

SCENARIO

You are a captain and the base engineer at a large army post in Mississippi. It's an old base. Most of its housing, 2,000 units in all, dates back to the Korean War. The gas heating and electric air conditioning systems in the units are expensive to run and maintain. They frequently break down, and they heat and cool inefficiently. The heaters have recently caused several fires. You and the base commander have agreed that the equipment must be replaced. But with what?

You decide you need a feasibility study that will lead to a feasibility report to the base commander. As you study the problem, it's clear that the choice lies between updated (and more efficient versions) of the current equipment and geothermal heat pumps (GHPs).

The criteria for the choice begin to emerge: initial cost, maintenance cost, energy cost, efficiency, safety, and environmental impact. Luckily, you have a pilot program at Fort Polk in Louisiana to draw data from. Results there indicate that GHPs are better by every criterion. It becomes clear what your final recommendation will be. Now, you have to organize and write a report to support that recommendation.

For details on how to structure recommendation reports, read on in this chapter.

chapter 16

Recommendation Reports

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Our purpose in this chapter is to give you a sense of the large class of reports known as recommendation reports. Recommendation reports present data, draw

conclusions from the data, and make recommendations based on the data and the conclusions. If the person making the report has the authority to do so, the recommendations may be presented as decisions. The feasibility report, the last report presented in this chapter, has fairly standard features. However, many recommendation reports have no particular or prescribed format or organization beyond the need to do the following:

- Introduce the report.
- Present enough data in words and visuals to justify any conclusions drawn.
- Discuss and evaluate the data.
- Summarize the data.
- Draw conclusions from the data.
- Present recommendations based upon the data and the conclusions.

In presenting your report, choose a content, style, tone, and design suitable for your purpose and your audience. A careful reading of Parts I and II in this book will help you make the right choices. The methods of analysis presented in Chapter 10, Analyzing Information, are particularly useful for recommendation reports.

Your choice may be to present your report as a formal report, using all or some of the format features described in Report Format in Appendix B. Or you may choose a less formal method of presentation, such as a letter or memo (see Letter and Memorandum Format in Appendix B).

To help you with the choices you have to make, we present three sample reports in this chapter, each developed to meet a different situation. Studying these reports will show how the writers developed their reports to meet their situations. Applying what you learn will help you design and write your reports to meet your situations.

We show each report in an annotated figure. We describe the situation that generated the report and point out important features of the report.

AN INFORMAL REPORT: THE CHURCH REPAIR PROJECT

Many reports are best designed and written as informal reports, usually presented as a letter or memo. Such was the case in our first example.

The Situation

Graham and Simpson is an architectural consulting firm that specializes in analyzing construction problems. The membership of a historic New England church has hired Graham and Simpson to determine why the chimneys of the church are leaking and to recommend solutions to the problem. Tim Fong, the managing engineer on the project, writes an internal report to Eben Graham, one

of the principals of Graham and Simpson, who is dealing directly with the church repair committee (see Figure 16-1). Tim has two purposes in his report: (1) to report to Eben the progress his team has made, and (2) to alert Eben to the seriousness of the problems and let him know what his recommendations will be. With this information, Eben can deal with the church committee in an informed, responsible, and ethical way.

Important Features of Report

- For short internal documents, an informal memorandum design is often the best choice. The choice eliminates such things as title pages and tables of contents, needed for long reports but not usually needed for short reports. Information and analysis are presented quickly and with little formality.
- Both the subject line, functioning here like a report title, and the introduction make the subject and purpose immediately clear.
- The conclusions section both summarizes the damage and reaches conclusions concerning the damage. The summary and recommendations are presented up front in numbered lists. Executives like key information to appear early in reports and summaries, conclusions, and recommendations are certainly key information.
- The design of the “Field Observations” portion of the report allows the reader to easily find and easily read the information presented (see Chapter 11). Headings and subheadings guide the reader. Short paragraphs arranged in list fashion make the extent of the damage to the two chimneys immediately clear.
- Because the report is in part a progress report (see Chapter 15), in “General Observations of the Roof Structure” the writer describes future work. He concludes with sources for additional information in case the reader has questions.

