

# **Estimating Economic Impacts of Tourist Spending on Local Regions; A Comparison of Satellite and Survey/I-O Approaches**

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This paper summarizes recent efforts to refine tools for estimating the economic impacts of tourist spending on local regions. Although tourism's impacts are most clearly felt within local tourism destination regions, economic impact models, data, and methods have been more widely available for national and state regions, e.g., The Travel Industry Associations' TEIM model (TIA, 2001). Convention and Visitor Bureaus (CVB's) and other local tourism organizations frequently lack the resources and skills to conduct or contract for economic studies, although many have conducted small scale studies of the economic impacts of individual facilities or special events (Crompton 1999). These studies vary widely in quality and generally require considerable local data gathering.

The most widely used tourism economic impact models are variations on the simple visits \* spending \* multiplier equation, where total spending by visitors is estimated by multiplying measures of tourist volume for a region times an average spending per unit of visitation. Tourist spending estimates can then be applied to economic ratios, multipliers or an input-output model to convert spending to the associated income and jobs and, if desired, to estimate secondary effects. The Travel Industry Association's economic impact model (TEIM) and my own MITEIM model for Michigan (Stynes 2000) use this basic approach. Tourism Satellite Accounts (TSA) are a more recent development, focusing primarily at the national level. The World Travel and Tourism Council (WTTC, 2001) has recently extended the satellite approach to the state level. Here I report my efforts to apply TSA approaches at the local level and also compare results between the TSA and MITEIM models.

A constraint to estimating impacts at the local level is the lack of reliable estimates of tourist volumes. While room occupancies and room taxes provide good estimates of visitors staying overnight in hotels, few areas have good estimates of campers, day visitors, visitors staying with friends and relatives or visitors staying in owned seasonal homes. While economic data covering hotel, restaurant, amusements, retail and other tourism-related sectors is available at the county level, many CVB's are not fully aware of these data sources or how to "extract" tourism-related activity from it.

With the assistance of Travel Michigan and the Greater Lansing Convention and Visitor Bureau, I've been able to triangulate across a number of data sources and develop reasonably consistent estimates of tourism's overall economic contribution to local areas. The approach combines the MITEIM model with TSA approaches, making use of IMPLAN's county economic data and local area multipliers, as well as what local spending and visit data exists. Perhaps the greatest advantage for local tourism organizations of the approach is that spending and economic impact estimates can be derived at minimal cost.

## **Methods for estimating tourism's economic significance**

There are three basic approaches to estimating tourism's local economic impact. Each has its own strengths and weaknesses. My approach here is to triangulate by drawing on multiple methods and data sources to provide as defensible and reliable estimates as the topic permits.

A variety of ad hoc methods have been used to make what I would call "quick and dirty" estimates of tourism's economic importance. These rely on the most convenient secondary data sources, even though they may provide an incomplete picture or require fairly heroic or unrealistic assumptions. For example,

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one approach is to estimate tourism sales by simply adding total hotel and restaurant sales for the area. This omits tourism activity in many other sectors of the economy and attributes all restaurant spending to tourists. The approach may be reasonably accurate if the overestimate from including all restaurant sales compensates for omitting other kinds of tourist spending<sup>2</sup>.

Another quick and dirty approach is to apply an average tourist spending figure to some guesstimate or available estimate of tourist volume in an area, e.g. an area attracts 200,000 visitors who each spend \$100 per trip for a total of \$20 million in tourism sales. As tourists vary widely in their spending patterns, estimating an "average" across all tourists can be difficult. An average from one study cannot be readily applied to other situations if it entails a quite different mix of visitors, prices and spending opportunities. There are also significant problems in measuring tourist volumes and obtaining representative samples of tourists. These problems can lead to biased estimates of both tourist volumes and spending from local surveys. The advantages of the ad hoc approaches is that they are inexpensive and, lacking other estimates, the aggregate figures derived from such approaches are often difficult to challenge.

