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Hospitality Valuation Software 2.5

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Hospitality Valuation Software 2.5

Abstract
[Revised 2008]

Developed by Stephen Rushmore, CRE, MAI, CHA and Jan deRoos, Ph.D. Stephen Rushmore is Founder and President of HVS International, a corporate partner of the CHR. Jan deRoos is HVS International Professor of Hotel Finance and Real Estate in the School of Hotel Administration at Cornell University. This tool is provided through the generosity of HVS International.

The Hospitality Valuation Software is the only non-proprietary computer software designed specifically to assist in the preparation of market studies, forecasts of income and expense, and valuations for lodging property. The software provides an accurate, consistent, and cost-effective way for hospitality professionals to forecast occupancy, revenues and expenses and to perform hotel valuations. Using established methodology, the Hospitality Valuation Software is a sophisticated tool for lodging professionals. The tool consists of three separate software programs written as Microsoft Excel files and a software users' guide. The three programs are:

The three programs are:

Room Night Analysis:

- Enables the appraiser to evaluate the various competitive factors such as occupancy, average room rate, and market segmentation of all hotels in a local market.
- Calculates the area-wide occupancy and average room rate, as well as the competitive market mix.
- Produce a forecast of occupancy for each existing hotel or proposed hotel in a local market. The program incorporates such factors as competitive occupancies, market segmentation, unaccommodated demand, latent demand, growth of demand, and the relative competitiveness of each property in the local market. The program output is a ten-year projection of occupancy.

Fixed and Variable Revenue and Expense Analysis:

- The key to any market study and valuation is a supportable forecast of revenues and expenses. Hotel revenue and expenses are comprised of many different components that display certain fixed and variable relationships to each other. This program enables the appraiser to input comparable financial operating data and forecast a complete 11-year income and expense statement by defining a small set of inputs:
- The expected future occupancy levels for the subject hotel
- Base year operating data for the subject hotel
- Expected inflation rates for revenues and expenses

Hotel Capitalization Software:

- A discounted cash flow valuation model utilizing the mortgage-equity technique forms the basis for this program. Values are produced under two different binding constraints:
- A loan-to-value ratio, in which the size of the mortgage is based on property value.
- A debt coverage ratio (also known as a debt-service coverage ratio), in which the size of the mortgage is based on property level cash flow.

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- By entering the terms of typical lodging financing, along with the ten-year forecast of revenue and expense, the program determines the value that provides the stated returns to the mortgage and equity components.

Keywords
Cornell. tools, room night analysis, FIXVAR

Disciplines
Hospitality Administration and Management

Comments
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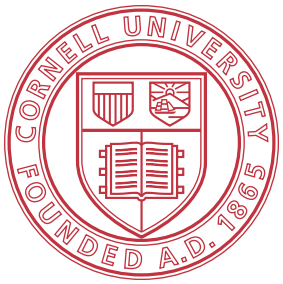

Cornell University
School of Hotel Administration

Hospitality Valuation Software

2nd edition

Operating and Use Guide

Version 2.5

by Jan A. deRoos, Ph.D.

HVS International Professor of Hotel Finance and Real Estate
School of Hotel Administration at Cornell University
and
Stephen Rushmore, CRE, MAI, CHA

Founder and President
HVS International

The Center for Hospitality Research
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Table of Contents

Market Study, continued

HOSPITALITY
VALUATION
SOFTWARE

Introduction to the Hospitality Valuation Software

The Hospitality Valuation Software remains the only non-proprietary computer software designed specifically to assist in the preparation of market studies, forecasts of income and expense, and valuations for lodging property. The software provides an accurate, consistent, and cost-effective way for appraisers and consultants to implement computer-based forecasts and valuations. Using established methodology, the Hospitality Valuation Software is a sophisticated tool for lodging professionals.

The tool consists of three separate software programs written as Microsoft Excel™ files and a software manual written as an Adobe™ PDF file. They require an IBM-PC compatible personal computer capable of running Microsoft Windows 95 and Microsoft Office 97 (or later versions of the operating system and office suite) and Adobe Acrobat Reader or Adobe Acrobat. All output is formatted for a standard laser printer using 8½ by 11-inch paper. The programs and their contents are outlined below.

Room Night Analysis (RNA.XLS)

The Room Night Analysis program performs several functions:

- Enables the appraiser to evaluate the various competitive factors such as occupancy, average room rate, and market segmentation of all hotels in a local market.
- Calculates the area-wide occupancy and average room rate, as well as the competitive market mix.
- Produce a forecast of occupancy for each existing hotel or proposed hotel in a local market. The program incorporates such factors as competitive occupancies, market segmentation, unaccommodated demand, latent demand, growth of demand, and the relative competitiveness of each property in the local market. The program output is a ten-year projection of occupancy.

HOSPITALITY VALUATION SOFTWARE

Fixed and Variable Income and Expense Forecasting Model (FIXVAR.XLS)

The key to any market study and valuation is a supportable forecast of revenues and expenses. Hotel revenue and expenses are comprised of many different components that display certain fixed and variable relationships to each other. This program enables the appraiser to input comparable financial operating data and forecast a complete 11-year income and expense statement by defining a small set of inputs:

- The expected future occupancy levels for the subject hotel
- Base year operating data for the subject hotel
- Expected inflation rates for revenues and expenses

Hotel Capitalization Software (HCS.XLS)

A discounted cash flow valuation model utilizing the mortgage-equity technique forms the basis for this program that was developed from the Simultaneous Valuation Formula. Values are produced under two different binding constraints:

- A loan-to-value ratio, in which the size of the mortgage is based on property value.
- A debt coverage ratio (also known as a debt-service coverage ratio), in which the size of the mortgage is based on property level cash flow.

By inputting the terms of typical lodging financing, along with the ten-year forecast of revenue and expense, the program determines the value that provides the stated returns to the mortgage and equity components.

Authoritative Text

The software programs were developed by Jan A, deRoos, Ph.D., Suzanne Mellen, CRE, MAI, and Stephen Rushmore, MAI, CRE, CHA. They are based on the considerable knowledge and experience of these three leading lodging authorities. Within the text, each program is thoroughly described and illustrated with a case study example. Users of these programs are encouraged to obtain a copy of *Hotels and Motels: valuations and market studies*, Stephen Rushmore and Erich Baum, 2001, Appraisal Institute, as a solid accompaniment to this software and instruction manual.

Instruction Manual

The purpose of this manual is to provide a complete description of the three programs comprising the Hospitality Valuation Software, 2nd Edition package and to show how these programs assist in performing a lodging market study and valuation.

The manual starts with a general overview of the various steps involved in developing a lodging market study and valuation. It then leads the user through the specific procedures involved with the market study phase, which concentrates on the supply and demand analysis. The Room Night Analysis program (RNA) is described and demonstrated in this section. Once the subject hotel's occupancy has been projected,

the manual then turns to the task of producing the ten-year forecast of revenue and expense using the Fixed and Variable Forecasting program (FIXVAR). The final step demonstrates the valuation process, which employs a discounted cash flow valuation model known as the Hotel Capitalization Software (HCS). Interwoven throughout the manual is a realistically simulated case study that illustrates how an appraiser can utilize the Hospitality Valuation Software for all types of lodging valuation assignments.

We strongly recommend reading this manual thoroughly prior to attempting to use the programs. Try entering the data set forth in the case study so you can understand the logic of the software, and the various analytical features it offers.

Important Technical Information

This Hospitality Valuation Software manual assumes the user has a working knowledge of personal computers and Microsoft Excel. If you are not familiar with the following operations, consult one of the many Microsoft Excel or Microsoft Office instructional books before proceeding:

- Retrieving and saving a file
- Operating the cursor
- Entering data
- Navigating between sheets of a workbook
- Printing

The user should immediately copy the program files to a secure location on a hard drive for use should they be needed.

Each file contains a series of print settings using Excel's "Report Manager." If this feature is not available on your copy of Excel, it can be enabled by checking the "Report Manager" box by going to the **Tools, Add-Ins** menu in Excel, as detailed on pages 55-56 of this manual.

The Software is Not Supported

Hospitality Valuation Software is distributed on a non-profit basis as a service to the hospitality appraisal and real estate professions. As a freely downloadable tool, the authors, Hotel Valuation Software, Inc., the Center for Hospitality Research and the School of Hotel Administration will not provide any type of software support as part of the distribution. If you have a question or problem, please contact the Center for Hospitality Research; the e-mail address is hosp_research@cornell.edu.

On-line courses covering the use of the software and advanced modeling techniques are offered through the Professional Development Program at the Cornell University Hotel School. The Professional Development office can be reached on the web at

HOSPITALITY
VALUATION
SOFTWARE

http://hotelschool.cornell.edu/execed/pdp/ or exec_ed_hotel@sha.cornell.edu or via phone at 607-255-4919.

Trademark Acknowledgements

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Acknowledgements

Development of the Hospitality Valuation Software has been an ongoing effort that commenced in the 1970s with the advent of the personal computer and spreadsheet software. The initial design of the software was intended to serve the needs of HVS International, an international appraisal and consulting firm, specializing in the lodging industry. The first edition of the software was released in 1990, and has continued to evolve into a highly sophisticated set of programs.

In an effort to further the quality level of lodging market studies and appraisals, the authors have written or co-authored 6 books and over 200 articles on this topic. Opening the computer software to the profession represents a continued attempt to provide state-of-the-art tools and knowledge so that appraisers and analysts can advance their ability to produce top-quality lodging market studies and appraisals.

The authors would like to express their sincere thanks to the entire staff of HVS International, in particular we remain indebted to Suzanne Mellen, managing director of the San Francisco office of HVS for her work on the development of the Simultaneous Valuation Equation (see Suzanne Mellen in "Simultaneous Valuation: A New Technique" *Appraisal Journal*, April 1983).

We would also like to thank present and former students of the School of Hotel Administration at Cornell University, in particular, Mark Owens, class of 2000. Their contributions in the development and evolution of the Hospitality Valuation Software have been invaluable, and we thank them all.

Jan A. deRoos, Ph.D.

Stephen Rushmore, CRE, MAI, CHA

About the Authors

Jan deRoos, Ph.D. is the HVS International Professor of Hotel Finance and Real Estate at the School of Hotel Administration at Cornell University. He has dedicated his career to creating and sharing knowledge in the area of hospitality real estate. Areas of teaching expertise include hospitality real estate finance, lodging property valuation, real estate management, hotel planning and design, hotel development and construction, and the timeshare/vacation ownership industry. A frequent speaker on these topics, Dr. deRoos has recently contributed to lodging industry conferences in Singapore, New York, Ft. Lauderdale, and London.

He is one of the principal researchers on the Lodging Property Index, a quarterly report on total returns to lodging property. He has authored numerous publications on the topic of lodging valuation, lodging industry supply and demand dynamics, and lodging investment analysis.

Stephen Rushmore, CRE, MAI, CHA is founder and president of HVS International, a global hospitality consulting organization with offices in New York (Mineola), San Francisco, Miami, Boulder, Vancouver, Mexico City, São Paulo, London, New Delhi, Singapore, and Toronto. He directs the worldwide operation of this firm and is responsible for future office expansion and new product development. Mr. Rushmore has provided consultation services for more than 8,000 hotels throughout the world during his 30-year career and specializes in complex issues involving hotel feasibility, valuations, and financing. He was one of the creators of the Microtel Concept and was instrumental in its initial public offering.

As a leading authority and prolific author on the topic of hotel feasibility studies and appraisals, Mr. Rushmore has written all four textbooks and two seminars for the Appraisal Institute covering the subject. He has also authored three reference books on hotel investing and has published more than 300 articles. He writes a monthly column for *Hotels* magazine, a quarterly column for the *Real Estate Finance Journal*, and is widely quoted by major business and professional publications. Mr. Rushmore lectures extensively on hotel trends and has taught hundreds of classes and seminars to more than 20,000 industry professionals. He is an adjunct professor at New York University and is on the faculty of the Cornell Hotel School's professional development program.

HOSPITALITY
VALUATION
SOFTWARE

Case Study Overview

CASE STUDY

To make the case study portion of this manual stand apart from the procedural and theoretical sections, dark borders are used to encircle the case study material. It should be noted that while the case study is realistic, the location, facts, names, and so forth are totally hypothetical. Any resemblance to an actual lodging facility is pure coincidence.

The case study assumes the appraiser is standing at the beginning of year 1 (January 1, 2001), looking back at the markets actual operating performance for the base year of 2000 (year 0). The subject property is a proposed 250-room Sheraton hotel that will be entering the market approximately two years from the date of the study, for an opening date of January 2003 (year 3). For clarity, think of the time line as follows:

Year 0 - Base Year	2000
Year 1 - Date of Study	2001
Year 3 - Date of Sheraton Opening	2003

The proposed Sheraton Hotel will be located at the southeast corner of I-495 and County Route 110, Huntington, Long Island, New York. The area is characterized as a suburb of New York City (35 miles to the west), and the surrounding neighborhood is a mixture of office, light industrial, and retail property. The site has good access and visibility from nearby highways and is considered a desirable hotel location.

Construction on the proposed Sheraton is expected to commence during the Spring of 2001 with an opening date scheduled for January 1, 2003. The parcel on which the hotel is to be built consists of seven acres of land and has all the necessary utilities.

The improvements will be designed with an orientation towards the commercial and meeting/convention segments of the market and will target those travelers looking for a first-class quality level. The following table summarizes the facilities and amenities planned for the Sheraton:

250 Guestrooms
175-seat Restaurant
150-seat Lounge
40-seat Lobby Bar
12,500 square feet (approx. 1200 m^2) of meeting space
Indoor/outdoor swimming pool

CASE STUDY (continued)

The owner of the property will utilize this study to determine initial project feasibility and to obtain debt and equity financing. The appraisal will estimate the market value of the fee simple interest as of the date the hotel is fully complete and operational, which is assumed to be January 1 of year 3. The financial projections will commence as of this date utilizing current (inflated) dollars for each projection year.

HOSPITALITY
VALUATION
SOFTWARE

The Process of Performing a Hotel Market Study and Valuation

The process followed in performing a hotel market study and valuation can be broken down into three primary components:

- Market Study
- Forecast of Revenue and Expense
- Valuation (Income Approach)

Market Study

The market study component forms the basis for estimating a hotel's revenue via a supply and demand analysis in which historical room night demand is first quantified. The competitive environment is then evaluated to determine how the subject property will interact with the other lodging facilities in the market. Based on the dynamics of this supply and demand relationship, a model can be developed to estimate the room nights captured by the subject hotel, which is then converted into a forecast of occupancy.

Forecast of Revenue and Expense

The second component is the forecast of revenue and expense, which generally projects the subject hotel's financial results out to a point where the occupancy reaches a stabilized level. The basis for the revenue forecast comes from the market study component described above. Expenses are normally keyed to area hotel operating costs and are adjusted to varying levels of occupancies through a fixed and variable analysis.

Valuation

The valuation component utilizes a mortgage-equity technique. In this procedure, the net income of a hotel is partitioned into a mortgage component and an equity component over a number of years, and these are discounted to the present value. In addition, a reversion (or assumed selling price) is estimated and this amount is split into mortgage and equity components, and discounted. The resulting value derived from the income capitalization approach is compared to the values indicated by the cost and sales comparison approaches before a final value is estimated.

HOSPITALITY
VALUATION
SOFTWARE

Market Study

Occupancy and average rate projections are generally formulated from the market study. This software uses the built-up approach to lodging supply and demand.

Room Night Defined

The basis of a hotel's occupancy forecast is the amount of demand captured over a given period of time (usually one year) divided by the number of rooms available over the same period. A *room night* is the unit used by hotel appraisers to quantify this demand. A room night is a unit of lodging demand representing one room occupied by one or more people for one night.

Market Study Procedure

The process of forecasting occupancy for both existing and proposed hotels can be accomplished in nine steps, which are outlined as follows:

1. Define the primary market area
2. Define the market area's primary market segments
3. Quantify the existing room night demand
4. Forecast the room night demand into the future
5. Quantify the market area's total guestroom supply, the total room nights available, the accommodatable latent demand, and the total usable demand
6. Calculate the areawide occupancy
7. Evaluate the relative competitiveness of all hotels in the market area
8. Fit each new hotel into the market based on their expected competitiveness
9. Calculate the subject property's market share, room nights captured, and occupancy percentage.

Step #1: Define the Primary Market Area

The first step in performing a lodging market study is to define the subject property's market area in geographic terms. A market area can be described as a perimeter surrounding the subject property. Within this area are various generators of transient demand, whose visitors are likely to utilize the accommodations offered by the subject property.

Step #2: Define the Market Area's Primary Market Segments

Once the market area has been outlined, the appraiser should then determine the primary segments of transient demand presently using local hotels. The three market segments generally found in most market areas are transient commercial travelers, meeting/convention visitors (also known as group business), and pleasure/leisure travelers. Other segments often present include: government, airline crews, extended stay/relocation guests (generally staying over one week at a time), sports teams, military, truck drivers, hospital/out-patient, cruise ship, etc.

Step #3: Quantify the Existing Room Night Demand

In order to forecast hotel room night demand into the future, it is necessary to quantify the current demand. From this base level, the appraiser will make projections of future demand changes (growth, stability, or decline) for each market segment.

Existing room night demand is generally quantified by utilizing the built-up approach based on an analysis of lodging activity.

Built-up Approach Based on an Analysis of Lodging Activity

The built-up approach based on an analysis of lodging activity utilizes the premise that existing hotel demand can be quantified by totaling the number of hotel rooms actually occupied in the market. This is accomplished by surveying the local lodging facilities and determining their room count, percentage of occupancy, and market segmentation. A factor can then be added for any latent demand that may be comprised of unaccommodated and/or induced demand. The actual procedure for performing the *Analysis of Lodging Activity* (ALA) approach is summarized as follows:

ALA-1 — Identify the primary and secondary competitive lodging facilities situated within the market area.

ALA-2 — Estimate the occupancies of all competitive lodging facilities in the market area.

ALA-3 — Determine the percentage relationship of each market segment to the whole for each of the competitive facilities.

ALA-4 — Determine the historic average room count (HARC).

ALA-5 — Quantify the market area's current accommodated room night demand.

ALA-6 — Estimate the market area's total latent demand, which is composed of unaccommodated and induced demand.

Each of the steps in the built-up approach is based on an analysis of lodging activity, which will be discussed and illustrated with the case study. The computer software utilized in this approach is known as the Room Night Analysis (RNA) program. It will also be explained and demonstrated in the case study.

ALA-1 – Identify the Primary and Secondary Competitive Lodging Facilities Situated Within the Market Area

The primary and secondary competitive lodging facilities within a market area are part of the overall lodging supply that can be defined as all transient accommodations catering to overnight visitors.

Primary competitors are those hotels that are similar to the subject property with respect to the class and type of facilities offered. These hotels compete for the same type of transient visitor. Secondary competition consists of those lodging facilities that would not normally attract the same type of visitor, but because of special circumstances (such as location), they become competitive.

CASE STUDY

Identify Primary and Secondary Competition – A survey of the subject property's market area found 20 hotels containing 2,762 rooms. Of those 20 hotels, 9 were judged to represent primary competition (1,604 rooms) and 6 were considered secondarily competitive (743 rooms).

Based on this criteria, the following hotels were identified as primarily competitive with the subject property:

Primary Competition

- Embassy Suites Hotel
- Hilton Inn
- Radisson Hotel
- Holiday Inn
- Courtyard by Marriott
- Ramada Inn
- Island Inn
- Quality Inn
- Days Hotel

CASE STUDY (continued)

The following hotels were considered secondarily competitive:

Table 1 – Summary of Secondary Competition

Hotel	Rooms	Competitive Weighting Factor
Red Roof Inn	110	50%
Super 8	125	50%
Microtel	100	25%
Residence Inn	75	33%
Delta Inn	83	40%
Four Seasons Hotel	250	75%

Based on competitive criteria, competitive weighting factors were assigned to each secondary hotel. When used in the supply and demand computer program (Room Night Analysis), the competitive weighting factor reduces that hotel's room count, producing an 'effective' room count.

ALA-2— Estimate the Occupancies of all Competitive Lodging Facilities in the Market Area

The key ingredient in the build-up approach based on an analysis of lodging activity is the occupancy estimate for each of the primary and secondary competitive hotels in the market area. The estimate of competitive occupancies should cover a full 12-month period. Ideally, this period (called the base year) will closely precede the first projected year in the room night analysis.

ALA-3—Determine the Percentage Relationship of each Market Segment to the Whole for each of the Competitive Facilities

Because each market segment has unique characteristics, it is necessary to allocate the market's overall room night demand into individual segments. This is typically done by estimating the percent of room night demand in each market segment.

ALA-4—Determine the Historic Average Room Count (HARC)

It is necessary to determine the room counts of all the competitive hotels. In addition to knowing the size of each property, an adjustment must be made to the room counts of those hotels that open during the 12-month base year corresponding with the estimates of occupancy and market segmentation. For example, in the case study, the 124-room Courtyard by Marriott opened on July 1, 2000, which is midway between the base year period that extends from January 1, 2000, to December 31, 2000. Since the Courtyard only operated for six months, its historic average room count (HARC) is 62 rooms (50% x 124 = 62).

The historic average room count equates to the hotel's room count multiplied by the percentage of the base year that the property is actually open. In addition to weighting the impact of new hotels on the market, the HARC can also be used for seasonal properties that may close for a portion of the year, or existing hotels that add new rooms during the base year.

CASE STUDY

The following table shows the room count, HARC, occupancy estimate and market segmentation for each of the 15 competitive hotels.

Table 2 – Summary of Primary and Secondary Competition

Hotel	# of Rooms	HARC	Average Rate	Occ%	Market Segmentation Comm.	Meeting & Convention	Leisure
Embassy Suites	200	200	$151.00	78%	80%	5%	15%
Hilton Inn	275	275	$136.00	72	40	50	10
Radisson Hotel	250	250	$131.00	68	45	40	15
Holiday Inn	175	175	$127.00	73	55	25	20
Courtyard	124	62[(1)]	$133.00	65	75	5	20
Ramada Inn	150	150	$124.00	66	65	20	15
Island Inn	135	135	$110.00	62	60	30	10
Quality Inn	175	175	$125.00	78	50	10	40
Days Hotel	120	120	$121.00	74	70	5	25
Red Roof Inn	110	110	$45.25	82	60	5	35
Super 8	125	125	$42.50	78	60	5	35
Microtel	100	100	$35.75	90	75	0	25
Residence Inn	75	75	$98.00	77	55	10	35
Delta Inn	83	83	$41.50	63	65	10	25
Four Seasons	250	250	$150.00	72	60	30	10

[(1)] Courtyard opened July 1, 2000 (HARC = .50 X 124)

The first nine hotels were considered primary competition to the proposed Sheraton. The first step in using the Room Night Analysis program is to enter data about these hotels into the *Primary* sheet of the RNA program.

The last six of the hotels set forth above were considered secondary competition to the proposed Sheraton. In order to make the RNA program more straightforward, it is desirable to combine the secondary competition into one generic hotel by utilizing weighted averages based on the previously defined effective room count. The *Secondary* sheet of the RNA program is used to expedite these calculations.

Use of these two sheets is illustrated on the following page. The completed *Primary* sheet is shown in Figure 1 on the next page, followed by instructions for its use.

HOSPITALITY
VALUATION
SOFTWARE

	A	B	C	D	E	F	G	H	I	J	K	L
1	**Competition Inputs**			**Project Information**								
2	Segment #	Market Segments		Job Title								
3	1	Commercial		Prepared by								
4	2	Meeting & Convention		Prepared for								
5	3	Leisure		Job #								
6	4	N/A		Base Year	2000							
7	5	N/A										
8	**Primary Competitors**		**Property Data**				**Estimated Market Segmentation**					
9	Hotel #	Property	Hist ARC	# Rooms	Occupancy	Avg. Rate	1	2	3	4	5	Check
10	N/A	Secondary	389	389	75%	$ 95.80	61%	17%	22%	0%	0%	100%
11	1	Embassy Suites	200	200	78%	$ 151.00	80%	5%	15%	0%	0%	100%
12	2	Hilton Inn	275	275	72%	$ 136.00	40%	50%	10%	0%	0%	100%
13	3	Radisson Hotel	250	250	68%	$ 131.00	45%	40%	15%	0%	0%	100%
14	4	Holiday Inn	175	175	73%	$ 127.00	55%	25%	20%	0%	0%	100%
15	5	Courtyard	62	124	65%	$ 133.00	75%	5%	20%	0%	0%	100%
16	6	Ramada Inn	150	150	66%	$ 124.00	65%	20%	15%	0%	0%	100%
17	7	Island Inn	135	135	62%	$ 110.00	60%	30%	10%	0%	0%	100%
18	8	Quality Inn	175	175	78%	$ 125.00	50%	10%	40%	0%	0%	100%
19	9	Days Hotel	120	120	74%	$ 121.00	70%	5%	25%	0%	0%	100%
20	10	Hotel #10	0	0	0%		0%	0%	0%	0%	0%	0%
21	11	Hotel #11	0	0	0%		0%	0%	0%	0%	0%	0%
22	12	Hotel #12	0	0	0%		0%	0%	0%	0%	0%	0%
23	13	Hotel #13	0	0	0%		0%	0%	0%	0%	0%	0%
24	14	Hotel #14	0	0	0%		0%	0%	0%	0%	0%	0%
25	15	Hotel #15	0	0	0%		0%	0%	0%	0%	0%	0%
26	16	Hotel #16	0	0	0%		0%	0%	0%	0%	0%	0%
27	17	Hotel #17	0	0	0%		0%	0%	0%	0%	0%	0%
28	18	Hotel #18	0	0	0%		0%	0%	0%	0%	0%	0%
29	19	Hotel #19	0	0	0%		0%	0%	0%	0%	0%	0%
30		**Total**	**1,931**	**1,993**		**$ 128.67**						

Figure 1 - *Primary* sheet from RNA program

Use of the *Primary* Sheet of the RNA program

CASE STUDY

The *Primary* sheet contains three input areas: market segment inputs, project information, and primary competitor data. To use the sheet, the appraiser starts by entering the name of each market segment into cells B3 through B7. The case study has only three market segments, Commercial, Meeting & Convention, and Leisure, as detailed in Table 2 on page 14.

