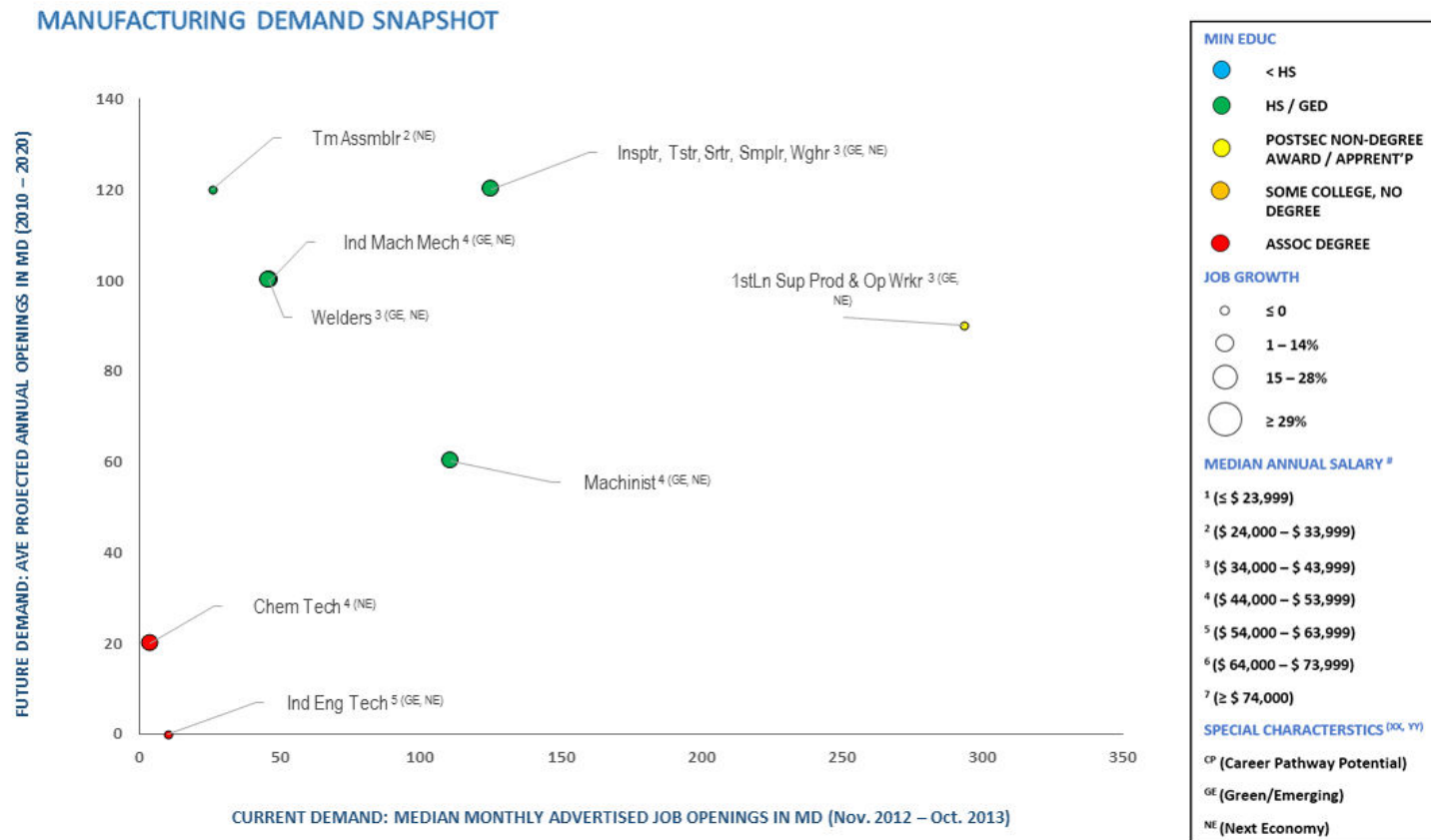
Mechanics and Team Assemblers, tend to be those with the lowest educational requirements. Those occupations also pay good wages, with all but Team Assembler in the \$34,000 - \$43,999 or \$44,000 - \$53,999 range.

Missing from the list is Electro-Mechanical Technician, an occupation that BCCC targeted with a new program, Robotics, in 2009; neither current advertised job openings nor statewide projections support it as having robust demand. In fact, there were no statewide projections for 2010-2020 and projections for 2012-2022 show a four-percent decline in employment and 0 projected annual openings.³²

Among the more striking features are the dearth of occupations depicted, the relatively low numbers of current and projected openings, and relatively modest projected growth. These factors kept Chemical Technician and Industrial Engineering Technician from making the list of best prospects. Five of six (83%) programs are cited as “green or emerging” and as “next economy” jobs. The lone exception is team assembler, which bears only the “next economy” label.

³² BCCC's Program Proposal for Robotics Submitted to MHEC in June of 2009 states that robotics technician is synonymous with “electrical/electronics/automation/manufacturing/industrial technician” and that, in 2006, there were 7,800 people employed collectively in these jobs, with expected job growth between 2006 and 2016 of 10 percent.

FIGURE 7. MANUFACTURING DEMAND³³



³³ Sources: Future demand, median salary, min. educ., projected job growth, green/emerging characteristics taken from occupational profile data for Maryland, America's Career InfoNet, www.careerinfo.net; Current demand data taken from Maryland Workforce Exchange, <https://mwejobs.maryland.gov/vosnet/Default.aspx>; Career pathway potential taken from Opportunity Collaborative, Baltimore Regional Pipeline Development Study (Oct. 2013); Next economy characteristics taken from J.Vey, *Building from Strength: Creating Opportunity in Baltimore's Next Economy* (Brookings Institution, 2012).

Supply - Programs & Outcomes in Manufacturing

Just as there are a dearth of manufacturing occupations featured in our demand snapshot, so are there a dearth of associated educational programs in the supply snapshot, Figure 8, below.

Program Availability: The seven programs that match the best prospect occupations are all at CCBC, and include non-credit programs for training first-line supervisors, along with welders and machinists, both of which have associated credentials, two credit programs for training machinists, and one credit certificate program for training Inspectors, Testers, Samplers and Weighers.

