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Cluster Analysis: A New Tool for Understanding the Role Of the Inner City in a Regional Economy

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Introduction

This project, conducted as part of Arizona State University's Community Outreach Partnership Center grant from the U.S. Department of Housing and Urban Development, examines the location of industry clusters in the Phoenix Metropolitan Area. The objective is to find out if there are identifiable concentrations of industry in Phoenix' inner city areas.

For what purpose? Why is this information important? Its significance is based on a set of ideas, drawn from the work of Harvard Business School Professor Michael Porter and others, that suggests a new approach for both understanding and creating economic success in a global economy. This new approach has public officials addressing new issues, using new tools, and beginning to experience new kinds of results. It is called *cluster-based* economic analysis and strategy development, and there seems to be a consensus emerging that, "if it's done right, it can provide a foundation of useful information about how a local economy works and what can be done to make it better" (Fulton, 1997). Some even see the cluster idea as a doorway to conceptualizing city-suburb linkages and the need for the two to collaborate on inner city development strategy. (ICF-Kaiser, 1996).

New Directions for Economic Analysis and Strategy Development

The central idea behind this new approach is that industry clusters—unique geographic concentrations of companies in related fields—are the key to competitiveness for both enterprises and regions. On the enterprise side, the basic idea is that firms tend to locate near suppliers, customers, important services, and competitors—that is, to "cluster"—for bottom-line reasons. Firms well connected to one another within a regional economy can reduce transaction costs, specialize, exploit one another's specialties, increase rates of innovation, pursue joint solutions to common problems, build a common labor pool, and learn collectively what it takes to be competitive. In other words, clustering gives firms a competitive advantage.

The link between clusters and regional competitiveness is thought to be just as strong. Here, the basic idea is that economic performance—measured in terms of the creation of quality jobs, income, and export growth—is a function of clusters of related industries, rather than single industries. Clusters can occur in all places and in all industries, but most observers find that metropolitan regions have uniquely configured portfolios of industry clusters. Regions succeed most against their global competitors when they have significant clusters of information-intensive, technology-based, globally-oriented industries.

By this view of the economy, clusters are the ultimate "customers" of economic development activities. In other words, if the health of a region depends on the health of its most dynamic clusters, the challenge for communities and their leaders is to develop strategies to influence cluster development and performance to optimize economic benefits for both the constituent firms and the regions in which they are located.

Basing economic development strategies on these "customers" makes cluster intelligence or cluster analysis the backbone of policy formulation. That analysis can, and should, provide several types of information, including which industry groups and clusters are present, which are growing in importance, and which are declining in importance. The analysis may need to determine whether a

group of firms in a region is sufficiently large and interrelated to constitute a cluster. Not every group of firms is a cluster, but some may be “emerging” clusters in need of immediate study or policy support. Cluster analysis can also reveal how industry groups and clusters are distributed throughout the region. The businesses of an industry cluster may be spread throughout a metropolitan region, but particular types of activity tend to concentrate in certain areas. For example, development of advanced financial instruments or fashion design may be conducted in downtown city offices, while other cluster-related activities, such as “back office” data processing or clothing manufacturing, may occur in outlying suburban locations within the region.

Clusters as the Key to Inner City Development

For the most part, it has been countries, states, and some regions that have focused their economic development strategy on industry cluster development. Very few cities have utilized this model. This may be changing, however, because of the tremendous interest generated by Porter’s analysis of and field work in many major cities nationwide. Based on his research and experience, Porter argues in *Harvard Business Review* and elsewhere that a cluster-based economic development strategy for inner cities must focus on developing the clusters within cities, instead of isolated companies, and linking them better to those in the surrounding economy” (Porter, 1997).

In a way, Porter and others have laid down the gauntlet to economic development professionals, policy makers, and even academic researchers to use a cluster approach to improve economic policy. To summarize, this new approach requires communities, cities, regions, states or countries to undertake economic-base analysis for two key purposes:

- (1) identifying concentrations of similar or related firms that are driving the economy, and
- (2) assessing what resources rooted in the city or region, ranging from research universities to cultural attractions to airports and skilled workers, provide these firms, and the clusters of firms, with a competitive advantage in responding to global markets.

