ECONOMIC IMPACT OF RENOVATION SPENDING AT KANSAS BOARD OF REGENTS UNIVERSITIES
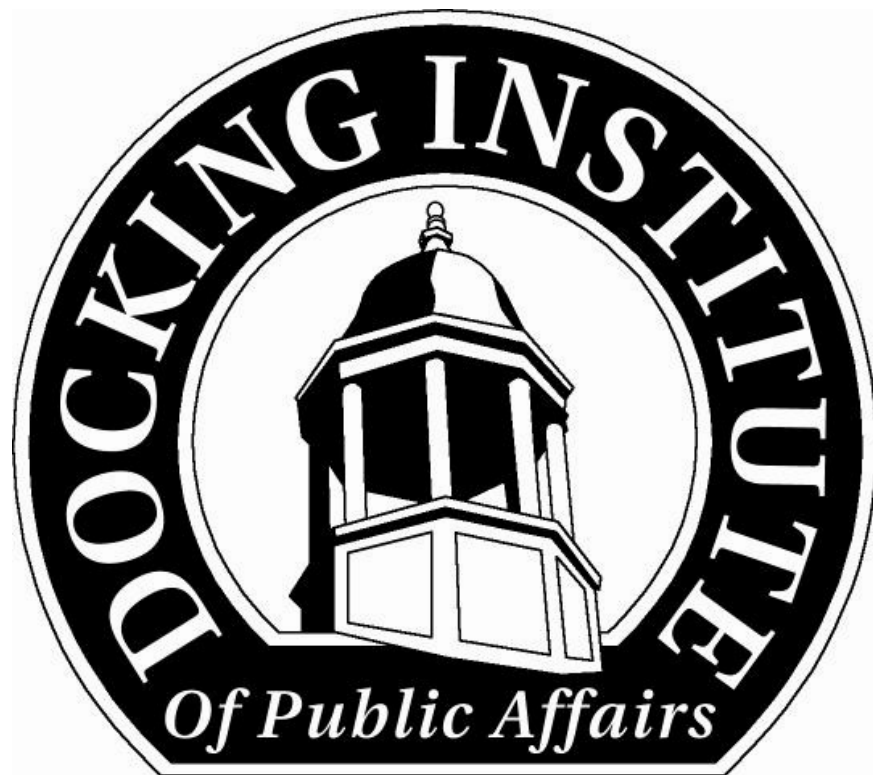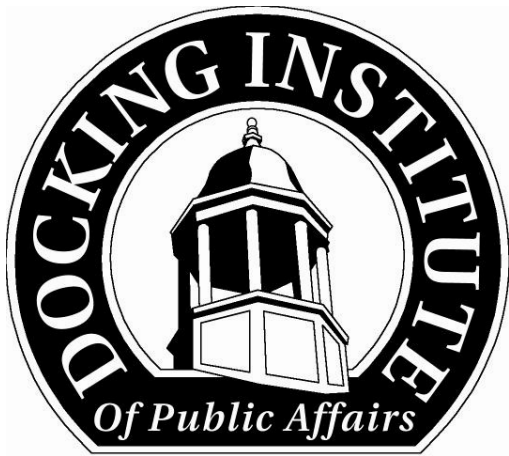

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Report by
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Economic Impact Methodology Used in this Study

Effective planning for public and private sector projects requires a systematic analysis of the impacts of these projects on the affected region. How a regional (State) economy responds to changes in economic activity is largely determined by the buy-sell relationships among companies located within that region. Input-Output (I-O) models estimate inter-industry relationships in a region by measuring the distribution of inputs purchased and output sold by each industry. Using I-O models, it is possible to calculate how the impact of one dollar "ripples" through out the regional economy, creating additional expenditures and jobs. An economic multiplier is a measure of the ripple effect that an initial expenditure has on the regional economy.

Direct, Indirect and Induced Effects

The direct impact expenditures generate a multiplier effect within the regional economy. Because of the sales resulting from the direct expenditures, businesses will purchase goods and services from their suppliers to support these sales. This increased demand continues down the supply chain. This is referred to as indirect impact. As a result of the direct and indirect impacts the level of household income throughout the economy will increase as a result of increased employment, a proportion of this increased income will be re-spent on final goods and services: this is the induced effect. The total multiplier effect is the sum of the three components: the direct effects plus indirect effects plus induced effects.

