

Hotel Valuation Software

6th edition, Version 6.0

Operating and Use Guide

by Steve Rushmore, MAI, CHA and Jan A. deRoos, Ph.D.

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Chapter 1 Introduction to the Hotel Valuation Software

Version 6.0 of the Hotel Valuation Software remains the only non-proprietary computer software designed specifically to assist in the preparation of hotel market studies, forecasts of income and expense, and valuations. The software provides a mathematical framework, and user-friendly way for analysts and consultants to implement computer-based forecasts and valuations. Using established methodology, the Hotel Valuation Software is a sophisticated tool for hotel professionals.

The tool consists of three separate software programs written as Microsoft Excel® workbooks and a software manual. Version 6.0 can be run in one of two ways:

- Using Microsoft Excel® on the Windows® or OSX® operating systems, or;
- Using Google Sheets® and an Internet Browser, such as Firefox®, Google Chrome®, Safari®, Opera®, Microsoft Edge® or Internet Explorer®.

Use of the software manual requires a computer capable of reading Adobe® PDF files.

All output is formatted for a standard laser printer using 8½ by 11-inch or A4 paper. The programs and their contents are outlined below.

Version 6.0 of the Hotel Valuation Software contains significant enhancements over Version 5.0 which is no longer distributed. Version 4.0 is available to those who purchased the text: *Hotel Market Analysis and Valuation- International Issues and Software Applications* from the Appraisal Institute. Version 4.0 only runs on Windows and the user interface is not particularly user-friendly. Hotel Valuation Software is also available in Mandarin.

Hotel Market Analysis and ADR Forecasting Model (HMA.XLSX)

The Hotel Market Analysis and ADR Forecasting Model performs several functions:

- Enables the analyst 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 a specific existing hotel or proposed hotel in a local market. The program incorporates such factors as competitive occupancies,

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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.

- Produce a forecast of Average Daily Rate (ADR) for a specific existing hotel or proposed hotel in a local market over a ten-year projection period. The program incorporates factors such as expected inflation, current room rates by segment and the market mix of the specific existing or proposed hotel.

Hotel Revenue and Expense Forecasting Model (HREF.XLSX)

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 analyst 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
- The preferred future average daily rates for the subject hotel
- Base year operating data for the subject hotel
- Expected inflation rates for revenues and expenses

Hotel Mortgage- Equity Valuation Model (HMEV.XLSX)

A discounted cash flow valuation model utilizing the mortgage-equity technique forms the basis for this program which values a hotel using three different loan underwriting criteria:

- 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.
- A debt yield, in which the size of the mortgage is based on property level cash flow.

By inputting the terms of typical hotel financing, along with a forecast of revenue and expense, the program determines the value that provides the stated returns to the mortgage and equity components. The program produces an estimate of value based on a 5-year and a 10-year holding period. Users desiring to value a property assuming a refinancing of the property during the holding period should request version 4.0 of the Hotel Valuation Software, as the calculations require the use of Visual Basic code compatible only with a PC using Excel[®] on the Windows[®] operating system.

Developers

The software models were developed by Steve Rushmore, MAI, CHA and Jan A, deRoos, PhD. The software programs rely on work by Suzanne Mellen, CRE, MAI,

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and Stephen Rushmore, Jr., MAI, FRICS. Within the manual, each program is thoroughly described and illustrated with a case study example.

Instruction Manual

The purpose of this manual is to provide a complete description of the three programs comprising the Hotel Valuation Software, 6.0 and to show how these programs assist in performing a hotel market study and valuation.

The manual starts with a general overview of the various steps involved in developing a hotel 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 Hotel Market Analysis and ADR Forecasting Model (HMA) is described and demonstrated in this section. Once the subject hotel's occupancy and ADR has been projected, the manual then turns to the task of producing the ten-year forecast of revenue and expense using the Hotel Revenue and Expense Forecasting Model (HREF). The final step demonstrates the valuation process, which employs a discounted cash flow valuation model known as the Hotel Mortgage-Equity Valuation Model (HMEV). Interwoven throughout the manual is a realistically simulated case study that illustrates how an analyst can utilize the Hotel Valuation Software for all types of hotel 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 Hotel Valuation Software manual assumes the user has a working knowledge of personal computers and Microsoft Excel[®] (or Google Sheets[®]). If you are not familiar with retrieving and saving a file, using the cursor and the keyboard to enter information and data, and printing, please consult online or print instructional materials for Microsoft Excel[®], Microsoft Office[®], or Google Sheets[®] before proceeding.

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

**The Software is Not
Supported**

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Acknowledgements**

Hotel Valuation Software is a registered trademark of Jan A. deRoos and Steve Rushmore.

All tradenames are the registered marks of their respective companies.

Acknowledgements

Development of the Hotel 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 created by Steve Rushmore for the needs of his firm- HVS, an international appraisal and consulting firm, specializing in the hotel industry. The first public edition of the software was released in 1990 and has continued to evolve into a highly sophisticated set of programs. Hotel Valuation Software utilizes the same mathematical methodology as the software used by the consultants of HVS.

Providing this computer software to the profession represents a continued attempt to provide state-of-the-art tools and knowledge so that hotel investors and analysts can advance their ability to produce top-quality hotel market studies and appraisals. The work rests on the efforts of many individuals, with particular contributions by the following people and firms.

The authors would like to express their sincere thanks to the entire staff of HVS. In particular we are indebted to Suzanne Mellen, managing director 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), and in ("Hotel Values in Transition: An Appraised Technique for These Uncertain Times" HVS, January 2009) and to Stephen Rushmore, Jr for his helpful suggestions on this release and his work on HREF (see "Updated Benchmarks for Projecting Fixed and Variable Components of Hotel Financial Performance" by Stephen Rushmore, Jr. and John W. O'Neill, *Cornell Hospitality Quarterly*, 56(1) 2015.)

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About the Authors

Steve Rushmore, MAI, CHA is the Founder of HVS, a global hospitality consulting organization with 35 offices around the globe. He focuses on HVS's future office expansion and new product development. Steve has provided consultation services for more than 15,000 hotels throughout the world during his 40-year career and specializes in complex issues involving hotel feasibility, valuation and financing. He was one of the creators of the Microtel concept and was instrumental in its IPO. Steve is a partner in HEI Hospitality, LLC, a hotel investment fund.

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Jan A. deRoos, Ph.D. is the HVS Professor of Hotel Finance and Real Estate at the School of Hotel Administration at the Cornell SC Johnson College of Business. 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, hotel management contracts, hotel development and construction, and the timeshare/vacation ownership industry. A frequent speaker on these topics, Dr. deRoos contributed to lodging industry conferences worldwide and frequently conducts seminars for senior executives at such companies as Four Seasons Hotels and Resorts, Hilton Hotels and Resorts, and Jumeirah Group.

He was one of the principal researchers on the Lodging Property Index, a quarterly report on total returns to lodging property, now part of the NCREIF Indexes. He has authored numerous publications on the topic of lodging valuation, lodging investment analysis, and the seminal text on hotel management agreements, "The Negotiation and Administration of Hotel Management Contracts", 5th edition in 2018.

He created the acclaimed on-line certificate in Hotel Real Estate Investments and Asset Management that focuses on developing a comprehensive knowledge base and tool set that enables learners to fully understand the complex dynamics surrounding

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the hotel real estate and management contracts from the point of view of the property owner, operator, and lender.

Chapter 2 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 hotel facility is pure coincidence.

The Case Study assumes the analyst is standing at the beginning of year 1 (January 1, 2021), looking back at the market's actual operating performance for the base year of 2020 (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 2023 (year 3). For clarity, think of the time line as follows:

Year 0 - Base Year	2020
Year 1 - Date of Study	2021
Year 3 - Date of Sheraton Opening	2023

The proposed Sheraton Hotel will be located at the southeast corner of I-495 and County Route 110, 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 2021 with an opening date scheduled for January 1, 2023. 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 group 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 swimming pool & exercise facility

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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, 2023 (January 1 of year 3). The financial projections will commence as of this date utilizing current (inflated) dollars for each projection year.

Chapter 3 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 hotel 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. Similarly, based on the average daily rates achieved in various market segments, a model is used to forecast the subject hotel's Average Daily Rate (ADR), based on the market mix established in the analysis of supply and demand.

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 occupancy and ADR's established in 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. The Hotel Valuation Software only provides estimates derived from the income approach.

Chapter 4 Market Study

Occupancy and average rate projections are generally formulated from the market study. This software uses the built-up approach to hotel 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 analysts to quantify this demand. A room night is a unit of hotel demand representing one room occupied by one or more people for one night.

Market Study Overview

The market study consists of two interlinked processes. First, a forecast of occupancy is produced using an analysis of supply and demand. Second, using the supply and demand analysis, plus estimates of average rates in the market, a forecast of Average Daily Rate (ADR) is produced. The HMA spreadsheet handles both processes, but always starts with the occupancy forecast.

Occupancy Forecast 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 guestroom supply growth, the total room nights available, the accommodatable latent demand, and the total usable demand over the forecast period
6. Calculate the area wide 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.

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Step #1: Define the Primary Market Area

The first step in performing a hotel 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 analyst 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.

Getting Started with the HMA software

CASE STUDY

The three workbooks employ a common look and feel and share a common user interface that includes:

- An opening screen with a black colored tab
- Navigation is via a set of tabs along the bottom of the screen.
 - Tabs are color coded to facilitate navigation; blue tabs are for inputs, yellow tabs are for outputs, red tabs are used for calculations, the black tab is the introductory tab and the purple tab contains the software license.

Before starting, it is helpful to cover one last preliminary item, found in the legend of the Primary tab. All three models use the same protocols for cell color, to facilitate the use of software.

- Cells with blue text a light blue background are mandatory inputs.
- Cells with blue text and a light-yellow background are optional inputs.
- Cells with black text and a white background are outputs and do not require an input.
- Cells with black text and a grey background are for error checking or for clarity of format.

The top portion of the *Primary* tab of HMA is shown on the next page as Figure 1. (All "screen shots" were made using on a PC using Windows 10[®] and Excel[®] 2016 for PC). The rightmost panel of Figure 1 contains the legend, with the colors corresponding to various cells found in the workbooks.

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Market Segment Inputs		Project Information		Legend	
Segment #	Market Segments	Job Title	Proposed Sheraton		
1	Commercial	Prepared by	HV Software	Mandatory Input	
2	Group	Prepared for	HV Software Manual	Optional Input	
3	Leisure	Job #	001-001	Output	
4		Base Year	2020	Error Check	
5					

Figure1 – Project Information, Market Segments and Legend from the *Primary* Tab of HMA

CASE STUDY

The middle panel of Figure 1 shows the Project Information, which has been entered in cells F4 through F9; this will vary from firm to firm.

The market for the proposed Sheraton has three market segments, Commercial, Group, and Leisure; these are entered in the left panel labeled “Market Segment Inputs”. The HMA model can handle up to five market segments.

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 analyst 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 to estimate the overall accommodated demand in the market. Accommodated demand is then adjusted for any latent demand that may be present; comprised of unaccommodated and/or induced demand. The 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.

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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 using the case study. We then show how to implement the steps using the Hotel Market Analysis and ADR Forecasting Model (HMA).

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. Examples include secondary hotels that compete for weekend leisure guests or secondary hotels that compete for certain group business.

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 these criteria, the following hotels were identified as primarily competitive with the subject property:

Primary Competition for the proposed Sheraton

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

The following hotels were considered secondarily competitive:

Table 1 – Summary of Secondary Competition

Hotel	Competitive Weighting Factor
Red Roof Inn	50%
Super 8	50%
Microtel	25%
Residence Inn	33%
Delta Inn	40%
All Seasons Hotel	75%

Based on competitive criteria, competitive weighting factors were assigned to each secondary hotel. When used in the 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, 2020, which is midway between the base year period that extends from January 1, 2020, to December 31, 2020. Since the Courtyard only operated for six months, its historic average room count (HARC) is 62 rooms. Similarly, the Residence Inn which opened April 1 of the base year has 100 rooms, but a HARC of 75.

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.

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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	No. of Rooms	HARC	Occ%	Market Segmentation			Comp. Weight
				Commercial	Group	Leisure	
Embassy Suites	200	200	78%	80%	5%	15%	
Hilton Inn	275	275	72	40	50	10	
Radisson Hotel	250	250	68	45	40	15	
Holiday Inn	175	175	73	55	25	20	
Courtyard	124	62 ⁽¹⁾	65	75	5	20	
Ramada Inn	150	150	66	65	20	15	
Island Inn	135	135	62	60	30	10	
Quality Inn	175	175	78	50	10	40	
Days Inn	120	120	74	70	5	25	
Red Roof Inn	110	110	82	60	5	35	50%
Super 8	125	125	78	60	5	35	50%
Microtel	100	100	90	75	0	25	25%
Residence Inn	100	75 ⁽²⁾	77	55	10	35	33%
Delta Inn	83	83	63	65	10	25	40%
Four Seasons	250	250	72	60	30	10	75%

⁽¹⁾ Courtyard opened July 1, 2020

⁽²⁾ Residence Inn opened April 1, 2020

The first nine hotels were considered primary competition to the proposed Sheraton. The next step in using the Hotel Market Analysis and ADR Forecasting Model is to enter data about these hotels into the workbook.

The last six of the hotels set forth above were considered secondary competition to the proposed Sheraton. In order to make the HMA model 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.

Proper Data Entry for an Existing Subject Hotel

If the analyst is charged with performing a market study on an existing hotel in the market, this information should always be entered as Hotel #1 of the *Primary Competitors Screen*. If this is done, the information is automatically transferred to the proper location on all output screens of the HMA model. Entry of the primary and secondary competitor data is illustrated on the following pages.

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**Entering Primary
Competitor Data on
the *Primary* Tab
using HMA**

CASE STUDY

The Room Night Analysis workbook has one tab for primary competitor data and one tab for secondary competitor data entry. In addition, there a tab that provides summary data for primary competitors, secondary competitors and the accommodated demand in the base year.

Figure 2 shows the completed data entry screen for the primary competitors. Note that row 13 of this section contains summary information about the secondary competition. This data automatically carries over from the *Secondary* tab.

We use the Embassy Suites to demonstrate how to enter information. Enter the room count of 200 in column D. Since this property was open for the entire base year, its HARC equals its room count and is automatically copied into column E.

On the other hand, the Courtyard opened July 1, 2020, 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, rooms count is entered in row D as 124 and the HARC is entered as 62 in row E.

Enter the Occupancy and Market Segment data in the appropriate columns; Column L serves as a check to make sure that the market segments add to 100%. Enter these figures as integers (e.g. 78 for the Embassy Suites occupancy) the program automatically converts these to percentages.

Primary Competitors		Property Data			Estimated Market Segmentation				Check
Hotel #	Property	# Rooms	Hist ARC	Occupancy	Commercial	Group	Leisure		
N/A	Secondary Competition	389	389	75%	61%	17%	22%		100%
1	Embassy Suites	200	200	78%	80%	5%	15%		100%
2	Hilton Inn	275	275	72%	40%	50%	10%		100%
3	Radisson Hotel	250	250	68%	45%	40%	15%		100%
4	Holiday Inn	175	175	73%	55%	25%	20%		100%
5	Courtyard	124	62	65%	75%	5%	20%		100%
6	Ramada Inn	150	150	66%	65%	20%	15%		100%
7	Island Inn	135	135	62%	60%	30%	10%		100%
8	Quality Inn	175	175	78%	50%	10%	40%		100%
9	Days Inn	120	120	74%	70%	5%	25%		100%
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
	Total	1,993	1,931						

Figure 2 – Primary Competitor Inputs from the *Primary* Tab of HMA

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**Important Note!
Proper Data Entry
for an Existing
Subject Hotel**

**Use of the
Secondary Tab of
HMA**

If the analyst is charged with performing a market study on an existing hotel in the market, this information should always be entered in row 14 as Hotel #1 of the *Primary* tab. When this is done, the information is automatically transferred to the proper location on the *OccOutput A* tab of the HMA model.

CASE STUDY

The data entry process for the secondary competitors is similar to the primary competitors; identify the properties, specify room counts, the HARC and the occupancy, market segmentation. The only difference is that the competitive weighting factor must be entered to produce an effective room count and an effective HARC. Figure 3 below shows the property data and calculations.

The *Secondary* tab of the RNA program contains two input sections as shown below in Figure 3. Columns C through I require property data, while columns J through N require market segmentation data.

To use the *Secondary* tab, the analyst starts by entering the name of each secondary competitor in column C. The *Secondary* tab can accommodate up to 20 properties.

Enter the competitive weighting factor and number of rooms in columns D and E. Using the Red Roof Inn as an example, the competitive weight of 50% and the room count of 110, as detailed in Table 2 on page 16.