Questions can also be asked about defects in economic infrastructure—talent, technology, and infrastructure base—and what can be done to make it better. Information of this nature can help public officials decide on strategies for improving the development and performance of clusters, which in turn, generates economic growth for regions, cities, and firms.

Taking the Challenge

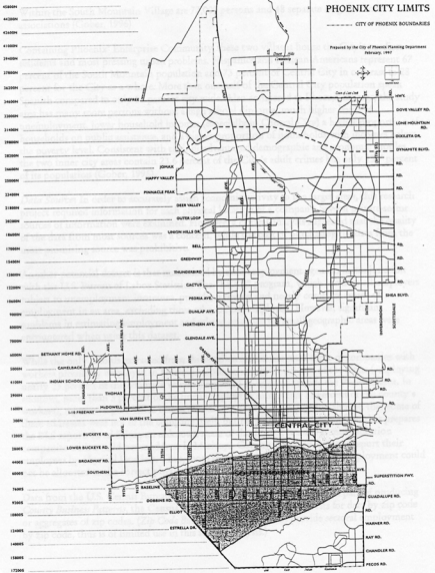
In 1995, as part of the City of Phoenix-ASU Community Outreach Partnership Center (COPC), we decided to “try out” a cluster-based approach to economic analysis and strategy development in the Phoenix metropolitan area. A subset of this analysis would examine the economic conditions in two Phoenix inner city areas, the South Mountain and Central City urban villages, which were our COPC’s “target areas.” We chose to use the cluster framework for this analysis partly to address Porter’s challenge but mostly because the state of Arizona had started down the cluster path several years earlier, one of the first states to use this policy approach to economic development.

When the Arizona Strategic Plan for Economic Development (ASPED) “arrived” on the scene in 1992, many instantly embraced it as a new model for state economic strategies. Its story was carried not only by popular media such as *CNN* and *Business Week*, but also by scholarly journals such as *Public Administration Review*. Moreover, two high-profile national organizations—the Southern

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Growth Policies Board and the Council of Governors' Policy Advisors—endorsed ASPED's cluster concept for other states to consider. Most recently, *World Trade* magazine launched a ten-part series that showcases how Arizona is using its environmental technology cluster organization to ease small and medium-sized firms into the global market place. The National Council for Urban Economic Development (CUED) selected Arizona for the 1996 National Economic Development Export Trade Award based on its use of industry cluster organizations to promote exports.

While the state found a number of advantages to a cluster approach to economic development, its metropolitan areas—Phoenix included—never really pursued it (Waits & Howard, 1996). This is not as surprising as it may seem. As mentioned earlier, so far it has been mostly countries, states, and a few regions that have crafted cluster-based economic development strategies. It is a rather recent phenomenon to find cities even discussing such a strategy, much less crafting one.

In the following sections, we discuss the results of our research. Specifically, we describe the lessons learned from this project, first in terms of understanding the Phoenix Metro area's economy from a variety of perspectives, and second in terms of the roles universities can play in inner city development.

But before we discuss the two sets of lessons learned, some background on our target areas and research methodology is in order.

The setting: The COPC project focused on the city of Phoenix' two poorest "urban villages." (For planning purposes, the city is divided into 12 so-called urban villages.) The Central City Village contains the downtown business district, and South Mountain Village straddles it immediately to the south (see map). In no way are these large villages equivalent to neighborhoods in the traditional sense of small, close-knit residential areas. The Central City Village itself contains about 58,000 residents and 39 functioning neighborhood organizations. Within the South Mountain Village are 77,000 persons and 48 separate neighborhood associations (Gober, 1996).

Containing Phoenix' Enterprise Community, these two villages house the City's neediest residents and most pressing urban problems. Hispanics and African-Americans represent 67 percent of the South Mountain population and 73 percent of Central City in contrast to 28 percent for the City as a whole. More than one-half of the Central City population speak Spanish compared to only 14 percent city wide. Also compared to Phoenix at large, the study area has many more persons without a high school diploma, much higher levels of unemployment, lower household incomes (especially in Central City) a higher proportion of households on public assistance, and a higher proportion of households with incomes below the poverty level. Consistent with their disadvantaged demographic and economic profiles, the two inner city areas contain 23.6 percent of the City's adult crimes but only 13.7 percent of its population (Gober, 1996).

