

# Basic House Designs

# 2



## Objectives

After studying this chapter, you will be able to:

- List the four basic house designs.
- Explain the chief advantages of each house design.
- List disadvantages of each house design.
- Explain traffic circulation in a floor plan.

## Key Terms

Intermediate-Level	Sleeping Level
Living Level	Split-Level
One-and-One-Half Story	Traffic Circulation
One-Story Ranch	Two-Story

A residential home designer has four basic designs to choose from: one-story ranch, one-and-one-half-story, two-story, and split-level. Each of these styles has strengths and weaknesses that should be considered before making a choice. Factors such as space available for the house “footprint,” site contour, climate, convenience, cost, surroundings, personal preference, and personal needs should all play a role in the final decision.

## One-Story Ranch Designs

The *one-story ranch* style house has all the regular living space on one level, Figure 2-1. It may have a basement, depending on the section of the country in which it is built and preference of the prospective owner. Otherwise, it will sit on a crawl space or slab floor. A one-story ranch house is often simply called a ranch house.



**Figure 2-1.** A typical one-story ranch house has all of the normal living space on the main level.  
(Ken Hawk)

One of the chief advantages of the ranch design is that it lends itself beautifully to indoor-outdoor living, Figure 2-2. Patios, porches, and terraces can be added off of virtually any room. With lots of glass, it is possible to visually bring the outdoor surroundings inside



**Figure 2-2.** The quality of this outdoor space greatly enhances the living area of the home.

(The Oshkosh, WI private residence of Chancellor Richard H. Wells and family—formerly the Alberta Kimball Home)

to make the house appear even larger than it is. Another advantage of this design is the absence of stairs when the house is on a crawl space or slab. The ranch without a basement is popular with many older and handicapped people.

The ranch usually has a low-pitched roof, since no headroom is necessary above the ceiling, and wide overhangs. The low-pitched roof and short walls make outside maintenance easy. Cleaning the gutters, removing the screens, and painting do not require long ladders or other special equipment. Low height also simplifies construction. See Figure 2-3 and Figure 2-4.

The low and long appearance of the ranch is pleasing to most people, Figure 2-5. The ranch may be built with a full basement, Figure 2-6; crawl space, Figure 2-7; or on a slab, Figure 2-8. A great number of variations is possible. The ranch easily lends itself to expansion and modification.

A ranch house is not without disadvantages. One disadvantage of a ranch house is that it usually costs more to build than other designs of the same square footage. This stems from the fact that there is more roof area and more foundation length, Figure 2-9.



**Figure 2-3.** This modern variation on the basic ranch design minimizes height problems in construction.



**Figure 2-4.** This computer-generated rendering shows a large ranch house that combines simplified construction and minimal maintenance. (Helmuth A. Geiser, Member AIBD)

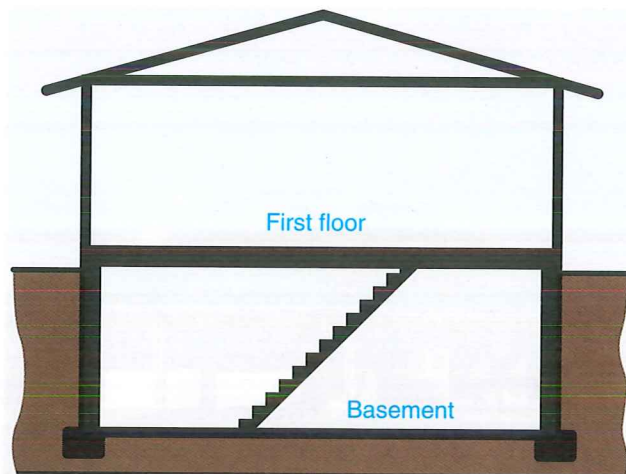
Another negative aspect of the ranch is that it requires a larger lot, since it spreads out rather than up. Furthermore, the large “foot-print” sometimes causes heating problems for certain areas of the house because of the distance from the furnace. There is generally

no problem with electric heat. However, electric heat may be more expensive to operate than gas or oil.