Secondary Competitors		Property Data						Estimated Market Segmentation			
Hotel #	Property	Comp. %	# Rooms	Eff Rooms	HARC	Eff HARC	Occupancy	Commercial	Group	Leisure	Check
1	Red Roof Inn	50%	110	55	110	55	82%	60%	5%	35%	100%
2	Super 8	50%	125	63	125	63	78%	60%	5%	35%	100%
3	Microtel	25%	100	25	100	25	90%	75%		25%	100%
4	Residence Inn	33%	100	33	75	25	77%	55%	10%	35%	100%
5	Delta Inn	40%	83	33	83	33	63%	65%	10%	25%	100%
6	All Seasons Hotel	75%	250	188	250	188	72%	60%	30%	10%	100%
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
Totals				768	397	743	389				
Averages											

Figure 3 – Secondary Competitors Property Data from the *Secondary* Tab of HMA

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**Use of the
Secondary Tab of
HMA, continued**

CASE STUDY

The program automatically calculates the Effective Room Count in column F, by multiplying the competitive weighting factor by the room count.

Similar to the *Primary* tab, the *Secondary* tab keeps track of any difference between a hotel's room count and its HARC. In this case study, the 100-room Residence Inn opened on April 1 of 2020, which is one-quarter of the way through the base year. Its HARC is therefore 75% of its room count or 75 rooms ($75\% \times 100 = 75$). For the Residence Inn, the room count is entered in row E as 100 and the HARC is entered in row G as 75. The program calculates an Effective HARC in column H, by multiplying the competitive weighting factor by the HARC.

Enter the occupancy for each property in column I. Simply enter the number 82 for the Red Roof Inn; the program automatically converts this to a percent.

Columns J through N are for the market segmentation percentages. The market segments are defined on the *Primary* sheet and are labeled Commercial, Group, and Leisure. Enter the segmentation figures as whole numbers; the program automatically converts them to percentages.

Column O 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 4 and transfers this data to the *Primary* sheet.

Room Nights						Average
Commercial	Group	Leisure		Total		Occupancy
9,877	823	5,762		16,462		
10,762	897	6,278		17,936		
6,159		2,053		8,213		
3,864	703	2,459		7,026		
4,932	759	1,897		7,588		
29,644	14,822	4,941		49,406		
65,239	18,003	23,389		106,631		
61.18%	16.88%	21.93%				75.10%

Figure 4 - Summary data from *Secondary* Tab of HMA

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CASE STUDY (continued)

The weighted average occupancy percentage is found in cell V26 (75.10%).

The *Secondary* tab 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 H25)	389
Commercial Segment Percentage (cell P26)	61.18%
Group Segment Percentage (cell Q26)	16.88%
Leisure Segment Percentage (cell R26)	21.93%
Occupancy (cell V26)	75.10%

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

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

$$\text{Historic Average Room Count} \times \text{Occupancy} \times \text{Market Segmentation} \\ \text{Percentage} \times 365 = \text{Room Nights Accommodated in the Market} \\ \text{Segment}$$

Use of the *Demand-Base Year* Tab of the HMA

This process is repeated for each of the competitive hotels in the market area. The number of room nights accommodated for each market segment at each hotel is then combined to give the market area’s current accommodated room night demand. These data are used to produce a set of summary information for the base year:

- Accommodated Room Nights Demand, by hotel, by segment, and total room night demand.
- Competitive Indices, by hotel, by segment
- Overall accommodated room night demand, market segmentation, and market occupancy.

Figure 5 on the next page shows the *Accommodated Demand Base Year* screen, which summarizes information for the entire competitive set.

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Hotel Market Analysis and ADR Forecasting Model - Demand Base Year Sheet										www.hotelvaluationsoftware.com		
Competitors	Room Nights Sold by Market Segment			Fair	Overall	Market Segment Competitive Indices			Total Accommodated Demand Output			
	Commercial	Group	Leisure	Share	Comp. Index	Commercial	Group	Leisure	Segment	Base Year Rm Nights	Segment Percent	
Secondary Competition	65,239	18,003	23,389	20.1%	104.2%	110%	76%	119%				
Embassy Suites	45,552	2,847	8,541	10.4%	108.2%	150%	23%	85%	1 Commercial	293,717	57.8%	
Hilton Inn	28,908	36,135	7,227	14.2%	99.9%	69%	217%	52%	2 Group	117,193	23.1%	
Radisson Hotel	27,923	24,820	9,308	12.9%	94.3%	73%	164%	74%	3 Leisure	97,240	19.1%	
Holiday Inn	25,646	11,657	9,326	9.1%	101.3%	96%	110%	106%	4			
Courtyard	11,032	735	2,942	3.2%	90.2%	117%	20%	94%	5			
Ramada Inn	23,488	7,227	5,420	7.8%	91.5%	103%	79%	72%	TOTAL	508,149	100.0%	
Island Inn	18,330	9,165	3,055	7.0%	86.0%	89%	112%	45%				
Quality Inn	24,911	4,982	19,929	9.1%	108.2%	94%	47%	226%	Market Occupancy	72.1%		
Days Inn	22,688	1,621	8,103	6.2%	102.6%	124%	22%	134%				

Figure 5 – Demand-Base Year Tab from RNA program

**Base Year
Accommodated
Demand**

**Fair Share and
Competitive Index
Defined**

CASE STUDY

The *Demand-Base Year* tab presents several sets of information. In columns C through G, the sheet displays Room Nights Sold by Market Segment, calculated according to the formula presented on the previous page. When totaled for the market as a whole, these figures are known as the base year accommodated demand.

Second, the fair share for each hotel is shown in column H. 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.

Third, competitive indices are shown in columns I through M. The competitive index is used to assess the relative competitiveness of each hotel, as a whole and within each market segment. The "Overall Competitive Index" figures in column I represents the amount of business captured by a particular hotel as compared to that hotel's fair share. The "Market Competitive Index" figures in columns I through M represent the 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 Group 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 34. The "heat map" formatting of this section provides a quick visual check.

Lastly, the "Total Accommodated Demand Output" section at the right contains the "market data;" the grand total of the room nights per segment data, presented in Column R of the tab. In addition, overall market segmentation is shown in column S and the overall market occupancy is presented in cell R13.

Overall this market ran a 72.1% occupancy in the base year with 57.8% of the market consisting of commercial demand, 23.1% consisting of group demand and 19.1% consisting of Leisure demand.

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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 hotel 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 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 hotel facilities are filled. Because this type of demand is not actually accommodated by the area’s hotel facilities, it is not 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 hotel rooms increases, more of the unaccommodated demand will be accommodated during periods of peak visitation. Because these uncounted room nights help cushion the dilution effect of adding more rooms to a market, it becomes important to quantify the amount of unaccommodated visitation currently attempting to utilize hotel facilities in the area. One of the ways the hotel industry quantifies unaccommodated demand by tracking “turn-away” business, the number of reservations that cannot be taken because a hotel is sold out.

Unaccommodated demand is brought into the market analysis as accommodated demand when new rooms added to the market which can now 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 is covered in Step #5: Quantify the Area’s Total Guestroom Supply and the Total Room Nights Available (see page 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:

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- The opening of new hotels that offer previously unsupplied amenities such as extensive group 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.

**Latent Demand for
the Proposed
Sheraton**

CASE STUDY

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 an analysis of turn-away business in 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 Demand	Unaccommodated Percentage
Commercial	293,895	23,511	8%
Group	117,205	5,860	5%
Leisure	97,287	2,919	3%

The opening of the proposed Sheraton is expected to create induced demand in the group 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 (2023)	20%	3,000 room nights
Year #2 of operation (2024)	60%	9,000 room nights
Year #3 of operation (2025)	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 Demand* tab shows the portion of the HMA model where the unaccommodated and induced demand are entered. The completed tab is shown in Figure 6, followed by instructions for its use.

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Hotel Market Analysis and ADR Forecasting Model - Latent Sheet				www.hotelvaluationsoftware.com						
Assumptions for Unaccommodated and Induced Demand										
Segment	Unaccommodated		Induced Demand	Phase In for Induced						
	Percent	Room-Nights		2021	2022	2023	2024	2025	2026	2027
Commercial		23,511								
Group		5,860	15000			20%	60%	100%	100%	100%
Leisure		2,919								
		-								
		-								

Figure 6 – *Latent Demand* Tab from HMA model

Using the *Latent Demand* Tab of HMA

CASE STUDY

Unaccommodated demand can be entered as a percentage of segment demand in column C, or as a number of room nights for the segment in column D as shown in Figure 6. Be sure to enter the unaccommodated demand only once.

If the market contains induced demand, the number of total induced room nights is entered into the appropriate market segment of column E. The phase-in percentage is entered in the appropriate year, under the appropriate market segment. Because the proposed Sheraton does not open until projection year three, the phase-in starts at that point with 20% entered in 2023, 60% in 2024, and 100% in 2025. Unless a percentage is entered in the phase-in section, the HMA model assumes that none of the induced demand will be utilized.

Note that Figure 6 shows only the first seven years of a potential 10-year phase-in period.

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

Because a market study and valuation require the analyst 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.

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.

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Using the *Demand Base Year* Tab of HMA

CASE STUDY

Historical data on market supply and demand is available from various sources. Table 4 below contains a summary of supply, demand, and occupancy data 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* tab, as this data source 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 (%)
2010	691,075	990,083	69.8%
2011	685,125	1,018,286	67.3%
2012	663,639	1,028,256	64.5%
2013	671,023	1,036,876	64.7%
2014	707,644	1,058,952	66.8%
2015	740,023	1,109,618	66.7%
2016	783,857	1,165,655	67.3%
2017	837,987	1,205,831	69.5%
2018	880,664	1,238,459	71.1%
2019	916,270	1,283,078	71.4%

The historic supply and demand data are entered on the *Demand Inputs* tab of the HMA spreadsheet. As illustrated below in Figure 7, this portion of the spreadsheet not only calculates historical occupancies, it also calculates annual and compound supply and demand growth rates.

Historical Market Growth Rate											
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Average
Room Demand	691,075	685,125	663,639	671,023	707,644	740,023	783,857	837,987	880,664	916,270	
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	
Occupancy	69.80%	67.28%	64.54%	64.72%	66.82%	66.69%	67.25%	69.49%	71.11%	71.41%	
Yearly Change in Demand		-0.86%	-3.14%	1.11%	5.46%	4.58%	5.92%	6.91%	5.09%	4.04%	3.23%
Yearly Change in Supply		2.85%	0.98%	0.84%	2.13%	4.78%	5.05%	3.45%	2.71%	3.60%	2.93%
		9 Years	8 Years	7 Years	6 Years	5 Years	4 Years	3 Years	2 Years	1 Year	
Compound Growth in Demand		3.18%	3.70%	4.72%	5.33%	5.30%	5.49%	5.34%	4.57%	4.04%	
Compound Growth in Supply		2.92%	2.93%	3.21%	3.61%	3.91%	3.70%	3.25%	3.15%	3.60%	
Assumed Compound Supply Growth for Supply Addn sheet		2.92%									

Figure 7 – Historical Market Growth Portion of *Demand Inputs* Tab from RNA program

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CASE STUDY (continued)

To use this screen, simply enter the annual Room Night Demand and Room Night Supply as shown in Figure 7. 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.

Growth Rates of Accommodated and Unaccommodated Demand

The forecast of both direction and rate of change in room night demand is 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. Thus, the program provides the flexibility to specify these growth rates separately.

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	2011	2012	2013	Stabilized
Commercial	5.0%	4.0%	3.0%	3.0%
Group	2.0%	2.5%	2.75%	2.75%
Leisure	1.5%	1.5%	1.5%	1.5%

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Enter data from Table 5 into the *Demand Growth Rates* screen as shown in Figure 8.

Hotel Market Analysis and ADR Forecasting Model - Demand Inputs Sheet											www.hotelvaluationsoftware.com
Accommodated Demand Growth Rates											Compound
Segment	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	Growth
Commercial	5.00%	4.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.30%
Group	2.00%	2.50%	2.75%	2.75%	2.75%	2.75%	2.75%	2.75%	2.75%	2.75%	2.65%
Leisure	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%
Weighted Average	3.69%	3.22%	2.68%	2.68%	2.69%	2.69%	2.69%	2.70%	2.70%	2.70%	2.84%
Unaccommodated Demand Growth Rates											Compound
Segment	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	Growth
Commercial	5.00%	4.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.30%
Group	2.00%	2.50%	2.75%	2.75%	2.75%	2.75%	2.75%	2.75%	2.75%	2.75%	2.65%
Leisure	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%

Figure 8 – Entering Growth Rates on the *Demand Inputs* Tab

Entering Demand Growth Data in the *Demand Inputs* Tab of HMA

CASE STUDY

The top portion of Figure 8 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 2021, so the 5% growth factor is entered as shown. A commercial demand growth rate of 4% is entered for 2022, and the stabilized growth rate of 3% is entered for 2023. 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, years 2024 - 2030 automatically pick up the 3% growth rate entered for 2023.

The group growth rates are entered in row 6 and the leisure growth rates are entered in row 7.

Note the weighted average growth rate for accommodated demand is calculated automatically. This gives the analyst a good overall view of projected market demand growth, by year and by segment.

The bottom portion of Figure 8 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 this section of the screen.

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Step #5: Quantify the market area’s guestroom supply growth, the total room nights available, the accommodatable latent demand, and the total usable demand over the forecast period

**Total Guestroom
Supply**

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

The analyst 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 hotel supply or whether it should be 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 analyst estimated that there was only a 50% chance that this project would be built. When totaling the size of the competitive supply, the analyst 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 HMA model handles this calculation automatically.

**Accommodatable
Latent Demand**

If the analyst 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

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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 area wide 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. HMA assumes that the new supply added to a market is able to accommodate latent demand based on the annual market occupancy. The calculations are as follows:

$$\text{Accommodatable Latent Demand} = \text{Total New Supply (Room Nights)} * \text{Annual Market Occupancy Percentage}$$

$$\text{Total Latent Demand} - \text{Accommodatable Latent Demand} = \text{Unaccommodatable Latent Demand}$$

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.

The HMA model automatically handles all the latent demand calculations in the background on the *Demand Cals* tab 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, 2023, there are two other hotel facilities currently under construction that will be added to the hotel supply during the projection period. These two hotels are:

- 140-room Best Western Hotel scheduled to open October 1, 2021
- 200-unit Marriott Suite Hotel scheduled to open January 1, 2022

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

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Use of the *Supply Addn* Tab

The *Supply Addn* tab shows the portion of the HMA model where the additions to supply are entered. The completed sheet, based on the Case Study information, is shown in Figure 9, together with instructions for its use.

Hotel Market Analysis and ADR Forecasting Model - Supply Additions Sheet												www.hotelvaluationsoftware.com	
Proposed Hotels to Be Added													
Hotel		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	
	HARC in Base Year		1931	1931	1931	1931	1931	1931	1931	1931	1931	1931	
			Enter the average room count for the year for each year the new hotel is open, pro-rate if a hotel opens part way through a year.										
1	Proposed Sheraton	N/A			250	250	250	250	250	250	250	250	
2	Best Western	N/A	35	140	140	140	140	140	140	140	140	140	
3	Marriott Suites	N/A		200	200	200	200	200	200	200	200	200	
4		N/A											
5		N/A											
6		N/A											
7		N/A											
8		N/A											
9		N/A											
10	Long-Term Supply Growth	2.70%				70	142	216	291	369	449	531	
	Total New Rooms		35	340	590	660	732	806	881	959	1039	1121	
	Change in Base Year HARC	70	70	70	70	70	70	70	70	70	70	70	
	Total Supply at Year End	2001	2036	2341	2591	2661	2733	2807	2882	2960	3040	3122	
	Total Room Nights Available	704,815	743,140	854,465	945,715	971,249	997,473	1,024,405	1,052,064	1,080,469	1,109,642	1,139,602	
	Unadjusted Market Occupancy	76.68%	75.39%	67.67%	63.10%	63.69%	64.26%	64.21%	64.17%	64.13%	64.09%	64.05%	
	Adjusted Market Occupancy	72.10%	74.75%	67.67%	63.10%	63.69%	64.26%	64.21%	64.17%	64.13%	64.09%	64.05%	

Figure 9 – The *Supply Addn* tab

Accounting for the Change in HARC

Important Note! 🚨

Proper Data Entry for a Proposed Subject Hotel

CASE STUDY

The top row of figures contains the number of existing hotel rooms in the market area during the base year (2020). The room count of 1,931 rooms is the total of the historic average room count entered for each competitive hotel on the *Primary* tab. Remember that the HARC is weighted for those hotel rooms that open during the base year.