Secondly, the appraiser enters project information in cells E2 through E6. The information used will vary from firm to firm.

Last, the appraiser enters information relating to each competitor in cells B11 through K29. Start by entering the name of each competitor in column B, starting in row 11. The sheet can accommodate up to 19 primary competitors. Note that row 10 of this section contains summary information about the secondary competition. This data is automatically carried over from the *Secondary* sheet.

CASE STUDY (continued)

The HARC, room count, and occupancy percentage for each primary competitor are entered in columns C, D, and E, respectively.

Hotel #1, the Embassy Suites, will be used to demonstrate exactly where the information is entered. The historic average room count, or HARC, of 200 is entered into cell C11. Since this property has been opened for the entire base year, its HARC equals its room count. As this is the usual case, the actual number of rooms (200) is automatically entered into cell D11.

On the other hand, the Courtyard by Marriott (Hotel #5) opened July 1, 2000, which is midway through the base year. Its HARC is therefore 50% of its room count or 62 rooms (50% x 124 = 62). For the Courtyard, the HARC is entered as 62 in cell C15 and the number of rooms must be manually entered in cell D15 as 124.

The Embassy Suites' occupancy percentage (78%) is entered into cell E11. This number may be entered as a percent (78%), or as a decimal (.78). Be sure to visually verify that the result is correct (not 7800% or 0.78%).

Columns G through K are for the market segmentation percentages, which are entered as a percent. Column L is a check column that adds the percentages in columns G through K. This provides a quick visual check to make sure that the market segmentations percentages were entered correctly.

The market segmentation percentages are entered into cells G11 - K11, under the appropriate segment number. The segmentation percentages are entered as a percent (80% for commercial demand), or as a decimal (.8). Be sure to visually verify that the result is correct (not 8000% or 0.80%).

The process of entering the data for each competitive hotel is continued in the same manner.

Proper Data Entry for an Existing Subject Hotel

If the appraiser is charged with performing a market study on an existing hotel in the market, this information should always be entered in row 11 as Hotel #1 of the *Primary* sheet. If this is done, the information is automatically transferred to the proper location on the *Final Output* sheet of the RNA program.

The completed *Secondary* sheet is shown in Figure 2 at the top of the next page, followed by instructions for its use.

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	A	B	C	D	E	F	G	H	I	J	K	L	M
2	**Secondary Competitors**		**Property Data**					**Estimated Market Segmentation**					
3	Hotel #	Property	Comp. %	# Rooms	Eff HARC	Occupancy	Rate	Seg 1	Seg 2	Seg 3	Seg 4	Seg 5	Check
4	1	Red Roof Inn	50%	110	55	82%	$ 45.25	60%	5%	35%	0%	0%	100%
5	2	Super 8	50%	125	63	78%	$ 42.50	60%	5%	35%	0%	0%	100%
6	3	Microtel	25%	100	25	90%	$ 35.75	75%	0%	25%	0%	0%	100%
7	4	Residence Inn	33%	75	25	77%	$ 98.00	55%	10%	35%	0%	0%	100%
8	5	Delta Inn	40%	83	33	63%	$ 41.50	65%	10%	25%	0%	0%	100%
9	6	Four Seasons	75%	250	188	72%	$ 150.00	60%	30%	10%	0%	0%	100%
10	7	Hotel #7	0%	0	0	0%	$ -	0%	0%	0%	0%	0%	0%
11	8	Hotel #8	0%	0	0	0%	$ -	0%	0%	0%	0%	0%	0%
12	9	Hotel #9	0%	0	0	0%	$ -	0%	0%	0%	0%	0%	0%
13	10	Hotel #10	0%	0	0	0%	$ -	0%	0%	0%	0%	0%	0%
14	11	Hotel #11	0%	0	0	0%	$ -	0%	0%	0%	0%	0%	0%
15	12	Hotel #12	0%	0	0	0%	$ -	0%	0%	0%	0%	0%	0%
16	13	Hotel #13	0%	0	0	0%	$ -	0%	0%	0%	0%	0%	0%
17	14	Hotel #14	0%	0	0	0%	$ -	0%	0%	0%	0%	0%	0%
18	15	Hotel #15	0%	0	0	0%	$ -	0%	0%	0%	0%	0%	0%
19	16	Hotel #16	0%	0	0	0%	$ -	0%	0%	0%	0%	0%	0%
20	17	Hotel #17	0%	0	0	0%	$ -	0%	0%	0%	0%	0%	0%
21	18	Hotel #18	0%	0	0	0%	$ -	0%	0%	0%	0%	0%	0%
22	19	Hotel #19	0%	0	0	0%	$ -	0%	0%	0%	0%	0%	0%
23	20	Hotel #20	0%	0	0	0%	$ -	0%	0%	0%	0%	0%	0%
24	**Totals**			743	389								
25	**Averages**												

Figure 2 - *Secondary* sheet from RNA program

Use of the *Secondary* Sheet of the RNA program

CASE STUDY

The *Secondary* sheet of the RNA program contains two input sections. Columns B through G require property data, while columns H through L require market segmentation data.

To use the *Secondary* sheet, the appraiser starts by entering the name of each secondary competitor in column B, rows 4 through 23. The *Secondary* sheet can accommodate up to 20 properties.

The appropriate competitive weighting factor and number of rooms are entered in columns C and D. Using the Red Roof Inn as an example, the competitive weight is entered as 50% and the room count is entered as 110, as detailed in Table 1 on page 12.

The program then automatically calculates the Effective HARC in column E, which is calculated by multiplying the competitive weighting factor by the HARC.

The occupancy percentage for each property is entered as a percentage in column F. For the Red Roof Inn, this can be entered as a percent (82%) or as a decimal (.82).

The average room rate for each property is entered in column G. For the Red Roof Inn, entering 45.25 will result in the sheet displaying $45.25.

CASE STUDY (continued)

Columns H through L are for the market segmentation percentages. The market segments are defined on the *Primary* sheet. Be sure to follow the order established on this sheet. In this case, there are only three segments, Segment 1 is for Commercial demand, Segment 2 is for Meeting & Convention demand, and Segment 3 is for Leisure demand. These segmentation percentages may be entered as a percent (60% for Commercial demand in the case of the Red Roof Inn), or as a decimal (.6), as shown in Table 2 on page 14.

Column M is a check column that adds the market segmentation percentages in columns H through L. The total of all market segments should equal 100%.

After all the data has been entered, the *Secondary* sheet produces the summary data shown below in Figure 3 and transfers this data to the *Primary* sheet.

	N	O	P	Q	R	S	T	U
2	Room Nights						Average	Average
3	Seg 1	Seg 2	Seg 3	Seg 4	Seg 5	Total	Occupancy	Rate
4	9,877	823	5,762	0	0	16,462		744,883
5	10,762	897	6,278	0	0	17,936		762,284
6	6,159	0	2,053	0	0	8,213		293,597
7	3,864	703	2,459	0	0	7,026		688,573
8	4,932	759	1,897	0	0	7,588		314,917
9	29,644	14,822	4,941	0	0	49,406		7,410,960
10	0	0	0	0	0	0		0
11	0	0	0	0	0	0		0
12	0	0	0	0	0	0		0
13	0	0	0	0	0	0		0
14	0	0	0	0	0	0		0
15	0	0	0	0	0	0		0
16	0	0	0	0	0	0		0
17	0	0	0	0	0	0		0
18	0	0	0	0	0	0		0
19	0	0	0	0	0	0		0
20	0	0	0	0	0	0		0
21	0	0	0	0	0	0		0
22	0	0	0	0	0	0		0
23	0	0	0	0	0	0		0
24	65,239	18,003	23,389	0	0	106,631		10,215,214
25	61.18%	16.88%	21.93%	0.00%	0.00%		75.10%	$ 95.80

Figure 3 - Summary data from *Secondary* sheet from RNA program

CASE STUDY (continued)

The weighted average occupancy percentage is found in cell T25 (75.10%).

The weighted average room rate is found in cell U25 ($95.80).

The *Secondary* sheet has enabled the appraiser to combine six secondarily competitive hotels into one generic property. The attributes of this generic hotel are summarized as follows:

Effective HARC (cell E24)	389
Commercial Segment Percentage (cell N25)	61.18%
Meeting & Convention Segment Percentage (cell O25)	16.88%
Leisure Segment Percentage (cell P25)	21.93%
Occupancy (cell T25)	75.10%
Average Room Rate (cell U25)	$95.80

ALA-5—Quantify the Area's Current Accommodated Room Night Demand

This step of the analysis of lodging activity is performed automatically by the RNA program. The information entered on the *Primary* and *Secondary* sheets is used to separately calculate current accommodated room demand for each market segment, using the following equation:

Historic Average Room Count x Occupancy x Market Segmentation Percentage x 365 = Room Nights Sold in the Market Segment

Use of the *Demand-Base Year* Sheet of the RNA Program

This process is repeated for each of the competitive hotels in the market area. The number of room nights sold for each market segment at each hotel is then combined to give the market area's current accommodated room night demand. Figure 4 on the next page shows a screen shot of the *Demand-Base Year* sheet, which summarizes the information.

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	A	B	C	D	E	F	G	H	I	J	K	L	M
1	**Base Year Demand**												
2		Room Nights Sold by Market Segment					Fair	Overall	Market Segment Penetration				
3	**Competitors**	Seg 1	Seg 2	Seg 3	Seg 4	Seg 5	Share	Penetration	Seg 1	Seg 2	Seg 3	Seg 4	Seg 5
4	Secondary	65,045	18,127	23,459	0	0	20.1%	104.2%	110%	77%	120%	0%	0%
5	Embassy Suites	45,552	2,847	8,541	0	0	10.4%	108.2%	150%	23%	85%	0%	0%
6	Hilton Inn	28,908	36,135	7,227	0	0	14.2%	99.9%	69%	216%	52%	0%	0%
7	Radisson Hotel	27,923	24,820	9,308	0	0	12.9%	94.3%	73%	163%	74%	0%	0%
8	Holiday Inn	25,646	11,657	9,326	0	0	9.1%	101.3%	96%	110%	106%	0%	0%
9	Courtyard	11,032	735	2,942	0	0	3.2%	90.2%	117%	20%	94%	0%	0%
10	Ramada Inn	23,488	7,227	5,420	0	0	7.8%	91.5%	103%	79%	72%	0%	0%
11	Island Inn	18,330	9,165	3,055	0	0	7.0%	86.0%	89%	112%	45%	0%	0%
12	Quality Inn	24,911	4,982	19,929	0	0	9.1%	108.2%	94%	47%	226%	0%	0%
13	Days Hotel	22,688	1,621	8,103	0	0	6.2%	102.6%	124%	22%	134%	0%	0%
14	Hotel #10	0	0	0	0	0	0.0%	0.0%	0%	0%	0%	0%	0%
15	Hotel #11	0	0	0	0	0	0.0%	0.0%	0%	0%	0%	0%	0%
16	Hotel #12	0	0	0	0	0	0.0%	0.0%	0%	0%	0%	0%	0%
17	Hotel #13	0	0	0	0	0	0.0%	0.0%	0%	0%	0%	0%	0%
18	Hotel #14	0	0	0	0	0	0.0%	0.0%	0%	0%	0%	0%	0%
19	Hotel #15	0	0	0	0	0	0.0%	0.0%	0%	0%	0%	0%	0%
20	Hotel #16	0	0	0	0	0	0.0%	0.0%	0%	0%	0%	0%	0%
21	Hotel #17	0	0	0	0	0	0.0%	0.0%	0%	0%	0%	0%	0%
22	Hotel #18	0	0	0	0	0	0.0%	0.0%	0%	0%	0%	0%	0%
23	Hotel #19	0	0	0	0	0	0.0%	0.0%	0%	0%	0%	0%	0%

	P	Q	R
	Total Accommodated Demand Output		
	Segment	**Base Year Rm Nights**	**Segment Percent**
1	**Commercial**	293,523	57.76%
2	**Meeting & Conver**	117,317	23.09%
3	**Leisure**	97,309	19.15%
4	**N/A**	0	0.00%
5	**N/A**	0	0.00%
	TOTAL	508,149	100.00%
	Market Occupancy	72.10%	

Figure 4 - *Demand-Base Year* sheet from RNA program

Fair Share and Market Penetration Defined

CASE STUDY

The *Demand-Base Year* sheet presents several sets of information. In columns B through F, the sheet displays Room Nights Sold by Market Segment, calculated according to the formula presented on the previous page.

The second set of information is a grand total of the room nights per segment data, presented in Column Q of the sheet, in the "Total Accommodated Demand Output" section. In addition, overall market segmentation is presented in column R.

Third, the fair share for each hotel is shown in column G. The fair share for a given property is that property's room count as a percent of the total room count in the competitive set.

Fourth, market penetrations are shown in columns H through M. The market penetration is used to assess the relative competitiveness of each hotel, as a whole and within each market segment. The "Overall Penetration" figures in column H represents the amount of business captured by a particular hotel as compared to that hotel's fair share. The "Market Segment Penetration" figures in columns I through M represent the within segment competitiveness of each hotel. As an example, the Embassy Suites has an overall penetration rate of 108.2%, meaning that the hotel captures 108.2% of its fair share. The market segment penetration shows that the Embassy Suites captures 150% of its fair share of commercial demand, only 23% of its fair share of meeting and convention demand and 85% of its fair share of leisure demand. Details of the fair share and penetration calculations are given in Step #7 of the Market Study Procedure, starting on page 35.

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ALA-6—Estimate the Area's Total Latent Demand, which is Composed of Unaccommodated and Induced Demand

Quantifying Latent Demand

The previous calculations quantify the area's current accommodated room night demand. Because this demand is based on actual hotel occupancies, the accommodated demand accounts for only those hotel rooms that have been utilized by guests. It does not take into account other types of demand that may have been present in the market, but for one reason or another has not been accommodated in the area's current supply of lodging facilities. This additional demand is called latent demand, which is composed of Unaccommodated Demand and Induced Demand.

Unaccommodated Demand Defined

Unaccommodated demand arises when transient travelers who seek accommodations within a market area must either defer their trip, settle for a less desirable hotel outside the competitive set or stay outside of the market area, due to the fact that all local lodging facilities are filled. Because this type of demand is not actually accommodated by the area's lodging facilities, it will not be included in the room nights quantified by the previous steps described in the lodging activity approach.

When quantifying current hotel room night demand, unaccommodated demand only becomes a factor when the number of competitive rooms in the market is expanding. As the supply of rooms increases, more of the unaccommodated demand will be accommodated during periods of peak visitation. Because these uncounted room nights help cushion the dilution affect of adding more rooms to a market, it becomes important to quantify the amount of unaccommodated visitation currently attempting to utilize lodging facilities in the area.

Unaccommodated demand is generally brought into the market analysis as accommodated demand at the point in time where there are a sufficient number of new rooms available to absorb this form of latent demand. Care must be taken to make sure that the amount of unaccommodated demand that is converted into accommodated demand is justified by the number of new rooms opening in the market. The amount of capacity (new rooms) available to convert unaccommodated demand into accommodated demand is called the accommodatable latent demand and will be covered in Step #5: Quantify the Area's Total Guestroom Supply and the Total Room Nights Available (p. 28).

Induced Demand Defined

The second type of latent demand is called induced demand. Induced demand is additional room nights that will be attracted to the market area for one or more specific reasons. Examples of induced demand include the following:

- The opening of new hotels that offer previously unsupplied amenities such as extensive meeting and convention space or specialized recreational amenities such as golf, skiing, and health spa.
- The aggressive marketing efforts of individual properties. Some of the major hotel chains are able to bring new room nights into the market as a direct result of the marketing performed by other properties they operate.
- The opening of a new major demand generator such as a convention center, commercial enterprise, retail complex, transportation facility (airport), or recreational attraction.

CASE STUDY

Estimate Total Latent Demand for the Market Area

An analysis of the subject's market area indicates a presence of latent hotel demand composed of both unaccommodated and induced room night demand. In order to show the true depth of the market, the amount of latent demand must be quantified.

Based on analysis of the market, the following base year unaccommodated demand estimates were made for the subject's market area.

Table 3 – Estimates of Unaccommodated Demand

	Accommodated Demand	Unaccommodated Percentage	Unaccommodated Demand
Commercial	293,523	8%	23,482
Meeting & Convention	117,317	5%	5,866
Leisure	97,309	3%	2,919

The opening of the proposed Sheraton is expected to create induced demand in the meeting and convention segment. Based on discussions with the operator, it is anticipated that Sheraton will be referring approximately 15,000 room nights of additional demand per year.

This induced demand will be attracted to the Sheraton over the first three years of its operation based on the following phase-in schedule:

Year #1 of operation (2003)	20%	3,000 room nights
Year #2 of operation (2004)	60%	9,000 room nights
Year #3 of operation (2005)	100%	15,000 room nights

Note: Operational Year #1 of the Sheraton is the same as projection year three (three years from the base year).

The *Latent* sheet shows the portion of the RNA program where the unaccommodated and induced demand are entered. The completed sheet, based on the Case Study information, is shown below, followed by instructions for its use.

	A	B	C	D	E	F	G	H
1	Latent Demand Inputs							
2	Assumptions for Unaccomodated and Induced Demand							
3		Unaccom.	Induced	Phase In for Induced				
4	Segment	%	(Rm Nts)	2001	2002	2003	2004	2005
5	Commercial	8.00%	0	0%	0%	0%	0%	0%
6	Meeting & Convention	5.00%	15000	0%	0%	20%	60%	100%
7	Leisure	3.00%	0	0%	0%	0%	0%	0%
8	N/A	0.00%	0	0%	0%	0%	0%	0%
9	N/A	0.00%	0	0%	0%	0%	0%	0%

Figure 5 - *Latent* sheet from RNA program

CASE STUDY

Unaccommodated demand, expressed as a percentage of accommodated demand, is entered in column B adjacent to the appropriate market segment in column A. This data can be entered as a percent (8%) or as a decimal (.08). Be sure to visually verify that the result is correct (not 800% or 0.08%).

If the market contains induced demand, the number of total induced room nights is entered adjacent to the appropriate market segment in column C. The phase-in percentage is entered under the appropriate year, adjacent to the appropriate market segment. Enter the phase-in percentage as a percent (20%) or as a decimal (.2). Because the proposed Sheraton does not open until projection year three, the phase-in starts at that point with 20% entered in 2003, 60% in 2004, and 100% in 2005. Unless a percentage is entered in the phase-in section, the RNA program assumes that none of the induced demand will be utilized.

Step #4: Forecast the Room Night Demand into the Future

Because a market study and valuation require the appraiser to look into the future, the existing room night demand must now be forecast over the projection period. Future hotel demand will either increase, decrease, or remain level. The direction and rate of change is estimated through an analysis of various economic and demographic indicators, as well as an examination of historic supply and demand changes.

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The estimated change in hotel demand is generally projected by market segment for periods ranging from three to ten years. The annual compounded percent change should reflect the most probable trend in hotel room night demand.

CASE STUDY

Historical data on market supply and demand is available in the form of a "Trend Report," obtainable from Smith Travel Research. Table 4 below contains a summary of supply, demand, and occupancy data from a Trend Report for the Central Long Island market area. Note that the supply and demand figures do not align with the data in the *Demand-Base Year* sheet, as the Trend Report covers a larger area than the more tightly defined market area for the subject Sheraton Hotel.

Table 4 Trend Report for Central Long Island

Year	Room Night Demand	Room Night Supply	Occupancy (%)
1990	691,075	990,083	69.8%
1991	685,125	1,018,286	67.3%
1992	663,639	1,028,256	64.5%
1993	671,023	1,036,876	64.7%
1994	707,644	1,058,952	66.8%
1995	740,023	1,109,618	66.7%
1996	783,857	1,165,655	67.3%
1997	837,987	1,205,831	69.5%
1998	880,664	1,238,459	71.1%
1999	916,270	1,283,078	71.4%

The historic supply and demand data are entered on the *Demand Inputs* sheet of the RNA spreadsheet. As illustrated below in Figure 6, this portion of the spreadsheet not only calculates historical occupancies, it also calculates annual and compound supply and demand growth rates.

	A	B	C	D	E	F	G	H	I	J	K	L
19	Historical Market Growth Rate											
20		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	Average
21	Room Demand	691,075	685,125	663,639	671,023	707,644	740,023	783,857	837,987	880,664	916,270	
22	Room Supply	990,083	1,018,286	1,028,256	1,036,876	1,058,952	1,109,618	1,165,655	1,205,831	1,238,459	1,283,078	
23	Occupancy	69.80%	67.28%	64.54%	64.72%	66.82%	66.69%	67.25%	69.49%	71.11%	71.41%	
24												
25	Yearly Change in Demand		-0.86%	-3.14%	1.11%	5.46%	4.58%	5.92%	6.91%	5.09%	4.04%	3.23%
26	Yearly Change in Supply		2.85%	0.98%	0.84%	2.13%	4.78%	5.05%	3.45%	2.71%	3.60%	2.93%
27												
28			9 Years	8 Years	7 Years	6 Years	5 Years	4 Years	3 Years	2 Years	1 Year	
29	Compound Growth in Demand		3.18%	3.70%	4.72%	5.33%	5.30%	5.49%	5.34%	4.57%	4.04%	
30	Compound Growth in Supply		2.92%	2.93%	3.21%	3.61%	3.91%	3.70%	3.25%	3.15%	3.60%	
31												
32	Assumed Compound Supply		2.92%									
33	Growth for Supply Addn sheet											

Figure 6 – Historical Market Growth Portion of *Demand Inputs* sheet from RNA program

CASE STUDY (continued)

Use of the *Demand Inputs* Sheet

To use this portion of the *Demand Inputs* sheet, simply enter the Room Night demand into cells B21 through K21, and Room Night supply into cells B22 through K22. The program will automatically calculate occupancy, annual change in demand and supply, and the compound growth rate for each year data is entered. For the Central Long Island market, recent demand growth has been very strong, reflecting the vigor of the local economy. Supply growth has been moderate, although it has grown quickly in the past few years.

The program uses the 'oldest' compound growth rate as its assumed supply growth rate in the future. If future supply growth is not expected to mirror the entry in cell C32, the analyst should enter the expected growth rate in cell C32 as a manual 'override' to the calculated figure.

Growth Rates of Accommodated and Unaccommodated Demand

The forecasted direction and rate of change in room night demand is generally applied separately to the accommodated and unaccommodated demand components. While these components tend to move together in synchronization, there may be specific reasons to estimate each component separately. For instance, accommodated leisure demand may grow at a slower rate than unaccommodated leisure demand, if it is difficult for price-sensitive leisure travelers to find accommodations during mid-week, a period typically dominated by price-insensitive commercial travelers.

Induced demand is not usually affected by projected changes in the accommodated and unaccommodated components. Rather it depends on the demand characteristics exhibited by the specific demand generator.

CASE STUDY

The change in room night demand for the subject's market area will be forecasted over the projection period using local economic and demographic trends as a basis, as well as incorporating the historical patterns of supply and demand growth.

Based on this analysis, the following growth rates were used to project hotel room night demand for the subject's market area:

Table 5 Forecast Demand Growth Rates, for both Accommodated and Unaccommodated Demand

Segment	2001	2002	2003	Stabilized
Commercial	5.0%	4.0%	3.0%	3.0%
Meeting & Convention	2.0%	2.5%	2.75%	2.75%
Leisure	1.5%	1.5%	1.5%	1.5%

The data from Table 5 is entered into the *Demand Inputs* sheet as shown in Figure 7.

	A	B	C	D	E	F	G	H	I	J	K
1	Demand Inputs										
2	Accommodated Demand Growth Rates										
3	Segment	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
4	Commercial	5.00%	4.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
5	Meeting & Convention	2.00%	2.50%	2.75%	2.75%	2.75%	2.75%	2.75%	2.75%	2.75%	2.75%
6	Leisure	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%
7	N/A	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
8	N/A	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
9	Weighted Average	3.69%	3.22%	2.68%	2.68%	2.69%	2.69%	2.69%	2.70%	2.70%	2.70%
10											
11	Unaccommodated Demand Growth Rates										
12	Segment	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
13	Commercial	5.00%	4.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
14	Meeting & Convention	2.00%	2.50%	2.75%	2.75%	2.75%	2.75%	2.75%	2.75%	2.75%	2.75%
15	Leisure	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%
16	N/A	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
17	N/A	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Figure 7 – Growth Rates Portion of *Demand Inputs* sheet from RNA program

CASE STUDY

The top portion of Figure 7 (rows 2 to 9) shows the growth factors for accommodated demand. The growth rates from Table 5 are entered in the appropriate cell. For example, commercial demand is expected to grow by 5% from the end of the base year to the end of 2001, so the 5% growth factor is entered in cell B4. The 2002 commercial growth rate of 4% is entered in cell C4, and the stabilized growth rate of 3% is entered in cell D4. No additional entries are required for that particular market segment, because each subsequent cell refers to the rate used in the previous year. For example, cells E4 through K4 automatically pick up the 3% growth rate entered in cell D4.