A FORMAL REPORT: THE OIL SPILL PROBLEM

Long complicated reports, particularly for an external audience, need a design that guides the reader to the information in the report. These more formal designs call for such features as title pages, letters of transmittal, and tables of content (see Chapter 11). Such is the case in the oil spill report. Although such design features create what is known as a formal report, their use is not really meant to increase formality. Rather, report writers use them to help readers find their way in a report.

The Situation

R. J. Meyers and Associates, Environmental Engineering and Consulting, has the task of determining whether oil spills at a British Petroleum facility can be controlled by containment booming. The Environmental Protection Agency (EPA) will not permit the use of chemical dispersants for controlling oil spills at this

locality. Larry Payne, a consulting engineer with R. J. Meyers, has the task of investigating and solving the problem. The report in Figure 16-2 describes his investigation and details the recommendations he came to. Like many such reports, it has mixed elements. Although it is primarily a recommendation report, it is partly an instructional document (see Chapter 18) and partly a research report (see Chapter 17). To help his readers sort out and find the various elements of his report, Larry uses a formal report design.

Important Features of Report

- Larry writes the letter of transmittal in a somewhat informal style, indicating that he has a friendly relationship with the recipient, R. G. Rolan. If such a relationship did not exist, or if the letter were going to a culture that values formality, Larry would have to be more formal (see Chapter 7). As is common, the letter of transmittal briefly summarizes the report something that would be appreciated by a busy executive.
- The introduction serves several purposes. It makes subject and purpose clear. It indicates the plan of development of the report. Finally, it reassures the reader that the recommendations will meet all government regulations and reduce costs for British Petroleum (BP).
- The section of the report labeled “Summary: Oil Spill Response at BP’s Marcus Hook Facility” is an excellent executive summary (see Report Format in Appendix B). It provides background information, explains the nature of the problem, gives the major implications (conclusions) of the data, and provides a summary of the recommendations. A busy executive would have every thing needed right here.
- Pages 3 through 9 provide instruction on boom containment and provide the theory that suggests that an angled boom deployment will be more effective than a straight-line deployment. The section is written on the assumption that readers of the report may not know how such booms work. If a reader wants the information it’s in the report. For readers who don’t want the information, the good design of the report with its headings and subheadings makes it easy to skip or skim over the technical parts. Chapter 18 and two sections in Chapter 9 (Mechanism Description and Process Description) are useful in learning how to write such instruction and description.
- Not content with providing only theory to validate the choice of angled boom containment, the author on page 10 reports field research conducted on the BP site that supports the theory.
- On page 11, the author provides a narrative statement of the recommendations that are listed on page 2. The narrative both states and supports the recommendations.

A FEASIBILITY REPORT: DEPARTMENT STORE LOCATION

A feasibility report is a recommendation report that reports the results of a feasibility study. Feasibility is determined by the answers to questions concerning technological possibility, economic practicality, social desirability, environmental soundness, and so forth. The feasibility report presents, interprets, and summarizes the data relevant to feasibility. It presents the conclusions of the study and recommends actions to be taken.

Before discussing the preparation of a feasibility report, let's examine the feasibility study of which the report is the end product. Although exactly how you would conduct a feasibility study would depend upon your discipline and your level of expert knowledge, we can, in general terms, describe the conduct of a study for you.

Logic of the Feasibility Study

A feasibility study involves a choice among options. The options may involve doing something or not doing it. Or, given the decision that something should be done, the choice may lie among the options available to do it. At all levels of human activity, from the individual engrossed in personal and domestic problems to the highest level of policy making in government, we live in a society where such decision making goes on:

- Homeowners may discuss whether to replace the worn-out furnace with a new conventional furnace or to switch to a heat pump.
- A city council may debate whether to install a downtown heating plant and sell heat to local businesses.
- A company may study the feasibility of manufacturing a new product.
- A company may want to know whether land it owns near an interstate highway should be developed into a shopping mall, a business park, or some combination of both.
- The governments of the United States, Canada, and Mexico may study the feasibility of a \$300 billion water system to bring water from Alaska and the Yukon to the rest of Canada and the United States and to Mexico.