Note year 2020 ends with a total of 2,001 rooms. The additional 70 rooms represent the Courtyard and the Residence Inn, both of which were partially open during the base year. The program considers these 70 rooms as new rooms opening at the end of the base year, and shows their effect in row 18, entitled “Change in HARC.”

If the subject property is a proposed hotel, **it must be entered** as the first proposed hotel. When this is done, the information is automatically transferred to the proper location on the *OccOutput B* tab of the HMA model.

Enter a proposed hotel’s room count under the year it opens in the appropriate row. The spreadsheet formulas refer to the room count contained in the preceding cell (to the left) so whatever number is entered into this cell is copied across to the right. The proposed Sheraton will enter the market on January 1, 2023, with 250 rooms. The room count of 250 is entered into cell H7.

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Long Term Supply Growth

CASE STUDY (continued)

The Best Western hotel is under construction and is scheduled to open October 1, 2021, 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 2021 is 35 ($140 \times 25\% = 35$). The number 35 is entered for year 2021. The full 140 rooms is entered for year 2022.

The Marriott Suites hotel is expected to open on January 1, 2022, with 200 units. Its room count is entered into the appropriate row for year 2022. The program contains space to enter up to nine proposed properties or additions to existing hotels.

The *Supply Addm* tab has one last input; the remainder of this screen is a summary. Note the “Long-Term Supply Growth” in cell D16. In the HMA template, this figure is copied from cell D33 of the *Demand Inputs* tab, where the long-term room supply growth is calculated. For the Case Study, the analyst feels the historical growth rate of 2.92% will be tempered in the future due to the lack of available hotel sites and uses a figure of 2.70%. The *Supply Addm* tab automatically increases the supply by 2.70% per year in each year there are no explicit additions to supply to account for long-term supply growth trends.

If the analyst 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 analyst has reason to believe the future long-term trend will be different from the historical growth of supply; the expected future supply growth can be modified as needed.

Before the market-area occupancy can be properly calculated, the HMA model must determine the accommodatable latent demand and the total usable latent demand. This information could affect the estimated area wide occupancy. As shown in Figure 9, there is an adjustment for unaccommodated latent demand. Row 23 shows the market occupancy calculation unadjusted for unaccommodatable latent demand, while row 25 shows the market occupancy calculation with the proper adjustment. These adjustments are performed automatically on the *Demand Calcs* tab.

Adjusting for Unaccommodatable Latent 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 calculated total room night demand. These calculations are illustrated on the next page.

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Allocating Unaccommodatable Demand

CASE STUDY

Consider the year 2021 calculation. The Best Western opens on October 1, 2021, with 200 rooms, which represents effectively 35 rooms for the full year. In addition, the Courtyard by Marriott and Residence Inn were open for the entire full year. Because the Courtyard and Residence Inn only operated for part of the year during the base year of 2020, 70 rooms not included in 2020 are considered to be new rooms in 2021 for the purpose of calculating the accommodatable latent demand.

The accommodatable latent demand for 2021 is determined by first multiplying the number of new rooms that opened subsequent to the base year times 365 to give the total number of new rooms available per year. Next, the unadjusted area wide occupancy is calculated for 2021. The result of this calculation is 75.39% and is contained in cell G23 of the *Supply Addn* tab (See Figure 9 on page 30).

Finally, the accommodatable latent room night is calculated by multiplying the total number of new rooms available per year by the estimated area wide occupancy ($38,325 \times 75.39\% = 28,894$). The unaccommodatable latent demand is the difference between the total latent demand (see Demand Calc tab) and the accommodatable latent demand; for 2021, this calculation is $33,627 - 28,894$ or 4,733.

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 6 Calculation of 2021 Unaccommodatable Demand

Market Segment	Unaccommodatable Latent Demand	Percent of Total	Allocation to Each Segment
Commercial Group	4,733	X 73.4%*	= 3,475
Leisure	4,733	X 17.8%*	= 841
Total	4,733	X 8.8%*	= 417
		100.0%	= 4,733

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

CASE STUDY (continued)

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

Table 7 Calculation of 2021 Adjusted Room Night Demand

Market Segment	Unadjusted Room Night Demand	Unaccommodatable Room Night Demand	Adjusted Room Night Demand
Commercial	333,090	3,475	329,615
Group	125,514	841	124,673
Leisure	<u>101,661</u>	<u>417</u>	<u>101,244</u>
Total	560,512	4,733	555,532

The adjusted market occupancy of 74.75% for 2021 (cell F25 of Figure 9, page 30) results from the following calculation:

$$\text{Adjusted Market Occupancy} = \frac{\text{Total Market Demand Adjusted for Unaccommodatable Demand}}{\text{Room Nights Available}}$$

$$74.75\% = 555,532 \div 743,140$$

The remainder of the calculations detailed in row 25 of Figure 9 are performed using the adjusted room night demand just illustrated.

With the opening of the 200-room Marriott Suite hotel and the full operation of the Best Western hotel in year 2022, there are 410 new rooms in the market since the base year (2,341 rooms vs. 1,931 rooms). This is more than enough to accommodate all the latent demand. Thus, the unaccommodatable demand calculation is zero for 2022 and beyond, as illustrated in Figure 9; the unadjusted and adjusted market occupancies are identical.

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Step #6: Calculate the Area Wide Occupancy

The area wide, 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 as the “Adjusted Market Occupancy” on row 25 of the *Supply Addn* tab and is illustrated in Figure 9 on page 30.

Step #7: Evaluate the Relative Competitiveness of Area Hotels

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

The relative competitiveness of hotels can be measured by competitive indices. As stated in Step #3, ALA-5 on page 20 the competitive index expresses the hotel's relative competitiveness as a percentage of its fair share. Conceptually, the competitive index is calculated as the market share divided by the fair share. Table 8 illustrates the computation of competitive indices.

Consider a market containing only Hotels A and B, with three market segments: Commercial, Meeting, and Leisure. Table 8 shows the percent of business within each market segment, and the resulting competitive indices for each market segment at the two hotels, as well as the overall competitive index.

Table 8 Example of Competitive Index 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 Competitive Index	Market Segment Competitive Indices		
		Comm.	Meet.	Leis.
A	118%	129%	57%	143%
B	88%	81%	129%	71%

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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 competitive index for each hotel is the ratio of each hotel's occupancy to the market occupancy. For example, Hotel A has an overall competitive index of $80\% \div 68\%$ or 118%.

Third, the market segment competitive index 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 competitive index to the nearest whole percent.

Using competitive index, the analyst can state in simple terms that Hotel A has an overall competitive index 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, competitive indices 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 as 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 competitive index approach. The market competitive indices for each hotel in the market have already been calculated in the HMA model, as detailed in Step #3, ALA-5 on page 20.

As we have seen in the *Demand-Base Year* tab (Figure 5, page 21) the overall competitive indices vary from 86% for the Island Inn to 108% for the Quality Inn. Figure 5 also shows the competitive indices for each hotel by market segment. Note that the market segment competitive indices show a wide range of values, corresponding to the business mix of the hotel.

In Figure 5, it is very clear that the Hilton is a group-oriented property, with a 217% competitive index in the Group segment. Similarly, the Embassy Suites is oriented toward commercial demand with a 150% competitive index in the Commercial segment, and the Quality Inn is oriented toward leisure demand with a 226% competitive index in the Leisure segment.

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

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

Once competitive index information for all existing and proposed hotels has been assembled, it is entered in the *Comp Index* tab of the HMA model. To illustrate the process, a narrative for the competitive indices for the Case Study is presented, followed by instructions on how the data is entered into the HMA model.

**Narrative and
Market Rationale for
Competitive Indices**
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 competitive index factors into the future.

Embassy Suites is a relatively new (2016) 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 competitive index presently achieved by the Embassy Suites are expected to continue at similar levels into the future.

The Hilton Inn was constructed ten years ago (2011) 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 (group) market. With so much emphasis directed towards the group 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 group patronage. A recent renovation has brought this property up to first-class condition, and it should remain as the group leader into the future. The competitive indices 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 2006, this property is in need of an extensive renovation, which is expected to commence early in 2021. The upgrade should enable the

CASE STUDY (continued)

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 competitive indices presently achieved by the Radisson are expected to continue at similar levels into the future, with the exception of the commercial segment, which will increase from 73% to 76% next year (2021).

The Holiday Inn is one of the area's newer hotels; it opened in 2015. 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, group, 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 group 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 competitive indices 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 group or leisure business. The neighborhood surrounding the Ramada consists of warehouses and industrial buildings, which is not conducive to either group or leisure demand. Ownership has renovated the property on a regular basis, so its competitive position is not expected to deteriorate. The competitive indices 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 1988. 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 competitive indices 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%, group patronage dropping 13%, and leisure usage going down by 6%. Based on this analysis, the competitive indices for the Island Inn are projected as shown in Table 9 on the next page.

CASE STUDY (continued)
Table 9 Competitive Indices for the Island Inn

	2020	2021	2022	2023	2024 - 2030
Commercial	89%	87%	84%	80%	80%
Group	112%	102%	93%	85%	85%
Leisure	45%	40%	40%	40%	40%

The Quality Inn opened in 2016 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 competitive index 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 group 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 competitive indices 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 2008. This hotel's convenient highway location enables it 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 group 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 competitive indices 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 competitive indices presently achieved by these properties should continue at the current levels into the future.

The Courtyard by Marriott opened July 1, 2020, 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

CASE STUDY (continued)

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 group segment and almost as competitive as the Embassy Suites in the commercial segment. Based on this analysis, the competitive indices for the Courtyard by Marriott are projected as shown in Table 10:

Table 10 Competitive Indices for the Courtyard by Marriott

	2020	2021	2022	2023	2024 - 2030
Commercial	117%	117%	134%	140%	140%
Group	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 2011. 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 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 competitive indices for the Best Western hotel are shown in Table 11:

Table 11 Competitive Indices for the Best Western

	2021	2022	2023	2024 - 2030
Commercial	74%	80%	87%	87%
Group	9%	17%	17%	17%
Leisure	111%	121%	131%	131%

CASE STUDY (continued)

The Marriott Suites hotel will be the second Marriott product in the marketplace. It is expected to open in January 2022 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 group segment. Based on this analysis, the competitive indices for the Marriott Suites hotel are projected in Table 12:

Table 12 Competitive Indices for the Marriott Suites

	2022	2023	2024	2025 - 2030
Commercial	120%	134%	140%	140%
Group	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. The hotel plans to target both the group and commercial segments in a manner that will maximize rooms revenue by not displacing the higher-rated commercial demand with lower-priced group patronage. The new facilities offered by the Sheraton, along with its excellent location, should make it highly competitive in the local market. Its competitive indices in all three segments are expected to stabilize at a level somewhat above those experienced by the Radisson. Based on this analysis, the competitive indices for the proposed Sheraton hotel are projected in Table 13:

Table 13 Competitive index for the Proposed Sheraton Hotel

	2023	2034	2035	2026 - 2030
Commercial	74%	77%	80%	80%
Group	135%	169%	186%	186%
Leisure	40%	60%	81%	81%

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The *Comp Index* Tab of the HMA model

Once competitive index information for all existing and proposed hotels has been assembled, it is entered in the *Comp Index* tab of the HMA model. Figure 10 shows a screen shot for the Commercial segment.

Commercial Segment	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Secondary Competition	110%	110%	110%	110%	110%	110%	110%	110%	110%	110%	110%
Embassy Suites	150%	150%	150%	150%	150%	150%	150%	150%	150%	150%	150%
Hilton Inn	69%	69%	69%	69%	69%	69%	69%	69%	69%	69%	69%
Radisson Hotel	73%	73%	73%	73%	73%	73%	73%	73%	73%	73%	73%
Holiday Inn	96%	96%	96%	96%	96%	96%	96%	96%	96%	96%	96%
Courtyard	117%	117%	134%	140%	140%	140%	140%	140%	140%	140%	140%
Ramada Inn	103%	103%	103%	103%	103%	103%	103%	103%	103%	103%	103%
Island Inn	89%	87%	84%	80%	80%	80%	80%	80%	80%	80%	80%
Quality Inn	94%	94%	94%	94%	94%	94%	94%	94%	94%	94%	94%
Days Inn	124%	124%	124%	124%	124%	124%	124%	124%	124%	124%	124%
Modify the Competitive Index Percentages Below as Needed - The Default Assumption is that Each Hotel Obtains A 100% Share											
Proposed Sheraton				74%	77%	80%	80%	80%	80%	80%	80%
Best Western		74%	80%	87%	87%	87%	87%	87%	87%	87%	87%
Marriott Suites			120%	134%	140%	140%	140%	140%	140%	140%	140%
		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Long-Term Supply Growth	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Figure 10 – The *Comp Index* Tab for the Commercial segment

CASE STUDY

The white formatted column to the right of the hotel names on the *Comp Index* tab in Figure 10 contains the calculated data from the *Demand Base Year* tab (Figure 5 , Page 21), and is useful as a visual tool to verify correct information. Before data entry is started on this tab, all cells to the right contain the zeros. The analyst’s task is to continue or modify the competitive index data to reflect any anticipated changes.

For the existing supply, all competitive indices are expected to hold constant, with the exception of the Courtyard by Marriott and the Island Inn. To change these two

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CASE STUDY (continued)

hotels, the analyst will enter the data from the Commercial segment in Table 9 for the Island Inn; it is projected to have a competitive index of 87% in 2021, 84% in 2022, and 80% thereafter. Data from Table 10 is entered for the Courtyard; a competitive index of 117% in 2021, 134% in 2022, and 140% thereafter.

The analyst enters data for the new supply below the heavy line. It is easy to see how the data from Tables 11, 12, and 13 is entered to this section of the worksheet. For all additions to supply, the competitive index is always entered at 100%, equivalent to saying that the long-term supply obtains its fair share of demand.

Figure 11 shows the Group segment of the *Comp Index* tab. Market Penetrations from Tables 9 through 13 and the Long-Term Supply are entered in the same manner as the Commercial segment.

Group Segment	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Secondary Competition	76%	76%	76%	76%	76%	76%	76%	76%	76%	76%	76%
Embassy Suites	23%	23%	23%	23%	23%	23%	23%	23%	23%	23%	23%
Hilton Inn	217%	217%	217%	217%	217%	217%	217%	217%	217%	217%	217%
Radisson Hotel	164%	164%	164%	164%	164%	164%	164%	164%	164%	164%	164%
Holiday Inn	110%	110%	110%	110%	110%	110%	110%	110%	110%	110%	110%
Courtyard	20%	21%	25%	25%	25%	25%	25%	25%	25%	25%	25%
Ramada Inn	79%	79%	79%	79%	79%	79%	79%	79%	79%	79%	79%
Island Inn	112%	102%	93%	85%	85%	85%	85%	85%	85%	85%	85%
Quality Inn	47%	47%	47%	47%	47%	47%	47%	47%	47%	47%	47%
Days Inn	22%	22%	22%	22%	22%	22%	22%	22%	22%	22%	22%
Modify the Competitive Index Percentages Below as Needed - The Default Assumption is that Each Hotel Obtains A 100% Share											
Proposed Sheraton				135%	169%	186%	186%	186%	186%	186%	186%
Best Western		9%	17%	17%	17%	17%	17%	17%	17%	17%	17%
Marriott Suites			17%	25%	34%	34%	34%	34%	34%	34%	34%
		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Long-Term Supply Growth	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Figure 11 – The *Comp Index* Tab for the Group Segment

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CASE STUDY (continued)

Figure 12 shows the Leisure segment of the *Comp Index* tab. Market Penetrations from Tables 9 through 13 and the Long-Term Supply are entered in the same manner as the Commercial segment.

Leisure Segment	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Secondary Competition	119%	119%	119%	119%	119%	119%	119%	119%	119%	119%	119%
Embassy Suites	85%	85%	85%	85%	85%	85%	85%	85%	85%	85%	85%
Hilton Inn	52%	52%	52%	52%	52%	52%	52%	52%	52%	52%	52%
Radisson Hotel	74%	74%	74%	74%	74%	74%	74%	74%	74%	74%	74%
Holiday Inn	106%	106%	106%	106%	106%	106%	106%	106%	106%	106%	106%
Courtyard	94%	94%	101%	101%	101%	101%	101%	101%	101%	101%	101%
Ramada Inn	72%	72%	72%	72%	72%	72%	72%	72%	72%	72%	72%
Island Inn	45%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%
Quality Inn	226%	226%	226%	226%	226%	226%	226%	226%	226%	226%	226%
Days Inn	134%	134%	134%	134%	134%	134%	134%	134%	134%	134%	134%
Modify the Competitive Index Percentages Below as Needed - The Default Assumption is that Each Hotel Obtains A 100% Share											
Proposed Sheraton			40%	60%	81%	81%	81%	81%	81%	81%	81%
Best Western		111%	121%	131%	131%	131%	131%	131%	131%	131%	131%
Marriott Suites		60%	71%	71%	71%	71%	71%	71%	71%	71%	71%
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Long-Term Supply Growth	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Figure 12 – The *Comp Index* Tab 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 competitive indices form the basis for calculating the market share of competitive hotel. Once the market share is known, the projected room nights captured can be determined, which then leads to an estimate of occupancy for each hotel in the market. The process is performed on a year-by-year basis on the *Fair Share* and *Occ Calcs* tabs in HMA. The calculations are done 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 competitive index 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.