The meeting & convention growth rates are entered in row 5 and the leisure growth rates are entered in row 6.

Note the weighted average growth rate for accommodated demand in row 9. This gives the analyst a good overall view of projected market demand growth.

The bottom portion of Figure 7 (rows 11 to 17) shows the growth factors for unaccommodated demand. These figures are entered automatically, under the assumption they have the same values as the accommodated demand growth factors. In the event unaccommodated growth is expected to differ from accommodated growth, the proper growth factors should be entered manually in rows 13 through 17.

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The *Demand Calcs* Sheet, Unadjusted for Unaccommodatable Demand

Once the growth rates have been entered, the program calculates the accommodated demand for each year of the ten-year projection period, adds unaccommodated and induced demand, and computes to appropriate totals. Shown below in Figure 8 is a screen shot of this portion of the *Demand Calcs* sheet, which illustrates the process.

However, since latent demand can only be captured with the addition of new supply, these figures must be adjusted to reflect that portion of latent demand that is accommodatable. This work is performed as part of the next step (Step #5) of the market study process.

	A	B	C	D	E	F	G	H	I	J	K	L
1	Demand Calcs											
2	Accomodated Demand											
3	Segment	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
4	Commercial	293,523	308,199	320,527	330,143	340,047	350,248	360,755	371,578	382,725	394,207	406,033
5	Meeting & Convention	117,317	119,663	122,655	126,028	129,494	133,055	136,714	140,474	144,337	148,306	152,384
6	Leisure	97,309	98,769	100,251	101,755	103,281	104,830	106,402	107,998	109,618	111,262	112,931
7	N/A	0	0	0	0	0	0	0	0	0	0	0
8	N/A	0	0	0	0	0	0	0	0	0	0	0
9	Total	508,149	526,631	543,433	557,926	572,822	588,133	603,871	620,050	636,680	653,775	671,348
10												
11	Unaccomodated Demand											
12	Segment	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
13	Commercial	23,482	24,656	25,642	26,411	27,203	28,019	28,860	29,726	30,618	31,537	32,483
14	Meeting & Convention	5,866	5,983	6,133	6,302	6,475	6,653	6,836	7,024	7,217	7,415	7,619
15	Leisure	2,919	2,963	3,007	3,052	3,098	3,144	3,191	3,239	3,288	3,337	3,387
16	N/A	0	0	0	0	0	0	0	0	0	0	0
17	N/A	0	0	0	0	0	0	0	0	0	0	0
18	Total	32,267	33,602	34,782	35,765	36,776	37,816	38,887	39,989	41,123	42,289	43,489
19												
20	Induced Demand											
21	Segment	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
22	Commercial	0	0	0	0	0	0	0	0	0	0	0
23	Meeting & Convention	0	0	0	3,000	9,000	15,000	15,000	15,000	15,000	15,000	15,000
24	Leisure	0	0	0	0	0	0	0	0	0	0	0
25	N/A	0	0	0	0	0	0	0	0	0	0	0
26	N/A	0	0	0	0	0	0	0	0	0	0	0
27	Total	0	0	0	3,000	9,000	15,000	15,000	15,000	15,000	15,000	15,000
28												
29	Total Market Demand - Unadjusted for Unaccommodatable Demand											
30	Segment	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
31	Commercial	317,005	332,855	346,169	356,554	367,250	378,267	389,615	401,304	413,343	425,744	438,516
32	Meeting & Convention	123,183	125,646	128,788	135,330	144,969	154,708	158,550	162,498	166,554	170,721	175,003
33	Leisure	100,228	101,732	103,258	104,807	106,379	107,974	109,593	111,237	112,906	114,599	116,318
34	N/A	0	0	0	0	0	0	0	0	0	0	0
35	N/A	0	0	0	0	0	0	0	0	0	0	0
36	Total RN Demand	540,416	560,233	578,215	596,691	618,598	640,949	657,758	675,039	692,803	711,064	729,837

Figure 8 – Portion of the *Demand Calcs* sheet from RNA program

Step #5: Quantify the Area's Total Guestroom Supply, the Total Room Nights Available, the Accommodatable Latent Demand, and the Total Usable Latent Demand

Total Guestroom Supply

The total guestroom supply consists of the existing hotels (primary and secondary competition) previously identified, plus any facilities currently under construction, or proposed projects likely to be completed. In addition, the RNA program provides the option of growing the supply in accordance with historical growth patterns in those years when no identifiable supply is added.

The appraiser evaluates each proposed hotel within the market area and makes a determination as to whether the project should be considered a definite addition to the future lodging supply or whether it should be totally disregarded. An alternative would be to assign a probability factor based on its estimated chance of ultimately being developed. This procedure allows the project to be considered as a future addition to the competitive supply, but with a weighted room count determined by its development probability. For example, a proposed 200-room hotel is planned for a site within a market area. Based on discussions with the building department and developer, the appraiser estimated that there was only a 50% chance that this project would be built. When totaling the size of the competitive supply, the appraiser would include this project, but would consider it to be a 100-room rather than a 200-room hotel utilizing the 50% probability factor.

The total guestroom supply is estimated for each projection year by totaling the existing supply of hotel rooms using the HARC for the primary competition and an effective HARC for the secondary competition. To this existing supply is added any new rooms for hotels currently under construction, as well as those that are proposed and have a probability of being completed. If a hotel under construction or proposed is expected to open at some point during one of the projection years, its room count is weighted for that year based on the actual number of months open. For example, if a property opens on August 1, it would have 5/12 of the actual room count in the first year of its operation. In the event a hotel is being removed from the market during the projection period, its room count is deducted after being appropriately weighted for month of removal in the first year of its deletion.

Total Room Nights Available

The total room nights available is quantified by multiplying the total guestroom supply for each projection year by 365. Note that the RNA program handles this calculation automatically.

Accommodatable Latent Demand

If the appraiser projects any type of latent demand, a calculation should be made to determine what portion of the latent demand can actually be accommodated by the new

additions to the guestroom supply. Accommodatable latent demand is determined for each projection year as follows:

- Calculate the number of new room nights available per year by multiplying the number of new hotel rooms that have opened since the base year by 365.
- Calculate the accommodatable latent demand by multiplying the number of new room nights available by the estimated areawide occupancy for that year.

That portion of the latent demand that cannot be accommodated by the new rooms entering the market is known as the unaccommodatable latent demand. It is calculated as follows:

Total Latent Demand – Accommodatable Latent Demand =

Unaccommodatable Latent Demand

Unaccommodatable latent demand arises because the supply of hotel rooms is insufficient to accommodate total latent demand. Thus, unaccommodatable latent demand must be deducted from the previously calculated total demand in order to have an accurate estimate of occupancy and total usable demand. The unaccommodatable latent demand is allocated to each market segment based on the percentage relationship of each segment's latent demand to the market's total latent demand.

Total Usable Latent Demand

The total usable latent demand for any given projection year is the lesser of the total latent demand or the accommodatable latent demand.

Fortunately, the RNA program automatically handles these calculations and produces accurate estimates of both accommodatable and unaccommodatable latent demand, as well as properly adjusted occupancy rates.

CASE STUDY

In addition to the 250-room proposed Sheraton, which is scheduled to open January 1, 2003, there are two other lodging facilities currently under construction that will be added to the lodging supply during the projection period. These two hotels are:

- 140-room Best Western Hotel scheduled to open October 1, 2001
- 200-unit Marriott Suite Hotel scheduled to open January 1, 2002

Each of these hotels is considered fully competitive with the proposed Sheraton.

Use of the *Supply Addn* Sheet

The *Supply Addn* sheet shows the portion of the RNA program where the additions to supply are entered. The completed sheet, based on the Case Study information, is shown on the following page, together with instructions for its use.

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	**Additions to Supply**												
2													
3	**Hotel**		**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
4		Existing Rooms	1931	1931	1931	1931	1931	1931	1931	1931	1931	1931	1931
5	1	Proposed Sheraton	N/A	0	0	250	250	250	250	250	250	250	250
6	2	Marriott Suites	N/A	0	200	200	200	200	200	200	200	200	200
7	3	Best Western	N/A	35	140	140	140	140	140	140	140	140	140
8	4	Proposed 4	N/A	0	0	0	0	0	0	0	0	0	0
9	5	Proposed 5	N/A	0	0	0	0	0	0	0	0	0	0
10	6	Proposed 6	N/A	0	0	0	0	0	0	0	0	0	0
11	7	Proposed 7	N/A	0	0	0	0	0	0	0	0	0	0
12	8	Proposed 8	N/A	0	0	0	0	0	0	0	0	0	0
13	9	Proposed 9	N/A	0	0	0	0	0	0	0	0	0	0
14	10	Long Term Supply Growth	N/A	0	0	0	75	153	233	315	400	487	577
15		Total New Rooms	0	35	340	590	665	743	823	905	990	1077	1167
16		Change in HARC		62	62	62	62	62	62	62	62	62	62
17		Total Supply	1931	2028	2333	2583	2658	2736	2816	2898	2983	3070	3160
18													
19		Total Room Nights Available	704,815	740,220	851,545	942,795	970,345	998,701	1,027,885	1,057,922	1,088,836	1,120,654	1,153,402
20													
21		Unadjusted Market Occupancy	76.67%	75.68%	67.90%	63.29%	63.75%	64.18%	63.99%	63.81%	63.63%	63.45%	63.28%
22													
23		Adjusted Market Occupancy	72.10%	74.77%	67.90%	63.29%	63.75%	64.18%	63.99%	63.81%	63.63%	63.45%	63.28%
24		(Adjusted For Unaccommodated											
25		Demand)											

Figure 9 – The *Supply Addn* sheet from RNA program

CASE STUDY (continued)

Row 4 contains the number of existing hotel rooms in the market area. The base year (cell C4) is the total of the historic average room count entered for each competitive hotel above. Remember that the HARC has been weighted for those hotel rooms that open during the base year.

Note that the base year (2000) ends with a total of 1,931 rooms, which increases to 1,993 rooms at the beginning of 2001. The additional 62 rooms represent the Courtyard by Marriott, which was partially open during the base year. The program considers these 62 rooms as new rooms opening at the beginning of the first year, and shows their effect in row 16, entitled "Change in HARC."

If the subject property is a proposed hotel, its room count is entered under the year it opens in row 5. The spreadsheet formulas refer to the room count contained in the preceding cell (to the left) so whatever number is entered into this row is entered across to the right. The proposed Sheraton is expected to enter the market on January 1, 2003, with 250 rooms. The room count of 250 is entered into cell F5.

The program contains space to enter up to nine proposed properties or additions to existing hotels. The Marriott Suites hotel is expected to open on January 1, 2002, with 200 units. Its room count is entered into cell E6.

CASE STUDY (continued)

The Best Western hotel is under construction and is scheduled to open October 1, 2001, with 140 units. Because this property will be open for only part of a year, its room count has to be adjusted in the same manner as the HARC. October 1 represents three quarters of a year, so with one quarter remaining (25%), the effective number of rooms for the Best Western during 2001 is 35 (140 x 25% = 35). The number 35 is entered into cell D7. The full 140 rooms is then entered in cell E7.

Long Term Supply Growth

Lastly, note the addition to supply in row 14, entitled "Long Term Supply Growth." This figure comes from the *Demand Inputs* sheet, where room supply is calculated to have grown by an annual average of 2.92% over the 1990 through 1999 period. The *Supply Addn* sheet automatically increases the supply by 2.92% per year in each year there are no explicit additions to supply to account for long-term supply growth trends.

If the appraiser has reason to believe that only the hotels listed under additions to supply are likely to come into the market, the long-term supply increase can be 'zeroed out.' Alternatively, if the appraiser has reason to believe that the future long-term trend will be different than the historical growth of supply, the expected future supply growth can be entered in cell C32 of the *Demand Inputs* sheet, as detailed on page 25.

Proper Data Entry for a Proposed Subject Hotel

If the appraisal assignment involves performing a market study on a proposed hotel, this information should always be entered in row 5 as Hotel #1 of the *Supply Addn* sheet. If this is done, the information is automatically transferred to the proper location on the *Final Output* sheet of the RNA program.

Before the area occupancy can be properly calculated, the RNA program must determine the accommodatable latent demand and the total usable latent demand. This information could affect the estimated areawide occupancy. As shown in Figure 9 on page 30, there is an adjustment for unaccommodatable latent demand. Row 21 shows the market occupancy calculation unadjusted for unaccommodatable latent demand, while row 23 shows the market occupancy calculation with the proper adjustment. These adjustments are performed on the *Demand Calcs* sheet, and are shown on the next page in Figure 10.

	A	B	C	D	E	F	G	H	I	J	K	L
38	**Adjustment for Unaccommodatable Demand**											
39		**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
40	**New Rooms**	0	97	402	652	727	805	885	967	1,052	1,139	1,229
41	**New Room Nights Avail**	0	35,405	146,730	237,980	265,530	293,886	323,070	353,107	384,021	415,839	448,587
42												
43	**Unadjusted Occ.**	76.67%	75.68%	67.90%	63.29%	63.75%	64.18%	63.99%	63.81%	63.63%	63.45%	63.28%
44												
45	**Accommodatable Room Nig**	0	26,796	99,632	150,617	169,276	188,611	206,737	225,310	244,344	263,853	283,852
46												
47	**Total Latent Demand**	32,267	33,602	34,782	38,765	45,776	52,816	53,887	54,989	56,123	57,289	58,489
48												
49	**Unaccommodatable Demar**	-32,267	-6,806	0	0	0	0	0	0	0	0	0
50												
51	**Allocation of Unaccommodatable Demand**											
52	**Segment**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
53	**Percent of Latent Demand**											
54	**Commercial**	73%	73%	74%	68%	59%	53%	54%	54%	55%	55%	56%
55	**Meeting & Convention**	18%	18%	18%	24%	34%	41%	41%	40%	40%	39%	39%
56	**Leisure**	9%	9%	9%	8%	7%	6%	6%	6%	6%	6%	6%
57	**N/A**	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
58	**N/A**	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
59	**Unaccommodatable Demand by Segment**											
60	**Commercial**	-23,482	-4,994	0	0	0	0	0	0	0	0	0
61	**Meeting & Convention**	-5,866	-1,212	0	0	0	0	0	0	0	0	0
62	**Leisure**	-2,919	-600	0	0	0	0	0	0	0	0	0
63	**N/A**	0	0	0	0	0	0	0	0	0	0	0
64	**N/A**	0	0	0	0	0	0	0	0	0	0	0
65												
66	**Total Market Demand - Adjusted for Unaccommodatable Demand**											
67	**Segment**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
68	**Commercial**	293,523	327,861	346,169	356,554	367,250	378,267	389,615	401,304	413,343	425,744	438,516
69	**Meeting & Convention**	117,317	124,434	128,788	135,330	144,969	154,708	158,550	162,498	166,554	170,721	175,003
70	**Leisure**	97,309	101,132	103,258	104,807	106,379	107,974	109,593	111,237	112,906	114,599	116,318
71	**N/A**	0	0	0	0	0	0	0	0	0	0	0
72	**N/A**	0	0	0	0	0	0	0	0	0	0	0
73	**Total RN Demand**	508,149	553,427	578,215	596,691	618,598	640,949	657,758	675,039	692,803	711,064	729,837

Figure 10 – The *Demand Calcs* sheet, Showing Adjustments for Unaccommodated Demand

During the base year, the accommodatable latent demand is always zero. As a result, all of the latent demand is considered unaccommodatable latent demand that must be allocated to each market segment and deducted from the previously calculated room night demand. These calculations are illustrated as follows:

Allocating Unaccommodatable Demand

CASE STUDY

The total unaccommodatable latent demand for the base year is 32,271 room nights (the total latent demand). This is allocated to the three market segments based on the percentage relationship of each segment's latent demand to the market's total latent demand.

Table 6 Calculation of Base Year Unaccommodatable Demand

Market Segment	Total Latent Demand		Percent Of Total		Allocation to Each Segment
Commercial	32,267	X	72.8%*	=	23,482
Meeting & Convention	32,267	X	18.2%*	=	5,866
Leisure	32,267	X	9.0%*	=	2,919
Total			100.0%		32,267

* The percentages are rounded. The allocation to each segment is exact.

The unaccommodatable portion of the latent demand does not actually exist in the market. As a result, these room nights must be deducted from the total demand that was previously calculated.

Table 7 Calculation of Base Year Adjusted Room Night Demand

Market Segment	Unadjusted Room Night Demand	Unaccommodatable Latent Demand	Adjusted Room Night Demand
Commercial	317,005	23,482	293,523
Meeting & Convention	123,183	5,866	117,317
Leisure	100,228	2,919	97,309
Total	540,416	32,267	508,149

The adjusted room night demand calculation detailed in Table 7 is performed in the bottom portion of the *Demand Calcs* sheet in cells B68 through B70.

A better illustration of this process would be the year 2001 calculation. During the first year, the Best Western opens on October 1, 1990, with 200 rooms, which represents effectively 35 rooms for the full year. In addition, the 124-room Courtyard by Marriott was open for the first full year. Because the Courtyard only operated for 6 months during the base year, 62 rooms not included in the base year are considered to be new rooms in 2001 for the purpose of calculating the accommodatable latent demand.

CASE STUDY (continued)

The accommodatable latent demand for 2001 is determined by first multiplying the number of new rooms that opened subsequent to the base year times 365 yielding the total number of new rooms available per year. This calculation is illustrated in cells C40 and C41 of the *Demand Calcs* sheet (97 x 365 = 35,405), see Figure 10 on page 32.

Next, the unadjusted areawide occupancy is calculated for 2001. The result of this calculation is 75.68%, and is contained in cell C43 of the *Demand Calcs* sheet.

Finally, the accommodatable latent room night is calculated by multiplying the total number of new rooms available per year by the estimated areawide occupancy (35,405 x 76.68% = 26,796). This calculation is performed in Cell C45 of the *Demand Calcs* sheet.

In Figure 10, the total latent demand of 33,602 room nights for 2001 is shown in cell C47. The unaccommodatable latent demand is the difference between the total latent demand and the accommodatable latent demand; for 2001, this calculation is 33,602 – 26,796 or 6,806, with the result shown in cell C49.

The unaccommodatable latent demand is allocated to the three market segments based on the percentage relationship of each segment's latent demand to the market's total latent demand. The following table illustrates this calculation:

Table 8 Calculation of 2001 Unaccommodatable Demand

Market Segment	Unaccommodatable Latent Demand		Percent Of Total		Allocation To Each Segment
Commercial	6,806	X	73.4%*	=	4,994
Meeting & Convention	6,806	X	17.8%*	=	1,212
Leisure	6,806	X	8.8%*	=	600
Total			100.0%	=	6,806

* The percentages are rounded. The allocation to each segment is exact.

The unaccommodatable portion of the latent demand is then deducted from the total demand to produce the adjusted total market demand.

CASE STUDY (continued)

Table 9 Calculation of 2001 Adjusted Room Night Demand

Market Segment	Unadjusted Room Night Demand	Unaccommodatable Room Night Demand	Adjusted Room Night Demand
Commercial	332,855	4,994	327,861
Meeting & Convention	125,646	1,212	124,434
Leisure	101,732	600	101,132
Total	560,233	6,806	553,427

The adjusted market occupancy calculation detailed in row 23 of Figure 9 (p. 30) is performed using the adjusted room night demand in row 73 of the *Demand Calcs* sheet, see Figure 10 on page 32.

With the opening of the 200-room Marriott Suite hotel and the full operation of the Best Western hotel in year 2002, there are 402 new rooms in the market since the base year. This is more than enough to accommodate all the latent demand. Thus, the unaccommodatable demand calculations show zeros for 2002 and beyond, as illustrated in cells D60 through L64 of Figure 10.

Step #6: Calculate the Areawide Occupancy

The areawide, or market occupancy for any given year is calculated by dividing the projected room night demand, consisting of both the accommodated demand and the usable latent demand, by the total room nights available. This calculation is shown in row 23 of the *Supply Addn* sheet, and is illustrated in Figure 9 on page 30.

Step #7: Evaluate the Relative Competitiveness of Area Hotels

In order to fit any new lodging facilities into a market, the relative competitiveness of the existing supply must first be quantified.

Penetration Calculations

The relative competitiveness of hotels can be measured by penetration factors. As stated in Step #3, ALA-5 on page 19 the penetration factor expresses the hotel's relative competitiveness as a percentage of its fair share. Conceptually, the penetration factor is calculated as the market share divided by the fair share. Table 10 on the next page illustrates the computation of penetration factors.

Consider a market containing only Hotels A and B, with three market segments; Commercial, Meeting, and Leisure. Table 10 shows the percent of business within each

market segment, and the resulting penetration factors for each market segment at the two hotels, as well as the overall market penetration.

Table 10 Example of Penetration Factor Calculations

Hotel	Occ.	Rms.	Fair Share	Market Segment Percentage			Market Segment Rooms Sold		
				Comm.	Meet.	Leis.	Comm.	Meet.	Leis.
A	80%	200	40%	60%	10%	30%	35,040	5,840	17,520
B	60%	300	60%	50%	30%	20%	32,850	19,710	13,140
Market	68%	500					67,890	25,550	30,660

Hotel	Overall Penetration	Market Segment Penetration Factors		
		Comm.	Meet.	Leis.
A	118%	129%	57%	143%
B	88%	81%	129%	71%

The first thing to note is that each hotel has a fair share based on its room count as a percent of the market total. For example, Hotel A has a fair share of 40% because it contains 200 of the 500 rooms in the market.

Second, the overall penetration factor for each hotel is the ratio of the each hotel's occupancy to the market occupancy. For example, Hotel A has an overall penetration factor of 80% ÷ 68% or 118%.

Third, the market segment penetration factor results from calculating the within segment actual rooms sold as a percent of the within segment fair share. Consider the commercial market segment penetration factor of 129% for Hotel A. That figure is calculated as the actual commercial rooms sold, 35,040, divided by the fair share (40% of 67,890 or 27,156). It is convention to round the penetration factor to the nearest whole percent.

Using penetration factors, the appraiser can state in simple terms that Hotel A has an overall penetration factor of 118%, meaning that it captures 118% of its fair share of business in the market. Further, Hotel A captures 129% of its fair share of commercial business, only 57% of its fair share of meeting business and 143% of its fair share of leisure business.

Fourth, penetration factors can be used to facilitate comparisons of relative competitiveness. For example, compare Hotel A with Hotel B. Hotel A is 50% more competitive than Hotel B in the commercial market. Hotel B is more than twice as competitive than Hotel A in the meeting market. Hotel A is twice as competitive in the leisure segment as Hotel B.

CASE STUDY

The relative competitiveness of the existing area hotels will be compared using the market penetration approach. The market penetrations for each hotel in the market have already been calculated in the *Demand-Base Year* sheet of the RNA program, as detailed in Step #3, ALA-5 on page 19. Figure 11 repeats this information. Overall penetration for each hotel is shown in column H. The market segment penetrations for each hotel are shown in columns I through M under the label "Market Segment Penetration."

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Base Year Demand												
2		Room Nights Sold by Market Segment					Fair	Overall	Market Segment Penetration				
3	Competitors	Seg 1	Seg 2	Seg 3	Seg 4	Seg 5	Share	Penetration	Seg 1	Seg 2	Seg 3	Seg 4	Seg 5
4	Secondary	65,045	18,127	23,459	0	0	20.1%	104.2%	110%	77%	120%	0%	0%
5	Embassy Suites	45,552	2,847	8,541	0	0	10.4%	108.2%	150%	23%	85%	0%	0%
6	Hilton Inn	28,908	36,135	7,227	0	0	14.2%	99.9%	69%	216%	52%	0%	0%
7	Radisson Hotel	27,923	24,820	9,308	0	0	12.9%	94.3%	73%	163%	74%	0%	0%
8	Holiday Inn	25,646	11,657	9,326	0	0	9.1%	101.3%	96%	110%	106%	0%	0%
9	Courtyard	11,032	735	2,942	0	0	3.2%	90.2%	117%	20%	94%	0%	0%
10	Ramada Inn	23,488	7,227	5,420	0	0	7.8%	91.5%	103%	79%	72%	0%	0%
11	Island Inn	18,330	9,165	3,055	0	0	7.0%	86.0%	89%	112%	45%	0%	0%
12	Quality Inn	24,911	4,982	19,929	0	0	9.1%	108.2%	94%	47%	226%	0%	0%
13	Days Hotel	22,688	1,621	8,103	0	0	6.2%	102.6%	124%	22%	134%	0%	0%
14	Hotel #10	0	0	0	0	0	0.0%	0.0%	0%	0%	0%	0%	0%
15	Hotel #11	0	0	0	0	0	0.0%	0.0%	0%	0%	0%	0%	0%
16	Hotel #12	0	0	0	0	0	0.0%	0.0%	0%	0%	0%	0%	0%
17	Hotel #13	0	0	0	0	0	0.0%	0.0%	0%	0%	0%	0%	0%
18	Hotel #14	0	0	0	0	0	0.0%	0.0%	0%	0%	0%	0%	0%
19	Hotel #15	0	0	0	0	0	0.0%	0.0%	0%	0%	0%	0%	0%
20	Hotel #16	0	0	0	0	0	0.0%	0.0%	0%	0%	0%	0%	0%
21	Hotel #17	0	0	0	0	0	0.0%	0.0%	0%	0%	0%	0%	0%
22	Hotel #18	0	0	0	0	0	0.0%	0.0%	0%	0%	0%	0%	0%
23	Hotel #19	0	0	0	0	0	0.0%	0.0%	0%	0%	0%	0%	0%

	P	Q	R
	Total Accommodated Demand Output		
	Segment	Base Year Rm Nights	Segment Percent
1	Commercial	293,523	57.76%
2	Meeting & Conver	117,317	23.09%
3	Leisure	97,309	19.15%
4	N/A	0	0.00%
5	N/A	0	0.00%
	TOTAL	508,149	100.00%
	Market Occupancy	72.10%	

Figure 11 – The *Demand-Base Year* sheet, showing Competitive Indexes

Step #8: Fit each New Hotel into the Market Based on its Expected Competitiveness

Market Penetration indexes must now be assigned to each new lodging facility as it enters the market. In addition, if the relative competitiveness of any area hotel is expected to change, its market penetration needs to be adjusted. The process of assigning or adjusting competitive indexes is largely judgmental, utilizing the indices of similar hotels operating within the market as a basis.