This study utilizes regional I-O multipliers from the Regional Industrial Multiplier System (RIMS II) model developed by the U.S. Department of Commerce, Bureau of Economic Analysis. The model traces the interindustry flow of business activity in the State of Kansas. It contains multipliers for output, earnings and employment.

- The output multiplier demonstrates how much Kansas total output of goods and services increases in response to each dollar of spending associated with the proposed project.
- The earnings multiplier demonstrates the increase in Kansas earnings associated with each dollar of spending for the proposed project.
- The employment multiplier indicates how many jobs are likely to be created throughout the Kansas economy in response to each million dollars of spending on the proposed project.

Accuracy of RIMS II

Empirical tests indicate that RIMS II yields multipliers that are not substantially different in magnitude from those generated by regional I-O models based on relatively expensive surveys. For example, a comparison of 224 industry-specific multipliers from survey-based tables for Texas, Washington, and West Virginia indicates that the RIMS II average multipliers overestimate the average multipliers from the survey-based tables by approximately 5 percent. For the majority of individual industry-specific multipliers, the difference between RIMS II and

survey-based multipliers is less than 10 percent. In addition, RIMS II and survey multipliers show statistically similar distributions of affected industries.[1]

Advantages of RIMS II

There are numerous advantages to using RIMS II. First, the accessibility of the main data sources makes it possible to estimate regional multipliers without conducting relatively expensive surveys. Second, the level of industrial detail used in RIMS II helps avoid aggregation errors, which often occur when industries are combined. Third, RIMS II multipliers can be compared across areas because they are based on a consistent set of estimating procedures nationwide. Fourth, RIMS II multipliers are updated to reflect the most recent local-area wage-and-salary and personal income data.

The Economic Impact of Renovation Projects

According to the Kansas Board of Regents, the six state universities now face a maintenance backlog of $726,989,777 that continues to grow. If this problem is not addressed, today's deferred maintenance backlog of $726,989,777 will grow to nearly $863,435,802 in 5 years.[2]

Given the fact that the backlog of about $727 million is in current dollars and that renovation will take place over several years, and given the likelihood of continuing inflation (including

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[1] "Regional Multipliers from the Regional Input-Output Modeling System (RIMS II): A Brief Description," Bureau of Economic Analysis. http://bea.gov/bea/regional/rims/brfdesc.cfm#f4
[2] This assumes a 3.5% inflation rate compounded annually. It also assumes all maintenance is deferred and no additional maintenance is identified.

labor cost increases), the actual dollar cost for the State of Kansas will exceed the current estimate.

RIMS II, like all Input-Output models, is a "static equilibrium" model. This means that there is no specific time dimension associated with the results using the model. For the RIMS II model, it is customary to assume that the impacts occur in 1 year because the model is based on annual data.

The different renovation activities at the various state universities will vary in length and take several years. This complicates an impact analysis by not knowing the spending each year as well as the difficulty of accounting for the effects of changes in prices and wages.

In order to use the estimate of $727 million, a simplifying assumption is made that all expenditures occur in one year and the impact should be thought of in current year dollars.

The total increase in economic output of goods and services (gross state product) associated with $726,989,777 spending is **$1,630,347,274**. (See bottom of column 1 in Table 1.) Since the RIMS II multipliers are industry specific, it is possible to determine how each of the industry categories is affected by the proposed spending. It is interesting to note that the indirect and induced effects[3] are associated with a large number of aggregate industry categories.[4] Although the model

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[3] The total impact minus the direct effect of $727 million gives the combined indirect and induced effects.

[4] A more detailed breakout of industries included in these aggregate industry categories is presented in an Appendix B; however, multipliers are not presented at that level of disaggregation.

pertains to the State economy, the greatest positive impact is likely to occur in close proximity to

the counties in which the spending occurs.