Market Share Adjusters for each segment are calculated as follows:

$$\text{Market Share Adjuster} = \text{Competitive Index} * \text{Fair Share}$$

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

$$\text{Market Share Percentage} = \frac{\text{Market Share Adjuster for Given Property}}{\text{Total Market Share Adjusters for all Properties}}$$

- The market share percentages are then multiplied by the total market demand. 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.

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

$$\text{Room Nights Captured} = \text{Market Share Percentage} * \text{Adjusted Market Demand for the Segment}$$

Percentage of Occupancy

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

We are now ready to view the occupancy forecast for any of the primary competitors or any of the additions to the supply.

HOTEL VALUATION SOFTWARE

Use of the *Final Output* tabs

The *Output* tabs of the HMA model provide reports based on all the information entered on the various tabs of the program. There are two final output tabs; *OccOutput-A* is for an existing hotel, and *OccOutput-B* is for a proposed hotel. Figure 13 is the *Output* tab relating to the proposed Sheraton.

Property Analysis												
Proposed Property Name:		Proposed Sheraton										
Subject Property Projections	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	
Occupancy	N/A	N/A	N/A	54.2%	62.6%	69.2%	69.1%	69.0%	68.9%	68.8%	68.7%	
Market Share	N/A	0.0%	0.0%	8.3%	9.2%	9.9%	9.6%	9.3%	9.1%	8.8%	8.6%	
Fair Share	N/A	0.0%	0.0%	9.6%	9.4%	9.1%	8.9%	8.7%	8.4%	8.2%	8.0%	
Competitive Index	N/A	#DIV/0!	#DIV/0!	85.8%	98.4%	107.7%	107.6%	107.5%	107.4%	107.3%	107.2%	
Room Nights by Segment												
Commercial	0	0	0	25,463	26,380	27,419	27,506	27,594	27,681	27,769	27,857	
Group	0	0	0	19,623	24,494	27,511	27,420	27,331	27,246	27,163	27,083	
Leisure	0	0	0	4,336	6,289	8,215	8,113	8,013	7,914	7,816	7,720	
0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	
TOTAL	0	0	0	49,422	57,163	63,145	63,039	62,938	62,841	62,748	62,660	
Percent of Total Room Nights by Segment												
Commercial	0.0%	0.0%	0.0%	51.5%	46.1%	43.4%	43.6%	43.8%	44.0%	44.3%	44.5%	
Group	0.0%	0.0%	0.0%	39.7%	42.8%	43.6%	43.5%	43.4%	43.4%	43.3%	43.2%	
Leisure	0.0%	0.0%	0.0%	8.8%	11.0%	13.0%	12.9%	12.7%	12.6%	12.5%	12.3%	
0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
TOTAL	0.0%	0.0%	0.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
Market Occupancy	72.1%	74.8%	67.7%	63.1%	63.7%	64.3%	64.2%	64.2%	64.1%	64.1%	64.0%	

Figure 13 – The *Occ Output-B* Tab, showing the Proposed Sheraton

CASE STUDY

Note that market occupancy starts to decline in 2022, as new supply enters the market. For the proposed Sheraton, the program shows the following occupancy projection:

2023	54.2%	2026	69.1%
2024	62.6%	2027	69.0%
2025	69.2%	2028	68.9%

Based on the commercial and group orientation of the property, the occupancy is expected to stabilize in the third year (2025) at a level of 69%. This subjective evaluation is based on the analyst's knowledge of similar properties and is roughly equivalent to the average to the figures produced by the HMA model.

The *OccOutput* tabs present additional data related to the subject property's occupancy estimate: Market Share, Fair Share, Competitive Index, Room-Nights Captured by Segment and Market Segmentation, all on an annual basis.

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Average Daily Rate Forecast

Now that the forecast of occupancy is complete, the program turns to the forecast of the average daily rate. Two different average daily rate methodologies are used, a competitive positioning method and a market segmentation method.

Average Rate per Occupied Room Defined

The average daily rate (or ADR) is known formally as the “Average rate per occupied room” in the Uniform System of Accounts for the Lodging Industry. It is defined as the net rooms revenue derived from the sale of guestrooms divided by the number of rooms occupied. In reality, the ADR is the weighted average of all the different rates charged by the hotel.

ADR Forecast Procedures

The competitive positioning method of forecasting ADR for both existing and proposed hotels follows these steps:

1. Compile historical ADR data for the subject hotel (if existing) and for the primary competitive hotels in the market. This analysis provides a range of room rates that are likely to be achieved in the market.
2. Analyze historical trends in the ADR's, both overall and by market segment.
3. Consider the relationship between the historical overall ADR's and occupancy.
4. Compare the ADR of the subject hotel and the competition in terms of the quality, size, facilities, amenities, market orientation, location, management quality, and affiliation. Make adjustments to reflect the differences between the comparable hotels and the subject hotel.

The market segmentation method of forecasting takes the data from the competitive positioning framework and adds the following two steps.

5. Project future changes in ADR's, by market segment
6. Project the subject property's ADR based on its market share.

The HMA model considers both methods.

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SOFTWARE**

**Competitive
Positioning of ADR**

CASE STUDY

For the proposed Sheraton, the existing primary competitors are used to provide the competitive positioning information for average daily rates. Table 14 shows the ADR's at the nine primary competitors.

Table 14 Summary of ADR's at Primary Competitors

Hotel	ADR
Embassy Suites	\$160.00
Hilton Inn	\$155.00
Radisson Hotel	\$150.00
Holiday Inn	\$132.50
Courtyard	\$135.00
Ramada Inn	\$115.00
Island Inn	\$ 97.50
Quality Inn	\$102.50
Days Inn	\$100.00

**Using the ADR
CompPos Tab**

Enter the ADR information in the blue cells of the *ADR CompPos* tab as shown in Figure 14. Note that the model produces both a numerical average and a weighted average ADR for the market. The weighted average is based on room counts.

The bottom panel of the *ADR CompPos* tab allows the analyst to forecast the ADR according to step 4 of the ADR Forecast Procedures. In this case, the analyst feels that the new Sheraton Hotel will be most competitive with the Embassy Suites and forecasts future ADR using the \$160.00 ADR from this hotel.

Hotel Market Analysis and ADR Forecasting Model - ADR Competitive Positioning Sheet					www.hotelvaluationsoftware.com							
Primary Competitors		Property Data										
Hotel #	Property	# Rooms	Occupancy	ADR								
1	Embassy Suites	200	78%	\$ 160.00								
2	Hilton Inn	275	72%	\$ 155.00								
3	Radisson Hotel	250	68%	\$ 150.00								
4	Holiday Inn	175	73%	\$ 132.50								
5	Courtyard	124	65%	\$ 135.00								
6	Ramada Inn	150	66%	\$ 115.00								
7	Island Inn	135	62%	\$ 97.50								
8	Quality Inn	175	78%	\$ 102.50								
9	Days Inn	120	74%	\$ 100.00								
10	0	0	0%	\$ -								
11	0	0	0%	\$ -								
12	0	0	0%	\$ -								
13	0	0	0%	\$ -								
14	0	0	0%	\$ -								
15	0	0	0%	\$ -								
16	0	0	0%	\$ -								
17	0	0	0%	\$ -								
18	0	0	0%	\$ -								
19	0	0	0%	\$ -								
Numerical Average			70.7%	\$ 127.50								
Weighted Average			71.1%	\$ 132.42								
Competitive Positioning Forecast		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Percent Change			3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Projected Average Rate		\$ 160.00	\$164.80	\$169.74	\$174.84	\$180.08	\$185.48	\$191.05	\$196.78	\$202.68	\$208.76	\$215.03

Figure 14 – ADR CompPos Tab of HMA

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**Competitive
Positioning
Conclusion for the
Proposed Sheraton**
CASE STUDY (continued)

Based on the historical ADR's achieved by competitive hotels in the market, it is estimated that the proposed Sheraton would have an ADR above all hotels in the market and should be roughly equal to the Embassy Suites Hotel. The Hilton Inn and Radisson Hotel are similar group-oriented facilities, but the Sheraton will have higher quality and a greater amount of meeting space than either, allowing the Sheraton to have a higher ADR.

Accordingly, the Sheraton is positioned to have an ADR in the range of \$155 to \$165, in current dollars. This figure would need to be inflated to account for the market when the hotel opens in 2023.

**Market Segment
Positioning for the
Proposed Sheraton**
CASE STUDY

Further research provides insight on the average rates within each market segment for the Embassy Suites Hotel. These ADR's along with the ADR's anticipated for the proposed Sheraton are presented in Table 15.

Table 15 Market Segment ADR's for Embassy Suites and Proposed Sheraton

Market Segment	Embassy Suites Average Rate	Proposed Sheraton Average Rate
Commercial	\$170.00	\$160.00
Group	\$160.00	\$170.00
Leisure	\$140.00	\$130.00

The proposed Sheraton is positioned to have ADR's slightly below the Embassy Suites for the commercial and leisure market segments, and slightly above the Embassy Suites in the group segment. This is due to the proposed Sheraton's positioning as the premier meeting hotel in the market; while the larger suite rooms of the Embassy Suites have greater appeal to the commercial and leisure travelers.

The ADR module includes the ability to forecast rates at two hotels; the first hotel entered in the *Primary* tab and any proposed property. In Figure 15 on the following page the Embassy Suites and the proposed Sheraton are shown at the top panel.

The market segment ADR's come from Table 15 and the segment percent for the proposed Sheraton come from the stabilized year (2025) market segment percentages on the *Output-B* tab for the proposed Sheraton. The data produce a base-year ADR estimate of \$160.45 for the proposed Sheraton. The final task for the ADR forecast is to incorporate the impact of the inflation on ADR's. The HMA software produces a 10-year forecast, tied to dates established when producing the room night analysis occupancy forecast.

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Hotel Market Analysis and ADR Forecasting Model - ADR Segmentation Inputs Sheet											www.hotelvaluation
The information below shows the market segmentation for Embassy Suites & Proposed Sheraton. Enter the segment ADR data for ea each hotel. In addition, enter the segment percentages for the Proposed Sheraton from the stabilized year on the Supply Addn tab.											
Embassy Suites											
Segment	Segment Percent	Segment ADR	Extension								
Commercial	80%	\$ 170.00	\$ 136.00								
Group	5%	\$ 160.00	\$ 8.00								
Leisure	15%	\$ 140.00	\$ 21.00								
		\$ -	\$ -								
		\$ -	\$ -								
Base Year Average			\$ 165.00								
Proposed Sheraton											
Segment	Segment Percent	Segment ADR	Extension								
Commercial	43.4%	\$ 160.00	\$ 69.47								
Group	43.6%	\$ 170.00	\$ 74.07								
Leisure	13.0%	\$ 130.00	\$ 16.91								
		\$ -	\$ -								
		\$ -	\$ -								
Base Year Average			\$ 160.45								
Expected ADR inflation rates for each segment											
	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	
Commercial	4.00%		-2.00%		6.00%	3.00%	3.00%	3.00%	3.00%	3.00%	
Group	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	
Leisure	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	

Figure 15 – ADR Seg Inputs Tab – Input for Segment Average Daily Rates and Inflation

CASE STUDY

The proposed Sheraton's market has the following expected ADR inflation rates:

Table 16 ADR Growth for Proposed Sheraton – by Segment

Market Segment	2021	2022	2023	2024	2025	2026-2030
Commercial	4.0%	0.0%	-2.0%	0.0%	6.0%	3.0%
Group	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
Leisure	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%

The proposed Sheraton's market expects some ADR volatility in the commercial segment and constant growth in the remaining two segments.

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Note that the program can handle negative growth rates. Note also that a number entered in the left most entry cells carried to subsequent years on entry time saver. Override these entries by entering the correct number in cells that need changes.

The *ADR Output* tabs of the HMA model provide reports based on the ADR information entered on the various tabs. There are two final output tabs for the ADR forecast; *ADR Output-A* is for an existing hotel, and *ADR Output-B* is for a proposed hotel. Figure 16 is the *ADR Output* tab relating to the proposed Sheraton. Figure 16 shows the overall ADR forecast at the top, followed by the forecast of the segment ADR's segment room revenues and overall room revenue.

Property Analysis - ADR Forecast										
Subject Property Name: Proposed Sheraton										
Subject Property Projections	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Weighted ADR	#DIV/0!	#DIV/0!	\$ 170.06	\$ 173.03	\$ 180.06	\$ 185.38	\$ 190.87	\$ 196.52	\$ 202.34	\$ 208.34
Segment ADR by Year	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
1 Commercial	\$ 176.80	\$ 176.80	\$ 173.26	\$ 173.26	\$ 183.66	\$ 189.17	\$ 194.84	\$ 200.69	\$ 206.71	\$ 212.91
2 Group	\$ 164.80	\$ 169.74	\$ 174.84	\$ 180.08	\$ 185.48	\$ 191.05	\$ 196.78	\$ 202.68	\$ 208.76	\$ 215.03
3 Leisure	\$ 143.50	\$ 147.09	\$ 150.76	\$ 154.53	\$ 158.40	\$ 162.36	\$ 166.42	\$ 170.58	\$ 174.84	\$ 179.21
4	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Annual Room-Nights by Segment										
1 Commercial	-	-	25,463	26,380	27,419	27,506	27,594	27,681	27,769	27,857
2 Group	-	-	19,623	24,494	27,511	27,420	27,331	27,246	27,163	27,083
3 Leisure	-	-	4,336	6,289	8,215	8,113	8,013	7,914	7,816	7,720
4	-	-	-	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-	-	-	-
Total Room-Nights	-	-	49,422	57,163	63,145	63,039	62,938	62,841	62,748	62,660
Annual Room Revenue by Segment										
1 Commercial	\$ -	\$ -	\$ 4,152,297	\$ 4,301,804	\$ 4,739,469	\$ 4,897,235	\$ 5,060,221	\$ 5,228,596	\$ 5,402,532	\$ 5,582,215
2 Group	\$ -	\$ -	\$ 3,645,296	\$ 4,686,639	\$ 5,421,769	\$ 5,565,889	\$ 5,714,407	\$ 5,867,423	\$ 6,025,073	\$ 6,187,532
3 Leisure	\$ -	\$ -	\$ 607,042	\$ 902,504	\$ 1,208,304	\$ 1,223,150	\$ 1,238,212	\$ 1,253,486	\$ 1,268,961	\$ 1,284,657
4	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total Room Revenue	\$ -	\$ -	\$ 8,404,634	\$ 9,890,946	\$ 11,369,542	\$ 11,686,274	\$ 12,012,839	\$ 12,349,505	\$ 12,696,566	\$ 13,054,403

Figure 16 – The *ADR Output* Tab - ADR Forecast for the Proposed Sheraton

Printing from the HMA model

Printing from the HMA model is quite straightforward. Each of the output pages of the HMA model has a set of predefined print area and page format that facilitate the printing process. These routines are embedded in the standard print features of Excel® and Google Sheets®. Users are free to modify these as desired to meet their needs.

Chapter 5 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 analyst 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 room revenue the following formula is used:

$$\text{Occupancy} * \text{Average Room Rate} * \text{Room Count} * 365 = \text{Rooms Revenue}$$

CASE STUDY

The initial estimate of room 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. Table 17 demonstrates this calculation using occupancy estimates from HMA rounded to the nearest whole percent and ADR estimates rounded to the nearest whole dollar.

Table 17 Proposed Sheraton Hotel – Room Revenue Calculation

Projection Year	3	4	5
Actual Year	2023	2024	2025
Occupancy	54%	62%	69%
Average Rate	\$170	\$173	\$180
Number of Rooms	250	250	250
Days per Year	365	365	365
Rooms Revenue (\$000)	\$8,380	\$9,790	\$11,337

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Fixed and Variable Component Approach to Forecasting Revenues and Expenses

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 hotel revenues and expenses. This approach developed by Steve Rushmore for HVS is one of the most accurate methodologies available to model hotel financial performance. It forms the basis for most of the forecasting models utilized by hotel consultants, appraisal firms, hotel brands and management 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:

1. Adjust each base year revenue or expense item for inflation, which can be specified for each line item and for each year.
2. Established that portion of the inflation adjusted revenue or expense item component that is fixed.
3. Establish that portion of the inflation-adjusted revenue or expense item component that is variable. Adjust the variable component for the percentage change between the projected occupancy or facility utilization and the base level of occupancy or facility utilization.
4. Add the fixed and variable components together to obtain the total projected revenue or expense item.

