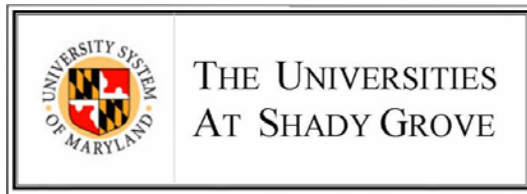




Follow the Data: A Collaborative Approach to Planning for Academic Programs to Meet Workforce Demands

Presented at the 2006 AIR Forum, Chicago, IL

Authors: Michelle Appel, Patrick Arnold, John Dobrosielski,
Jeffrey Gabriel, Mary Lang and Bob Lynch



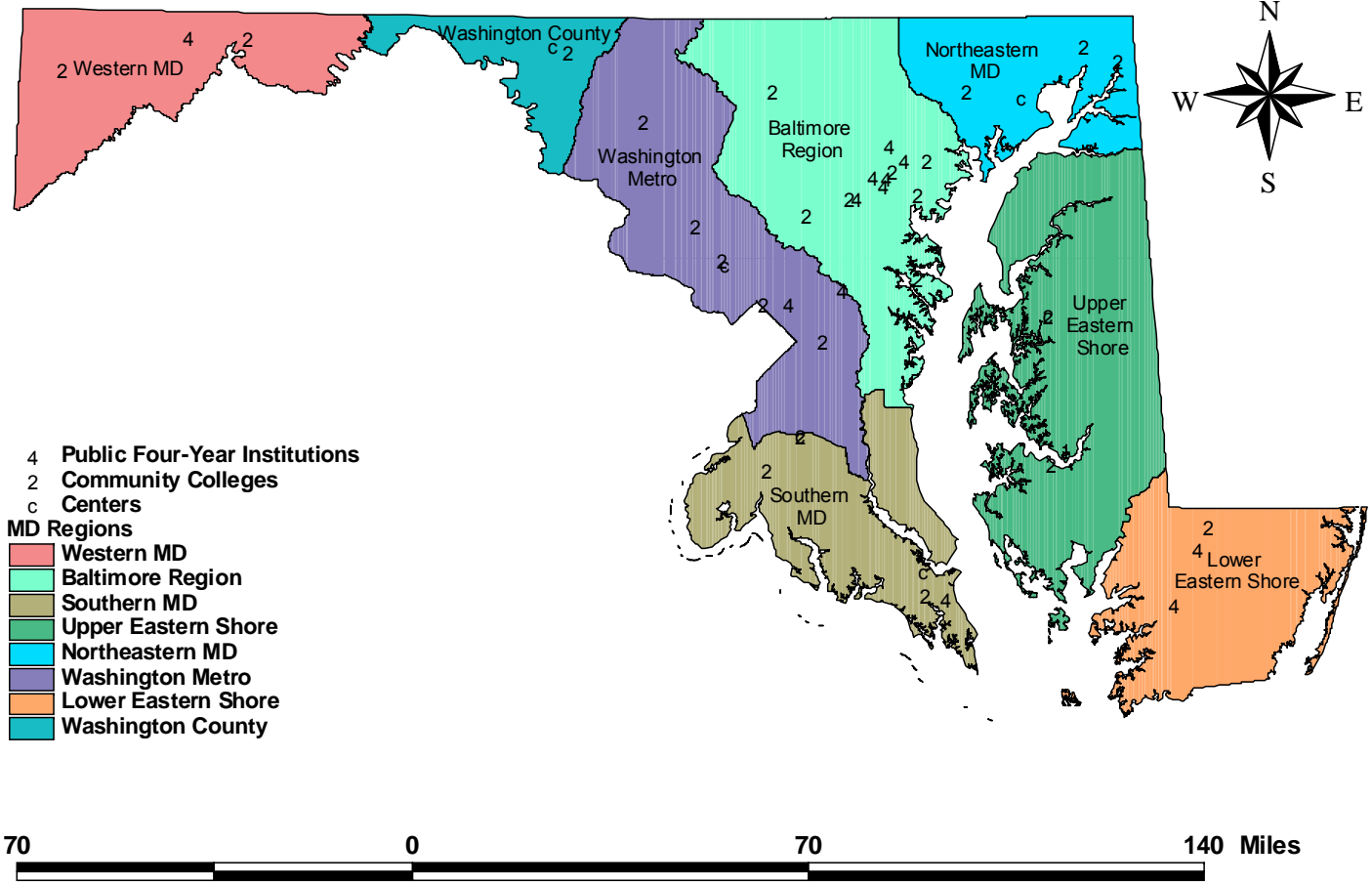
DEPARTMENT OF LABOR, LICENSING & REGULATION

USG Offers 30+ Degree Programs from 8 Public Universities in MD

- ❖ Bowie State University
- ❖ Towson University
- ❖ University of Baltimore
- ❖ University of Maryland, Baltimore
- ❖ University of Maryland, Baltimore County
- ❖ University of Maryland, College Park
- ❖ University of Maryland Eastern Shore
- ❖ University of Maryland University College



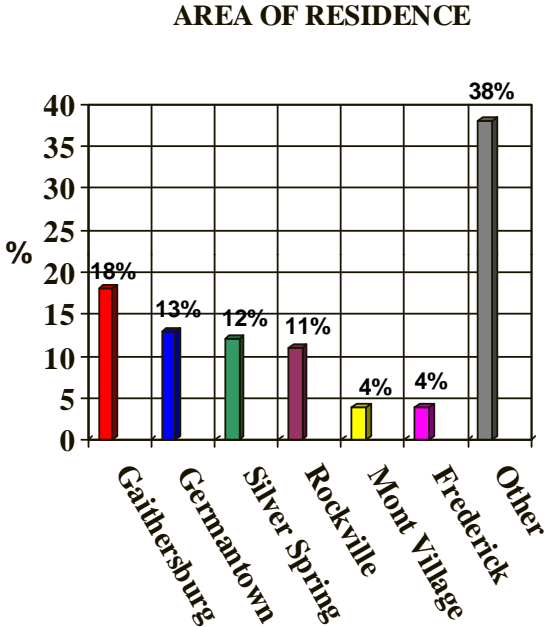
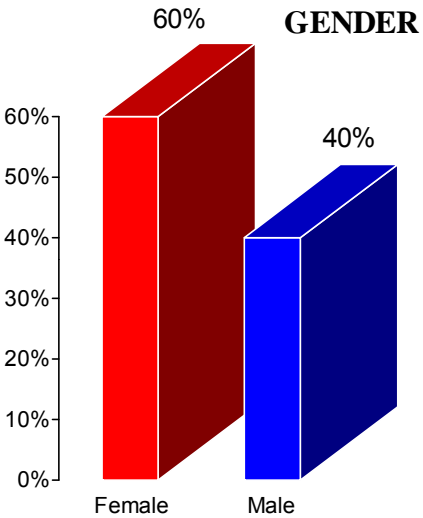
Map A: Public Four-Year Institutions, Community Colleges, and Centers by Maryland Regions



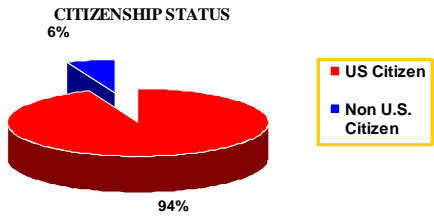
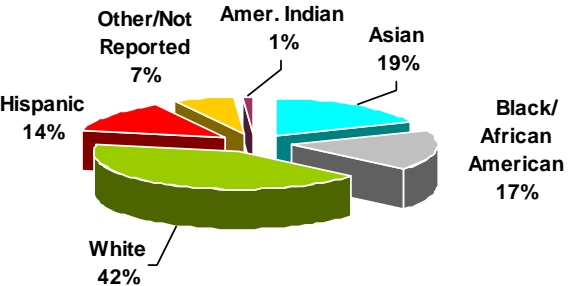
Source: USM/MACC Capacity Workgroup Report, November 2003



USG Students Are Diverse - 2005




ETHNICITY



USG is growing




- ❖ SGIII:
 - Will triple current student capacity
 - Will open for classes Fall 2007
- ❖ USG formed planning group composed of partner institutions and community businesses to address growth. Planning group asked USG to organize a data workgroup to support its strategic planning effort.
- ❖ USG data work group was asked to determine whether or not an analytic effort could be forged among regional demographic workforce and education institutions that could inform academic program planning.