These ad hoc methods do contain the key elements of more scientific approaches. The two more substantive approaches to estimating economic impacts of tourism may be labeled the "visitor survey method" and "tourism satellite accounting approach (TSA)". TSA's rely on extracting tourism-related economic activity from existing systems of economic accounts, while survey methods rely on more directly estimating tourism volumes and spending via formal visitor surveys. Survey methods often use regional economic tools such as input-output models and multipliers to convert tourist spending to the associated income and jobs and to estimate secondary impacts (multiplier effects). TSA's generally cover only the direct effects of tourism spending in tourism-related industries. Some TSA's have gone beyond visitor spending to include investments in tourism industries and infrastructure, consumer durables such as recreation vehicles, boats and sporting goods, and imputed rents on vacation homes (Okubo and Planting 2001). Survey-based methods focus mainly on the impacts of visitor spending while on trips away from home.

### **The MITEIM Model - Visitor Survey Approach**

The Michigan Tourism Economic Impact Model (MITEIM) developed for Travel Michigan (Stynes 2000) represents the "survey" approach. It estimates economic impacts based on the number and types of visitors, spending profiles, and economic multipliers. The tourist volume and spending estimates may come from systematic surveys, may be derived from secondary sources, or be based on good judgment. Here, we apply the MITEIM model to the Lansing MSA by using the model's default lodging segments, adjusted visitor spending averages, multipliers from a 1998 input-output model of the region's economy, and tourist volume estimates from a county level Michigan tourism spending model (Stynes, 1998). The five default lodging segments are (1) day visitors, and four types of overnight visitors -- those staying overnight in the area in (2) motels, (3) campgrounds, (4) seasonal homes, and (5) with friends and relatives. The camping and seasonal home segments are not very significant for Lansing, so the model essentially reduces to three key segments: day visitors, and overnight visitors staying in motels or with friends and relatives.

Table 1 reports the MITEIM model estimates of spending and party nights for the Greater Lansing region for 1998. A travel party is a group of people traveling or staying together. Nights are treated as equivalent to days, i.e. day trips count as one night and overnight stays are measured in nights, not days.

Spending profiles are adapted from statewide averages built into the model. For example, the local room and campsite rental rates replace the model defaults and spending in other categories are set slightly above average to reflect somewhat higher prices and greater spending opportunities in the Lansing metro area compared with northern and rural areas. Detailed spending profiles in the MITEIM model permit fine tuning of the spending averages to reflect local conditions.

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<sup>2</sup> This simple approach applied to 1998 National and Michigan data overestimates tourism sales by about a third compared to the U.S. Satellite accounts and ratios.

Estimates of tourist volumes are derived from a Michigan county level tourism spending estimator (Stynes, 1998), using updated estimates of rooms and room taxes from the Lansing CVB.

In 1998 the Lansing area hosted 3.5 million travel party days/nights, averaging about \$90 per night for a total of \$316 million in tourist spending. The motel segment accounts for 46% of this spending. Visitors spent \$64 million on rooms, \$75 million in restaurants and bars, \$48 million on groceries, etc. Economic ratios and multipliers may be applied to the spending totals to convert spending to income, jobs or value added or to estimate secondary effects. Tax rates may also be applied to estimate tax revenues. The MITEIM model automates this process using multipliers and ratios derived from local area input-output models estimated with the IMPLAN system (MIG, Inc. 2000).

