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# The Kentucky Bridges to Opportunity: Career Pathways Initiative

Career Pathways Institute

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Shauna King-Simms

Director, College and Career Transitions

Kentucky Community and Technical College System

[shauna.king-simms@kctcs.edu](mailto:shauna.king-simms@kctcs.edu)

KCTCS Career Pathways Webpage: <http://kctcs.edu/student/careerpathways/>

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# Kentucky Snapshot

- KCTCS is one of nine postsecondary institutions coordinated by CPE along with adult education
  - KCTCS is a centralized system comprised of 16 colleges and 65 campuses with over 81,000 students governed by KCTCS Board of Regents
  - 120 KY Adult Education Providers – KYAE housed in CPE
  - 10 KY WIB/WIA regions housed in KY Education Cabinet/Dept. for Workforce Investment
  - Secondary Career and Technical ed provided through KDE (175 school districts) and OCTE (55 ATC's)
  - KY Economic Development Cabinet – BGSSC and the “Golden Triangle”
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# Career Pathways: The KCTCS Vision

- Not a program but a **systemic framework** for a new way of doing business in our colleges and communities
  - An **economic development** process - the synergy created when best practices and resources are aligned to target an employment sector critical to a regional labor market
  - A model that both strengthens connections to business while providing academic credentials and increased educational **opportunities for individuals**
  - **Mission Integration** – a strategic tool for institutional and instructional transformation
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# Mission Integration

...is what **Mission Integration Does** [John Colburn – Ford Foundation]

- All students will enter the workplace
  - Separation of institutional missions in workforce, academic, remediation, student affairs and categorical programs promotes silos with impact on student and employer customers
  - Public policy reinforces these silos; and changes in public policy can improve mission integration
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# Mission Integration

...is what **Mission Integration Does** [John Colburn – Ford Foundation]

- Students starting in one mission area transfer seamlessly to another
  - Learning is accelerated and targeted
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# Career Pathways: A Synergy of Promising Practices (AKA The Whole is Greater than the Sum of Its Parts)

- ❑ New certificates and degrees
  - ❑ New courses
  - ❑ Remedial bridges
  - ❑ Secondary alignment
  - ❑ Articulation with 4 year
  - ❑ Customized and short term training interventions
  - ❑ Integrated work experience
  - ❑ More career counseling
  - ❑ Improved assessments
  - ❑ Non-traditional delivery (time, place, technology)
  - ❑ Other
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## Career Pathways: Operationalizing (Essential Elements)

- Employers engaged / contributing / work experience
  - Academic framework – credentials
  - Remedial and secondary bridge
  - Transfer to 4 year
  - Short term customized interventions
  - Supportive services/career counseling
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# Kentucky's Mission Integration Quotient

A tool assessing the status of:

- Employer Engagement
  - Partner Engagement
  - Student Support Services Integration
  - Instructional Transformation
  - Continuous Improvement
  - Sustainability
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# Career Pathways: Lessons Learned

- Every college starts in a different place, builds upon different strengths and progresses at a different rate
  - Redesign of curriculum and delivery methods (internal issues) as challenging as employer and agency partnership development (external issues)
  - Conversations between colleges (academic faculty) and employers were elevated to a new level
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## Career Pathways: Lessons Learned (2)

- Workforce development staff facilitate and support while reinventing their role and relationships
  - Be prepared to align pathways with corresponding secondary efforts (Perkins, Tech Prep, High Schools that Work, etc.)
  - Colleges initially look to adult ed providers for more flexible and targeted remediation – engage dev ed
  - Additional technical assistance and resources needed to engage college faculty in curriculum design and redesign
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# Curriculum Re-Design Efforts

- Increase entry/exit points
  - Embedded certificates
  - Modularized courses/fractional credit
  - Alternative delivery systems
  - “Creditizing” non-credit offerings
  - Integrate industry-based credentials
  - Career Pathways remediation pilots
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# Shoring Up The Secondary Pipeline:

- KDE/OCTE/KCTCS curriculum alignment initiative
  - Using CCTI Curriculum Template
  - Perkins Funded
  - Six sectors currently being addressed
    - Construction
    - Education
    - Health Science
    - Information Technology
    - Manufacturing
    - STEM
  - Joint Faculty Teams to:
    - Identity pathways in sector
    - Align secondary and post secondary curricula
    - Identify dual credit opportunities
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# KENTUCKY CAREER PATHWAY/PROGRAM OF STUDY TEMPLATE