Once penetration information for all existing and proposed hotels has been assembled, it is entered in the *Mkt Pen* sheet of the RNA program. To illustrate the process, the market penetrations for the case study will be developed, followed by instructions on how the data is entered into the RNA program.

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Market Rationale

CASE STUDY

After reviewing the various factors that affect the relative competitiveness of all the hotels within the subject's market area, the following rationale was developed and utilized in projecting each hotel's market penetration factors into the future.

Embassy Suites is a relatively new (1996) commercially oriented hotel that currently operates at its stabilized occupancy level. The property is well located relative to the competition and demand generators. Its facilities are up-to-date and well maintained. Management operates the property in a competent manner and the Embassy Suites identification is well recognized among frequent travelers. The market penetrations presently achieved by the Embassy Suites are expected to continue at similar levels into the future.

The Hilton Inn was constructed ten years ago (1991) as a convention-oriented hotel and is currently the largest hotel in the market. Its extensive meeting and banquet space, along with aggressive group marketing and skilled management, makes this property the most competitive product in the meeting and convention market. With so much emphasis directed towards the meeting and convention demand, the Hilton is the area's least competitive hotel in the commercial market. Essentially, most of the Hilton's commercial demand has been purposely displaced by meeting and convention patronage. A recent renovation has brought this property up to first-class condition, and it should remain as the meeting and convention leader into the future. The market penetrations presently achieved by the Hilton Inn are expected to continue into the future.

The Radisson Hotel is a convention hotel that competes with the Hilton for group patronage. Constructed in 1986, this property is in need of an extensive renovation, which is expected to commence early in 2001. The upgrade should enable the Radisson to maintain its present competitive position, but it will probably not make any inroads on business now using other hotels. The square footage of its meeting space is somewhat less than the Hilton, making the property less attractive to large groups and banquets. Like the Hilton, the Radisson concentrates on group patronage, which displaces much of the commercial business that would normally be using the hotel Monday through Thursday. The market penetrations presently achieved by the Radisson are expected to continue at similar levels into the future.

CASE STUDY (continued)

The Holiday Inn is one of the area's newer hotels; it opened in 1995. Its facilities include extensive recreational amenities. Like most Holiday Inns, this property benefits from a strong reservation system that draws a good mix of commercial, meeting and convention, and leisure demand. The sports facilities are particularly attractive to weekend visitors who come to the property for various organized escape packages. The Holiday Inn also has some attractive meeting and banquet space, which attracts small groups and conferences. As with the group-oriented Radisson and Hilton, the meeting and convention demand displaces some of the commercial patronage that would generally use the hotel during the week. The hotel is well maintained and operated by a competent management company. The market penetrations presently achieved by the Holiday Inn are expected to continue at similar levels into the future.

The Ramada Inn is a 17-year-old property that suffers from some deferred maintenance and a second-rate location in an older industrial park. It has a similar market orientation as the Holiday Inn, but does not capture as much meeting and convention or leisure business. The neighborhood surrounding the Ramada consists of warehouses and industrial buildings, which is not conducive to either meeting or leisure demand. Ownership has renovated the property on a regular basis so its competitive position is not expected to deteriorate. The market penetrations presently achieved by the Ramada Inn are expected to continue at similar levels into the future.

The Island Inn is the oldest hotel in the market, having been constructed in 1975. Frequent changes in ownership, along with indifferent management has adversely affected the operating results of this property over the past five years. The Island Inn was originally a Sheraton Inn, but lost its franchise four years ago. Without a national identification, reservation system, or sufficient revenue to maintain this property at an attractive level, it is likely that the Island Inn's competitive position will decline over the coming years. The market penetrations presently achieved by the Island Inn are expected to decline in the future. Declines in competitiveness are anticipated in all three market segments, with commercial demand falling approximately 4%, meeting and convention patronage dropping 13%, and leisure usage going down by 6%. Based on this analysis, the market penetrations for the Island Inn are projected as follows:

CASE STUDY (continued)

Table 11 Market Penetrations for the Island Inn

	2000	2001	2002	2003	2004 - 2010
Commercial	89%	87%	84%	80%	80%
Meeting & Convention	112%	102%	93%	85%	85%
Leisure	45%	40%	40%	40%	40%

The Quality Inn opened in 1996 with immediate success. Its location next to a growing office complex and an established recreational theme park has enabled this property to capture an attractive mix of commercial and leisure patronage. Weekends and holiday periods are particularly strong for the Quality Inn, enabling it to achieve the area's highest market penetration in the leisure segment. Ownership is presently considering the addition of more meeting space, which currently is quite limited. Initial indications show, however, that the property has a good market mix and any increase in meeting and convention usage would probably just displace commercial demand and ultimately lower the average room rate. The property is well maintained and in good physical condition. Its management is competent, especially in marketing to the leisure segment. The market penetrations presently achieved by the Quality Inn are expected to continue at similar levels into the future.

The Days Hotel is a commercially oriented property that opened in 1988. Its convenient highway location enables this hotel to attract a sizable amount of weekend leisure demand along with a high level of commercial patronage. On the other hand, limited meeting space makes the Days Hotel somewhat uncompetitive in the meeting and convention segments, but it does attract some rate-sensitive groups. The property has been well maintained and effectively managed. It benefits from a strong reservation system and moderate prices. The market penetrations presently achieved by the Days Hotel are expected to continue at similar levels into the future.

The composition and competitiveness of the secondary competition is not expected to change over the projection period so the consolidated market penetrations presently achieved by these properties should continue at the current levels into the future.

CASE STUDY (continued)

The Courtyard by Marriott opened July, 1 2000, achieving an immediate penetration of all market segments, with particular strength demonstrated in the commercial and leisure markets. Its excellent location, strong management, and connection with the Marriott brand should make the Courtyard one of the occupancy leaders in the area. With only six months of operating history, the Courtyard has not yet achieved a stabilized level of competitiveness. Gains are expected in all three market segments. The market mix of the Courtyard is expected to be similar to that of the Embassy Suites (i.e., strong commercial, minimal meeting & convention, and good leisure). It should undercut the Embassy Suites in room rate, capturing the more price-sensitive travelers, particularly in the leisure market. On the other hand, the suite concept seems to be uniformly more competitive in the commercial segment. These factors should enable the Courtyard to be more competitive in the leisure segment, somewhat more competitive in the meeting and convention segment and almost as competitive as the Embassy Suites in the commercial segment. Based on this analysis, the market penetrations for the Courtyard by Marriott are projected as follows:

Table 12 Market Penetration for the Courtyard by Marriott

	2000	2001	2002	2003	2004 - 2010
Commercial	117%	117%	134%	140%	140%
Meeting & Convention	20%	21%	25%	25%	25%
Leisure	94%	94%	101%	101%	101%

In addition to these existing hotels, there are two new and one proposed hotel planned for the market; the Best Western and Marriott Suites are under construction. The proposed Sheraton hotel (subject property) is in the planning process.

The Best Western hotel is expected to open in October 2001. Its facilities will be oriented toward the rate-sensitive commercial traveler and weekend leisure patronage. Meeting space will be limited, so its competitiveness in this segment is anticipated to be minimal. The Best Western has building plans that look attractive, but the property will have an inferior location near the interstate. Based on this competitive analysis, the Best Western should be slightly less competitive than the nearby Days Hotel for highway-oriented leisure patrons. Its competitiveness in the commercial segment is expected to be just below the Quality Inn, which is also a new property with limited meeting space. The market penetrations for the Best Western hotel are projected as follows:

CASE STUDY (continued)

Table 13 Market Penetration for the Best Western

	2001	2002	2003	2004 - 2010
Commercial	74%	80%	87%	87%
Meeting & Convention	9%	17%	17%	17%
Leisure	111%	121%	131%	131%

The Marriott Suites hotel will be the second Marriott product in the marketplace. It is expected to open in January 2002, and will cater to a more upscale traveler than the Courtyard and thereby achieve a higher average room rate. Plans call for limited meeting space similar to the Embassy Suites, but the property will have a more upscale overall décor. With a projected room rate somewhat higher than the Embassy Suites, the Marriott Suites should be slightly less competitive in the commercial and leisure segments as far as occupancy is concerned, but should achieve a higher overall room rate. Marriott's strength in marketing to meeting planners is anticipated to make this property more competitive than the Embassy in the meeting & convention segment. Based on this analysis, the market penetrations for the Marriott Suites hotel are projected as follows:

Table 14 Market Penetration for the Marriott Suites

	2002	2003	2004	2005 - 2010
Commercial	120%	134%	140%	140%
Meeting & Convention	17%	25%	34%	34%
Leisure	60%	71%	71%	71%

The proposed Sheraton hotel has been designed as a convention-oriented hotel with approximately the same amount of meeting space as the Radisson Hotel. It plans to go after both the meeting and convention and commercial segments in a manner that will maximize rooms revenue by not displacing as much of the higher-rated commercial demand with lower-priced meeting and convention patronage. The new facilities offered by the Sheraton, along with its excellent location, should make it highly competitive in the local market. Its market penetrations in all three segments are expected to stabilize at a level somewhat above those experienced by the Radisson Based on this analysis, the market penetrations for the proposed Sheraton hotel are projected as follows:

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CASE STUDY (continued)

Table 15 Market Penetration for the Proposed Sheraton Hotel

	2003	2004	2005	2006 - 2010
Commercial	74%	77%	80%	80%
Meeting & Convention	135%	169%	186%	186%
Leisure	40%	60%	81%	81%

Use of the *Mkt Pen* Sheet of the RNA Program

Once market penetration information for all existing and proposed hotels has been assembled, it is entered in the *Mkt Pen* sheet of the RNA program. The *Mkt Pen* sheet is divided into five sections, one for each market segment. Figure 12 shows a screen shot for the Commercial segment.

	B	C	D	E	F	G	H	I	J	K	L	M	N
1		Market Segment Penetration Inputs											
2													
3		Commercial Segment	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
4		Secondary	110%	110%	110%	110%	110%	110%	110%	110%	110%	110%	110%
5		Embassy Suites	150%	150%	150%	150%	150%	150%	150%	150%	150%	150%	150%
6		Hilton Inn	69%	69%	69%	69%	69%	69%	69%	69%	69%	69%	69%
7		Radisson Hotel	73%	73%	73%	73%	73%	73%	73%	73%	73%	73%	73%
8		Holiday Inn	96%	96%	96%	96%	96%	96%	96%	96%	96%	96%	96%
9		Courtyard	117%	117%	134%	140%	140%	140%	140%	140%	140%	140%	140%
10		Ramada Inn	103%	103%	103%	103%	103%	103%	103%	103%	103%	103%	103%
11		Island Inn	89%	87%	84%	80%	80%	80%	80%	80%	80%	80%	80%
12		Quality Inn	94%	94%	94%	94%	94%	94%	94%	94%	94%	94%	94%
13		Days Hotel	124%	124%	124%	124%	124%	124%	124%	124%	124%	124%	124%
14		Hotel #10	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
15		Hotel #11	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
16		Hotel #12	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
17		Hotel #13	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
18		Hotel #14	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
19		Hotel #15	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
20		Hotel #16	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
21		Hotel #17	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22		Hotel #18	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23		Hotel #19	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
24		Proposed Sheraton	0%	0%	0%	74%	77%	80%	80%	80%	80%	80%	80%
25		Marriott Suites	0%	0%	120%	134%	140%	140%	140%	140%	140%	140%	140%
26		Best Western	0%	74%	80%	87%	87%	87%	87%	87%	87%	87%	87%
27		Proposed 4	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
28		Proposed 5	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
29		Proposed 6	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
30		Proposed 7	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
31		Proposed 8	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
32		Proposed 9	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
33		Long Term Supply Growth	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

CASE STUDY

Column D of the *Mkt. Pen* sheet in Figure 12 contains the calculated data from the *Demand-Base Year* sheet, and is useful as a visual tool to verify correct information. Before data entry is started on this sheet, all cells in columns E through N contain the number in Column D, thus implicitly assuming that the historical Market Penetration will continue to hold in the future. The analyst's task is to modify the Market Penetration data to reflect any anticipated changes.

For the existing supply, all market penetrations are expected to hold constant, with the exception of the Courtyard by Marriott (row 9) and the Island Inn (row 11). To change these two hotels, the analyst will enter the data from the Commercial segment in Tables 11 for the Island Inn; it is projected to have a penetration of 87% in 2001, 84% in 2002, and 80% thereafter. Data from Table 12 is entered for the Courtyard; a penetration of 117% in 2001, 134% in 2002, and 140% thereafter.

The analyst enters data for the new supply in rows 24 through 33. It is easy to see how the data from Tables 13, 14, and 15 is entered to this section of the worksheet. For the Long Term Supply, the Market Penetration over the projection period is always 100%.

Figure 13, on the next page, shows the Meeting and Convention segment of the *Mkt Pen* sheet. Market Penetrations from Tables 11 through 15, and the Long Term Supply are entered in the same manner as the Commercial segment.

	B	C	D	E	F	G	H	I	J	K	L	M	N
35		**Meeting & Convention Seg**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
36		Secondary	77%	77%	77%	77%	77%	77%	77%	77%	77%	77%	77%
37		Embassy Suites	23%	23%	23%	23%	23%	23%	23%	23%	23%	23%	23%
38		Hilton Inn	216%	216%	216%	216%	216%	216%	216%	216%	216%	216%	216%
39		Radisson Hotel	163%	163%	163%	163%	163%	163%	163%	163%	163%	163%	163%
40		Holiday Inn	110%	110%	110%	110%	110%	110%	110%	110%	110%	110%	110%
41		Courtyard	20%	21%	25%	25%	25%	25%	25%	25%	25%	25%	25%
42		Ramada Inn	79%	79%	79%	79%	79%	79%	79%	79%	79%	79%	79%
43		Island Inn	112%	102%	93%	85%	85%	85%	85%	85%	85%	85%	85%
44		Quality Inn	47%	47%	47%	47%	47%	47%	47%	47%	47%	47%	47%
45		Days Hotel	22%	22%	22%	22%	22%	22%	22%	22%	22%	22%	22%
46		Hotel #10	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
47		Hotel #11	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
48		Hotel #12	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
49		Hotel #13	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
50		Hotel #14	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
51		Hotel #15	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
52		Hotel #16	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
53		Hotel #17	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
54		Hotel #18	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
55		Hotel #19	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
56		Proposed Sheraton	0%	0%	0%	135%	169%	186%	186%	186%	186%	186%	186%
57		Marriott Suites	0%	0%	17%	25%	34%	34%	34%	34%	34%	34%	34%
58		Best Western	0%	9%	17%	17%	17%	17%	17%	17%	17%	17%	17%
59		Proposed 4	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
60		Proposed 5	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
61		Proposed 6	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
62		Proposed 7	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
63		Proposed 8	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
64		Proposed 9	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
65		Long Term Supply Growth	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Figure 13 – The *Mkt Pen* sheet for the Meeting and Convention Segment

CASE STUDY (continued)

Figure 14 below shows the Leisure segment of the *Mkt Pen* sheet. Market Penetration data for this section is entered in an identical manner as outlined above for Figure 12 and Figure 13.

	B	C	D	E	F	G	H	I	J	K	L	M	N
67		**Leisure Segment**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
68		Secondary	120%	120%	120%	120%	120%	120%	120%	120%	120%	120%	120%
69		Embassy Suites	85%	85%	85%	85%	85%	85%	85%	85%	85%	85%	85%
70		Hilton Inn	52%	52%	52%	52%	52%	52%	52%	52%	52%	52%	52%
71		Radisson Hotel	74%	74%	74%	74%	74%	74%	74%	74%	74%	74%	74%
72		Holiday Inn	106%	106%	106%	106%	106%	106%	106%	106%	106%	106%	106%
73		Courtyard	94%	94%	101%	101%	101%	101%	101%	101%	101%	101%	101%
74		Ramada Inn	72%	72%	72%	72%	72%	72%	72%	72%	72%	72%	72%
75		Island Inn	45%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%
76		Quality Inn	226%	226%	226%	226%	226%	226%	226%	226%	226%	226%	226%
77		Days Hotel	134%	134%	134%	134%	134%	134%	134%	134%	134%	134%	134%
78		Hotel #10	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
79		Hotel #11	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
80		Hotel #12	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
81		Hotel #13	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
82		Hotel #14	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
83		Hotel #15	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
84		Hotel #16	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
85		Hotel #17	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
86		Hotel #18	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
87		Hotel #19	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
88		Proposed Sheraton	0%	0%	0%	40%	60%	81%	81%	81%	81%	81%	81%
89		Marriott Suites	0%	0%	60%	71%	71%	71%	71%	71%	71%	71%	71%
90		Best Western	0%	111%	121%	131%	131%	131%	131%	131%	131%	131%	131%
91		Proposed 4	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
92		Proposed 5	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
93		Proposed 6	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
94		Proposed 7	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
95		Proposed 8	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
96		Proposed 9	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
97		Long Term Supply Growth	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Figure 14 – The *Mkt Pen* sheet for the Leisure Segment

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Step #9: Calculate the Subject's Market Share, Room Nights Captured, Occupancy Percentage, and Stabilized Occupancy

The Market Penetrations form the basis for calculating the market share of each hotel within the market. Once the market share is known, the projected room nights captured can be determined, which then leads to an estimate of occupancy.

The process is performed on a year-by-year basis, in the following manner:

Fair Share Calculations

- Fair share calculations are performed to determine the fair share for each hotel in the market. Since the room count changes annually due to changes in the HARC and additions to supply, fair share calculations must be performed for each year of the projection period.

Market Share Adjusters and Market Share Percentages

- For each hotel, the market penetration is multiplied by its appropriate fair share, resulting in a factor referred to as the market share adjuster. The market share adjuster for each property is then divided by the total of all the market share adjusters for the area's competitive hotels. This calculation results in each property's market share percentage.

Room Nights Captured

- The market share percentages are then multiplied by the total market demand (from the *Demand Calcs* sheet). This step produces the actual room nights captured by each hotel, in each market segment.
- The room nights captured by segment are then summed to obtain the total room night capture for each hotel.

Percentage of Occupancy

- Each property's percentage of occupancy is then determined by dividing the total room nights captured by the hotel's number of available rooms per year (room count x 365).

CASE STUDY

The *Fair Share* sheet is used to calculate each hotel's fair share, as outlined on page 36. The *Occ Calcs* sheet contains the portion of the RNA program where the previously entered market penetrations are used to calculate each hotel's market share adjuster, market share percentage, room night capture, and percentage of occupancy. The *Occ Calcs* sheet works left to right, with each section of the spreadsheet corresponding to one of the five bullet points in the process outlined above. No data entry by the analyst is required on either sheet. These sheets are illustrated on the next six pages.

Following the illustration of the *Occ Calcs* sheet is the *Final Output* sheet, which provides a summary of all data entered in the RNA program. The *Final Output* sheet gives a summary for one existing hotel in the market and one proposed hotel.

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Fair Share Sheet

CASE STUDY (continued)

Figure 15 below illustrates the *Fair Share* sheet. Note that fair shares for each hotel decrease over time as additional supply enters the market.

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	**Fair Share Calculations**												
2													
3	**Hotel**		**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
4		Secondary		19.18%	16.67%	15.06%	14.63%	14.22%	13.81%	13.42%	13.04%	12.67%	12.31%
5		Embassy Suites		9.86%	8.57%	7.74%	7.52%	7.31%	7.10%	6.90%	6.70%	6.51%	6.33%
6		Hilton Inn		13.56%	11.79%	10.65%	10.34%	10.05%	9.77%	9.49%	9.22%	8.96%	8.70%
7		Radisson Hotel		12.33%	10.72%	9.68%	9.40%	9.14%	8.88%	8.63%	8.38%	8.14%	7.91%
8		Holiday Inn		8.63%	7.50%	6.78%	6.58%	6.40%	6.21%	6.04%	5.87%	5.70%	5.54%
9		Courtyard		6.11%	5.32%	4.80%	4.66%	4.53%	4.40%	4.28%	4.16%	4.04%	3.92%
10		Ramada Inn		7.40%	6.43%	5.81%	5.64%	5.48%	5.33%	5.18%	5.03%	4.89%	4.75%
11		Island Inn		6.66%	5.79%	5.23%	5.08%	4.93%	4.79%	4.66%	4.53%	4.40%	4.27%
12		Quality Inn		8.63%	7.50%	6.78%	6.58%	6.40%	6.21%	6.04%	5.87%	5.70%	5.54%
13		Days Hotel		5.92%	5.14%	4.65%	4.51%	4.39%	4.26%	4.14%	4.02%	3.91%	3.80%
14		Hotel #10		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
15		Hotel #11		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
16		Hotel #12		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
17		Hotel #13		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
18		Hotel #14		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
19		Hotel #15		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
20		Hotel #16		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
21		Hotel #17		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
22		Hotel #18		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
23		Hotel #19		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
24		Proposed Sheraton		0.00%	0.00%	9.68%	9.40%	9.14%	8.88%	8.63%	8.38%	8.14%	7.91%
25		Marriott Suites		0.00%	8.57%	7.74%	7.52%	7.31%	7.10%	6.90%	6.70%	6.51%	6.33%
26		Best Western		1.73%	6.00%	5.42%	5.27%	5.12%	4.97%	4.83%	4.69%	4.56%	4.43%
27		Proposed 4		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
28		Proposed 5		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
29		Proposed 6		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
30		Proposed 7		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
31		Proposed 8		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
32		Proposed 9		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
33		Long Term Supply Growth		0.00%	0.00%	0.00%	2.84%	5.60%	8.28%	10.88%	13.41%	15.87%	18.26%
34			Check	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Figure 15 – The *Fair Share* sheet

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	B	C	D	E	F	G	H	I	J	K	L	M
2	**Market Share Adjusters**											
3	Commercial Segment		2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
4		Secondary	21.10%	18.34%	16.57%	16.10%	15.64%	15.19%	14.76%	14.34%	13.94%	13.54%
5		Embassy Suites	14.79%	12.86%	11.61%	11.28%	10.96%	10.65%	10.35%	10.06%	9.77%	9.49%
6		Hilton Inn	9.36%	8.13%	7.35%	7.14%	6.93%	6.74%	6.55%	6.36%	6.18%	6.00%
7		Radisson Hotel	9.00%	7.82%	7.07%	6.86%	6.67%	6.48%	6.30%	6.12%	5.94%	5.78%
8		Holiday Inn	8.28%	7.20%	6.50%	6.32%	6.14%	5.97%	5.80%	5.63%	5.47%	5.32%
9		Courtyard	7.15%	7.12%	6.72%	6.53%	6.34%	6.16%	5.99%	5.82%	5.65%	5.49%
10		Ramada Inn	7.62%	6.62%	5.98%	5.81%	5.65%	5.49%	5.33%	5.18%	5.03%	4.89%
11		Island Inn	5.79%	4.86%	4.18%	4.06%	3.95%	3.84%	3.73%	3.62%	3.52%	3.42%
12		Quality Inn	8.11%	7.05%	6.37%	6.19%	6.01%	5.84%	5.68%	5.51%	5.36%	5.21%
13		Days Hotel	7.34%	6.38%	5.76%	5.60%	5.44%	5.28%	5.13%	4.99%	4.85%	4.71%
14		Hotel #10	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
15		Hotel #11	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
16		Hotel #12	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
17		Hotel #13	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
18		Hotel #14	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
19		Hotel #15	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
20		Hotel #16	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
21		Hotel #17	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
22		Hotel #18	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
23		Hotel #19	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
24		Proposed Sheraton	0.00%	0.00%	7.16%	7.24%	7.31%	7.10%	6.90%	6.70%	6.51%	6.33%
25		Marriott Suites	0.00%	10.29%	10.38%	10.53%	10.23%	9.94%	9.66%	9.39%	9.12%	8.86%
26		Best Western	1.28%	4.80%	4.72%	4.58%	4.45%	4.33%	4.20%	4.08%	3.97%	3.85%
27		Proposed 4	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
28		Proposed 5	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
29		Proposed 6	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
30		Proposed 7	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
31		Proposed 8	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
32		Proposed 9	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
33		Long Term Supply Growth	0.00%	0.00%	0.00%	2.84%	5.60%	8.28%	10.88%	13.41%	15.87%	18.26%
34		Total	99.82%	101.48%	100.36%	101.09%	101.33%	101.29%	101.25%	101.22%	101.18%	101.15%

Figure 16 – The *Occ Calcs* sheet, showing Market Share Adjusters

Market Share Adjusters

Market Share Adjusters for each segment are calculated as follows:

Market Share Adjuster = Market Penetration x Fair Share

CASE STUDY

As an example of how the Market Share Adjusters are calculated, consider the Embassy Suites hotel. Its market penetration in the Commercial segment is 150%, which when multiplied by its fair share of 9.86%, results in a market share adjuster of 14.79%. Identical calculations are performed for each hotel, in each market segment.

