IMPLAN Workshop Exercises

Each exercise is based on a clean Larimer county 1997 model. To replicate our results, your ODF file must be version 7-18-2000, and your 1997 structural matrix file must be version 3-15-2000.

Exercise 1

Objective: To learn how to create the initial IMPLAN model and identify the different multipliers.

	Task	Hints
1.	Start IMPLAN.	Click on **Start**, **Programs**, **IMPLAN Professional 2.0, IMPLAN Professional 2.0**
2.	Select a new model.	Click **File, New Model.**
3.	Give the model a name.	Type a name in the **Create New Model** dialog box. Call it "Larimer". Click **Save.**
4.	Pick the state, county or counties you want to include in your region.	Select the directory where your data is located. Pick the county or state you want by double clicking the name. You can select more than one. You will see the selected county(s) or state(s) in the right hand window. Click **Continue** when you are done selecting counties. Click **Ok** when the study area is completed.
5.	Construct the predictive model.	Click the **Construct Model** button. Click the **Type SAM** check box. Notice that the **Social Accounts** box will also be selected. Click **Continue**. Click **OK**, then click **Close** when done.
6.	Print preview the multiplier report.	Click the **Reports** button on the **Model Control Center**. Select the **Multipliers** tab. Click the **Print Preview** option. Select the **Output Multipliers** by clicking the **Check Box** next to **Output**. Click the **Zero Suppressed** option. Click the **Continue** button.
7.	Write down the value of the Type SAM output multiplier for sector 339:	You can zoom the report to enlarge the typeface.
8.	What is the difference between the Type I and Type SAM output multiplier?	
9.	Close the preview.	Click the **X** box in the upper right hand corner to close the report.
10.	Close the report window.	Click **Close** and you will be back at the **Model Control Center**.

Exercise 2

Objective: To learn how different RPCs affect the multipliers.

	Task	Hints
1.	Start IMPLAN.	Click on **Start**, **Programs**, **IMPLAN Professional 2.0, IMPLAN Professional 2.0**
2.	Select a new model.	Click **File, New Model.**
3.	Give the model a name.	Type a name in the **Create New Model** dialog box. Call it "Larimer". Click **Save.**
4.	Pick Larimer CO, 1997.	Select the directory where you data is located. Pick the county or state you want by double clicking the name. You can select more than one. You will see the selected county(s) or state(s) in the right hand window. Click **Continue** when you are done selecting counties. Click **Ok** when the study area is completed.
5.	Construct the predictive model.	Click the **Construct Model** button. Click the **Type SAM** check box. Notice that the **Social Accounts** box will also be selected. Click **Continue**. Click **OK** and then **Close** when done.
6.	Print preview the multiplier report.	Click the **Reports** button on the **Model Control Center**. Select the **Multipliers** tab. Click the **Print Preview** option. Select the **Output Multipliers** by clicking the **Check Box** next to **Output**. Click the **Continue** button.
7.	Write down the value of the Type SAM output multiplier for sector 65 Fluid Milk:	You can zoom the report to enlarge the typeface.
8.	Edit the regional purchase coefficient for sector 1 Dairy Products and change the value to 1.1. What happens?	Close the **Multiplier Report** by clicking the **X** at the top right hand side of the window. Click **Close** to close the **Report** window. Click the **Edit** button on the **Model Control Center** and select **Regional Purchase Coefficients**. Click on the **Estimated Average Regional Purchase** text box and change the existing value for "Dairy" from 0.098158 to 1.1.
9.	Change the RPC value to 1.0.	Change the value to 1.0 and hit **Enter**. Close the window by clicking the X in the upper right hand corner. Click Ok that the model has changed.
10.	Rerun the model	We have changed the picture of our economy so our model is now invalid. We have to rerun the model. Click **Construct Model** and then **Continue** to reprocess. When its complete, click **Ok** and then **Close**.

11.	Print preview the multiplier report.	Click the **Reports** button on the model control center. Select the **Multipliers** tab. Click the **Print Preview** option. Select the output multipliers by clicking the check box next to **Output**. Click the **Continue** button.
12.	Write down the value of the Type SAM output multiplier for sector 65 Fluid Milk:	You can zoom the report to enlarge the typeface.
13.	Why is there a difference?	

Exercise 3

Objective: To create a simple single industry impact.

	Task	Hints
1.	Start IMPLAN	
2.	Either open a clean Larimer model or create a new one	
3.	Open the impact analysis portion of the program.	Click **Impact** from the **Model Control Center**, or click **Impact** then **Create/Edit**
4.	Create a new event for a 200 job change in the Electronic Computer sector.	Click **Add New** in the **Event Options** box. Type in an event name, call it "Computers". Hit **Enter** to set the name and then **Enter** again to move to the next field. Click the down arrow and scroll to sector 339. Click on the sector name. Hit **Enter** to move to the next field. Hit **Enter** to move to the job field. Type 200 and then hit **Enter**.
5.	Run the analysis.	Click the **Analyze** button. This will bring up the impact analysis dialog box. Leave the **Level** at **1.0**. Enter an impact name, call it "Computer Run". Click **Run Impact**.
6.	Look at the results.	Once the impact is run, click **Yes** to view the results.
7.	Fill in the table below.	

