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Lodging and Restaurant Establishment Spending Patterns in Northwest Lower Michigan  
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# RESEARCH REPORT

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Recreation and Tourism

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AGRICULTURAL EXPERIMENT STATION EAST LANSING

## Lodging and Restaurant Establishment Spending Patterns in Northwest Lower Michigan



# Lodging and Restaurant Establishment Spending Patterns in Northwest Lower Michigan

by

Mary Lou Marino and Daniel E. Chappelle<sup>1</sup>

## ABSTRACT

Currently several alternative highway plans for the northwest region of lower Michigan are under consideration. This study was undertaken to estimate the portion of the tourist dollar remaining in the region after the first round of spending. Study results indicate a major portion of tourist revenues going to each of the investigated expense categories remain in the region. These results tend to support highway construction, if the goal is to increase the region's economic base. Because of resulting reduced transit time and increased attractiveness to tourists, those alternatives including limited access freeways should be favored. However, a benefit-cost analysis considering factors other than tourist expenditures is needed before a final decision is made.

## INTRODUCTION

Highway improvements are frequently lauded as solutions to many economic ills plaguing a region. This is particularly true if the area has tourist potential or is already a tourist area. An accepted theory of regional economic development is that increased access is expected to make the region more attractive to tourists from outside the region, resulting in more

outside money entering the economy. This theory, the export base theory, assumes that rate of economic growth is a function of the growth rate of regional exports.<sup>2</sup> Growth of exports, other things equal, is increased through reduced transportation costs (expressed in both dollars and time) as access is improved by construction of a major highway where once only a two-lane road ran. Tourist activities are for the most part export activities since revenue from outside the region constitutes the major proportion of expenditures by tourists. These added revenues will cycle and reverberate through the economy, generating total benefits larger than initial transactions.

There is, however, some question whether this generally accepted theory applies to a region that is largely a natural resource based recreation area surrounded by rural land. Opportunities for leakage of revenues out of the region appear to be likely, thereby possibly disrupting the multiplier effect at an early stage. For example, it is possible that the owner of a tourist establishment may not be able to obtain all the supplies he needs locally. In particular, large motels and hotels have been known to order their supplies from a central distributor in a large city such as New York, Chicago, or Detroit. A study on the Ozarks by Ronald Bird and Frank Miller (3) indicated

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<sup>2</sup>For a summary of the export base theory see Richardson [8], pp. 16-22.

that a large portion of the semi-skilled and unskilled employees were hired from outside the tourist area (53.9% and 58.1% respectively). An even higher figure was characteristic of managerial positions (65.8%).

Another problem is absentee ownership. Because capital is needed to open a tourist establishment, sometimes persons from more "wealthy" areas invest in businesses in a tourist area. Someone will be hired to manage the establishment in the owner's absence. Thus, not all money going to profits will enter the regional economy. If the tourist industry is highly seasonal, a special type of absentee ownership can occur. This is especially true if summer is the peak tourist season. In this case, owners make their home outside the region. However, they do live at their establishments during the tourist season. When owners leave at the end of the season, a portion of the revenues are taken with them. Leakages could be compounded if such establishments were completely family operated and if all supplies and services were purchased outside the region. Thus it is possible for a region to bear many indirect "costs" of a highway project (loss of land, pollution, unwanted development) while receiving few of the benefits.

Currently, the Michigan Department of State Highways and Transportation is considering several alternative highway plans for the Northwest Region of Lower Michigan. Alternatives range from upgrading the two major routes (US-31 and US-131) to two lane standards, to the building of two limited access freeways (see Fig. 1). In the economic analysis of these alternatives, some of the issues identified in the first few paragraphs become important. The Northwest Region is a prime outdoor recreation area especially for the large cities of southern Michigan and of northern Illinois, Ohio, and Indiana. Highway improvements, particularly those containing expressways, would bring these population centers closer to the Northwest in terms of transit time. The region is primarily rural and many of the tourist establishments close for the winter. A previous study has indicated that many of these businesses are family owned and operated (2).

Currently very little is known about what happens to the tourist dollar once it is spent at a tourist establishment. A study was undertaken to obtain information on leakages and the multiplier effect. The prime concern of this study was to estimate that part of the tourist dollar remaining in the region during the first round of spending. It is recognized that to approximate the multiplier effect accurately, more than just the first round must be examined. However, time and budget constraints prevented inclusion of secondary and subsequent rounds in this study.