**Table 1. Greater Lansing Visitor Spending Summary, 1998**

	Segment spending averages				Total \$MM's	Spending Percent
	Day	Motel	Camp	VFR		
<b>Spending category</b>	<i>\$ per party per night</i>					
Motel, hotel, B&B	0.00	79.00	0.00	0.00	64	20%
Camping fees	0.00	0.00	14.87	0.00	1	0%
Restaurants & bars	19.76	42.77	14.63	12.38	75	24%
Groceries, take-out food	5.59	11.27	11.27	20.00	48	15%
Gas & oil	9.75	12.06	8.84	9.29	35	11%
Other vehicle expenses	0.43	1.53	1.87	0.22	2	1%
Local transportation	1.37	6.53	2.88	0.65	8	3%
Admissions & fees	9.59	9.93	5.13	3.84	24	8%
Clothing	3.95	6.03	2.82	2.15	13	4%
Sporting goods	0.30	0.74	0.80	1.23	3	1%
Souvenirs, other expenses	<u>12.44</u>	<u>11.22</u>	<u>6.48</u>	<u>12.57</u>	<u>42</u>	<u>13%</u>
<b>Total</b>	<b>63.17</b>	<b>181.07</b>	<b>69.58</b>	<b>62.33</b>	<b>316</b>	<b>100%</b>
Party nights (000's)	1,003	806	83	1,613	3,505	
Total spending (\$MM)	63.3	146.0	5.7	100.6	316	
Percent of spending	20%	46%	2%	32%	100%	

### Tourism Satellite Approach (TSA)

Tourism satellite approaches are a more recent development, with most of the attention at the national level. The basic idea is to apply a set of "tourism industry ratios" (TI ratio) to reported sales in each tourism-related sector of the economy. The TI ratio captures the proportion of sales in each sector to tourists. For example, the 1997 U.S. National TSA counts 80% of lodging sector sales and 17% of restaurant sales as tourism (Kass and Okubo 2000). While TSA's have not yet been widely applied at state or local levels, the basic approach generalizes readily to any region. The primary obstacle is estimating the tourism industry ratios for local areas, as the necessary economic data is readily available at the county level<sup>3</sup>. The vast majority of tourist spending is captured by a handful of economic sectors, most notably, hotels, eating and drinking places, amusements, and retail trade. Fortunately, these sectors do not generally have significant disclosure problems at the two digit SIC/NAICS level. Airlines and other transportation sectors, car rentals, and travel arrangements can be important if covering travelers using other than personal vehicles. The method will miss some spending that accrues to government and miscellaneous sectors not identified as "tourism-related".

<sup>3</sup> Economic accounts are usually 2-3 years behind, so projections must be made to produce more timely estimates.

While the hotel ratio (the percentage of hotel sales to tourists vs local residents) will be reasonably consistent across different regions, ratios for other sectors will vary according to the tourism dependency of the region. For example, the percentage of restaurant sales to tourists will be low in areas with very few tourists or large resident populations and perhaps as high as 90% in tourist areas with a limited local population base. The national TI ratios are derived primarily from personal consumption expenditures (PCE) in the national I-O accounts and the Bureau of Labor Statistics' consumer expenditure survey (CEX), supplemented by selected travel surveys such as the in-flight surveys to estimate spending of foreign visitors in the U.S. and D.K. Shifflet and other surveys to correct for some known biases in the CEX data<sup>4</sup>. These data sources are, however, not rich enough to explain likely differences in the TI ratios across state and local areas.

Tourism industry ratios for a local area could be derived using either industry surveys or surveys of visitors. However, many businesses are not able to clearly distinguish sales to locals from sales to tourists. Also, wide variations across seasons and individual businesses, along with non-response problems complicate attempts to estimate TI ratios from industry surveys. The other approach is to directly estimate tourist spending via visitor surveys and then divide the tourist spending total by local sales figures for each tourism-related sector. Many communities and regions periodically conduct visitor surveys although sampling and measurement problems make these surveys somewhat unreliable. More importantly, many do not provide a way to expand from the sample to all visitors, a pre-requisite to estimating tourist industry ratios. TI ratios for an area rest largely on the ratio of tourists to local residents in the region and their respective propensities to spend money in different sectors. Armed with reliable counts of visitors to an area, local estimates of tourism industry ratios are within reach. The problem for most local areas is the lack of accurate visitor counts either to expand spending averages to totals or to estimate tourism shares of sales in different sectors.