At any level, a feasibility study involves steps like these:

- Setting the purpose and scope of the study
- Gathering and checking information
- Analyzing data
- Reaching conclusions
- Arriving at a decision or recommendation

Because formulating purpose and scope is so critical to the success of a feasibility study, we discuss them at some length here.

Purpose Before you do any research, define the precise purpose of all the work you will do. Usually, a single sentence is ideal for the purpose statement:

The purpose of this investigation is to determine whether X Company of Old Town should establish a branch plant in New Town.

An announcement such as this may seem easy and self-evident, perhaps superfluous. But many investigators have floundered around and eventually bogged down simply because they did not clearly and consciously formulate the objective toward which they were striving.

Here are some additional examples of purpose statements:

- The purpose of this study is to determine the feasibility of using particle board to sheathe the interior of houseboats.
- The purpose of this investigation is to select the best methods for instructing elementary schoolchildren about the effects of toxic pollution on water quality.
- Our primary objective is to decide which of several microcomputers would be the best choice for the Department of Mechanical Engineering to purchase.

Scope Once the purpose of a feasibility study has been clearly and exactly decided, you must determine the methods of accomplishing your purpose. The methods chosen dictate the scope of the study, that is, the actions to be taken, the range of data to be gathered, the bounds to be set in studying the problem, and the criteria against which you will measure possible solutions. To illustrate, let us use our purpose statement example:

Purpose

- Should X Company of Old Town establish a branch plant in New Town?

Scope

- Does X Company now have, or can it develop, enough business in New Town to justify a branch there?
- Does New Town offer adequate physical facilities, utilities, and other services for plant operation there—office space, transportation, communications, and so forth?
- Can the required staff be obtained, whether by local hiring or moving personnel into the area, or both?
- Are local business practices and codes, tax structure, and so forth favorable for conducting business there?
- What effect, for better and worse, would opening a branch plant in New Town have upon overall company organization, operations, policy, and financial condition?

From such an initial statement of scope, the investigation can proceed, although the questions asked may be broadened and rephrased. As an investigator you should not remain blindly committed to your initial statement of scope but should reexamine it from time to time in the light of the information you gather. Look for holes, overlaps, superfluous items, and the like. Frequently, a person unacquainted with the study is in a far better position than you to spot shortcomings and illogicalities in the statement. Therefore, you should ask someone outside the study to review and react to the list of scope items you compile.

Preparation of the Feasibility Report

Your feasibility study will be complete when you have fulfilled your purpose and scope, that is, when you have gathered, checked, and analyzed your data, reached your conclusions, and arrived at your recommendation or decision. At that point you will need to plan your report.

Your feasibility report may include all or some of the following elements:

- Letter of transmittal or preface
- Title page
- Table of contents
- List of illustrations
- Glossary of terms
- Executive summary
- Introduction
- Discussion
- Summary
- Conclusions
- Recommendations
- Appendixes
- References

How many of these elements you include will depend upon audience factors and the length and complexity of the report. For example, a long report aimed at a narrow audience of several people should have a letter of transmittal. A long report for a more general audience would have a preface instead. A short feasibility report of only several pages may be cast as a memorandum or letter and essentially consist of only an executive summary, discussion, conclusions, and recommendations.

We discuss all the elements you may need for a feasibility report in Appendix B. As with all recommendation reports, the methods of analysis presented in Chapter 10, Analyzing Information, are particularly useful for feasibility reports.

A report based upon the feasibility of X Company establishing a branch plant in New Town could be based upon the criteria used in the investigation. The complete plan of the report, then might look like this:

Letter of Transmittal

Title Page

Table of Contents

Executive Summary: Should Company establish a branch plant in New Town, yes or no? Why?