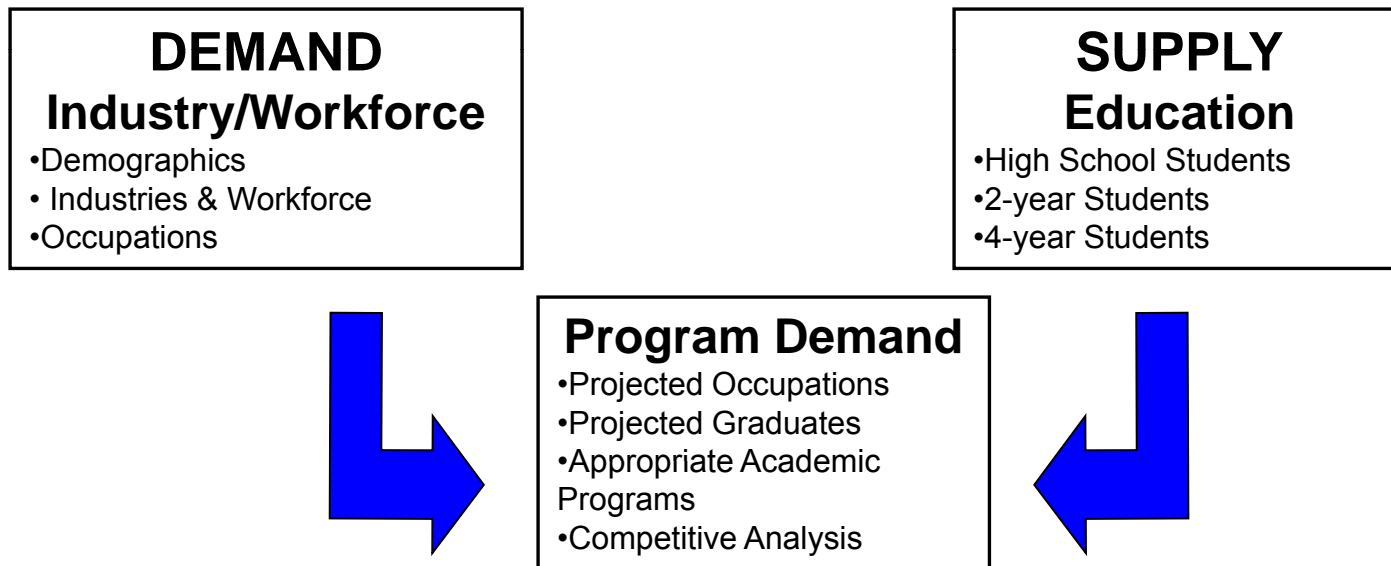


Development of an academic program planning framework is based on regional collaboration

- ❖ Maryland Department Labor and Licensing Regulations
- ❖ Maryland Workforce Investment Board
- ❖ Jacob France Institute – Market-Responsive Education and Employment Training System (MEETS), University of Baltimore
- ❖ University of Maryland, College Park Office of Institutional Research and Planning
- ❖ Montgomery College Office of Institutional Research and Analysis
- ❖ Montgomery County Public Schools
- ❖ Universities at Shady Grove



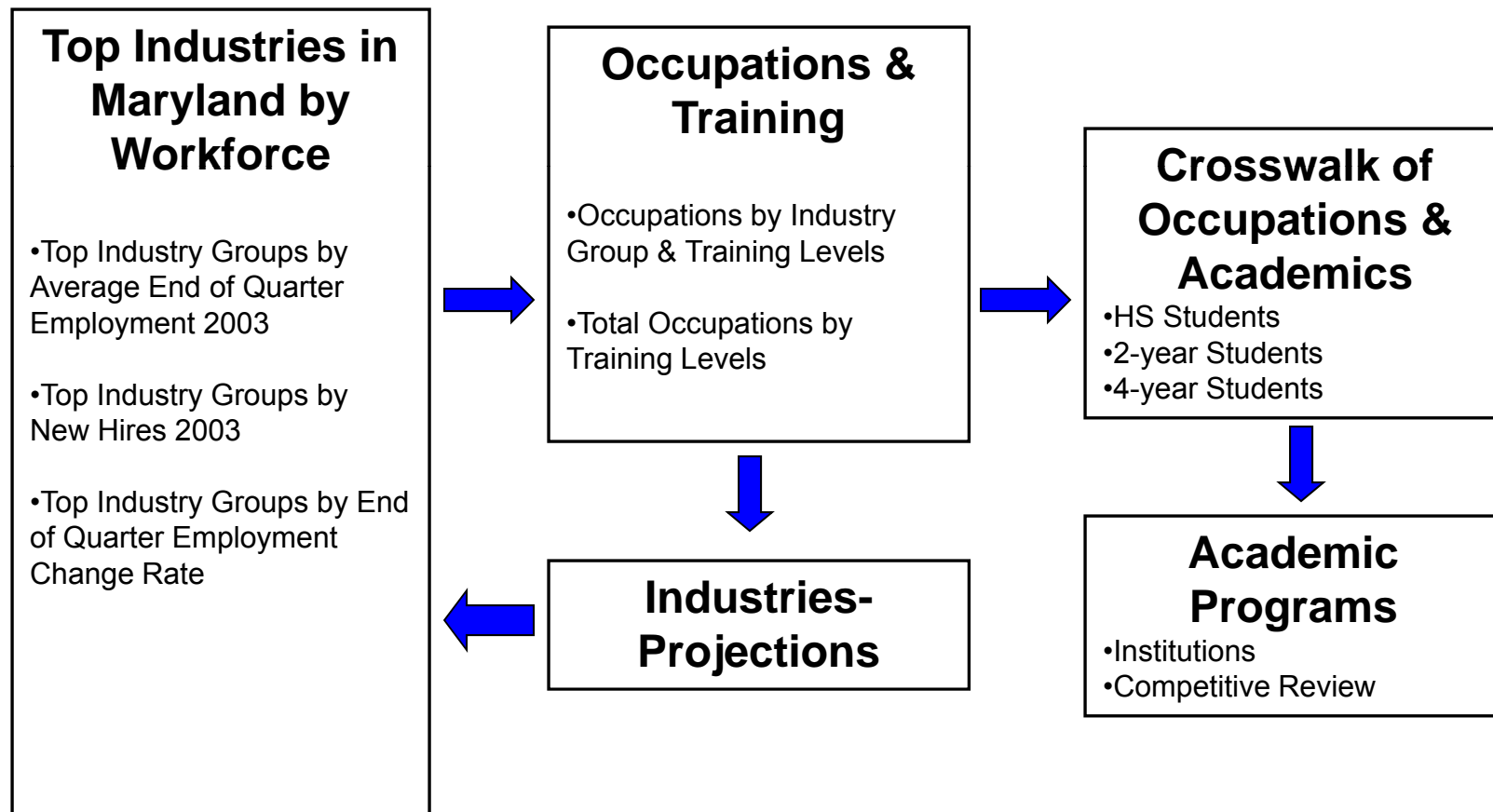
What is the demand for workers?
What education do those workers require?