**COLLEGE/UNIVERSITY:**

**CLUSTER:**

**HIGH SCHOOL (S):**

**PATHWAY:**

**PROGRAM:**

|               | GRADE   | ENGLISH | MATH | SCIENCE | SOCIAL STUDIES | REQUIRED COURSES             |                        |  | CREDENTIAL CERTIFICATE<br>DIPLOMA<br>DEGREE |
|---------------|---------|---------|------|---------|----------------|------------------------------|------------------------|--|---|
|               |         |         |      |         |                | RECOMMENDED ELECTIVE COURSES | OTHER ELECTIVE COURSES | CAREER AND TECHNICAL EDUCATION COURSES |   |
| SECONDARY     | 9       |         |      |         |                |                              |                        |  |   |
|               | 10      |         |      |         |                |                              |                        |  |   |
|               | 11      |         |      |         |                |                              |                        |  |   |
|               | 12      |         |      |         |                |                              |                        |  |   |
| POSTSECONDARY | Year 13 |         |      |         |                |                              |                        |  |   |
|               | Year 14 |         |      |         |                |                              |                        |  |   |
|               | Year 15 |         |      |         |                |                              |                        |  |   |
|               | Year 16 |         |      |         |                |                              |                        |  |   |



Funded by the U. S. Department of Education

(V051B020001)

Revised Jan. 2005

October, 2006-CTE/Kentucky

**Required Courses**

**Recommended Elective Courses**

**Other Elective Courses**

**Career and Technical Education Courses**

**Credit-Based Transition Programs (e.g. Dual/Concurrent Enrollment, Articulated Courses, 2+2+2)**

**(☐ = High School to Comm. College) (• = Com. College to 4-Yr Institution) (■ = Opportunity to test out)**

**Mandatory Assessments, Advising, and Additional Preparation**

**Note:** Categories of courses (e.g. Required, Recommended Electives, other Electives and career and Technical Education) apply to both secondary and postsecondary levels.

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## And Career Pathways Make Economic Sense: Kentucky's Projected ROI (July 2004 – February 2007)

- At least 22 Pathways (to date)
    - Allied Health (14)
    - Advanced Manufacturing (3)
    - Construction (2)
    - Transportation (1)
    - Business (2)
  - KY WINS (Workforce Training Incentive Funds) commitment of \$4.1M
  - Projected project revenue of \$1.1M
  - Cash and in kind contributions of \$7.9M
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## Kentucky Career Pathways Outcomes to date:

