

## **SECTION 6: TASK 4 - MEASURING TOTAL ECONOMIC IMPACTS: (ASSESSING INDIRECT IMPACTS VIA THE MULTIPLIER EFFECT)**

### **The Multiplier Concept**

Visitor spending in a community can have a multiplied effect beyond the impacts of the original spending. Multiplied impacts arise from the fact that local businesses, households and government agencies purchase goods and services from one another. Such interaction within the local community resulting from the stimulus of event visitor spending creates indirect or multiplier effects. The multiplier is a number that summarizes total direct and indirect spending effects given a change in the local economy.

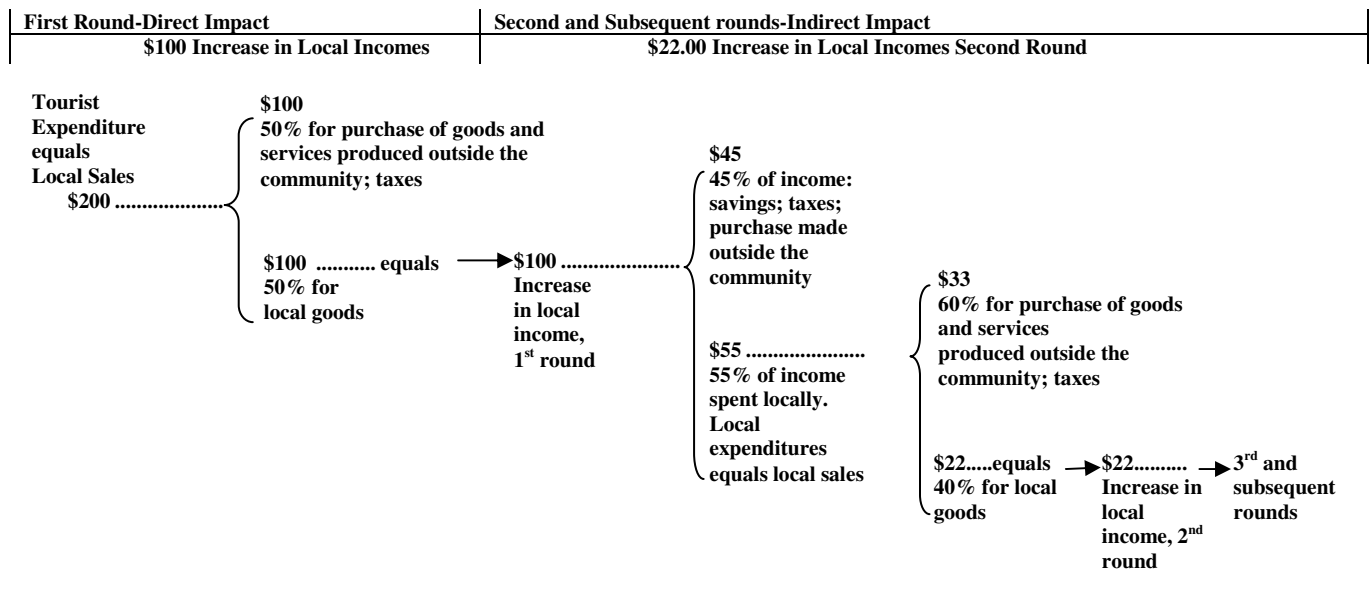
Recreation event visitors make expenditures at local establishments, for example on accommodation at a local motel. These visitors therefore generate increased income for the motel. This is, however, not the end of the matter - the recipient of this income will spend a portion for goods and services, some produced locally and some imported. The motel proprietor hires staff buys groceries at the local market and gasoline at the filling station, generating additional local income. These second round recipients will have less of the total to spend than the first round recipients - those who received income from the initial tourist purchase - and third round recipients will have less again because only a portion of respending in each round takes place within the local area.

The result of this “chain of spending” is a multiplier process whereby the local income added directly is multiplied to give the total income created in the community. The difference between the total added income and the income created in the first round and subsequent is known as the indirect impact.