	O	P	Q	R	S	T	U	V	W	X	Y	Z
2		**Market Share Percentages**										
3		Commercial Segment	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
4		Secondary	21.14%	18.07%	16.51%	15.92%	15.43%	15.00%	14.58%	14.17%	13.77%	13.39%
5		Embassy Suites	14.82%	12.67%	11.57%	11.16%	10.82%	10.52%	10.22%	9.94%	9.66%	9.39%
6		Hilton Inn	9.37%	8.01%	7.32%	7.06%	6.84%	6.65%	6.47%	6.28%	6.11%	5.94%
7		Radisson Hotel	9.02%	7.71%	7.04%	6.79%	6.58%	6.40%	6.22%	6.04%	5.87%	5.71%
8		Holiday Inn	8.30%	7.10%	6.48%	6.25%	6.06%	5.89%	5.72%	5.56%	5.41%	5.26%
9		Courtyard	7.17%	7.02%	6.70%	6.46%	6.26%	6.09%	5.92%	5.75%	5.59%	5.43%
10		Ramada Inn	7.63%	6.53%	5.96%	5.75%	5.57%	5.42%	5.26%	5.12%	4.97%	4.83%
11		Island Inn	5.80%	4.79%	4.17%	4.02%	3.90%	3.79%	3.68%	3.58%	3.48%	3.38%
12		Quality Inn	8.13%	6.95%	6.35%	6.12%	5.93%	5.77%	5.61%	5.45%	5.30%	5.15%
13		Days Hotel	7.35%	6.29%	5.74%	5.54%	5.37%	5.22%	5.07%	4.93%	4.79%	4.66%
14		Hotel #10	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
15		Hotel #11	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
16		Hotel #12	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
17		Hotel #13	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
18		Hotel #14	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
19		Hotel #15	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
20		Hotel #16	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
21		Hotel #17	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
22		Hotel #18	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
23		Hotel #19	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
24		Proposed Sheraton	0.00%	0.00%	7.14%	7.16%	7.21%	7.01%	6.81%	6.62%	6.44%	6.26%
25		Marriott Suites	0.00%	10.14%	10.34%	10.42%	10.10%	9.82%	9.54%	9.27%	9.01%	8.76%
26		Best Western	1.28%	4.73%	4.70%	4.53%	4.39%	4.27%	4.15%	4.03%	3.92%	3.81%
27		Proposed 4	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
28		Proposed 5	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
29		Proposed 6	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
30		Proposed 7	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
31		Proposed 8	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
32		Proposed 9	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
33		Long Term Supply Growth	0.00%	0.00%	0.00%	2.81%	5.52%	8.17%	10.75%	13.25%	15.69%	18.05%

Figure 17 – The *Occ Calcs* sheet, showing Market Share Percentages

Market Share Percentages

Market Share Percentages for each market segment are calculated as follows:

Market Share Percentage = Market Share Adjuster for Given Property ÷ Total Market Share for all Properties

CASE STUDY

As an example of the Market Share Percentages calculation, consider the 2001 figure for the Embassy Suites hotel. Its market share adjuster in the Commercial segment is 14.79%. The total of all market share adjusters is 99.82%. Thus, the market share adjuster for the Embassy Suites is 14.79% ÷ 99.82% = 14.82%. Identical calculations are performed for each hotel, in each market segment.

	AB AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM
2	**Room Nights Captured**										
3	Commercial Segment	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
4	Secondary	69,301	62,566	58,854	58,477	58,380	58,446	58,512	58,576	58,641	58,705
5	Embassy Suites	48,587	43,865	41,262	40,998	40,930	40,977	41,022	41,068	41,113	41,158
6	Hilton Inn	30,731	27,745	26,098	25,931	25,888	25,918	25,947	25,975	26,004	26,032
7	Radisson Hotel	29,557	26,685	25,101	24,940	24,899	24,927	24,955	24,983	25,010	25,038
8	Holiday Inn	27,209	24,564	23,107	22,959	22,921	22,947	22,973	22,998	23,023	23,048
9	Courtyard	23,497	24,295	23,877	23,724	23,685	23,712	23,738	23,765	23,791	23,817
10	Ramada Inn	25,022	22,590	21,250	21,114	21,079	21,103	21,127	21,150	21,173	21,196
11	Island Inn	19,022	16,581	14,854	14,759	14,735	14,752	14,768	14,784	14,801	14,817
12	Quality Inn	26,642	24,053	22,625	22,481	22,443	22,469	22,494	22,519	22,544	22,568
13	Days Hotel	24,099	21,757	20,466	20,335	20,301	20,324	20,347	20,370	20,392	20,414
14	Hotel #10	0	0	0	0	0	0	0	0	0	0
15	Hotel #11	0	0	0	0	0	0	0	0	0	0
16	Hotel #12	0	0	0	0	0	0	0	0	0	0
17	Hotel #13	0	0	0	0	0	0	0	0	0	0
18	Hotel #14	0	0	0	0	0	0	0	0	0	0
19	Hotel #15	0	0	0	0	0	0	0	0	0	0
20	Hotel #16	0	0	0	0	0	0	0	0	0	0
21	Hotel #17	0	0	0	0	0	0	0	0	0	0
22	Hotel #18	0	0	0	0	0	0	0	0	0	0
23	Hotel #19	0	0	0	0	0	0	0	0	0	0
24	Proposed Sheraton	0	0	25,445	26,307	27,287	27,318	27,348	27,379	27,409	27,439
25	Marriott Suites	0	35,092	36,861	38,265	38,202	38,245	38,288	38,330	38,372	38,414
26	Best Western	4,195	16,376	16,752	16,645	16,618	16,636	16,655	16,674	16,692	16,710
27	Proposed 4	0	0	0	0	0	0	0	0	0	0
28	Proposed 5	0	0	0	0	0	0	0	0	0	0
29	Proposed 6	0	0	0	0	0	0	0	0	0	0
30	Proposed 7	0	0	0	0	0	0	0	0	0	0
31	Proposed 8	0	0	0	0	0	0	0	0	0	0
32	Proposed 9	0	0	0	0	0	0	0	0	0	0
33	Long Term Supply Growth	0	0	0	10,315	20,897	31,842	43,130	54,773	66,779	79,161

Figure 18 – The *Occ. Calcs* sheet, showing Room Nights Captured in the Commercial Segment

Room Nights Captured

Room Nights Captured for each market segment are calculated as follows:

Room Nights Captured = Market Share Percentage x
Adjusted Market Demand for the Segment

CASE STUDY

As an example of the Room Nights Captured calculation, consider the 2001 figure for the Embassy Suites hotel. Its market share percentage in the Commercial segment is 14.82%. The adjusted market demand is 327,861 (cell C68 on the *Demand Calcs* sheet). Thus, the room nights captured for the Embassy Suites is 14.82% x 327,861 = 48,587. Identical calculations are performed for each hotel, in each market segment.

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VALUATION
SOFTWARE

	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY
2	**Total Room Nights Captured**										
3	Total	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
4	Secondary	111,901	103,149	96,521	95,344	94,894	94,590	94,293	94,001	93,715	93,435
5	Embassy Suites	60,041	54,544	51,306	50,770	50,506	50,438	50,372	50,307	50,244	50,182
6	Hilton Inn	76,103	72,828	66,887	66,323	66,704	66,457	66,216	65,981	65,750	65,525
7	Radisson Hotel	65,025	61,543	56,848	56,283	56,407	56,195	55,988	55,785	55,587	55,392
8	Holiday Inn	48,866	45,468	42,354	41,866	41,765	41,621	41,479	41,340	41,204	41,070
9	Courtyard	30,996	31,975	31,108	30,756	30,569	30,513	30,458	30,404	30,351	30,299
10	Ramada Inn	38,045	35,178	32,830	32,494	32,430	32,352	32,276	32,202	32,129	32,058
11	Island Inn	30,582	27,185	23,877	23,665	23,684	23,632	23,582	23,532	23,483	23,436
12	Quality Inn	51,697	47,286	44,550	43,779	43,260	43,028	42,800	42,576	42,356	42,139
13	Days Hotel	33,833	30,745	28,970	28,587	28,350	28,270	28,192	28,116	28,041	27,967
14	Hotel #10	0	0	0	0	0	0	0	0	0	0
15	Hotel #11	0	0	0	0	0	0	0	0	0	0
16	Hotel #12	0	0	0	0	0	0	0	0	0	0
17	Hotel #13	0	0	0	0	0	0	0	0	0	0
18	Hotel #14	0	0	0	0	0	0	0	0	0	0
19	Hotel #15	0	0	0	0	0	0	0	0	0	0
20	Hotel #16	0	0	0	0	0	0	0	0	0	0
21	Hotel #17	0	0	0	0	0	0	0	0	0	0
22	Hotel #18	0	0	0	0	0	0	0	0	0	0
23	Hotel #19	0	0	0	0	0	0	0	0	0	0
24	Proposed Sheraton	0	0	49,433	57,056	62,894	62,656	62,423	62,195	61,972	61,754
25	Marriott Suites	0	42,729	45,925	48,141	47,945	47,883	47,823	47,764	47,707	47,651
26	Best Western	6,339	25,585	26,084	25,691	25,425	25,329	25,235	25,142	25,051	24,962
27	Proposed 4	0	0	0	0	0	0	0	0	0	0
28	Proposed 5	0	0	0	0	0	0	0	0	0	0
29	Proposed 6	0	0	0	0	0	0	0	0	0	0
30	Proposed 7	0	0	0	0	0	0	0	0	0	0
31	Proposed 8	0	0	0	0	0	0	0	0	0	0
32	Proposed 9	0	0	0	0	0	0	0	0	0	0
33	Long Term Supply Growth	0	0	0	17,844	36,116	54,793	73,903	93,459	113,475	133,968
34	Total Room Nights	553,427	578,215	596,691	618,598	640,949	657,758	675,039	692,803	711,064	729,837

Figure 19 – The *Occ Calcs* sheet, showing Total Room Nights Captured

Total Room Nights Captured

Total Room Nights Captured for each market segment are calculated by summing the Room Nights Captured for each market segment.

CASE STUDY

As an example of how the Total Room Nights Captured are calculated, we again consider the 2001 result for the Embassy Suites hotel. This hotel captured 48,587 room nights in the Commercial segment, 2,960 room nights in the Meeting & Convention segment, and 8,494 room nights in the Leisure segment. The three segments sum to 60,041. Identical calculations are performed for each hotel.

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VALUATION
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	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK
2	**Occupancy**										
3	**Projections**	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
4	Secondary	78.81%	72.65%	67.98%	67.15%	66.83%	66.62%	66.41%	66.20%	66.00%	65.81%
5	Embassy Suites	82.25%	74.72%	70.28%	69.55%	69.19%	69.09%	69.00%	68.91%	68.83%	68.74%
6	Hilton Inn	75.82%	72.56%	66.64%	66.08%	66.45%	66.21%	65.97%	65.73%	65.50%	65.28%
7	Radisson Hotel	71.26%	67.44%	62.30%	61.68%	61.82%	61.58%	61.36%	61.13%	60.92%	60.70%
8	Holiday Inn	76.50%	71.18%	66.31%	65.54%	65.39%	65.16%	64.94%	64.72%	64.51%	64.30%
9	Courtyard	68.49%	70.65%	68.73%	67.95%	67.54%	67.42%	67.29%	67.18%	67.06%	66.94%
10	Ramada Inn	69.49%	64.25%	59.96%	59.35%	59.23%	59.09%	58.95%	58.82%	58.68%	58.55%
11	Island Inn	62.06%	55.17%	48.46%	48.03%	48.07%	47.96%	47.86%	47.76%	47.66%	47.56%
12	Quality Inn	80.93%	74.03%	69.74%	68.54%	67.73%	67.36%	67.01%	66.66%	66.31%	65.97%
13	Days Hotel	77.24%	70.19%	66.14%	65.27%	64.73%	64.54%	64.37%	64.19%	64.02%	63.85%
14	Hotel #10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
15	Hotel #11	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
16	Hotel #12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
17	Hotel #13	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
18	Hotel #14	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
19	Hotel #15	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
20	Hotel #16	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
21	Hotel #17	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
22	Hotel #18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
23	Hotel #19	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
24	Proposed Sheraton	N/A	N/A	54.17%	62.53%	68.92%	68.66%	68.41%	68.16%	67.91%	67.68%
25	Marriott Suites	N/A	58.53%	62.91%	65.95%	65.68%	65.59%	65.51%	65.43%	65.35%	65.27%
26	Best Western	49.62%	50.07%	51.04%	50.28%	49.76%	49.57%	49.38%	49.20%	49.02%	48.85%
27	Proposed 4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
28	Proposed 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
29	Proposed 6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
30	Proposed 7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
31	Proposed 8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
32	Proposed 9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
33	Long Term Supply Growth	N/A	N/A	N/A	64.77%	64.60%	64.39%	64.19%	63.99%	63.80%	63.61%
34											
35											
36	Market Occupancy	74.77%	67.90%	63.29%	63.75%	64.18%	63.99%	63.81%	63.63%	63.45%	63.28%

Figure 20 – The *Occ. Calcs* sheet, showing Occupancy Projections

Occupancy Calculations

The Occupancy section of the *Occ Calcs* sheet contains the yearly percentage of occupancy calculations for each hotel, as well as an overall market occupancy in row 36. Occupancy is calculated as follows:

$$\text{Occupancy Percentage} = \frac{\text{Total Room Nights Captured by a Given Property}}{\text{Annual Available Room Nights}}$$

Annual Available Room Nights are simply the historic annual room count (HARC) x 365.

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As an example of how Occupancy is calculated, consider the 2001 figure for the Embassy Suites hotel. Its Total Room Nights Captured are 60,041. The available room nights are 200 x 365 = 73,000. Thus the Embassy Suites' occupancy is 60,041 ÷ 73,000 or 82.25%.

Use of the *Final Output* Sheet

The *Final Output* sheet of the RNA program provides a useful report based on all the information entered on the various sheets of the RNA program. Below is the portion of *Final Output* sheet relating to the proposed Sheraton. Note that rows 3 through 22 are hidden; they contain a report on an existing hotel. As stated earlier in the manual, the *Final Output* will provide information for the first hotel listed on the *Primary* sheet and the first hotel listed on the *Supply Addn* sheet.

	B	C	D	E	F	G	H	I	J	K	L	M
2	**Property Analysis**											
23												
24	Market Occupancy	72.10%	74.77%	67.90%	63.29%	63.75%	64.18%	63.99%	63.81%	63.63%	63.45%	63.28%
25												
26	Proposed Property Name:	Proposed Sheraton										
27	Room Nights by Segment	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
28	Commercial	0	0	0	25,445	26,307	27,287	27,318	27,348	27,379	27,409	27,439
29	Meeting & Convention	0	0	0	19,655	24,478	27,433	27,282	27,135	26,991	26,851	26,714
30	Leisure	0	0	0	4,332	6,271	8,174	8,056	7,939	7,825	7,712	7,601
31	N/A	0	0	0	0	0	0	0	0	0	0	0
32	N/A	0	0	0	0	0	0	0	0	0	0	0
33	TOTAL	0	0	0	49,433	57,056	62,894	62,656	62,423	62,195	61,972	61,754
34	Percent of Total Room Nights by Segment											
35	Commercial	0.00%	0.00%	0.00%	51.47%	46.11%	43.39%	43.60%	43.81%	44.02%	44.23%	44.43%
36	Meeting & Convention	0.00%	0.00%	0.00%	39.76%	42.90%	43.62%	43.54%	43.47%	43.40%	43.33%	43.26%
37	Leisure	0.00%	0.00%	0.00%	8.76%	10.99%	13.00%	12.86%	12.72%	12.58%	12.44%	12.31%
38	N/A	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
39	N/A	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
40	TOTAL	0.00%	0.00%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
41	Subject Property Projections											
42	Occupancy	N/A	N/A	N/A	54.17%	62.53%	68.92%	68.66%	68.41%	68.16%	67.91%	67.68%
43	Market Share	N/A	0.00%	0.00%	8.28%	9.22%	9.81%	9.53%	9.25%	8.98%	8.72%	8.46%
44	Fair Share	N/A	0.00%	0.00%	9.68%	9.40%	9.14%	8.88%	8.63%	8.38%	8.14%	7.91%
45	Penetration	N/A	#DIV/0!	#DIV/0!	85.60%	98.08%	107.40%	107.30%	107.21%	107.12%	107.03%	106.95%

Figure 21 – The *Final Output* sheet, showing the proposed Sheraton

Note that market occupancy (row 24) starts to decline in 2002, as new supply enters the market. For the proposed Sheraton, the RNA program shows the following occupancy projection, as detailed on row 42:

2003	54.17%	2006	68.66%
2004	62.53%	2007	68.41%
2005	68.92%	2008	68.16%

Based on the commercial and meeting & convention orientation of the property, the occupancy is expected to stabilized in the third year (2005) at a level of 68%. This subjective evaluation is based on the appraiser's knowledge of similar properties and represents a slight increase to the figures produced by the RNA program.

The Final Output sheet then calculates additional comparison data relative to the subject property's occupancy estimate: Market Share, Fair Share, and Occupancy Penetration.

A similar set of calculations is performed in rows 3 through 22 for the first property entered in the *Primary* sheet of the RNA program (Embassy Suites). This data is presented below in Figure 22.

	B	C	D	E	F	G	H	I	J	K	L	M
2	**Property Analysis**											
3	**Subject Property Name:**	**Embassy Suites**										
4	**Room Nights by Segment**	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
5	**Commercial**	45,552	48,587	43,865	41,262	40,998	40,930	40,977	41,022	41,068	41,113	41,158
6	**Meeting & Convention**	2,847	2,960	2,990	2,679	2,665	2,714	2,699	2,684	2,670	2,656	2,643
7	**Leisure**	8,541	8,494	7,688	7,365	7,107	6,862	6,763	6,665	6,569	6,474	6,381
8	**N/A**	0	0	0	0	0	0	0	0	0	0	0
9	**N/A**	0	0	0	0	0	0	0	0	0	0	0
10	**TOTAL**	56,940	60,041	54,544	51,306	50,770	50,506	50,438	50,372	50,307	50,244	50,182
11	**Percent of Total Room Nights by Segment**											
12	**Commercial**	80.00%	80.92%	80.42%	80.42%	80.75%	81.04%	81.24%	81.44%	81.63%	81.83%	82.02%
13	**Meeting & Convention**	5.00%	4.93%	5.48%	5.22%	5.25%	5.37%	5.35%	5.33%	5.31%	5.29%	5.27%
14	**Leisure**	15.00%	14.15%	14.10%	14.35%	14.00%	13.59%	13.41%	13.23%	13.06%	12.89%	12.72%
15	**N/A**	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
16	**N/A**	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
17	**TOTAL**	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
18	**Subject Property Projections**											
19	**Occupancy**	78.00%	82.25%	74.72%	70.28%	69.55%	69.19%	69.09%	69.00%	68.91%	68.83%	68.74%
20	**Market Share**	11.21%	10.85%	9.43%	8.60%	8.21%	7.88%	7.67%	7.46%	7.26%	7.07%	6.88%
21	**Fair Share**	10.36%	9.86%	8.57%	7.74%	7.52%	7.31%	7.10%	6.90%	6.70%	6.51%	6.33%
22	**Penetration**	108.19%	110.01%	110.04%	111.05%	109.09%	107.80%	107.97%	108.14%	108.31%	108.47%	108.64%
23												
24	**Market Occupancy**	72.10%	74.77%	67.90%	63.29%	63.75%	64.18%	63.99%	63.81%	63.63%	63.45%	63.28%

Figure 22 – The *Final Output* sheet, showing the existing Embassy Suites

Printing from the RNA Program

Printing from the RNA Program is quite straightforward. Rather than attempting to perform *ad hoc* printing using the printer settings, the RNA program has a set of preprogrammed routines that facilitate the printing process. These routines are created with the Report Manager feature of Excel. The first thing to determine is whether the Report manager is available in your Excel installation.

This is done using the **View, Report Manager** command, as shown in Figure 23 on the following page.

Figure 23 – The Report Manager command on the View menu

If this command is not visible on your menu screen, the Report Manager needs to be installed. This is a relatively simple matter, as the Report Manager is part of Excel's Add-Ins collection. As Figure 24 illustrates, select the **Tools, Add-Ins** command, which will display the **Add-Ins** dialog box. Scroll down to the Report Manager. Simply check the box for the Report Manager, click on the **OK** box and the Report Manager will be installed.

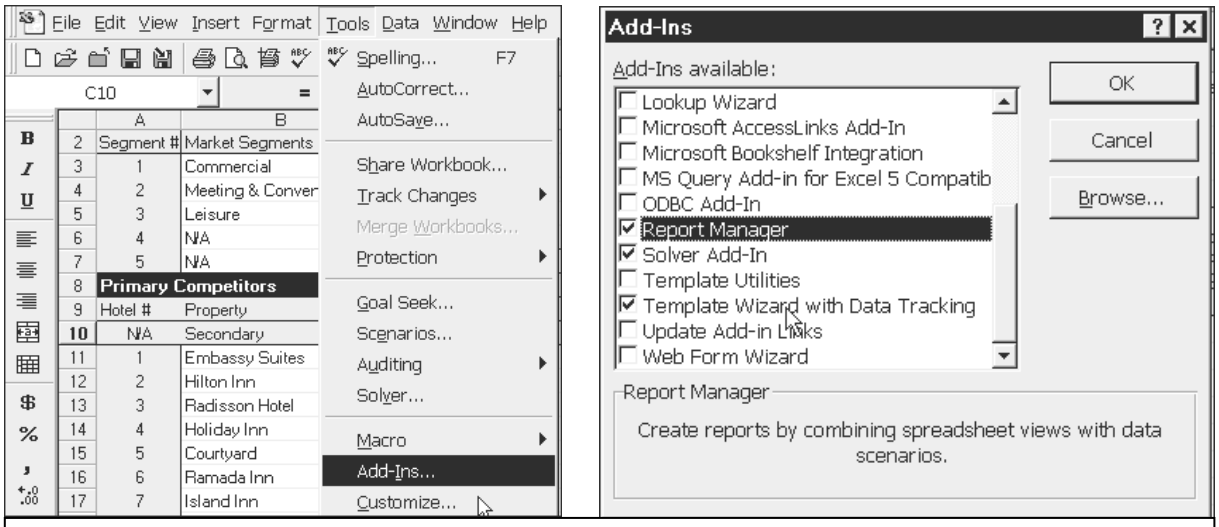

Figure 24 – The Add-Ins command on the Tools menu and the Add-Ins dialog box

Once you have verified that the report manager is installed, it is a simple matter to use this tool to produce printed output. Figure 25 shows the report manager dialog box, which is called using the **View, Report Manager** menu command in Excel.

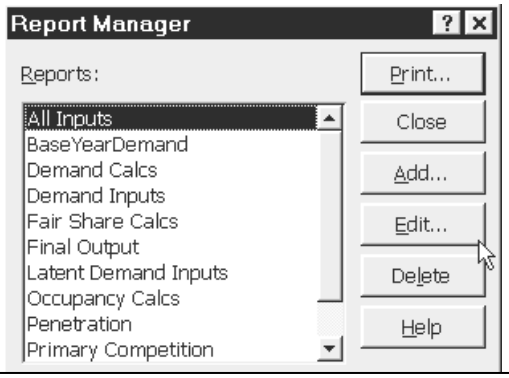

Figure 25 – The Report Manager dialog box

There are 12 reports available in **Report Manager** of the RNA program; all of those listed in figure 25 as well as "Secondary Competition" and "Supply Additions" reports that are hidden from view. To print, simply highlight the desired report and click on the **Print** box.

The reports correspond to the various sheets found in the RNA program. All reports are formatted to use a minimal amount of paper. Note that the Occupancy Calcs report consumes seventeen sheets of paper, as it is a comprehensive report.

All of the reports have been formatted assuming the user has access to a standard laser printer that is capable of printing in both landscape and portrait mode on 8½" by 11" paper.

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Forecast of Revenue and Expense

The forecast of revenue and expense starts by taking occupancy and average rate projections and converting them into an estimate of rooms revenue. Using additional data collected from the market, along with other industry statistics, the appraiser is then able to develop a forecast of other revenue items such as food, beverage, telephone, and other income, as well as normal hotel operating expenses. This section will demonstrate how all types of hotel revenues and expenses are forecasted.

Rooms Revenue

To derive a projection of rooms revenue the following formula is used:

Occupancy x Average Room Rate x Room Count x 365 = Rooms Revenue

CASE STUDY

The rooms revenue for the proposed Sheraton hotel is calculated by multiplying the hotel's projected occupancy by its projected average room rate by its room count by 365. The following table demonstrates this calculation.