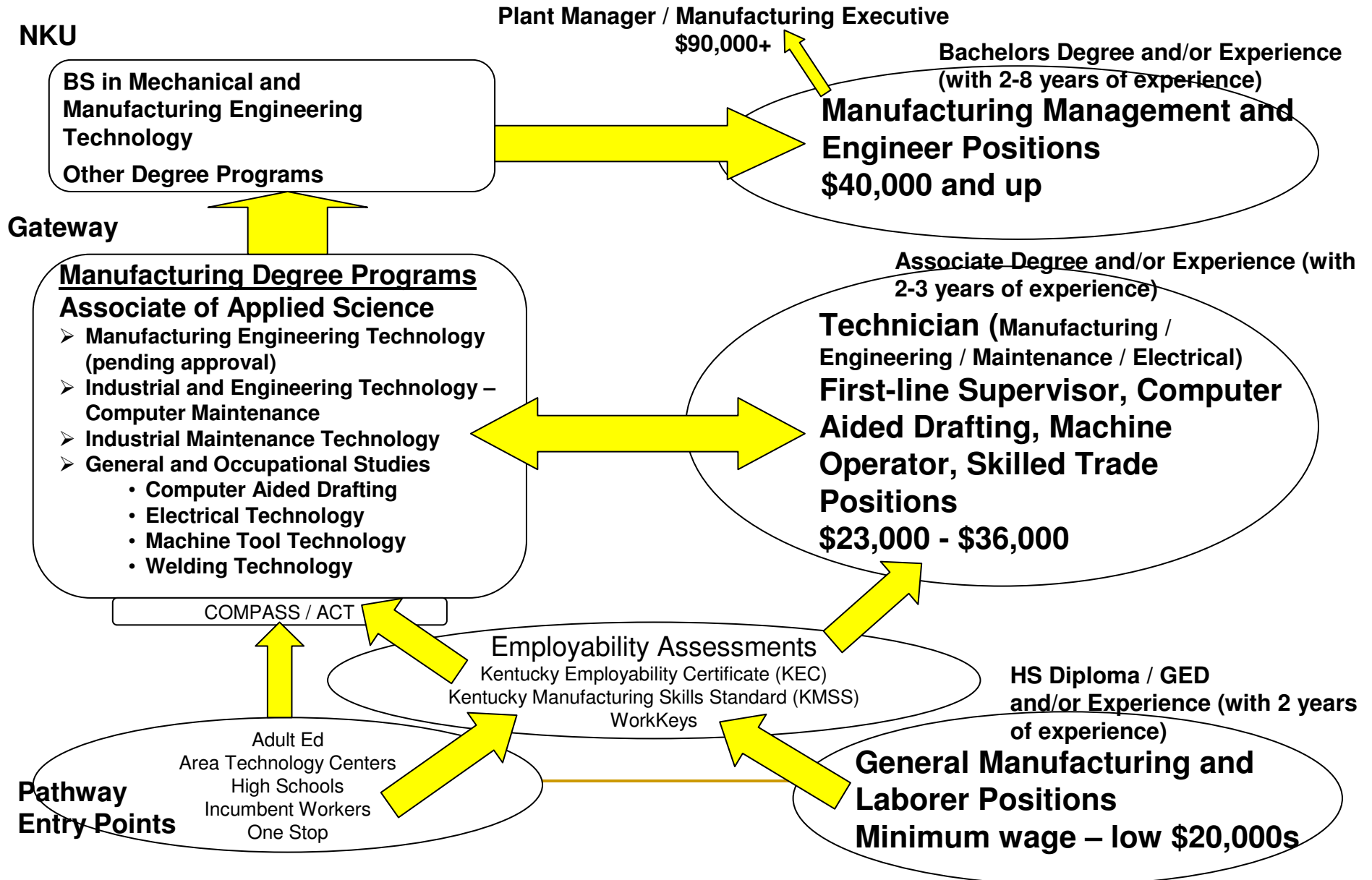
- Approximately 1,685 students served per year
  - Career Pathways students earned 573 credentials since July, 2004
    - 155 Associate Degrees
    - 91 Diplomas
    - 327 Certificates
  - Career Pathways students had a higher retention rate than the KCTCS student population from Fall 2005 to Fall 2006
    - Career Pathways Students 73%
    - KCTCS population 52%
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# Manufacturing Careers Pathway



# Engineering Technician Knowledge and Skills

## Quantitative Ratings

A = 2

B = 1

C = 0

Employers were asked to rate each knowledge and skill area with A being the most important and C being the least important when considering the knowledge and skills required of entry-level engineering technicians.

| Knowledge / Skill Area            | Rating   | Average Rating |
|-----------------------------------|--|----------------|
| Manufacturing Processes           | A, A, A, B, A, A, A, A, A, B, A, A, B, A, B    | 1.9            |
| Math                              | A, A, C, B, A, A, B, B, B, A, A, A, B, B, A, A | 1.6            |
| CAD / CAM                         | B, A, C, B, A, A, B, A, A, A, B, A, A, A       | 1.5            |
| Interpersonal skills              | B, A, A, A, B, C, A, B, C, B, A, A, A, A, A, B | 1.4            |
| Production Operations             | A, A, B, A, B, B, B, A, A, A, B, A, B, C, A, B | 1.4            |
| Co-op Experience                  | A, A, A, B, C, A, B, A, C, B                   | 1.4            |
| Effective speaking                | B, A, B, A, B, B, A, C, B, C, B, A, A, A, A, B | 1.3            |
| Writing                           | C, A, B, A, B, B, A, B, B, C, A, A, B, A, A, B | 1.3            |
| Quality Control                   | A, A, A, B, B, B, B, B, A, B, B, B, B, C, B, C | 1.2            |
| Statistics                        | A, A, C, C, C, B                               | 0.8            |
| Statics / Strength of Materials   | B, A, C, C, C, A                               | 0.8            |
| Maintenance                       | B, A, A, A, A, C, C, B, C, C, C, B, C, C, B, C | 0.8            |
| Tooling                           | C, A, B, C, A, B, C, B, C, B, C, B, C, C, B, A | 0.8            |
| CNC Programming / PLC Programming | C, C, A, C, C, A, C, C, B, A, C, C, C, C, A, A | 0.7            |
| Project Management                | C, C, C, A, A, A, A, B, A, C                   | 0.6            |
| Management                        | C, B, B, B, C, C, B, C, B, B, C, A, C, B, C, C | 0.6            |
| Economics                         | C, A, C, C, C, C                               | 0.3            |
| Cost Accounting / Budgeting       | C, C, C, C, B, C, C, B, A, C                   | 0.2            |