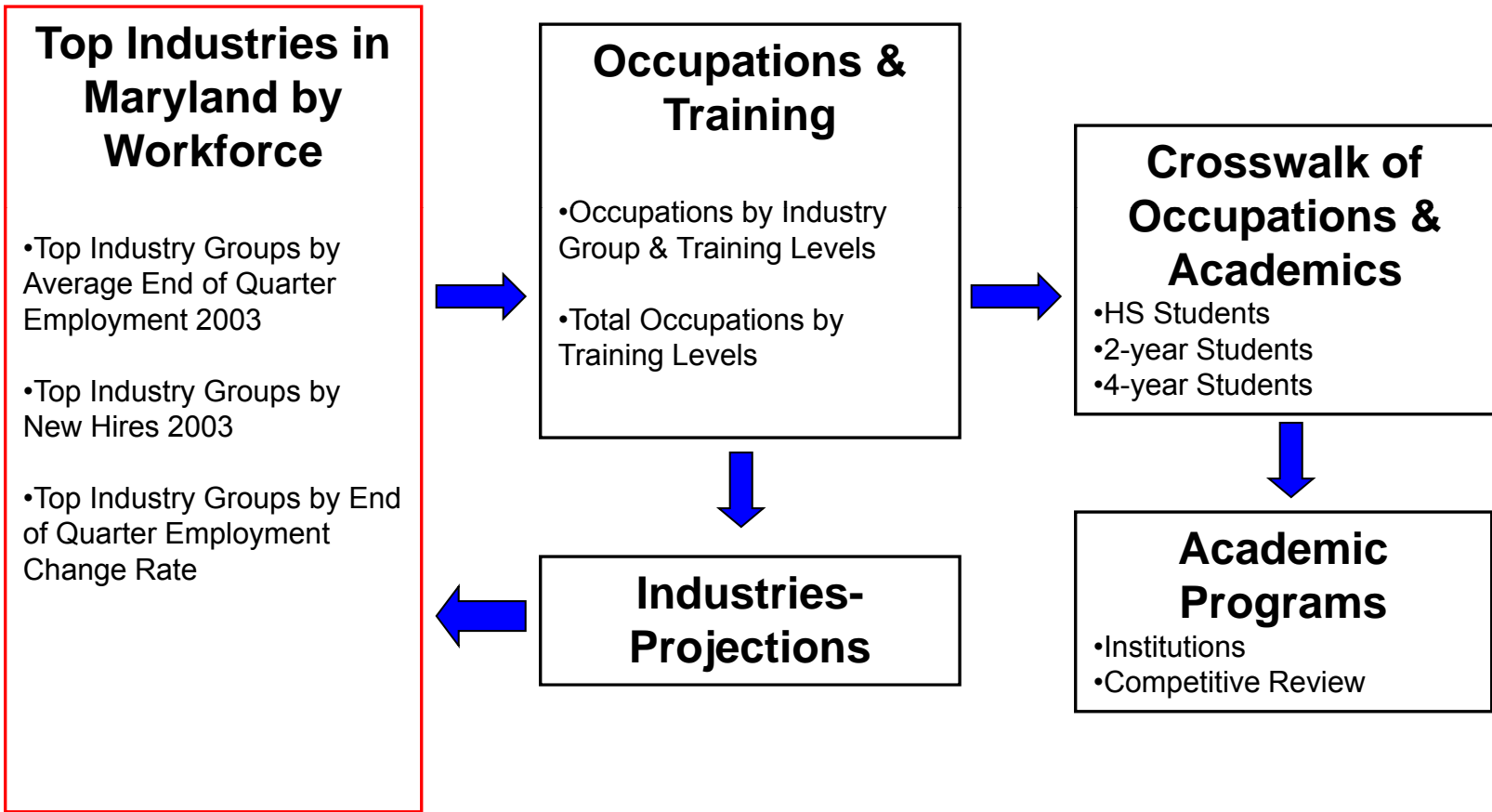


State, Region, Montgomery County



Demand Estimates for Occupations & Training





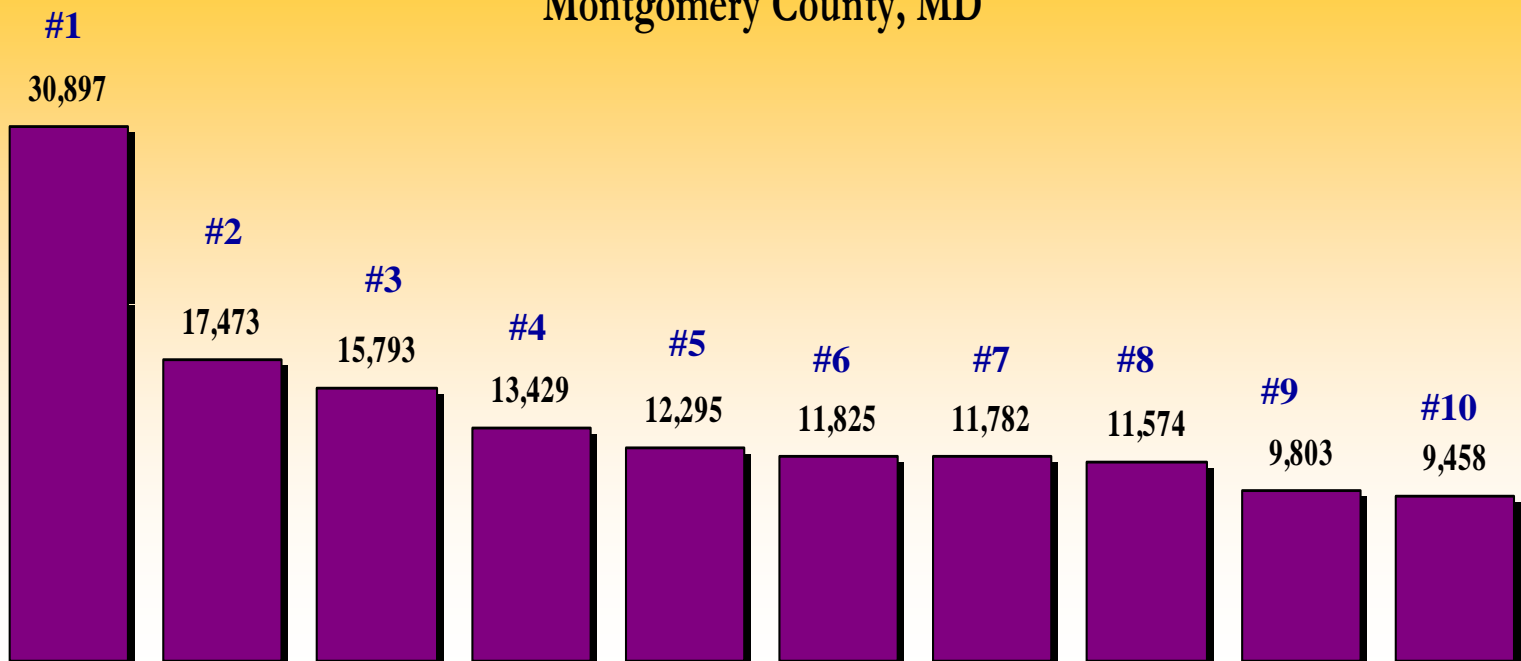


Industry Data Methodology

- ❖ Use Local Employment Dynamics (LED) program <http://lehd.dsd.census.gov> to show industry employment and hiring patterns
- ❖ Data run for all NAICS (North American Industry Classification System)- coded Industry Groups (4-digit level)
- ❖ Data run at single-county, 5-county service region, and state levels
- ❖ Top 10 Industry Groups in each measure are identified for Montgomery County, then compared to standing in service region and Maryland



Top Ten Industry Groups by Average Quarterly Employment Montgomery County, MD



Elementary & Secondary Schools.	Computer Sys. Design & Related Services	Scientific Research & Development Services	General Medical & Surgical Hospitals	Services to Buildings & Dwellings	Full-Service Restaurants	Executive, Legislative & General Government	Limited-service Eating Places	Grocery Stores	Employment Services
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#1	#2	#10	#8	#9	#3	#4	#5	#7	#11
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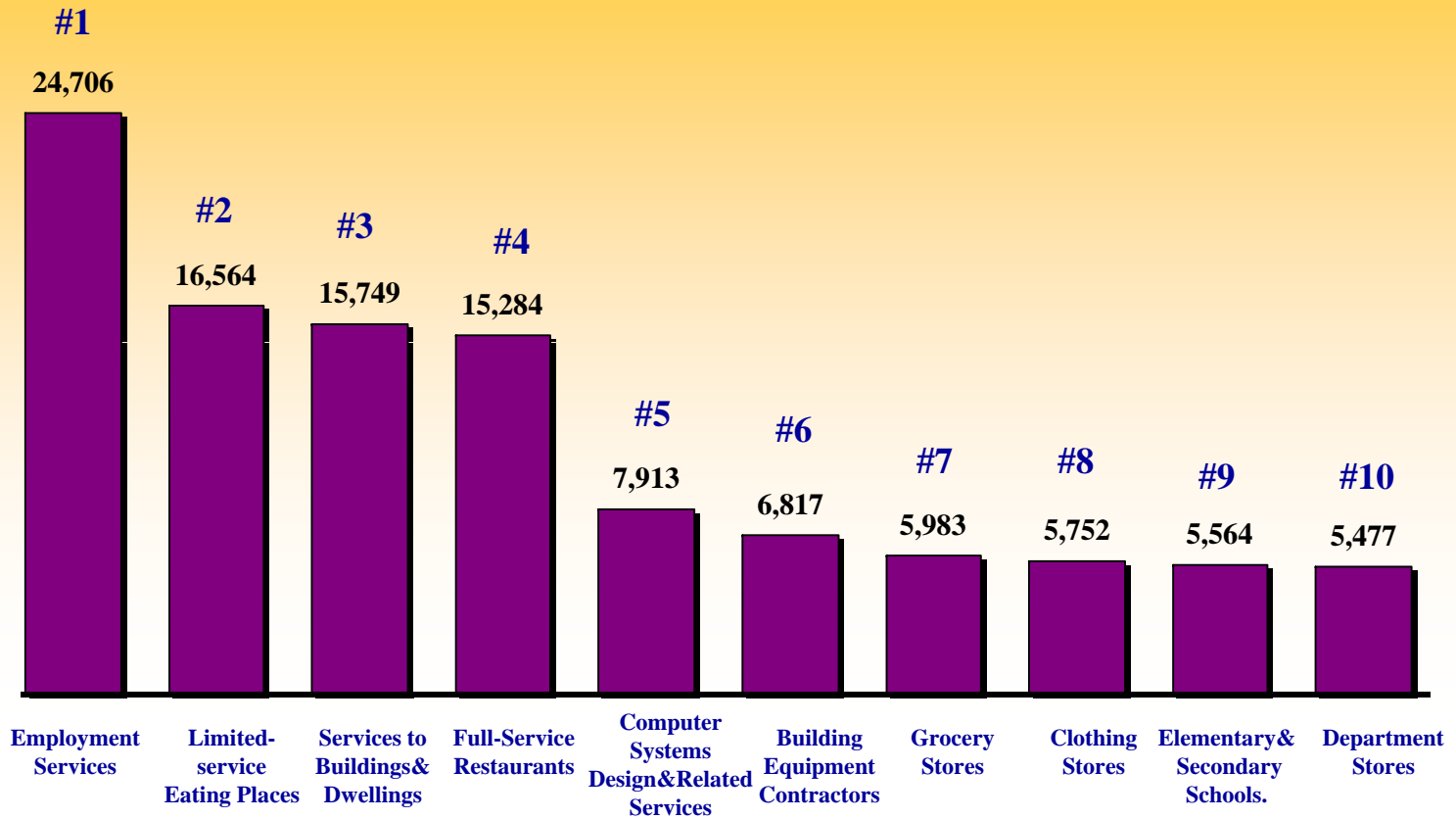
Service Region	64,657	32,404	20,009	23,902	22,407	31,049	28,410	27,724	2,5201	17,899
----------------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------