The amount of income generated locally in the second, third and subsequent round of spending is determined by the same considerations as determined the direct impact - the pattern of spending, in this case by local residents, the proportion of income spent on local goods and services and the percentage of these goods and services produced locally. Figure 6.1 takes \$200 tourist expenditure into the second round of spending. Taxes are treated as a payment for services performed by outsiders. The \$200 in purchases created \$100 income for local residents in the first round. They in turn, spend 55% of this, \$55 at local shops and businesses.

The other \$45 goes into savings, taxes or into other communities as a portion of their incomes is spent outside their community. The additional \$55 in local sales adds more to local income. Again, however, the addition to local incomes will be less than the amount of the sales. If 40% of the goods and services sold are produced locally, there will be another \$22 added to local incomes which will lead to still further increases in local sales and incomes. This process continues with ever decreasing amounts of income being created in subsequent rounds of respending. The process stops when all \$200 of the original visitor expenditure has flowed out of the local region. The multiplier is a mathematical way of expressing the relationship between the original visitor spending change and the total of all related respending and income creation

**Figure 6.1 An Example of the Impact of a \$200 Tourist Expenditure of Local Incomes**



Through the use of multipliers, it is therefore possible to estimate the magnitude of the total economic impact resulting from an initial given change in economic activity.

### Use of Published Multipliers

Proper use of multipliers is critical for credible economic impact studies. It is suggested that parties looking to complete economic impact studies follow the format laid out in the AVESTA website and obtain assistance in planning and calculating direct and multiplied effects.

Highly aggregated multipliers are available at the provincial level through Statistics Canada. Dr. Brian VanBlarcom of Acadia University has developed a 16 sector input-output model for Kings County, Nova Scotia. This model contains Kings County expenditure and income multipliers for each of 16 industries. This model has been used for a number of economic impact studies, many are available on the AVESTA website. This model is available for use in conjunction with studies being completed via the AVESTA website. The Canadian Sports Tourism Alliance (CSTA) has conducted a number of economic impact studies related to sports events across Canada using their STEAM (Sports Tourism Economic Assessment Model). Details of the STEAM model and a number of completed studies are available on the CSTA website:

[http://www.canadiansporttourism.com/eng\\_home.cfm](http://www.canadiansporttourism.com/eng_home.cfm).

Some other studies examining economic impacts for region of Nova Scotia have made estimates of local multipliers but such studies are few.

### **Construction of Your Own (Keynesian Type) Multipliers**

There are significant data requirements for constructing your own multiplier. Such data include:

- The pattern and volume of visitor expenditure in the region;
- The percentage of goods and services produced locally;
- The percentage of local income that is spent locally.

These data requirements are discussed below. Some of the data requirements may be available through Statistics Canada or Provincial/Municipal Governments or other published sources. Some data requirements may necessitate a survey of households and businesses. Data availability will vary by study region.

#### *Determine Pattern and Volume of Tourist Expenditures*

The pattern and volume of tourist expenditures will in most instances be the first type of data collected in evaluating visitor impact. The income that accrues to local residents will depend first on the size of tourist expenditure. Second, the amount of local income created will depend on the level of spending and the pattern of expenditure by the tourist.

### *Percentage of Goods and Services Produced Locally*

Also important is the extent to which different sectors within the local area purchase goods and services from each other. If the local restaurant is able to purchase food from farmers in the region, more of the visitor expenditure will accrue as local income. It is useful to estimate, for sectors important in serving visitors, the percent of each purchase that is produced locally. Survey/interviews of business persons in each sector can provide you with this information.

Your local economic development agency may be able to provide you with an estimate of the percentage of local income spent locally and the percentage of local goods and services produced locally. With these estimates, it is not necessary to trace out each round of spending to approximate the total local income created. Creating the multiplier will allow easy calculation of the total for all rounds.

### *Calculate Percentage of Local Incomes Spent Locally*

Once the percentage of goods and services produced locally has been estimated, the amount of direct income coming into the local area can be calculated. If \$100 is spent for lodging, and if 40% of this sum must go to buy goods and services outside the area, only 60% of the \$100 or \$60 is received as local income. The role of taxes that can partially flow out of the community has been neglected for simplicity. This however, is not the end of the story as a portion of this \$60 will be respent in the local area, creating additional local income, which will then be respent thereby creating further rounds of respending.