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# What We Heard

## Manufacturing Engineering Technicians need...

- (8) Strong communication and interpersonal skills, the ability to work with others
- (7) Co-op experience – strongly preferred, a plus, the more the better
- (6) Strong math skills – extremely important, grasp concepts, Algebra II, Trigonometry, fractions, decimals
- (5) Speaking and presentation skills
- (5) Project management skills
- (4) Team skills – work in teams to get the job done
- (4) Business-level understanding of manufacturing processes – from order to shipment, how the company makes its products

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(x) = number of times mentioned in interviews

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# What We Heard - Quality Certificate

## Favorable

1. Would want Quality engineers to understand CMM (Coordinate Measurement Machine).
2. QC certificate should include process understanding, gage maintenance and calibration, perhaps not TQM, statistics / SPC in depth, exposure to Six Sigma, understanding of drawings
3. Absolutely saw value in a QC certificate – should cover computer skills, interpersonal skills, communication, problem-solving and basic statistics
4. Person with QC certificate needs knowledge of basic measuring tools – scales, micrometers, CMM machines, video measuring, automatic gauging
5. QC should focus on tolerances
6. Would like more QC experience, more quality engineering focused, not sure that an AAS in Quality provides more than a certificate
7. QC certificate – a plus for people to get hired

## Unfavorable

1. Quality Control and Lean is secondary
2. Not a lot of value in a QC certificate
3. Lean manufacturing of higher value in industry than Quality Control
4. Already does a lot of training in Quality Control and Lean – everyone does it a little bit differently

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# What We Heard - Lean Certificate

## Favorable

1. Does see value in offering a certificate for new employees and current employees who want to formalize their skills.
2. Lean certificate should be 4-5 hours online and 3 hours in a face-to-face simulation
3. Lean manufacturing of higher value in industry than Quality Control
4. Must be able to work in a lean environment – offer suggestions

## Unfavorable

1. Did not see value in a Lean Certificate – need other skills to make Lean work – saw value in having lean topics as part of a QC certificate
2. Lean manufacturing as a part of manufacturing processes
3. Quality Control and Lean is secondary
4. Lean – so many different theories, which one would you focus on
5. Already does a lot of training in Quality Control and Lean – everyone does it a little bit differently

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# Interpreting What We Heard

## Degree program should include...

- Interpersonal skills
- Co-op experience
- Strong math component
- Communication skills – speaking, presenting, writing
- Project management
- An emphasis on working in teams
- Business-level understanding of manufacturing along with some understanding of manufacturing process and production operations
- CAD / CAM introduction
- Quality Control component

# Three New Certificates

## EMBEDDED CERTIFICATES

Are earned with the General Education and Technical Core Courses  
within the AAS degree

Can also be earned independent of the AAS degree

### Integrated Manufacturing Technologies Certificate

(6 courses with 2 labs)

- Electrical Circuits
- Intro to CAD
- Manufacturing Processes
- College Algebra
- Trigonometry
- Statics and Strengths of Materials

### Manufacturing Operations Certificate

(6 courses)