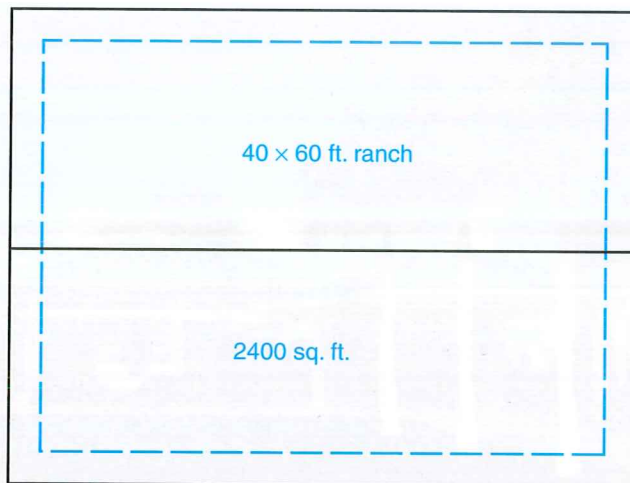
Maintenance costs may be more on a ranch because of the large roof and exterior wall surfaces, Figure 2-10. Considerable hall space



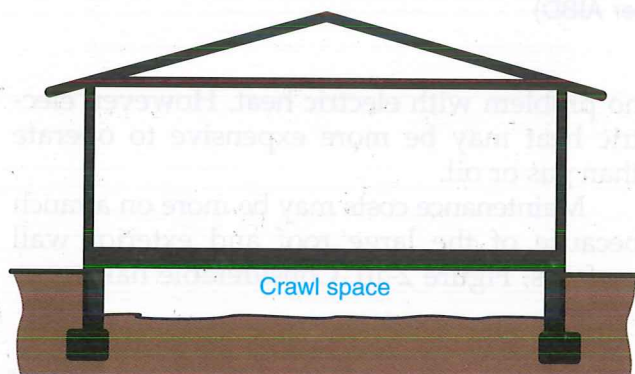
**Figure 2-5.** The low, long design of this ranch home in Florida is attractive to most people.



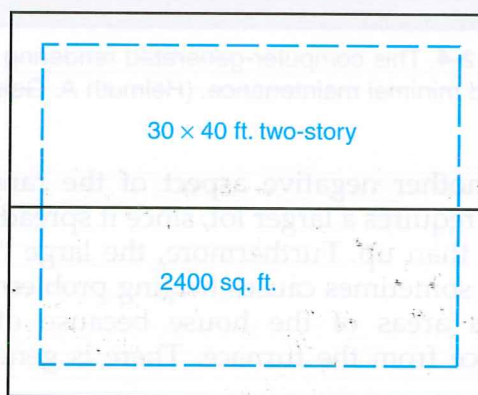
**Figure 2-6.** Including a full basement in the design adds valuable usable space to a ranch house.



**Foundation length = 200 ft.  
Roof area = Between 2600 and 2800 sq. ft.**

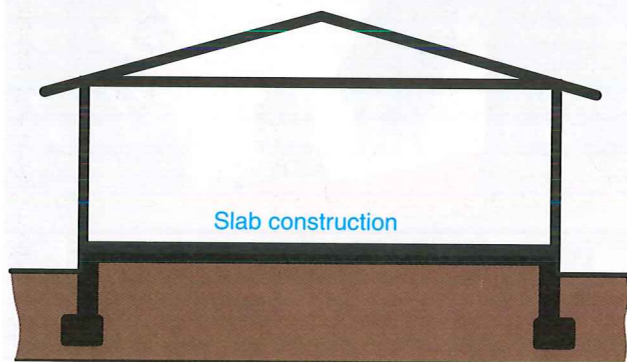


**Figure 2-7.** A crawl space under a ranch house adds accessibility for service and maintenance.



**Foundation length = 140 ft.  
Roof area = Approximately 1300 sq. ft.**

**Figure 2-9.** A comparison of the foundation length and roof area of a ranch and a two-story house having the same square footage of living area reveals why a ranch is usually more expensive to build.



