Looking Ahead:

Workforce Development for Transportation & Logistics in the 4th Industrial Revolution

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For I-NUF on October 16, 2019

PimaCommunityCollege

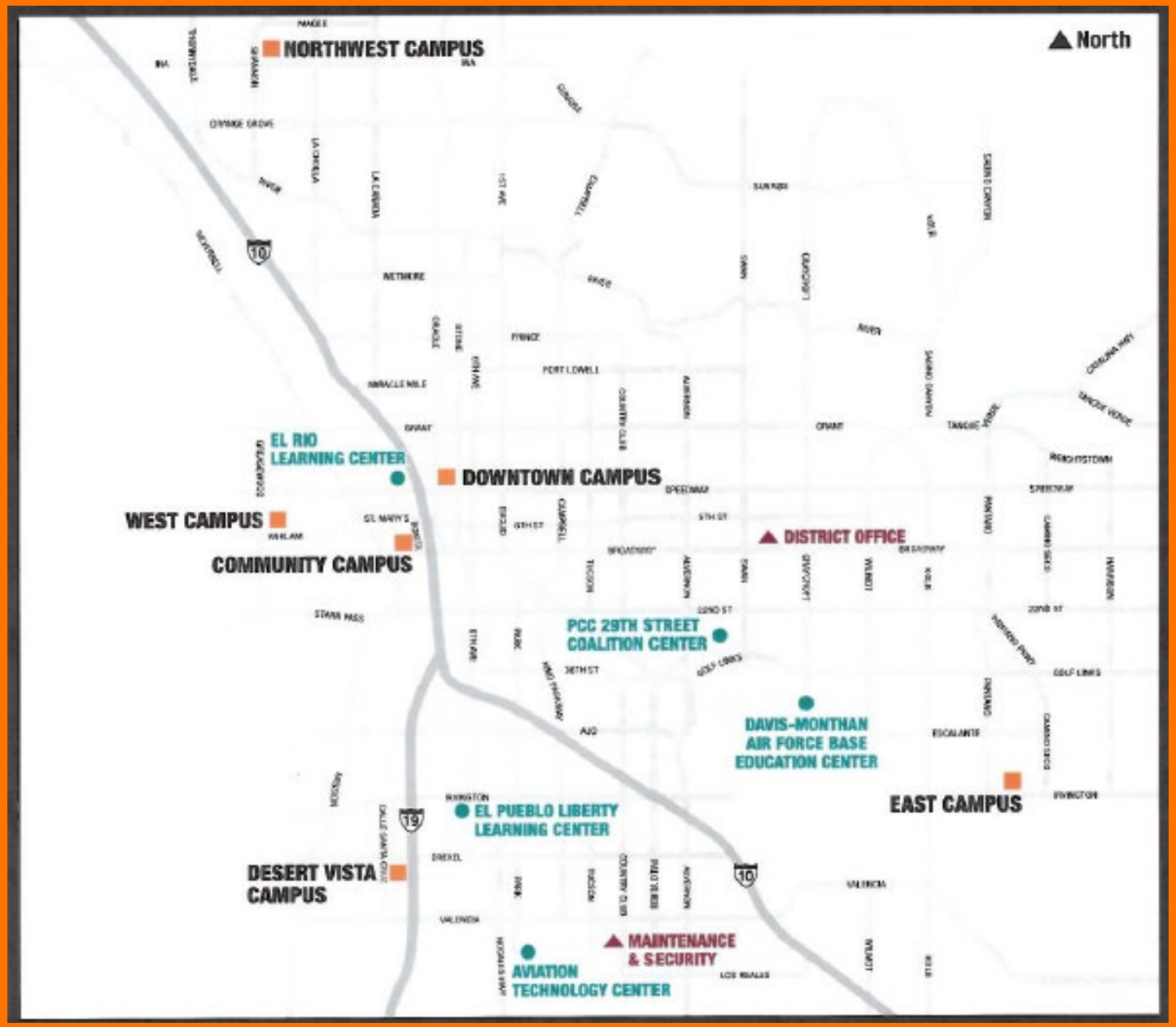
Keep striving.

Topics

1. Introduction/Context
2. Technology and “Skills”
3. Demographics
4. Current Strategies
5. Looking Forward

Pima at a glance

- **50,000** students
- **69% part time**
- **23 %** of courses offered online
- **28** Average Age
- **HSI** 45% Hispanic


North
NORTHWEST CAMPUS
EL RIO LEARNING CENTER
DOWNTOWN CAMPUS
WEST CAMPUS
COMMUNITY CAMPUS
DISTRICT OFFICE
PCC 29TH STREET COALITION CENTER
DAVIS-MONTHAN AIR FORCE BASE EDUCATION CENTER
EAST CAMPUS
EL PUEBLO LIBERTY LEARNING CENTER
DESERT VISTA CAMPUS
MAINTENANCE & SECURITY
AVIATION TECHNOLOGY CENTER

Workforce Development circa 2005

Workforce Development circa 2015

Workforce Development circa 2019 (How We Feel)

Workforce Development circa 2030 (The Great Displacement)

Technology and “skills”

The Skills Gap (Outdated Model?)