Table 16 Proposed Sheraton Hotel

Projection Year	3	4	5
Actual Year	2003	2004	2005
Occupancy	53%	62%	67%
Average Rate	$135.43	$147.24	$159.64
Number of Rooms	250	250	250
Days per Year	365	365	365
Rooms Rev ($000)	$6,550	$8,330	$7,960

Fixed and Variable Component Approach to Forecasting

Before demonstrating the process of projecting individual items of hotel revenue and expense, it is important to understand the fixed and variable component approach to forecasting. The procedures utilized in this approach represent one of the most accurate models of hotel financial performance. It forms the basis for many computerized hotel forecasting programs utilized by hotel appraisal firms, hotel companies, investors, lenders, and developers.

Fixed and Variable Theory

The theory underlying the fixed and variable component approach is based on the premise that hotel revenues and expenses have a component that is fixed and another component that varies directly with occupancy or other measures of facility utilization. The fixed and variable approach starts by establishing a known base level, or base year of revenues and expenses for a given property.

Future projections are established in the manner outlined below:

- Inflation adjust the base year revenue or expense item.
- Established that portion of the inflation adjusted revenue or expense item component that is fixed.
- Establish that portion of the inflation-adjusted revenue or expense item component that is variable. The variable component is adjusted for the percentage change between the projected occupancy or facility utilization and the base level of occupancy or facility utilization.
- Add the fixed and variable components together to obtain the total projected revenue or expense item.

The process can be demonstrated with the following example.

Example of Fixed and Variable Revenue and Expense Calculations

A 200-room commercial hotel operated in 2000 with an occupancy of 70%, an average room rate of $104.33, and a rooms department expense of $1,226,000, or 23% of rooms revenue. A forecast of 2001 occupancy indicates that due to a significant increase in the competitive supply during the year, the subject's occupancy is expected to fall to 61%. The 2001 rooms department expense would be calculated as follows.

The 2000 rooms department expense is first inflation adjusted so that the 2000 figure is expressed in 2001 dollars. The inflation rate is assumed to be 3%. Thus, the inflation adjustment calculation is:

$1,226,000 x 1.03 = $1,262,780

For rooms department expenses, the fixed component is typically 60% of the total, with the remaining 40% varying in proportion to occupancy. The fixed component is calculated as 60% of the inflation adjusted expense:

Fixed Component: 60% x $1,262,780 = $757,668

The variable component is calculated in a two-step process. First, the unadjusted variable component is estimated as 40% of the inflation-adjusted expense:

Unadjusted Variable Component: 40% x $1,262,780 = $505,112

The unadjusted component is then adjusted for the decline in occupancy from 70% to 61%. The percentage decline in occupancy (occupancy adjustment) is calculated by dividing the projected occupancy by the base occupancy.

Occupancy Adjuster: 61% ÷ 70% = 0.8714

Multiplying the occupancy adjustment by the variable component yields the adjusted variable component.

Adjusted Variable Component: 0.8714 x $505,112 = $440,155

Combining the fixed component and the adjusted variable component produces the estimated 2001 rooms department expense at a 61% occupancy.

Fixed Component	$ 757,668
Adjusted Variable Component	440,155
Projected Rooms Department Expense	$1,197,823

Fixed and Variable Implementation

The process of forecasting hotel revenue and expenses by the fixed and variable component approach is implemented through a series of steps, which are outlined as follows:

1. The basis for forecasting all items of revenue and expense comes from financial statements representing comparable hotels. If the subject property is an existing hotel, then its past operating performance is generally utilized in establishing future projections. For proposed hotels, the appraiser must rely on the operating results from hotels considered comparable to the subject property.

2. The comparable financial statement is then adjusted or modified to reflect the unique characteristics of the subject property. The objective of the various adjustments and modifications is twofold. First, to establish a one-year financial statement based on the average room rate the subject is expected to achieve in its first year of operation, expressed in current dollars. Second, to establish income and expense ratios representing the level of occupancy and operational efficiency actually expected by the subject. The resulting profit and loss statement is called the base and forms the basis for calculating the fixed and variable component relationships.

3. The revenue and expense numbers comprising the base are inflated (or deflated) to a level reflecting nominal dollars for each forecast year. The rate of inflation reflects the anticipated price change for *individual* line items in the income and expense statement. The purpose of Step 3 is to put the comparable financial data comprising the base in the inflated dollars anticipated for that particular year.

4. The fixed and variable percentages are estimated for each revenue and expense category. Table 17 illustrates typical ranges of fixed or variable percentages along with the index utilized to measure variable change.

   These fixed and variable percentages were developed from a regression analysis that evaluated hundreds of financial statements to determine what portion of each revenue and expense category was fixed and what portion was variable.

   The index of variability refers to a factor that controls the movement of the variable component. For example, the variable component of food revenue moves in accordance with changes in occupancy. Beverage revenue seems to be tied directly with food revenue. Food and beverage expense is largely dependent on changes in food and beverage revenue. The variable component of

undistributed operating expenses moves in line with total revenue, as do all fixed expenses.

Table 17 Typical Fixed and Variable Expense Percentages

Revenue and Expense Category	Percent Fixed	Percent Variable	Index of Variability
Revenues			
Rooms	Not Applicable		
Food	10 – 50	50 – 70	Occupancy
Beverage	0 – 30	70 –100	Food Revenue
Telephone	10 – 40	60 – 90	Occupancy
Other Income	30 – 60	40 – 70	Occupancy
Departmental Expenses			
Rooms	50 – 70	30 – 50	Occupancy
Food and Beverage	35 – 60	40 – 65	F&B Revenue
Telephone	55 – 75	25 – 45	Telephone Revenue
Other Income	40 – 60	40 – 60	Other Income
Undistributed Operating Expenses			
Administrative and General	65 – 85	15 – 35	Total Revenue
Transportation	65 – 90	10 – 35	Occupancy
Human Resources	80 – 95	5 – 20	Total Revenue
Information Systems	80 –100	0 – 20	Total Revenue
Security	65 – 90	10 – 35	Occupancy
Marketing	65 – 85	15 – 35	Total Revenue
Franchise Fees	0	100	Rooms Revenue
Prop. Operations and Maintenance	55 – 75	25 – 45	Total Revenue
Energy (Utility) Costs	80 – 95	5 – 20	Total Revenue
Fixed Expenses			
Management Fee	0	100	Total Revenue
Property Taxes	100	0	Total Revenue
Insurance	100	0	Total Revenue
Reserve for Replacement	0	100	Total Revenue

5. Each individual line item in a hotel's financial statement is projected separately by utilizing the following fixed and variable calculation. The fixed component is estimated by multiplying the appropriate fixed percentage by the base revenue or expense line item for the corresponding projected year.

6. The variable components are assumed to vary directly with the index of variability set forth in Step #4. The amount of variable change is quantified by dividing the appropriate projected index of variability by the index of variability for the base.

7. The unadjusted variable component is calculated by multiplying the appropriate base revenue or expense category for the projected year by the percent variable estimated in Step #4.

8. The unadjusted variable component are now be adjusted for variability by multiplying the results of Step #7 by the variable percentage change calculated in Step #6. The resulting product is known as the adjusted variable component.

9. The forecasted revenue or expense category is the total of the fixed component calculated in Step #5 and the adjusted variable component calculated in Step #8.

CASE STUDY

A forecast of income and expense for the proposed Sheraton hotel will be made utilizing the fixed and variable component approach. The process will follow the nine steps described previously in this section.

Step #1: Obtain financial operating statements from comparable hotels.

The proposed Sheraton hotel has no financial operating history, so it will be necessary to develop the basis for its projection by utilizing income and expense statements from comparable hotels.

The first statement of income and expense in Table 18 (on page 65), labeled "Comparable Statement," originates from a hotel considered closely comparable to the proposed Sheraton hotel. The second statement, labeled "Proposed Sheraton Base," has been adjusted to account for differences between the comparable and the subject.

Step #2: Adjust comparable financial statements to reflect any physical, operational, or locational differences between the comparable and the subject property.

The second statement, labeled "Proposed Sheraton Base" in Table 18, represents the comparable statement after appropriate adjustments have been made for any physical, operational, or locational differences.

This base financial statement utilizes the subject's first year's average room rate expressed in current 2000 dollars, undiscounted for any start-up or first year promotional pricing. Additionally, the Comparable Statement has been adjusted to reflect the income and expense ratios expected to be achieved by the subject, at the comparable property's occupancy level. Note, for example, that franchise fees are 6% of rooms revenue for the Comparable Property ($551 ÷ $9,117), but are 5% of rooms revenue ($403 ÷ $8,067) for the Proposed Sheraton. The resulting adjusted profit and loss statement forms the basis for calculating the fixed and variable component relationships developed in the next steps.

Step #3: Inflate the base revenue and expense categories to reflect expected nominal dollars in each forecast year.

The purpose of Step #3 is to express the financial data comprising the subject property's base in the inflated dollars anticipated for any particular year. The calculated base for the proposed Sheraton was made in 2000 dollars. In order to compute the

Table 18 Comparable and Proposed Sheraton Base Statements

	Comparable Statement	Proposed Sheraton Base
Number of Rooms	290	250
Occupancy	68.0%	68.0%
Average Rate	$ 127.50	$ 130.00
Days Open	365	365
Rooms Occupied	71,978	62,050

Revenues	$(000)	Percent	$/Avail Rm	$/Occ Rm	$(000)	Percent	$/Avail Rm	$/Occ Rm
Rooms	$ 9,177	54.8	$ 31,646	$ 127.50	$ 8,067	59.3%	$ 32,266	$ 130.00
Food	$ 4,679	27.9%	$ 16,134	$ 65.01	$ 3,469	25.5%	$ 13,876	$ 55.91
Beverages	$ 1,544	9.2%	$ 5,324	$ 21.45	$ 937	6.9%	$ 3,748	$ 15.10
Telephone	$ 486	2.9%	$ 1,676	$ 6.75	$ 403	3.0%	$ 1,612	$ 6.49
Rentals and Other Income	$ 870	5.2%	$ 3,000	$ 12.09	$ 725	5.3%	$ 2,900	$ 11.68
Total Revenue	$ 16,756	100.0%	$ 57,780	$ 232.80	$ 13,601	100.0%	$ 54,402	$ 219.19
Departmental Expenses								
Rooms	$ 2,050	22.3%	$ 7,069	$ 28.48	$ 1,875	23.2%	$ 7,500	$ 30.22
Food & Beverages	$ 4,550	73.1%	$ 15,690	$ 63.21	$ 3,350	76.0%	$ 13,400	$ 53.99
Telephone	$ 210	43.2%	$ 724	$ 2.92	$ 175	43.4%	$ 700	$ 2.82
Rentals and Other Income	$ 430	49.4%	$ 1,483	$ 5.97	$ 350	48.3%	$ 1,400	$ 5.64
Total Dept. Expenses	$ 7,240	43.2%	$ 24,966	$ 100.59	$ 5,750	42.3%	$ 23,000	$ 92.67
Departmental Income	$ 9,516	56.8%	$ 32,814	$ 132.21	$ 7,851	57.7%	$ 31,402	$ 126.52
Undist. Oper. Expenses								
Administrative & General	$ 1,425	8.5%	$ 4,914	$ 19.80	$ 1,150	8.5%	$ 4,600	$ 18.53
Marketing	$ 675	4.0%	$ 2,328	$ 9.38	$ 550	4.0%	$ 2,200	$ 8.86
Franchise Fees	$ 551	3.3%	$ 1,899	$ 7.65	$ 403	3.0%	$ 1,613	$ 6.50
Prop. Oper. & Maintenance	$ 790	4.7%	$ 2,724	$ 10.98	$ 625	4.6%	$ 2,500	$ 10.07
Energy Costs	$ 720	4.3%	$ 2,483	$ 10.00	$ 575	4.2%	$ 2,300	$ 9.27
Total UDOEs	$ 4,161	24.8%	$ 14,347	$ 57.80	$ 3,303	24.3%	$ 13,213	$ 53.24
Income Before Fixed Charges	$ 5,356	32.0%	$ 18,467	$ 74.41	$ 4,547	33.4%	$ 18,189	$ 73.28
Fixed Charges								
Management Fee	$ 586	3.5%	$ 2,022	$ 8.15	$ 476	3.5%	$ 1,904	$ 7.67
Property Tax	$ 560	3.3%	$ 1,931	$ 7.78	$ 440	3.2%	$ 1,760	$ 7.09
Insurance	$ 210	1.3%	$ 724	$ 2.92	$ 150	1.1%	$ 600	$ 2.42
Reserve for Replacement	$ 503	3.0%	$ 1,733	$ 6.98	$ 408	3.0%	$ 1,632	$ 6.58
Total Fixed Charges	$ 1,859	11.1%	$ 6,411	$ 25.83	$ 1,474	10.8%	$ 5,896	$ 23.76
Net Income	$ 3,496	20.9%	$ 12,057	$ 48.58	$ 3,073	22.6%	$ 12,293	$ 49.53

CASE STUDY (continued)

fixed and variable relationships for each projection year, the 2000 base must be inflated (or, in rare cases, deflated) to reflect an assumed rate of inflation.

Each category of revenue and expense can be affected by different types of inflation. For example, future changes in the average room rate are influenced more by local supply and demand conditions than by expected changes in the CPI. On the other hand, energy costs are usually tied to the price of fuels, which frequently move in response to national and world events. Movement in property taxes is often correlated to changes in the local tax base.

The appraiser should look at each category of revenue and expense and establish unique inflation assumptions reflecting how the market is currently viewing this type of price change. In many instances, it is often appropriate to utilize a single inflation factor for all categories of revenue and expense, particularly for the projection years after the point where the property reaches a stabilized level of occupancy.

Looking at the local market for both subject properties, the following inflation assumptions were developed:

- Average Room Rate – The rate of growth for the area's hotel room rates are estimated as follows:

	Change from Previous Year
2001	+6%
2002	+5%
2003	+4%
2004 & Beyond	+3%

- All Other Categories – An overall inflation assumption of 3% per year will be utilized for other categories of revenue and expense.

Step #4: Estimate the fixed and variable percentage for each revenue and expense category.

Each category of revenue and expense has a component that is fixed and one that varies directly with occupancy and facility utilization. To utilize the fixed and variable component approach to forecasting, a fixed and variable percentage must be assigned to each revenue and expense category based on an evaluation as to what portion of the category is fixed and what portion is variable.

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CASE STUDY

The following table shows the fixed and variable percentages selected for the proposed Sheraton hotel.

Table 19 Proposed Sheraton Fixed and Variable Percentages

Category	Fixed	Variable
Food Revenue	40%	60%
Beverage Revenue	0%	100%
Telephone Revenue	10%	90%
Other Revenue	50%	50%
Rooms Expense	60%	40%
F & B Expense	55%	45%
Telephone Expense	60%	40%
Other Expense	50%	50%
Admin & General	70%	30%
Management Fee	0%	100%
Marketing	70%	30%
Franchise Fees	0%	100%
PO & M	70%	30%
Energy Costs	90%	10%
Property Taxes	100%	0%
Insurance	100%	0%
Reserve for Replacement	0%	100%

Fixed and Variable Income and Expense Forecasting Model (FIXVAR)

Once the appraiser has projected the subject's occupancy rate via the room night analysis program, developed the property's base income and expense statement, and formulated the future inflation assumptions, the data can be entered into the fixed and variable income and expense forecasting model.

The fixed and variable income and expense forecasting model is known as FIXVAR.XLS and is written as an Excel97 file. The file contains three sheets:

- *Inputs* - the sheet on which all input data will be entered
- *Calcs* - the sheet used to perform the fixed and variable calculations
- *Output* - the sheet that contains formatted output, including the base year and 11 years of forecast projections

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Use of the *Inputs* Sheet

In the sections that follow, use of the *Input* sheet is illustrated, along with the use and printing of the *Output* sheet.

The *Inputs* sheet consists of four sections:

- Project Information and Base Year Room Inputs
- Revenue and Expense Inputs
- Inflation Estimates
- Occupancy and Average Rate Inputs

Steps #1 to #3 on pages 64 to 66 have developed the data and information necessary to input all of the data into the *Inputs* sheet.

Project Information and Base Year Room Inputs

CASE STUDY

Figure 26 below illustrates the project information and base year room inputs section.

	A	B	C	D	E	F
3		**Project Information and Base Year Room Inputs**				
4						
5		**Project Information**				
6		Job Title		Operating Manual		
7		Prepared by		JdR/SR		
8		Prepared for		Operating Manual		
9		Job #		AAA-01		
10		**Base Year Room Inputs**				
11		Base Year		2000		
12		Number of Rooms		250		
13		Days Open		365		
14		Occupancy		68.00%		
15		Average Rate		$ 130.00		

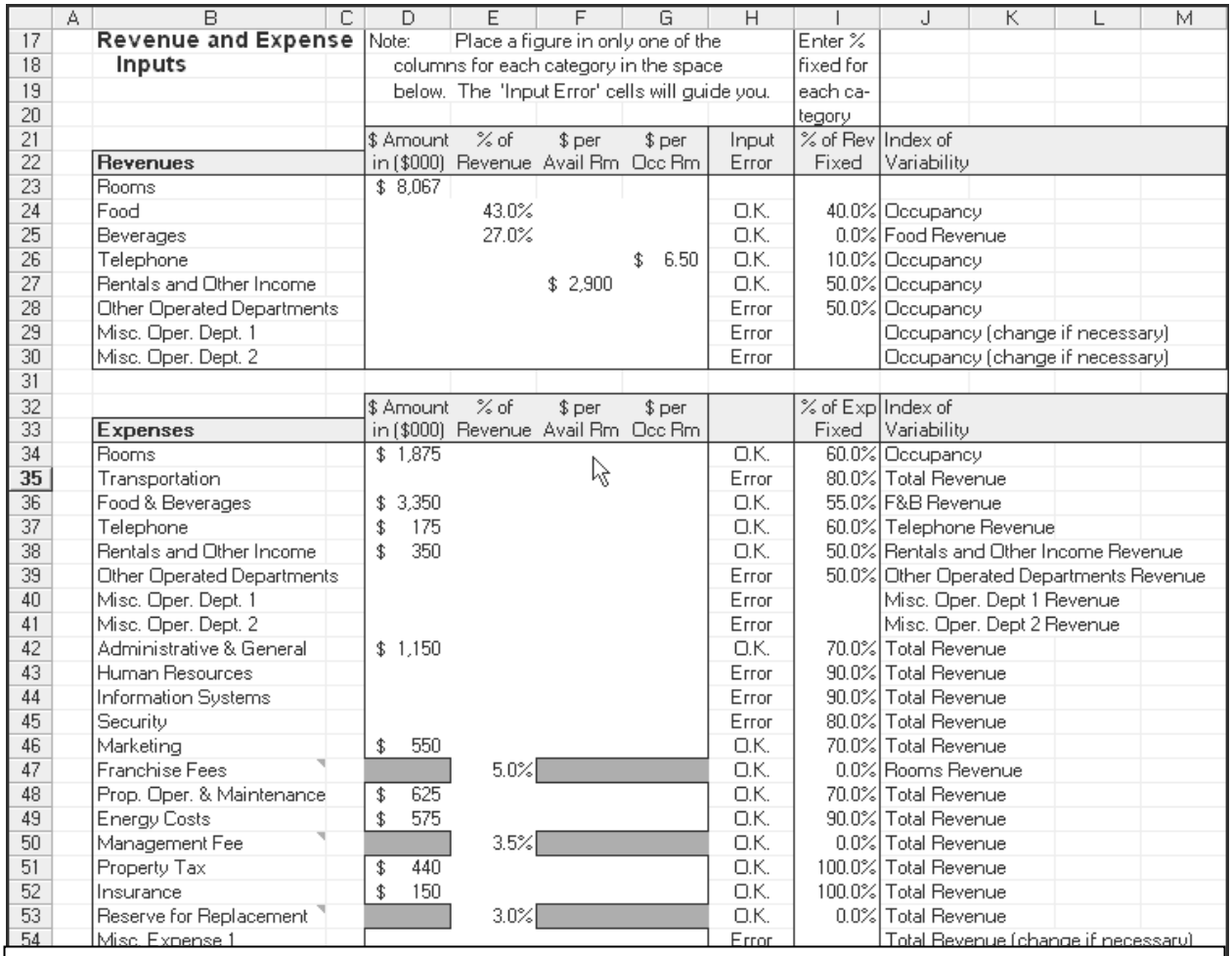
Figure 26 – The Project Information and Base Year Room Inputs portion of the *Inputs* sheet

This portion of the *Inputs* sheet is very straightforward. Project information is entered for use by the appraiser. The base year room inputs come from the base financial statement. The base year is entered in cell D11, room count in D12, days open in D13, occupancy in D14, and average room rate in D15.

All of the cells are preformatted, so occupancy should be entered as 68, not .68 and average rate is entered as 130, not $130.00. The analyst should visually verify the data after entry.

Revenue and Expense Inputs

Figure 27 shows a screen shot of the revenue and expense inputs section of the *Inputs* sheet. This portion is the heart of the FIXVAR program.



	A	B	C	D	E	F	G	H	I	J	K	L	M
17		**Revenue and Expense Inputs**		Note: Place a figure in only one of the					Enter %				
18				columns for each category in the space					fixed for				
19				below. The 'Input Error' cells will guide you.					each ca-				
20									tegory				
21				$ Amount	% of	$ per	$ per	Input	% of Rev	Index of			
22		**Revenues**		in ($000)	Revenue	Avail Rm	Occ Rm	Error	Fixed	Variability			
23		Rooms		$ 8,067									
24		Food			43.0%			O.K.	40.0%	Occupancy			
25		Beverages			27.0%			O.K.	0.0%	Food Revenue			
26		Telephone					$ 6.50	O.K.	10.0%	Occupancy			
27		Rentals and Other Income				$ 2,900		O.K.	50.0%	Occupancy			
28		Other Operated Departments						Error	50.0%	Occupancy			
29		Misc. Oper. Dept. 1						Error		Occupancy (change if necessary)			
30		Misc. Oper. Dept. 2						Error		Occupancy (change if necessary)			
31													
32				$ Amount	% of	$ per	$ per		% of Exp	Index of			
33		**Expenses**		in ($000)	Revenue	Avail Rm	Occ Rm		Fixed	Variability			
34		Rooms		$ 1,875				O.K.	60.0%	Occupancy			
35		Transportation						Error	80.0%	Total Revenue			
36		Food & Beverages		$ 3,350				O.K.	55.0%	F&B Revenue			
37		Telephone		$ 175				O.K.	60.0%	Telephone Revenue			
38		Rentals and Other Income		$ 350				O.K.	50.0%	Rentals and Other Income Revenue			
39		Other Operated Departments						Error	50.0%	Other Operated Departments Revenue			
40		Misc. Oper. Dept. 1						Error		Misc. Oper. Dept 1 Revenue			
41		Misc. Oper. Dept. 2						Error		Misc. Oper. Dept 2 Revenue			
42		Administrative & General		$ 1,150				O.K.	70.0%	Total Revenue			
43		Human Resources						Error	90.0%	Total Revenue			
44		Information Systems						Error	90.0%	Total Revenue			
45		Security						Error	80.0%	Total Revenue			
46		Marketing		$ 550				O.K.	70.0%	Total Revenue			
47		Franchise Fees			5.0%			O.K.	0.0%	Rooms Revenue			
48		Prop. Oper. & Maintenance		$ 625				O.K.	70.0%	Total Revenue			
49		Energy Costs		$ 575				O.K.	90.0%	Total Revenue			
50		Management Fee			3.5%			O.K.	0.0%	Total Revenue			
51		Property Tax		$ 440				O.K.	100.0%	Total Revenue			
52		Insurance		$ 150				O.K.	100.0%	Total Revenue			
53		Reserve for Replacement			3.0%			O.K.	0.0%	Total Revenue			
54		Misc. Expense 1						Error		Total Revenue (change if necessary)			

Figure 27 – The Revenue and Expense Inputs portion of the *Inputs* sheet

Column B contains the headings that describe the various categories comprising the base statement of income and expense. These are arranged in accordance with the Uniform System of Accounts for Lodging Property, 9th Edition.

Cells D21/22, E21/22, F21/22 and G21/22 contain the following titles, which are defined as:

Amount in ($000)	Total Dollars Expressed in $1,000
% of Revenue	Percent of a Defined Revenue
$ per Avail Rm	Dollars per Available Room per Year
$ per Occ Rm	Dollars per Occupied Room per Day

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Dollars per available rooms is calculated by dividing the total dollar amount by the property's room count (cell D12).

Dollars per occupied room is calculated by dividing the total dollar amount by the number of rooms occupied per year (cell D12 x cell D13 x cell D14).

Note the following when using the "Percent of Revenue" column to enter revenues and expenses:

Revenues

- Food Revenues are calculated as a Percent of Rooms Revenue
- Beverage Revenues are calculated as a Percent of Food Revenue
- All other revenues are calculated as a Percent of Rooms Revenue

Expenses

- Rooms Expenses are calculated as a Percent of Rooms Revenue
- Food and Beverage expenses are calculated as a percent of combined Food and Beverage revenues
- All other Departmental Expenses are calculated as a Percent of the Departmental Revenue
- All Undistributed Operating Expenses and Fixed Expenses are calculated as a Percent of Total Revenues, with the exception of Franchise Fees, which are calculated as a percent of Rooms Revenue

Important Note

While base revenue and expense data may be entered in any of the four columns, it is very important to enter data for each line item in only one of the columns. Serious errors in the forecast of income and expense will result if this rule is violated.