**Figure 2-8.** A ranch design with a concrete slab floor reduces cost and simplifies construction.



**Figure 2-10.** This spacious ranch house has extensive roof and wall areas that may produce maintenance problems.

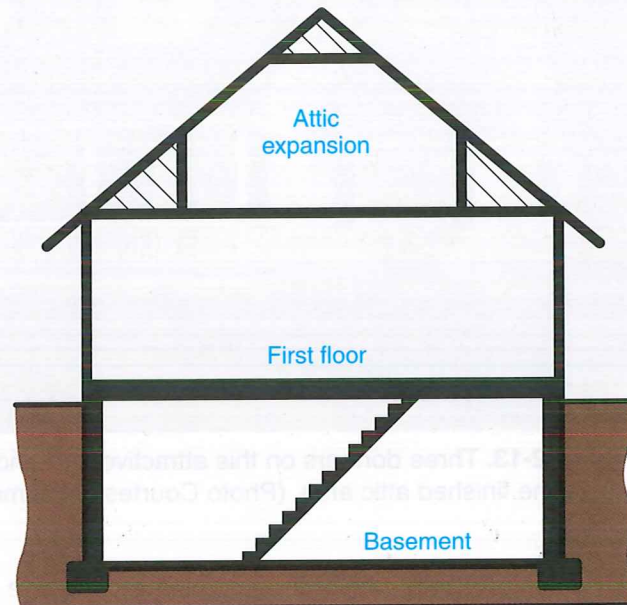
may be required in a large ranch style house to provide access to all rooms, Figure 2-11. Careful planning should be done to keep hall space to a minimum.

## One-and-One-Half-Story Designs

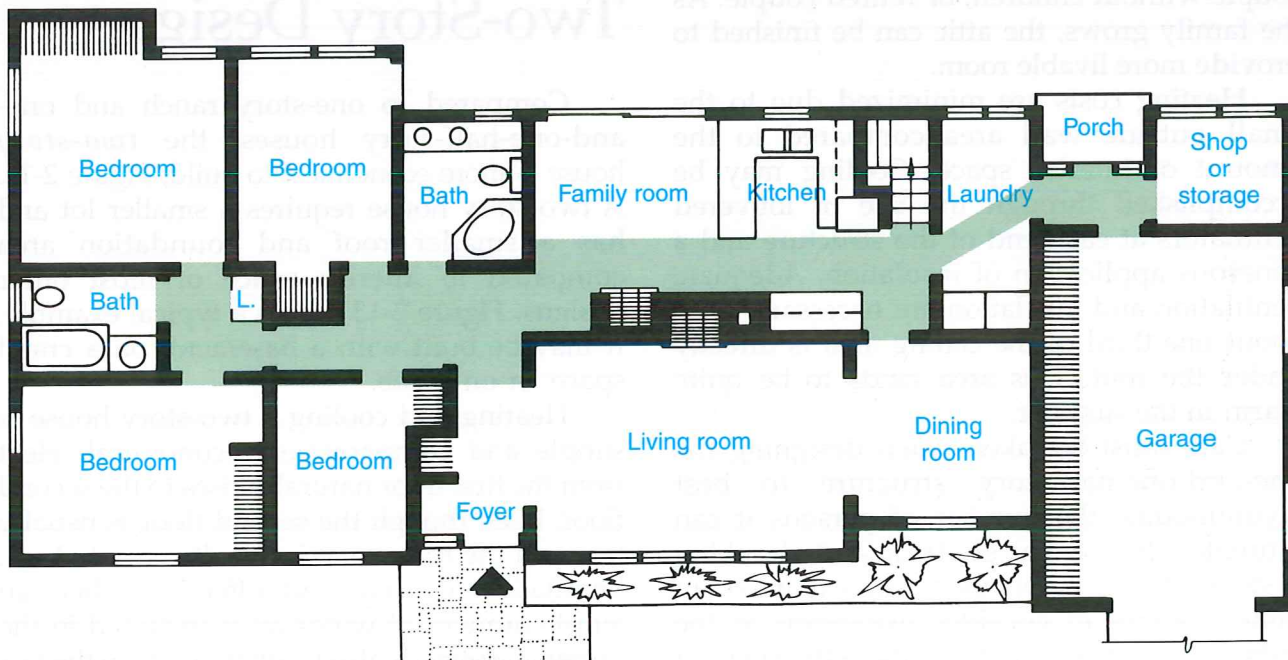
The *one-and-one-half-story* style house, sometimes called a Cape Cod, is essentially a one-story ranch with a steeper roof that allows for expansion of the attic, Figure 2-12. Dormers are usually added to provide additional light and ventilation in the attic space, Figure 2-13. A one-and-one-half-story house has two distinct advantages. The cost per unit of habitable living space is low. Also, there is built-in expandability since the attic space can be, and often is, finished.

When the attic space is finished, it generally contains bedrooms and a bath. Since any space with less than five feet of headroom is considered unusable, the total square footage in the attic is about one-half that of the first floor. Notice the unused side portions of the attic in Figure 2-12.