Employability Skills

- Critical thinking
- Integrity
- Works in teams
- Dependability
- Initiative

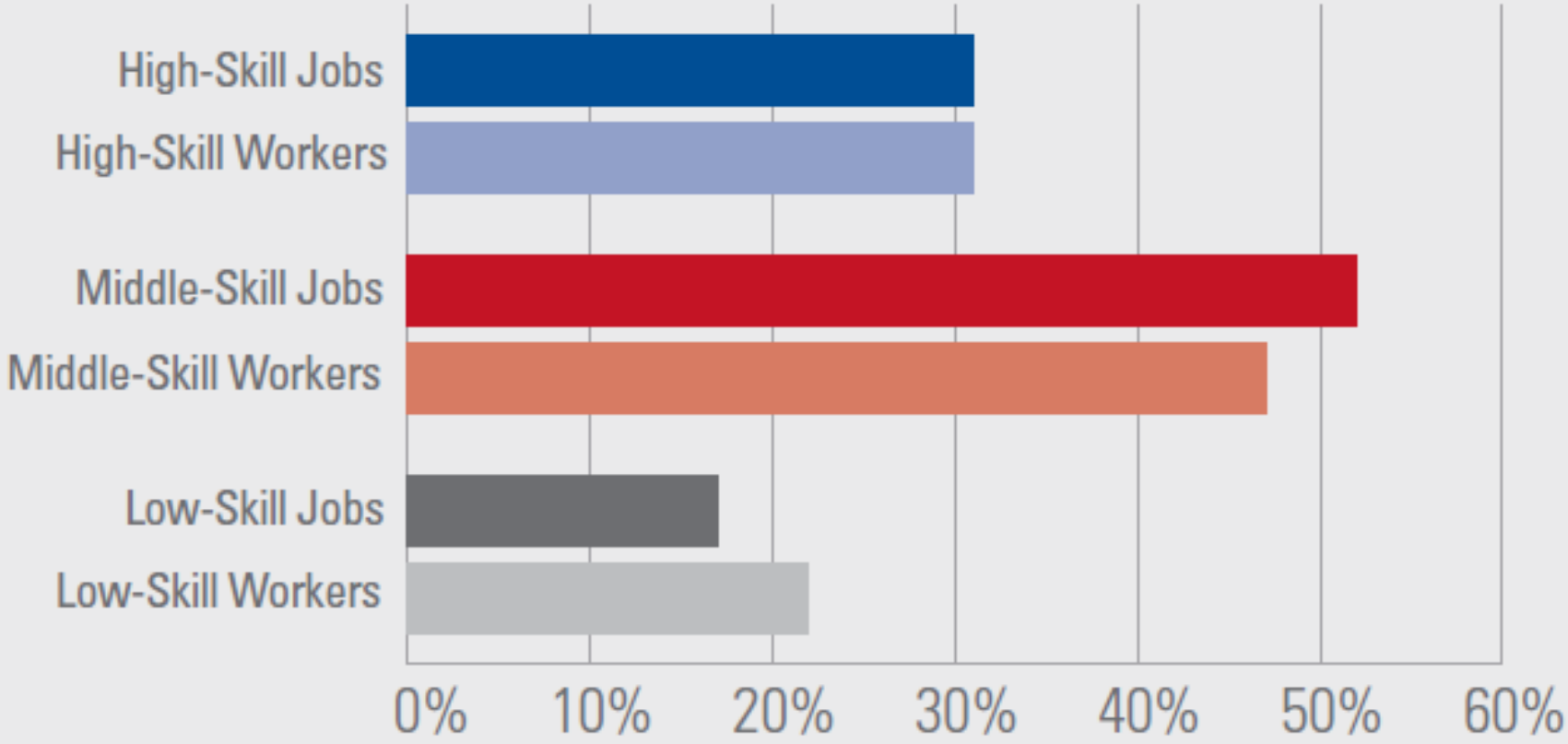
Technical Skills

- Industry standards
- Demonstrated competencies
- Technology
- Math in context
- Technical writing

Talent Supply

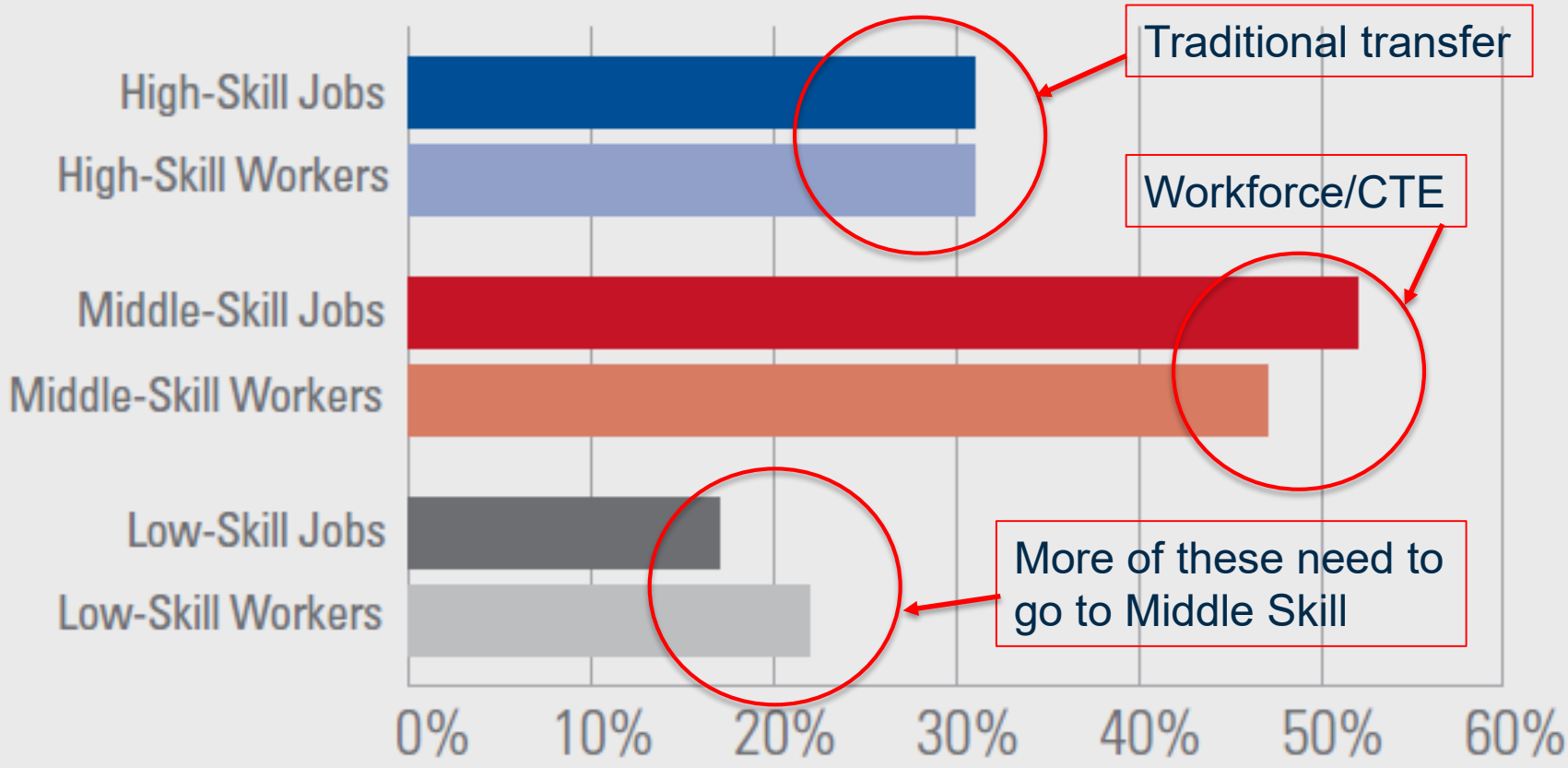
- Experience
- Quantity
- Reliable pool
- “Fit”

Jobs and Workers by Skill Level, Arizona, 2015

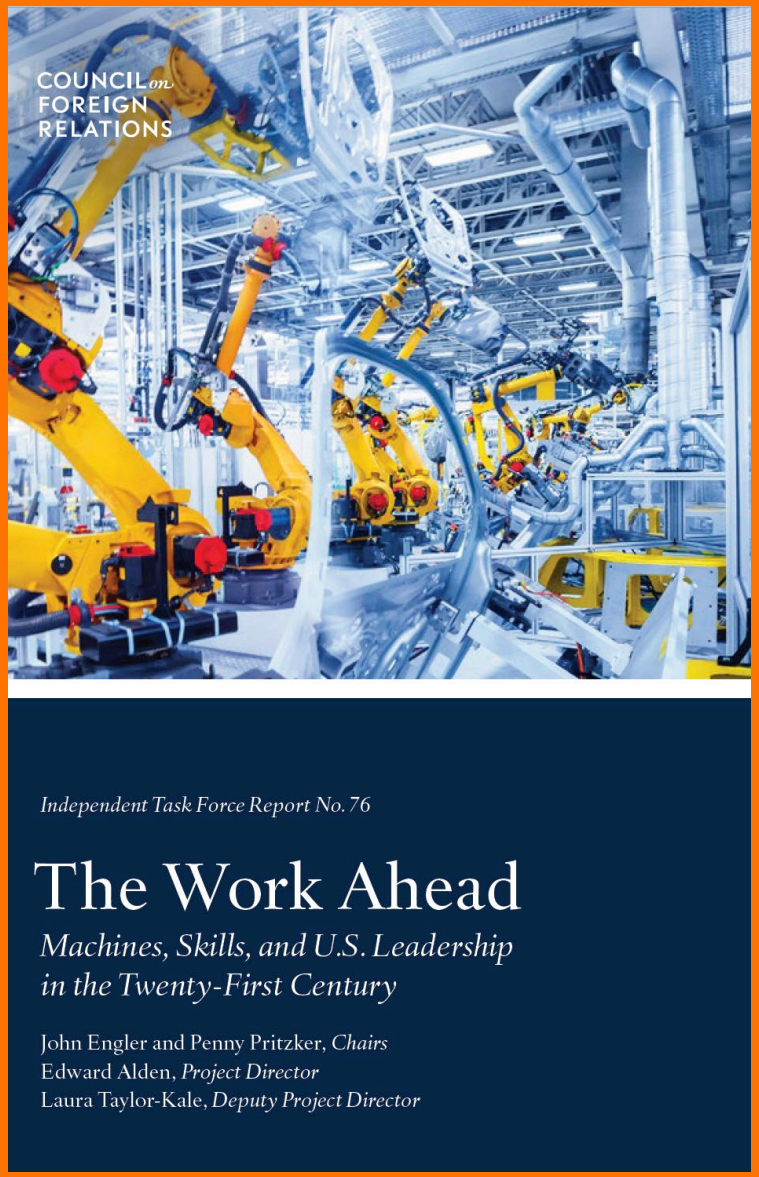


Source: NSC analysis of Bureau of Labor Statistics Occupational Employment Statistics by State, May 2015 and American Community Survey data, 2015.