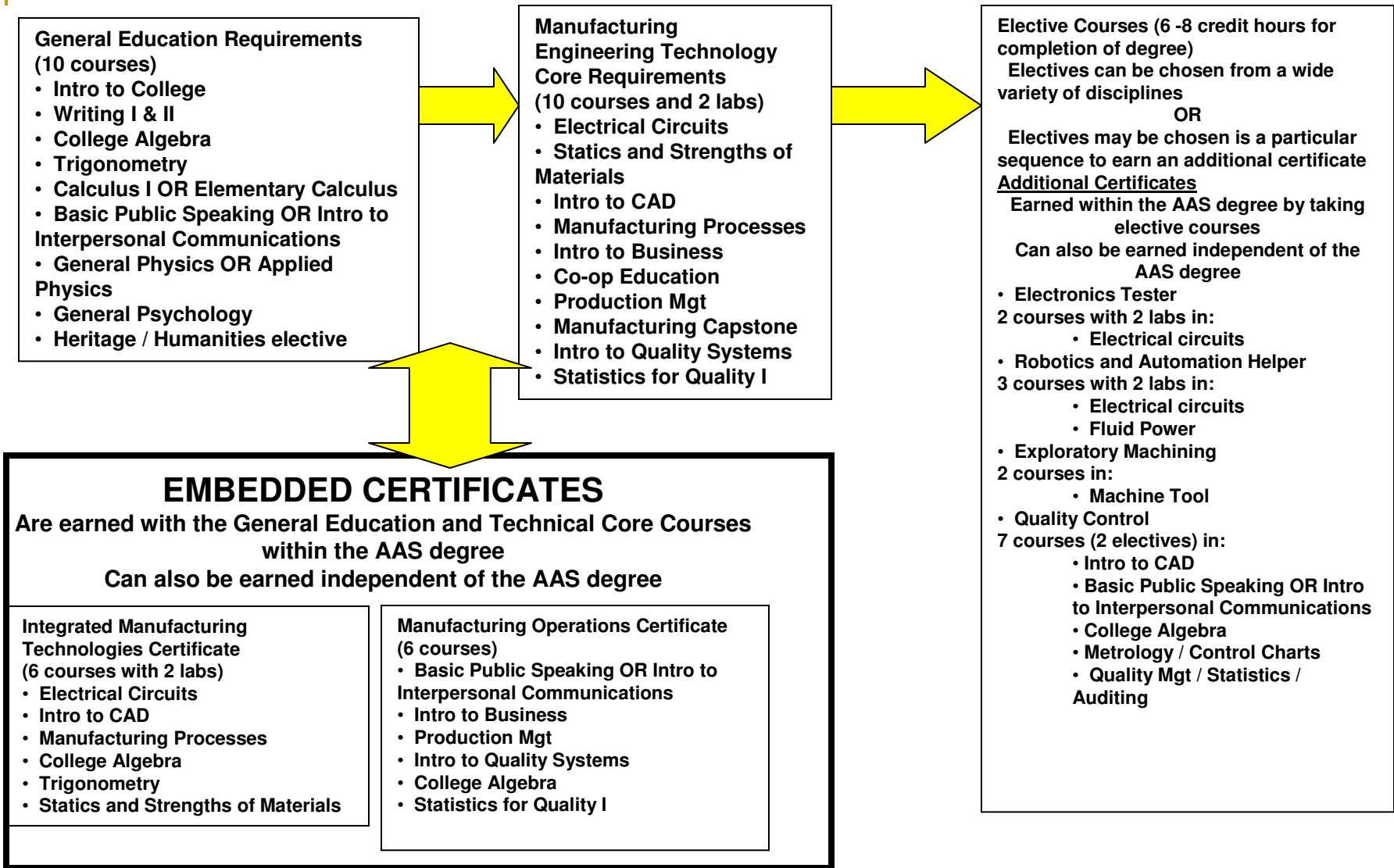
- Basic Public Speaking  
OR Intro to Interpersonal  
Communications
- Intro to Business
- Production Mgt
- Intro to Quality Systems
- College Algebra
- Statistics for Quality I

### Quality Control Certificate

(7 courses)

- Intro to CAD
- Basic Public Speaking OR  
Intro to Interpersonal  
Communications
- Metrology / Control  
Charts (elective course – not  
embedded)
- Intro to Quality Systems
- Quality Audits (elective course  
– not embedded)
- College Algebra
- Statistics for Quality I