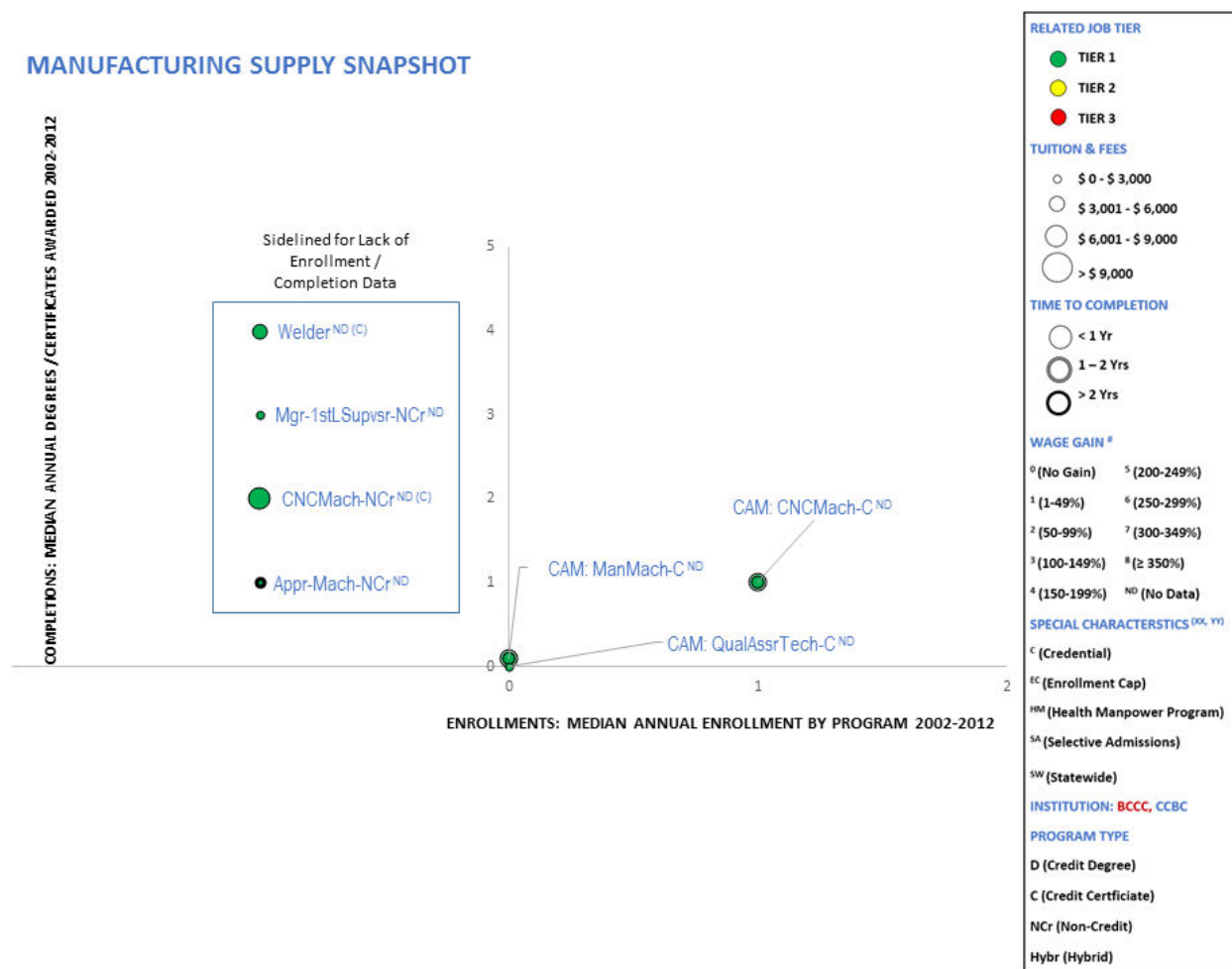
During the time period covered by this study, there were no programs at either college training individuals as Industrial Machinery Mechanics or Team Assemblers. In 2015, CCBC intends to offer a non-credit Industrial Maintenance Mechanic, a program that is one step above CNC machinist, which CCBC already has, and which has been developed at many colleges with advanced manufacturing pathways.³⁴ Assembly workers are at the base of the career lattice for advanced manufacturing, but are considered to be positions where at least some postsecondary training is appropriate.³⁵

Enrollment, Completion and Wage Outcomes: Among these, we have no data from which to draw conclusions about outcomes for the non-credit programs. On the credit side, enrollments and completions are extremely low, and we have no information on earnings gains, as a result.

³⁴ See, for example, Ivy Tech Community College, Advanced Manufacturing Career Pathway (Available at <http://www.ivytech.edu/advanced-manufacturing-institute/adv-manufacturing-pathway.html>).

³⁵ See, for example, Careeronestop.org, *Sample Career Ladder/Lattice for Advanced Manufacturing* (Available at: http://www.careeronestop.org/CompetencyModel/careerpathway/ReviewCareerPathways/AdvancedManufacturing_CPW.pdf)

FIGURE 8. MANUFACTURING SUPPLY³⁶



³⁶All data on enrollment is from MHEC, *Trends in Enrollment by Program* (1999-2012), data on degrees and certificates awarded is from MHEC, *Trends in Degrees and Certificates Awarded* (1999-2012), and data on earnings was compiled by the Jacob France Institute.

2. Manufacturing Demand/Supply Summary

TABLE 8. MANUFACTURING TAKEAWAYS

Demand

Best Prospect Occupations	6
Best Prospects by Tier	Tier 1: 6 (100%)
Med. Annual Wages	5 (83%) \geq \$34,000
Special Characteristics of Best Prospects	GE: 5 (83%) NE: 6 (100%)

Supply

Programs Aligned with Best Prospects	Number: 7 Institution: BCCC: 0; CCBC: 7 (100%) Type: Credit: 3 (43%); Non-credit: 4 (57%)
Best Prospects without Programs	2 occupations: <ul style="list-style-type: none"> Industrial Machinery Mechanic (Tier 1)³⁷ Team Assembler (Tier 1)
Cancelled Programs Aligned with Best Prospects	None
Program Outcomes	<ul style="list-style-type: none"> Because the majority of programs are non-credit, we can say nothing about their associated outcomes On the credit side, enrollments and completions are quite low and we can provide no information on earnings gains, as a result.
Special Characteristics of Aligned Programs	2 (33%) non-credit programs (Welding and CNC Machinist) have associated credentials

³⁷ Non-credit program coming to CCBC in 2015.