Jobs and Workers by Skill Level, Arizona, 2015



Source: NSC analysis of Bureau of Labor Statistics Occupational Employment Statistics by State, May 2015 and American Community Survey data, 2015.


COUNCIL on FOREIGN RELATIONS
Independent Task Force Report No. 76
The Work Ahead
Machines, Skills, and U.S. Leadership in the Twenty-First Century
John Engler and Penny Pritzker, Chairs
Edward Alden, Project Director
Laura Taylor-Kale, Deputy Project Director


McKinsey&Company
MCKINSEY GLOBAL INSTITUTE
JOBS LOST, JOBS GAINED: WORKFORCE TRANSITIONS IN A TIME OF AUTOMATION
DECEMBER 2017

"As technology disrupts industry after industry, the United States needs better ways to help Americans access the many new opportunities technology is also creating, in particular by strengthening the link between education and employment prospects."—The Work Ahead

The (Real) Great Displacement

- By 2020, artificial intelligence will create 2.3 million jobs worldwide and eliminate 1.8 million.
- By 2030, 1 in 3 U.S. workers will need to learn new skills and find work in new occupations

McKinsey Global Institute, 2017

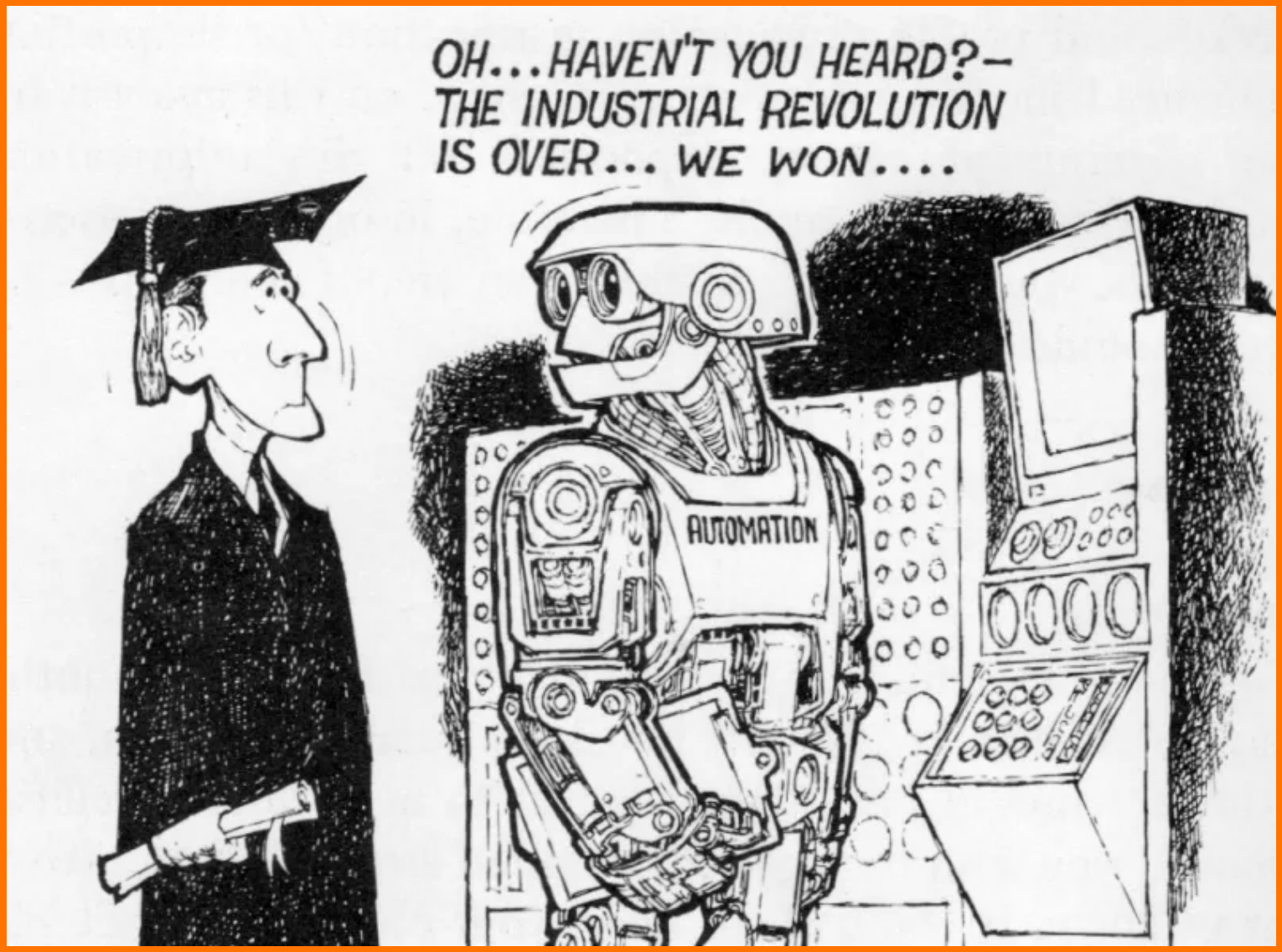
The (Real) Great Displacement

- “Any work tasks that can be routinized by even in part are subject to replacement by computers or robots, and advances in AI will steadily increase the number of occupations affected.”

The 4 Superpowers (+1)

- AI (and Automation): intelligence everywhere
- Mobile: unprecedented reach
- Cloud: previously unimaginable scale
- IoT: connecting the physical and digital worlds
- AR/VR: enhancing the physical and creating experiences

The World Economic Forum, January 2018


OH...HAVEN'T YOU HEARD?—
THE INDUSTRIAL REVOLUTION
IS OVER... WE WON....
AUTOMATION

A Learning Model for the Future

- The New Literacies:
  - Technological literacy
  - Data literacy
  - Human literacy
- The Cognitive Capacities
  - Critical thinking
  - Systems thinking
  - Entrepreneurship
  - Cultural agility

Demographics: Labor “Pools”, Mobility, and Age

The Declining Labor Participation Rate

- Today's unemployment rate of 3.5% shows the United States near "full employment."

- However the labor force participation rate has declined to **62.9%** from **67.3%** in the 1990s.