Data Source: In order to accurately assign economic activity to the target areas, this research project required information for each physical location of a company. Several private-sector sources of information were examined. However, a critical analysis suggested that the quality of the data from most sources was a concern, while the cost of purchasing the data from the most promising source was prohibitive.

Another potential dataset is that maintained by state employment agencies in conjunction with the U.S. Bureau of Labor Statistics. The "ES202" program, which includes all employers subject to

unemployment insurance, provides a timely and nearly complete count of employment in an area, excluding those who are self-employed. However, significant problems in estimating employment and related statistics for small geographic areas were encountered when using this dataset.

While the only records extracted from the Arizona ES202 file were those of companies with workers physically employed in Maricopa County, nearly 12 percent of the firms (employing nearly 23 percent of the county's workers) reported an address outside the Phoenix area. In addition, more than 3 percent of the firms (employing more than 11 percent of the county's workers), reported a post office box as the address. Further investigation showed that some of these addresses were not of the company itself, but rather of an accounting firm that prepares the BLS report. In addition, an unknown share of the employment is at multi-location companies with a valid street address in Maricopa County, but which do not report their employees by physical location. Thus, more than one-third of the county's employment could not be allocated to the correct physical location within the county.

Data from the U.S. Census Bureau ultimately was used in this research. As part of producing *County Business Patterns*, the Census Bureau responds to special requests for data by zip code or aggregates of zip codes. (*Zip Code Business Patterns* does not provide sectoral employment by zip code, thus is of limited use in this sort of analysis.)

The Census Bureau information is subject to the same physical location problems as the ES202 file. However, the geographic imprecision is of a much lesser magnitude because of various efforts by Census Bureau staff to determine employment by physical location. For example, zip codes used solely for post office boxes were far less common in the Census Bureau data than in the ES202 file.

The Census Bureau data, however, excludes the farming and government sectors, as well as railroad employees, domestic service workers, and self-employed persons. Further, the information is more than two years old by the time it becomes available. Like the ES202 file, laws protecting confidentiality can significantly limit the desired output. To avoid a large number of data cells in which the employment figure is suppressed, users need to be familiar with the data and not request too fine a level of industrial/geographic detail.

Geographic unit of analysis: Geographically, the most detailed economic data are by zip code, but zip code boundaries do not match those of the target areas. For this project, the South Mountain area was assigned three zip codes that reasonably approximate the Village's boundaries. Six zip codes were selected for the Central City area but the sum of the six added miles, population, and jobs to the Central City Village. Post office box zip codes also were assigned to the two areas based on the physical location of the post office to which the PO box mail is delivered. This hardly had an effect on the South Mountain employment estimate, but accounted for some increase in jobs in the expanded Central City area.

The two urban village units were compared to a unit of the country as a whole (Maricopa County—this county is generally considered synonymous with the Phoenix metro-area) and to 11 other county subset areas.

Economic unit of measurement: Employment was used as the basic unit of measurement, but various forms of this measure could have been applied. While total employment is easy to

understand, it is misleading if the geographic size or population of subcounty units varies substantially, as it did in this analysis.

Employment per square mile was also a possibility for this research, but is not so useful on the urban fringe. Zip codes at the fringe often consist of many square miles, some of which may be developed but others may be nearly vacant of human activity.

Finally, geographic variations in industrial composition could have been analyzed through sectoral shares. However, vast differences in economic activity by subcounty area make interpretation of this measure difficult. For example, a high sectoral share for a particular industry in an outlying area may be less important from a metro-wide perspective than a low sectoral share in the central core.

Thus, the measure most used in this research was *employment per capita*, which avoids each of the above problems.

Industry Definitions: Two alternative industry definitions were used in this research. In the first alternative, all two-digit SIC codes in the Census Bureau dataset were aggregated into 21 groups (see Table 1). Major industries were subdivided whenever possible while trying to avoid disclosure problems in industry groups in the subcounty areas. The second definition was that of industry clusters. A study of the Arizona economy by SRI International and DRI/McGraw-Hill established eight key industry clusters and three “potential” clusters that continue to be used in Arizona economic development.