E. Professional, Business & Information Services³⁸

According to The Opportunity Collaborative study, the Baltimore-Washington corridor is “one of the strongest Information Technology (IT) markets in the country,” employing nearly 68,000 workers.³⁹ This sector actually added jobs during the recession, and is projected to create 7,800 new jobs between 2012 and 2020.⁴⁰

The same study cites Business Services as the largest sector in the Baltimore Region. Although the sector lost jobs in the recession, it is expected to return to pre-recession levels in the current year, adding another 12,000 jobs between 2014 and 2020.⁴¹

1. Demand - Best Prospect Careers in Professional, Business & Information Services

The Professional, Business and Information Services industries offer a cornucopia of opportunity for job-seekers. The demand snapshot for these industries (Figure 9) highlights 18 occupations as best prospects in Tiers 1 and 2, delineated in Table 9 below.

TABLE 9. "BEST PROSPECTS" IN PROFESSIONAL, BUSINESS & INFO. SERVICES

Tier 1: Strong Demand, Modest Educational Requirements for Entry

Administrative Services Managers*
Billing & Posting Clerks
Bookkeeping Accounting & Auditing Clerks*
Computer User Support Specialists*
Human Resources Assistants, Except Payroll
Maintenance & Repair Workers*
Payroll & Timekeeping Clerks
Purchasing Agents
Secretaries*

Tier 2: Strong Demand, Higher Educational Requirements for Entry

Advertising Sales Agents
Biological Technicians
Business Operations Specialists*
Computer Network Support Specialists*
Executive Secretaries*

³⁸ We make small break with the NAICS industry classifications in discussing the occupations related to the professional, business & information services sectors. The NAICS segregates information technology sectors related to internet hosting and publishing in a separate “Information” industry grouping; most other information technology sectors are found in the “Professional and Business Services” industry grouping. Given that we identified only a few occupations accessible with a two-year degree or less in the NAICS Information sector, namely Web Developer and Telecommunications Equipment Installers and Repairers, we include evaluation of those occupations here.

³⁹ Opportunity Collaborative, p. 23.

⁴⁰ Ibid.

⁴¹ Ibid.

Graphic Designers
Information Security Analysts*
Life, Physical & Social Science Technicians, All Other (Precision Agriculture Technicians, Quality Control Analysts, Remote Sensing Technicians)
Web Developers*

**Indicates programs with the strongest current and/or projected demand*

Among the “best prospects,” demand is strongest for Bookkeeping, Accounting & Auditing Clerks, Computer User Support Specialists, Computer Network Support Specialists, Information Security⁴² Analysts & Web Developers, Maintenance and Repair Workers, and Secretaries and Executive Secretaries. Within this list, all programs have a median annual wage at or above \$34,000 and 65 percent are at or above \$44,000. There are several standouts when it comes to median annual salaries, including Executive Secretary in the \$54,000 to \$63,999 range and Information Security Analyst, Web Developer, and Computer Network Support Specialist in the \$64,000 to \$73,999 range. Other jobs in somewhat lesser demand, including Administrative Services Manager and Purchasing Agent, are remarkable for their earning potential, especially when viewed in light of the fact that the minimum education typically required for entry is a high school diploma.

Programs that did not make the list fall at either end of the demand spectrum. With high demand, but low median annual salaries are Office Clerk, Receptionist and Information Clerk, Landscaping and Groundskeeping Workers, and Stock Clerks and Order Fillers. With extremely low demand, so low, in fact, that other redeeming factors like career pathways potential and being designated as “green/emerging” or “next economy” could not elevate the occupation for further consideration, are Architectural and Civil Drafter, Mechanical Engineering Technician, Mechanical Drafter Computer Operator, Environmental Science and Protection Technician, Treatment Plant Operator and Telecommunications Equipment Installers & Repairers.⁴³