Dormers, stairs, and a slightly steeper roof are the principal sources of the additional costs required to build a one-and-one-half-story house over a one-story house. Additional costs will also be incurred if the design is adapted for disabled-accessible housing.



**Figure 2-12.** A section view of a typical one-and-one-half-story house with a basement.



**Figure 2-11.** An excessive amount of hall space is required to make this ranch design serviceable. Better planning is desirable.



**Figure 2-13.** Three dormers on this attractive one-and-one-half-story house provide natural light and ventilation to the finished attic area. (Photo Courtesy of James Hardie® Siding Products)

The one-and-one-half-story design is quite versatile. It can be constructed as a two-bedroom, one-bath house with the upper area left unfinished. This “minimal” house will meet the needs of a single person, married couple without children, or retired couple. As the family grows, the attic can be finished to provide more livable room.

Heating costs are minimized due to the small outside wall area compared to the amount of interior space. Cooling may be accomplished through the use of louvered ventilators at each end of the structure and a generous application of insulation. Adequate ventilation and insulation are necessary since about one-third of the ceiling area is directly under the roof. This area tends to be quite warm in the summer.

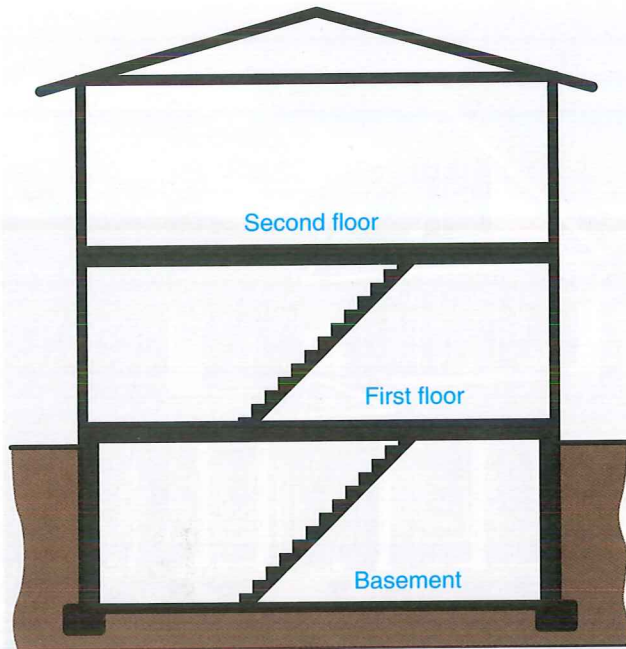
Care must be taken when designing the one-and-one-half-story structure to best accommodate the number of persons it can ultimately house. The electrical and plumbing systems should be planned with expansion in mind. Failure to consider expansion at the outset can greatly reduce the efficiency of these systems after expansion or may prevent the expansion all together. Other areas of the

house, such as the kitchen, dining, and living rooms, should also be planned for the maximum number of occupants.

## Two-Story Designs

Compared to one-story ranch and one-and-one-half-story houses, the *two-story* house is more economical to build, Figure 2-14. A two-story house requires a smaller lot and has a smaller roof and foundation area compared to interior space of most other designs. Figure 2-15 shows a typical example. It may be built with a basement, on a crawl space, or on a slab.

Heating and cooling a two-story house is simple and comparatively economical. Heat from the first floor naturally rises to the second floor. Even though the second floor is usually far from the furnace, it is usually easy to heat. Ventilation is easy and effective when an ample number of windows is included in the design. Cooling is also facilitated due to the fact that the ceiling is not directly under the roof, rather under an attic space.



**Figure 2-14.** A section view of a typical two-story house.

In many areas, the two-story design is not as popular today as it was in the past, Figure 2-16. This is probably a result of the turn to more contemporary styles and the readily available inexpensive land in these areas. Two-story houses built in an ornate traditional style may appear to be out of place unless located among other similar styles, Figure 2-17. On the other hand, in some areas of the country, almost all new houses are an updated version of the traditional two-story design, Figure 2-18.