# Manufacturing Engineering Technology degree with Associated Certificates



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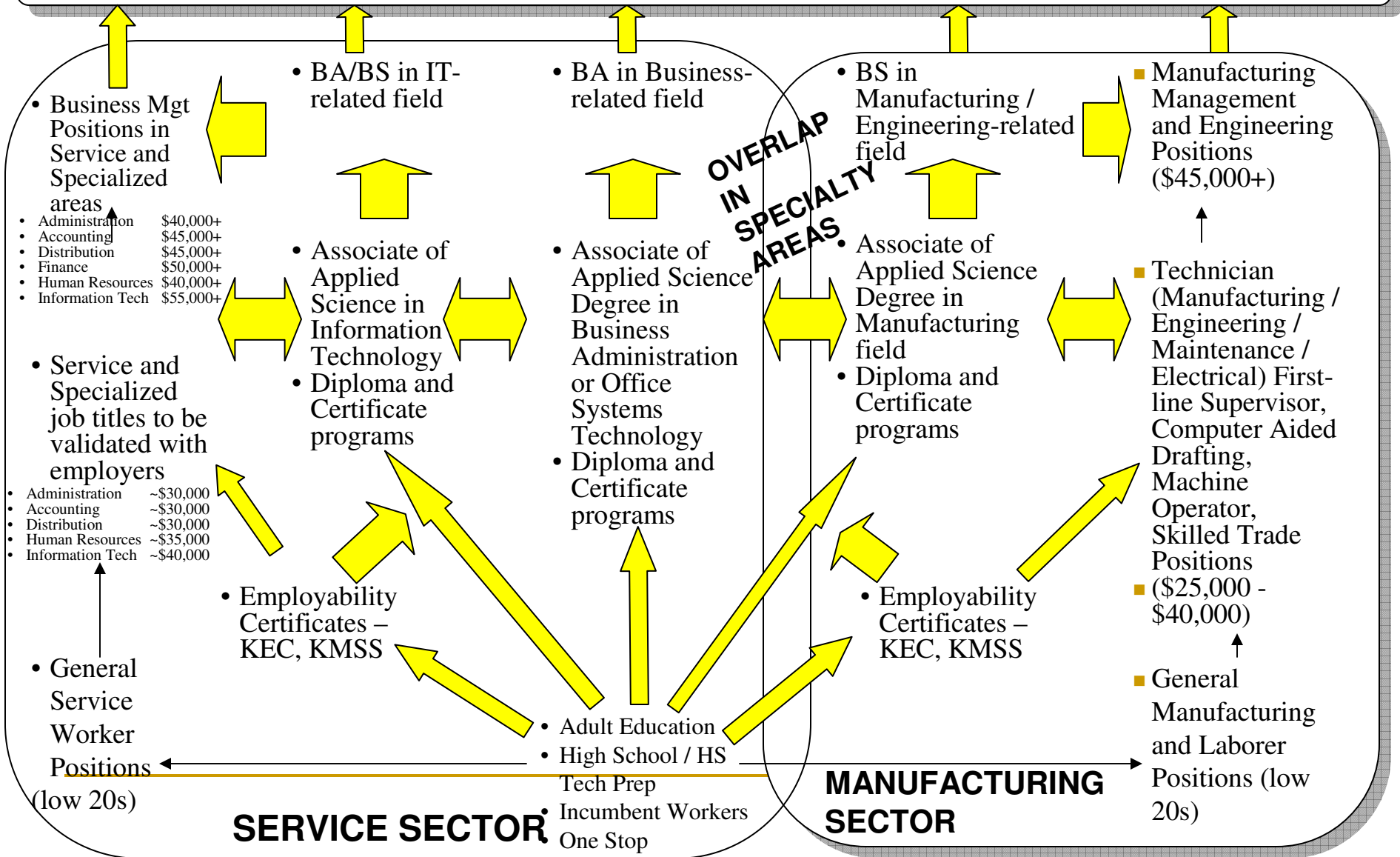
# Project Outcomes

- Increased enrollment in manufacturing programs
  - 72 new students enrolled on the pathway by Fall 2006
- Make Gateway's manufacturing programs more accessible to potential participants
  - Marketing and communication at pathway entry points
  - Recruiter / Advisor positions
  - Marketing materials
- Curriculum alignment with
  - Secondary schools
  - Northern Kentucky University
- The foundation of a manufacturing pathway that is
  - A systematic tool for lifelong learning
  - A data-driven accountability tool
  - A strategic tool for institutional transformation