The process is demonstrated with the following example.

Example of Fixed and Variable Revenue and Expense Calculations

A 200-room commercial hotel operated in 2020 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 2021 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 2021 rooms department expense would be calculated as follows.

1. The 2020 rooms department expense is first inflation adjusted so that the 2020 figure is expressed in 2021 dollars. The inflation rate is assumed to be 3%. Thus, the inflation adjustment calculation is:

$$\$1,226,000 * 1.03 = \$1,262,780$$

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2. 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:

$$\text{Fixed Component:} \quad 60\% * \$1,262,780 = \$757,668$$

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

$$\text{Unadjusted Variable Component:} \quad 40\% * \$1,262,780 = \$505,112$$

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.

$$\text{Occupancy Adjuster:} \quad 61\% \div 70\% = 0.8714$$

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

$$\text{Adjusted Variable Component:} \quad 0.8714 * \$505,112 = \$440,155$$

4. Combining the fixed component and the adjusted variable component produces the estimated 2021 rooms department expense at a 61% occupancy.

Fixed Component	\$ 757,668
Adjusted Variable Component	<u>440,155</u>
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, 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 the best benchmark. For proposed hotels, the analyst must rely on the operating results from hotels considered comparable to benchmark 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.

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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 18 illustrates typical ranges of fixed or variable percentages along with the index utilized to measure variable change.

The Table 18 figures are based on "Updated Benchmarks for Projecting Fixed and Variable Components of Hotel Financial Performance" by Stephen Rushmore, Jr. and John W. O'Neill, *Cornell Hospitality Quarterly*, 56(1) 2015.

The index of variability refers that 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 is 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.

Judgement is needed in using the Table 18 numbers as a hotel can often have a unique situation that calls for a different input. For example, an urban hotel may have restaurants and bars that cater to local clientele, not hotel guests. In this case, the percent fixed would be high, with food and beverage revenues independent of hotel occupancy. A highway-oriented hotel dependent on in-house guests for F&B volume would have a lower fixed percentage of food and beverage revenues.

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 is now 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.

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Table 18 Typical Fixed and Variable Expense Percentages

Revenue and Expense Category	Percent Fixed	Percent Variable	Index of Variability
Revenues			
Rooms	Not Applicable		
Food	10 – 75	25 – 90	Room Revenue
Beverage	0 – 75	25 – 100	Room Revenue
Other Operated Departments	10 – 40	60 – 90	Room Revenue
Miscellaneous Income	30 – 60	40 – 70	Room Revenue
Departmental Expenses			
Rooms	50 – 70	30 – 50	Room Revenue
Food and Beverage	35 – 60	40 – 65	F&B Revenue
Other Operated Departments	55 – 75	25 – 45	Other Oper Dept Revs
Miscellaneous Income	40 – 60	40 – 60	Misc Income
Undistributed Operating Expenses			
Administrative and General	25 – 50	50 – 75	Total Revenue
Information & Telecom Systems	60 – 80	20 – 40	Total Revenue
Marketing	20 – 50	50 – 80	Total Revenue
Franchise Fees	0	100	Rooms Revenue
Prop. Operations and Maintenance	25 – 50	50 – 75	Total Revenue
Utility Costs	25 – 50	50 – 75	Total Revenue
Management Fees	0	100	Total Revenue
Non-Operating Income and Expenses			
Income	80 - 100	0 - 20	Total Revenue
Rent	100	0	Total Revenue
Property Taxes	100	0	Total Revenue
Insurance	100	0	Total Revenue
Reserve for Replacement	0	100	Total Revenue

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 19 (on 56), labeled “Comparable Statement,” is based on a set of hotels that are closely comparable to the proposed Sheraton. 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 19, represents the comparable statement after appropriate adjustments have been made for any physical, operational, or locational differences; while holding occupancy at 68% to match the “Comparable Statement”.

This base financial statement utilizes the Proposed Sheraton’s average room rate expressed in current 2020 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 8% of **rooms** revenue for the Comparable Property ($\$910 \div \$11,373$), and for the Proposed Sheraton ($\$799 \div \$9,990$). 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: 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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Table 19 Comparable and Proposed Sheraton Base Statements

	Comparable Statement				Proposed Sheraton Base			
	\$(000)	Percent	\$/Avail Rm	\$/Occ Rm	\$(000)	Percent	\$/Avail Rm	\$/Occ Rm
Number of Rooms	290				250			
Occupancy	68.0%				68.0%			
Average Rate	\$ 158.00				\$ 161.00			
Days Open	365				365			
Rooms Occupied	71,978				62,050			
Revenues								
Rooms	\$ 11,373	57.1%	\$ 39,217	\$ 158.01	\$ 9,990	59.6%	\$ 39,960	\$ 161.00
Food	\$ 5,118	25.7%	\$ 17,648	\$ 71.11	\$ 3,996	23.8%	\$ 15,984	\$ 64.40
Beverages	\$ 1,791	9.0%	\$ 6,176	\$ 24.88	\$ 1,439	8.6%	\$ 5,756	\$ 23.19
Other Operated Departments	\$ 532	2.7%	\$ 1,834	\$ 7.39	\$ 450	2.7%	\$ 1,800	\$ 7.25
Business Center	\$ 737	3.7%	\$ 2,541	\$ 10.24	\$ 600	3.6%	\$ 2,400	\$ 9.67
Miscellaneous Income	\$ 361	1.8%	\$ 1,245	\$ 5.02	\$ 300	1.8%	\$ 1,200	\$ 4.83
Total Operating Revenue	\$ 19,912	100%	\$ 68,661	\$ 276.65	\$ 16,775	100.0%	\$ 67,100	\$ 270.35
Departmental Expenses								
Rooms	\$ 2,445	21.5%	\$ 8,431	\$ 33.97	\$ 2,278	22.8%	\$ 9,112	\$ 36.71
Food & Beverages	\$ 4,961	71.8%	\$ 17,107	\$ 68.92	\$ 3,821	70.3%	\$ 15,284	\$ 61.58
Other Operated Departments	\$ 392	73.7%	\$ 1,352	\$ 5.45	\$ 350	77.8%	\$ 1,400	\$ 5.64
Business Center	\$ 299	40.6%	\$ 1,031	\$ 4.15	\$ 240	40.0%	\$ 960	\$ 3.87
Miscellaneous Income	\$ 161	44.6%	\$ 555	\$ 2.24	\$ 150	50.0%	\$ 600	\$ 2.42
Total Dept. Expenses	\$ 8,258	41.5%	\$ 28,476	\$ 114.73	\$ 6,839	40.8%	\$ 27,356	\$ 110.22
Departmental Income	\$ 11,654	58.5%	\$ 40,186	\$ 161.91	\$ 9,936	59.2%	\$ 39,744	\$ 160.13
Undistributed Operating Expenses								
Administrative & General	\$ 1,447	7.3%	\$ 4,990	\$ 20.10	\$ 1,225	7.3%	\$ 4,900	\$ 19.74
Information & Telecom Syst.	\$ 296	1.5%	\$ 1,021	\$ 4.11	\$ 252	1.5%	\$ 1,008	\$ 4.06
Marketing	\$ 777	3.9%	\$ 2,679	\$ 10.79	\$ 654	3.9%	\$ 2,616	\$ 10.54
Franchise Fees	\$ 910	4.6%	\$ 3,137	\$ 12.64	\$ 799	4.8%	\$ 3,196	\$ 12.88
Prop. Oper. & Maintenance	\$ 872	4.4%	\$ 3,007	\$ 12.11	\$ 721	4.3%	\$ 2,884	\$ 11.62
Utilities	\$ 832	4.2%	\$ 2,869	\$ 11.56	\$ 671	4.0%	\$ 2,684	\$ 10.81
Total UDOEs	\$ 5,134	25.8%	\$ 17,703	\$ 71.33	\$ 4,322	25.8%	\$ 17,288	\$ 69.65
Gross Oper. Profit (GOP)	\$ 6,520	32.7%	\$ 22,483	\$ 90.59	\$ 5,614	33.5%	\$ 22,456	\$ 90.48
Management Fees	\$ 697	3.5%	\$ 2,403	\$ 9.68	\$ 587	3.5%	\$ 2,348	\$ 9.46
Income Before NOIEs	\$ 5,823	29.2%	\$20,080	\$80.90	\$5,027	30.0%	\$20,108	\$81.02
Non-Operating Income and Expenses								
Non-Operating Income	\$ 162	0.8%	\$ 559	\$ 2.25	\$ 150	0.9%	\$ 600	\$ 2.42
Rent	-	0.0%	-	-	-	-	-	-
Property Tax	\$ 517	2.6%	\$ 1,783	\$ 7.18	503	3.0%	\$ 2,012	\$ 8.11
Insurance	\$ 248	1.2%	\$ 855	\$ 3.45	\$ 201	1.2%	\$ 804	\$ 3.24
Total NOIEs	\$ 603	3.0%	\$ 2,079	\$ 8.38	\$ 554	3.3%	\$ 2,216	\$ 8.93
EBITDA	\$ 5,220	26.2%	\$ 18,001	\$ 72.53	\$ 4,473	26.7%	\$ 17,892	\$ 72.09
Replacement Reserve	\$ 796	4.0%	\$ 2,746	\$ 11.07	\$ 671	4.0%	\$ 2,684	\$ 10.81
EBITDA Less Replacement Reserve	\$ 4,424	22.2%	\$ 15,254	\$ 61.46	\$ 3,802	22.7%	\$ 15,208	\$ 61.27

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Step #4: Inflate the base revenue and expense categories to reflect expected nominal dollars in each forecast year.

The purpose of Step #4 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 2020 dollars. In order to compute the fixed and variable relationships for each projection year, the 2020 base must be inflated (or, in rare cases, deflated) to reflect an assumed rate of inflation.

Each category of revenue and expense can have its own inflation rate, based on market information. For example, future changes in ADRs are influenced more by local supply and demand conditions than by expected changes in the CPI. On the other hand, utility costs are usually tied to the price of fuels, which frequently move in response to national and world events. Movement in property taxes are correlated with changes in the local tax base.

The analyst 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, and are based on the ADR forecast from HMA:

2021	+3.0%
2022	-2.9%
2023	+5.6%
2024	+1.8%
2025	+4.0%
2026 & Beyond	+3.0%

- 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

Table 20 shows the fixed and variable percentages selected for the proposed Sheraton.

Table 20 Proposed Sheraton Fixed and Variable Percentages

Category	Fixed	Variable
Food Revenue	25%	75%
Beverage Revenue	10%	90%
Other Operated Dept Revs	15%	85%
Business Center Revenue	15%	85%
Miscellaneous Revenue	25%	85%
Rooms Expense	35%	65%
F & B Expense	30%	70%
Other Operated Dept Exp	25%	75%
Business Center Expense	60%	40%
Admin & General	70%	30%
Information & Telcom Sys	70%	30%
Marketing	30%	70%
Franchise Fees	0%	100%
PO & M	35%	65%
Utilities	35%	65%
Management Fee	0%	100%
Non-Operating Income	90%	10%
Property Taxes	100%	0%
Insurance	100%	0%
Replacement Reserve	0%	100%

Hotel Revenue and Expense Forecasting Model (HREF)

Once the analyst has projected the subject's occupancy rate via the Hotel Market Analysis and ADR Forecasting Model, 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 Hotel Revenue and Expense Forecasting Model is known as HREF and is written as an Excel[®] file. The file contains five color-coded tabs:

- Intro (black tab) – introductory tab
- Inputs (blue tab) - the tab on which all input data will be entered
- Output (yellow tab) - the tab that contains formatted output, including the base year and 11 years of forecast projections
- Calcs (red tab) - the tab used to perform the fixed and variable calculations
- License (purple tab)

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In the section that follows, use of the input screens is illustrated, along with the use of the Output Menu.

**Use of the *Inputs*
Tab**

The *Inputs* tab 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 #4 on pages 56 to 58 have developed the data and information necessary to input all the data into the *Inputs* tab.

**Project Information
and Base Year
Inputs**

CASE STUDY

Figure 17 below illustrate the project information and base year inputs of the *Inputs* tab in HREF. This portion of the Inputs sheet is very straightforward. Project information is entered for use by the appraiser.

All 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.

Hotel Revenue and Expense Forecasting Model - Input Sheet		www.hotelvaluationsoftware.com	
Project Information and Base Year Room Inputs			
Project Information		Legend	
Job Title	Proposed Sheraton		
Prepared by	HV Software	Mandatory Input	
Prepared for	HV Software Manual	Optional Input	
Job #	001-001	Output	
Base Year Room Inputs		Error Check	
Base Year	2020		
Number of Rooms	250		
Days Open	365		
Occupancy	68.00%		
Average Rate	\$161.00		
Occupied Rooms	62,050		

Figure 17 – Project Information and Base Year Inputs

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Revenue and Expense Inputs

Figure 18 shows a screen shot of the revenue and expense inputs section of the *Inputs* tab. This portion is the heart of the HREF model.

Column B contains the headings that describe the line items comprising the base

Revenue and Expense Inputs	Note: Place a figure in only one of the columns for each category in the space below. The 'Input Error' cells will guide you.				Enter % fixed for each category	Index of Variability	Quick Check					
	\$ Amount in (\$000)	% of Revenue	\$ per Avail Rm	\$ per Occ Rm			Input Error	% of Rev Fixed	\$ Amount in (\$000)	% of Revenue	\$ per Avail Rm	\$ per Occ Rm
Revenues												
Rooms	\$ 9,990				O.K.	25.0%	Room Revenue	\$ 9,990	59.6%	\$ 39,960	\$ 161.00	
Food				\$ 64.40	O.K.	10.0%	F&B Revenue	\$ 3,996	23.8%	\$ 15,984	\$ 64.40	
Beverages				\$ 23.19	O.K.	15.0%	Room Revenue	\$ 1,439	8.6%	\$ 5,756	\$ 23.19	
Other Operated Departments	\$ 450				O.K.	15.0%	Room Revenue	\$ 450	2.7%	\$ 1,800	\$ 7.25	
Business Center	\$ 600				O.K.	15.0%	Room Revenue	\$ 600	3.6%	\$ 2,400	\$ 9.67	
Additional Oper Dept 2					Error	15.0%	Room Revenue	\$ -	0.0%	\$ -	\$ -	
Additional Oper Dept 3					Error	15.0%	Room Revenue	\$ -	0.0%	\$ -	\$ -	
Miscellaneous Income		3.0%			O.K.	25.0%	Room Revenue	\$ 300	1.8%	\$ 1,199	\$ 4.83	
								\$ 16,775	100.0%	\$ 67,099	\$ 270.34	
Expenses												
Rooms		22.8%			O.K.	35.0%	Room Revenue	\$ 2,278	22.8%	\$ 9,111	\$ 36.71	
Food & Beverages		70.3%			O.K.	30.0%	F&B Revenue	\$ 3,821	70.3%	\$ 15,283	\$ 61.58	
Other Operated Departments	\$ 350				O.K.	25.0%	Other Oper. Dept Revenue	\$ 350	77.8%	\$ 1,400	\$ 5.64	
Business Center		40.0%			O.K.	60.0%	Addl. Oper. Dept 1 Revenue	\$ 240	40.0%	\$ 960	\$ 3.87	
Additional Oper Dept 2					Error	25.0%	Addl. Oper. Dept 2 Revenue	\$ -	#DIV/0!	\$ -	\$ -	
Additional Oper Dept 3					Error	25.0%	Addl. Oper. Dept 3 Revenue	\$ -	#DIV/0!	\$ -	\$ -	
Miscellaneous Income		50.0%			O.K.	50.0%	Miscellaneous Revenue	\$ 150	50.0%	\$ 599	\$ 2.42	
Administrative & General		7.3%			O.K.	35.0%	Total Revenue	\$ 1,225	7.3%	\$ 4,898	\$ 19.73	
Information & Telecom Systems		1.5%			O.K.	70.0%	Total Revenue	\$ 252	1.5%	\$ 1,006	\$ 4.06	
Marketing		3.9%			O.K.	30.0%	Total Revenue	\$ 654	3.9%	\$ 2,617	\$ 10.54	
Franchise Fees		8.0%			O.K.	0.0%	Rooms Revenue	\$ 799	4.8%	\$ 3,197	\$ 12.88	
Prop. Oper. & Maintenance		4.3%			O.K.	35.0%	Total Revenue	\$ 721	4.3%	\$ 2,885	\$ 11.62	
Utilities		4.0%			O.K.	35.0%	Total Revenue	\$ 671	4.0%	\$ 2,684	\$ 10.81	
Management Fees		3.5%			O.K.	0.0%	Total Revenue	\$ 587	3.5%	\$ 2,348	\$ 9.46	
Non-Operating Income	\$ 150				O.K.	90.0%	Total Revenue	\$ 150	0.9%	\$ 600	\$ 2.42	
Rent					Error	100.0%	Total Revenue	\$ -	0.0%	\$ -	\$ -	
Property and Other Taxes		3.0%			O.K.	100.0%	Total Revenue	\$ 503	3.0%	\$ 2,013	\$ 8.11	
Insurance		1.2%			O.K.	100.0%	Total Revenue	\$ 201	1.2%	\$ 805	\$ 3.24	
Other Non-Oper Expense					Error	100.0%	Total Revenue	\$ -	0.0%	\$ -	\$ -	
Replacement Reserve		4.0%			O.K.	0.0%	Total Revenue	\$ 671	4.0%	\$ 2,684	\$ 10.81	
							Total Expenses	\$ 12,973	77.3%	\$ 51,892	\$ 209.07	
							EBITDA Less Replacement Reserve	\$ 3,802	22.7%	\$ 15,207	\$ 61.27	

Figure 18 – The Revenue and Expense Inputs portion of the *Inputs* sheet

System of Accounts for Lodging Industry, 11th Edition (USALI).