### *Multiplier Calculation*

Summarized below in a step-by-step fashion is this method of estimating the impact of tourist expenditures on local income using constructed multipliers. A numerical example is included in Table 6.1.

**Step 1** Collect data on the volume and pattern of visitor spending. This information will come from your visitor survey.

- Step 2** For each sector receiving visitor expenditure, estimate the percentage of sales which remain in the area. Survey/interviews with business persons in each sector can provide this estimate.
- Step 3** Determine the percentage of tourist expenditure that directly increases local incomes (A in the multiplier formula). This is a “weighted” average of all sectors where the weights are the percent of the tourist expenditure in each sector.
- Step 4** Estimate the percentage of income that local people spend in your community (B in the multiplier formula). Such information may be available through local economic development agencies or it may require a survey of local households.
- Step 5** Estimate the percentage of goods and services sold locally that are produced locally (C in the multiplier formula).. Such information may be available through local economic development agencies or it may require a survey of local businesses.
- Step 6** Calculate your expenditure multiplier  $M_E$  from the following formula:
- $$M_E = \frac{1}{1 - (B \times C)}$$
- Step 7** Calculate your income multiplier  $M_I$  from the following formula:
- $$M_I = \frac{A}{1 - (B \times C)}$$
- Step 8** Determine the total increase in local expenditure and income by multiplying total visitor spending by the expenditure and income multipliers respectively.

Table 6.1 shows an example of these calculations. For the expenditure multiplier of 1.28, total (direct, indirect and induced) expenditures in the local area rise \$128 for every \$100 of visitor expenditures. For the income multiplier of 0.64, total local incomes (direct, indirect and induced) increase \$64 for every \$100 of visitor expenditure.

Please note that while calculating the total increase in local expenditures (sales) is useful, it should not be the variable of focus in terms of the impact of visitor expenditures on the local economy. Where we may be interested in the volume of

sales attributable to the tourist expenditure, of more critical concern is the portion of that expenditure which ends up as local income.