Single Industry Impact

	Output	Employment	Labor Income
Total Direct			
Total Indirect			
Total Induced			
Total			

8.	Change the impact from industry to commodity.	Click the **X** in the top right hand corner of the results window to close the screen. Click on the **Basis** cell in your impact event table and change **Industry** to **Commodity**.
9.	Re-Run the analysis.	Click the **Analyze** button. This will bring up the impact analysis dialog box. Leave the **Level** at 1.0. Enter an impact name, call it Computer Commodity Run. Click **Run Impact**.
10.	Look at the results.	Once the impact is run, click **Yes** to view the results.
11.	Fill in the table below.	

Single Industry Impact Commodity Basis

	Output	Employment	Labor Income
Total Direct			
Total Indirect			
Total Induced			
Total			

11.	Why is it different?	

Exercise 4

Objective: To understand the use of margins.

In this exercise, we are going to examine the use of margins. The example will involve looking at the impacts of visiting golfers. We did a survey of visiting golfers and their average per day spending is in the following table. These golfers arrive predominantly by car, they stay an average of **2.5** days. We estimate that there were a total of **22,500** golfing visitors in the last year. What is the impact of tourism on our county?

	Task	**Hints**
1.	Start IMPLAN	
2.	Either open a clean Larimer model or create a new one through Type SAM Multipliers.	
3.	Fill in the table below.	We need to calculate the total spending, figure out which IMPLAN sector to use, decide whether or not we need margins, the basis, and how much of the spending takes place locally. Remember margins are only used for stuff that is bought from a retailer (e.g. gas station). For snacks and auto gas use margins the typical way. Select the manufacturer of the good and use the household margins. For souvenirs, we will assume that the manufacturer is not local so we buy these directly from General Merchandise (retail) and we will take advantage of a special feature of the 97 database. Keep the default (100%) for % Local.

Category	Per Day Spending	Total Per Visitor Spending	IMPLAN Sector	Margin	Basis	% Local
Lodging	$45.00					
Restaurants	$25.00					
Souvenirs	$15.75					
Auto Gas	$9.75					
Golfing	$20.00					
Snacks	$2.25					

4.	Enter the values from the above table in the event table.	From the **Model Control Center**, click **Impacts** to get to the Impact screen. Select the **Ungrouped Events** group if it is not already selected. If there are any events in this group, click **All** under the **Delete Event Options**. Click **Add New** to place the cursor in the first **Event Name** field. Give the event a name, for example, “Lodging”. Enter the information from the above table. Do this for each of the events in the above table.

5.	Set the % Local to 0 for the manufacturing sector for snacks and auto gas.	Click the **Edit** button next to the **Margin** cell. This will bring up the margin edit screen. Set the **% Local** to 0 for the manufacturer.
6.	Run an analysis of visitation by golfers.	From the **Impact** screen, click **Analyze**. Select the **Ungrouped events**. Set the **Level** to the number of visitors. Give the analysis run a name "Visitor Spending", then **click Run Impact.**
7.	Examine the results of the analysis	Click **Yes** when the analysis run is complete and the Results screen will be displayed. Click on the Employment node to see the Employment impact. You can also select any other type of report as well.
8.	Fill in the table below	

Visitor Spending Results

	Output	Employment	Labor Income
Total Direct			
Total Indirect			
Total Induced			
Total			

What are the top 5 industries for

Output Impact	Employment Impact	Labor Income Impact
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.
5.	5.	5.

Exercise 5

Objective: To understand the use of institutional impacts and using the model's consumption functions.

In this exercise, we are going to use the model's household spending pattern to estimate the effects of government transfer payments. We will assume that our average household is getting a $1,500 sales tax rebate and that they are going to spend their entire rebate.

	Task	**Hints**
1.	Start IMPLAN	
2.	Either open a clean Larimer model or create a new one through the Type SAM multipleirs.	
3.	How many households are in this region?	Read the value from the **Model Control Center**.
4.	Open the impact screen.	From the **Model Control Center**, click **Impacts**.
5.	Import a household institution.	Click the **Import** button on the lower right hand corner of your **Impacts** screen. Select the **Institution** tab. Click on **Households 30-40k**. Their spending pattern will represent average household consumption. Click **Import**, then **Ok**, and then **Close**.
6.	From the Impacts screen look at the average consumption pattern.	Click on the "Households 30-40k" group in the **Groups** box (under "Ungrouped Events"). A list of events will be shown. This is the consumption pattern of households in this income group. You can see the different things households buy. This consumption function has already been margined. The **% Local** has been set to the models regional purchase coefficients to allow for leakage of household spending to outside the region.
7.	Run an analysis of household spending. What should the level be set to?	To get the level, multiply the number of households by the sales tax rebate per household. Write it in the space to the left. Then click **Analyze**, pick the group you want to run, and set the **Level** to your calculated total spending value. Click on the **Name** cell and give your impact run a name. Then click **Run Impact**.
8.	Examine the results of the analysis	Click **Yes** when the analysis run is complete and the **Results** screen will be displayed.
9.	Fill in the table below	

Visitor Spending Results

	Output	Employment	Labor Income
Total Direct			
Total Indirect			
Total Induced			
Total			

10.	Sort your results and see what sectors are affected by household spending.	Click on the header of the Total field to sort the column.

What are the top 5 industries for

Output Impact	Employment Impact	Labor Income Impact
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.
5.	5.	5.

11.	Compute the earnings per worker for the top 5 industries in terms of employment impacts.	

Top 5 industries for Employment

Industry	Employment	Labor Income	Earnings per Worker
1.			
2.			
3.			
4.			
5.			

12.	Are these good jobs?	
13.	What else can we say about the impact of household spending.	

Exercise 6

Objective: To estimate the contribution of a local industrial sector to the rest of the economy.