Source: Pima County Workforce Investment Board

Arizona's Labor Force Participation and Unemployment by County

Area	Population Estimates		Labor Force Participation Rate		Age 25-64 Not in the Labor Force		Age 25-64 Unemployed (Est.)	
	Total Pop.	25-64	16+	25-64	%	#	%	#
United States	314,107,084	165,878,168	63.9%	77.6%	22.4%	37,148,568	7.6%	12,619,550
Arizona, Statewide	6,561,516	3,310,289	60.1%	74.4%	25.6%	848,169	8.3%	273,618
Apache County	72,142	33,783	43.7%	56.7%	43.3%	14,641	17.0%	5,734
Cochise County	130,807	64,900	52.2%	64.8%	35.2%	22,824	8.5%	5,506
Coconino County	135,817	65,819	65.4%	77.1%	22.9%	15,081	6.4%	4,183
Gila County	53,242	25,136	47.6%	64.0%	36.0%	9,053	10.0%	2,511
Graham County	37,311	18,119	49.3%	59.9%	40.1%	7,258	11.0%	2,002
Greenlee County	8,800	4,538	57.3%	70.0%	30.0%	1,363	8.4%	382
La Paz County	20,348	8,617	42.5%	64.9%	35.1%	3,024	11.4%	980
Maricopa County	3,947,382	2,037,056	63.7%	77.2%	22.8%	465,207	7.4%	150,950
Mohave County	202,482	98,076	46.9%	63.5%	36.5%	35,803	12.7%	12,499
Navajo County	107,489	50,717	50.0%	63.4%	36.6%	18,572	16.0%	8,130
Pima County	993,144	489,913	59.5%	75.0%	25.0%	122,405	8.6%	42,017
Pinal County	390,160	196,682	51.0%	63.9%	36.1%	71,030	9.5%	18,645
Santa Cruz County	47,250	22,145	57.1%	73.7%	26.3%	5,817	10.2%	2,254
Yavapai County	213,689	103,998	50.7%	69.2%	30.8%	32,070	9.1%	9,478
Yuma County	201,453	90,790	55.3%	72.1%	27.9%	25,338	11.8%	10,717

Source: U.S. Census American Community Survey 2010-2014 5-Year Estimates. NOTE: Subject to a margin of error that varies by location and data point.

Arizonans 35-to-44 not in the Labor Force

Arizona's Labor Force Participation by Age Group (2015)

Age Group	AZ Rank	Participating %	Unemployed %	Participation Top Rank	Participation Bottom Rank
TOTAL	42	60.0%	6.0%	70.9% (ND)	53.0 (WV)
16 to 19	25	36.4%	17.9%	56.3% (IA)	19.7% (DC)
20 to 24	31	71.5%	10.0%	83.0% (NH)	62.9% (NY)
25 to 34	47	78.0%	6.4%	90.1% (IA)	74.0% (WV)
35 to 44	**49**	**76.9%**	**4.4%**	**90.1% (IA)**	**74.4% (KY)**
45 to 54	37	78.3%	4.3%	88.7% (IA)	69.4% (WV)
55 to 64	38	62.3%	4.7%	72.2% (ND)	50.8% (KY)
65+	48	14.7%	5.9%	26.7% (DC)	13.7% (MS)

Source: 2015 Geographic Profile Survey from the Bureau of Labor Statistics

Arizona Commerce Authority | Office of Economic Opportunity

Arizona Population 35-to-44 Not in the Labor Force by County (2014)

County	Not in Labor Force #	Not in Labor Force %
Apache	3,060	46.3%
Cochise	4,366	39.3%
Coconino	2,697	20.9%
Gila	1,248	33.5%
Graham	1,803	45.8%
Greenlee	304	28.3%
La Paz	291	23.6%
Maricopa	99,443	22.8%
Mohave	5,922	37.0%
Navajo	2,919	32.3%
Pima	22,057	23.8%
Pinal	15,715	34.5%
Santa Cruz	1,098	25.8%
Yavapai	3,657	23.9%
Yuma	4,732	25.98%

Source: 2014 American Community Survey 5-Year Estimates from table B23001.

Arizona Commerce Authority | Office of Economic Opportunity

The Birth Dearth

- The number of births in U.S. down nearly 13 percent since the 2008 recession

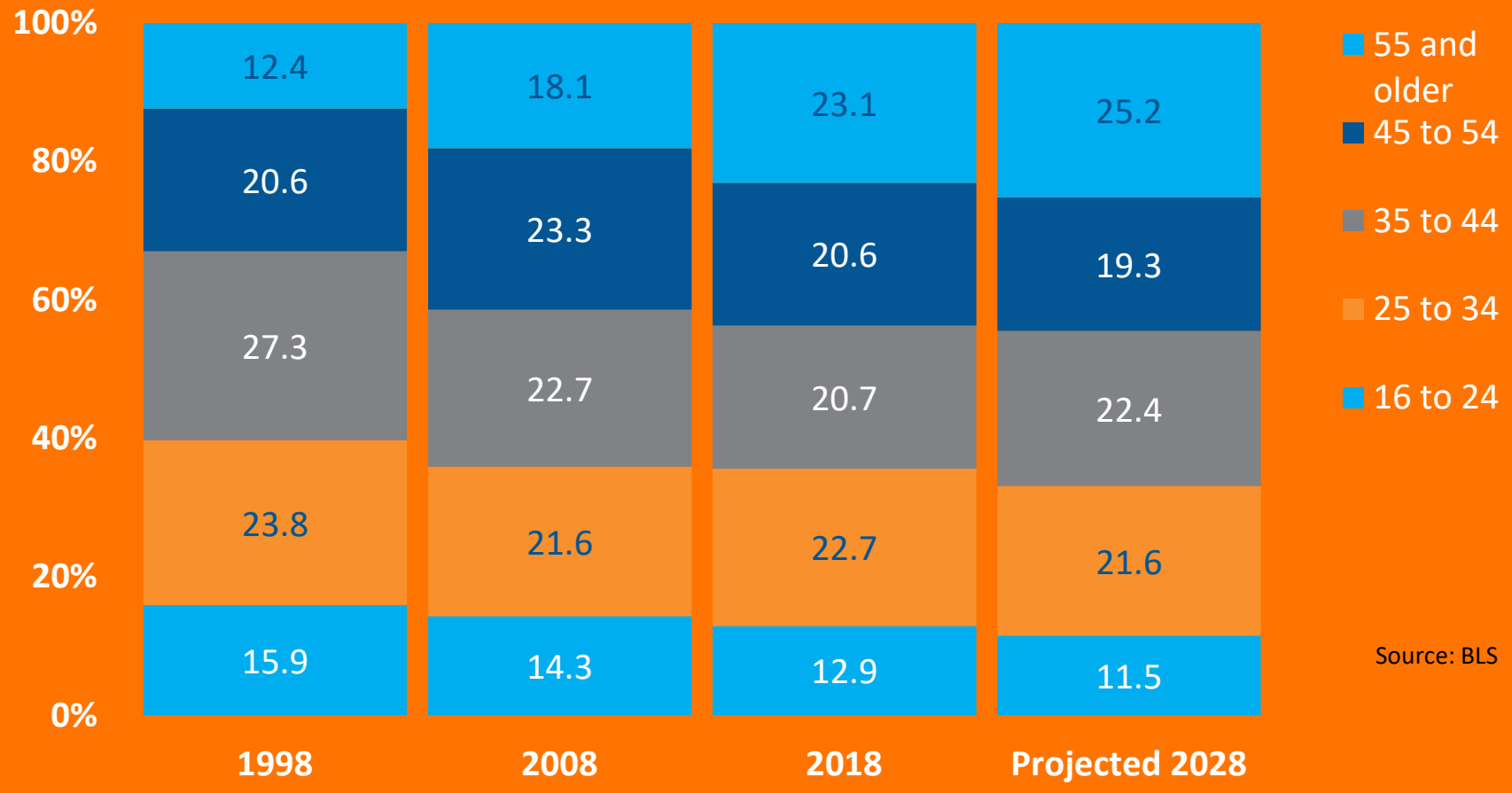
- There are more households with dogs than with children, 43 million vs. 33 million