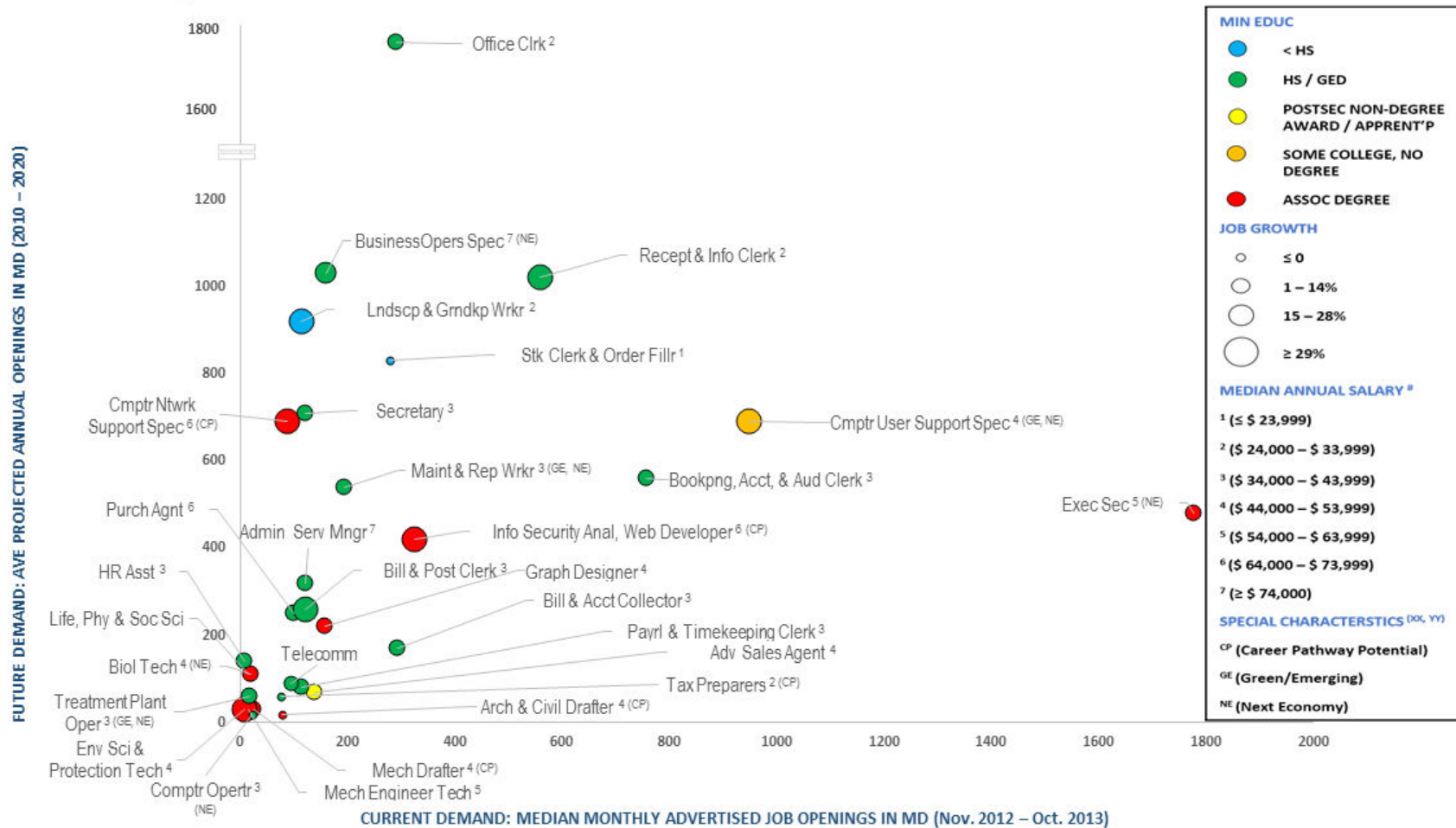
Seventeen percent of the programs in this sector are labeled as having career pathway potential, another seventeen percent are dubbed green or emerging and 24 percent are cited as “next economy” jobs.

⁴² “Many of the region’s entry-level jobs in cybersecurity are designed for younger workers through work-study programs, internships, and cooperative programs to help less experienced workers gain work experience while training.” Opportunity Collaborative, p. 22.

⁴³ Positions for architectural drafters are projected to decline by 5% between 2010 and 2020 statewide, and median advertised job openings stood at just 79 statewide last year. America’s Career Infonet. Meanwhile, local projected growth for the same period is just over one percent. (Md. Dept. of Labor, Licensing & Regulation (DLLR). Drafting jobs are expected to grow by six percent statewide between 2010 and 2020, with a somewhat more modest growth of four percent projected for Baltimore City and County **Invalid source specified**.. Median advertised openings for this job stood at just 26 statewide last year. Similarly, mechanical engineering technician jobs are projected to grow by six percent statewide, while the local projection is approximately 2 percent locally; median monthly advertised job openings statewide last year was just 16.

FIGURE 9. PROFESSIONAL, BUSINESS & INFORMATION SERVICES DEMAND⁴⁴

PROFESSIONAL, BUSINESS & INFORMATION SERVICES DEMAND SNAPSHOT



⁴⁴ Sources: Future demand, median salary, min. educ., projected job growth, green/emerging characteristics taken from occupational profile data for Maryland, America's Career InfoNet, www.careerinfonet.org; Current demand data taken from Maryland Workforce Exchange, <https://mwejobs.maryland.gov/vosnet/Default.aspx>; Career pathway potential taken from Opportunity Collaborative, [Baltimore Regional Pipeline Development Study](https://www.opportunitycollaborative.org) (Oct. 2013); Next economy characteristics taken from J.Vey, [Building from Strength: Creating Opportunity in Baltimore's Next Economy](https://www.brookings.edu/research/building-from-strength-creating-opportunity-in-baltimore-s-next-economy/) (Brookings Institution, 2012).

2. Supply – Programs & Outcomes in Professional, Business and Information Services

Program Availability: Of the 18 Professional, Business and Information Services occupations, all but two (Maintenance & Repair Worker and Life, Physical & Social Scientists) are associated with one or more programs at BCCC and/or CCBC, and many occupations have programs that span two tiers. Among the 31 programs shown in Figure 10, 26 (84%) are credit and the balance non-credit. In addition, 24 (77%) are at CCBC and 7 (23%) are at BCCC.⁴⁵

CCBC has recently added an Information Systems Security Degree program affiliated with a best prospect occupation which is relatively well enrolled but too recent for completion outcomes. With implementation of this program and its network technology offerings, CCBC has achieved recognition as a Center of Academic Excellence (CAE) by the National Security Administration (NSA).⁴⁶ BCCC introduced its own Cyber Security Program in 2014 and an Information Technology-Basic Skills Program in 2013.

Both colleges have canceled programs associated with occupations on our list of best prospects. BCCC canceled its Web Developer and Network Specialist certificate programs in 2011, a somewhat surprising result given the strong demand and relatively high median annual salaries shown for occupations associated with these programs. CCBC canceled its Biotech Manufacturing and Biotechnology Degree Program in 2012.

Enrollment, Completion and Wage Outcomes: The best enrollment and completion outcomes are associated with longer, more expensive programs like Information Technology, Business Management, Network Technology and Computer Graphics at CCBC, and Computer Information Systems and Accounting at BCCC. These outcomes are reminiscent of those in Health Care and Social Assistance. What is starkly different here, however, is that the earnings gains, where that information was available, are much lower.

Generally the less expensive and shorter programs have low enrollments and low number of graduates, explaining why the Jacob France Institute was unable to supply salary data for most of these jobs. This is unfortunate since many of these include industry credentials that usually result in higher earnings for successful completers.