### **Satellite Accounts for the Greater Lansing CVB**

The Greater Lansing CVB encompasses a three county MSA region (Clinton, Eaton and Ingham counties in Michigan). Satellite accounts are developed by identifying a set of tourism-related sectors and then extracting the portion of sales, income and jobs in each of these sectors that may be attributed to tourist spending. The 15 tourism-related sectors and TSA calculations are shown in Table 2, using sales and value added as the economic measures. Tourism-related sectors include hotels, restaurants (eating and drinking establishments), amusements and recreation services, retail and wholesale trade, and selected entertainment and transportation sectors. These 15 tourism-related sectors accounted for 12% of sales, 23% of jobs, and 16% of value added in the Greater Lansing area in 1998 (Table 2).

However, not all of this economic activity can be attributed to tourism. Only a portion of sales in hotels, restaurants and other sectors is to tourists. The largest tourism-related sectors are retail and wholesale trade sectors (over a million in sales for each in 1998), but only a small share of activity in these sectors can be directly attributed to tourist spending. Transportation sectors, restaurants and amusements serve a mix of locals and travelers. Hotels are probably the "purest" tourism sector, although even hotels depend on local sales for meetings, banquets and receptions, and also local use of restaurants and retail shops in hotels.

The specific economic activity attributed to tourists can be extracted from each of the tourism-related sectors using a set of TI ratios for the Lansing area. As the ratio of visitors to residents for Lansing is similar to the national ratio, the national tourism industry ratios are a good place to start. The TI ratios in the middle column of Table 2 indicate the proportion of sales, income, and jobs for each sector attributed to tourist spending. The TI ratio for each industry sector is multiplied by the total output, income, jobs and value added in the left hand columns of Table 2 to yield tourist sales and value added in the right hand columns.

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<sup>4</sup> See Okubo and Planting (1997) and Kass and Okubo (2000) for details on how the national ratios were estimated. Their "method 2" ratios from the 1997 TSA are used here.

Based on the U.S. National TI ratios, we estimate that tourist sales in the Lansing area in 1998 was \$293 million. Tourist spending in the Greater Lansing area represents about 2.5 % of employment and about half this percentage of sales, income and value added. Tourism spending supported 7,200 jobs and paid out \$111 million in employee compensation. Total tourism value added in 1998 was \$183 million, or about 1.3% of total value added for the tri-county region. After air transportation (\$57 million), the largest contributors to tourism sales are restaurants (\$75 million), hotels (\$66 million), and retail trade (\$48 million).

**Table 2. Tourism Satellite Accounts for Greater Lansing Region, 1998<sup>a</sup>**

Sector	Tourism Industry Output		Tourism Industry Ratio <sup>b</sup>	Tourism Sales		
	Output (\$millions)	Value Added (\$millions)		Tourism Output (\$millions)	Tourism Value Added (\$millions)	Pct of Tourism Output
Hotels	81	52	81%	66	42	22%
Eating & Drinking	442	225	17%	75	38	26%
Amusements/Recreation	25	16	20%	5	3	2%
Membership sports	13	6	32%	4	2	1%
Entertainment	55	12	18%	10	2	3%
Prof sports	5	2	9%	0	0	0%
Retail Trade	1,208	1,032	4%	48	41	16%
Wholesale Trade	1,009	689	1%	10	7	3%
Auto rental and leasing	60	39	11%	6.6	4	2%
Auto repair and services	136	77	3%	4	2	1%
Local transportation	22	13	23%	5	3	2%
Air transportation	113	73	50%	57	37	19%
Arrange. Pass. Trans.	19	14	5%	1	1	0%
Transportation Services	8	5	5%	0	0	0%
<u>Rail Transport</u>	<u>31</u>	<u>18</u>	<u>3%</u>	<u>1</u>	<u>1</u>	<u>0%</u>
Total tourism	3,228	2,274		293	183	100%
Total economy	27,690	14,411				
Tourism industry Pct	12%	16%		1.1%	1.3%	

a. Covers all sales by businesses in Clinton, Eaton and Ingham Counties in 1998. Tourism industry output includes all sales of each industry, while tourism sales includes only sales to tourists. Output and value added data are from 1998 IMPLAN accounts.