#1	#9	#16	#2	#11	#3	#5	#4	#7	#10
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Maryland	144,052	50,621	29,388	73,181	42,462	72,533	64,622	66,818	54,276	45,215
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Top Ten Industry Groups by New Hires, 2003- Montgomery County, MD

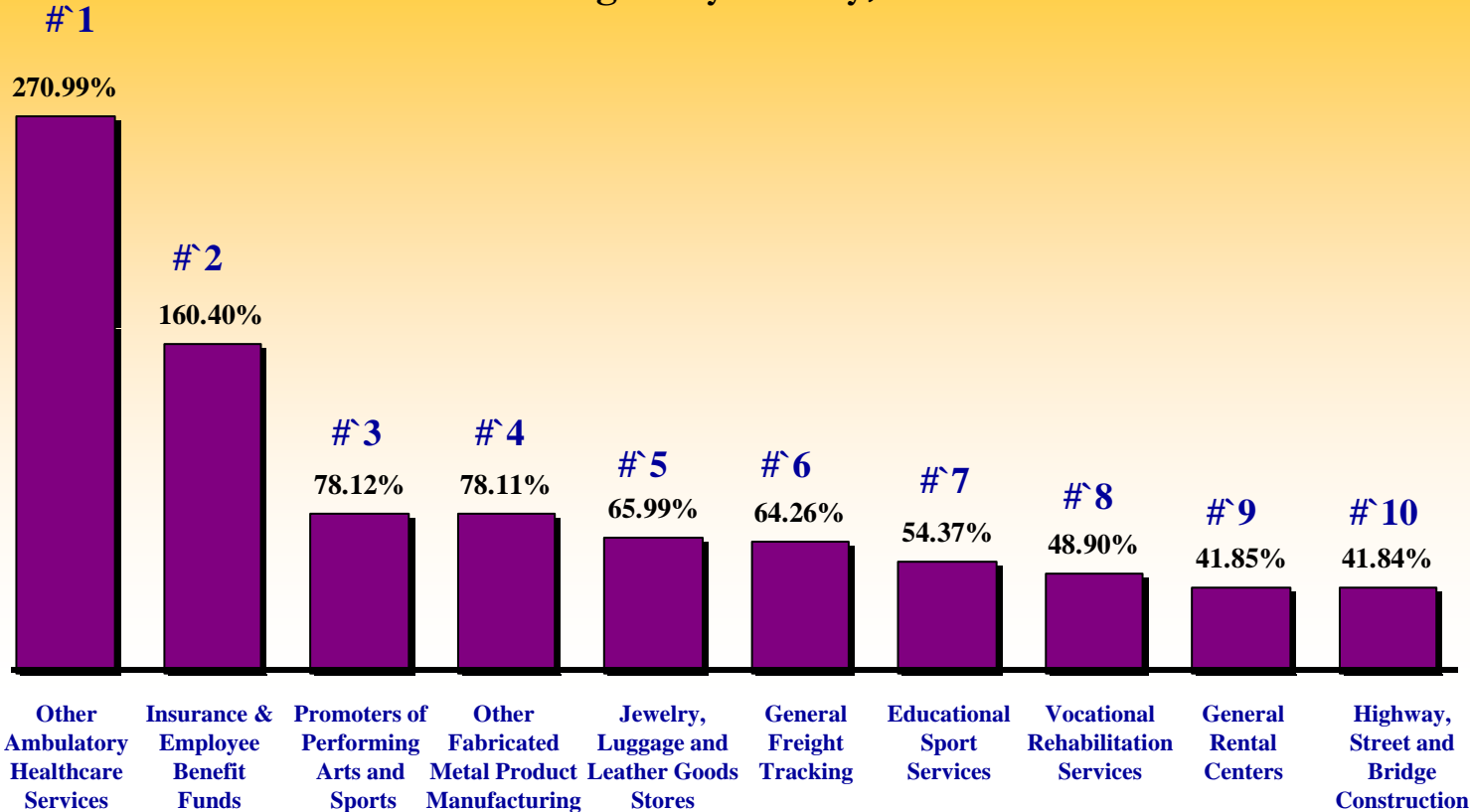


#1 #3 #4 #2 #7 #5 #6 #10 #9 #8

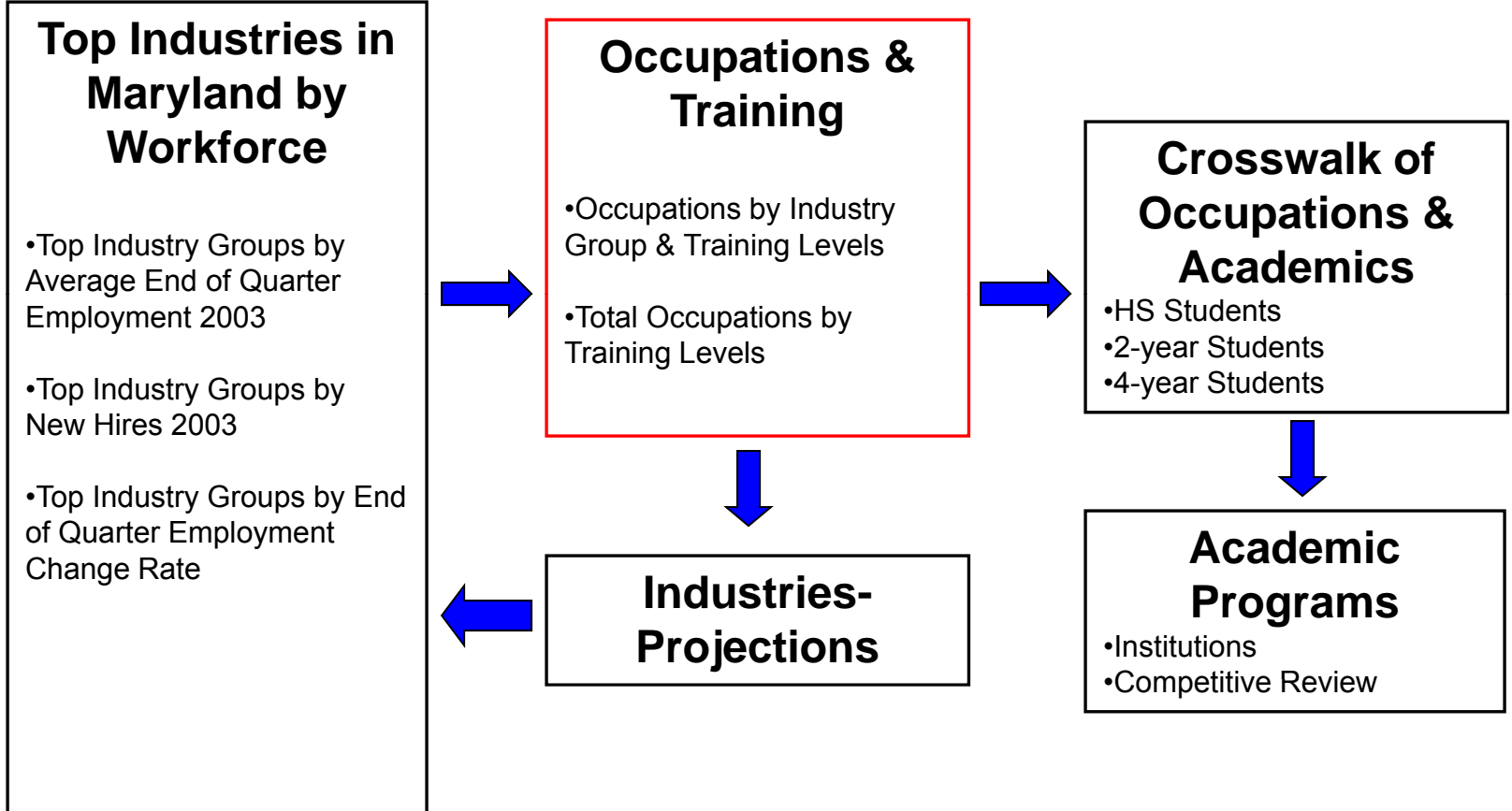
Service Region	46,230	43,030	28,776	44,133	15,308	21,196	16,742	14,812	14,830	15,085
	#1	#2	#4	#3	#12	#6	#5	#9	#8	#7
Maryland	131,859	108,915	56,195	105,609	24,022	40,623	41,763	30,568	33,112	36,166



Top Ten Industry Groups by Employment Change Rate Montgomery County, MD



	#20	#15	#26	#222	#25	#42	#17	#204	#18	#52
Service Region	41.11%	47.49%	29.61%	-17.73%	30.60%	17.47%	42.18%	-11.74%	41.62%	12.61%
	#86	#7	#191	#244	#98	#127	#24	#151	#299	#15
Maryland	5.24%	39.96%	-1.90%	-6.43%	4.48%	2.35%	17.46%	0.77%	-82.80%	23%