CASE STUDY

Data is entered in its appropriate form under the proper column title and adjacent to the proper category. For example, food revenue could be entered as one of four types of units.

Cell	Entry Units	Amount Entered
D24	Amount in ($000)	$ 3,469
E24	% (Rms Rev)	43.0%
F24	$ per Avail Rm	$13,876
G24	$ per Occ Rm	$ 55.91

CASE STUDY (continued)

For illustrative purposes, the various revenues for the proposed Sheraton are entered as a dollar amount, dollars per occupied room, dollars per available room, and a percentage of revenue.

Because the income and expense data was previously calculated as part of the process of establishing the 'Base' Statement, all of the expense inputs could have been entered as a dollar amount. However, for numerical accuracy the following expenses must be entered as a percent of revenue:

- Franchise Fees, this is entered as a percent of **room** revenues
- Management Fee, this is entered as a percent of **total** revenues
- Reserve for Replacement, this is entered as a percent of **total** revenues

This convention is followed in Figure 28 on page 72.

The Revenue and Expense section of the Inputs sheet contains a complete listing of revenue and expense line items, based on the *Uniform System of Accounts for the Lodging Industry,* 9th Edition. The illustration used in this operating manual does not use all of the line items. Be assured that the spreadsheet will produce the desired results when needed.

Fixed and Variable Component Inputs

CASE STUDY (continued)

Column I requires the fixed percentage used for each revenue and expense category. When first opened, the *Inputs* sheet contains typical values in this column. Column J describes the index of variability used to calculate the fixed and variable components. Since these cells are preformatted, percentages should be entered as whole numbers. Thus, the fixed percentage of 40.0% in cell I24 is entered as 40, not .40. The program automatically formats the entry as 40.0%.

All line items used for revenues and expenses must have a corresponding entry in column I to define the fixed percentage. Omission of this input will produce significant errors in the output.

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Entering Inflation Estimates

The appraiser enters projected inflation figures in the Inflation Estimates section of the *Inputs* sheet. Figure 28 illustrates this section of the program.

Figure 28 – The Inflation Estimates portion of the *Inputs* sheet

	B	C	D	E	F	G	H	I	J	K	L	M	N	O
58	**Inflation Estimates**			Note: While only the 'bright' blue cell (E63) is needed to complete the grid,										
59				the yellow cells can be configured individually as needed.										
60														
61				Base +1	Base +2	Base +3	Base +4	Base +5	Base +6	Base +7	Base +8	Base +9	Base +10	Base +11
62	Revenues			2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
63	Rooms			6.0%	5.0%	4.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
64	Food			3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
65	Beverages			3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
66	Telephone			3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
67	Rentals and Other Income			3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
68	Other Operated Departments			3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
69	Misc. Oper. Dept. 1			3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
70	Misc. Oper. Dept. 2			3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
71														
72	Expenses			2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
73	Rooms			3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
74	Transportation			3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
75	Food & Beverages			3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
76	Telephone			3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
77	Rentals and Other Income			3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
78	Other Operated Departments			3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
79	Misc. Oper. Dept. 1			3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
80	Misc. Oper. Dept. 2			3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
81	Administrative & General			3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
82	Human Resources			3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
83	Information Systems			3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
84	Security			3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
85	Marketing			3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
86	Franchise Fees			3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
87	Prop. Oper. & Maintenance			3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
88	Energy Costs			3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
89	Management Fee			3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
90	Property Tax			3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
91	Insurance			3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
92	Reserve for Replacement			3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
93	Misc. Expense 1			3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
94	Misc. Expense 2			3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%

CASE STUDY

When the Inputs sheet is first loaded, the Inflation Estimates section is populated with zeros. If only one inflation estimate is used, it is entered in cell E63. The program is set up to take this number and copy it to all other cells in this section. These cells are preformatted to accept a whole number as input. Thus, the 6.0% entered in Cell E63 is entered as 6, not .06. The program automatically formats this entry as 6.0%.

You will note that the 6.0% entry in cell E63 is copied to all cells of the Inflation Estimates section as soon as it is entered. If unique inflation estimates are needed in different years and various line items, they should be entered in the following manner:

CASE STUDY (continued)

- Enter inflation estimates for rooms revenues first, from left to right. You will note that cell F63 copies the value in E63, G63 copies the value in F63, and so on. The appraiser may manually override these settings by simply entering the desired inflation rate. In Figure 28, data needs to be entered in cells E63 through H63; 6% is entered in E63, 5% in F63, 4% in G63, and 3% in H63. Since inflation is expected to hold steady from 2004 to 2011, cell H63 is the last needed entry in this row. The program automatically copies the 3% entry in cells I63 through O63.
- Enter 3.0% in cell E64, the 2001 expected inflation for Food Revenue. Note that the 3.0% figure is copied to the right in all cells of row 64, as well as down to all other cells in the remainder of the section.
- The program is designed to copy down only in column E, and then each line item copies left to right from column E to subsequent years in that line item.
    - For instance, if energy costs are expected to increase at (say) 5%, this figure would be entered in cell E88. Immediately, all inflation estimates to the right and below cell E88 would change to 5%. To change line items below row 88 back to 3%, simply enter 3% in cell E89. Try it!

Occupancy and Average Rate Inputs

The bottom portion of the *Inputs* sheet contains the Occupancy and Average Rate Inputs. Figure 29 contains a screen shot of this portion of the sheet.

	B	C	D	E	F	G	H	I	J	K	L	M	N	O
96	**Occupancy and Average Rate Estimates**													
97				Note: Only cells E103 through G 103 are needed to complete the occupancy estimates, however, each year's										
98				occupancy can be configured individually as needed. Average rates can be configured as as needed. Average										
99				rates must be over ridden in row 104, not row 105.										
100			Base Yr	Base +1	Base +2	Base +3	Base +4	Base +5	Base +6	Base +7	Base +8	Base +9	Base +10	Base +11
101			2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
102	Analyst Estimate:													
103	Occupancy Rate		68.0%	68.0%	68.0%	53.0%	62.0%	67.0%	67.0%	67.0%	67.0%	67.0%	67.0%	67.0%
104	Average Rate		$130.00	$137.80	$144.69	$135.43	$147.24	$159.64	$164.43	$169.36	$174.44	$179.68	$185.07	$190.62
105	Inflated Average Rate		$130.00	$137.80	$144.69	$150.48	$154.99	$159.64	$164.43	$169.36	$174.44	$179.68	$185.07	$190.62

Figure 29 – The Occupancy and Average Rate Estimates portion of the *Inputs* sheet

The Occupancy and Average Rate Estimates portion of the Inputs sheet automatically enters the base year occupancy estimate from cell D14 into row 103. As soon as cell D14 is entered, this data is copied to cell D103 and then copied left to right in all cells across this row. However, the occupancy figures will have to be adjusted to reflect the projections from the Room Night Analysis Program. This process is described on the following page.

The program automatically calculates inflated average rate data in row 105. However, there are instances when adjusted average rates are needed. Most importantly, a new property often discounts its average rates in the first years of operation to secure a proper volume of business. The FIXVAR program automatically copies the inflated data from row 105 into row 104. Adjustments are made in row 104.

The adjustments to occupancy and average rate are outlined as follows.

CASE STUDY

When the Sheraton is expected to open in 2003, the room night analysis projected an occupancy of 53%. In cell G103, the sheet contains the base occupancy of 68%, which must be overridden by entering 53% in this cell. Similar occupancy adjustments must be made to projection years 2004 and 2005 in accordance with Table 18. Once the adjusted occupancy of 67% is entered in cell I103, note how this figure is copied to all subsequent years.

In 2003, cell G105 shows the undiscounted average room rate of $150.48, which must be overridden by entering the discounted average room rate of $135.43 (a 10% discount). A similar average rate adjustment must be made to projection year 2004 in accordance with Table 20. Average rate adjustments must be entered in row 104, not row 105.

Table 20 Adjusted Data for the Occupancy and Average Rate Inputs Section

	2003 Column G	2004 Column H	2004 Column I
Unadjusted Occupancy	68%	68%	68%
Adjusted Occupancy	53%	62%	67% (Stab).
Unadjusted Average Rate	$150.48	$154.99	$159.64
Adjusted Average Rate	$135.43	$147.24	$159.64

Output Sheet from the FIXVAR Program

Output from the FIXVAR program is found on the *Output* sheet. Figure 30 on the following page shows a section of the output, showing the first year of operation (2003) and the next two years. The actual sheet contains the base year, plus an 11-year projection. Each year contains four columns, as shown in the figure. The 'Percent' column follows the convention of showing departmental expenses as a percent of departmental revenue. All other percentages are a percent of total revenue.

	B	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF
1															
2	Operating Manual	Base +3					Base +4					Base +5			
3		2003					2004					2005			
4	Number of Rooms	250					250					250			
5	Occupancy	53.0%					62.0%					67.0%			
6	Average Rate	$ 135.43					$ 147.24					$ 159.64			
7	Days Open	365					365					365			
8	Rooms Occupied	48363					56575					61138			
9															
10	Revenues	$(000)	Percent	$/Avail Rm	$/Occ Rm		$(000)	Percent	$/Avail Rm	$/Occ Rm		$(000)	Percent	$/Avail Rm	$/Occ Rm
11	Rooms	$ 6,550	55.6%	$ 26,199	$ 135.43		$ 8,330	58.6%	$ 33,320	$ 147.24		$ 9,760	60.6%	$ 39,040	$ 159.64
12	Food	$ 3,288	27.9%	$ 13,154	$ 67.99		$ 3,697	26.0%	$ 14,789	$ 65.35		$ 3,986	24.7%	$ 15,942	$ 65.19
13	Beverages	$ 888	7.5%	$ 3,554	$ 18.37		$ 999	7.0%	$ 3,997	$ 17.66		$ 1,077	6.7%	$ 4,310	$ 17.62
14	Telephone	$ 353	3.0%	$ 1,411	$ 7.29		$ 417	2.9%	$ 1,668	$ 7.37		$ 461	2.9%	$ 1,843	$ 7.54
15	Rentals and Other Income	$ 705	6.0%	$ 2,819	$ 14.57		$ 780	5.5%	$ 3,120	$ 13.79		$ 834	5.2%	$ 3,335	$ 13.64
19	Total Revenue	$ 11,784	100.0%	$ 47,136	$ 243.66		$ 14,224	100.0%	$ 56,894	$ 251.41		$ 16,118	100.0%	$ 64,471	$ 263.63
20															
21	Departmental Expenses														
22	Rooms	$ 1,868	28.5%	$ 7,473	$ 38.63		$ 2,036	24.4%	$ 8,142	$ 35.98		$ 2,160	22.1%	$ 8,641	$ 35.33
23	Food & Beverages	$ 3,444	82.5%	$ 13,776	$ 71.21		$ 3,682	78.4%	$ 14,729	$ 65.08		$ 3,870	76.4%	$ 15,478	$ 63.29
24	Telephone	$ 176	49.9%	$ 703	$ 3.64		$ 191	45.7%	$ 763	$ 3.37		$ 202	43.8%	$ 808	$ 3.30
25	Rentals and Other Income	$ 345	49.0%	$ 1,380	$ 7.13		$ 378	48.5%	$ 1,513	$ 6.69		$ 403	48.4%	$ 1,613	$ 6.60
29	Total Departmental Expenses	$ 5,833	49.5%	$ 23,332	$ 120.61		$ 6,287	44.2%	$ 25,147	$ 111.12		$ 6,635	41.2%	$ 26,540	$ 108.53
30															
31	Departmental Income	$ 5,951	50.5%	$ 23,804	$ 123.05		$ 7,937	55.8%	$ 31,747	$ 140.29		$ 9,483	58.8%	$ 37,931	$ 155.10
32															
33	Undistributed Operating Expe														
34	Administrative & General	$ 1,188	10.1%	$ 4,754	$ 24.57		$ 1,267	8.9%	$ 5,069	$ 22.40		$ 1,330	8.3%	$ 5,320	$ 21.75
38	Marketing	$ 569	4.8%	$ 2,275	$ 11.76		$ 606	4.3%	$ 2,425	$ 10.71		$ 637	3.9%	$ 2,546	$ 10.41
39	Franchise Fees	$ 327	2.8%	$ 1,310	$ 6.77		$ 417	2.9%	$ 1,666	$ 7.36		$ 488	3.0%	$ 1,952	$ 7.98
41	Prop. Oper. & Maintenance	$ 645	5.5%	$ 2,581	$ 13.34		$ 687	4.8%	$ 2,749	$ 12.15		$ 721	4.5%	$ 2,885	$ 11.80
42	Energy Costs	$ 616	5.2%	$ 2,466	$ 12.75		$ 642	4.5%	$ 2,569	$ 11.35		$ 665	4.1%	$ 2,661	$ 10.88
45	Total UDOEs	$ 3,346	28.4%	$ 13,385	$ 69.19		$ 3,619	25.4%	$ 14,478	$ 63.97		$ 3,841	23.8%	$ 15,364	$ 62.83
46															
47	Income Before Fixed Charges	$ 2,605	22.1%	$ 10,419	$ 53.86		$ 4,317	30.4%	$ 17,270	$ 76.31		$ 5,642	35.0%	$ 22,566	$ 92.28
48															
49	Fixed Charges														
50	Management Fee	$ 412	3.5%	$ 1,650	$ 8.53		$ 498	3.5%	$ 1,991	$ 8.80		$ 564	3.5%	$ 2,256	$ 9.23
51	Property Tax	$ 481	4.1%	$ 1,924	$ 9.95		$ 495	3.5%	$ 1,980	$ 8.75		$ 510	3.2%	$ 2,040	$ 8.34
52	Insurance	$ 165	1.4%	$ 660	$ 3.41		$ 170	1.2%	$ 680	$ 3.00		$ 175	1.1%	$ 700	$ 2.86
53	Reserve for Replacement	$ 354	3.0%	$ 1,414	$ 7.31		$ 427	3.0%	$ 1,707	$ 7.54		$ 484	3.0%	$ 1,934	$ 7.91
54	Total Fixed Charges	$ 1,412	12.0%	$ 5,648	$ 29.20		$ 1,590	11.2%	$ 6,358	$ 28.10		$ 1,733	10.7%	$ 6,931	$ 28.34
55															
56	Net Income	$ 1,193	10.1%	$ 4,771	$ 24.66		$ 2,728	19.2%	$ 10,912	$ 48.22		$ 3,909	24.3%	$ 15,636	$ 63.94

Figure 30 – The *Output* sheet, showing the First Three Years of Operation

Note that several rows have been hidden, for clarity of presentation. The program will print all of the rows in the sheet.

Figure 30 clearly demonstrates how the Fixed and Variable Component technique changes revenues and expenses in response to changing occupancy. For example, the reserve for replacement stays fixed at 3.0% of total revenues, while Energy Costs are declining as a percent of total revenue.

Printing in the FIXVAR Program

The Excel **Report Manager** is used to produce printed output. Figure 31 shows the report manager dialog box, which is called using the **View, Report Manager** menu command. If the **Report Manager** is not available, see pages 55 and 56 for instructions on how to add it.

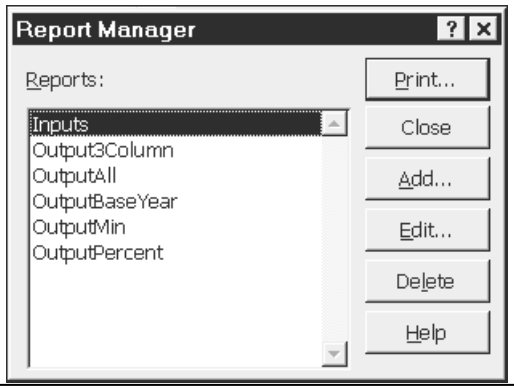

Figure 31 – The Report Manager dialog box in the FIXVAR program

There are six reports available in **Report Manager** of the FIXVAR program; all are listed in figure 31. To print, simply highlight the desired report and click on the **Print** box.

The reports correspond to the *Inputs* sheet and various views of the *Output* sheet in the FIXVAR program. All reports are formatted to use a minimal amount of paper. The six reports contain the following:

- Inputs - The entire Inputs sheet
- Output3Column - Output sheet showing $, percent and $ per available room, for the 11 projection years
- OutputAll - Output sheet showing all four columns per year, for the 11 projection years
- OutputBaseYear - Output sheet showing all four columns per year for the base year only
- OutputMin - Output sheet showing only $, for the 11 projection years
- OutputPercent - Output sheet showing $ and percent, for the 11 projection years

All of the reports have been formatted assuming the user has access to a standard laser printer, capable of printing in both landscape and portrait mode on 8½" by 11" paper.

In addition, users can define their own print areas to print only those years of interest.

Modifying Formulas in the *Output* Sheet

As a final point, the *Output* sheet FIXVAR program can be modified to reflect unique circumstances that are difficult to model on the *Input* sheet. As an example, consider the assumption that the proposed Sheraton is expected to have lower-than-normal property operations and maintenance expenses during the first two years of operation, a typical assumption for a new hotel.

CASE STUDY

To reflect the improvement in property operation and maintenance, the formulas in cells S41 and X41 need to be altered. Specifically, the 2003 (first year of operation) property operations and maintenance ratio will be changed to 4.0% of total revenue and the 2004 (second year of operation) ratio will be changed to 4.2% of total revenue. It should be noted that as of the third year of operation, this expense ratio stabilizes at 4.5% of total revenue. The following formulas have been written in cells S41 and X41:

Cells	New Formulas
S41	.040 * S19
X41	.042 * X19

The results are shown on the following page in Figure 32. Compare this to Figure 30 on page 75, which does not reflect these changes.

The next chapter demonstrates how to use the forecast of revenue and expense developed using the FIXVAR program to determine a value for the property using an income approach to valuation.

HOSPITALITY
VALUATION
SOFTWARE

	B	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF
1															
2	Operating Manual	Base +3					Base +4					Base +5			
3		2003					2004					2005			
4	Number of Rooms	250					250					250			
5	Occupancy	53.0%					62.0%					67.0%			
6	Average Rate	$ 135.43					$ 147.24					$ 159.64			
7	Days Open	365					365					365			
8	Rooms Occupied	48363					56575					61138			
9															
10	Revenues	$(000)	Percent	$/Avail Rm	$/Occ Rm		$(000)	Percent	$/Avail Rm	$/Occ Rm		$(000)	Percent	$/Avail Rm	$/Occ Rm
11	Rooms	$ 6,550	55.6%	$ 26,199	$ 135.43		$ 8,330	58.6%	$ 33,320	$ 147.24		$ 9,760	60.6%	$ 39,040	$ 159.64
12	Food	$ 3,288	27.9%	$ 13,154	$ 67.99		$ 3,697	26.0%	$ 14,789	$ 65.35		$ 3,986	24.7%	$ 15,942	$ 65.19
13	Beverages	$ 888	7.5%	$ 3,554	$ 18.37		$ 999	7.0%	$ 3,997	$ 17.66		$ 1,077	6.7%	$ 4,310	$ 17.62
14	Telephone	$ 353	3.0%	$ 1,411	$ 7.29		$ 417	2.9%	$ 1,668	$ 7.37		$ 461	2.9%	$ 1,843	$ 7.54
15	Rentals and Other Income	$ 705	6.0%	$ 2,819	$ 14.57		$ 780	5.5%	$ 3,120	$ 13.79		$ 834	5.2%	$ 3,335	$ 13.64
19	Total Revenue	$ 11,784	100.0%	$ 47,136	$ 243.66		$ 14,224	100.0%	$ 56,894	$ 251.41		$ 16,118	100.0%	$ 64,471	$ 263.63
20															
21	Departmental Expenses														
22	Rooms	$ 1,868	28.5%	$ 7,473	$ 38.63		$ 2,036	24.4%	$ 8,142	$ 35.98		$ 2,160	22.1%	$ 8,641	$ 35.33
23	Food & Beverages	$ 3,444	82.5%	$ 13,776	$ 71.21		$ 3,682	78.4%	$ 14,729	$ 65.08		$ 3,870	76.4%	$ 15,478	$ 63.29
24	Telephone	$ 176	49.9%	$ 703	$ 3.64		$ 191	45.7%	$ 763	$ 3.37		$ 202	43.8%	$ 808	$ 3.30
25	Rentals and Other Income	$ 345	49.0%	$ 1,380	$ 7.13		$ 378	48.5%	$ 1,513	$ 6.69		$ 403	48.4%	$ 1,613	$ 6.60
29	Total Departmental Expenses	$ 5,833	49.5%	$ 23,332	$ 120.61		$ 6,287	44.2%	$ 25,147	$ 111.12		$ 6,635	41.2%	$ 26,540	$ 108.53
30															
31	Departmental Income	$ 5,951	50.5%	$ 23,804	$ 123.05		$ 7,937	55.8%	$ 31,747	$ 140.29		$ 9,483	58.8%	$ 37,931	$ 155.10
32															
33	Undistributed Operating Expe														
34	Administrative & General	$ 1,188	10.1%	$ 4,754	$ 24.57		$ 1,267	8.9%	$ 5,069	$ 22.40		$ 1,330	8.3%	$ 5,320	$ 21.75
38	Marketing	$ 569	4.8%	$ 2,275	$ 11.76		$ 606	4.3%	$ 2,425	$ 10.71		$ 637	3.9%	$ 2,546	$ 10.41
39	Franchise Fees	$ 327	2.8%	$ 1,310	$ 6.77		$ 417	2.9%	$ 1,666	$ 7.36		$ 488	3.0%	$ 1,952	$ 7.98
41	Prop. Oper. & Maintenance	$ 471	4.0%	$ 1,885	$ 9.75		$ 597	4.2%	$ 2,390	$ 10.56		$ 721	4.5%	$ 2,885	$ 11.80
42	Energy Costs	$ 616	5.2%	$ 2,466	$ 12.75		$ 642	4.5%	$ 2,569	$ 11.35		$ 665	4.1%	$ 2,661	$ 10.88
45	Total UDOEs	$ 3,172	26.9%	$ 12,689	$ 65.59		$ 3,529	24.8%	$ 14,118	$ 62.38		$ 3,841	23.8%	$ 15,364	$ 62.83
46															
47	Income Before Fixed Charges	$ 2,779	23.6%	$ 11,115	$ 57.45		$ 4,407	31.0%	$ 17,630	$ 77.90		$ 5,642	35.0%	$ 22,566	$ 92.28
48															
49	Fixed Charges														
50	Management Fee	$ 412	3.5%	$ 1,650	$ 8.53		$ 498	3.5%	$ 1,991	$ 8.80		$ 564	3.5%	$ 2,256	$ 9.23
51	Property Tax	$ 481	4.1%	$ 1,924	$ 9.95		$ 495	3.5%	$ 1,980	$ 8.75		$ 510	3.2%	$ 2,040	$ 8.34
52	Insurance	$ 165	1.4%	$ 660	$ 3.41		$ 170	1.2%	$ 680	$ 3.00		$ 175	1.1%	$ 700	$ 2.86
53	Reserve for Replacement	$ 354	3.0%	$ 1,414	$ 7.31		$ 427	3.0%	$ 1,707	$ 7.54		$ 484	3.0%	$ 1,934	$ 7.91
54	Total Fixed Charges	$ 1,412	12.0%	$ 5,648	$ 29.20		$ 1,590	11.2%	$ 6,358	$ 28.10		$ 1,733	10.7%	$ 6,931	$ 28.34
55															
56	Net Income	$ 1,367	11.6%	$ 5,467	$ 28.26		$ 2,818	19.8%	$ 11,271	$ 49.81		$ 3,909	24.3%	$ 15,636	$ 63.94

Figure 32 – The *Output* sheet, showing the First Three Years of Operation, with modifications to Property Operation and Maintenance

HOSPITALITY
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Valuation

When appraising hotels, the appraiser has three approaches from which to select: the Income Capitalization, Sales Comparison, and Cost. Although all three valuation procedures are generally given consideration, the inherent strength of each approach and the nature of the subject property must be evaluated to determine which will provide supportable estimates of market value. This manual will demonstrate only the Income Capitalization Approach, which is particularly suited to computer applications.

The final value estimate should be made only after evaluating the three approaches; the appraiser should take the cost and sales comparison approaches into account prior to completing any appraisal assignment.

Income Capitalization Approach

The Income Capitalization Approach is based on the principle that the value of a property is indicated by the net return to the going concern, or what is also known as the present worth of future benefits. The future benefits from income-producing properties such as hotels and motels are the annual net incomes and the net receipts from selling the property in the future. These future benefits can then be converted into an indication of the market value through a capitalization process and discounted cash flow analysis.

Conversion of the forecasted income stream into an estimate of value is accomplished by allocating the anticipated net income to the mortgage and equity components based on market rates of returns and lending parameters. The value of the property equals the sum of the mortgage component plus the equity component.

The process of estimating the value of the mortgage and equity components is summarized as follows:

1. The terms of typical hotel financing are set forth including: interest rate, amortization term, loan-to-value ratio, and the debt coverage ratio.

2. A before-tax equity yield is established. The equity yield takes into account the benefits of ownership; it is typical for buyers to base their equity yield on a ten-year holding period. The yield explicitly includes annual cash flow distributions and the equity residual. The equity yield implicitly includes refinancing distributions that return any property appreciation and mortgage amortization, income tax benefits, and non-financial considerations such as status and prestige.