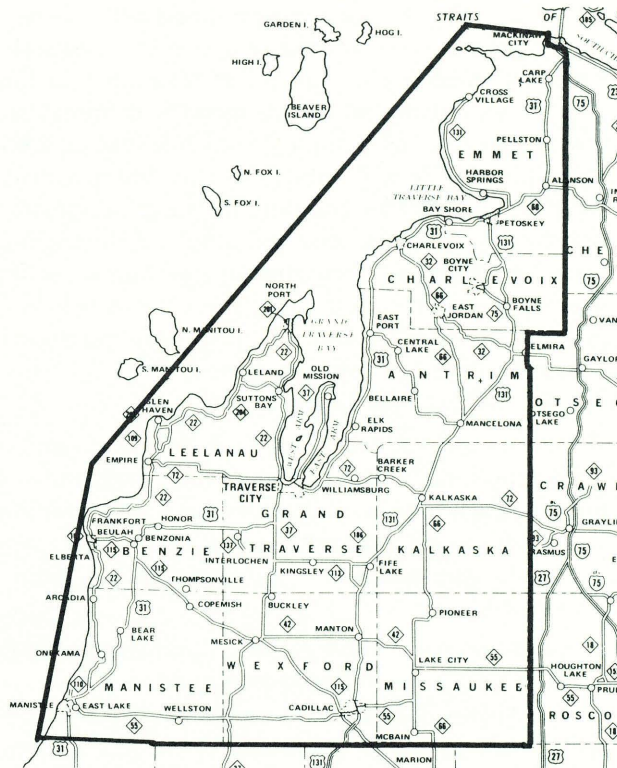


Fig. 1: Northwest corner of Michigan's Lower Peninsula. The study region is the area outlined in black.

## METHODS

During the first spending round, tourist dollars become the revenues of tourist establishments. They are in turn respent by owners or management of these establishments. Expenditures include operating expenses (wages and the purchase of supplies and services), profits (payment to the owner), and capital expenses (real estate and property taxes, insurance payments, and mortgage expenses).

Questionnaires were sent to managers of restaurants and lodging establishments in the Northwest Region in order to obtain data on the flow of profits and operating expenses and other variables. The permanent address of the owner was requested to provide data on the flow of profits out of the region. Operating expense data consisted of two questions. The first centered on employment. A list of job types was provided and the respondent was asked to indicate the number of people hired for each job type from each of several specified geographic areas (local, Northwest Region but outside the local areas, and outside the Northwest Region). Respondents were also asked to indicate jobs performed by family members. The second question dealt with supplies and services and was similar to that for employment. The percentage of the listed supply or service purchased in each geographic area was requested rather than the amount.

Knowledge of the amount purchased and dollars spent for each category was needed to accurately calculate the proportion of the tourist dollar remaining in the region. However, it was known through communication with Chamber of Commerce officials that data on the financing of tourist establishments are jealously guarded by owners. In addition, a strong antigovernmental feeling existed among the people of the region. Returns of Highway Department questionnaires in previous studies were quite low. Thus, it was believed that inclusion of questions on quantities purchased and dollars spent on goods and services would jeopardize the response further.

Direct questions were avoided for the capital expense questions. Instead, such items as the address of the construction firms and sources of large purchase items (furnishings, restaurant equipment) were requested. Also, the nature of initial investment spending was requested.

An additional question on establishment size was also included. The size measure used for lodging establishments was number of rooms and the number of seats was used for restaurants. Data were needed so that information from larger establishments could be weighted proportionately higher than that from smaller establishments. Also, such information could then be cross classified with data from other questions, thereby indicating the effects of size.

## RESULTS

The return rate for lodging establishments questionnaires was 63% (234 respondents) and 52% (101 respondents) for restaurants. In comparison with the returns for similar questionnaires from this region, these response rates were quite high.

Size information indicated that 80% of the lodging establishments involved 20 rooms or less. The next highest was the 21-40 unit class with 6%. Only 14% of the sample establishments had more than 40 units. Restaurants were more evenly distributed. Each size class contained at least 4% of the establishments and no class accounted for more than 24%. The highest percentages were in the first and second size classes (1-30 and 31-60 seats) with 20% and 24% respectively, and the remaining classes ranged from 11% to 4%.

Of the total number of lodging establishments, 85% were family operated. Twelve were not family operated and ownership of two percent was unknown. Restaurants did not show as high a level of family operation. Forty-two percent were not family operated.

Approximately 88% of lodging establishment owners lived inside the Northwest Region while 12% lived

outside. These percentages were tabulated from a sample of 214. Most restaurant owners (92%) lived inside the region, while only 8% lived outside. Sample size for this establishment type was 99.