In this exercise, we are going to remove an entire industry from our economy and then look at the impacts of this. The impact represents that sector's contribution to the economy. In other words, how much other economic activity is supported by our sector of interest?

	Task	Hints
1.	Start IMPLAN	
2.	Either open a clean Larimer model or create a new one	
3.	Determine the IMPLAN sector we are going to remove and enter it in the table below.	Use Appendix A from the IMPLAN manual to look for the "Beer Brewing" sector. It may have a different name from "Beer Brewing".
4.	Open the study area editing screen and get the total value of employment and output for the Beer sector. Enter it in the table below	From the **Model Control Center**, click **Edit**, **Region Data**, **Study Area**. Scroll down to the correct **IMPLAN** sector and click on it. You can read the employment and output value from the left-hand side of the screen.

Industry Name	Beer Brewing
Sector	
Employment	
Total Output	

5.	Close the edit screen and create an impact for losing the Beer Brewing industry.	Click the **X** in the top right hand corner of the edit screen to close it. Click the **Impacts** button from the **Model Control Center**. Click **Add New** to set the cursor in the **Event Name** field. Give the event a name, call it "Beer Brewing". Hit **Enter** to set the name, then **Enter** again to move to the **Sector** field. Click the **Down Arrow** and scroll down the list until you reach the Beer sector. Click **Enter** to move to the **Value** field, click **Enter** again to move to the **Employment** field. Enter the number of employees from the table above. Hit **Enter** to set the value.
6.	Run the analysis.	Click **Analyze** to bring up the analysis screen. Be sure "Ungrouped Events" is selected. Set the Level either to 1.0 or –1.0. Hit **Enter** to move to the **Name** field and give your impact run a name. Call it "Beer 1". Click **Run Impact**.
7.	Examine the results of the analysis	Click **Yes** when the analysis run is complete and the Results screen will be displayed. Click on the Employment node to see the Employment impact. You can also select any other type of report as well.
8.	Fill in the table below	

Beer Brewing Results

	Output	Employment	Labor Income
Total Direct			
Total Indirect			
Total Induced			
Total			

9.	Compute the earnings per worker for the top 5 industries in terms of employment and fill in the table below.	

Top 5 industries for Employment

Industry	Employment	Labor Income	Earnings per Worker
1.			
2.			
3.			
4.			
5.			

10.	How do these jobs compare to those in Exercise 6?	
11.	What does this mean?	

Extra Credit

12.	Have we overestimated the impact at all?	Look at the output impact results. What is the total output impact? What is the actual total output of the beer sector. Should the total impact be greater than total output of the beer sector.

Exercise 7

Objective: To modify our model to make the direct effects the same as the firm we are studying.

In this exercise, we are being asked to look at the impact of a new company moving into our study area. The industry already exists in our region and we have been given their industrial sector as well as their employment, total sales and payrolls. The data we need is in the following table:

Company Name	Specialty Food Machines
Sector	330
Employment	18 full and part-time
Payroll (including benefits and SS)	$985,000
Total Sales	$2,150,000

We want to modify our existing model to match our new company.

	Task	**Hints**
1.	Start IMPLAN	
2.	Either open a clean Larimer model or create a new one	
3.	Open the study area editing screen	From the **Model Control Center**, click **Edit**, **Region Data**, **Study Area Data**.
4.	Select sector 330.	First click on the **Sector List**. You can then either scroll down to the sector or then type the sector number. If you type the sector number, you need even keystrokes otherwise the software won't know what you are trying to do. When you reach the sector you want, click on it or hit **Enter**.
5.	Calculate the payroll per worker and sales per worker from the new company data above (round to the nearest dollar). Payroll per worker:_____ Sales per worker _____	You can use the handy calculator button on the menu bar to bring up the Windows calculator.
6.	Change the study area data to reflect your new values Write the new values here. Output: _____ Employee compensation: _____	We need to change the output and employee compensation accordingly. We are assuming the other value-added elements, other property type income and indirect business taxes remain the same. First re-key the existing employment figure of 217. This will eliminate any rounding problems. Then calculate the new output value we need and the new payroll figure. Note that all values in the edit screen except employment are in millions of dollars. Employment is in terms of jobs. Change the proprietor income to 0. Do this by multiplying the existing study area employment figure by the new sales per worker value. This is the new output value. Replace

		the existing study area output number with your new calculated value. Remember that the study area output data is in terms of millions of dollars.
7.	Why is there a difference between the IMPLAN data and the individual company data?	
8.	Rerun the model with the corrected sector	Go back to **Construct Model** and rerun the **Type SAM** multipliers.
9.	Run an impact on sector 330 with 18 jobs	Click **Impacts** from the **Model Control Center**. Click **Add New** in the **Event Options** box. Type in an event name, call it "Specialty Machine". Hit **Enter** to set the name and then **Enter** again to move to the next field. Click the down arrow and scroll to sector 330. Click on the sector name. Hit **Enter** to move to the next field. Hit **Enter** to move to the job field. Type 18 and then hit **Enter**.
10.	Run the analysis.	Click the **Analyze** button. This will bring up the impact analysis dialog box. Leave the **Level** at 1.0. Enter an impact name, call it "New Company". Click **Run Impact**.
11.	Look at the results.	Once the impact is run, click **Yes** to view the results.
12.	Fill in the table below.	

Specialty Food Machines Impact

	Output	Employment	Labor Income
Total Direct			
Total Indirect			
Total Induced			
Total			

13.	Fill in the tax impact table below.	Click the **X** to close the **Results** screen. Click the **X** to close the **Impacts** screen. Click the **Reports** button on the **Model Control Center**. Select the **Impacts** tab and then select the impact run you want to examine. Click the **Tax Impact** check box. Click **Print Preview**, then click **Continue**. You can zoom the report to read the values.