Lessons About the Role of Phoenix Central City in the Regional Economy

Our research shows that the central city plays many essential roles as part of the larger metropolitan marketplace. It is, for example, the center for financial, business and professional services, for government services, and for cultural, entertainment and tourism attractions. However, the news is not all good because there is a substantial mismatch between the jobs generated by the industries concentrated in the target areas and the skills central city residents offer to the job market.

Another lesson learned from this project is that economic information and analytic tools have not kept pace with economic development theory and practice. This lesson is discussed first, since it also explains the caveats to our research methods and findings.

1. Most conventional datasets and analytic methods were not designed for cluster analysis. It takes creativity, resources and perseverance to get beyond this pitfall.

In theory, cluster analysis will help us better understand the economy and deploy economic development resources more strategically. Those goals can be met in practice too, but it takes substantial effort and new expertise to assemble quality datasets, perform analyses, and provide information useful to cluster identification and intelligence. And unfortunately, it takes even more effort when smaller geographic areas—for example inner cities—are targeted for analysis.

The pitfalls discussed below helps explain why only a handful of metropolitan areas have started down the cluster analysis path, and why those few have relied heavily on major consulting firms and

their databases for cluster analysis. Recognizing the problems cities face in employing clusters, HUD launched a new initiative—a “Metropolitan Regional Strategy”—in 1996 to put national resources behind an invitation to cities to define their own clusters and strategies. To kick things off, HUD completed in-depth studies on the economic dynamics of 10 metro areas. Unfortunately, Phoenix was not among the first round of studies. Thus we were left to our own devices to get beyond the data and analytic pitfalls. These included:

- *Shortcoming in existing datasets on the economic composition of small geographic areas.* The limiting factor in conducting subcounty economic research is data availability. The most common sources of employment and other economic data are available only by state and county; most do not provide much industry detail, especially by county. To conduct the research discussed in this paper, finding a source of industry detail for subcounty areas was a major challenge as discussed in the previous section.
- *Outdated “standard industry classification” (SIC) codes.* Headlines to a *Wall Street Journal* article succinctly telegraphed this issue: “New Economy, Old Data Leave Planners Groping” (Wartzman, 1997). The bottom line is that SIC codes, which classify all businesses into categories, are so outdated that they do not adequately identify many of the major employers in the new economy, particularly in technology fields. One California economist figures that many Internet-related companies (*e.g.*, a Web-site designer) wind up in the infamous “Business Services, Not Elsewhere Classified” grouping because a more definitive slot has not been established. As a result, he says, it is difficult to accurately assess the impact of these businesses and their workers on the California economy (Wartzman, 1997). We found the same situation in Arizona, especially with optics, environmental technology and bioscience industries.
- *Few guidelines on what business classifications—SIC Codes—to “lump” together to yield working definitions for clusters.* Clusters take shape differently in each region, and they are more than simply a set of seemingly related industry groups or SIC codes. Nevertheless, a “by the numbers” analysis is the first step to identify clusters, and for now, SIC data, contained in standard state or federal reporting systems, is the first step in determining such things as industry concentration, size, growth and linkage. For regions and analysts newly embarking on cluster analysis the simple task of grouping or reconfiguring SIC codes into hypothesized clusters for further study can be a daunting prospect, especially without some “tutoring” from regions or experts who are experienced in these matters. Fortunately, DRI/McGraw-Hill had already identified key clusters in the Arizona economy and we could use their working definitions for our analysis of the Phoenix metropolitan area. Had we not had that help, we could have easily been “scared away” from cluster analysis, especially given our limited resources. However, even with DRI/McGraw Hill’s prior work in hand, we still had to seek guidance on what to look for in identifying component firms.
- *Cluster studies are a complex undertaking that allows for very few shortcuts.* The magnitude of the process is captured by a New York State policy analyst’s description of that state’s approach to cluster analysis: “Our two-stage method is to use quantitative analysis as a first cut, followed by qualitative analysis and additional quantitative analysis. The first state of this analysis employs factor analysis and expert interviews to identify a set of clusters. The second stage applies input-output analysis, location quotients, shift-share analysis, and focus groups to assess each cluster” (Held, 1996). Essentially, the analyst is