Turning to operating expenses, data on job types from questionnaires were pooled. The left side of Table 1 contains the proportion of the total number of people hired for a given job in each geographic area by lodging establishments. Regionally only 4.38% of all jobs reported were held by people hired from outside.

Those jobs showing the highest outside hiring were cooks (7.5%) and waitresses (6.81%). Others showing some leakages were salespeople (5.26%), housekeepers (2.91%), and busboys (1.10%). These job types are often labeled "unskilled." A possible cause of leakage in these cases is that college students were employed from outside the region. Some managers indicated that they occasionally hired college students. However, to really say anything conclusive, detailed information is needed about those being hired from outside the region. In looking at the more highly paid jobs such as managers and accountants, the pattern of high outside hiring observed by other investigators (e.g., Bird and Miller) did not appear for lodging establishments.

For restaurants a similar pattern is observed in the study region. As indicated in Table 1, regionally only 5.7% of all jobs indicated on the questionnaire were hired from outside. In looking at job types individually, not one shows more than 9% outside hiring. Again, most large leakages are found in unskilled categories—cashiers (6.15%), waitresses (6.89%), and busboys (7.04%). However, the highest outside hiring is for managers (8.18%) as would be expected from results of previous studies. If this job type is cross classified by size, average leakages are associated with larger establishments. Accountants showed a much lower leakage (3.85%) and cross classification by size indicated increased leakage with size.

Data were also collected on the filling of jobs by family members. Many lodging establishments use only family members for some job types (e.g., managers). Only 29 of 218 responding businesses claim to hire managers (12%). In remaining establishments, a family member performs this task. Other job types showing a high level of family performance were maintenance (58%) and secretaries (63%). For restaurants, this pattern of family performance of job type was not as evident. However, as with lodgings, the category "managers" showed the highest amount of family performance (33%).

Data on supplies and services are contained in Table 2. These figures indicate the average of each supply and service purchased in each geographical

**Table 1: Percentage of total number of people regionally and by job type from each geographical area**

Job Type	LODGING ESTABLISHMENTS			RESTAURANTS		
	Local	Northwest, Outside Local	Outside Northwest	Local	Northwest, Outside Local	Outside Northwest
Managers	98.39	1.61	0.00	87.27	4.55	8.18
Housekeepers	93.61	3.49	2.91	NA	NA	NA
Maintenance	97.16	1.14	1.71	NA	NA	NA
Cooks	92.50	0.00	7.50	93.32	4.37	2.31
Busboys	98.90	0.00	1.10	85.43	7.54	7.04
Clerks	96.91	3.09	0.00	NA	NA	NA
Secretaries	96.77	3.23	0.00	91.67	4.17	4.17
Accountants	98.15	1.85	0.00	83.67	12.25	4.08
Sales People	94.74	0.00	5.26	NA	NA	NA
Doormen	100.00	0.00	0.00	NA	NA	NA
Waitresses	92.92	0.27	6.81	70.58	22.52	6.89
Cashiers	NA	NA	NA	83.85	10.00	6.15
Hostesses	NA	NA	NA	94.19	3.49	2.33
Other	81.89	4.72	13.39	88.35	6.77	4.89
Regional	93.64	1.98	4.38	80.34	13.96	5.70

area by type of establishment. Items such as furnishings and restaurant equipment are discussed below under the category "capital expenses." For lodging establishments, the majority of each supply item appears to be purchased from within the region. Excluding restaurant equipment, an average establishment

purchased at least 74% of its supplies within the local area. If purchasing in the region is considered, for 5 of the items, 91% was purchased within the region. For all items, the lowest inside purchasing was 82%. Supplies and services showing highest average leakages are china and glassware (17.3%), office supplies (12.6%), and office equipment (11.78%).

**Table 2: Mean percent of supplies and services purchased in each geographic area**

Supply or Service	LODGING ESTABLISHMENTS		
	Local	Northwest, Outside Local	Outside Northwest
Food	75.89	15.23	8.88
Beverages	87.94	12.06	0.00
Linen Supplies	75.12	10.06	14.82
Linen Services	81.99	11.73	6.28
Sundry Goods	80.40	12.45	7.15
Office Supplies	74.22	13.18	12.60
China and Glassware	66.43	16.27	17.30
Cleaning Supplies	78.25	15.95	5.80
Restaurant Equipment	74.29	25.71	0.00
Office Equipment	77.15	11.09	11.78
Other	64.92	17.87	17.20
	RESTAURANTS		
Meat	69.53	30.47	0.00
Poultry	54.93	23.16	21.91
Sea Food	34.52	29.73	35.75
Vegetables	68.79	19.37	11.84
Fruit	63.51	25.67	10.82
Dairy Products	71.00	23.12	5.88
Grain Products	42.47	27.89	29.65
Beverages	74.24	25.76	0.00
Laundry Services	72.99	23.56	3.45
Cleaning Supplies	58.32	18.82	22.87
Silverware	26.46	31.25	42.29
Glassware	30.93	25.67	43.40
Dishes	26.18	24.65	49.17
Office Supplies	73.27	17.38	9.35
Linen	69.23	30.77	0.00
Furnishings	32.47	21.44	46.10
Restaurant Equipment	33.79	21.34	44.87
Office Equipment	59.92	21.21	18.87
Other	48.46	9.23	42.31