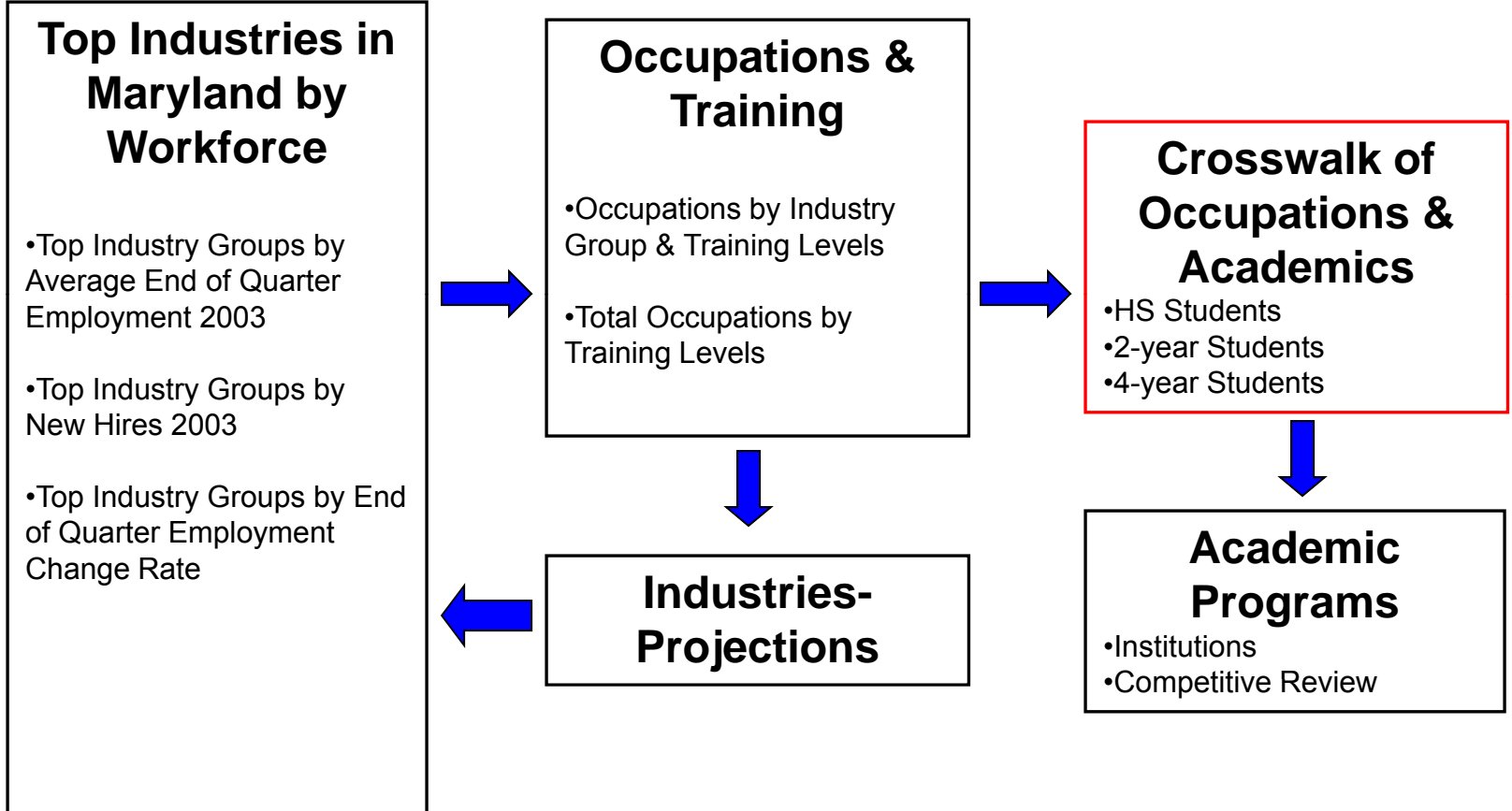
Getting to the Occupational Level and Beyond


- ❖ Occupational Employment Statistics (OES) employer survey used to identify the occupational staffing patterns and occupational content of each selected Industry Group by NAICS code
- ❖ Industry and occupational projections provide a picture of expected demand in the future
- ❖ Replacement and growth openings both important
- ❖ Filtering occupations by training requirements identifies occupations upon which colleges/universities can have impact

Illustrative Projected Occupations Requiring Bachelors Degrees Within A Specific Industry Group for 2012

5417 Scientific R&D Services	2002 Maryland Employment	Growth (2002-2012)	Replacement	Total Add'l 2012
Management Occupations	1,485	220	236	456
General & Operations	364	53	53	106
Business & Financial Occupations	806	120	127	247
Computer & Mathematical	3,513	515	207	722
Computer & Software Engineers, Applications	836	123	38	161
Computer Software Engineers , Systems Software	719	106	33	139
Computer System Analysts	588	86	40	126
Computer Specialists, all Other	801	118	50	168
Life, Physical & Social Sciences	3,135	464	806	1,270
Life Scientists, All Other	466	68	141	209
SECTION TOTAL	20,070	2,963	3,171	6,134

SOURCE: Maryland Department of Labor, Licensing & Regulation, 2005





Cross-walking: Occupations to Educational Programs

- ❖ Linked occupations to academic programs
 - Only occupation codes designated by DLLR as requiring a bachelor's
- ❖ National Center for Educational Services crosswalk translates occupational titles to corresponding CIP codes
 - <http://nces.ed.gov/pubs2002/cip2000/index.asp>
- ❖ MD Occ. Titles (BLS standard) → Census 2000 → CIP
 - Keyword search for occupational titles
 - Why didn't we crosswalk directly with the BLS codes?

Input keywords
for a given
occupation

CIP 2000 - Occupational Crosswalks
Keyword Search

computer and or network and or administrator
2000 Census Classification GO Clear page

Instructions:
Enter the terms you wish to search on. By default the search returns only whole word matches. If you wish to search on partial word, simply place an asterisk (*) at the beginning or the end of the word you wish to use as a root.

CENSUS2K Occupation Title	CENSUS2K Code	CIP Code	CIP 2000 Title
110 Network & Computer Systems Administrators		11.0101	Computer & Information Sciences, General
110 Network & Computer Systems Administrators		11.0401	Information Science/Studies
110 Network & Computer Systems Administrators		11.0501	Computer Systems Analysis/Analyst
110 Network & Computer Systems Administrators		11.0901	Computer Systems Networking & Telecommunications (New)
110 Network & Computer Systems Administrators		11.1001	System Administration/Administrator (New)
110 Network & Computer Systems Administrators		11.1002	System, Networking, & LAN/WAN Management/Manager (New)
110 Network & Computer Systems Administrators		11.1003	Computer & Information Systems Security (New)
110 Network & Computer Systems Administrators		11.9999	Computer & Information Sciences & Support Services, Other

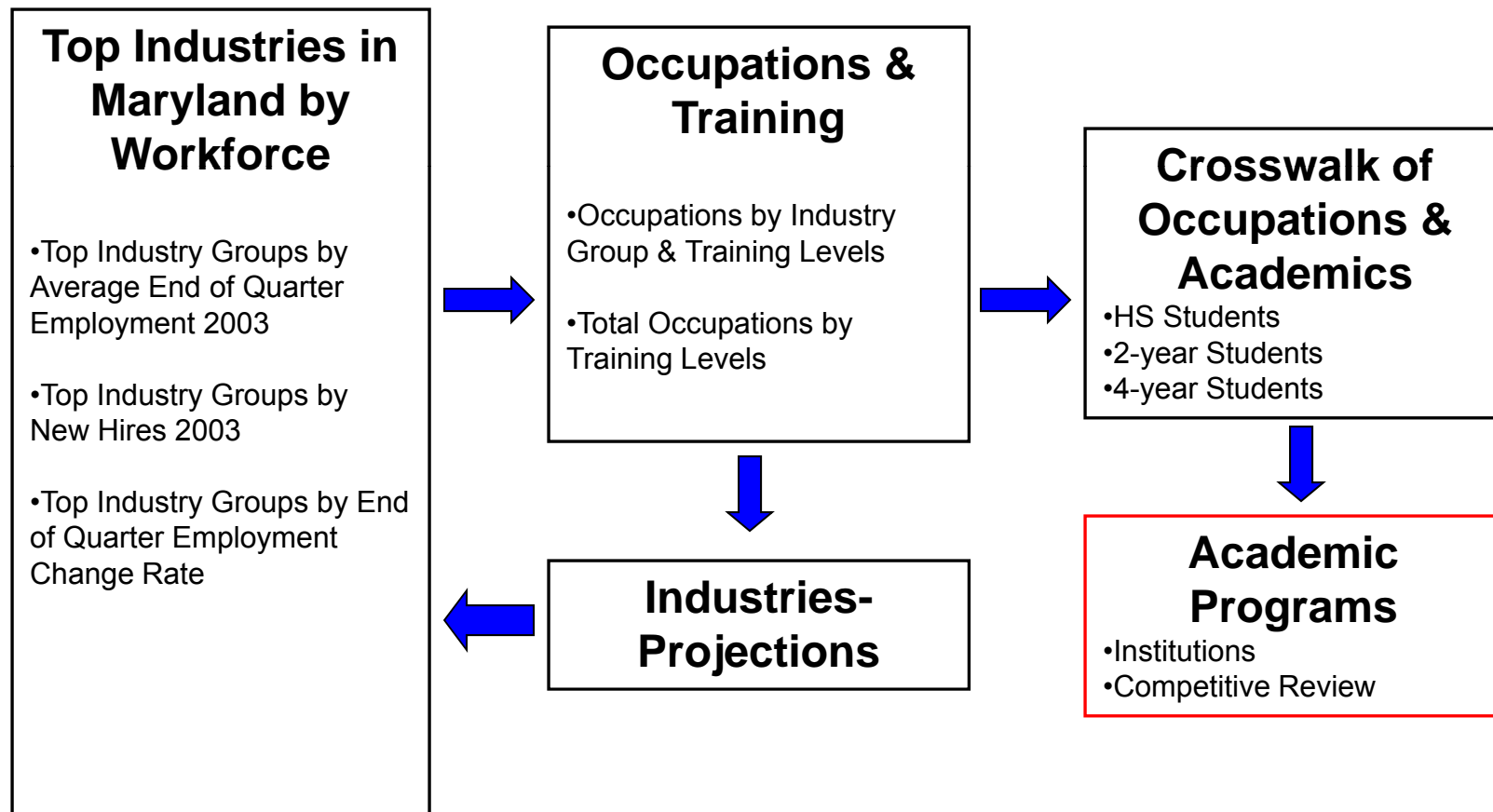
Crosswalk translates
occupation title to
corresponding CIP
codes