"Demographics and the Demand for Higher Education"; Forbes, Sept. 6, 2018

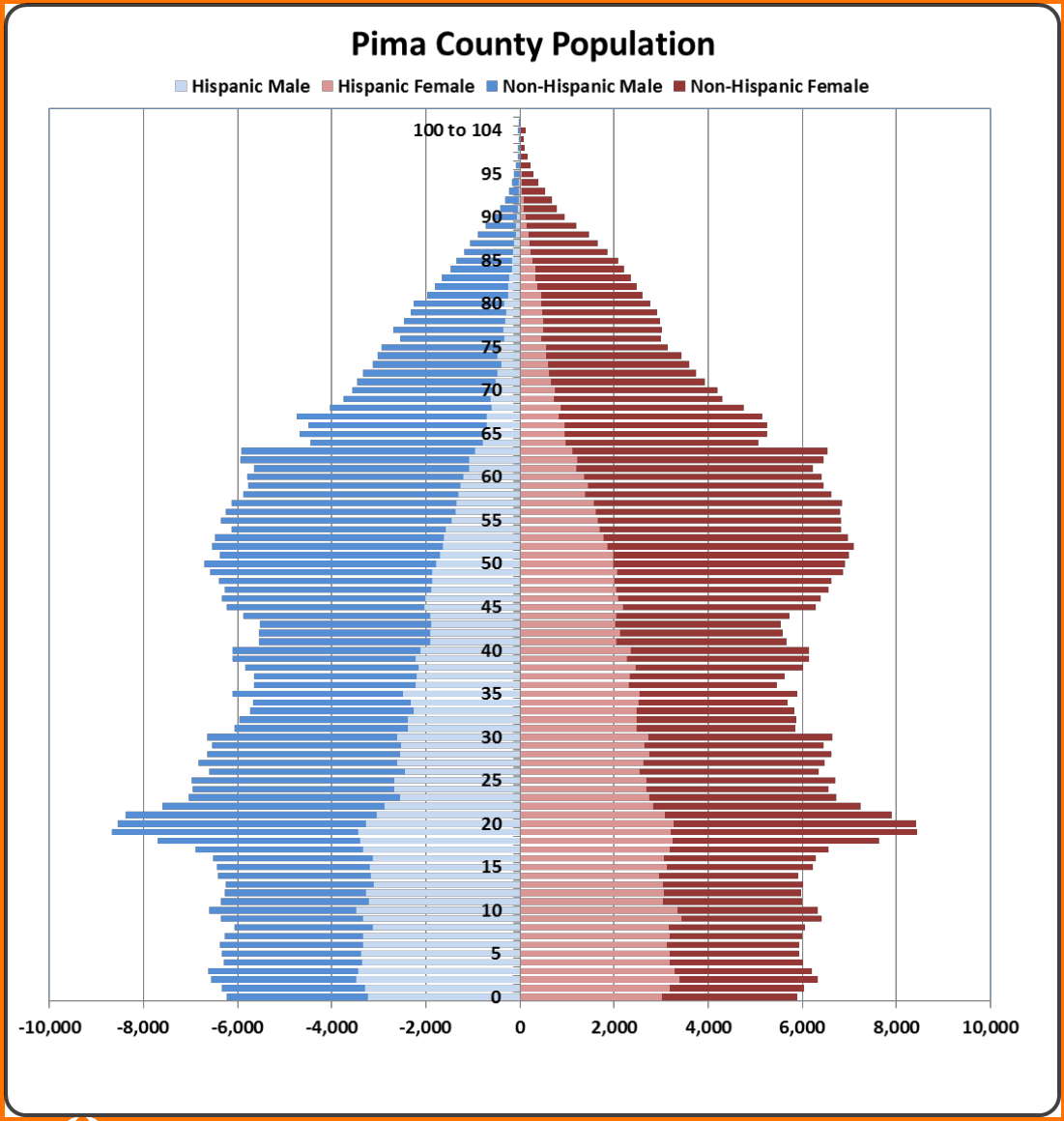
Aging in America

- 20% of all people in the US are 60 and older (63 million)
- By 2020, 25% of Arizona residents will be 60+
- 24.6% of Pima County residents were already 60+ in 2015 (248,475)

The Labor Force is Aging



Source: BLS

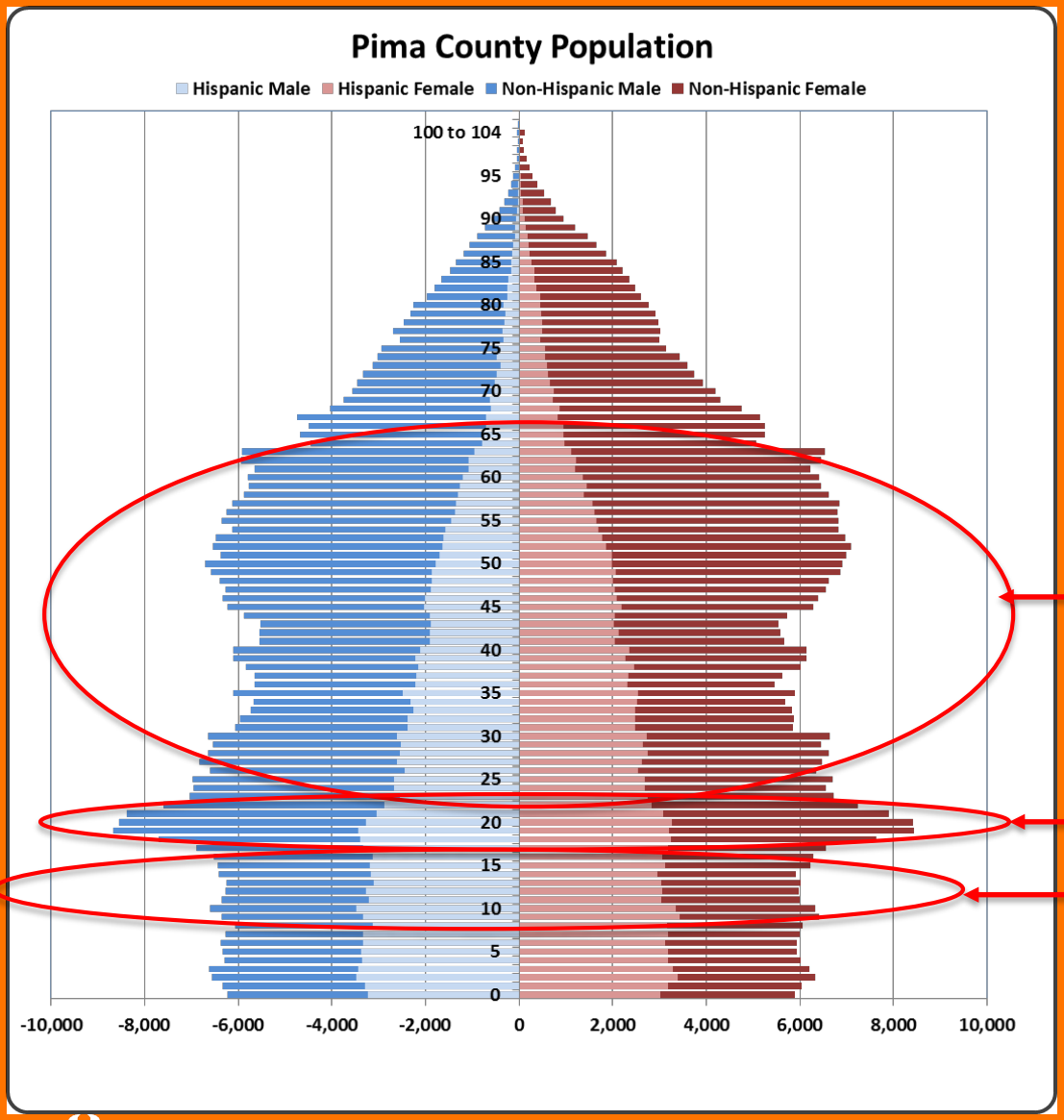


Pima County

Census 2010

Total Population 980,263

Hispanic	338,802	34.6%
Male	165,575	16.9%
Female	173,227	17.7%
Non-Hispanic	641,461	65.4%
Male	315,862	32.2%
Female	325,599	33.2%
Under 17	211,872	21.6%
Age 17-24	121,235	12.4%
Age 25-34	126,176	12.9%
Age 35-44	115,795	11.8%
Age 45-54	131,528	13.4%
Age 55-64	122,367	12.5%
Over 64	151,293	15.4%