For restaurants the pattern is more varied, as average leakages range from almost 50% to 0%. If the largest leakage items (glassware, silverware, dishes, seafood, and the "other" category) are excluded, average purchasing within the region is at least 70%, representing 76% of the categories.

Like the lodging establishments, one of the largest leakage items was glassware and dishes. It is possible that these supplies are either not manufactured in the region or they are not handled by a wholesaler within the region. Another possibility is that it is cheaper to order them from outside the region. Seafood shows large outside purchasing by restaurants. This is probably explained by the ocean origin of many popular seafoods (e.g., lobster and shrimp).

Supplies and services which are not bought outside by restaurants are beverages, linen, and meat. Lodging establishments also purchased all their beverages in the region, but linen showed one of the larger leakages. This difference in purchasing pattern between two establishment types perhaps is explained by the different types of linen they use. Restaurants use tableclothes, napkins, and aprons while lodgings use sheets and towels. It is likely that these are distributed through different outlets.

Supply and service results for both restaurants and lodging establishments should be considered with caution. It is possible that many supplies purchased by both establishment types from sellers within the

region are bought through distributors, which in turn obtain supplies from outside the region. Several managers and owners contacted by telephone indicated this was especially true for food. However, this aspect was not investigated further because only the first spending round was of concern in this study. In a subsequent section some ramifications of this leakage in the second spending round are examined.

The final category of inquiry was capital expenses and investment. For this factor, purchasing of expensive items (furniture, kitchen equipment, etc.) and location of the firm which built the establishments were examined. For lodgings, restaurant equipment seems to be purchased mostly within the region with an average establishment purchasing 67% locally. For furnishings, an average leakage of 20% was calculated. Restaurants were found to have a larger leakage than lodging establishments. For lodging furniture, an average of 46% was purchased outside while a 45% leakage existed for restaurant equipment.

Most construction firms employed to build lodging establishments were located in the region (Table 3). In fact, most were located within the same city as the contracting establishment. When this information was cross classified by size class, it was found that most leakages were in the 21-40 unit size class. In larger size classes (41-181 units), construction firms were all from the region.

Table 3: Remaining capital expenditure items(a)

Item	LODGING ESTABLISHMENTS			Number in Tabulation
	Local	Northwest, Outside Local	Outside Northwest	
Furnishings	67.39	12.99	19.92	115
Address of Construction Firm	63.00	15.00	22.00	120
	RESTAURANTS			
Address of Construction Firm	79.00	9.00	12.00	65

(a) Numbers represent percent of total tabulation.

Fewer restaurants indicated that their construction firm was from the northwest. However, the leakage was only 22%. With respect to size, it was difficult to see any pattern. The largest leakage was for the category 91-120 seats with the second highest coming from the 121-150 seat class and followed by the 241-270 seat class. The rest, including the highest size class, show percentages lower than that for the region as a whole. In no case was the percentage hired from the outside greater than 43%.

## DISCUSSION

Results indicate that most of the tourist dollar spent in restaurants and in lodging establishments stays within the region, at least for the first spending round. In the case of the portion going to profits, 88% of the owners of lodgings live in the region while only 73% of restaurant owners did. However, before conclusions can be drawn about this portion of the tourist dollar, effects of size should be taken into account. A 20% leakage from a million dollar business is a much larger sum of money than a 20% leakage from a hundred thousand dollar business. To investigate this effect, the sample for each establishment type was broken into three size classes (lodgings: 1-20 units, 21-40 units and 41 units or more; restaurants: 1-90 seats, 91-180 seats and 181 seats or more). Weights for each size class were calculated by dividing the total number of rooms or seats in the questionnaire sample into the number of rooms or seats found in each sample size class. Owner address data tabulated by size class was then multiplied by these size class weights. For lodgings the profit leakage was approximately 13% and for restaurants it was 11%.

These results should help to dispel fear of extensive absentee ownership within these businesses. It is possible that many families or people from outside the region have opened lodging establishments and restaurants there. However, sample results seem to indicate that most of them have subsequently made the area their home.