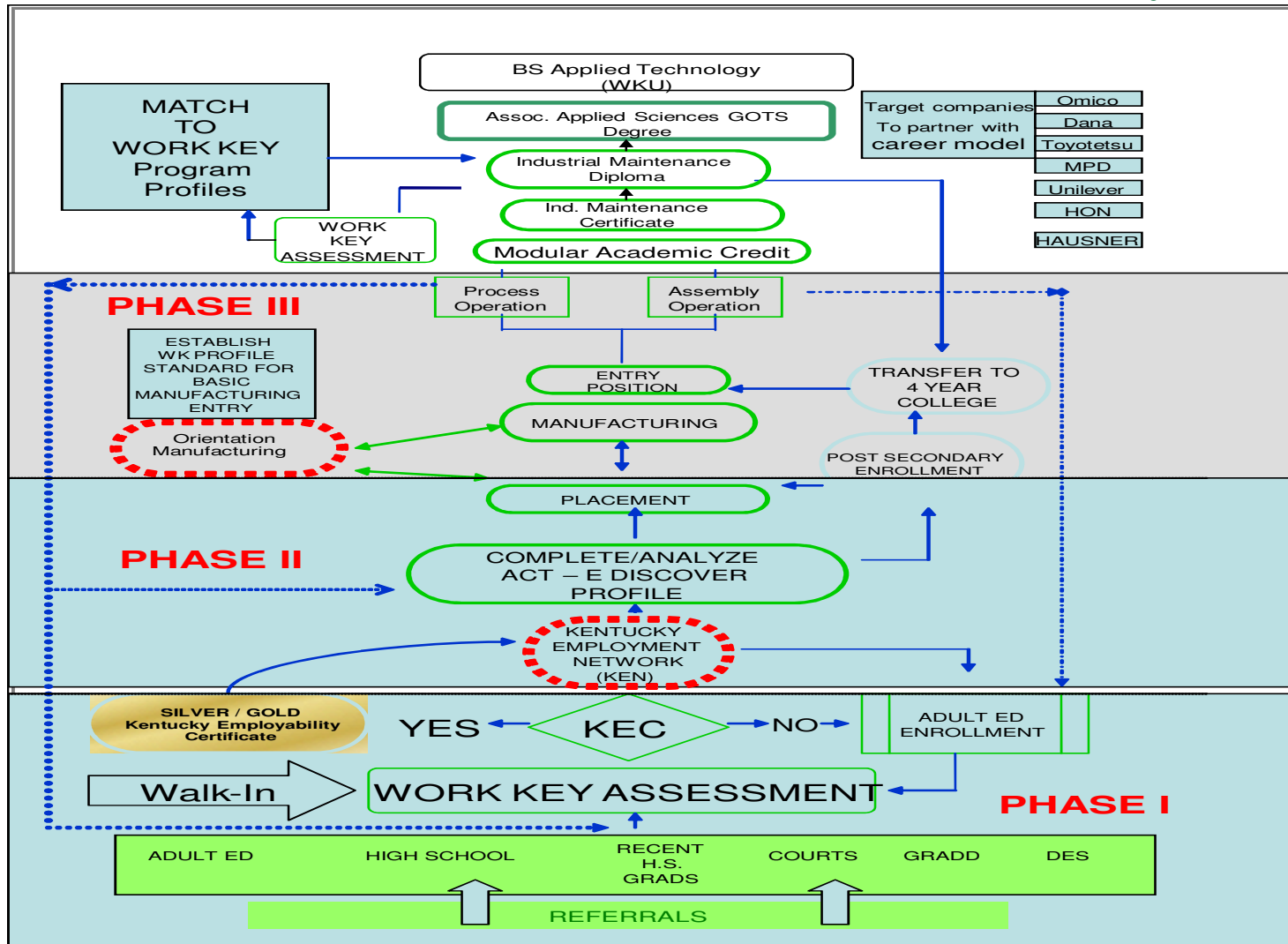
## Business Careers Pathway

**General Management Positions or Business Management Positions with Areas of Specialization (\$90,000+) Sales / Marketing , Accounting / Finance, Human Resources, Operations / Manufacturing, Information Technology**