Crosswalk

Occupational Title	CENSUS2K Occupational Title	CIP Code	CIP 2000 Title	5-county employ. 2010	Employ. Change	% Employ. Change	Total Openings	
Computer Software Engineers, Applications	Computer Software Engineers	11.0102	Artificial Intelligence & Robotics (New)	8,860	3,910	79%	4,240	
		11.0103	Information Technology (New)					
		11.0401	Information Science/Studies					
		11.0701	Computer Science					
		14.0901	Computer Engineering, General					
Computer Software Engineers, Systems Software			14.0903	Computer Software Engineering (New)	8,680	3,800	78%	4,140
		15.1299	Computer Engineering Technologies/Technicians, Other (New)					
		26.1103	Bioinformatics (New)					
		51.2706	Medical Informatics (New)					
		51.2799	Medical Illustration and Informatics, Other					
Network and Computer Systems Administrators	Network and Computer Systems Administrators	11.0101	Computer & Information Sciences, General	5,230	2,230	74%	2,350	
		11.0401	Information Science/Studies					
		11.0501	Computer Systems Analysis/Analyst					
		11.0901	Computer Systems Networking & Telecommunications (New)					
		11.1001	System Administration/Administrator (New)					
		11.1002	System, Networking, & LAN/WAN Management/Manager (New)					
		11.1003	Computer & Information Systems Security (New)					
		11.9999	Computer & Information Sciences & Support Services, Other					
Preschool Teachers, Except Special Education	Preschool and Kindergarden Teachers	13.1209	Kindergarten/Preschool Education and Teaching (NEW)	560	180	47%	230	
		13.1210	Early Childhood Education & Teaching					
		19.0708	Child Care & Support Services Management (New)					
		13.1210	Early Childhood Education & Teaching					
Personal Financial Advisors	Personal Financial Advisors	52.0801	Finance, General	2,800	880	46%	1,120	
		52.0804	Financial Planning & Services					
Writers and Authors	Writers and Authors	9.0101	Communications Studies/Speech Communication & Rhetoric	2,840	800	39%	1,180	
		9.0102	Mass Communications/Media Studies					
		9.0401	Journalism					
		9.0402	Broadcast Journalism					
		9.9999	Communications, Journalism, & Related Fields, Other					
		19.0202	Family & Consumer Sciences/Human Sciences Communications					
		23.0401	English Composition					
		23.0501	Creative Writing					
		23.1101	Technical & Business Writing					
		50.0504	Playwriting & Screenwriting					
		52.0501	Business/Corporate Communications					



Demand Estimates for Occupations & Training





Trends in completions

- ❖ CIP Codes → Current Demand → Competitors
- ❖ IPEDS Peer Analysis System
 - Bachelor's degree data over the past 5 years (2000-2004)
 - Every institution in the MD/VA/DC area
 - 6 digit CIP level
- ❖ From this data, we identified, by program:
 - Trends in number of degrees awarded
 - Trends in number of institutions granting degrees
 - Major competitors

Trends in completions

CIP Code	CIP 2000 Title	Occupational Title	5-county employ.			Total Openings	Total Bach. Degrees - MD/VA/DC					# of Inst. Granting Degrees - MD/VA/DC				
			2010	Change	% Change		2000	2001	2002	2003	2004	2000	2001	2002	2003	2004
11.0401	Information Science/Studies	Computer and Information Systems Managers	5,840	1,590	37%	2,330	1014	1759	1850	1995	2046	19	21	22	24	26
		Computer Software Engineers, Applications	8,860	3,910	79%	4,240										
		Computer Software Engineers, Systems Software	8,680	3,800	78%	4,140										
		Computer Systems Analysts	14,340	3,910	37%	4,850										
		Network and Computer Systems Administrators	5,230	2,230	74%	2,350										
52.0101	Business/Commerce, General	Chief Executives	6,200	1,160	23%	2,750	1191	1462	1469	1700	1801	14	15	14	15	16
		Administrative Services Managers	1,470	350	31%	530										
		Construction Managers	4,450	1,010	29%	1,610										
		Management Analysts	9,980	2,260	29%	2,990										
52.0201	Business Administration/Management	Chief Executives	6,200	1,160	23%	2,750	3725	4322	4345	4727	5112	54	56	57	61	58
		Administrative Services Managers	1,470	350	31%	530										
		Construction Managers	4,450	1,010	29%	1,610										
		Management Analysts	9,980	2,260	29%	2,990										
52.0801	Finance, General	Financial Managers	8,100	1,620	25%	2,630	1196	1287	1311	1430	1525	18	18	17	17	17
		Personal Financial Advisors	2,800	880	46%	1,120										



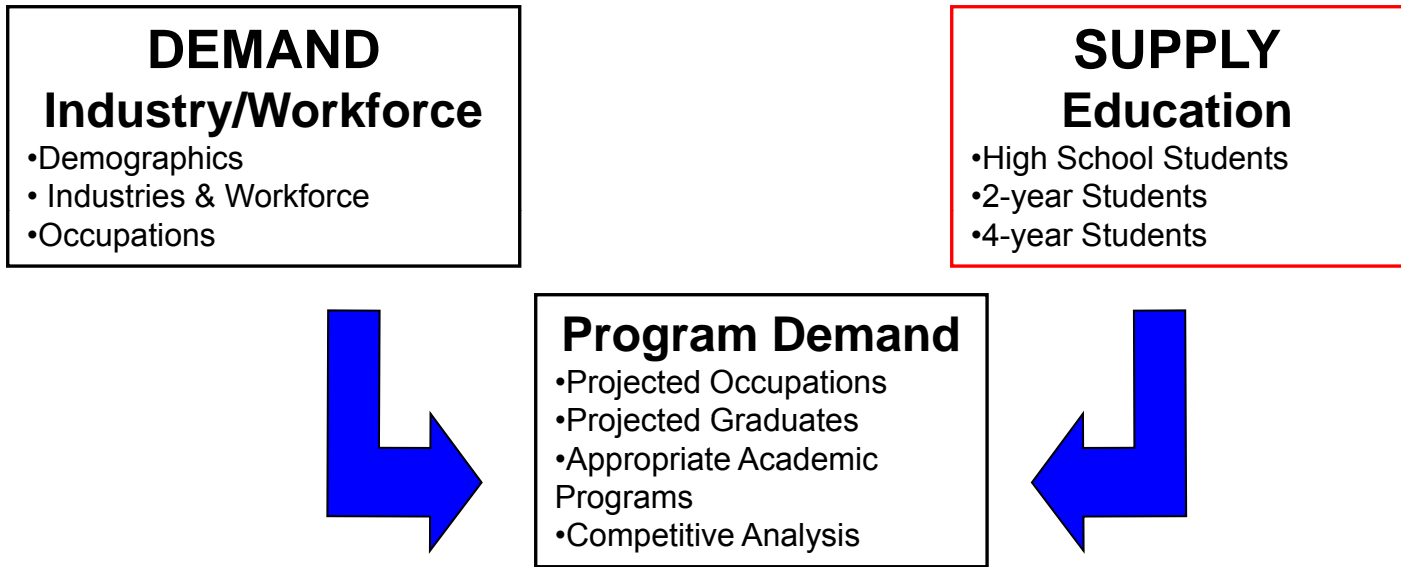
Understanding What's Out There: Program Matrices