For that portion of the tourist dollar going to employment, again the fraction remaining in the region appears high, assuming that the sample is representative. For lodging establishments, it does not appear that higher paying jobs are being filled by more outside people than lower paying ones nor is there any evidence that larger establishments tend to do this more frequently than smaller. Major leakages seem to be in lower skilled jobs. There does not appear to be a tendency for larger establishments to hire more people from outside the region than smaller ones. In fact, most frequently, leakages occur in the smallest size class. Given this, plus equal ease of hiring people for all job types, the probability is quite high that new establishments moving into the area will hire most employees from the area.

Restaurants appear to hire a major portion of all job types within the region. The largest leakages appear to be for managers, although even this leakage is less than 10%. Larger establishments appear to hire more from outside than do smaller ones, but this averages less than 27%. Again, given this, plus equal ease of hiring, it is highly probable that new restaurants moving into the region will show a similar pattern. The larger of these would tend to hire slightly more from the outside than smaller establishments.

**Table 4: Illustration of the method used in calculating proportion of the tourist dollar remaining in the region**

Revenue Information for Lodgings: Percent of Total Revenue Spent on Expense Items		Lodgings: Proportion of Each Expense Category Purchased in Each Geographic Region		
Category	1-20 Units Proportion (a)	1-20 Units		Outside
		Northwest		
I. Operating Expenses				
A. Payroll	10.87	.96		.04
B. Supplies and Services				
1. Food	---	---		---
2. Beverages	---	---		---
3. Linen, China and Glassware	1.21	.84		.16
4. Laundry	5.01	.94		.06
5. Office Supplies	2.95	.88		.12
6. Cleaning Supplies	1.15	.95		.05
7. Maintenance	3.98	1.00		.00
8. Other	14.75	.00		1.00
II. Capital Expenses				
A. Local Taxes	4.31	1.00		.00
B. Interest	7.35	1.00		.00
C. Insurance	1.69	.00		1.00
D. Rent	1.18	.91		.09
E. Depreciation	22.6	.71		.29
III. Profits				
A. Income Tax	6.41	.00		1.00
B. Net Profits	16.41	.91		.09

(a) Gunn and McIntosh [5], p. 25.

Information on family operation does alter employment results slightly because a "hidden" leakage is introduced. When a family from outside the region buys an area business many jobs which could have been filled by residents are made unavailable, particularly management positions. Since lodging establishments tend to be family operated more frequently than restaurants, the probability of this type of leakage is higher. Unfortunately, this study was not designed to detect this leakage. To properly evaluate this situation, family operators would have to be asked how long they lived in the region prior to opening their present establishment.

Given the form of data on supplies and services, it is difficult to take into account size effects. Overall results indicate that on the average many supplies and services are purchased within the region by both types of establishments. This leakage is probably larger than that for profits and employment. However, supply and service data were analyzed by size class and no category showed a leakage higher than 50%.

Turning to capital expenses, results are similar. A high portion of large purchase items were bought within the region for both establishment types with restaurants showing the most leakage. These findings imply that most replacement or expansion purchases for both types of establishments would probably be made within the region. Most of these items are probably manufactured outside the region. However, this represents a leakage of expenditures beyond the first round and thus falls outside the study scope.

Construction firm address data seem to indicate that a large portion of initial investment was made

within the region with more by restaurants than lodging establishments. Therefore, if conditions persist, the probability that new restaurants and lodging establishments will spend capital within the region is quite high.

#### PROPORTION OF THE TOURIST DOLLAR REMAINING IN THE REGION

The above expense information cannot be combined to calculate that part of the tourist dollar remaining in the region at the end of the first spending round because it is not known what percentage of the tourist dollar is represented by each of the categories investigated. Fortunately, tables showing average proportion of the total revenues going to each category were available (3, 5, 6, 7, 9). Using this information, the fraction remaining in the region was calculated. The method used is briefly outlined below. It should be remembered that the resulting estimate is at best crude, because some data used were old and table formats from secondary data sources did not exactly parallel the questionnaire format.

Data expressing the proportion of total revenues for an average lodging establishment in size classes (1-20 units, 21-40 units, and 41 units or more) going to each listed expense category were used to calculate proportion of the tourist dollar remaining in the region. The size breakdown was needed because it is known that total revenues going to each of the included categories vary with establishment size. An example of the expense sheet for the 1-20 unit size class is given in the left side of Table 4.