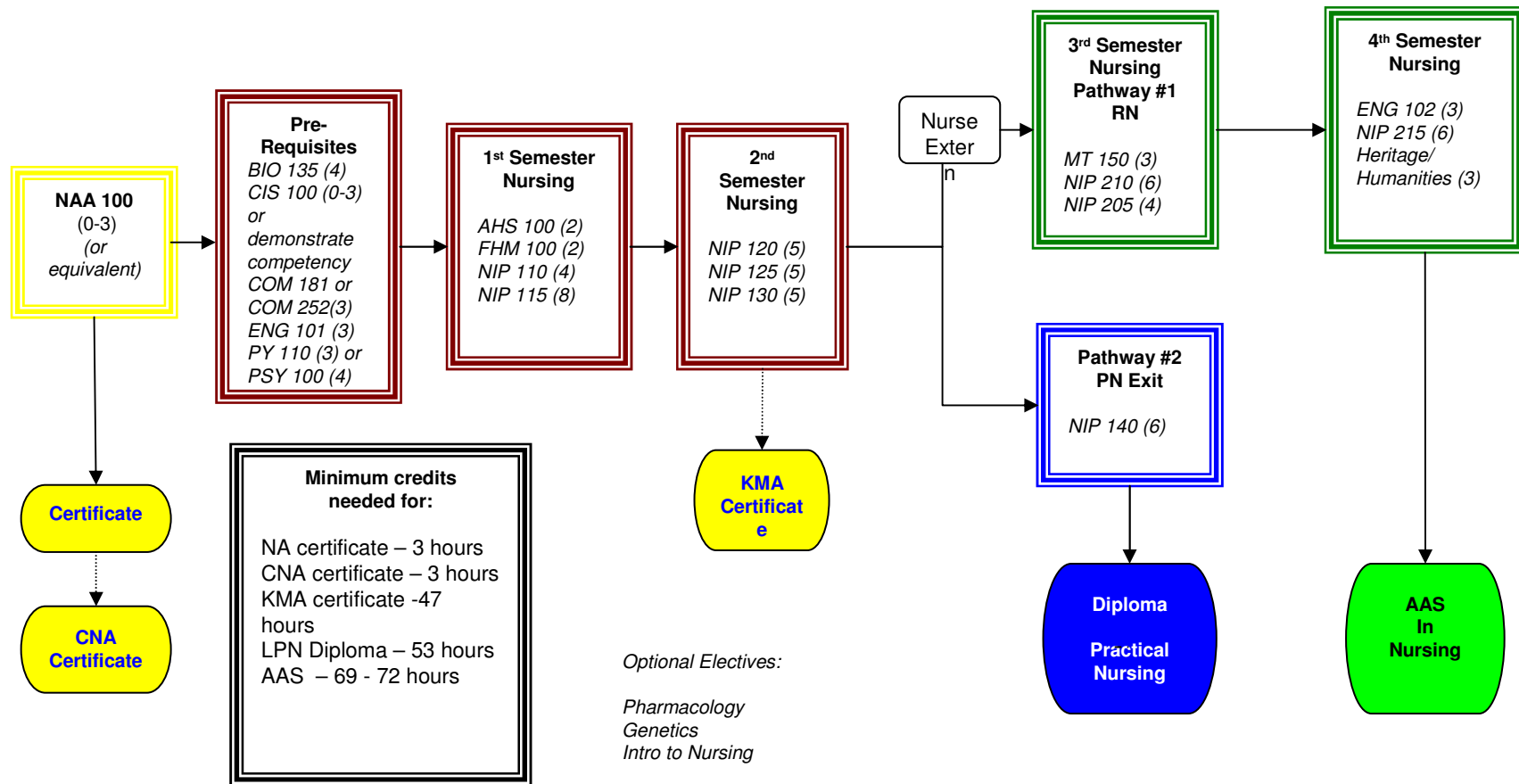


All salaries are estimates and need to be validated with employers.

# Owensboro Community and Technical College's Industrial Maintenance Career Pathway



# Madisonville Community College Nursing Pathway



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# The 5 Ss to Success

Strategic

Systemic

Synergistic

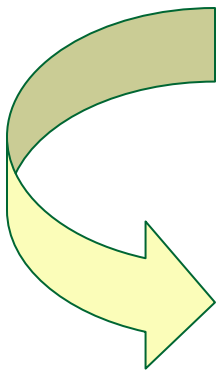
Sustainable

Scalable

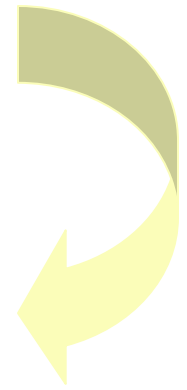
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*The Kentucky Journey  
to Educational Attainment  
and Economic Success*

*“Random Acts of Progress”*



*“Best Practices”*



*“Strategic Systems”*