saying that traditional economic analytic methods can answer important sets of questions about the location, growth patterns and purchasing needs of businesses, all of which are useful to define and describe clusters. But he is also saying that most conventional analysis cannot capture and describe the underlying dynamics and energy of clusters, features that distinguish an industry concentration from a cluster. These “softer” elements of clusters can only be revealed through surveys, personal interviews, or other creative means. In short, conventional data analysis that provides location patterns and counts of employers and employees, while valuable, is but a start in crafting the kind of analysis needed to make substantive policy choices about how to develop and improve the performance of clusters. The implication for regions, cities and even universities is that a cluster approach to economic development is a long-term, resource-intensive endeavor. It can, however, be done in stages as we did in Phoenix.

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2. The Phoenix metro area has a highly diverse urban core that provides high-wage jobs in some of the most globally competitive technology and advanced services industries.
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Like other major cities in the U.S., Phoenix has experienced a decentralization of jobs and people, and the central city (the target areas) has very poor residents compared to the rest of the metro area. But amid this distressed residential environment is the metropolitan area’s largest and best paid employment core.

According to County Business Patterns, the total number of non-farm, non-government jobs in Maricopa County in 1994 was 959,158. County-wide, the employment-to-population ratio was quite close to the national average. The number of non-farm, non-government jobs per 1,000 residents was 376.

In South Mountain Village, employment was 30,758. The employee-to-population figure was only 5 percent below the county average at 356. Such a lower figure is typical of areas outside the central core.

Employment was substantially higher in Central City Village, as would be expected of a central business district. In March 1994, 146,078 were employed. The number of employees per 1,000 residents was 1,212 (employment exceeded population), more than three times higher than the county average. These figures do not reflect the substantial government employment found in this Village. Phoenix City Hall, the state capital, and the county seat all are located within this Village.

County-wide, payroll per employee averaged \$25,021 in 1994. At \$24,988, the South Mountain Village average was essentially the same. In the Central City Village, the average wage was 25 percent higher at \$31,185—the highest in the metro area.

The industrial mix in South Mountain Village is considerably different from the county total. Most of the sectors with a relatively large presence in this Village pay middle to slightly above average wages. These include manufacturing, transportation, wholesale trade, and construction. Few jobs are present in some industries. Some are high-paying industries, such as health services, professional services, finance, and insurance, but others are low-paying sectors, such as retail trade and hotels/entertainment. In general, employment is high in goods-producing industries as well as transportation and wholesale trade. Employment is low in nearly all of the other services industries.

Table 1
Employment per 1,000 Residents in 1994: Target Areas

	Maricopa County	South Mountain	Central City
Total	376	356	1,212
Industry Group			
Agricultural Services	3	9	4
Mining & Miscellaneous	1	2	3
Construction	29	49	60
Manufacturing			
Non-durables	13	20	58
High-technology	23	26	112
Other durables	19	53	59
Transportation	17	29	153
CPU ¹	9	3	70
Wholesale Trade	24	46	82
Restaurants & Bars	31	10	51
Other Retail Trade	50	32	40
Finance	15	1	41
Insurance	10	1	13
Real Estate	8	1	20
Services:			
Hotels & Entertainment	16	3	40
Personal & Miscellaneous	8	6	29
Business	31	20	91
Repair	8	13	28
Health	34	11	149
Legal & EARM ²	14	6	63
ESM ³	16	14	46

Source: Calculated from data of the U.S. Department of Commerce, Bureau of the Census: *County Business Patterns*, special zip code business patterns tabulations, and the 1995 special census for Maricopa County.

1. Communications and Public Utilities
2. Engineering, Accounting, Research, and Management Services
3. Educational, Social, and Membership Services

Central City Village has a very large number of jobs in nearly every industry, given both the population and the aerial size of the Village. Most sectors with relatively few jobs in South Mountain Village have a substantial number of jobs in Central City Village.

Based on sectoral shares, employment in the Central City is especially high in transportation, communications and public utilities, health and professional services, and some types of manufacturing, all high-paying industries. Sectoral shares are relatively low in retail trade and construction.