- ❖ Identified major competitors
 - Grouped 6-digit CIP degree data by 2 digit CIP category
 - Selected institutions with 3% or more of the graduates
- ❖ Used internet to gather information on competitor programs, organized in program matrix
 - Basic information on programs (number of credits, tuition, admission requirements, etc.)
 - Special areas of primary concern for USG including alternative education offerings (distance ed, evening-only courses, etc.) and transfer student policies



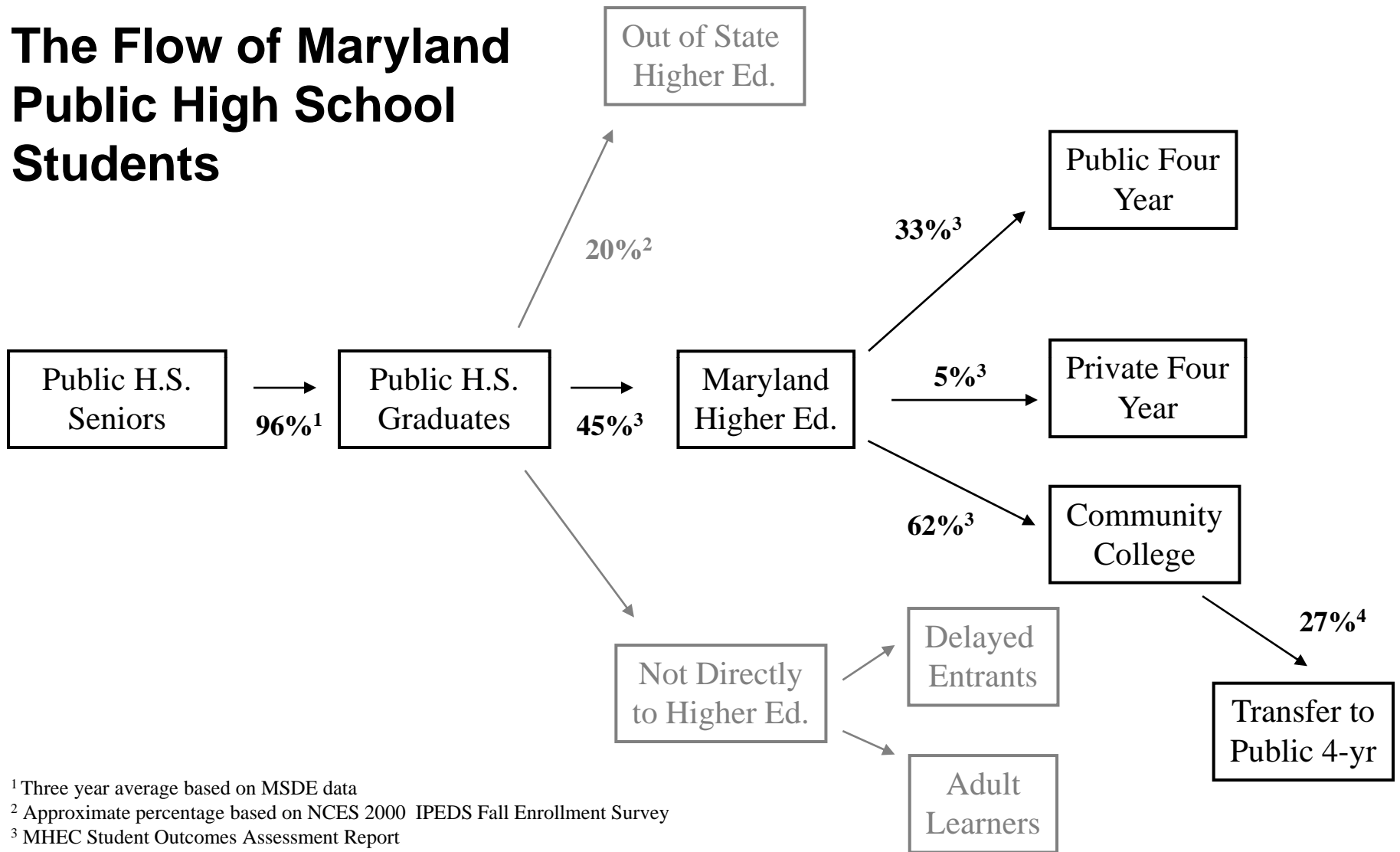
Sample Academic Program Comparison Matrix

Comparison	Institution 1	Institution 2
Degree(s) Conferred		
Concentration		
Credits Required		
Tuition		
Admissions Requirements		
Practicum, internship or research/training req.?		
Distance Program (online vs interactive classroom vs other)?		
Other Specialized Format (e.g. evening only, accelerated exec)?		
Offered at satellite or commuter campus		
Type of Institution (traditional, upper div., commuter, online, etc)		
Special transfer program?		
Institutional scholarships or grants for transfers?		