**Figure 2-15.** This attractive two-story house will fit comfortably on a narrow lot.



**Figure 2-16.** Two-story houses like this one were once very common throughout the midwestern states. Modern variations are still popular in some areas. (Shouldice)



**Figure 2-17.** This house is an ornate traditional two-story house often found in the southern states.



**Figure 2-18.** The basic two-story house takes on a contemporary appearance with an overhanging porch roof, dormers, and a small room addition. (Photo Courtesy of James Hardie® Siding Products)

General exterior maintenance is usually more difficult and costly for a two-story house because of the height. For some people, the necessity of climbing stairs from level to level is considered a disadvantage. However, some styles may be adapted to include a stairway lift or elevator to provide greater accessibility. The two-story does not lend itself to variations in style as well as some other designs. However, architects have added a contemporary flair and, as a result, have improved the overall appearance and demand for two-story homes.

## Split-Level Designs

The *split-level* was conceived to solve the problems presented by a sloping or hilly lot. It takes advantage of what might otherwise prove to be a troublesome difference in elevation, Figure 2-19. As a general rule, a split-level should not be built on a flat lot. Mounding up soil in front of the high section to give the appearance of a hill usually yields poor results.



**Figure 2-19.** This contemporary split-level house is well integrated within a steep hill on the site. (Cultured Stone by Stucco Stone Products, Inc.)

A split-level makes efficient use of space. The general arrangement of the split-level separates sleeping, living, and recreation areas on different levels, Figure 2-20. Little or no hall space is required in a split-level house due to its basic design. This is a positive factor to consider when selecting a house design.





Figure 2-20. This split-level house illustrates a standard arrangement of living quarters.

At the lowest level, there may be a basement that houses the heating and cooling equipment, storage, and perhaps a shop or washroom, Figure 2-21. This area is the usual depth of a basement on a ranch house. The basement "footprint" is about 40 to 60 percent of the house "footprint." This is usually enough for efficient use without wasted space.

In some instances, a basement may not be desired. In these cases, a crawl space is provided for maintenance and ventilation.

The next level up from the basement is the *intermediate level*. It generally houses the garage and recreation area, Figure 2-21. This area is ground level and thus lends itself to these functions. Patios and terraces may be

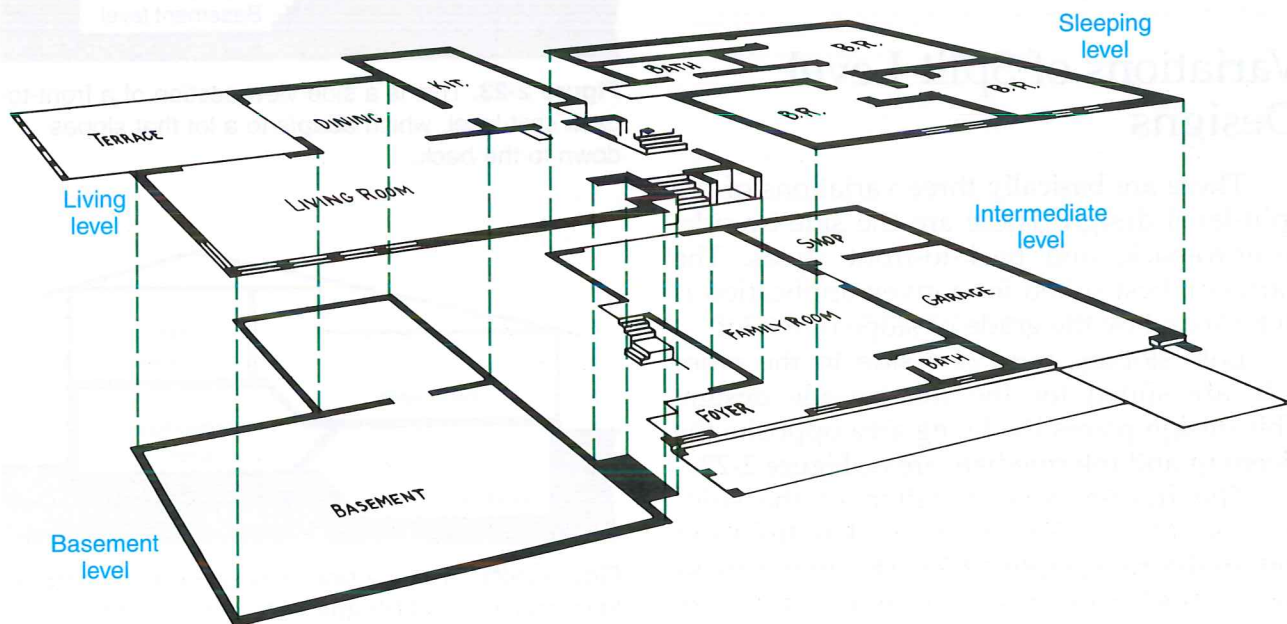


Figure 2-21. This three-dimensional drawing shows the arrangement of the four levels in a split-level house.

attached to the recreation area that further enhances its use. The intermediate level may also have a large foyer, mud room, or family room.