b. The tourism industry ratios are the percentage of sales in each industry to tourists. These ratios are taken from the National Tourism Satellite Accounts for 1996/1997 with a few exceptions. Ratios for air transportation and travel arrangements were adjusted downward to omit sales to local residents traveling away from Lansing. The auto rental ratio was adjusted downward from 58% to 11% to account for new car leases. The retail ratio is a weighted average of 7% for gas service stations and 3% other retail.

It should be noted that the TSA excludes some tourist spending that accrues to sectors not considered as tourism-related, and also excludes tourist spending that accrues to businesses outside the three county region. For example, only the retail and a part of the wholesale margins on goods that tourists buy are included. The TSA approach does not capture the producer prices of goods that tourists buy at retail, even if they are manufactured locally. Tourist spending estimates derived from visitor surveys will typically include the full costs of all goods purchased, even if the good is not made locally. The estimates for Lansing also do not include any imputed rents, tourism-related capital formation or consumer purchases of durable goods related to travel (e.g. RV's and boats).

## Consistency of the Results

We now have two quite independent estimates of tourism output for the Lansing area for 1998. The MITEIM model estimates \$316 million in tourism spending (Table 1), while the satellite approach estimates \$293 million in sales by tourism-related firms to tourists. MITEIM and TSA estimates for the four primary tourism sectors can be seen to be very similar (Table 3)<sup>5</sup>. To put the overall totals on a comparable basis, air transportation, car rentals and travel arrangements must be omitted from the satellite total (leaving a total of \$230 million in sales) as these categories are not covered by the MITEIM model. Also, the producer prices of all goods bought by visitors must be added to the satellite accounts to estimate tourist spending, as the TSA's include no manufacturing sectors (i.e., they only capture retail and wholesale margins on purchases of goods). It is useful here to distinguish locally produced goods (estimated at \$9 million), from imported goods (estimated at \$76 million in producer prices), as the former have local economic impacts while the latter do not.

**Table 3. GLCVB Tourist Spending : Satellite and MITEIM Estimates for 1998 (\$ millions in sales)**

Industry/Commodity	MITEIM	Satellite	Pct of Total
Hotels	\$65	\$66	28%
Restaurants	\$75	\$75	31%
Amusements/Recreation	\$24	\$20	8%
Retail margins	\$47	\$48	20%
Wholesale margins	\$10	\$10	4%
<u>Other sectors</u>	<u>\$10</u>	<u>\$11</u>	<u>5%</u>
Total excl goods	\$231	\$230	96%
<u>Locally produced goods</u>	<u>\$9</u>	<u>\$9</u>	<u>4%</u>
Total Local Sales	\$240	\$239	100%
<u>Imported Goods</u>	<u>\$76</u>	<u>\$76</u>	
<u>Total Spending</u>	<u>\$316</u>	<u>\$315</u>	

Excludes airfares, car rentals and travel arrangements. MITEIM estimates are on a commodity basis, while Satellite accounts are on an industry basis.

After adjusting for differences in coverage, both the MITEIM and Satellite estimates indicate tourist spending (excluding air fares) was about \$316 million in 1998, of which \$240 million was captured by the tri-county economy as local production. We update the estimates to 2000 before completing the impact analysis to estimate jobs and secondary effects. .