3. The value of the equity component is calculated by first deducting the yearly debt service from the forecasted income before debt service, leaving the net income to equity for each forecasted year. The net income as of the 11th year is capitalized into a reversionary value. After deducting the mortgage balance as of the end of the 10th year along with normal legal and selling costs, the equity residual is discounted back to the date of value at the equity yield rate. The net income to equity for each of the ten projection years also undergoes a similar discounting process. The sum of these discounted values equates to the value of the equity component. Adding the equity component to the initial mortgage balance yields the overall property value.

4. The amount of the mortgage, the amount of the annual debt service, and the remaining mortgage balance all depend on the value to be calculated, the classic simultaneous valuation problem. Thus, the preceding calculation must be solved either by an iterative process on a computer or through an algebraic equation that computes the total property value. This software uses the algebraic solution first developed by Suzanne Mellen in "Simultaneous Valuation: A New Technique" *Appraisal Journal*, April 1983.

5. In addition to calculating value using a specified loan-to-value ratio, the software also calculates value using a debt coverage ratio. Lenders are increasingly using a debt coverage ratio to size their loans, and are placing less emphasis on the loan-to-value ratio.

6. The proof of value is performed by allocating the total property value between mortgage and equity components and verifying that the rates of returns set forth in Steps #1 and #2 can be precisely met from the forecasted net income.

Each of these steps will be described separately and illustrated with the case study. The software program that calculates the value is called the Hotel Capitalization Software program (abbreviated HCS).

Step #1: Estimate the appropriate terms under which the subject property could be financed with mortgage debt capital.

CASE STUDY

The proposed Sheraton hotel will have new facilities, good management, and a recognized affiliation. Based on this analysis, the following mortgage terms would probably be available for the proposed Sheraton hotel:

Interest Rate	8.5%
Mortgage Amortization	25 years
Payments per Year	Monthly
Mortgage Term	10 years
Loan-to-Value Ratio	65%
Debt Coverage Ratio	1.3 (on year 2 income)

Step #2: Establish an appropriate equity yield rate and a terminal capitalization rate.

The remaining portion of the capital required for a hotel investment generally comes from the equity investor(s). The rate of return that an equity investor expects over a ten-year holding period is called an equity yield. The equity yield specifically considers a long-term holding period (typically 10 years), annual cash flows adjusted for inflation, property appreciation, mortgage amortization, and proceeds from a sale at the end of the holding period. In concept, the equity yield is the internal rate of return to equity capital. It is very important to note that equity yield is not the same as the equity dividend rate, which is a short-term rate of return.

CASE STUDY

A survey was conducted of hotel investors to determine their current equity yield requirements. As of January 1, 2000, the range of equity yields for hotels that would be comparable to the proposed Sheraton was between 17% and 20%. Using the same investment criteria that was employed for the mortgage interest rate, the range was narrowed to an 18% equity yield. Based on a survey of terminal capitalization rates, a 12.0% rate was considered appropriate for the proposed Sheraton hotel.

Step #3: The overall property value is estimated through a mortgage-equity technique by first valuing the equity component and then adding the initial mortgage balance to that value.

A necessary prerequisite to separately calculating the value of the equity and value of the mortgage is to establish the net income over the projection period, as well as the remainder of the valuation parameters.

In most instances, the net incomes that occur after the stabilized year are projected at an assumed rate of inflation. By increasing a property's revenue and expenses at the same rate as inflation, the net income expressed as a percentage of total revenue will remain constant and the dollar amount of net income will escalate each year at the inflation rate.

In situations where a category of revenue and/or expense is expected to increase at a rate other than inflation, the appraiser should reflect this peculiarity in the specific year's forecasts of income and expense. Instances of where this situation is likely to occur include: contractual changes in a ground rent expense, an escalating reserve for replacement percentage, or an expected change in property tax assessment.

The Hotel Capitalization Software is designed to give the user a choice of using net incomes developed in a projection of revenue and expense or to calculate net incomes after the stabilized year, based on an inflation assumption.

CASE STUDY

Table 21 on the next page contains the net incomes for the proposed Sheraton from the FIXVAR program, as modified in Figure 32 on page 78. Note that the net incomes are available only through year 9. Since the Hotel Capitalization Software assumes a 10-year holding period, two years of projection beyond year 9 are needed; year 10 for the discounted cash flow analysis, and year 11 to determine the residual value of the property.

HOSPITALITY VALUATION SOFTWARE

CASE STUDY (continued)

Table 21 Net Incomes from the FIXVAR program for the Proposed Sheraton

Projection Year	Net Income
1 (2003)	$1,355,000
2 (2004)	2,816,000
3 (2005)	3,911,000
4 (2006)	4,029,000
5 (2007)	4,150,000
6 (2008)	4,277,000
7 (2009)	4,403,000
8 (2010)	4,533,000
9 (2011)	4,670,000

At the time this appraisal was being prepared, hotel investors were utilizing inflation rates of approximately 3%.

Summarizing the information gathered thus far, the Hotel Capitalization Software (HCS) will be demonstrated using the proposed Sheraton hotel. The known variables are as follows:

Annual Net Incomes	See Table 21
Stabilized Year	Year 3 (2005)
Inflation Rate After Stabilization	3.0%
Loan-to-value Ratio	65%
Debt Coverage Ratio (on Year 2 Net Income)	1.3
Mortgage Amortization (years)	25
Payments per Year	Monthly
Equity Yield	18%
Terminal Capitalization Rate	12.0%
Selling Expenses at Reversion	3%

Hotel Capitalization Software Program (HCS)

The discounted cash flow hotel capitalization calculations necessary to value a lodging property are contained in an Excel program called HCS. This program permits rapid computation of the component values. It can also prove the yield to each component so the appraiser can verify the various assumptions utilized in the formula.

HOSPITALITY VALUATION SOFTWARE

The HCS program contains three sheets, similar to the FIXVAR program.

- *Input* - the sheet on which all input data will be entered
- *Calcs* - the sheet used to perform the fixed and variable calculations
- *Output* - the sheet that contains formatted output, including two valuations: one using the loan-to-value ratio, and one using the debt coverage ratio. In addition, this sheet includes a proof of value for each valuation.

The *Input* Sheet of the HCS Program

To utilize the Hotel Capitalization Software program, the appraiser starts by entering the previously determined data in the input section of the spreadsheet. This section of the

	B	C	D	E	F	G	H
2	**Hotel Capitalization Software**						
3							
4	**Project Information**						
5	Job Title	Operating Manual					
6	Prepared by	JdR/SR		Blue cells indicate where an input is needed			
7	Prepared for	Operating Manual		Best viewed with zoom set at 75%.			
8	Job #	AAA-01					
9							
10	**Valuation Inputs for Loan to Value Based Model:**						**NOI's**
11	First Projection Year		2003		Year 1	2003	$ 1,355
12	Equity Yield		18.0%		Year 2	2004	$ 2,816
13	Mortgage Interest Rate		8.50%		Year 3	2005	$ 3,911
14	Mortgage Amortization (years)		25		Year 4	2006	$ 4,029
15	Mortgage payments per year		12		Year 5	2007	$ 4,150
16	Loan to Value Ratio		65%		Year 6	2008	$ 4,277
17	Terminal Cap Rate		12.00%		Year 7	2009	$ 4,403
18	Selling Expenses at Reversion		3.0%		Year 8	2010	$ 4,533
19	Stabilized Year (*year 1, 2... not 2001*)		3		Year 9	2011	$ 4,670
20	Stabilized Year's Net Income		$ 3,911		Year 10	2012	
21	Inflation Rate after Stabilization		3.0%		Year 11	2013	
22							
23	**Additional Inputs for Debt Coverage Ratio Based Model:**						
24	Debt Coverage Ratio		1.3				
25	Enter the Year of the NOI to be used		2				
26							
27	**Calculated Information**						
28	Yearly Mortgage Const. (f)		0.096627				
29	% of Mortgage Paid in Year 10 (P)		18.2294%				
30	Equity Reversion (in Year 10)		$ 23,217				
31	Going In Cap Rate on PV of Year 1 NOI		4.15%				
32	Going In Cap Rate on PV of Stabilized NOI		11.64%				

Figure 33 – The *Input* Sheet of the HCS program

The first section at the top of the sheet, from row 4 to 8, contains cells for project information of interest to the appraiser.

The second section, from B10 through H21, contains cells for entering information relative to the terms of the mortgage and equity components, as well as the projected net incomes (called NOIs in the sheet).

Consistent with other input areas of the programs used in the Hotel Valuation Software, the cells in this section are preformatted. Thus, percentages are entered as whole numbers (i.e. the 65% loan-to-value ratio is entered as 65, which the program will interpret as 65%). The net incomes are entered without dollar signs; the program adds them automatically.

CASE STUDY

Below is a line by line explanation of the inputs necessary to complete the input section.

Description	Cell	Entry
First Projection Year	B11	Enter the year, 2003
Equity Yield	B12	Enter 18, not .18
Mortgage Interest Rate	B13	Enter 8.5, not .085
Mortgage Amortization	B14	Enter 25
Mortgage payments per year	B15	Enter 12, not monthly
Loan to Value Ratio	B16	Enter 65, not .65
Terminal Cap Rate	B17	Enter 12.0, not .120
Selling Expenses at Reversion	B18	Enter 3, not .03
Stabilized Year	B19	Enter 3, not 2005
Stabilized Year's Net Income	B20	Enter 3911, not $3,911
Inflation Rate after Stabilization	B21	Enter 3, not .03
Net Incomes	H11 - H21	Enter the figures from Table 21

Below this are two additional cells, which are needed if a value using the debt coverage ratio is desired. Below is a line-by-line explanation of the inputs necessary to complete the input section.

Description	Cell	Entry
Debt Coverage Ratio	B24	Enter 1.3
Year of NOI to be Used	B25	Enter 2, not 2004

One of the first things the program does is calculate the net incomes to be used for valuation purposes. In the instance of the proposed Sheraton, we assume that net income stabilizes in year three of operation (2005) and grows at 3% after this point.

Thus, the net incomes entered in cells H11 - H21 are not necessarily used for the valuation.

In fact, the program reads the input in cell D19, Stabilized Year, and calculates an inflated NOI for each year after this, using the Stabilized NOI entered in cell D20. Figure 34 shows where this is done on the *Calcs* sheet of the HCS program. Note that this section of the *Calcs* sheet also calculates the 'missing' net incomes for years 10 and 11. The net incomes found in cells E39 - E49 are labeled 'Raw NI' and the inflated net incomes in cells F39 - F49 are labeled 'Adj. NI'.

If the appraiser does not wish to use any adjusted net income data in the valuation, two steps **must** be taken on the *Input* sheet:

- Net Income data must be entered in all eleven years of cells H11 - H21 on the *Input* sheet.
- Cell B19 of the *Input* sheet, the Stabilized Year, should be set to 11.

	B	C	D	E	F
38	Income Calcs:		Year	Raw NI	Adj. NI
39			1	$ 1,355	$ 1,355
40			2	$ 2,816	$ 2,816
41			3	$ 3,911	$ 3,911
42			4	$ 4,029	$ 4,028
43			5	$ 4,150	$ 4,149
44			6	$ 4,277	$ 4,274
45			7	$ 4,403	$ 4,402
46			8	$ 4,533	$ 4,534
47			9	$ 4,670	$ 4,670
48			10	$ -	$ 4,810
49			11	$ -	$ 4,954

Figure 34 – Net Income Calculations on the *Calcs* sheet

At the very bottom of the Input sheet is a section labeled 'Calculated Information.' Figure 35 repeats this section, along with an explanation of the information.

	B	C	D
27	**Calculated Information**		
28	Yearly Mortgage Const. (f)		0.096627
29	% of Mortgage Paid in Year 10 (P)		18.2294%
30	Equity Reversion (in Year 10)		$ 23,217
31	Going In Cap Rate on PV of Year 1 NOI		4.15%
32	Going In Cap Rate on PV of Stabilized NOI		11.64%

Figure 35 – 'Calculated Information' on *Input* sheet

- Yearly Mortgage Constant - This is the percent of the mortgage that is paid each year. Thus, annual debt service is equal to the yearly mortgage constant times the mortgage amount.
- % of Mortgage paid in Year 10 - This is used to calculate the remaining mortgage balance in the 10th year. In the case of the Sheraton, 18.2% of the mortgage is paid during the first 10 years, leaving 81.8% remaining to be paid.
- Equity reversion in year 10 - This is the dollar amount that the equity participant will receive in year 10. Note that this is not the terminal selling price.
- Going-In Cap Rates - Two are presented, year one and the stabilized year. These are used as a check on the reasonableness of the terminal cap rate, as well as the overall valuation.

Step #4: Use an algebraic process to solve for value.

The *Calcs* Sheet of the HCS Program

The *Calcs* sheet contains the calculation 'engine' used to calculate value. Two values are calculated, one using the loan-to-value ratio and one using the debt coverage ratio. No output from this section is presented, as this is simply the mechanical portion of the valuation software.

Steps #5 and #6: Calculate values and perform a proof of value.

The *Output* Sheet of the HCS Program

The Output sheet contains formatted output with the valuations and the proofs of value. As illustrated on the following pages, the Output sheet is divided into two sections, the top section contains the valuation based on the loan-to-value ratio; the bottom section contains the valuation based on the debt coverage ratio.

Output Sheet

LTV Model:

Operating Manual	$(000)	IRR
Value of the Property	$ 31,666	12.78%
Value of the Mortgage Component	$ 20,583	8.50%
Value of the Equity Component	$ 11,083	18.00%

Cash Flows for IRR Calcs	Year	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Total Property		$ (31,666)	$ 1,355	$ 2,816	$ 3,911	$ 4,028	$ 4,149	$ 4,274	$ 4,402	$ 4,534	$ 4,670	$ 44,858
Mortgage		$ (20,583)	$ 1,989	$ 1,989	$ 1,989	$ 1,989	$ 1,989	$ 1,989	$ 1,989	$ 1,989	$ 1,989	$ 18,820
Equity		$ (11,083)	$ (634)	$ 827	$ 1,922	$ 2,039	$ 2,160	$ 2,285	$ 2,413	$ 2,545	$ 2,681	$ 26,038
Debt Coverage Ratio			0.68	1.42	1.97	2.03	2.09	2.15	2.21	2.28	2.35	2.42

Proof of Value

	Total Property Present Value				Mortgage Component Present Value				Equity Component Present Value			
	Year	Net Income Before D.S.	PV Factor @ 12.8%	Discounted Cash Flow	Year	Mortgage Payment	PV Factor @ 8.43%	Discounted Cash Flow	Year	Net Income to Equity	PV Factor @ 18.0%	Discounted Cash Flow
	1	$ 1,355	0.886674	$ 1,201	1	$ 1,989	0.922256	$ 1,834	1	$ (634)	0.847458	$ (537)
	2	$ 2,816	0.786190	$ 2,214	2	$ 1,989	0.850555	$ 1,692	2	$ 827	0.718184	$ 594
	3	$ 3,911	0.697094	$ 2,726	3	$ 1,989	0.784430	$ 1,560	3	$ 1,922	0.608631	$ 1,170
	4	$ 4,028	0.618095	$ 2,490	4	$ 1,989	0.723445	$ 1,439	4	$ 2,039	0.515789	$ 1,052
	5	$ 4,149	0.548048	$ 2,274	5	$ 1,989	0.667201	$ 1,327	5	$ 2,160	0.437109	$ 944
	6	$ 4,274	0.485940	$ 2,077	6	$ 1,989	0.615330	$ 1,224	6	$ 2,285	0.370432	$ 846
	7	$ 4,402	0.430870	$ 1,897	7	$ 1,989	0.567491	$ 1,129	7	$ 2,413	0.313925	$ 757
	8	$ 4,534	0.382041	$ 1,732	8	$ 1,989	0.523372	$ 1,041	8	$ 2,545	0.266038	$ 677
	9	$ 4,670	0.338746	$ 1,582	9	$ 1,989	0.482683	$ 960	9	$ 2,681	0.225456	$ 604
	10	$ 44,858	0.300357	$ 13,473	10	$ 18,820	0.445157	$ 8,378	10	$ 26,038	0.191064	$ 4,975
		Total Property Value		$ 31,666		Mortgage Component Value		$ 20,583		Equity Component Value		$ 11,083
Year 10 Cash Flow Calculations		Year 10 net income of		$ 4,810		Year 10 mort. payment of		$ 1,989		Year 10 net inc. to equity of		$ 2,821
		plus reversion of		$ 40,048		plus the RMB of		$ 16,831		plus the equity residual of		$ 23,217
Reversion Calculations for Proof		Year 11 Net Income of $4954				The reversion is the remaining mortgage				Net Sales Price (cell F37)		$ 40,048
		capitalized at 12% equals		$ 41,286		balance (RMB) of the loan in at the end				Less: RMB		$ 16,831
		Less: Selling Expenses		$ 1,239		of year 10.				Equals: Equity Residual		$ 23,217
		Equals: Net sales price		$ 40,048								

Figure 36 – *Output* Sheet, showing valuation based on the Loan-to-Value ratio

The value of the property, using the Loan-to-Value ratio to size the mortgage, is $31,666,000, rounded to $31,600,000. This figure is contained in cell D6.

Cell D7 shows that the value of the mortgage component is $20,583,000, or 65% of total value. Cell D8 shows that the value of the equity component is $11,083,000, or 35% of total value.

The IRR for the total property, or total property yield, calculates to 12.78% in cell F6.

The same process is performed to calculate the IRR for the mortgage component in cell F7. It is comforting to know that the IRR is 8.5%, which is the mortgage interest rate specified on the *Input* sheet. Similarly, the equity IRR or equity yield calculates to 18% in cell F8.

Cells B10 - N13 show the cash flows used in the IRR calculations; the year 10 flows (cells N11, N12, and N13) include both the annual cash flow as well as the reversion to each component of value. The reversion for each component is shown in rows 34 to 37 under "Reversion Calculations for Proof."

Row 14 shows the Debt Coverage Ratio for each year of the holding period.

The remaining portion of the Loan-to-Value section (rows 16 to 37) contains three tables that prove the yield calculations by showing the actual cash flow to each

component discounted at the appropriate yield rate. The sum of the annual discounted cash flows plus the discounted residual value should equal the value of that particular component.

Cells C16 to F37 shows the proof for the total property yield.

The next table, starting in Cell G16, proves the IRR of the mortgage component. Note that the interest rate used is 8.43%, not the 8.5% mortgage interest rate. The reason that this rate is different from the mortgage interest rate is due to the difference between the monthly payments used to calculate the mortgage payments and the yearly discounting used in the proof of value. The annual payment is assumed to be 12 times the monthly payment, which needs to be discounted at a slightly lower rate of interest to obtain the correct answer. Be assured that the software is correctly handling this situation.

The last table starting in cell K16 proves the equity yield of 18%.

These three tables prove the calculations of the Hotel Capitalization Software. They demonstrate that a total property value of $31,666,000 is the only value that would fulfill the requirements and assumptions set forth above, based on the cash flow projections for the proposed Sheraton hotel, the yield requirements of the debt and equity components, and the reversionary sale assumptions.

	B	C	D	E	F	G	H	I	J	K	L	M	N
39	DCR Model:												
40	Operating Manual		$(000)		IRR								
41	Value of the Property		$ 32,418		12.41%								
42	Value of the Mortgage Component		$ 22,418		8.50%								
43	Value of the Equity Component		$ 10,000		18.00%								
44													
45	Cash Flows for IRR Calcs	Year	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
46	Total Property		$ (32,418)	$ 1,355	$ 2,816	$ 3,911	$ 4,028	$ 4,149	$ 4,274	$ 4,402	$ 4,534	$ 4,670	$ 44,858
47	Mortgage		$ (22,418)	$ 2,166	$ 2,166	$ 2,166	$ 2,166	$ 2,166	$ 2,166	$ 2,166	$ 2,166	$ 2,166	$ 20,497
48	Equity		$ (10,000)	$ (811)	$ 650	$ 1,745	$ 1,862	$ 1,983	$ 2,108	$ 2,236	$ 2,368	$ 2,504	$ 24,360
49	Debt Coverage Ratio			0.63	1.30	1.81	1.86	1.92	1.97	2.03	2.09	2.16	2.22
50													
51	Proof of Value		Total Property Present Value				Mortgage Component Present Value				Equity Component Present Value		
52			Net Income	PV Factor @	Discounted		Mortgage	PV Factor @	Discounted		Net Income	PV Factor @	Discounted
53		Year	Before D.S.	12.41%	Cash Flow	Year	Payment	8.43%	Cash Flow	Year	to Equity	18.00%	Cash Flow
54		1	$ 1,355	0.889615	$ 1,205	1	$ 2,166	0.922256	$ 1,998	1	$ (811)	0.847458	$ (687)
55		2	$ 2,816	0.791415	$ 2,229	2	$ 2,166	0.850555	$ 1,842	2	$ 650	0.718184	$ 467
56		3	$ 3,911	0.704054	$ 2,754	3	$ 2,166	0.784430	$ 1,699	3	$ 1,745	0.608631	$ 1,062
57		4	$ 4,028	0.626337	$ 2,523	4	$ 2,166	0.723445	$ 1,567	4	$ 1,862	0.515789	$ 960
58		5	$ 4,149	0.557199	$ 2,312	5	$ 2,166	0.667201	$ 1,445	5	$ 1,983	0.437109	$ 867
59		6	$ 4,274	0.495692	$ 2,118	6	$ 2,166	0.615330	$ 1,333	6	$ 2,108	0.370432	$ 781
60		7	$ 4,402	0.440975	$ 1,941	7	$ 2,166	0.567491	$ 1,229	7	$ 2,236	0.313925	$ 702
61		8	$ 4,534	0.392298	$ 1,779	8	$ 2,166	0.523372	$ 1,134	8	$ 2,368	0.266038	$ 630
62		9	$ 4,670	0.348994	$ 1,630	9	$ 2,166	0.482683	$ 1,046	9	$ 2,504	0.225456	$ 564
63		10	$ 44,858	0.310470	$ 13,927	10	$ 20,497	0.445157	$ 9,124	10	$ 24,360	0.191064	$ 4,654
64			Total Property Value		$ 32,418		Mortgage Component Value		$ 22,418		Equity Component Value		$ 10,000
65													
66	Year 10 Cash Flow Calculations		Year 10 net income of		$ 4,810		Year 10 mort. payment of		$ 2,166		Year 10 net inc. to equity of		$ 2,644
67			plus reversion of		$ 40,048		plus the RMB of		$ 18,331		plus the equity residual of		$ 21,717
68													
69	Reversion Calculations for Proof		Year 11 Net Income of $4954				The reversion is the remaining mortgage				Net Sales Price (cell F72)		$ 40,048
70			capitalized at 12% equals		$ 41,286		balance (RMB) of the loan in at the end				Less: RMB		$ 18,331
71			Less: Selling Expenses		$ 1,239		of year 10.				Equals: Equity Residual		$ 21,717
72			Equals: Net sales price		$ 40,048								

Figure 37 – *Output* Sheet, showing valuation based on the Debt Coverage ratio

Figure 37 (previous page) shows the value of the property using the Debt Coverage ratio to size the mortgage. The value (cell D41) is $32,418,000, rounded to $32,400,000. Compare this to the $31,66,000 value obtained in Figure 36 on page 88. The appraiser should give more weight to the value that contains lending criteria most likely to be used at the time of the appraisal.

The remainder of the Debt Coverage Ratio section is organized identically to the Loan-to-Value section.

Printing in the HCS Program

The Excel **Report Manager** is used to produce printed output. Figure 38 shows the report manager dialog box, which is called using the **View, Report Manager** menu command. If the **Report Manager** is not available, see pages 55 and 56 for instructions on how to add it.

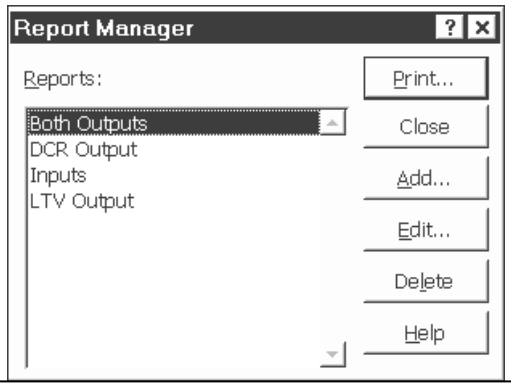

Figure 38 – The Report Manager dialog box in the HCS program

There are four reports available in **Report Manager** of the HCS program; all are listed in figure 38. To print, simply highlight the desired report and click on the **Print** box.

The reports correspond to the *Input* sheet and various views of the *Output* sheet in the HCS program. All reports are formatted to use a minimal amount of paper. The four reports contain the following:

- Inputs – The entire Input sheet.
- Both Outputs - Prints both the Loan-to-Value ratio output and the Debt Coverage ratio based output sections.
- DCR Output - Prints only the Debt Coverage ratio based output section.
- LTV Output - Prints only the Loan-to-Value ratio based output section.

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Conclusion

Hospitality Valuation Software provides the necessary computing tools to assist appraisers in performing hotel market studies, financial forecasts and income approach valuations. When combined with a thorough knowledge of the market, an understanding of the unique hotel operating characteristics and consideration of the cost and sales comparison approaches, an appraiser should be able to develop a supportable estimate of operating performance and value by utilizing this software.

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