3. The Phoenix central city is the core location for three of five key industry clusters that drive the regional and state economies. This leaves little doubt about the essential role the central city plays in the economy.

Arizona can boast eight industry clusters that are fully in gear, helping to create a diverse economy and making substantial contributions to the state's bottom line and overall competitiveness:

Information Industries	Transportation/Distribution Industries
Health and Biomedical Industries	Tourism and Experience Industries
Business Services Industries	Aerospace Industries
Minerals and Mining Industries	Agriculture/Food Processing Industries

Two of the original clusters—information industries and aerospace industries—have combined into one high-technology cluster. It includes various subsectors within the manufacturing industries of machinery and computer equipment, electronic and other electronic equipment, transportation equipment, and instruments.

Of the eight clusters defined in Arizona as part of the ASPED process, the minerals and mining industries cluster consists of very few establishments in Maricopa County, thus was not included in this analysis. The agriculture and food processing industries cluster had to be excluded because farms are not included in the Census Bureau's data.

At least three additional clusters have subsequently been identified as up-and-coming: optics, software, and environmental technologies. By their nature, these potential or emerging clusters are not very obvious and are, in fact, too small to examine at a small geographic level given the data limitations discussed in the first lesson.

For these reasons, our analysis of the Phoenix metropolitan region focuses on five clusters: high-technology; transportation/distribution; health and biomedical; tourism; and business services (see Table 2). And to examine the industrial composition of the central city vis-à-vis the metropolitan region, the industry clusters in the two target areas—South Mountain and Central City Villages—were compared first to Maricopa County totals, and second to 11 other areas into which the developed part of Maricopa County was subdivided (See Table 3).

Overall per capita employment in Central City Village was 3.2 times higher than the county total and 50 percent higher than that in the next highest ranked subcounty area. In three of the five clusters, Central City Village's per capita employment was highest of the 13 areas. It was among the leaders in the other two clusters.

Per capita employment in South Mountain Village was slightly below the county total and ranked eighth among the 13 subcounty areas. Per capita employment was quite low in three of five clusters, but ranked second in one cluster.

Table 2
Industry Clusters

	Maricopa County		Central City Village		South Mountain Village	
	Share of Employment	Payroll per Employee	Share of Employment	Payroll per Employee	Share of Employment	Payroll per Employee
High Technology	5.6%	\$43,300	7.5%	NA	6.3%	\$26,900
Transportation	4.5	26,600	12.6	26,700	8.0	21,700
Health & Biomedical	9.2	31,400	12.3	32,600	3.0	23,800
Tourism	12.5	10,800	8.3	13,400	3.5	9,900
Business Services	18.5	27,100	17.2	31,600	8.3	22,200

NA= Could not be estimated because of disclosure restrictions.

Source: Calculated from data of the U.S. Department of Commerce, Bureau of the Census: *County Business Patterns*, special zip code business patterns tabulations, and the 1995 special census for Maricopa County.

Table 3
Employment per 1,000 Residents in 1994 by Subcounty Areas

	Industry Cluster					
	Total	High Technology	Transportation	Health & Biomedical	Tourism	Business Services
Central City Village	1,212	91	153	149	101	208
South Mountain Village	356	22	29	11	12	30
Maricopa County	376	21	17	34	47	70
Tempe	600	57	8	23	62	155
Central Mesa	444	41	4	54	62	62
East Mesa	162	17	2	17	24	14
Southeast County	206	17	2	14	25	17
East Central Phoenix	799	0	14	45	113	337
Paradise Valley	486	1	3	52	128	96
Scottsdale	576	51	6	68	120	116
Northeast County	234	2	3	22	49	35
Black Canyon	389	28	10	23	46	89
West Central Phoenix	283	1	22	25	30	49
Glendale	193	11	4	20	24	16

Source: Calculated from data of the U.S. Department of Commerce, Bureau of the Census: *County Business Patterns*, special zip code business patterns tabulations, and the 1995 special census for Maricopa County.

By cluster, this research shows:

The Central City Village ranked first among the 13 subcounty areas in the **high technology cluster**, with per capita employment more than four times the county total and 60 percent higher than the second ranked subcounty area. In South Mountain Village, per capita employment was about equal to the county average.