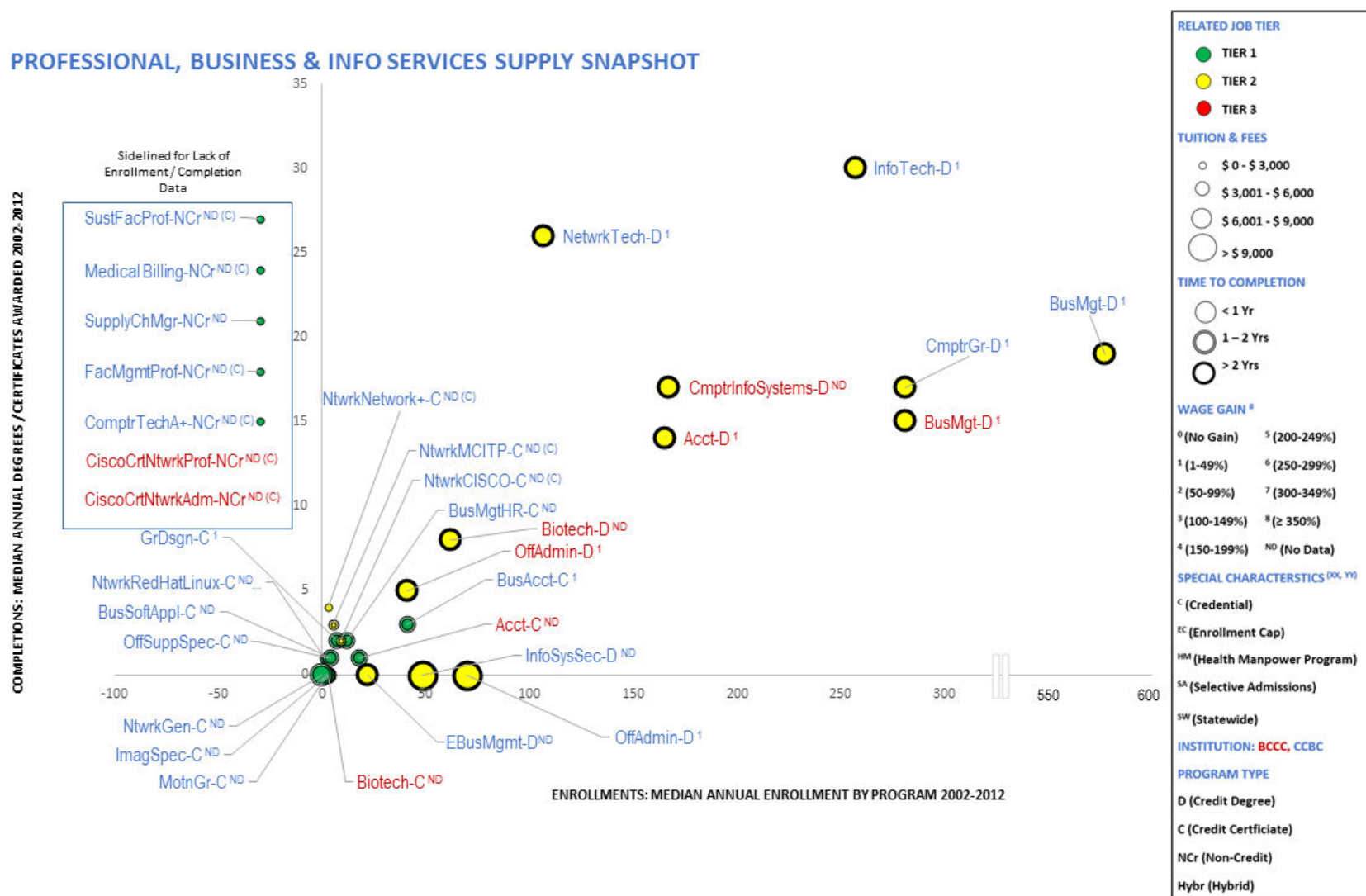
An anomaly here is the low enrollment in certificate programs that are associated with the computer network support specialist occupation, a higher paying occupation in the demand snapshot. Similarly Accounting and Secretarial roles cited as having robust demand, e.g., Business Accounting (CCBC), Office Administration (CCBC), Accounting (BCCC), and Office Administration (CCBC), are linked to programs with anemic rates of completion.

And we see again, here, a number of short, low-cost, non-credit programs, most associated with industry credentials, which we can say little about owing to having no enrollment or completion data, and, thus, no ability to track changes in earnings. Credentials are associated with the credit certificate programs in information technology and with four out of five of the non-credit program.

⁴⁵ This report covers a ten-year period that ended in 2012. In 2014, BCCC received approval to offer a new program in Cyber Security and Assurance, which is associated with the best prospect career shown above as Information Security Analysis. J.Reichenberg, Comments on Draft (December 2014).

⁴⁶ Opportunity Collaborative, p. 24. Two other Maryland colleges also have this designation: Anne Arundel Community College and Harford Community College.

FIGURE 10. PROFESSIONAL, BUSINESS & INFO. SERVICES SUPPLY⁴⁷



⁴⁷ All data on enrollment is from MHEC, *Trends in Enrollment by Program* (1999-2012), data on degrees and certificates awarded is from MHEC, *Trends in Degrees and Certificates Awarded* (1999-2012), and data on earnings was compiled by the Jacob France Institute.

3. Professional, Business and Information Services Demand/Supply Summary

TABLE 10. PROFESSIONAL, BUSINESS AND INFORMATION SERVICES TAKEAWAYS

Demand

Best Prospect Occupations	18
Best Prospects by Tier	Tier 1: 9 (50%) Tier 2: 9 (50%)
Med. Annual Wages	18 (100%) ≥ \$34,000 13 (72%) ≥ \$44,000
Special Characteristics of Best Prospects	CP: 3 (17%) GE: 3 (17%) NE: 3 (17%)

Supply

Programs Aligned with Best Prospects	Number: 31 Institution: BCCC: 7 (23%); CCBC: 24 (77%) Type: Credit: 26 (84%); Non-credit: 5 (16%)
Best Prospects without Programs	2 occupations: <ul style="list-style-type: none"> Maintenance & Repair Worker (Tier 1) Life, Physical and Social Science Technicians, All Other (Tier 2)
Cancelled Programs Aligned with Best Prospects	BCCC <ul style="list-style-type: none"> Web Developer Certificate Network Specialist Certificate CCBC <ul style="list-style-type: none"> Biomanufacturing & Biotech Degree
Program Outcomes	<ul style="list-style-type: none"> Enrollment and completion outcomes tend to be much lower for certificate than for degree programs Earnings gains are modest
Special Characteristics of Aligned Programs	8 (44%) have associated credentials