Introduction

- Subject, purpose, and scope of study
- Reasons for conducting study
- Procedures used for conducting study

Analysis of Factors Determining the Establishment of a Branch Plant in New Town

- Estimated profitability of new branch Facilities

- Existing office space

- Utilities

- Transportation

- Communication

- Land prices and availability

- Local construction prices

- Business climate

- Tax structure

- Building codes

- Business regulations

- Economic health

- Personnel

- Local labor market

- Personnel available for transfer

- Quality of life in New Town

- Schools

- Cost of living

- Effect on X Company of establishing a branch plant

- Existing organization

- Existing operations

- Company policy

- Financial resources

Summary

Conclusions

Recommendations

References

Appendixes

Generally speaking, the readers of feasibility reports are not experts in the field of the study. The users of an environmental impact study—a type of feasibility report—may be citizens' groups and state legislators. In industry, the users of feasibility studies will be the executives responsible for making decisions. All these diverse audiences, are, in general, acting as executives, and reports for them should be written in a manner suitable for executives. Write in plain language, avoiding technical jargon when possible. Give necessary definitions and background information. Use suitable graphics. Emphasize consequences and function over methodology and theory. Interpret your data and state clearly the conclusions and recommendations that your best professional judgment leads you to.

For the most part, feasibility studies are conducted by experts in the field of the study or, in many cases, teams of experts from several fields. For example, environmental impact studies are specialized forms of feasibility study used in deciding whether some new project, perhaps a new highway, is environmentally sound. Such studies may bring together in a collaborative effort, civil engineers, wildlife biologists, soil scientists, archaeologists, and so forth.

However, students are capable of writing good feasibility reports. They can use real problems in their discipline that need solving, or they can role-play as problem solvers in an occupation they may some day have. The student Jennifer Youngren, whose report we show you now, chose to role-play an executive in a department store chain asked to choose the location for a new store.

The Situation

Kate Hanson, chief executive officer for Haley's Department Stores, must decide where to locate a new Haley's store in Cass, Ohio. The choice has been narrowed down to two empty store locations, one in a mall and one in the downtown area. She asks Jennifer Youngren, her chief financial officer, to investigate and make a recommendation. She asks Jennifer to pay particular attention to lease arrangements and the accessibility and nature of each location. The feasibility report in Figure 16-3 is the result of Jennifer's investigation. While the report is not particularly long, it is complex, and Jennifer chose to give it elements such as an executive summary and a table of contents to make the document more accessible to Kate.

Important Features of Report

- The title page carries all the information needed and is simple and uncluttered.
- The memo of transmittal submits the report, gives the occasion for it, and states its subject and purpose. Why, you may wonder, should Jennifer give Kate information she already knows. One reason is to remind a busy

executive who has a great many things on her mind. Another is that the report goes on file as a part of the official record of the decision of where to locate the store. People who may examine the file in years to come will not be conversant with the details. Jennifer also forecasts her recommendation in the letter.

- The table of contents shows a simple two-level organization, as befits a fairly short report. Besides serving as a locating device, the table shows the logic and organization of the report.
- The executive summary summarizes the data and conclusions and announces Jennifer's recommendation to go with the downtown location.
- The introduction states the purpose, scope, and plan of development of the report.
- The discussion is organized to evaluate each location by the same criteria. A well-designed system of headings and subheadings makes the discussion easy to follow. The style used is plain, economical, and easy to read.
- The summary provides a table that is an excellent side-by-side factual comparison of the two sites. The conclusions, presented in narrative form, show that Jennifer has given both locations a fair appraisal. Because her choice of the downtown location involves some risk, she is careful to point out why she chose it. If Kate Hanson is like many executives, the introduction, summaries, conclusions, and recommendation of this report may be all she reads. If that is the case, she will have sufficient information to know how Jennifer has studied the problem and how she has arrived at her recommendation.
- The simply stated recommendation fulfills the purpose of Jennifer's report.

A FINAL WORD

In this chapter we have shown you three recommendation reports, with special emphasis on the feasibility report. All three reports are excellent, and studying them is a good guide to planning, designing, and writing any kind of recommendation report. However, remember that these reports are simply examples that provide guidelines to creating your own recommendation reports. Any report you do should respond to your own purpose, content, and audience.

PLANNING AND REVISION CHECKLISTS

You will find the planning and revision checklist inside the front cover valuable in planning and revising any presentation of technical information. The following questions specifically apply to recommendation reports. They summarize the key points in this chapter and provide a checklist for planning and revising.