The **transportation/distribution industries cluster**, which includes all transportation industries, is very highly concentrated in Central City Village, in part because of the location of Sky Harbor Airport in the Village. Per capita employment was nine times the county total and more than five times that in South Mountain Village, which ranked second.

The **health and biomedical industries cluster** includes health services and manufacturing of drugs and medical instruments. However, nearly all of the economic activity in this cluster in Maricopa County is in health services. Central City Village again is dominant in this cluster with per capita employment more than four times the county total and more than twice that of the second ranked subcounty area. South Mountain Village ranked last in this cluster.

The **tourism industries cluster** includes several services sectors and eating and drinking places. This cluster is more evenly spread around the metro area than the other clusters. Its highest concentration is in Paradise Valley-Scottsdale-East Central Phoenix, but per capita employment in Central City Village was only a little lower. In contrast, South Mountain Village ranked last.

The **business services cluster** includes finance, insurance, business services, legal services, and engineering, accounting, research, and management services. It is most highly concentrated in East Central Phoenix, which includes East Camelback Road. While per capita employment in Central City Village was 40 percent lower than in East Central Phoenix, it was triple the county total, ranking second. South Mountain Village ranked tenth.

Given this analysis of the situation, it appears that the Phoenix central city provides competitive advantages for three or more industry clusters. Clearly, there needs to be further examination of those advantages. Porter's research suggests the "genuine competitive advantages of inner cities" falls into four areas: strategic location, integration with regional clusters, unmet local demand, and human resources (Porter, 1995). He maintains a successful strategy for inner cities "will require an understanding of what is unique about each inner city, how to build on its advantages, and a plan to eliminate or reduce the many disadvantages to conducting business. This process will require the commitment and involvement of business, government and the non-profit sector"(Porter, 1997).

4. The presence of good jobs in the inner city does not ensure that inner city residents will be employed at these jobs, or employed at all.

As this research shows, many jobs exist within a few miles of the homes of residents of South Mountain Village and Central City Village. Though the jobs are tilted toward high-wage industries, jobs are numerous in all industries and in all pay ranges. Thus, other causes than a lack of jobs must be found for the low incomes and low employment-to-population ratios present in these inner city areas.

One such factor is the very low educational attainments prevalent in this inner city area. Another factor, identified by Gober in a study also conducted as part of our COPC project, is that many living in this area are legally ineligible to work because of their status as illegal immigrants (Gober, 1996).

Further, Gober notes that proximity of jobs to residences is not a necessity. She points out that low-income workers in the Phoenix inner city have access to automobiles, are willing to, and actually do, drive long distances to work, are not locationally constrained, and do not particularly prefer nearby job opportunities.

This implies that future strategies and policies to improve inner city conditions in Phoenix need not focus on job creation. Rather, emphasis should be placed on raising the labor force marketability of central city residents, through enhanced educational attainment and job training. Gober comes to the same conclusion: that the problem is employability and that the solution is education, training, and family-strengthening programs.

Conclusions and Lessons About the Role of the University

The preceding sections of this article discuss what was learned from our research on economic clusters in two inner city areas of Phoenix and certain surrounding suburbs. It clearly documents how important it is to take the time to analyze the economy before acting, and more importantly, to analyze the economy from the perspective of industry clusters rather than individual companies. Our research shows that the Phoenix metropolitan area may not fit the traditional model that has jobs, wealth and economic opportunity migrating out-ward, leaving behind isolated, economically disadvantaged inner city areas. The best evidence to counter this traditional view is the fact that the centers of at least three clusters driving the regional and state economies are located in the Phoenix central city. Moreover, these are primarily concentrations of firms in “new economy” industries—*e.g.*, advanced business support services for corporations—rather than “old economy” industries—*e.g.*, blue collar manufacturing—which means these firms are likely to continue to be an important part of the regional, state, national and even international economy in the future. The implications of this information for economic strategy development for both the inner city area and the metro region as a whole are obviously significant.

But this is not the entire story of our data and our conclusions. In addition, what was learned during the course of this research—and during the course of our entire COPC project for that matter—reveal important lessons about the role of universities in urban economic revitalization.