F. Trade, Transportation and Utilities

The Trade, Transportation and Utilities industry is an important focus for Baltimore. The expansion of the Panama Canal is projected to increase containerized cargo activity at East Coast ports by 20-25 percent once complete, and to add up to 138 new jobs at the port of Baltimore.⁴⁸ Baltimore, as an inland port, is viewed as having advantages over other ports because of its channel depth, existing infrastructure, nearby land available for warehousing, and proximity to areas of higher population density in the nation.⁴⁹ These benefits rely on the completion of the Baltimore-Washington Rail Intermodal Facility, which is expected to generate new jobs for 45 direct onsite workers and support 192 direct outside drayage contractors to accommodate the increase in cargo activity.⁵⁰

The Opportunity Collaborative study suggests that the sector will add 3,300 new jobs between 2012 and 2020, with larger job growth if the Intermodal Facility comes on line.⁵¹

1. Demand - Best Prospect Careers in Trade, Transportation and Utilities

There are 17 jobs in Trade, Transportation and Utilities that are rated as “best prospects” (Table 11). Noteworthy is the fact that all of these occupations require less than an Associate’s degree for entry.

In these fields, lower education minimums do not necessarily correlate with reduced salaries. Fourteen of 17 of the best prospects have median annual salaries at or above \$34,000, and 53% have median annual salaries at or above \$44,000.

TABLE 11. "BEST PROSPECTS" IN TRADE, TRANSPORTATION & UTILITIES

Tier 1: Strong Demand, Modest Educational Requirements for Entry

Automotive Service Technicians*
Bus & Truck Mechanics and Diesel Engine Specialists
Customer Service Representatives*
Dispatcher
First-line Supervisors, of Helpers, Laborers, and Material Movers, Hand
First-line Supervisors/Managers of Transportation & Material Moving Machine & Vehicle Operators
Heating, Air Conditioning, & Refrigeration Mechanics & Installers*
Industrial Truck & Tractor Operators*
Laborers, & Freight, Stock, & Material Movers Hand*
Production, Planning & Expediting Clerks
Shipping, Receiving & Traffic Clerks*

⁴⁸ Regional Economic Studies Institute, *Economic and Fiscal Impacts of the Panama Canal Expansion on the Port of Baltimore* (n.d.), p. 4-5.

⁴⁹ Ibid., p. 4.

⁵⁰ Ibid., p. 5

⁵¹ Ibid.

Transportation, Storage & Distribution Managers
Truck Drivers, Heavy & Tractor-Trailer*
Truck Drivers, Light Truck or Delivery Services Drivers*
Wholesale & Retail Buyers
Tier 3: Lower Demand, Other Redeeming Qualities
Aircraft Mechanics & Service Technicians
Cargo & Freight Agents

****Indicates programs with the strongest current and projected demand.***

Among the occupations listed in Table 11, demand is strongest for Automotive Service Technicians, Customer Service Representatives, Heating, Air Conditioning and Refrigeration Mechanics and Installers and Freight, Stock, and Materials Movers Hand, Shipping, Receiving and Traffic Clerks, Truck Drivers, Heavy and Tractor Trailer, and Truck Drivers, Light Truck or Delivery Service Drivers. The Tier 3 occupations, Aircraft Mechanic and Cargo and Freight Agent, landed there because, as is evident in Figure 11, demand for them is relatively low. They have strong median salaries and have been dubbed “next economy” careers, as having “career pathways potential,” or both and these factors elevated them to the list of best prospects.⁵²

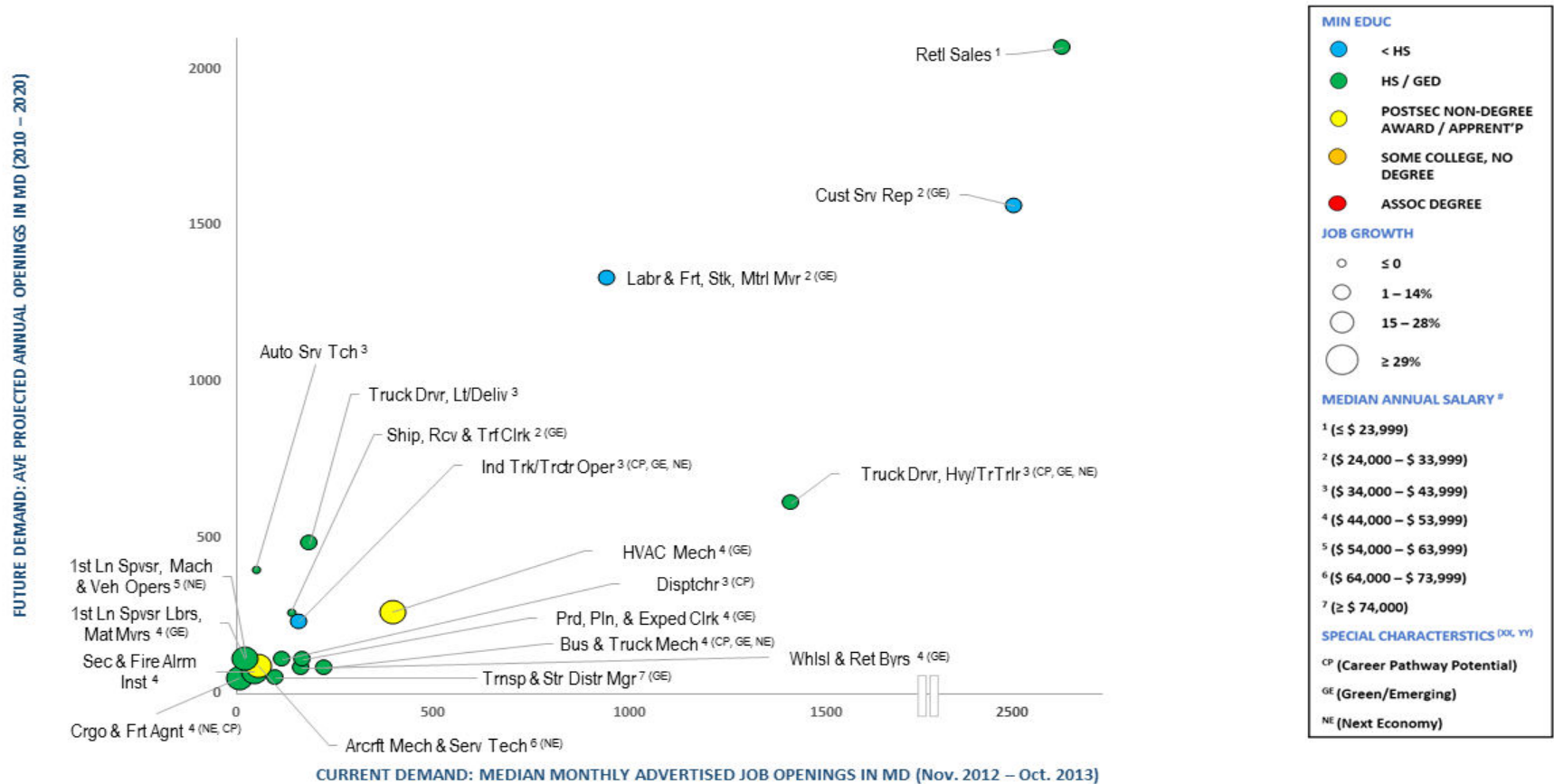
The demand snapshot for the Trade, Transportation and Utilities Industry is shown below in Figure 11. Only two occupations, Retail Sales⁵³ and Security and Fire Alarm Installer, did not make the list; the former because of an extremely low median salary in spite of extremely robust demand, and the latter because of low demand.