State, Region, Montgomery County

The Flow of Maryland Public High School Students



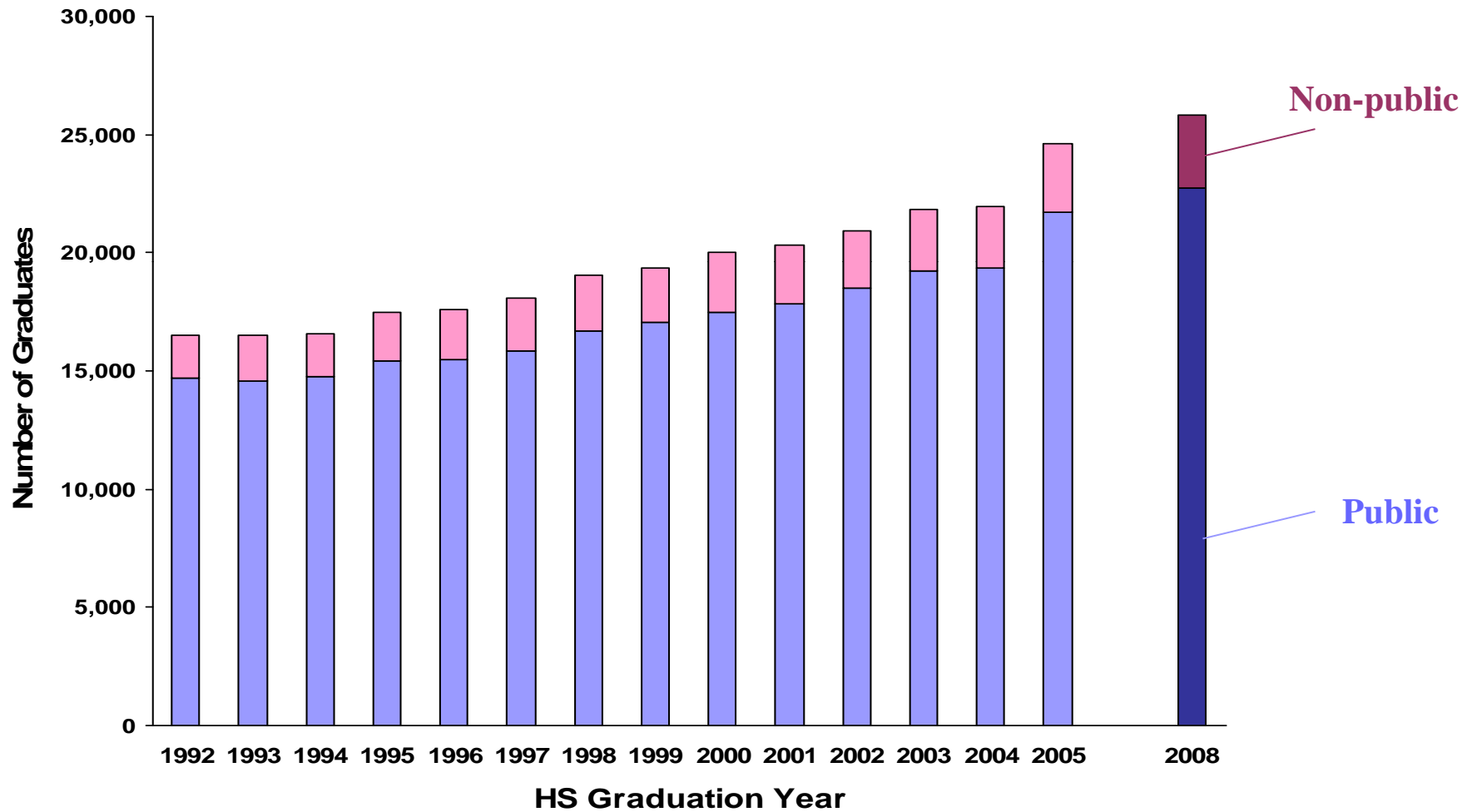
¹ Three year average based on MSDE data

² Approximate percentage based on NCES 2000 IPEDS Fall Enrollment Survey

³ MHEC Student Outcomes Assessment Report

⁴ MHEC Accountability Report – Transfer Rate of Transfer Students

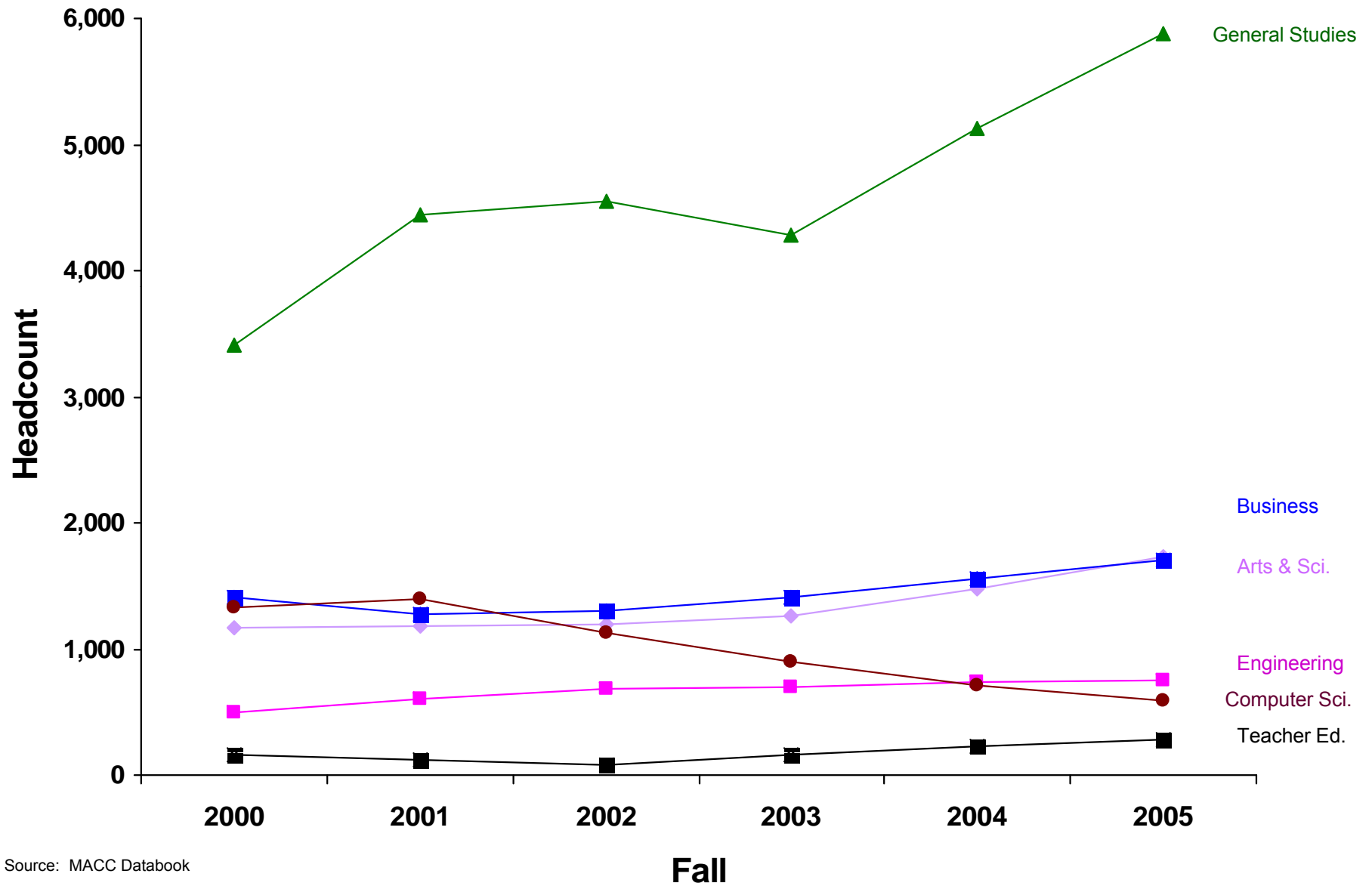
Washington Metro High School Graduates: Actual (1992-2005) and Predicted (2008)



Sources: Actual - MSDE Summary of Attendance and Non-Public Attendance
Projections - derived from Maryland Office of Planning Grade 12 Projections

Note: Montgomery, Frederick and Prince George's Counties only.

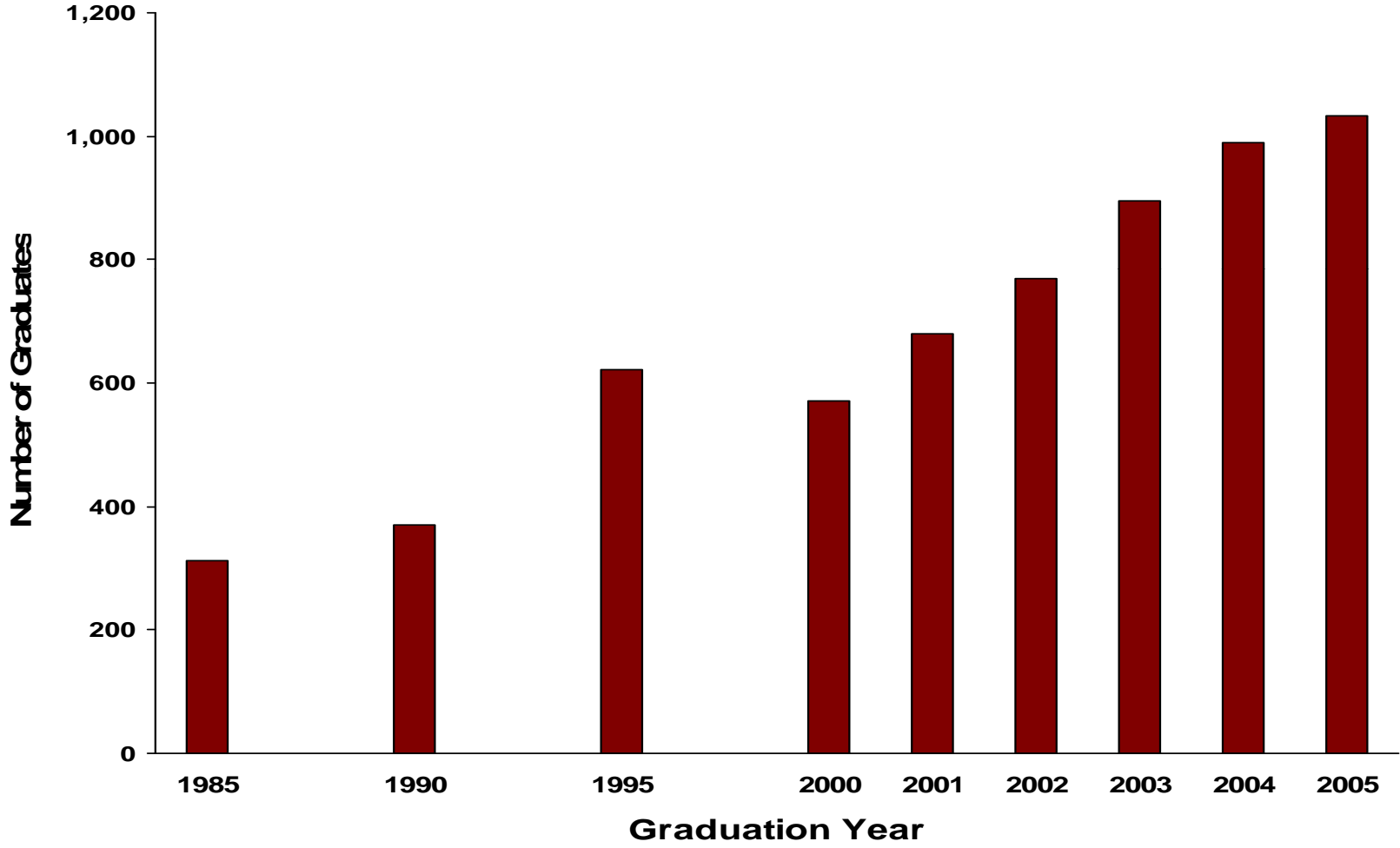
Enrollment in Transfer Programs at Montgomery College



Source: MACC Databook



Montgomery College Transfer Program Graduates: Trends 1985-2005



Source: MACC Databook



Survey of MC Students

- ❖ Web survey
 - All Montgomery College credit students
 - Spring 2006 – results very preliminary
- ❖ Over 1,400 respondents (about 7% response rate)
- ❖ About two-thirds have heard of USG
 - Tend to have positive or neutral impressions
- ❖ Majority of respondents plan on transferring
 - At least 1/3 don't know where they'll go



Project Products

- ❖ Numerous presentations prepared for USG Planning Group
- ❖ Notebook with relevant data
 - Industry trends
 - Trends in degrees
 - Program Matrices
 - Summary tables with industry and education information combined



Lessons Learned

- ❖ Collaborative process
- ❖ CIP & Occupation code overlap
- ❖ When the data don't support your expectations
 - Hot fields don't mean occupational demand
- ❖ Finding “teaching moments” for the data
 - Timing
 - Institutional program planning



Questions & Discussion

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