Pima County

Census 2010

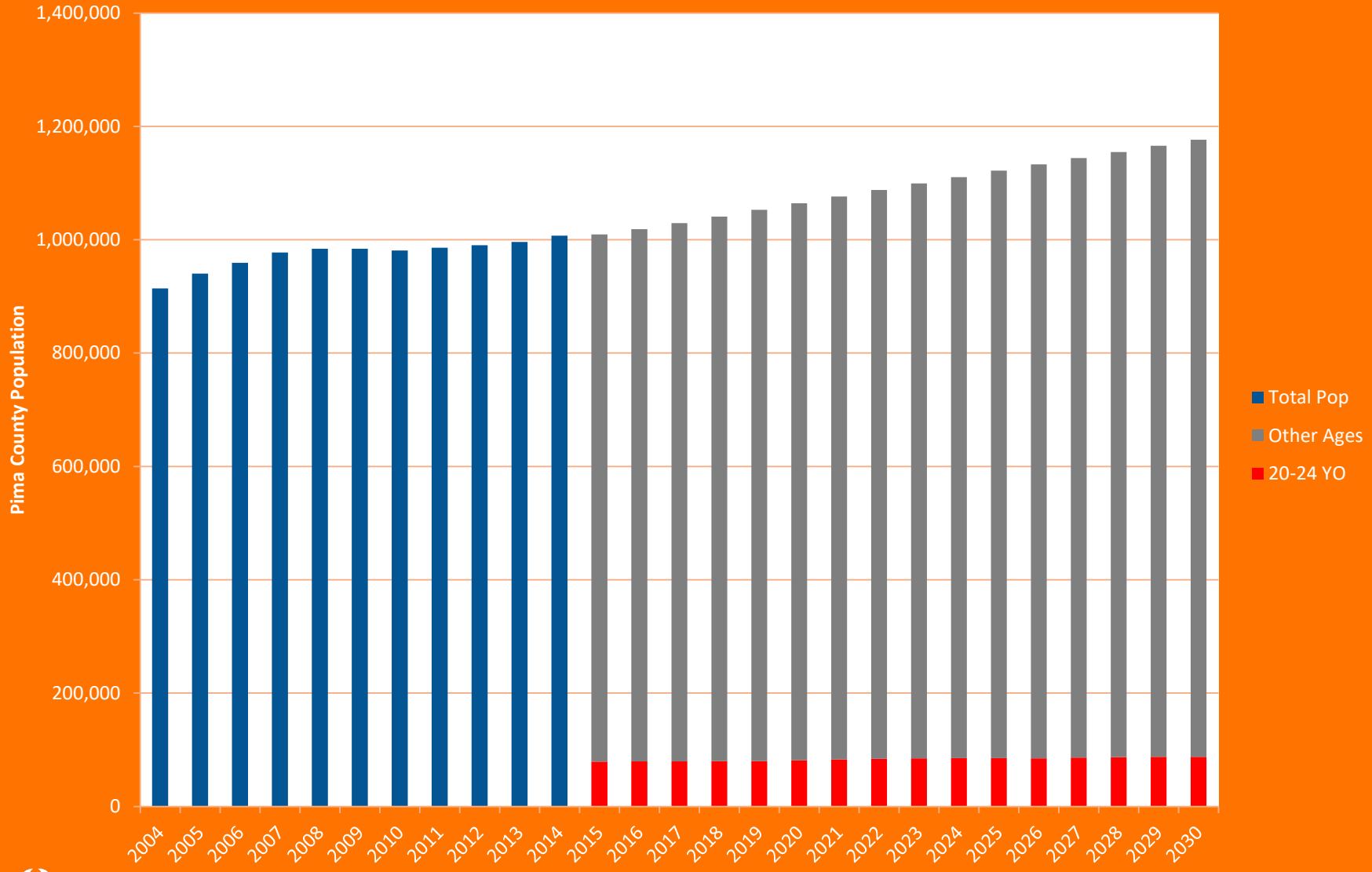
Total Population 980,263

Workforce/CTE

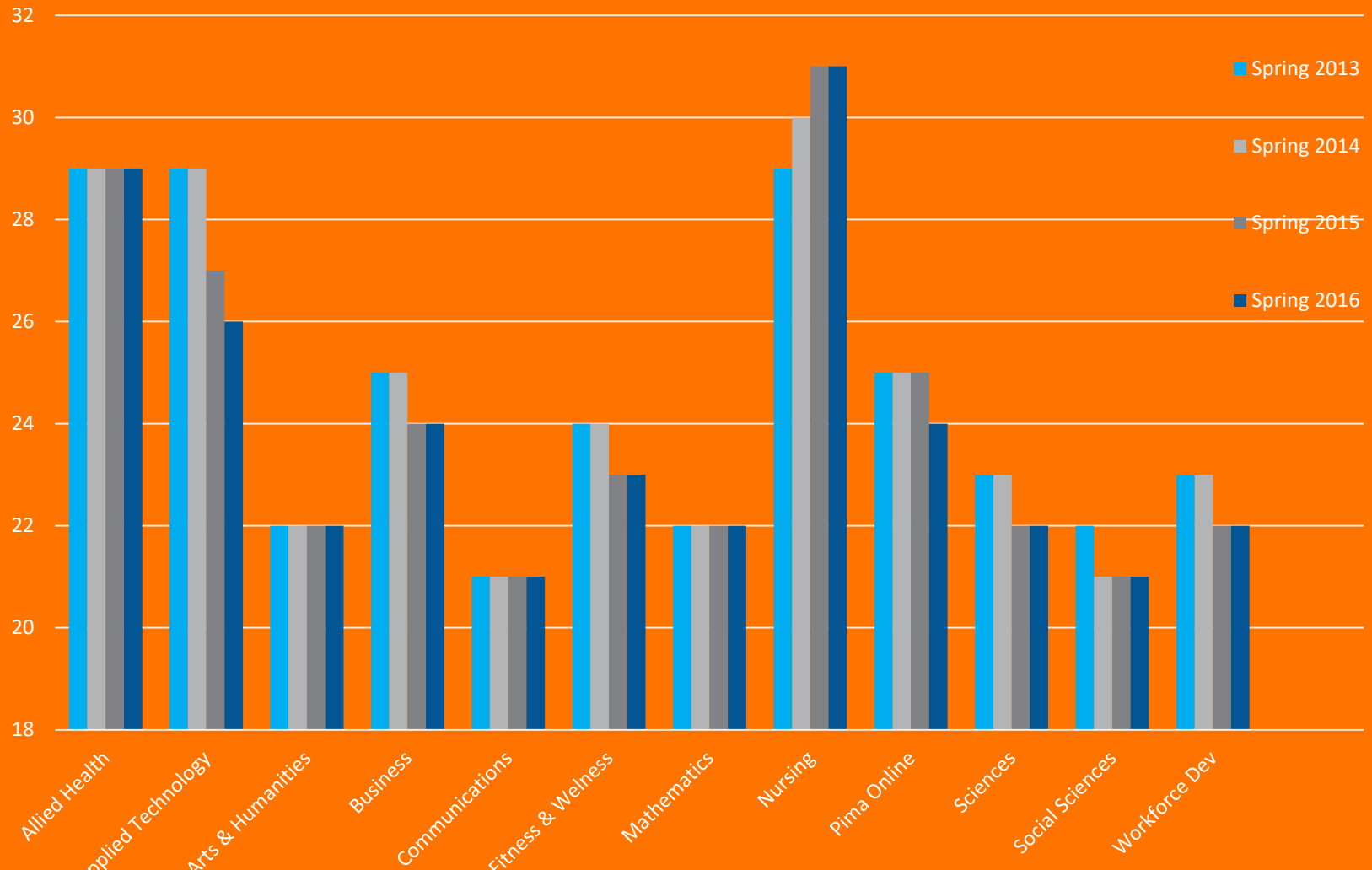
Traditional

Youth Programming and Early College

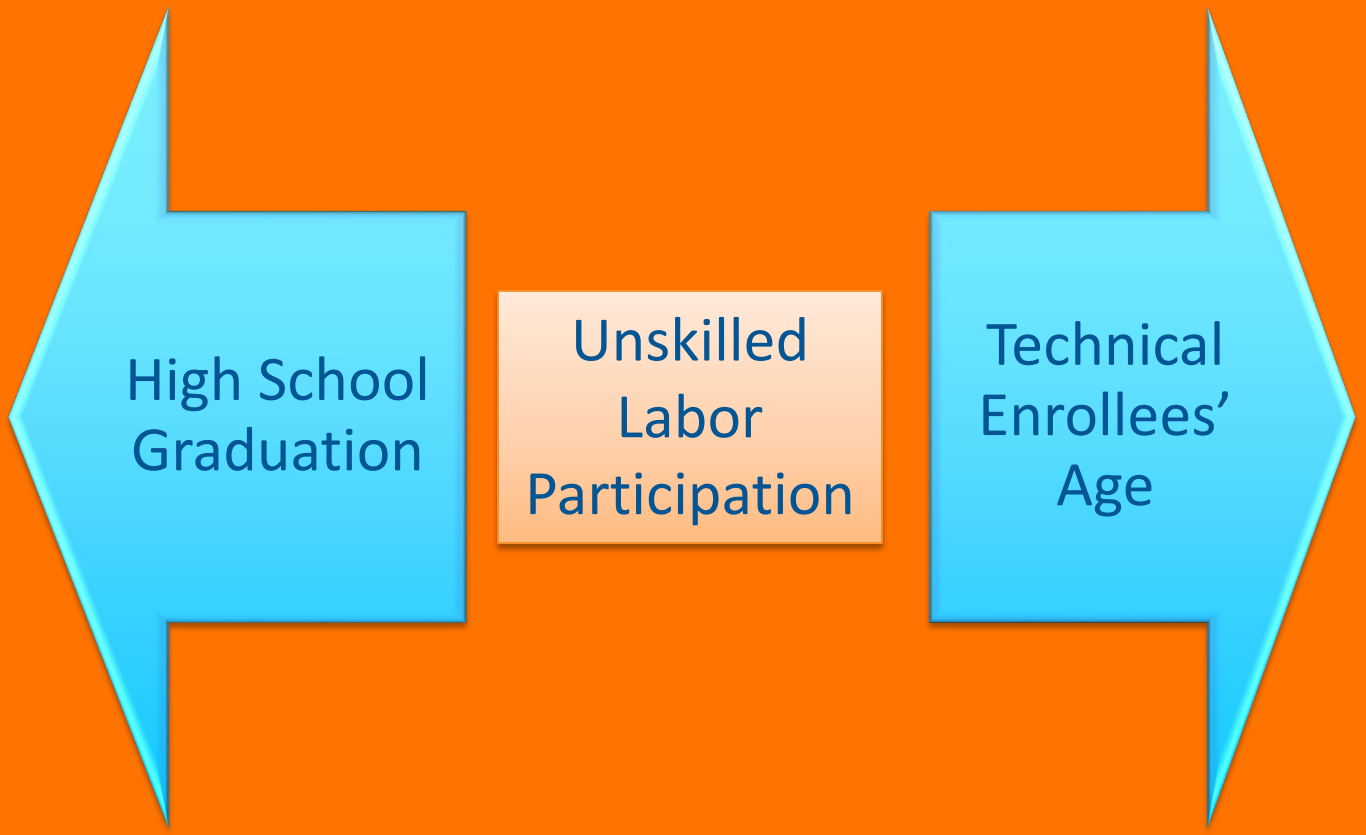
Pima County Population Projections

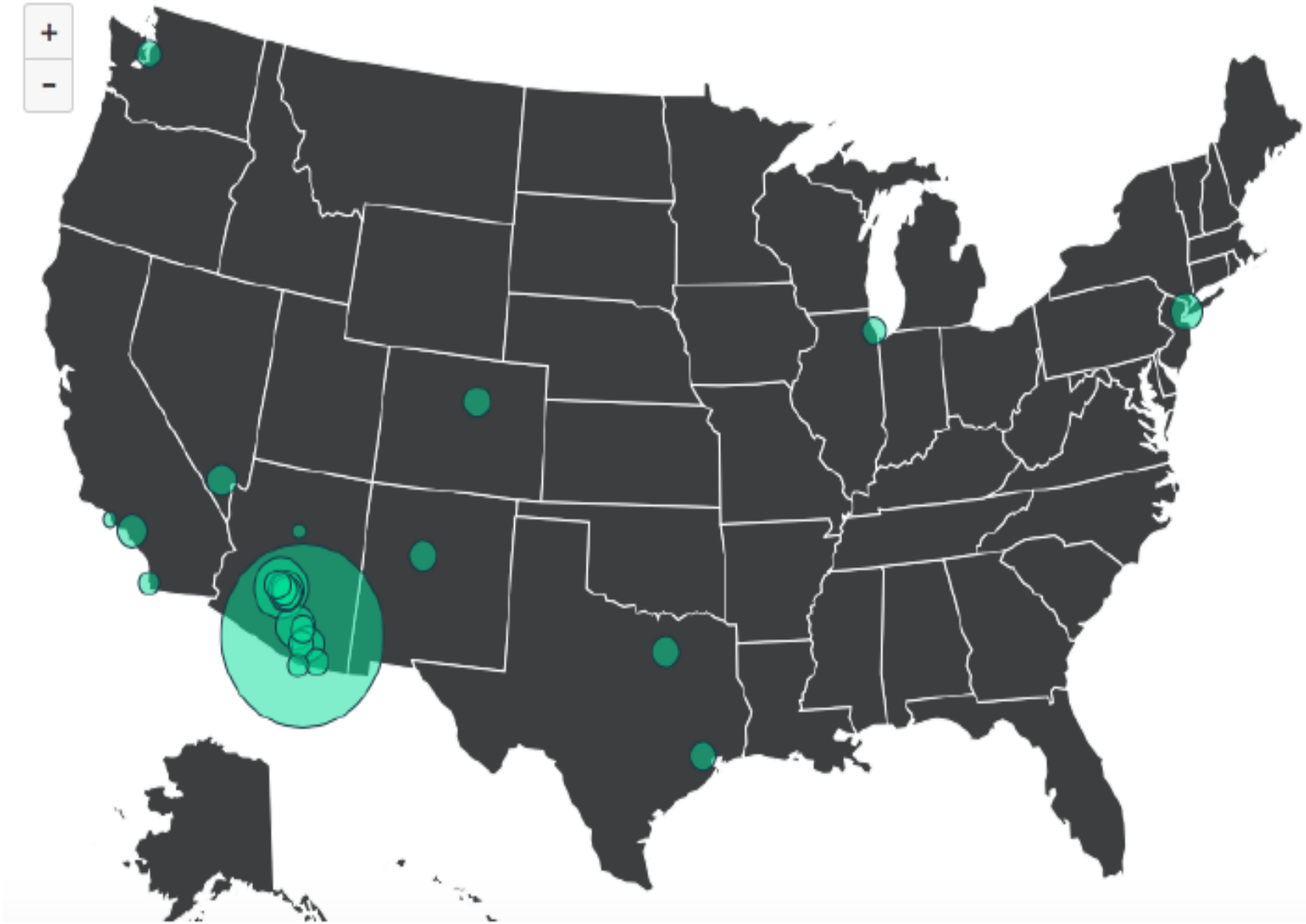


Median Age of Pima CC Students by Division



The “Lost Decade”





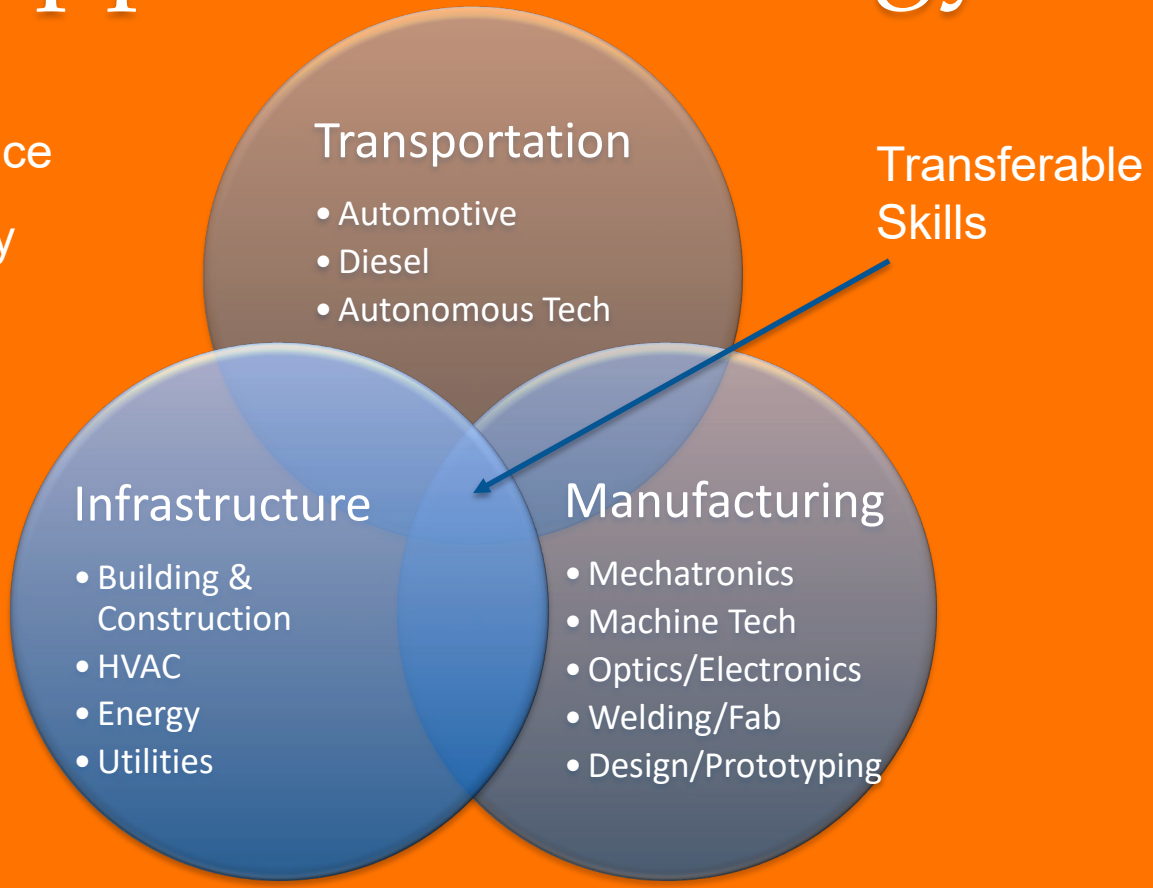
Centers for Excellence: Strategies for the Working Learner


We Need Better-Educated Workers!
We Need Better-Educated High-School Grads!
We Need Better-Prepared Mid-Schoolers!
We Need Better Pre-Natal Care!
We Need Better Jobs!
We Need Full-Day Kindergarten!
We Need Elementary Kids That Can Read And Do Math!
We Need More Pre-K Programs!
BUSINESS
COLLEGE
HIGH SCHOOL
PRE-K
KINDER-GARTEN
ELEMEN-TARY
MID-SCHOOL


Industry Standards & Thought Leadership
Partnerships: Industry, K-12, University, Community
Comprehensive Workforce Development
Training to Degree to CEU Spectrum
Cutting Edge Facilities & Equipment
World Class Instruction
Center for Excellence

Center for Excellence in Applied Technology

- Convergence