### Updating the Estimates

Having established the consistency of MITEIM and TSA estimates for 1998, we address procedures for updating the estimates to 2000. The TSA estimates cannot be easily updated until more current economic data become available at the county level. Then, one would also need to assess whether the TI ratios in Table 2 may have changed over

<sup>5</sup> A minor difference is that MITEIM figures are on a commodity basis, while TSA estimates are on an industry basis. For example, a small percentage of the reported hotel sales may be retail sales or sales of restaurants and bars in hotels. The MITEIM hotel figure only includes room sales. See Okubo and Planting (1998) for the TSA methods for converting between a commodity and industry basis.

time. Detecting changes in these ratios would require fairly accurate estimates of the number of visitors and any changes in their spending patterns.<sup>6</sup>

The MITEIM model is more readily updated over time and also has the added advantage of being able to track impacts of particular travel market segments. The MITEIM model has built-in price indices for each spending category to update spending averages over time. For the Greater Lansing area, overall price increases between 1998 and 2000 increased the average spending per party night from \$90 to \$99 (Table 4). Room rates increased from \$79 to \$85, including room taxes. Party nights also increased from 3.520 million to 3.769 million. The increase in party nights is based on reported room occupancies and an assumption that other travel segments increased at the same rate as visitors staying in hotels. With these updates, total spending of tourists in the Lansing area increased from \$316 million in 1998 to \$372 million in 2000 (Table 4).

**Table 4. Lansing Region Tourist Activity and Spending, 1997-2000**

	1997	1998	1999	2000
Party nights (000's) <sup>a</sup>	3,307	3,505	3,520	3,769
Spending per party night	90	90	93	99
Tourist Spending (\$millions) <sup>b</sup>	\$298	\$315	\$327	\$372

a. Covers all trips to the Lansing area (Clinton, Eaton & Ingham counties) from 60 miles or more.

A party night is one travel party staying one night in the area. One day for day trips is counted as one night.

b. Spending excludes airfares and car rentals which would add about \$60 million each year, counting only half of air transportation.

Both the TSA and MITEIM approaches estimate the direct effects of tourist spending in terms of sales, income, value added or jobs. The MITEIM model can also generate secondary or "multiplier" effects. Table 5 reports the impact estimates for the Lansing region for 2000 using the MITEIM model. Notice that \$372 million in visitor spending produces \$278 million in direct sales, as only 75% of spending is captured by the local economy. The \$94 million not captured represents the producer prices of visitors' purchases of goods that are not made in the local area. This figure corresponds to the \$76 million in imported goods in 1998 shown in Table 3.

The sales multiplier for the Greater Lansing region in 2000 was 1.45, so another \$.45 in sales was created through indirect and induced effects for every dollar of direct sales. With secondary effects, the total economic impact of tourist spending on the Lansing area economy in 2000 was \$404 million in sales, \$159 million in personal income, \$254 million in value added and about 9,500 jobs.

### Summary and Conclusions

Using the Greater Lansing CVB region as an example, we have shown that very similar tourist spending and impact estimates may be generated using the TSA approach or the MITEIM model. Consistency of the two results lends considerable credibility to the impact figures. The TSA approach, in particular, is well grounded in official economic statistics for the area and imposes some control on what are sometimes inflated estimates of tourist volume and spending.

We have obtained very similar findings for the State of Michigan and other Michigan CVB regions (Stynes, 2001), including some with TI ratios quite different from the national averages. TSA and survey-based

<sup>6</sup> If one could track tourist shares of a key sector, such as restaurant sales, this share might be used to adjust TI ratios for other sectors.

approaches help to validate each other. On the one hand, the TSA results for Lansing suggest the spending profiles and numbers of visitors used in MITEIM model are reasonable. Conversely, the MITEIM approach helps determine appropriate levels of the TI-ratios used in the satellite accounts. As always, multiple sources of data and distinct analytical tools provide a more complete picture.