Slightly higher than the intermediate level is the *living level*, Figure 2-21. Generally, this area is located at ground level also; the sloping grade makes this arrangement possible. The kitchen, dining room, living room, and a full or half bathroom are normally located on the living level. The foyer, mud room, and wash-room may also be located at this level, depending on the layout or preference.

At the highest elevation in the house is the *sleeping level*. This area contains the bedrooms and one or two bathrooms, Figure 2-21. The half-level difference between the living and sleeping levels affords greater privacy and quietness.

Split-level houses do have some negative aspects. They are generally more expensive to build than a two-story house. In most cases, however, they are cheaper than a ranch. Heating may be a problem if not handled properly. The use of zoned heating will usually solve the heating problem. This method of heating uses separate thermostats for various areas or “zones” of the house. Providing access to the different levels for an older or handicapped person can be a costly and difficult problem associated with a split-level house.

## Variations of Split-Level Designs

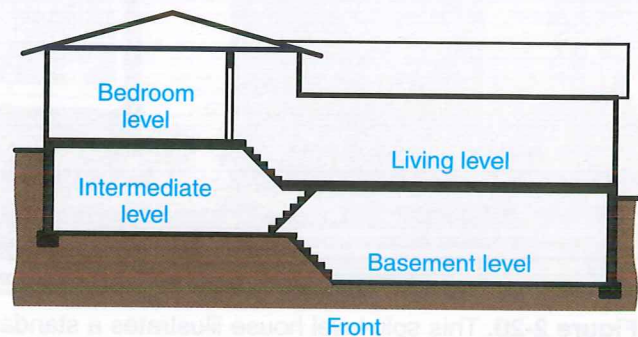
There are basically three variations of the split-level design. These are the side-by-side, front-to-back, and back-to-front styles. The variation best suited for a given application is determined by the grade or slope of the lot.

Lots sloping from one side to the other side are suited for the side-by-side design. This design places the living area opposite the sleeping and intermediate areas, Figure 2-22.

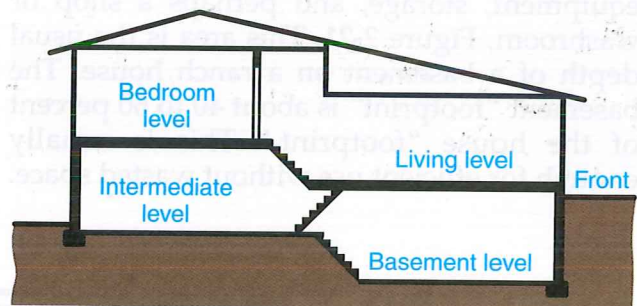
The front-to-back variation of the split-level is suited for lots that are high in front and low in the back, Figure 2-23. This house looks like a ranch from the front and a two-story from the rear. The living area faces the street

and the bedrooms are on the second level to the rear.

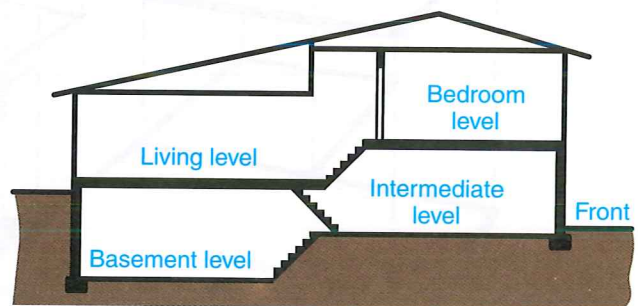
The back-to-front variation of the split-level requires a lot that is low in front and high in back, Figure 2-24. The intermediate level faces the street at grade. The bedrooms are above and also face the street. The living level is at the rear. This model looks like a two-story in front and ranch in the rear.



**Figure 2-22.** This is a front view section of a side-by-side split-level house.



**Figure 2-23.** This is a side view section of a front-to-back split-level, which adapts to a lot that slopes down to the back.



**Figure 2-24.** This is a side view section of a back-to-front split-level, which adapts to a lot that slopes down to the front.