Planning

- What is the purpose of your report? Have you stated it in one sentence?
- What is the scope of your report?
- Who is your reader? What is your reader's technical level?
- What will your readers do with the information?
- What information will you need to write the report?
- How long should the report be?
- What format should you use for the report?
- What report elements will you need?
- What elements do you need to include in your introduction?
- What arrangement will you use in presenting your report?
- What graphics will you need to present information or data?

Revision

- At a minimum, does your recommendation report do the following:
 Introduce the report?
 Present enough data in words and visuals to justify any conclusions drawn?
 Discuss and evaluate the data fairly?
 Summarize the data?
 Draw logical conclusions from the data?
 Present recommendations based upon the data and the conclusions?
- Are your data accurate?
- Do your visuals immediately show what they are designed to show?
- Is your format suitable for your content, audience, and purpose?
- Have you properly documented all information sources?

EXERCISES

1. Think of a piece of equipment your major department needs, such as a computer, camera, audio recorder, VCR, television, or test equipment. Explore the choices available for the particular piece of equipment needed. Write a report for the department head that evaluates the choices against appropriate criteria and that recommends which choice to buy. Submit your report as a memo (see Letter and Memorandum Format in Appendix B).
2. In groups of four or five, discuss some of the major problems students confront on campus. As a group, choose one of the problems as a project. Gather data that allow the group to define the problem accurately. Analyze the data and draw conclusions: Why does the problem exist? Based on the group's conclusions, develop possible solutions to the problem. After considering appropriate criteria—such as cost, personnel, and time—choose the most feasible solution to the problem.

Write a report that presents the group's data, analysis, conclusions, and recommendations. Use a report format similar to that in Figure 16-3. Address the report to the dean of your college.

3. Imagine you are the army captain of our opening scenario who must write a feasibility report concerning geothermal heat pumps to the base commander. To gather information for your report visit <http://www.eren.doe.gov/geothermal/> and check out the resources listed there. Use a report format similar to that in Figure 16-3. Submit your report to your instructor, who, for this exercise, will have the rank of brigadier general.
4. Seek out a subject for a feasibility study and report. In your local or campus newspaper identify any news items that call for feasibility studies. Is your community or school considering any actions that should be preceded by feasibility studies? Are there topics in your discipline that would lend themselves to feasibility studies?
 - Using the material you have gathered, prepare a list like the one shown here, but substitute your own subject matter following the four colons:

General field: Meteorology/physics

Specific topic: Short-term weather forecasting

Purpose: To determine the feasibility of devising and installing a lightning prediction system that will warn residents of a golf course community when lightning danger is imminent.

Client: Regina Bereswill, General Manager of the community.

- Using the list you prepared, determine the scope of your treatment (see 465–466). Rough out the areas of information you will need and the sources and methods you will use to gather the information (see Chapter 8, Gathering, Evaluating, and Documenting Information).
- Submit to your teacher a proposal for a feasibility report based on the information you have developed above (see Chapter 15, Proposals and Progress Reports).
- Using the planning checklists inside the front cover and following this chapter, prepare an organizational plan for your report. Begin with an updated purpose, scope, and audience statement. Decide on an appropriate format for the report. Will it be a memorandum, letter, or a formal report? If a formal report, which format elements will you include? How many visuals, and what kinds, do you anticipate? Be prepared to justify your choices in a discussion with your teacher.
- Begin work on your report. Midway through the process, submit a progress report to your teacher (see Chapter 15, Proposals and Progress Reports).

- Write, revise, and edit the report you have planned and researched. Address it to the client, but submit it to your teacher.
5. Prepare an oral report for either Exercise 2 or 4. If Exercise 2, your fellow students are your audience. If Exercise 4, your proposed client is your audience. Your teacher will specify the time duration for your oral report (see Chapter 19, Oral Reports).

FIGURE 16-1 • Church Repair Project

FIGURE 16-2 • The Oil Spill Problem

FIGURE 16-3 • Feasibility Study