Unfortunately a size breakdown could not be obtained for restaurants. It is known that size class variability does exist (Lane, personal communication) and information from this study supports this fact as well. In this study, most expense information was from motel restaurants (7, 3). Motel restaurant data were used rather than information for regular restaurants, though the sample contained only a few motel restaurants, because breakdown of revenue information from the secondary source was most like that of the study. In addition, comparisons indicated that motel restaurants varied in the proportion spent on each expense item only a few percent from normal restaurants. A table like that shown on the right side of Table 4 was compiled for each lodging establishment size class.<sup>3</sup> A similar chart (without the size class breakdown) was obtained for restaurants.<sup>4</sup>

The proportion of the tourist dollar staying in the region for lodging establishments by size class, was obtained by multiplying revenue information for each expense item by the portion of that item coming from each geographic region (Table 5). Next, column data for each geographic area were summed to yield the proportion of total revenues spent in each geographic area (bottom row, Table 5). This procedure was followed for each size class. To combine information for each size class, each column sum was weighted by a sample proportion of the total number of rooms contained in that size class. Resulting numbers for each geographic area were then summed. A similar procedure was followed for restaurants. However, because this information was not broken down by size, the last few steps were not required.

The final result for lodging establishments was that 71% of the tourist dollar spent on lodgings remains in the region at the end of the first spending round while 29% leaves. For restaurants, results indicated that 83% of the tourist dollar stayed in the region and 17% left by the end of the first round. Hence, results show more money remaining in the region for restaurants than for lodging establishments.

Initial investments may be looked at in a manner similar to revenues. It was assumed these investments primarily consisted of land, building costs, and furnish- ing expenses. Data were obtained on the proportions of the initial investment going to each of these categories for lodging establishments (5). Information from the study was broken into size classes, and calculations similar to those above were carried out. It was

<sup>3</sup>For those operating expenses for which no information exists in usable form (e.g. "other") a conservative estimate was formed by assuming that their purchase would be totally outside the region. It was also assumed that property and municipal taxes, interest, and rent would stay within the region. Insurance money was assumed to leak completely out of the region and depreciation was viewed as expenditures for replacement goods.

<sup>4</sup>Revenue data had only one expense category for food. Thus, an average regional coefficient for food items on the questionnaire was used to obtain the "food" entries in this table. Ideally, each category should have been weighed by amount spent on that item relative to the total amount spent on food; however, the information required was not available.

**Table 5: Proportions of expenditures inside and outside the region for lodging establishments of 1-20 units**

Category	Percent purchased inside region	Percent purchased outside region
I. Operating expenses		
A. Payroll	10.44	.43
B. Supplies and services		
1. Food	---	---
2. Beverages	---	---
3. Linen, china and glassware	1.02	.19
4. Laundry	4.71	.30
5. Printing, stationery, office supplies, advertising	2.59	.36
6. Cleaning supplies	1.09	.06
C. Other		
1. Repairs and maintenance	3.98	.00
2. Other	.00	14.75
II. Capital expenses		
A. Property and municipal taxes	4.31	.00
B. Interest	7.35	.00
C. Insurance	.00	1.69
D. Rent	1.07	.11
E. Depreciation	18.21	4.45
III. Profits		
A. Taxes	.00	6.41
B. Profit	15.00	1.48
TOTAL	69.77	30.23

found that at least 73% of the initial investment most likely stayed in the Northwest Region. Unfortunately, requisite secondary data could not be found for restaurants, thereby preventing calculation for that establishment type.

#### CALCULATION OF A MULTIPLIER

Though information obtained in this study is concerned only with the first spending round, it may be expanded into a multiplier provided certain assumptions are made. Most frequently, total impact of new outside income is expressed as:

$$(1) \quad \Delta Y = (1/(1-r))\Delta X \\ = (1+r+r^2+r^3\dots)\Delta X = M\Delta X$$

where  $\Delta Y$  is the total change in the income for the region once  $\Delta X$  has cycled through the economy.  $\Delta X$  is the initial change in regional income,  $r$  is the portion of increased income remaining in the region for each round and  $M$  is the multiplier.