	State Personal Income Tax Impact	State IBT Property Tax Impact	State income tax impact as a percent of income impact.
Total			

Exercise 8

Objective: To examine the impacts of a University on our local economy.

In this and the next two exercises, we are going to look at the impact of a university on our local economy. The first exercise will be to examine the impact of the operation of the college excluding the payrolls and student spending (these will be covered in the next two exercises).

Company Name	Colorado State University
Employment	1014 people 400 faculty 614 civil service staff
Total University Budget	$193,876,348
Payrolls	All $47,420,000 Faculty: $29,000,000 Staff: $18,420,000
Student population	22,782 full and part-time students

	Task	**Hints**
1.	Start IMPLAN	
2.	Either open a clean Larimer model or create a new one through Type SAM Multipliers.	
3.	Open the Impact screen.	Click **Impact** from the **Model Control Center**
4.	Calculate the total university budget minus payrolls. Write the value here.	
5.	Import the Higher Education consumption function from the Government Final Demands database.	If you do not have this, go to our web site, www.implan.com, and click on **Tech Support**, then **Knowledge Base**, and search for Government. Click on **Government Expenditure Groups** and download the file. Then, from the **Impact** screen, click **Import**, then from **Model**. Find the **Utilities** subdirectory of the IMPLAN Professional 2.0 subdirectory. Click the file **Expanded Gov FD.IAP**. You will see a screen with many different groups. You can get a complete list from the above **Knowledge Base** article. Find and select the group named "SL Govt Cons Exp Public Educational Facilities Beyond High School". This group has the consumption expenditures for higher education. Click **Import**, then click **OK**, and then click **Close**. You will be back to the **Impact** screen
6.	Run an analysis of the operations of the college (budget minus payroll).	From the **Impact** screen, click **Analyze**. Select the group you just imported. Set the level to the operations budget of the college. Give the analysis run a name, then click **Run Impact**.
7.	Examine the results of the analysis	Click **Yes** when the analysis run is complete and the **Results** screen will be displayed

8.	Fill in the table below	

College Operations Results

	Output	Employment	Labor Income
Total Direct			
Total Indirect			
Total Induced			
Total			

9.	For extra credit, have the college buy everything locally. How does that change the impact?	

Exercise 9

Objective: To examine the impacts of a University's faculty and civil service staff payrolls on our local economy.

The same general information is used in this exercise.

Company Name	Colorado State University
Employment	1014 people 400 faculty 614 civil service staff
Operational Budget	$193,876,348
Payrolls	All $47,420,000 Faculty: $29,000,000, Disposable income factor 85% Staff: $18,420,000, Disposable income factor 75%
Student population	22,782 full and part-time students

	Task	Hints
1.	Start IMPLAN	
2.	Either open a clean Larimer model or create a new one through Type SAM Multipliers.	
3.	Calculate the disposable income for the faculty and write it here:	Disposable income is that income left over after taxes and savings are removed. The disposable income factor is given above. Simply multiply the factor by the total payrolls to get the total disposable income. If you need to do this in real life, and you are using 1994 or later IMPLAN data, simply go back to the **Model Control Center** and click on **Construct Model.** Then click **Advanced**. If the **Multipliers** tab is enabled, select that tab and read the total household SAM disposable income factor. If the tab is not enabled, then run the model through the multipliers.
4.	Open the impact screen.	From the **Model Control Center**, click on **Impacts**.
5.	Import the faculty consumption function and run the faculty payrolls adjusted for disposable income.	From the **Impact** screen, click **Import**. Select the **Institution tab** and then select the **Households 40-50k** group. Click **Import**. Click **OK**, and then **Close**. You will return to the Impact screen.
6.	Change the group name from "Households 40-50k" to "Faculty Consumption"	Right click on the group name and click on **Rename**.
7.	Run the analysis.	From the **Impact screen**, click **Analyze** and select the group you want to run. Set the **Level** to your disposable income, give the impact run a name and click **Run Impact**.
8.	Examine the results	After the run is complete click **Yes** to view the results.
9.	Fill in the table below.	

Faculty Results

	Output	Employment	Labor Income
Total Direct			
Total Indirect			
Total Induced			
Total			

10.	Calculate the disposable income for the civil service staff and write it here:	
11.	Import the civil service consumption function and run the faculty payrolls adjusted for disposable income.	From the **Impact screen**, click **Import**. Select the **Institution** tab and then select the **Households 20-30k** group. Click **Import**. Click **OK**, and then **Close**. You will return to the Impact screen.
12.	Change the group name from “Households 20-30k” to “Civil Service Consumption”	
13.	Run the analysis.	
14.	Examine the results	
15.	Fill in the table below.	

Civil Service Results

	Output	Employment	Labor Income
Total Direct			
Total Indirect			
Total Induced			
Total			

Exercise 10

Objective: To examine the impacts of a University's student spending on our local economy.

Our students spend money in our region which has an impact the economy as well. We need to know the level of their spending beyond tuition and books (these are included in the University's operational budget). Our example is not exhaustive, we would want to really try to capture all spending differentiating students by those who live in dorms versus apartments and perhaps undergraduate versus graduate students.

Company Name	Colorado State University
Student population	22,782 full and part-time students 65% are from outside the region 45% are commuters living at home They are in school 240 days per year.