Figure 2-25 shows another style that is often called a split-level. However, this is nothing more than a ranch with a raised basement, which causes it to be taller than a ranch yet not as tall as a two-story. It has a split entry where the foyer is halfway between levels. This is probably the reason for it being identified as a split-level. This house is perhaps better called a split-entry house.

## Traffic Circulation

A primary consideration in designing a functional plan is traffic circulation. *Traffic circulation* is the movement of people from

one area or room to another. Circulation must be planned for maximum efficiency of movement. Travel should be short and, if possible, not pass through other rooms. The pattern shown in Figure 2-26 is an example of a well-planned arrangement. The distance from the garage to the kitchen is short and direct. The foyer is centrally located and convenient to all parts of the house. All bedrooms are close to a bath. This design has few rooms with traffic patterns through them. The family room and eating nook are exceptions. An analysis should be made of traffic circulation to determine if the plan is as functional as it could be. Frequently, a slight change in the floor plan can smooth the flow of traffic to desired locations.



**Figure 2-25.** This simple design has a split entry to take advantage of a raised basement to add height and better lighting. (Aside)

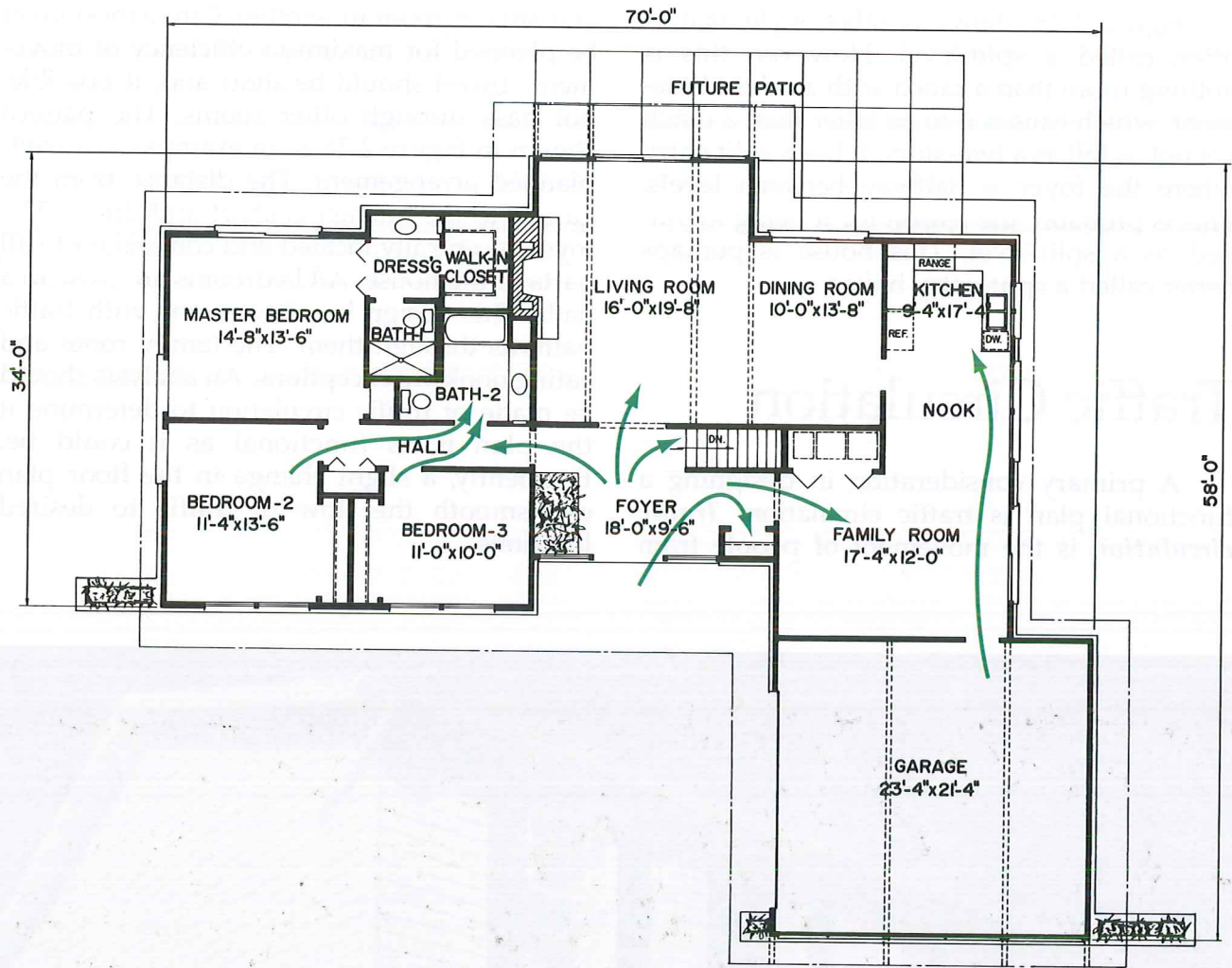


Figure 2-26. This is well-planned traffic circulation through the major living areas of a home.

## Internet Resources

www.boralbricks.com

*Boral Bricks*

www.buildsoft.com

*Buildsoft Construction Scheduling and Estimating Software*

www.designgroupstudio.com

*Eric Brown Design Group, designers of The Palladian Design Collection*

www.gp.com/build/index.html

*Georgia Pacific Corporation, supplier of building products*

www.masonite.com

*Masonite International Corporation, a door manufacturer*

www.meltonclassics.com

*Melton Classics, Inc., a producer of millwork*

www.owenscorning.com

*Owens Corning*

www.reynoldsbp.com

*Reynolds Building Products*

www.softplan.com

*SoftPlan Architectural Design Software*

www.studerdesigns.com

*Studer Residential Designs*

## Review Questions — Chapter 2

Write your answers on a separate sheet of paper. Do not write in this book.

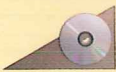
- List the four basic residential home designs.
- Identify five advantages of the ranch-style house.
- List five disadvantages of the ranch-style house.
- A one-and-one-half-story house can be recognized by its \_\_\_\_\_, which often has \_\_\_\_\_ to allow light into the attic.
- The one-and-one-half-story house has two distinct advantages— \_\_\_\_\_ and \_\_\_\_\_.
- One of the most economical houses to build is a \_\_\_\_\_ design.
- List three negative aspects of the two-story house.