Other Operated Department Revenues and Expenses

Because hotel properties are unique, the HREF model allows the analyst to add up to four “other operated departments”. For each of the other operated departments, placing a name into the input cell creates both the departmental revenue and department expense line item. Examples include a business center, spa operations, golf/tennis operations, or beach operations.

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Data Entry for the Base Year Inputs

The “Base Year Inputs” Section contains the following titles, which are defined as:

Amounts in (\$000)	Total Dollars Expressed \$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

- Dollars per available rooms is calculated by dividing the total dollar amount by the property’s room count.
- Dollars per occupied room is calculated by dividing the total dollar amount by the number of rooms occupied per year.

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 Operated Departmental Expenses are calculated as a Percent of the Other Operated Departmental Revenue
- All Undistributed Operating Expenses and Non-Operating Income and Expenses are calculated as a Percent of Total Revenues, with the exception of Franchise Fees, which are calculated as a percent of Rooms Revenue

Data Entry for Non- Operating Income

The Non-Operating Income line item is treated differently from all other expenses. The 11th edition of the Uniform System of Accounts for the Lodging Industry (USALI) created a new category of revenues and expenses, called Non-Operating Income and Expenses. Within this category is a revenue line, called “Non-Operating Income” that is used for revenue not associated with the operation of the hotel such as Interest, Antenna Leases, or Billboard or Building Wall Rental Income. In HREF, these amounts should be entered as a positive number even though they are in the “expense” portion of the data entry tab. The software automatically treats figures entered on this line as revenues and they are netted out of the total “Non- Operating Income and Expenses” when the results are presented on the *Output* tab.

Important Note! Data Entry for HREF

Note that once an entry is made in any column for a given line item, the remaining cells are grayed out. 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. Violations of this rule will introduce serious errors in the forecast and the program provides a warning if this should happen.

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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 any of:

<u>Entry Units</u>	<u>Amount Entered</u>
Amount in (\$000)	\$ 3,996
% (Rms Rev)	40.0%
\$ per Avail Rm	\$ 15,984
\$ per Occ Rm	\$ 64.40

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

Because the income and expense data were previously calculated as part of the process of establishing the 'Base' Statement, the expense inputs could have been entered in any of the four columns. 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
- Replacement Reserve, this is entered as a percent of total revenues

This convention is followed in Figure 18 on page 61.

The *Revenue and Expense Inputs* screen contains a complete listing of revenue and expense line items based on the "Uniform System of Accounts for the Lodging Industry, 11th 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.

HREF contains a "Quick Check" section in columns M through P. The Quick Check allows the analyst to obtain an understanding of overall revenues and expenses as well as the metrics for each line item in the forecast. This allows the analyst to verify whether the base year forecast is reasonable and accurate.

The Quick Check Section

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**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* tab 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% 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.

**Entering Inflation
Estimates**

The appraiser enters projected inflation figures in the Inflation Estimates section of the *Inputs* tab. Figure 19 illustrates this section of the program.

Inflation Estimates		Note: While only the 'bright' blue cell (E62) is needed to complete the grid, the yellow cells can be configured individually as needed.										
		Base +1	Base +2	Base +3	Base +4	Base +5	Base +6	Base +7	Base +8	Base +9	Base +10	Base +11
		2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Revenues												
Rooms		3.00%	-2.90%	5.60%	1.80%	4.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Food		3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Beverages		3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Other Operated Departments		3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Business Center		3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Additional Oper Dept 2		3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Additional Oper Dept 3		3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Miscellaneous Income		3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Expenses												
Rooms		3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Food & Beverages		3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Other Operated Departments		3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Business Center		3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Additional Oper Dept 2		3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Additional Oper Dept 3		3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Miscellaneous Income		3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Administrative & General		3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Information & Telecom Systems		3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Marketing		3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Franchise Fees		3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Prop. Oper. & Maintenance		3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Utilities		3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Management Fees		3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Non-Operating Income		3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Rent		3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Property and Other Taxes		3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Insurance		3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Other Non-Oper Inc. or Exp.		3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Replacement Reserve		3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%

Figure 19 – The Inflation Estimates portion if the Inputs tab

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CASE STUDY

When the *Inputs* tab is first loaded, the Inflation Estimates section is populated with zeros. If only one inflation estimate is used, it is entered in cell E62. 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 3.0% entered in Cell E62 is entered as 3, not .03. The program automatically formats this entry as 3.0%.

You will note that the 3.0% entry in cell E62 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:

- Enter inflation estimates for room revenues first, from left to right. You will note that any entry made to the right of the first cell is immediately copied to the other cells in the row. The analyst may manually override these settings by simply entering the desired inflation rate. In Figure 19, data needs to be entered for years 2022-2026. The expected inflation is -2.9% for 2022, 5.6% for 2023, 1.8% for 2024, 4.0% for 2025, and 3.0% for 2026. Since inflation is expected to hold steady from 2026-2031, the 2026 entry is the last needed entry in this row. The program automatically copies the 3% entry from 2026 to the other cells in the row.
- Enter 3.0% in cell E63, the 2021 expected inflation for Food Revenue. Note that the 3.0% figure is copied to the right in all cells of row 63, 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 example, if Utilities are expected to increase at (say) 5%, this figure would be entered in cell E84. Immediately, all inflation estimates to the right and below cell E84 would change to 5%. To change line items below row 84 back to 3%, simply enter 3% in cell E85. Try it!

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**Occupancy and
Average Rate Inputs**

The bottom portion of the *Inputs* tab contains the Occupancy and Average Rate Inputs. Figure 20 contains a screen shot of this portion of the tab.

Occupancy and Average Rate Estimates												
	Note: Only cells E101 through G101 are needed to complete the occupancy estimates, however, each year's occupancy can be configured individually as needed. Average rates can be configured as as needed. Average rates must be over ridden in row 103, not row 102.											
	Base Yr	Base +1	Base +2	Base +3	Base +4	Base +5	Base +6	Base +7	Base +8	Base +9	Base +10	Base +11
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Occupancy Rate	68.0%	68.0%	68.0%	54.0%	62.0%	69.0%	69.0%	69.0%	69.0%	69.0%	69.0%	69.0%
Inflated Average Rate	\$161.00	\$165.83	\$161.02	\$170.04	\$173.10	\$180.02	\$185.42	\$190.99	\$196.72	\$202.62	\$208.70	\$214.96
Average Rate for Projection	\$161.00	\$165.83	\$161.02	\$161.54	\$173.10	\$180.02	\$185.42	\$190.99	\$196.72	\$202.62	\$208.70	\$214.96

Figure 20 – The Inflation Estimates Portion if the Inputs Tab

The Occupancy and Average Rate Estimates portion of the *Inputs* tab automatically enters the base year occupancy estimate from cell D14 into cell D101. The remaining occupancy figures will have to be entered to reflect the projections from the Room Night Analysis Program, as detailed below.

The program automatically calculates inflated average rate data in row 102 using the base year ADR estimate from cell D15. 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 HREF model automatically copies the inflated data from row 102 into row 103. Adjustments are made in row 103.

CASE STUDY

When the Sheraton is expected to open in 2023, the Hotel Market Analysis and ADR Forecasting Model projected an occupancy of 54%. A 62% occupancy is entered for 2024 and 69% for 2025. Once the adjusted occupancy of 69% is entered for year 2025, note how this figure is copied to all subsequent years. For 2021 and 2022, the occupancy was entered as 68%; the hotel will not be open, and it is appropriate to continue the base year occupancy.

In 2023, Table 21 shows the inflated average room rate of \$170.04 which must be overridden by entering the discounted average room rate of \$161.54 (a 5% discount). This adjustment is made in the first year of operation on for this property. Occasionally there is a discount in the second year as well for a new property. Average rate adjustments must be entered in row 102, not row 101.

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CASE STUDY (continued)

Table 21 Adjusted Data for the Occupancy and Average Rate Inputs Section

	2023	2024	2025
Estimated Occupancy	54%	62%	69% (Stab).
Inflated Average Rate	\$170.04	\$173.10	\$180.02
(Adjusted) Average Rate*	\$161.54	\$173.10	\$180.02

* Management will use a 5% discount in 2023 to secure a proper volume of business.

Output from the HREF model

Output from the HREF model is found on the *Output* tab. Figure 22 on page 69 shows a section of the output, showing the first year of operation (2023) 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.

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

Figure 22 clearly demonstrates how the Fixed and Variable Component technique changes revenues and expenses in response to changing occupancy. For example, the Replacement Reserve stays fixed at 4.0% of total revenues, while Utilities are declining as a percent of total revenue.

Printing from the HREF model

The Custom Views feature of Excel® can be used to produce printed output. Figure 21 shows the report manager dialog box, which is found using the **View, Custom Views** menu command.

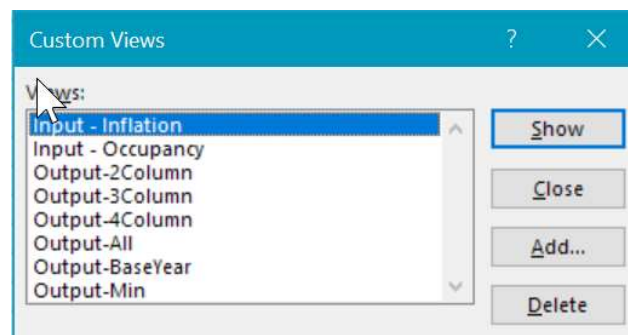


Figure 21 – The Custom Views Dialog Box in the HREF model

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There are seven reports available in **Custom Views** of the HREF model; all are listed in Figure 21. To view, simply highlight the desired report and click on the **Show** box.

The reports correspond to the *Inputs* tab and various views of the *Output* tab in the HREF model. All reports are formatted to use a minimal amount of paper. The seven reports contain the following:

- Input-Inflation – the inflation section of the *Inputs* tab
- Inputs-Occupancy – the occupancy section of the *Inputs* tab
- Output-2Column - Output sheet showing \$ and percent, for the 11 projection years
- Output3Column - Output sheet showing \$, percent and \$ per available room, for the 11 projection years
- Output-4Column - Output sheet showing all four columns per year, for the 11 projection years
- Output-All – Output sheet showing all four columns for all years including the base year.
- OutputBaseYear - Output sheet showing all four columns per year for the base year only
- OutputMin - Output sheet showing only \$, for the 11 projection years

All 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” or A4 paper.

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

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Hotel Revenue and Expense Forecasting Model - Output Sheet													www.hotelvaluationsoftware.com								
Proposed Sheraton													Base +3		Base +4		Base +5				
													2023		2024		2025				
Number of Rooms		250								250						250					
Occupancy		54.0%								62.0%						69.0%					
Average Rate	\$	161.54								\$	173.10					\$	180.02				
Days Open		365								365						365					
Rooms Occupied		49,275								56,575						62,963					
Revenues			\$/(000)	Percent	\$/Avail Rm	\$/Occ Rm					\$/(000)	Percent	\$/Avail Rm	\$/Occ Rm				\$/(000)	Percent	\$/Avail Rm	\$/Occ Rm
Rooms	\$	7,960	56.2%	\$ 31,840	\$ 161.54			\$	9,793	58.0%	\$ 39,172	\$ 173.10			\$	11,335	58.8%	\$ 45,340	\$ 180.03		
Food	\$	3,692	26.1%	\$ 14,768	\$ 74.93			\$	4,200	24.9%	\$ 16,800	\$ 74.24			\$	4,684	24.3%	\$ 18,736	\$ 74.39		
Beverages	\$	1,281	9.0%	\$ 5,124	\$ 26.00			\$	1,491	8.8%	\$ 5,964	\$ 26.35			\$	1,690	8.8%	\$ 6,760	\$ 26.84		
Other Operated Departments	\$	406	2.9%	\$ 1,624	\$ 8.24			\$	468	2.8%	\$ 1,872	\$ 8.27			\$	528	2.7%	\$ 2,112	\$ 8.39		
Miscellaneous Income	\$	277	2.0%	\$ 1,108	\$ 5.62			\$	315	1.9%	\$ 1,260	\$ 5.57			\$	351	1.8%	\$ 1,404	\$ 5.57		
Total Revenue	\$	14,157	100.0%	\$ 56,628	\$ 287.31			\$	16,892	100.0%	\$ 67,568	\$ 298.58			\$	19,292	100.0%	\$ 77,168	\$ 306.40		
Departmental Expenses																					
Rooms	\$	2,156	27.1%	\$ 8,624	\$ 43.75			\$	2,417	24.7%	\$ 9,668	\$ 42.72			\$	2,666	23.5%	\$ 10,664	\$ 42.34		
Food & Beverages	\$	3,700	74.4%	\$ 14,800	\$ 75.09			\$	4,091	71.9%	\$ 16,364	\$ 72.31			\$	4,465	70.1%	\$ 17,860	\$ 70.92		
Other Operated Departments	\$	332	81.8%	\$ 1,328	\$ 6.74			\$	371	79.3%	\$ 1,484	\$ 6.56			\$	409	77.5%	\$ 1,636	\$ 6.50		
Miscellaneous Income	\$	151	54.5%	\$ 604	\$ 3.06			\$	163	51.7%	\$ 652	\$ 2.88			\$	175	49.9%	\$ 700	\$ 2.78		
Total Departmental Expenses	\$	6,583	46.5%	\$ 26,332	\$ 133.60			\$	7,304	43.2%	\$ 29,216	\$ 129.10			\$	7,995	41.4%	\$ 31,980	\$ 126.98		
Departmental Profit	\$	7,574	53.5%	\$ 30,296	\$ 153.71			\$	9,588	56.8%	\$ 38,352	\$ 169.47			\$	11,297	58.6%	\$ 45,188	\$ 179.42		
Undistributed Operating Expenses																					
Administrative & General	\$	1,174	8.3%	\$ 4,696	\$ 23.83			\$	1,306	7.7%	\$ 5,224	\$ 23.08			\$	1,432	7.4%	\$ 5,728	\$ 22.74		
Information & Telecom Systems	\$	259	1.8%	\$ 1,036	\$ 5.26			\$	276	1.6%	\$ 1,104	\$ 4.88			\$	293	1.5%	\$ 1,172	\$ 4.65		
Marketing	\$	621	4.4%	\$ 2,484	\$ 12.60			\$	695	4.1%	\$ 2,780	\$ 12.28			\$	766	4.0%	\$ 3,064	\$ 12.17		
Franchise Fees	\$	637	4.5%	\$ 2,548	\$ 12.93			\$	783	4.6%	\$ 3,132	\$ 13.84			\$	907	4.7%	\$ 3,628	\$ 14.41		
Prop. Oper. & Maintenance	\$	692	4.9%	\$ 2,768	\$ 14.04			\$	769	4.6%	\$ 3,076	\$ 13.59			\$	844	4.4%	\$ 3,376	\$ 13.40		
Utilities	\$	644	4.5%	\$ 2,576	\$ 13.07			\$	716	4.2%	\$ 2,864	\$ 12.66			\$	785	4.1%	\$ 3,140	\$ 12.47		
Total Undistributed Expenses	\$	4,027	28.4%	\$ 16,108	\$ 81.73			\$	4,545	26.9%	\$ 18,180	\$ 80.34			\$	5,027	26.1%	\$ 20,108	\$ 79.84		
Gross Operating Profit	\$	3,547	25.1%	\$ 14,188	\$ 71.98			\$	5,043	29.9%	\$ 20,172	\$ 89.14			\$	6,270	32.5%	\$ 25,080	\$ 99.58		
Management Fees	\$	495	3.5%	\$ 1,980	\$ 10.05			\$	591	3.5%	\$ 2,364	\$ 10.45			\$	675	3.5%	\$ 2,700	\$ 10.72		
Inc. Before Non-Oper. Inc. and Exp.	\$	3,052	21.6%	\$ 12,208	\$ 61.94			\$	4,452	26.4%	\$ 17,808	\$ 78.69			\$	5,595	29.0%	\$ 22,380	\$ 88.86		
Non-Operating Income and Expenses																					
Non-Operating Income	\$	161	1.1%	\$ 644	\$ 3.27			\$	167	1.0%	\$ 668	\$ 2.95			\$	174	0.9%	\$ 696	\$ 2.76		
Rent	\$	-	0.0%	\$ -	\$ -			\$	-	0.0%	\$ -	\$ -			\$	-	0.0%	\$ -	\$ -		
Property and Other Taxes	\$	550	3.9%	\$ 2,200	\$ 11.16			\$	566	3.4%	\$ 2,264	\$ 10.00			\$	583	3.0%	\$ 2,332	\$ 9.26		
Insurance	\$	220	1.6%	\$ 880	\$ 4.46			\$	227	1.3%	\$ 908	\$ 4.01			\$	233	1.2%	\$ 932	\$ 3.70		
Other Non-Oper Expense	\$	-	0.0%	\$ -	\$ -			\$	-	0.0%	\$ -	\$ -			\$	-	0.0%	\$ -	\$ -		
Total Non-Oper. Inc. and Exp.	\$	609	4.3%	\$ 2,436	\$ 12.36			\$	626	3.7%	\$ 2,504	\$ 11.06			\$	642	3.3%	\$ 2,568	\$ 10.20		
EBITDA	\$	2,443	17.3%	\$ 9,772	\$ 49.58			\$	3,826	22.6%	\$ 15,304	\$ 67.63			\$	4,953	25.7%	\$ 19,812	\$ 78.67		
Replacement Reserve	\$	566	4.0%	\$ 2,264	\$ 11.49			\$	676	4.0%	\$ 2,704	\$ 11.95			\$	772	4.0%	\$ 3,088	\$ 12.26		
EBITDA Less Replacement Reserve	\$	1,877	13.3%	\$ 7,508	\$ 38.09			\$	3,150	18.6%	\$ 12,600	\$ 55.68			\$	4,181	21.7%	\$ 16,724	\$ 66.40		