Total change in regional income that can be attributed to a given type of establishment can be derived by solving equation (1) for that particular component of the economy assuming independence between sectors. The first "r" in equation 1 represents the initial income change remaining in the region at the end of the first spending round for each of these establishment types. These percentages, as noted above, were 71% for lodgings and 83% for restaurants. It could be assumed at this point that "r" does not change and the multiplier could be directly estimated by  $(1/(1-r))$ . However, this would most likely result in an over-estimate because money going to supplies and services most likely leaves the region in the next spending round. Most businesses supplying these products are distributors. To account for this, that

portion of the money remaining in the region that subsequently is expended for supplies and services should be subtracted. For lodgings this amount was approximately 15%. For restaurants it was 36%. The rest was assumed to remain constant for succeeding rounds. Thus the multiplier becomes:

$$(2) \quad M_{Lod} = (1 + .71 + .71 \times (.71 - .15) + .71 \times (.71 - .15) \times (.71 - .15) \dots)$$

$$(3) \quad M_{Res} = (1 + .83 + .83 \times (.83 - .36) + .83 \times (.83 - .36) \times (.83 - .36) \dots)$$

where  $M_{Lod}$  is the multiplier for lodging establishments and  $M_{Res}$  is the multiplier for restaurants. Taking only the first five spending rounds into account, multipliers were calculated to be 2.52 and 2.53 for lodgings and restaurants respectively. Given the nature of the calculations these multipliers do not significantly differ from one another.

In using the multiplier for restaurants and lodgings, its limitations should be remembered. Leakage of supply and service money during the second round was not proved and, thus, needs investigation. Additionally, the magnitude of this leakage is not based on primary data. To accurately calculate a multiplier, spending rounds two and three should be examined in a manner similar to that used for the first round. In this case, the establishments studied would be the receptors of monetary flow from the preceding round.<sup>5</sup> Given the current scarcity of data as well as high research costs, the multipliers shown above likely provide the best estimates without further research.

### CONCLUSIONS

These data indicate that a large portion of the tourist dollar remains in the region at the end of the first spending round. The monetary benefits resulting from this can be calculated for each proposed highway alternative by multiplying the tourist demand projection<sup>6</sup> for each proposed highway alternative by estimated tourist expenditures. This combined with study findings would yield the money remaining in the region at the end of the first spending round. Multipliers developed in this study may be used to roughly estimate the total impact on the regional economy by the tourist industry.

Viewing *only* the direct monetary benefits, highway construction would be supported by the study findings. This is especially true for limited access highways which would decrease transit time and in-

crease the attractiveness of the region to the tourist. This, however, gives only a limited view of the total impact for a given highway alternative. The indirect costs are needed. Included should be environmental impacts and their effects on the tourist industry, a consideration of the amount of development desired by the region's inhabitants, possible job losses in other sectors (e.g. farming), and person displacement. In addition, the accounting system used for the benefit-cost analysis should be chosen carefully because such systems carry with them an implicit distribution of benefits and costs. For example, an evaluation conducted at the state level could yield very different results from that conducted at the regional level. In the former, losses in other parts of the state resulting from the Northwest's gain would be included, whereas, in the latter only the Northwest's gain is considered.

Viewed in this way, study findings should not be taken as a mandate for one type of highway alternative, but rather as only part of the benefit-cost analysis which needs to be completed to correctly evaluate a given highway alternative.

### SUMMARY

This study indicates that a major portion of tourist revenues going to each investigated expense category remains in the Northwest Region during the first round of spending. For profits, the amount retained in the region was estimated as 87% and 89% for lodging establishments and restaurants respectively. It was also found that a large portion of each establishment type was family operated (86% for lodgings and 42% for restaurants). The lower proportion for restaurants may have been caused partly by the method used to determine family operation.

When hiring employees, it was found that both establishment types hired largely in the Northwest. Taking all jobs reported on the questionnaires, the leakage was only 4.38% for lodgings while restaurants showed a leakage of 5.70%. For lodgings, the largest leakages were found in lower skilled job types (e.g. cooks, waitresses, sales people, etc.). Unexpectedly, higher paid or skilled jobs (managers and accountants) were filled entirely with people from within the region. Restaurants showed a different pattern with managers showing the highest outside hiring (8.18%). Unskilled jobs, waitresses and busboys, showed the next highest leakages (6.89% and 7.04% respectively).

For supplies and services, a larger leakage was found for both establishment types. This was estimated to be no larger than 50% for all supplies and services investigated.

On the basis of construction firm addresses and purchase of large expense items, it appears that a large portion of the initial investment and subsequent

<sup>5</sup>For even greater accuracy a detailed input-output investigation should be carried out.

<sup>6</sup>Due to its consideration of travel times and of attractivity of tourist centers, the REC-SYS model would be the best method to use. For further information see Ellis [4].

replacement purchases are made in the region. It was found that 88% of the lodgings' construction firms were located within the Northwest Region. This was true for 63% of the restaurants. For large purchase items (furnishings, restaurant equipment) 80% of the lodging establishments made their purchases within the region. For restaurants, the result was 55%.