**Table 5. Economic impact of tourism spending on Lansing Area economy, 2000**

<b>Sector/Spending category</b>	<b>Direct Sales \$Millions</b>	<b>Jobs</b>	<b>Personal Income \$Millions</b>	<b>Value Added \$Millions</b>
<b>Direct effects</b>				
Motel, hotel, B&B	74	1,918	29	47
Camping fees	1	37	1	1
Restaurants & bars	85	2,638	30	43
Recreation/Entertainment	29	1,427	12	19
Other vehicle expenses	2	28	1	1
Local transportation	9	224	4	5
Retail Trade	56	1,440	29	47
Wholesale Trade	10	88	4	7
<u>Local Production</u>	<u>11</u>	<u>30</u>	<u>2</u>	<u>-</u>
<b>Total Direct Effects</b>	<b>278</b>	<b>7,742</b>	<b>111</b>	<b>171</b>
<b>Secondary effects</b>	<b>126</b>	<b>1,775</b>	<b>47</b>	<b>83</b>
<b>Total Effects</b>	<b>404</b>	<b>9,517</b>	<b>159</b>	<b>254</b>

a. Covers spending by visitors to Clinton, Eaton and Ingham counties on trips of 60 miles or more in 2000. Excludes airfares and car rentals.

Comparisons between MITEIM and TSA approaches has also raised several questions for further research. We did not include air transportation, car rentals and travel arrangements initially because the surveys used to estimate spending patterns in the MITEIM model did not include sufficient numbers of air travelers to reliably estimate the special expenses of air travelers. In applying TSA ratios to a local region, one must be careful to also distinguish between the size of the travel industry in the area and impacts of visitors. Local residents leaving the area will use air service and travel agents and their spending should be excluded if estimating impacts of visitors to the area. A check of local car rental sales suggested that the auto rental and leasing sector is contaminated by the trend of leasing new cars. The national ratio of 58% for this sector was reduced to 11% for Lansing. The tourism spending profiles in our MITEIM model also suggest that retail spending by tourists may be greater than indicated by the 3% ratio used in national accounts. Without going into details here, it suffices to note that having two somewhat independent estimates of tourism activity raises a number of productive research questions.

What are the implications for local CVB's? The findings suggest two avenues for estimating local tourism activity and economic impacts. If the 2-3 year time-lag in obtaining local economic accounts is acceptable, direct tourism sales, income and job estimates may be derived from county-level economic data by adjusting the national TI ratios and applying them to local economic data. We have used IMPLAN (MIG, Inc, 2000) county data files, but similar data may be obtained for any county from the WWW (e.g., County Business Patterns from U.S. Census or REIS income data from BEA at a two-digit level). Our analyses suggest that a ballpark estimate of the volume of tourists in a region relative to local populations may

suffice to adjust the national TI-ratios if ballpark spending estimates are desired<sup>7</sup>. Areas with good room tax data may use the lodging sector results as an initial check and also to extrapolate figures to a more recent year (i.e., assuming other travel components track reasonably with hotel sales).

The MITEIM model rests on accurate spending averages and estimates of the number and types of tourists to an area. Once these spending averages have been partially validated with a corresponding TSA approach, they can be more comfortably applied in forecasts or to estimate impacts of more narrowly defined actions. For example, we typically assume the spending patterns with segments are reasonably stable over time and can be updated using simple price indices. That is, travelers in a given segment purchase a similar set of goods and services, but must pay higher or lower prices depending on local trends. This leaves the tracking of the number and kinds of tourists as the central task.

One fact common to both survey and TSA approaches is that one cannot estimate tourist spending or economic impacts without reasonable estimates of the number and types of visitors to an area. CVB's and other local organizations should focus more attention on this problem. Leones (1999) discusses the most practical alternatives.

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<sup>7</sup> Our simple approach uses the ratio of visitors (person days) to permanent residents \* 365 to capture the proportion of visitors to residents of an area. This ratio is then applied to propensities of tourists vs local residents to purchase a given item on a given day.

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