- Adaptability
- Speed



PLA: The Next Disruption

Traditional Higher Ed.

- Classroom/Online
- Seat time/Carnegie Units
- Instructor-centric qualifications
- Instructor-determined standards
- Grades
- Semesters
- Debt

Prior Learning Assessment

- Industry certifications
- Work experience
- Life experience
- Student-centered qualifications
- Competency-based
- Not time-bound
- Not location bound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Looking Ahead

Dichotomies

- Traditional students
- Fall-Spring-Summer
- Academic/Workforce
- Credit/Non-credit
- Lecture/lab
- Time
- College ready
- Sequence
- Campus

- Post-traditional students
- Non-standard terms
- Applied
- Learning Outcomes
- Real-world/work-based
- Competency
- Integrated learning
- Multiple entry and exit
- Community

PSR Themes

- Technology for improved mobility
  - UCI, USC, UCLA, Pima
- Improving mobility for disadvantaged populations
  - UCLA, USC, NAU, Pima
- Improving resilience and protecting the environment
  - UH, UCD, USC
- Managing mobility in high growth regions
  - USC, UCLA, CSULB

PSR
Pacific Southwest Region UTC
University Transportation Center

Pima UTC PSR Deliverables

- Wholly online version of the Logistics program with a work-based learning component;
- Hybrid variant of truck-driver training;
- GIS technology into Logistics and truck driver training;
- integrate employ-ability or "soft skills" into these new models;
- delivery to under-served and rural populations, with an emphasis on indigenous people in the American Southwest

Investing in People

- Traditional labor “pools” and “pipelines” no longer exist (if they ever really did)
- Career Pathways are being supplanted by Career Lattices
- Beyond traditional tuition reimbursement

Lifelong Learning

PimaCommunityCollege

CATERPILLAR®

CAT/PCC Project Implications

- One and Done is Done!
- Lifelong Learning
- Expanded Role of Community Colleges
- Revenue Funding Models and Policy

TuSimple/PCC Project

TuSimple/PCC Project Implications

- Autonomous Vehicle Driver of the Future
- Erosion of Occupational Specificity
- Research Potential for the Impact of Autonomous Vehicle Technology on Workforce Development (Displacement, Training, Mobility)

Questions?

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