Figure 22 – The *Output* tab, showing the First Three Years of Operation

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Modifying Formulas in the *Output* Tab

As a final point, the *Output* sheet HREF model can be modified to reflect unique circumstances that are difficult to model on the *Input* tab. 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 S39 and X39 need to be altered. Specifically, the 2023 (first year of operation) property operations and maintenance ratio will be changed to 3.8% of total revenue and the 2024 (second year of operation) ratio will be changed to 4.0% of total revenue. It should be noted that as of the third year of operation, this expense ratio stabilizes at 4.1% of total revenue. The following formulas have been written in cells S40 and X40:

<u>Cells</u>	<u>New Formulas</u>
S39	.038 * S20
X39	.040 * X20

The results are shown on the following page in Figure 23. Compare this to Figure 22 on page 69, which does not reflect these changes.

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

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Hotel Revenue and Expense Forecasting Model - Output Sheet													www.hotelvaluationsoftware.com							
Proposed Sheraton																				
Base +3 2023													Base +4 2024				Base +5 2025			
Number of Rooms	250				250				250											
Occupancy	54.0%				62.0%				69.0%											
Average Rate	\$ 161.54				\$ 173.10				\$ 180.02											
Days Open	365				365				365											
Rooms Occupied	49,275				56,575				62,963											
Revenues	\$(000)	Percent	\$/Avail Rm	\$/Occ Rm	\$(000)	Percent	\$/Avail Rm	\$/Occ Rm	\$(000)	Percent	\$/Avail Rm	\$/Occ Rm	\$(000)	Percent	\$/Avail Rm	\$/Occ Rm				
Rooms	\$ 7,960	56.2%	\$ 31,840	\$ 161.54	\$ 9,793	58.0%	\$ 39,172	\$ 173.10	\$ 11,335	58.8%	\$ 45,340	\$ 180.03	\$ 11,335	58.8%	\$ 45,340	\$ 180.03				
Food	\$ 3,692	26.1%	\$ 14,768	\$ 74.93	\$ 4,200	24.9%	\$ 16,800	\$ 74.24	\$ 4,684	24.3%	\$ 18,736	\$ 74.39	\$ 4,684	24.3%	\$ 18,736	\$ 74.39				
Beverages	\$ 1,281	9.0%	\$ 5,124	\$ 26.00	\$ 1,491	8.8%	\$ 5,964	\$ 26.35	\$ 1,690	8.8%	\$ 6,760	\$ 26.84	\$ 1,690	8.8%	\$ 6,760	\$ 26.84				
Other Operated Departments	\$ 406	2.9%	\$ 1,624	\$ 8.24	\$ 468	2.8%	\$ 1,872	\$ 8.27	\$ 528	2.7%	\$ 2,112	\$ 8.39	\$ 528	2.7%	\$ 2,112	\$ 8.39				
Miscellaneous Income	\$ 277	2.0%	\$ 1,108	\$ 5.62	\$ 315	1.9%	\$ 1,260	\$ 5.57	\$ 351	1.8%	\$ 1,404	\$ 5.57	\$ 351	1.8%	\$ 1,404	\$ 5.57				
Total Revenue	\$ 14,157	100.0%	\$ 56,628	\$ 287.31	\$ 16,892	100.0%	\$ 67,568	\$ 298.58	\$ 19,292	100.0%	\$ 77,168	\$ 306.40	\$ 19,292	100.0%	\$ 77,168	\$ 306.40				
Departmental Expenses																				
Rooms	\$ 2,156	27.1%	\$ 8,624	\$ 43.75	\$ 2,417	24.7%	\$ 9,668	\$ 42.72	\$ 2,666	23.5%	\$ 10,664	\$ 42.34	\$ 2,666	23.5%	\$ 10,664	\$ 42.34				
Food & Beverages	\$ 3,700	74.4%	\$ 14,800	\$ 75.09	\$ 4,091	71.9%	\$ 16,364	\$ 72.31	\$ 4,465	70.1%	\$ 17,860	\$ 70.92	\$ 4,465	70.1%	\$ 17,860	\$ 70.92				
Other Operated Departments	\$ 332	81.8%	\$ 1,328	\$ 6.74	\$ 371	79.3%	\$ 1,484	\$ 6.56	\$ 409	77.5%	\$ 1,636	\$ 6.50	\$ 409	77.5%	\$ 1,636	\$ 6.50				
Miscellaneous Income	\$ 151	54.5%	\$ 604	\$ 3.06	\$ 163	51.7%	\$ 652	\$ 2.88	\$ 175	49.9%	\$ 700	\$ 2.78	\$ 175	49.9%	\$ 700	\$ 2.78				
Total Departmental Expenses	\$ 6,583	46.5%	\$ 26,332	\$ 133.60	\$ 7,304	43.2%	\$ 29,216	\$ 129.10	\$ 7,995	41.4%	\$ 31,980	\$ 126.98	\$ 7,995	41.4%	\$ 31,980	\$ 126.98				
Departmental Profit	\$ 7,574	53.5%	\$ 30,296	\$ 153.71	\$ 9,588	56.8%	\$ 38,352	\$ 169.47	\$ 11,297	58.6%	\$ 45,188	\$ 179.42	\$ 11,297	58.6%	\$ 45,188	\$ 179.42				
Undistributed Operating Expenses																				
Administrative & General	\$ 1,174	8.3%	\$ 4,696	\$ 23.83	\$ 1,306	7.7%	\$ 5,224	\$ 23.08	\$ 1,432	7.4%	\$ 5,728	\$ 22.74	\$ 1,432	7.4%	\$ 5,728	\$ 22.74				
Information & Telecom Systems	\$ 259	1.8%	\$ 1,036	\$ 5.26	\$ 276	1.6%	\$ 1,104	\$ 4.88	\$ 293	1.5%	\$ 1,172	\$ 4.65	\$ 293	1.5%	\$ 1,172	\$ 4.65				
Marketing	\$ 621	4.4%	\$ 2,484	\$ 12.60	\$ 695	4.1%	\$ 2,780	\$ 12.28	\$ 766	4.0%	\$ 3,064	\$ 12.17	\$ 766	4.0%	\$ 3,064	\$ 12.17				
Franchise Fees	\$ 637	4.5%	\$ 2,548	\$ 12.93	\$ 783	4.6%	\$ 3,132	\$ 13.84	\$ 907	4.7%	\$ 3,628	\$ 14.41	\$ 907	4.7%	\$ 3,628	\$ 14.41				
Prop. Oper. & Maintenance	\$ 538	3.8%	\$ 2,152	\$ 10.92	\$ 676	4.0%	\$ 2,703	\$ 11.94	\$ 844	4.4%	\$ 3,376	\$ 13.40	\$ 844	4.4%	\$ 3,376	\$ 13.40				
Utilities	\$ 644	4.5%	\$ 2,576	\$ 13.07	\$ 716	4.2%	\$ 2,864	\$ 12.66	\$ 785	4.1%	\$ 3,140	\$ 12.47	\$ 785	4.1%	\$ 3,140	\$ 12.47				
Total Undistributed Expenses	\$ 3,873	27.4%	\$ 15,492	\$ 78.60	\$ 4,452	26.4%	\$ 17,807	\$ 78.69	\$ 5,027	26.1%	\$ 20,108	\$ 79.84	\$ 5,027	26.1%	\$ 20,108	\$ 79.84				
Gross Operating Profit	\$ 3,701	26.1%	\$ 14,804	\$ 75.11	\$ 5,136	30.4%	\$ 20,545	\$ 90.79	\$ 6,270	32.5%	\$ 25,080	\$ 99.58	\$ 6,270	32.5%	\$ 25,080	\$ 99.58				
Management Fees	\$ 495	3.5%	\$ 1,980	\$ 10.05	\$ 591	3.5%	\$ 2,364	\$ 10.45	\$ 675	3.5%	\$ 2,700	\$ 10.72	\$ 675	3.5%	\$ 2,700	\$ 10.72				
Inc. Before Non-Oper. Inc. and Exp.	\$ 3,206	22.6%	\$ 12,824	\$ 65.06	\$ 4,545	26.9%	\$ 18,181	\$ 80.34	\$ 5,595	29.0%	\$ 22,380	\$ 88.86	\$ 5,595	29.0%	\$ 22,380	\$ 88.86				
Non-Operating Income and Expenses																				
Non-Operating Income	\$ 161	1.1%	\$ 644	\$ 3.27	\$ 167	1.0%	\$ 668	\$ 2.95	\$ 174	0.9%	\$ 696	\$ 2.76	\$ 174	0.9%	\$ 696	\$ 2.76				
Rent	\$ -	0.0%	\$ -	\$ -	\$ -	0.0%	\$ -	\$ -	\$ -	0.0%	\$ -	\$ -	\$ -	0.0%	\$ -	\$ -				
Property and Other Taxes	\$ 550	3.9%	\$ 2,200	\$ 11.16	\$ 566	3.4%	\$ 2,264	\$ 10.00	\$ 583	3.0%	\$ 2,332	\$ 9.26	\$ 583	3.0%	\$ 2,332	\$ 9.26				
Insurance	\$ 220	1.6%	\$ 880	\$ 4.46	\$ 227	1.3%	\$ 908	\$ 4.01	\$ 233	1.2%	\$ 932	\$ 3.70	\$ 233	1.2%	\$ 932	\$ 3.70				
Other Non-Oper Expense	\$ -	0.0%	\$ -	\$ -	\$ -	0.0%	\$ -	\$ -	\$ -	0.0%	\$ -	\$ -	\$ -	0.0%	\$ -	\$ -				
Total Non-Oper. Inc. and Exp.	\$ 609	4.3%	\$ 2,436	\$ 12.36	\$ 626	3.7%	\$ 2,504	\$ 11.06	\$ 642	3.3%	\$ 2,568	\$ 10.20	\$ 642	3.3%	\$ 2,568	\$ 10.20				
EBITDA	\$ 2,597	18.3%	\$ 10,388	\$ 52.70	\$ 3,919	23.2%	\$ 15,677	\$ 69.28	\$ 4,953	25.7%	\$ 19,812	\$ 78.67	\$ 4,953	25.7%	\$ 19,812	\$ 78.67				
Replacement Reserve	\$ 566	4.0%	\$ 2,264	\$ 11.49	\$ 676	4.0%	\$ 2,704	\$ 11.95	\$ 772	4.0%	\$ 3,088	\$ 12.26	\$ 772	4.0%	\$ 3,088	\$ 12.26				
EBITDA Less Replacement Reserve	\$ 2,031	14.3%	\$ 8,124	\$ 41.22	\$ 3,243	19.2%	\$ 12,973	\$ 57.33	\$ 4,181	21.7%	\$ 16,724	\$ 66.40	\$ 4,181	21.7%	\$ 16,724	\$ 66.40				

Figure 23 – The *Output* Tab, showing the First Three Years of Operation, with modifications to Property Operation and Maintenance

Chapter 6 Valuation

When valuing hotels, the analyst applies the classic “three approaches” appraisal methodology, using the Income Capitalization approach, the Sales Comparison approach, and Cost approach. Although all three valuation methods 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 demonstrates only the Income Capitalization approach, which is particularly suited to computer applications.

The final value estimate should be made only after evaluating all three approaches; the analyst should take the Cost and Sales Comparison approaches into account prior to completing any appraisal assignment. See: *Hotel Market Analysis and Valuation-International Issues and Software Applications*, by Stephen Rushmore, for a full treatment of professional appraisal practice for hotel property.

Income Capitalization Approach

Mortgage-Equity Model

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 cash flows (called EBITDA less Replacement Reserve) and the net receipts from selling the property in the future. It is typical to model either a 5-year or 10-year holding period when using the mortgage-equity model. These future benefits can then be converted into an indication of the market value through a capitalization process and discounted cash flow analysis.

The Hotel Mortgage-Equity Valuation Model (HMEV) estimates the value of a hotel using a mortgage-equity model and allows for either a 5-year or 10-year holding period. The projected property cash flows are allocated to the mortgage and equity components based on current lending terms and market rates of returns to each component. 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 in the following six steps:

1. The terms of typical hotel financing are set forth including: interest rate, amortization term, loan-to-value ratio, the debt coverage ratio, and the debt yield.
2. A before-tax equity yield and terminal capitalization rate are established. The equity yield takes into account the benefits of

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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.

The terminal capitalization rate is established as that rate appropriate for the property at the end of the assumed 5-year or a 10-year holding period.

3. The value of the equity component is calculated by first deducting the yearly debt service from the forecasted EBITDA less Replacement Reserve, leaving the net income to equity for each forecast year. The EBITDA less Replacement Reserve forecast for the year following the end of the holding period is capitalized into a reversionary value. From this figure, we deduct the mortgage balance as of the end of the holding period along with normal selling expenses; the resulting 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 mortgage amount, 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 developed by Suzanne Mellen in "Simultaneous Valuation: A New Technique" *Appraisal Journal*, April 1983.
5. In addition to estimating value using a specified loan-to-value ratio, the software also estimates value using a debt coverage ratio and a debt yield. Lenders are increasingly using a debt coverage ratio or a debt yield 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 and data entry and output from HMEV.

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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 underwriting would probably be available for the proposed Sheraton hotel and would be the same for a 5-year or 10 year holding period:

Interest Rate	5.5%
Mortgage Amortization	25 years
Payments per Year	Monthly
Loan-to-Value Ratio	66%
Debt Coverage Ratio	1.75 (on year 3 (2025) income)
Debt Yield	13.0% (on year 3 (2025) income)

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

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.

The terminal capitalization rate is established as that rate appropriate for the particular asset and for the particular market. This information comes from databases and investor surveys.

CASE STUDY

A survey was conducted of hotel investors to determine their current equity yield requirements. As of January 1, 2020, the range of equity yields for hotels that would be comparable to the proposed Sheraton was between 15% and 18%. Using the same investment criteria that were employed for the mortgage interest rate, the range was narrowed to a 16% equity yield for both a 5-year or 10 year holding period. Based on the analysis of several surveys of hotel capitalization rates, an 8.0% terminal cap rate was considered appropriate for the proposed Sheraton hotel for a 10-year holding period but could be reduced to 7.75% for a 5-year hold due the reduced age of the property.

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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 property cash flows (called EBITDA less Replacement Reserve) over the projection period, as well as the remainder of the valuation parameters.

In most instances, the property cash flows 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 property cash flow 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 analyst 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 replacement reserve percentage, or an expected change in property tax assessment.