We surveyed the college students who were from outside the region to understand their spending habits. The summary results are here (based on dollars per day):

Category	Per Student Spending
Beer from a store	$0.75
Snack foods	$1.50
Parking	$2.40
Auto Gas	$0.80
Meals from a restaurant	$2.84

	Task	**Hints**
1.	Start IMPLAN	
2.	Either open a clean Larimer model or create a new one through Type SAM Multipliers.	
3.	Fill in the table below.	First compute the number of student days from those students coming from outside the region. Then take this value times the per-student spending. Remember, stuff bought at a store needs to be margined.

Category	Per Student spending	Total Spending	IMPLAN Sector	Margin	Basis	% Local
Beer from a store	$0.75					
Snack foods	$1.50					
Parking	$2.40					
Auto Gas	$0.80					
Meals from a restaurant	$2.84					

	Task	**Hints**
4.	Go to the Impact screen and enter the information from the above table into the events.	From the **Model Control Center**, click **Impacts** to get to the Impact screen. Select the **Ungrouped Events** group if it is not already selected. If there are any events in this group, click **All** under the **Delete Event Options**. Click **Add New** to place the cursor in the first

		Event Name field. Give the event a name, for example, “Beer from a store”. Enter the information from the above table. Do this for each of the events in the above table.
5.	Set the % Local to 0 for the manufacturing sector for snacks and auto gas. Set the % Local to 25% for Beer.	Click the **Edit** button next to the **Margin** cell. This will bring up the margin edit screen. Set the **% Local** to 0 for snacks and gas and .25 for beer..
6.	Form a group and call it “Student Spending”	Once the events have all been entered, click the **Create** button under the **Group Options**. Give the group a name “Student Spending”. Click **Ok**. Select the “Ungrouped Events” group and click **All** under the **Delete/Event Options**.
7.	Run the Student spending impact	Click **Analyze**. Highlight the group you want to run, and set the Level to 1.0. Give the impact run a name and click Run Impact.
8.	View the results and complete the following table.	Once the run is completed, click **Yes** to view the results.

Student Spending Results

	Output	Employment	Labor Income
Total Direct			
Total Indirect			
Total Induced			
Total			

9.	Create a project from the four groups we created in exercises 8, 9, and 10.	Close the results screen by clicking the **X** on the top right hand side of the window. From the **Impact screen**, click the **Projects tab**. On the right hand side are the groups that you can include in a project. Select the first group you want to add by clicking on the name. Then click the **<<** button to add the group. If this is the first group added, a dialog box will appear asking for a project name. Give the project a name and click **Ok**. Add the other groups.
10.	Run an analysis of the project.	
11.	Fill in the table below.	

Total Spending Results

	Output	Employment	Labor Income
Total Direct			
Total Indirect			
Total Induced			
Total			

Exercise 11

Objective: To estimate the impacts of a mixed residential, retail, and industrial park development

This type of analysis is more difficult since we don't necessarily know all the information we need. An industrial park usually targets some type of industry, but we often don't know which. The residential component brings its own difficulties, as does the retail. We usually have to make lots of assumptions about the actual business that come in.

For a project like this, there are two phases, construction and operations for all three developments. We will treat each develop as a separate exercise. The first being the residential component. The construction values can be calculated from the following information. The real estate agents get a 6% commission on these sales.

Development	Residential
1997 Single Family	100 Homes Sale price: $150,000 per home
1998 Condominiums	50 Unit Building Sale price: $95,000 per unit

What is the operations phase of a residential development? It's the spending of the households residing in the newly constructed homes. Should we count this? It depends on whether the new residents are new to the region or not. If they are people moving in from outside the region, we should count their spending as a new impact. If they are simply moving from one area of town to another, then we should not count their spending. Also, if these are new residents from outside the region, but they are going to work in the jobs created by this industrial park, then we should also not count their spending as the induced effect from the industrial park will pick up those household expenditures. For this analysis, we will assume that these residents are moving from within the region borders so their spending will not count.

	Task	**Hints**
1.	Start IMPLAN	
2.	Either open a clean Larimer model or create a new one through Type SAM Multipliers.	
3.	Fill in the following table:	

Development	Construction Value	IMPLAN Sector	Real Estate Commission	IMPLAN Sector
1997 Single Family				
1998 Condominiums				

4.	Open the impact screen and create 2 groups for each type of residential development.	Remember that we have two time periods here 1997 and 1998. Create each event and then group it. Give the groups distinct names.
5.	Run an analysis of both groups as a project and enter the information in the table below.	

Residential Construction Impact

	Output	Employment	Labor Income
Total Direct			
Total Indirect			
Total Induced			
Total			

Exercise 12

Objective: To estimate the impacts of a mixed residential, retail, and industrial park development

The next analysis will be of the Retail component.

Development	
Retail construction	20,000 square feet @ $100 per square foot-sector 49.
Retail operations	We plan to incorporate a restaurant (7,000 square feet), a hair stylist (3,000 square feet), and convenience store/filling station (5,000 square feet) – note this leaves 5000 square feet of open space/bathrooms.
	All construction will take place in 1997. Operations will commence in 1998.

The retail development is difficult in that we cannot be certain of the type of retail stores we are actually going to attract. In this case, our business plan calls for trying to attract the above retail establishments. Apart from the restaurant, in reality, the operation of the stores is going to be similar in each retail category as long as our region does not manufacture the goods that are sold in the stores. Remember that the value of retail output is only their margin. We do not count the value of the goods that are sold in the store.

The restaurant is different. A restaurant acts more like a manufacturer than a retailer. The restaurant buys raw materials and then transforms them into a finished product. There are no margins for eating and drinking establishments.