⁵² Only two occupations shown in figure 11, Retail Sales⁵³ and Security and Fire Alarm Installer did not make the list; Retail Sales due to an extremely low median salary in spite of extremely robust demand, and Security Installer because of low demand.

⁵³ The single largest low-wage occupation in the U.S. is retail sales, with 4.3 million workers in 2005, half of whom earned less than \$9.20 per hour. Boushey, p. 13.

FIGURE 11. TRADE, TRANSPORTATION & UTILITIES DEMAND ⁵⁴

TRADE, TRANSPORTATION & UTILITIES DEMAND SNAPSHOT



⁵⁴ Sources: Future demand, median salary, min. educ., projected job growth, green/emerging characteristics taken from occupational profile data for Maryland, America's Career InfoNet, www.careerinfonet.org; Current demand data taken from Maryland Workforce Exchange, <https://mwejobs.maryland.gov/vosnet/Default.aspx>; Career pathway potential taken from Opportunity Collaborative, [Baltimore Regional Pipeline Development Study](#) (Oct. 2013); Next economy characteristics taken from J.Vey, [Building from Strength: Creating Opportunity in Baltimore's Next Economy](#) (Brookings Institution, 2012).

2. Supply – Programs & Outcomes in Trade, Transportation and Utilities

Program availability: Only 9 of the 17 best prospect occupations in Trade and Transportation were associated with one or more programs at BCCC and/or CCBC as of the end of 2012. In 2014, CCBC added a non-credit Diesel and Equipment Maintenance Technician (Bus and Truck Mechanic) Program, after canceling a credit degree program of the same name owing to low enrollment, a lack of on-campus space, and low projected occupational growth in 2011. Among the 20 programs in figure 12, 14 are credit and six non-credit. Ninety-five percent of the programs are at CCBC, with just one, Business Management, at BCCC.

All of the automotive certificate programs are associated with credentials, as are two of the non-credit programs. The auto certificate and degree programs are also labeled as “statewide.” Finally, completion of the non-credit machinist apprenticeship program at CCBC leads to articulation of credits toward a credit Machinist certificate.

The occupations in table 12 that are not associated with a program at either college include Shipping, Receiving and Traffic Clerk, Industrial Truck/Tractor Operator, Dispatcher,⁵⁵ Wholesale and Retail Buyers, Aircraft Mechanic and Service Technician, Labor and Freight, Stock and Materials Movers, Bus and Truck Mechanic, and Cargo and Freight Agent.⁵⁶

Enrollment, Completion and Wage Outcomes: The higher enrollment and completion outcomes are associated with more expensive, more time- intensive degree programs (e.g., Automotive Tech and Business Management), most demonstrating modest earnings gains. There are also a number of less time-intensive, lower cost, largely non-credit options, several of which are associated with industry credentials, which we can say little about owing to having no enrollment or completion data, and, thus, no ability to track changes in earnings.

The strong market demand for Truck Drivers, Customer Service Representatives, HVAC Mechanics, Automotive Service Techs, Shipping and Receiving Clerks and Industrial Truck/Tractor Operators is not matched by program enrollment and outcomes in these sectors (figure 12). In addition, many of these occupations are associated with industry credentials that mean higher earnings for successful completers, a fact that makes low numbers of enrollees and completers all the more puzzling.