When information obtained from the questionnaires was combined with secondary data on percentage of revenues spent on each expense category, estimates of the portion of the tourist dollar remaining within the region at the end of the first spending round were obtained. Estimates were 65-70% for lodging establishments and 70-80% for restaurants. Using these findings, multipliers for each establishment type were estimated to be 2.52 and 2.53 for lodgings and restaurants respectively.

Study results appear to support highway construction. Because of their reduction of transit time and resulting increase in attractiveness to tourists, those alternatives containing limited access freeways appear to be favored. These results, however, should be used

with caution. Only tourist revenues were included, thereby allowing only calculation of "benefits." Once tourist demand and revenues have been formally linked, one may perform the required cost studies. Resulting "net benefits" will give a far more accurate basis for deciding among various alternatives.

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## REFERENCES

1. Arthur D. Little, Inc. (1967) *Tourism and Recreation*. Economic Development Administration, U.S. Department of Commerce, 301 pp.
2. Center for Economic Expansion and Technical Assistance. (1965). *Michigan Tourism*. Central Michigan University, Vols. I and II, 261 pp., 191 pp.
3. Dukas, Peter and Donald E. Lundberg. (1960). *How to Operate A Restaurant*. New York. Ahrens Book Company, Inc., 276 pp.
4. Ellis, Jack B. (1966). *Outdoor Recreation in Michigan by A Systems Analysis Approach: A Manual for the Program REC-SYS*. Lansing, Michigan: Planning Division, Michigan Department of Conservation, 63 pp.
5. Gunn, Clare A. and Robert W. McIntosh. (1964). *Motel Planning and Business Management*. Dubuque, Iowa: Wm. C. Brown Company, 233 pp.
6. Laventhol, Krekstein, Horwath, and Horwath. (1973). *The Lodging Industry*. Philadelphia, Pennsylvania, 64 pp.
7. Podd, George O. and John D. Lesure. (1954). *Planning and Operating Motels and Motor Hotels*. New York: Ahrens Book Company, Inc., 343 pp.
8. Richardson, Harry W. (1973). *Regional Growth Theory*. New York: John Wiley and Sons, 457 pp.
9. Whittington, Harold. (1963). *Starting and Managing a Small Motel*. Washington, D.C.: Small Business Administration Publication, U.S. Department of Commerce, 70 pp.

## Outlying Field Research Stations

These research units bring the results of research to the users. They are geographically located in Michigan to help solve local problems, and develop a closeness of science and education to the producers. These 15 units are located in important producing areas, and are listed in the order they were established with brief descriptions of their roles.



- 1 Michigan Agricultural Experiment Station. Headquarters, 101 Agriculture Hall. Established 1888. Research work in all phases of Michigan agriculture and related fields.
- 2 South Haven Experiment Station, South Haven. Established 1890. Breeding peaches, blueberries, apricots. Small fruit management.
- 3 Upper Peninsula Experiment Station, Chatham. Established 1907. Beef, dairy, soils and crops. In addition to the station proper, there is the Jim Wells Forest.
- 4 Graham Horticultural Experiment Station, Grand Rapids. Established 1919. Varieties, orchard soil management, spray methods.
- 5 Dunbar Forest Experiment Station, Sault Ste. Marie. Established 1925. Forest management.
- 6 Lake City Experiment Station, Lake City. Established 1928. Breeding, feeding and management of beef cattle and fish pond production studies.
- 7 W. K. Kellogg Farm and Bird Sanctuary, Hickory Corners, and W. K. Kellogg Forest, Augusta. Established 1928. Forest management, wildlife studies, mink and dairy nutrition.
- 8 Muck Experimental Farm, Laingsburg. Plots established 1941. Crop production practices on organic soils.
- 9 Fred Russ Forest, Cassopolis. Established 1942. Hardwood forest management.
- 10 Sodus Horticultural Experiment Station, Sodus. Established 1954. Production of small fruit and vegetable crops. (land leased)
- 11 Montcalm Experimental Farm, Entrican. Established 1966. Research on crops for processing, with special emphasis on potatoes. (land leased)
- 12 Trevor Nichols Experimental Farm, Fennville. Established 1967. Studies related to fruit crop production with emphasis on pesticides research.
- 13 Saginaw Valley Beet and Bean Research Farm, Saginaw. Established in 1971, the farm is owned by the beet and bean industries and leased to MSU. Studies related to production of sugar beets and dry edible beans in rotation programs.
- 14 Kalamazoo Orchard, Kalamazoo. Established 1974. Research on integrated pest control of fruit crops.
- 15 New Horticultural Field Station, Clarksville. Established 1974. Research on all types of tree fruits, vegetable crops, and ornamental plants. First research plots to be established during 1975.