We will want to find sales per square foot data to estimate the value of the direct impact. The web site for the International Council for Shopping Centers, www.icsc.org , posts data on sales per square foot. For convenience stores, I estimated a value from the other retail values. Margin data is from the Annual Survey of Retail Trade.

Data

	IMPLAN Sector	Sales per square foot	Square footage	Total Sales	Margin	Total Impact
Restaurant		$321	7,000		NA	
Hair Stylist		$322	3,000		NA	
Convenience store		$300	5,000		22%	

	Task	**Hints**
1.	Start IMPLAN	
2.	Either open a clean Larimer model or create a new one through Type SAM Multipliers.	
3.	Open the impact screen and create a group for each retail construction and retail operations.	Remember that construction is 1997 and operations is 1998 data.
4.	Run an analysis of each group and enter the information in the table below.	

Retail Construction Impact

	Output	Employment	Labor Income
Total Direct			
Total Indirect			
Total Induced			
Total			

Retail Operations Impact

	Output	Employment	Labor Income
Total Direct			
Total Indirect			
Total Induced			
Total			

Exercise 13

Objective: To estimate the impacts of a mixed residential, retail, and industrial park development

The last piece of this analysis will be of the industrial park. Often the difficulty with an industrial park development is that it is built without specific tenants in mind. There may be speculation buildings constructed and then marketed to prospective tenants.

For our analysis, we are going to assume that we will be building a 50,000 square foot warehouse, 20,000 square foot space for light industrial, and 10,000 square foot professional space. We will need construction costs per square foot. We will also need to assume what type of business will lease each different space.

The construction costs can likely come from the builders themselves. For our purposes, we will use costs of $95, $120, and $150 per square foot for each of the building types. Fill in the table below.

	Task	**Hints**
1.	Start IMPLAN	
2.	Either open a clean Larimer model or create a new one through Type SAM Multipliers.	
3.	Fill in the table below.	

Building Type	**IMPLAN Construction Sector**	**Total Square Footage**	**Construction Cost per Square Foot**	**Total Construction Cost**
Warehouse				
Light Industrial				
Professional				

4.	Open the impact screen and create a group for the construction activity.	Construction takes place in 1997.
5.	Run an analysis of each group and enter the information in the table below.	

Industrial Park Construction Impact

	Output	Employment	Labor Income
Total Direct			
Total Indirect			
Total Induced			
Total			

The next step is to figure out what kind of business might locate here. A warehouse is simply a storage facility usually tied with trucking or some other transportation. To determine the value of production or employment associated with this warehouse, again we would look for the average number of employees per square foot for warehousing. After searching the Internet, we came up with some rough figures. For warehousing, we will use a figure of 1 job per 1,000 square feet.

For the light industrial, we really need to know what kind of manufacturing firm might locate here. Manufacturing businesses will have very distinct production functions and therefore distinctly different multipliers. We will have to assume a particular type of firm. For this exercise, we will assume that this firm will make software. We could also create an aggregated model and have fewer manufacturing sectors and then be more general in our manufacturer assumption. This sector generates 1 job per 225 square feet.

Lastly, we have the professional space. Generally, professional services have very similar production functions so picking a specific sector is not as important. We can use the Other Business Services sector in most cases. This sector also generates 1 job per 225 square feet

	Task	**Hints**
6.	Start IMPLAN	
7.	Either open a clean Larimer model or create a new one through Type SAM Multipliers.	
8.	Fill in the table below.	

Building Type	**IMPLAN Sector**	**Total Square Footage**	**Employment per Square Foot**	**Total Employment**
Warehouse				
Light Industrial (Software)				
Professional				

9	Open the impact screen and create a group for the park operations	Remember that this is 1998 data.
10.	Run an analysis of each group and enter the information in the table below.	

Industrial Park Operations Impact

	Output	Employment	Labor Income
Total Direct			
Total Indirect			
Total Induced			
Total			

Exercise 14

Objective: To learn how to set up a group in Excel and then import that group into your model.

	Task	Hints
1.	Start Excel	
2.	Open the Excel Group Template.	Click **File** then **Open**. Find the **Utilities** subdirectory of the **IMPLAN Professional 2.0** directory. Open the file **Group Import Template**.
3.	Save the template under a different name prior to making any changes.	Click **File** then **Save As** and give it a new name.
4.	Clear the last three rows. Keep the first row to use as a template.	Highlight the last three rows of the grip and click **Edit** then **Delete**.
5.	Fill in the following information. Change the database year to 1997.	The cells to the right of the Event Level cell are optional. If you want to specify the margin or the deflators, you can fill these in. Otherwise leave the margin value set to 0 and the Margin deflator and Margin LPC set to 1.

Group Name	Unit Description	Group LeveL	Event Name	Sector	Basis
Visitors		65000	Eating & Drinking	454	Industry
Visitors		65000	Hotels	463	Industry
Visitors		65000	Clothing	124	Commodity

Value	Employment	Year	Deflator	Margin	% Local	Event Level
65	0	1997	1	No	0.85	1
150	0	1997	1	No	1	1
25	0	1997	1	Household	1	1

5.	After you have entered the information, save the file.	Click **Save**, then **Save As**. You should be in the **Utilities** directory still. Click on the **Save As Type** and select **CSV Comma Delimited**. Click **Ok** when **Excel** gives you the warning.
6.	Start IMPLAN	
7.	Either open a clean Larimer model or create a new one through Type SAM Multipliers.	
8.	Go to the impact screen.	Click **Impacts**.
9.	Import your text file.	Click **Import/Export** from the menu bar. Then click **Import** then **Group from Text File**. Find the **Utilities** subdirectory. Select the file you saved, then click **Open**. You text file should import.
10.	Run an analysis of your text file and fill the following table.	