The Hotel Mortgage-Equity Valuation Model is designed to give the user a choice of using the EBITDA less Replacement Reserve developed in a forecast of revenue and expense (like the HREF model) or to calculate them after the stabilized year, based on an inflation assumption.

CASE STUDY

Table 22 on the next page contains the estimates of EBITDA less Replacement Reserve (Cash Flows) for the proposed Sheraton from the HREF model. Note that the EBITDA less Replacement Reserve figures are available only through year 9. Since the Hotel Mortgage-Equity Valuation Model is based on a 10-year holding period, three years of projection beyond year 8 (2030) are needed; year 9 and 10 for the discounted cash flow analysis, and year 11 to determine the residual value of the property.

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CASE STUDY (continued)

Table 22 EBITDA less Replacement Reserve from the HREF model for the Proposed Sheraton

Projection Year	EBITDA less Replacement Reserve
1 (2023)	\$1,877,000
2 (2024)	\$3,150,000
3 (2025)	\$4,181,000
4 (2026)	\$4,307,000
5 (2027)	\$4,438,000
6 (2028)	\$4,571,000
7 (2029)	\$4,705,000
8 (2030)	\$4,847,000

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 Mortgage-Equity Valuation Model (HMEV) will be demonstrated using the proposed Sheraton hotel. The known variables are as follows:

	10-Year Holding Period	5-Year Holding Period
Annual EBITDA less Replacement Reserve	See Table 22	See Table 22
First Projection Year	2023	2023
Hotel Room Count	250	250
Equity Yield	16%	16%
Mortgage Interest Rate	5.5%	5.5%
Mortgage Amortization (years)	25	25
Payments per Year	Monthly	Monthly
Terminal Capitalization Rate	8.0%	7.75%
Selling Expenses at Reversion	3%	3%
Stabilized Year (Year of Operation)	Year 3	Year 3
Inflation Rate after Stabilization	3.0%	3.0%
Loan-to-value Ratio	66%	66%
Debt Coverage Ratio (On Year 3 Net Income)	1.75	1.75
Debt Yield (On Year 3 Net Income)	13.0%	13.0%

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Hotel Mortgage- Equity Valuation Model (HMEV)

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

The HMEV program contains one input tab, six outputs tabs – one for each underwriting model, and one calculation tab for valuation calculations.

- *Intro (black tab)* – introductory tab
- *Input (blue tab)* – The screen for all inputs including a section for loan underwriting.
- *Output (yellow) tabs* – These three tabs contain the formatted output for the evaluation estimates, one using the loan-to-value ratio, one using the debt coverage ratio, and using the debt yield. In addition, each output screen includes a proof of value and a set of ratios and metrics.
- *Calcs (red) tab* – This tab is the calculation engine for the spreadsheet.
- *License (purple) tab*

The *Input* Tab, Project Information and Overall Valuation Inputs

The first section at the top of the sheet contains cells for project information.

The second section contains the Overall Valuation Inputs, including related to the mortgage and equity components, as well as the projected EBITDA less Replacement Reserve in columns H and I.

Hotel Mortgage-Equity Valuation Model - Input Sheet						www.hotelvaluationsoftware.com	
Project Information:				Legend			
Job Title	Proposed Sheraton			Mandatory Input			
Prepared by	HV Software			Optional Input			
Prepared for	HV Software Manual			Output			
Job #	001-001						
				EBITDA less Repl. Reserve			
Overall Valuation Inputs:		10-Year	5-Year	Year	Year Number	10-Year	5-Year
First Projection Year	2023	2023	2023	Year 1	\$ 1,877	\$ 1,877	
Hotel Room Count	250	250	2024	Year 2	\$ 3,150	\$ 3,150	
Equity Yield	16.0%	16.0%	2025	Year 3	\$ 4,181	\$ 4,181	
Mortgage Interest Rate	5.50%	5.50%	2026	Year 4	\$ 4,306	\$ 4,306	
Mortgage Amortization (years)	25	25	2027	Year 5	\$ 4,436	\$ 4,436	
Mortgage payments per year	12	12	2028	Year 6	\$ 4,569	\$ 4,569	
Terminal Cap Rate	8.00%	7.75%	2029	Year 7	\$ 4,706		
Selling Expenses at Reversion	3.0%	3.0%	2030	Year 8	\$ 4,847		
Inflation Rate after Stabilization	3.0%	3.0%	2031	Year 9	\$ 4,992		
Number of Years to Stabilization	3	3	2032	Year 10	\$ 5,142		
Stabilized Year's EBITDA Less Repl. Reserve	\$4,181	\$4,181	2033	Year 11	\$ 5,296		

Figure 24 – The *Input* Tab – Project Information and Overall Valuation Inputs

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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 EBITDA less Replacement Reserve figures 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 for a 10-year holding period. Similar entry is performed for a 5-year holding period.

Description	Cell	Entry
First Projection Year	D10	Enter the year, 2023
Hotel Room Count	D11	Enter 250
Equity Yield	D12	Enter 16, not .16 or 16%
Mortgage Interest Rate	D13	Enter 5.5, not .055 or 5.5%
Mortgage Amortization	D14	Enter 25
Mortgage payments per year	D15	Enter 12, not monthly
Terminal Cap Rate	D16	Enter 8.0, not .08 or 8%
Selling Expenses at Reversion	D17	Enter 3, not .03 or 3%
Inflation Rate after Stabilization	D18	Enter 3, not .03 or 3%
Number of Years to Stabilization	D19	Enter 3, not 2025
EBITDA less Repl. Reserve	H10 – H12	Enter the figures from Table 22

Optional Input for Cash Flows Used in Analysis

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 the EBITDA less Replacement Reserve stabilizes in year three of operation (2025) and grows at 3% after this point. The HMEV program automatically grows the EBITDA less Replacement Reserve in cells H13 – H20 at stated inflation rate (D18).

If all 11 years of EBITDA less Replacement Reserve are provided in cells H10 - H20, the analyst only needs to enter the number 11 in cell D19. In this case, the cash flows entered in cells H10 - H20 are used for the valuation. If a stabilized year and inflation rate are used in D19 and D18, this data is used to calculate the cash flows used for valuation. The choice is up to the analyst.

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Input for the Underwriting Matrix

The lower portion of the *Input* tab is called the *Underwriting Matrix*, with inputs for the three loan underwriting criteria. The completed screen is shown in Figure 25. As stated earlier, the program produces three value estimates, each relevant on different loan underwriting criteria.

CASE STUDY

For the proposed Sheraton, the analyst feels the following underwriting criteria represent the market at the time the study is performed.

Underwriting Criteria	Value
Loan-to-Value Ratio	66%
Debt Coverage Ratio	1.75
Year of Cash Flow Used for Underwriting	Year 3 (2025)
Debt Yield	13.0%
Year of Cash Flow Used for Underwriting	Year 3 (2025)

These figures are based on the analyst's knowledge of typical loan underwriting in the market for hotels in the greater Long Island, New York area.

Underwriting Matrix		
Inputs for Loan-to-Value Ratio Based Model:		
	10-Year	5-Year
Loan to Value Ratio	66%	66%
Inputs for Debt Coverage Ratio Based Model:		
	10-Year	5-Year
Debt Coverage Ratio	1.75	1.75
Enter the Year of the Cash Flow Used for Underwriting	3	3
Underwritten Cash Flow to be Used	\$4,181	\$4,181
Inputs for Debt Yield Based Model:		
	10-Year	5-Year
Debt Yield	13.00%	13.00%
Enter the Year of the Cash Flow Used for Underwriting	3	3
Underwritten Cash Flow to be Used	\$4,181	\$4,181

Figure 25 – The Underwriting Matrix portion of the *Input* Tab

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

The *HMEV* software contains a calculation 'engine' used to calculate value on the *Calcs* tab. Three values are calculated, one using the loan-to-value ratio, one using the debt coverage ratio and one using the debt yield. No screen shots from this section are presented, as this is simply the mechanical portion of the valuation software.

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

The *Output* Tab for the LTV Output

The *Output* tabs contain formatted output with the valuations and the proofs of value. In Figure 26, the *Output* for the LTV model is presented, the screen contains the valuation, a proof of value, and a set of project metrics.

Hotel Mortgage-Equity Valuation Model - 10 Year Output - Loan to Value					www.hotelvaluationsoftware.com							
10 Yr LTV Model:		Value	% of Total	Value per	Project Metrics							
Proposed Sheraton	Value	Value	IRR	Room (\$)	Total Appreciation				37.17%			
Value of the Property	\$ 48,264	100.0%	10.29%	\$ 193,058	Annual Appreciation				3.21%			
Value of the Mortgage Component	\$ 31,854	66.0%	5.50%	\$ 127,418	Cash Flow Return				50.05%			
Value of the Equity Component	\$ 16,410	34.0%	16.00%	\$ 65,640	Appreciation Return				49.95%			
					Stabilized Going In Cap Rate				8.17%			
					Total Property Yield				10.29%			
Cash Flows for IRR Calcs												
	Year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Total Property		\$ (48,264)	\$ 1,877	\$ 3,150	\$ 4,181	\$ 4,306	\$ 4,436	\$ 4,569	\$ 4,706	\$ 4,847	\$ 4,992	\$ 69,361
Mortgage		\$ (31,854)	\$ 2,347	\$ 2,347	\$ 2,347	\$ 2,347	\$ 2,347	\$ 2,347	\$ 2,347	\$ 2,347	\$ 2,347	\$ 26,288
Equity		\$ (16,410)	\$ (470)	\$ 803	\$ 1,834	\$ 1,959	\$ 2,088	\$ 2,221	\$ 2,358	\$ 2,500	\$ 2,645	\$ 43,073
Debt Coverage Ratio			0.80	1.34	1.78	1.83	1.89	1.95	2.00	2.06	2.13	2.19
Debt Yield			5.89%	9.89%	13.13%	13.52%	13.92%	14.34%	14.77%	15.22%	15.67%	16.14%
Equity Dividend Rate			-2.87%	4.89%	11.17%	11.94%	12.73%	13.54%	14.37%	15.23%	16.12%	17.03%
Proof of Value												
		Total Property Present Value				Mortgage Component Present Value				Equity Component Present Value		
		EBITDA less	PV Factor @	Discounted		Mortgage	PV Factor @	Discounted		Net Income	PV Factor @	Discounted
	Year	Repl. Reserv	10.3%	Cash Flow	Year	Payment	5.43%	Cash Flow	Year	to Equity	16.0%	Cash Flow
	2023	\$ 1,877	0.9067	\$ 1,702	2023	\$ 2,347	0.9485	\$ 2,226	2023	\$ (470)	0.8621	\$ (405)
	2024	\$ 3,150	0.8221	\$ 2,589	2024	\$ 2,347	0.8996	\$ 2,112	2024	\$ 803	0.7432	\$ 596
	2025	\$ 4,181	0.7453	\$ 3,116	2025	\$ 2,347	0.8532	\$ 2,003	2025	\$ 1,834	0.6407	\$ 1,175
	2026	\$ 4,306	0.6758	\$ 2,910	2026	\$ 2,347	0.8093	\$ 1,900	2026	\$ 1,959	0.5523	\$ 1,082
	2027	\$ 4,436	0.6127	\$ 2,718	2027	\$ 2,347	0.7676	\$ 1,802	2027	\$ 2,088	0.4761	\$ 994
	2028	\$ 4,569	0.5555	\$ 2,538	2028	\$ 2,347	0.7280	\$ 1,709	2028	\$ 2,221	0.4104	\$ 912
	2029	\$ 4,706	0.5037	\$ 2,370	2029	\$ 2,347	0.6905	\$ 1,621	2029	\$ 2,358	0.3538	\$ 834
	2030	\$ 4,847	0.4567	\$ 2,214	2030	\$ 2,347	0.6549	\$ 1,537	2030	\$ 2,500	0.3050	\$ 762
	2031	\$ 4,992	0.4141	\$ 2,067	2031	\$ 2,347	0.6211	\$ 1,458	2031	\$ 2,645	0.2630	\$ 695
	2032	\$ 69,361	0.3754	\$ 26,040	2032	\$ 26,288	0.5891	\$ 15,487	2032	\$ 43,073	0.2267	\$ 9,764
		Total Property Value		\$ 48,264		Mortgage Component Valu		\$ 31,854		Equity Component Value		\$ 16,410
Year 10 Cash Flow Calculations												
		Year 10 Cash Flow of		\$ 5,142		Year 10 mort. payment of		\$ 2,347		Year 10 net inc. to equity of		\$ 2,795
		plus reversion of		\$ 64,218		plus the RMB of		\$ 23,941		plus the equity residual of		\$ 40,278
				\$ 69,361				\$ 26,288				\$ 43,073

Figure 26– 10-Yr Output Tab, showing valuation based on the Loan-to-Value Ratio (LTV) Model

The value of the property, using the Loan-to-Value ratio to size the mortgage, is \$48,264,000 (cell C5), rounded to \$48,300,000.

The value of the mortgage component is \$31,854,000, or 66% of total value (cell C6). The value of the equity component is \$16,410,000 (cell C), or 34% of total value. The program also shows value per room in cells F5 – F7.

The IRR for the total property (cell E5), or total property yield, calculates to 10.29%.

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Project Metrics on the *Output* Tab

The same process is performed to calculate the IRR for the mortgage component. It is comforting to know that the IRR is 5.5%, which is the mortgage interest rate specified in the inputs. Similarly, the equity IRR or equity yield calculates to 16%.

To the right of the values and IRR's are a set of project metrics. They are described in Table 23.

Table 23 Project Metrics on the HMEV Output

Metrics	Explanation
Total Appreciation	The change in property value over the holding period
Annual Appreciation	The average annual compound property value appreciation rate
Cash Flow Return	The proportion of property value attributable to property cash flows over the holding period
Appreciation Return	The proportion of property value attributable to the reversion at the end of the holding period
Stabilized Going In Cap Rate	The stabilized year's NOI (adjusted for inflation) divided by property value
Total Property Yield	The overall IRR property IRR over the holding period

Continuing with Figure 26, the second section of the output shows the cash flows used in the IRR calculations; the year 10 flows include both the annual cash flow as well as the reversion to each component of value. Below the cash flows are ratios for each year's Debt Coverage Ratio, Debt Yield and Equity Dividend Rate.

The remaining portion of the output 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.

The first section shows the proof for the total property yield.

The next section proves the IRR of the mortgage component. Note that the interest rate used is 5.43%, not the 5.5% 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 section proves the equity yield of 16%.

The three proofs of value show the calculations of the Hotel Mortgage-Equity Valuation Model. They prove that a total property value of \$48,264,000 is the only

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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.

Summary of 10-year Holding Period for All Underwriting

In addition to the LTV Output the HMEV program produces output for the Debt Coverage Ratio (DCR) underwriting model and for the Debt Yield Model. The results are summarized below in Table 24.

CASE STUDY				
Table 24 Summary of Valuation – 10-year Hold				
Underwriting	Value (\$000)	LTV	DCR Year 3	Debt Yield Year 3
LTV (66%)	\$48,264	66.0%	1.78	13.13%
DCR (1.75 on Yr 3)	\$48,533	66.8%	1.75	12.90%
Debt Yield (13.0% on Year 3)	\$48,410	66.4%	1.76	13.00%

Note that all models produce a value estimate in the range of \$48.3-\$48.5 million.

The 5-Year Holding Period

In addition to a 10-year holding period, the HMEV model produces an estimate of value for a 5-year holding period for all three underwriting criteria. Figure 27 illustrates that this value estimate is very similar to the 10-year holding period model. The 5-year holding period is appropriate for select service properties or properties that are considered to have very stable cash flows.

Hotel Mortgage-Equity Valuation Model - 5 Year Output - Loan to Value					www.hotelvaluationsoftware.com	
5 Yr LTV Model:	Value	% of Total	IRR	Value per	Project Metrics	
Proposed Sheraton	Value (\$000)	Value		Room (\$)		
Value of the Property	\$ 49,185	100.0%	9.73%	\$ 196,741	Total Appreciation	19.85%
Value of the Mortgage Component	\$ 32,462	66.0%	5.50%	\$ 129,849	Annual Appreciation	3.69%
Value of the Equity Component	\$ 16,723	34.0%	16.00%	\$ 66,892	Cash Flow Return	26.94%
					Appreciation Return	73.06%
					Stabilized Going In Cap Rate	8.01%
					Total Property Yield	9.73%

Figure 27 – 5-Year Output Tab, showing valuation based on the Loan-to-Value Ratio (LTV) Model

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Chapter 7 Conclusion

The Hotel Valuation Software provides the necessary computing tools to assist analysts 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 analyst should be able to develop a supportable estimate of operating performance and value by utilizing this software.

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