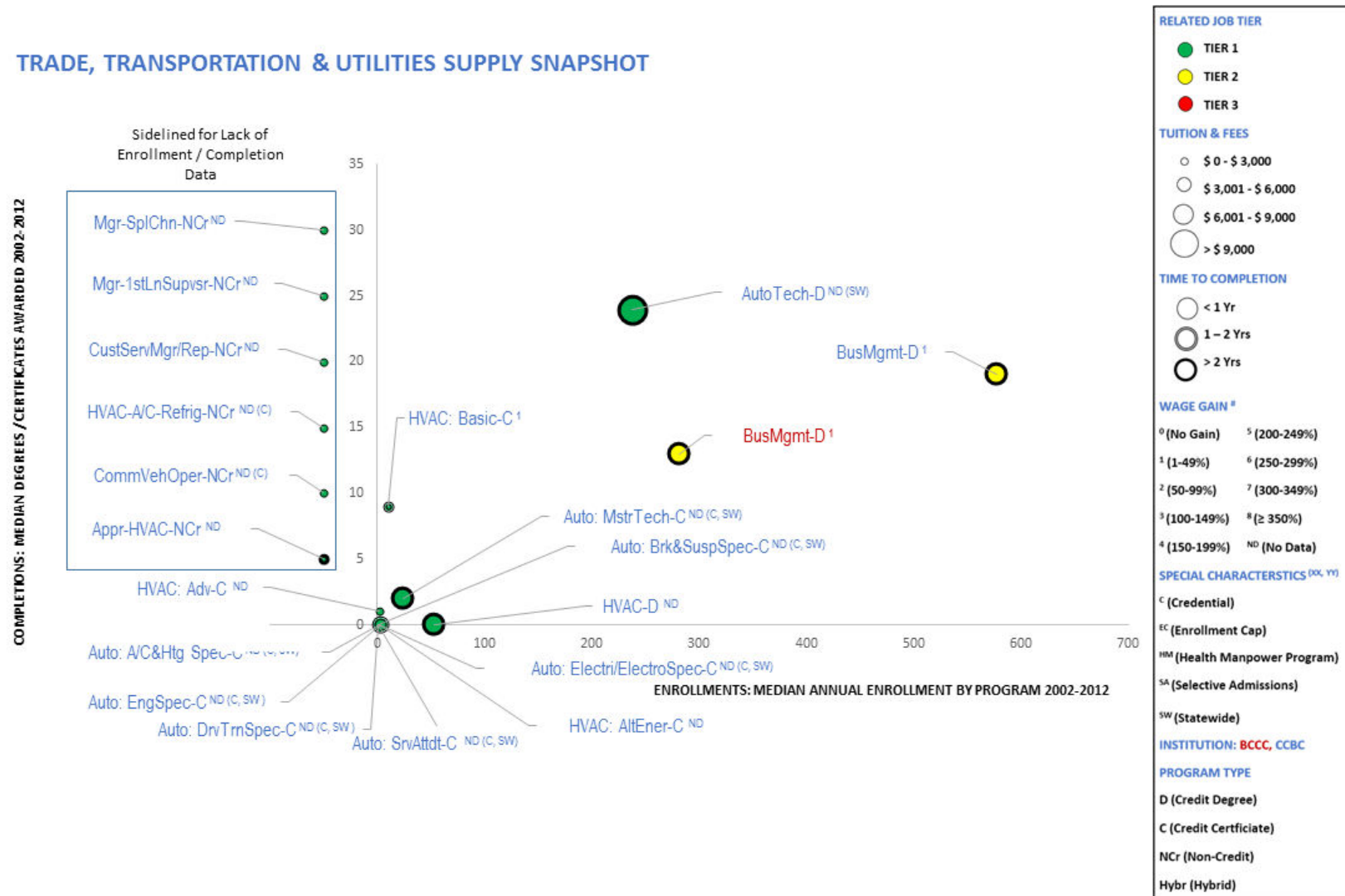
While outcomes for the Automotive Degree Program are strong, the same cannot be said for the certificate programs, all which hold the “Statewide” designation. Further, for the reasons noted above, we have no data with which to formulate a comment about outcomes for the Commercial Vehicle Operator or Customer Service programs.

⁵⁵ In a Transportation, Distribution and Logistics Career Pathway, Dispatchers are one step above CDL Class A Truck Drivers and are trained in AAS Programs in Logistics. Ivy Tech Community College, Transportation, Distribution and Logistics Career Pathway (Available at: <http://www.ivytech.edu/transportation-distrib-logistics-institute/tcl-pathway.html>). CCBC includes this training as part of a non-credit Warehouse Technician Training program that is offered to students with learning differences or disabilities .

⁵⁶ In a Logistics and Inventory Control Pathway, Shipping, Receiving, and Traffic Clerks, along with Labor and Freight, Stock and Materials Movers, are arguably positions for which training could take place in a high school CTE pathway and be articulated to a community college program in Logistics and Inventory Control. See, e.g. iseek careers: Minnesota's career, education and job resource, *Logistics and Inventory Control Pathway*. (Available at <http://www.iseek.org/careers/logistics-inventory-control-pathway.html>).

FIGURE 12. TRADE, TRANSPORTATION & UTILITIES SUPPLY⁵⁷

TRADE, TRANSPORTATION & UTILITIES SUPPLY SNAPSHOT



⁵⁷ All data on enrollment is from MHEC, *Trends in Enrollment by Program* (1999-2012), data on degrees and certificates awarded is from MHEC, *Trends in Degrees and Certificates Awarded* (1999-2012), and data on earnings was compiled by the Jacob France Institute.

3. Trade, Transportation and Utilities Demand/Supply Summary

TABLE 12. TRADE, TRANSPORTATION AND UTILITIES TAKEAWAYS

Demand

Best Prospect Occupations	17
Best Prospects by Tier	Tier 1: 15 (88%) Tier 3: 2 (12%)
Med. Annual Wages	14 (83%) ≥ \$34,000 8 (47%) ≥ \$44,000
Special Characteristics of Best Prospects	CP: 5 (29%) GE: 11 (65%) NE: 3 (35%)

Supply

Programs Aligned with Best Prospects	Number: 20 Institution: BCCC: 1 (5%); CCBC: 19 (95%) Type: Credit: 14 (70%); Non-credit: 6 (30%)
Best Prospects without Programs	8 occupations: <ul style="list-style-type: none"> • Shipping, Receiving and Traffic Clerk • Industrial Truck/Tractor Operator • Dispatcher • Wholesale and Retail Buyers, • Aircraft Mechanic and Service Technician • Labor and Freight, Stock and Materials Movers • Bus and Truck Mechanic⁵⁸ • Cargo and Freight Agent
Cancelled Programs Aligned with Best Prospects	CCBC: Diesel Equipment Maintenance Technology Degree
Program Outcomes	<ul style="list-style-type: none"> • The vast majority are credit, where enrollment and completion outcomes tend to be much lower for certificate programs than for degree programs. • Where data was available, earnings gains were modest
Special Characteristics of Aligned Programs	9 (45%) have associated credentials 8 (40%) statewide

⁵⁸ CCBC added a non-credit program in 2014.