Visitors Impact

	Output	Employment	Labor Income
Total Direct			
Total Indirect			
Total Induced			
Total			

Answers

Objective: To create a simple single industry impact.

Exercise 1

7.	1.704533
8.	The difference between the Type I and Type SAM multiplier is that the Type I includes only the business to business transactions while the Type SAM includes the Type I multiplier plus the effects of the households receiving income as a result of the direct and indirect expenditures.

Exercise 2

7.	1.352655
8.	You can't have a regional purchase coefficient larger than 1.0. The RPC tells you how much of local commodity supply you can buy. You can't buy more than 100% of your demand. You also cannot buy more than the supply produced supply. Therefore the RPC is not allowed to exceed the supply/demand pool ratio.
12.	1.909388
13.	Because we are now buying a lot more locally produced raw milk. Actually, 100% of local supply is now being bought locally. This results in a lot more dollars staying and re-circulating in the economy.

Exercise 3

Single Industry Impact

	Output	Employment	Labor Income
Total Direct	61,682,008	200.0	16,827,552
Total Indirect	29,190,686	221.4	9,057,177
Total Induced	14,266,342	236.2	5,165,509
Total	105,139,032	657.6	31,050,238

Single Industry Impact Commodity Basis

	Output	Employment	Labor Income
Total Direct	61,682,007	193.9	16,168,250
Total Indirect	28,187,938	213.9	8,744,633
Total Induced	13,730,750	227.4	4,971,578
Total	103,600,697	635.2	29,884,461

11.	The commodity impact allocates the 200 jobs to all industries producing computers. Therefore, the direct impact is a different mix of industry impacts with a commodity basis transaction. Look at the distribution of the direct output impact.

Exercise 4

Category	Per Day Spending	Total Per Visitor Spending	IMPLAN Sector	Margin	Basis	% Local
Lodging	$45.00	112.5	463	None	Industry	100%
Restaurants	$25.00	62.5	454	None	Industry	100%
Souvenirs	$15.75	39.375	449	Household	Commodity	100%
Auto Gas	$9.75	24.375	210	Household	Commodity	100%
Golfing	$20.00	50	488	None	Industry	100%
Snacks	$2.25	5.625	100	Household	Commodity	100%

Visitor Spending Results

	Output	Employment	Labor Income
Total Direct	5,995,308	154.8	2,051,106
Total Indirect	1,704,462	25.4	642,746
Total Induced	1,486,797	24.6	537,981
Total	9,186,568	204.8	3,231,833

What are the top 5 industries for

Output Impact	Employment Impact	Labor Income Impact
1. Hotels & Lodging	1. Hotels	1. Hotels
2. Eating & Drinking	2. Eating & Drinking	2. Eating & Drinking
3. Amusement & Recreation	3. Amusement & Recreation	3. Amusement & Recreation
4. Domestic Trade	4. Gen. Merchandise Stores	4. Gen. Merchandise Stores
5. Real Estate	5. Personal Supply Services	5. Maint. & Repair

Exercise 5

3.	88,664
7.	132,996,000

Visitor Spending Results

	Output	Employment	Labor Income
Total Direct	132,996,001	1,345.1	28,789,967
Total Indirect	19,851,371	279.2	7,446,381
Total Induced	19,998,423	331.1	7,236,410
Total	172,845,796	1,995.5	43,472,758

What are the top 5 industries for

Output Impact	Employment Impact	Labor Income Impact
1. Domestic Trade	1. Eating & Drinking	1. Hospitals
2. Owner Occupied Dwelling	2. Misc. Retail	2. Doctors & Dentists
3. Hospitals	3. Hospitals	3. Eating & Drinking
4. Real Estate	4. Nursing	4. Auto Dealers
5. Foreign Trade	5. Doctors & Dentists	5. Misc. Retail

Top 5 industries for Employment

Industry	Employment	Labor Income	Earnings per Worker
1. Eating & Drinking	221.1	2,307,657	10,437
2. Misc. Retail	173.7	1,884,075	10,847
3. Hospitals	161.8	5,883,617	36,363
4. Nursing	91.9	1,720,779	18,724
5. Doctors	88.7	4,305,685	48,542

12.	The eating & drinking and misc. retail have low earnings per worker, but this also reflects a lot of part-time workers. The medical related jobs have better earnings per worker.
13.	Personal spending crosses a wide range of industries, but really has the most impact on retail trade and services.

Exercise 6

Industry Name	Beer Brewing
Sector	91
Employment	895
Total Output	472,899,000

Beer Brewing Results

	Output	Employment	Labor Income
Total Direct	472,676,512	895.0	59,541,780
Total Indirect	91,190,341	1,227.2	33,231,753
Total Induced	51,142,305	846.9	18,515,633
Total	615,009,167	2,969.0	111,289,167

Top 5 industries for Employment

Industry	Employment	Labor Income	Earnings per Worker
1. Malt Beverages	895.2	59,552,560	66,524
2. Eating & Drinking	139.9	1,460,992	10,443
3. Personnel Supply Services	108.6	2,113,278	19,459
4. Misc. Retail	102.4	1,110,887	10,849
5. Wholesale Trade	96.2	3,443,535	35,796

10.	The manufacturing jobs pay more and there is less part-time employment. The importance of household spending also shows here with a large impact on eating & drinking and misc. retail.
11.	Manufacturing jobs contribute more income to the region.