TABLE 1: FINAL DEMAND MULTIPLIERS FOR RENOVATION RELATED EXPENDITURES FOR $726,989,777 SPENT AT REGENTS UNIVERSITIES IN KANSAS			
	(1) OUTPUT (DOLLARS)	(2) EARNINGS (DOLLARS)	(3)EMPLOYMENT (JOBS)
1. Agriculture, forestry, fishing, and hunting	$5,452,423	$581,592	52.08
2. Mining	$14,249,000	$2,980,658	57.15
3. Utilities	$22,318,586	$3,853,046	50.28
4. Construction	$731,569,813	$239,252,336	6587.81
5. Manufacturing	$215,843,265	$37,221,877	878.22
6. Wholesale trade	$61,866,830	$17,084,260	344.62
7. Retail trade	$95,962,651	$29,515,785	1440.49
8. Transportation and warehousing	$41,947,310	$11,195,643	285.74
9. Information	$38,457,759	$7,851,490	145.30
10. Finance and insurance	$72,408,182	$16,284,571	384.09
11. Real estate and rental and leasing	$82,876,835	$4,361,939	162.77
12. Professional, scientific, and technical services	$70,736,105	$27,480,214	633.09
13. Management of companies and enterprises	$12,795,020	$5,888,617	111.36
14. Administrative and waste management services	$25,517,341	$9,305,469	434.91
15. Educational services	$9,814,362	$4,216,541	214.72
16. Health care and social assistance	$65,647,177	$30,024,678	886.55
17. Arts, entertainment, and recreation	$4,943,530	$1,817,474	109.63
18. Accommodation and food services	$26,389,729	$9,523,566	729.11
19. Other services	$31,551,356	$10,105,158	456.45
TOTALS	$1,630,347,274	$468,544,911	13,964.36

Total earnings in the State increase by **$468,544,911** associated with the $727 million spending (see bottom of column 2 in Table 1). As expected, the largest increase in earnings, (about 51 percent) is in the construction industry, but significant increases in earnings are found across a variety of other industries as well.

Column 3 in Table 1 provides a measure of the employment or jobs expressed as full time person years of employment. The measure is person years of employment regardless of the term over which spending is aggregated. Row 4, for example, says that over the period in which the $727 million is spent, 6,588 person years of employment (jobs) will be created in the construction industry. The total employment impact is **13,964** jobs projected to be created in Kansas.

Provided in Appendix A is a table similar to Table 1, except each of the economic impacts are shown for a 1 million dollar initial project spending amount. The purpose of the table is to allow ease in calculating alternative amounts of project spending.

APPENDIX A

FINAL DEMAND MULTIPLIERS FOR CONSTRUCTION RELATED EXPENDITURES PER 1 MILLION DOLLARS SPENT AT REGENTS UNIVERSITIES IN KANSAS			
	(1) OUTPUT (DOLLARS)	(2) EARNINGS (DOLLARS)	(3) EMPLOYMENT (JOBS)
1. Agriculture, forestry, fishing, and hunting	$7,500	$800	0.07
2. Mining	$19,600	$4,100	0.08
3. Utilities	$30,700	$5,300	0.07
4. Construction	$1,006,300	$329,100	9.06
5. Manufacturing	$296,900	$51,200	1.21
6. Wholesale trade	$85,100	$23,500	0.47
7. Retail trade	$132,000	$40,600	1.98
8. Transportation and warehousing	$57,700	$15,400	0.39
9. Information	$52,900	$10,800	0.20
10. Finance and insurance	$99,600	$22,400	0.53
11. Real estate and rental and leasing	$114,000	$6,000	0.22
12. Professional, scientific, and technical services	$97,300	$37,800	0.87
13. Management of companies and enterprises	$17,600	$8,100	0.15
14. Administrative and waste management services	$35,100	$12,800	0.60
15. Educational services	$13,500	$5,800	0.30
16. Health care and social assistance	$90,300	$41,300	1.22
17. Arts, entertainment, and recreation	$6,800	$2,500	0.15
18. Accommodation and food services	$36,300	$13,100	1.00
19. Other services	$43,400	$13,900	0.63
TOTAL	$2,242,600	$644,500	19.21

Each entry in column 1 represents the total dollar change in output that occurs in all industries for 1 million dollars delivered to final demand by the construction industry corresponding to each entry

Each entry in column 2 represents the total dollar change in earnings of households employed by all industries for 1 million dollars of output delivered to final demand by the construction industry corresponding to each entry.

Each entry in column 3 represents the total change in the number of jobs that occurs in all in industries for each additional 1 million dollars of output delivered to final demand by the industry corresponding to the entry. Because the employment multipliers in RIMS II are based on 2003 data, 1 million dollars in output to final demand was converted to 2003 dollars.