- *Universities are more empowered than cities to be “on the cutting edge” of economic development concepts.* This lesson is not a criticism of city departments; rather, it is recognition of the *differing missions* of universities and cities as institutions. City departments, in this case ones that deal with economic development, are usually under pressure from constituents to solve *immediate* economic problems; that is, they often must deal with highly political situations. This responsibility can be especially daunting when addressing the economic problems of inner city areas, such as dire personal poverty, insufficient access to business services, and weak infrastructure. As such, cities often must address economic development issues in these areas as a series of tactical activities, as opposed to a longer-term and comprehensive strategy. On the other hand, universities are not subject to the same pressures as a city bureaucracy. The university heritage is to conduct research on issues rather than to provide direct service to solve them. Therefore, university faculty and staff who specialize in economic development can take a long-range and perhaps “bigger picture” view of what new strategies should be considered—like clusters—to create wealth in the so-called inner city. Fortunately, the differing missions of each institution are complimentary; a combination of cutting edge economic research and practical application can be a very powerful tool for revitalization of impoverished urban areas.
- *Universities can “champion” unique or controversial policies for urban revitalization with relatively little risk.* This lesson is, of course, closely related to the previous point one. Since universities are in the “idea” business, they can afford to suggest policies that defy conventional wisdom and “the way things have always been done.” This is not to suggest that universities can be cavalier about their recommendations; quite the contrary. Instead, it means that universities are in a good position to propose new approaches to solving tough economic problems without being subject to the same political pressures as many other institutions and organizations would be. This is a particularly valuable role for universities when it comes to addressing the tough economic problems of the inner city where governments have long-struggled to help residents achieve success.
- *Interdisciplinary research is tough to conduct, but I can produce significant payoffs.* The research on clusters that was conducted under the aegis of our COPC grant was clearly multi-disciplinary. Its primary researchers were from two different colleges at Arizona State University (the College of Business and the College of Public Programs) who used, among other work, research produced for COPC by faculty in the College of Liberal Arts and the College of Engineering. Unfortunately, the “natural” barriers in most universities to such cross-disciplinary projects are very real. They can include simple things such as differing physical locations among principal researchers and complicated things such as which academic unit will receive what share of indirect cost recovery for sponsored research. And, of course, there are often differing perspectives on research methodologies and standards between different academic disciplines. Notwithstanding such challenges, the various academic perspectives represented here (*i.e.*, economics, public policy, urban geography) were successfully blended to “add value” to the final analysis and report. Indeed, without such a combination of talents, the study would not have been undertaken in the first place.
- *Universities have access to vast amounts of information that can be valuable to inner city economic prospects.* During the course of this study, its researchers were constantly challenged by data collection problems. However, it is incumbent upon universities to know where

and how information can be obtained. In this case, the researchers had to really persevere when confronted with complicated issues of data collection, applicability and quality. But, one strength of university staff is typically the knowledge-base and ability to create alternative ways of getting information necessary for the successful conduct of important research. A by-product of such endeavors is often that potentially valuable data sets—even when considered but rejected—are nonetheless identified. Then, once they have been linked to a research question or policy topic, they may become useful in a future research endeavor. Such is the case with this study where many data-bases were reviewed before a final one was selected as the most appropriate.

- *It is hard for universities to sustain interest in the application of new ideas.* Although the aforementioned lessons point out the unique and potentially valuable role which universities can play in the economic revitalization of inner cities, university contributions in this policy area can also easily be overlooked or dismissed. In some cases, this is due to politics; in others, a university can just be too far out in front. As mentioned earlier in this paper, cities are relative late-comers to considering cluster theory as the basis for economic development policy. Indeed, the cluster approach may seem esoteric to some people in spite of its potential value. In situations like this, a university must sustain interest and promote understanding of a new concept over a long period of time. In the case of Arizona, it has taken years for certain key state organizations to recognize the utility of economic clusters. But, with substantial and enduring help from the state's universities, many public officials and private sector leaders are now adopting clusters as a primary economic development strategy. It should be pointed out, however, that there was a long period of time between when Arizona State University (along with its partners on the ASPED project) introduced clusters as an economic concept to the state and when strategies based on this concept actually took effect. And, during that period, the universities had to “stick with it” with very little compensation.

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