Exercise 7

5.	Payroll per worker: 54,722. Sales per worker: 119,444.
6.	New employee compensation value: 11,874,674. New output value: 25,919,348
7	Because in any industrial sector, the values are averages based on many different firms in that sector. Your firm may not be the county average.

Specialty Food Machines Impact

	Output	Employment	Labor Income
Total Direct	2,149,992	18	984,996
Total Indirect	365,646	4.6	138,866
Total Induced	619,300	10.3	224,270
Total	3,134,938	32.9	1,348,131

	State Personal Income Tax Impact	State IBT Property Tax Impact	Income taxes as a percent of income
Total	28,192	22,207	2.09%

Exercise 8

4.	146,456,348

College Operations Results

	Output	Employment	Labor Income
Total Direct	146,456,351	1,012.2	28,989,318
Total Indirect	22,037,429	303.6	8,599,960
Total Induced	20,755,940	343.7	7,508,699
Total	189,249,720	1,659.5	45,097,976

Exercise 9

3.	24,650,000

Faculty Results

	Output	Employment	Labor Income
Total Direct	24,650,000	239.6	4,961,619
Total Indirect	3,591,174	50.4	1,351,292
Total Induced	3,483,728	57.7	1,260,633
Total	31,724,902	347.7	7,573,544

10.	13,815,000

Civil Service Results

	Output	Employment	Labor Income
Total Direct	13,815,000	137.8	2,951,786
Total Indirect	2,066,906	28.8	775,263
Total Induced	2,056,888	34.1	744,288
Total	17,938,793	200.7	4,471,337

Exercise 10

The number of student days is 3,553,992

Category	Per Student spending	Total Spending	IMPLAN Sector	Margin	Basis	% Local
Beer from a store	$0.75	2,665,494	91	Household	Commodity	100%
Snack foods	$1.50	5,330,988	100	Household	Commodity	100%
Parking	$2.40	8,529,581	478		Industry	100%
Auto Gas	$0.80	2,843,194	210	Household	Commodity	100%
Meals from a restaurant	$2.84	10,093,337	454		Industry	100%

Student Spending Results

	Output	Employment	Labor Income
Total Direct	29,462,594	826.2	10,087,121
Total Indirect	4,166,860	56.9	1,442,784
Total Induced	6,362,257	105.3	2,302,339
Total	39,991,712	988.4	13,832,245

Total Spending Results

	Output	Employment	Labor Income
Total Direct	214,383,945	2,215.8	46,989,843
Total Indirect	31,862,371	439.7	12,169,300
Total Induced	32,658,812	540.8	11,815,959
Total	278,905,126	3,196.2	70,975,102

Exercise 11

Development	Construction Value	IMPLAN Sector	Real Estate Commission	IMPLAN Sector
1997 Single Family	14,100,000	48	900,000	462
1998 Condominiums	4,465,000	48	285,000	462

Residential Construction Impact

	Output	Employment	Labor Income
Total Direct	19,704,109	213.2	5,401,047
Total Indirect	5,700,728	97.9	2,231,455
Total Induced	4,216,529	69.8	1,525,036
Total	29,621,367	380.9	9,157,538

Exercise 12

Data

	IMPLAN Sector	Sales per square foot	Square footage	Total Sales	Margin	Total Impact
Restaurant	454	$321	7,000	2,247,000	NA	2,247,000
Hair Stylist	466	$322	3,000	966,000	NA	966,000
Convenience store	455	$300	5,000	1,500,000	22%	330,000

Retail Construction Impact

	Output	Employment	Labor Income
Total Direct	2,000,000	17.4	650,003
Total Indirect	669,045	10.9	270,570
Total Induced	508,517	8.4	183,928
Total	3,177,561	36.7	1,104,501

Retail Operations Impact

	Output	Employment	Labor Income
Total Direct	3,502,217	127.6	1,379,264
Total Indirect	1,012,284	20.2	378,796
Total Induced	971,463	16.1	351,319
Total	5,485,965	163.9	2,109,379

Exercise 13

Building Type	**IMPLAN Construction Sector**	**Total Square Footage**	**Cost per Square Foot**	**Total Construction Cost**
Warehouse	49	50,000	$95	4,750,000
Light Industrial	49	20,000	$120	2,400,000
Professional	49	10,000	$150	1,500,000

Industrial Park Construction Impact

	Output	Employment	Labor Income
Total Direct	8,650,000	75.2	2,811,261
Total Indirect	2,893,619	47.1	1,170,215
Total Induced	2,199,334	36.4	795,490
Total	13,742,953	158.7	4,776,966

Building Type	**IMPLAN Sector**	**Total Square Footage**	**Employment per Square Foot**	**Total Employment**
Warehouse	435	50,000	1/1000	50
Light Industrial (Software)	475	20,000	1/225	89
Professional	470	10,000	1/225	44

Industrial Park Operations Impact

	Output	Employment	Labor Income
Total Direct	15,447,967	180.6	6,755,785
Total Indirect	5,789,607	70.8	2,170,492
Total Induced	4,930,640	81.6	1,783,417
Total	26,168,215	333.0	10,709,693

Exercise 14

Visitors Impact

	Output	Employment	Labor Income
Total Direct	15,600,000	369.0	5,279,130
Total Indirect	4,801,466	72.3	1,826,500
Total Induced	3,919,943	64.9	1,418,692
Total	24,321,409	506.2	8,524,322