**Table 6.1 An Example of Calculating the Expenditure and Income Impacts of Visitor Spending**

| Step              | Procedure and Calculation  | Source of Information   |                |            |                 |                |                |         |                        |   |                |  |     |       |           |            |  |       |      |                |
|-------------------|--|---|----------------|------------|-----------------|----------------|----------------|---------|------------------------|---|----------------|--|-----|-------|-----------|------------|--|-------|------|----------------|
| 1                 | <p>Volume and Pattern of Tourist Spending</p> <table style="margin-left: 40px;"> <tr> <td>Total Expenditure</td> <td>\$200</td> <td>% of Total</td> </tr> <tr> <td>Food</td> <td>40</td> <td>20%</td> </tr> <tr> <td>Lodging</td> <td>40</td> <td>20%</td> </tr> <tr> <td>Transportation</td> <td>46</td> <td>23%</td> </tr> <tr> <td>Other</td> <td><u>74</u></td> <td><u>37%</u></td> </tr> <tr> <td></td> <td>\$200</td> <td>100%</td> </tr> </table>   | Total Expenditure   | \$200          | % of Total | Food            | 40             | 20%            | Lodging | 40                     | 20%   | Transportation | 46   | 23% | Other | <u>74</u> | <u>37%</u> |  | \$200 | 100% | Visitor Survey |
| Total Expenditure | \$200  | % of Total  |                |            |                 |                |                |         |                        |   |                |  |     |       |           |            |  |       |      |                |
| Food              | 40   | 20%   |                |            |                 |                |                |         |                        |   |                |  |     |       |           |            |  |       |      |                |
| Lodging           | 40   | 20%   |                |            |                 |                |                |         |                        |   |                |  |     |       |           |            |  |       |      |                |
| Transportation    | 46   | 23%   |                |            |                 |                |                |         |                        |   |                |  |     |       |           |            |  |       |      |                |
| Other             | <u>74</u>  | <u>37%</u>  |                |            |                 |                |                |         |                        |   |                |  |     |       |           |            |  |       |      |                |
|                   | \$200  | 100%  |                |            |                 |                |                |         |                        |   |                |  |     |       |           |            |  |       |      |                |
| 2                 | <p>% of Tourist Expenditure by sector which remains in area as income</p> <table style="margin-left: 40px;"> <tr> <td>Food</td> <td>40%</td> </tr> <tr> <td>Lodging</td> <td>60%</td> </tr> <tr> <td>Transportation</td> <td>40%</td> </tr> <tr> <td>Other</td> <td>57%</td> </tr> </table>  | Food  | 40%            | Lodging    | 60%             | Transportation | 40%            | Other   | 57%                    | Survey/interviews with knowledgeable business persons |                |  |     |       |           |            |  |       |      |                |
| Food              | 40%  |   |                |            |                 |                |                |         |                        |   |                |  |     |       |           |            |  |       |      |                |
| Lodging           | 60%  |   |                |            |                 |                |                |         |                        |   |                |  |     |       |           |            |  |       |      |                |
| Transportation    | 40%  |   |                |            |                 |                |                |         |                        |   |                |  |     |       |           |            |  |       |      |                |
| Other             | 57%  |   |                |            |                 |                |                |         |                        |   |                |  |     |       |           |            |  |       |      |                |
| 3                 | <p>% of total expenditure that directly increases local incomes. A weighted average of all sectors with the % of tourist expenditure in each sector as weights</p> <table style="margin-left: 40px;"> <tr> <td>Food</td> <td>20% X 40% = 8%</td> </tr> <tr> <td>Lodging</td> <td>20% X 60% = 12%</td> </tr> <tr> <td>Transportation</td> <td>23% X 40% = 9%</td> </tr> <tr> <td>Other</td> <td>37% X 57% = <u>21%</u></td> </tr> <tr> <td></td> <td>50%</td> </tr> </table> <p>(A in multiplier formula)</p> | Food  | 20% X 40% = 8% | Lodging    | 20% X 60% = 12% | Transportation | 23% X 40% = 9% | Other   | 37% X 57% = <u>21%</u> |   | 50%            | From calculations performed in Steps 1 and 2 |     |       |           |            |  |       |      |                |
| Food              | 20% X 40% = 8%   |   |                |            |                 |                |                |         |                        |   |                |  |     |       |           |            |  |       |      |                |
| Lodging           | 20% X 60% = 12%  |   |                |            |                 |                |                |         |                        |   |                |  |     |       |           |            |  |       |      |                |
| Transportation    | 23% X 40% = 9%   |   |                |            |                 |                |                |         |                        |   |                |  |     |       |           |            |  |       |      |                |
| Other             | 37% X 57% = <u>21%</u>   |   |                |            |                 |                |                |         |                        |   |                |  |     |       |           |            |  |       |      |                |
|                   | 50%  |   |                |            |                 |                |                |         |                        |   |                |  |     |       |           |            |  |       |      |                |
| 4                 | <p>% of local income spent in local community</p> <p>= 55%</p> <p>(B in multiplier formula)</p>  | From local economic development agency or a survey of local residents |                |            |                 |                |                |         |                        |   |                |  |     |       |           |            |  |       |      |                |
| 5                 | <p>% of local goods and services produced locally</p> <p>= 40%</p> <p>(C in multiplier formula)</p>  | From local economic development agency or a survey of local residents |                |            |                 |                |                |         |                        |   |                |  |     |       |           |            |  |       |      |                |
| 6                 | <p>Calculate Expenditure Multiplier</p> $M_E = \frac{1}{1 - (B \times C)} = \frac{1}{1 - (.40 \times .55)} = 1.28$   | From estimates made in Steps 4 and 5                                  |                |            |                 |                |                |         |                        |   |                |  |     |       |           |            |  |       |      |                |
| 7                 | <p>Calculate Income Multiplier</p> $M_I = \frac{A}{1 - (B \times C)} = \frac{.50}{1 - (.40 \times .55)} = .64$   | From estimate in Step 4 and 5   |                |            |                 |                |                |         |                        |   |                |  |     |       |           |            |  |       |      |                |
| 8                 | <p>Determine the total increase in local expenditures/income. Multiply total tourist expenditures by the expenditure/income multiplier</p> <p>\$200 X 1.28 = \$256</p> <p>\$200 X 0.64 = \$128</p>   | From Steps 1, 6 and 7   |                |            |                 |                |                |         |                        |   |                |  |     |       |           |            |  |       |      |                |