- The \_\_\_\_\_ design was developed to solve the problem of a sloping or hilly lot.

- Name the four levels of the split-level design.
- List three variations of the split-level.
- Why are dormers usually added to the one-and-one-half-story house?
- In a split-level house, the basement “footprint” usually equals what percentage of the house “footprint”?
  - 10 to 20 percent.
  - 20 to 40 percent.
  - 40 to 60 percent.
  - 60 to 80 percent.
- Which house design variation looks like a two-story from the front and a ranch from the rear?
- Traffic circulation must be planned for maximum efficiency of \_\_\_\_\_.

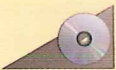
## Suggested Activities

- Look through magazines and find a photo of each of the basic house designs (one-story, one-and-one-half-story, two-story, and split-level). Make color copies of the photos and mount the copies on illustration board for display.
- Identify houses in or near your community that are examples of the basic house designs. Make a sketch of the house. Write descriptions of the materials used, colors, and location of each house.
- Obtain a floor plan of a house from a magazine, newspaper, or other source. Determine the basic design and compile the following information about the house.
  - How many square feet of living space is in the house?
  - List the rooms identified in the house.
  - How many sets of stairs are there in the house?
  - Does the house have a basement, crawl space, or slab?
- Visit a contractor or architectural firm and ask for prints of basic house designs. Bring these to class and discuss the advantages and disadvantages of each in respect to the families of different members of the class.

5. Invite an architect to your class to discuss how basic house designs are selected for various areas of your community.
6. Prepare a simple sketch of your own home showing the various levels for living and the contour of the property. Indicate what basic design your house resembles. If you live in a duplex, indicate which wall is shared and attempt to sketch the floor plan of the adjoining residence. If you live in an apartment or townhouse, sketch the home of a neighbor or friend.
7. Using your local newspaper for reference, read through the "houses for sale" section and make a list of the styles advertised. See if there seems to be a trend toward a particular basic design.



8. Using a computer-aided drafting and design (CADD) system, draw the floor plan shown in Figure 2-26 using single lines. Draw simplified doors and windows, as described by your instructor.



9. Using a computer-aided drafting and design (CADD) system, draw a top view of the floor plan pictorial shown in Figure 2-21 using single lines. If your CADD system supports layers, place each level on a different layer. Draw simplified doors and windows, as described by your instructor.